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STUDIES ON THE GENUS TRYPOXYLON LATREILLE OF THE ORIENTAL AND AUSTRALIAN REGIONS (HYMENOPTERA, SPHECIDAE)

III. SPECIES FROM THE INDIAN SUBCONTINENT INCLUDING SOUTHEAST ASIA

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STUDIES ON THE GENUS TRYPOXYLON LATREILLE OF THE ORIENTAL AND AUSTRALIAN REGIONS (HYMENOPTERA SPHECIDAE)

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S y n o p s i s

129 species including 8 subspecies are recorded, of which 103 species and 6 subspecies are new to science (see index). Trypoxylon bicolor s. Tsuneki, 1978 is separated into 2 species, T. bicolor Smith, 1856 s.str and T. petiolatum Smith, 1857, basing mainly upon the structural character of the male genital organs. Local variations are especially treated on T. errans Saussure, 1867, T. bicolor Smith and T. petiolatum Smith, within the range concerned here. In connection with the subspecies of T. fronticorne Gussakovskij, 1936 the Japanese race of this specis hitherto known as a subspecies of T. pennsylvanicum Saussure, 1867, is reinvestigated, together with the nominate species and the relationships between the Eurasian and the North American species are made clear.

The present Part deals with the representatives of the Indian Subcontinent and some Islands of the Indian Ocean, including Pakistan, Kashmir, India, Sri Lanka, the Seychelles, the Maldives, the Chagos, Nepal, Assam, Burma, Malaya, Singapore, Thailand, Cambodia, Viet-Nam and Laos.

Stress is placed maily on the detailed and acculate descriptions of the species newly discovered and supraspecific classification is reserved. For this purpose the male genital organs and sternite 8 of all the species are examined and illustrated, as far as possible. To describe other important characters such as supraclypeal structure and clypeus as many figures as possible are used, because a simple description, e. g. "apical margin of clypeus bidentate in middle" can involve various different features and of no use for the strict identification. However, the figures of the head, frontal, dorsal and lateral views, although they are certainly preferable, are dispensed with, because to draw correctly one of them over 15 measurements are necessary and too time consuming a work to me to whom the time left is already limited. On the other hand, in the group such as the genus treated here in which many closely allied species are involved and will be found in future, it is necessary to identify a specimen to use many characters and to examine the correlative relations among them. In order to approach this a set of measurable characters are selected and the values obtained are arranged in simple formulae. This is to abbreviate the description and to make easy the comparison. Many abbreviations of the terms are employed to enable this, most of which are, however, the same as those used in the preceding Parts.

Notwithstanding, there are considerable problems regarding the classification, identification and sex combination of the species that are determined provisionally or with a query in the present paper. Some of the problems, however, may be solved during the course of the subsequent studies on the materaal from other localities.

ABBREVIATIONS

A1, A2 and so on ... Antennal joint 1, Antennal joint 2 ...
A1-A5 ... from A1 to A5
ASR ... Antennal socket rim (raised upper part of rim of antennal socket)
AW ... Apical width or Width at apex (always maximum width in lateral view - A3 -)
BW ... Basal width or Width at base (ditto, in case of A13)
CV1, CV2 ... Abscissa 1 of cubital vein, Abscissa 2 of cubital vein
G1, G2 and so on ... Gastral segment 1 (=petiole), Gastral segment 2 and so on
GSR ... Gastral socket rim, really the dorsal rim of socket of lifting muscle of gaster (sometimes simple and not raised, frequently highly roundly raised)
HL ... Head length at inner orbit in dorsal view (not in middle where particularly longer due to SAT)
HW ... Head width in dorsal view
IOD ... Interocular distance or distance between eyes
IODc ... minimum IOD at about base of Clypeus (frontal view)
IODv ... minimum IOD at vertex (dorsal view)
IODs ... ratio of IODv to IODc, namely IODv/IODc
L/W ... ratio of Length to Width
Ma ... Maximum width (in case of petiole, dorsal view)
Mi ... Minimum width (ditto)
2(Ma), 3(Ma) ... Length of G2 (Maximum width of G2), ditto of G3
OOD (or OD) ... Ocellocular distance, namely the distance between inner margin of eye and outer margin of hind ocellus
Od ... Ocellar diameter (transversely measured)
P ... Petiole, = G1
PAF ... Post antennal furrow, transverse or oblique furrow between ASR and SAT
PD ... Puncture diameter (see also POD)
PIS ... Puncture interspace
POD ... Postocellar distance, distance between inner margins of hind ocelli (reabbreviated as PD in case of Table)
RC ... Radial cell of fore wing
Rl ... apical produced part of Rl beyond the meeting point with Rs, often very long
SAT ... Supraantennal tubercle, nasiform or tuberiform, characteristic to species
TCV ... Transverse cubital vein
T1, T2 and so on ... tarsal joint 1 and 2 ... T1 = metatarsus

FORMULAE

Formulae always show the relative length: HW,HL,A3,A13,P= measured under the standard of HW as 100, P,Ma,Mi,2(Ma),3(Ma)= measured under the standard of P as 100, OOD,Od,POD= (or ÷ .. nearly equal), IODs=, A3=AWx, B13=BWx, G1=AW(or Ma)x, CV1=CV2x, TCV:CV2=, A3,4,5= under the scale of A3 as 10.

Some special terms

Pronotal lamina ... Process on side of pronotum (apparent propleura), just above the prosternal tubercle, sometimes toothed, sometimes angulated and often rounded.
Area apicalis ... The area just above GSR, sometimes distinctly enclosed with carina.
M-type, B-type and C-type of radial cell ... see Part II, p. 3.

On the KEY TO THE SPECIES

1. Easily observable characters are utilized as far as possible.
2. When a character is variable and fit for both of the couplet the species is put under both of the branches.
3. When a character is intermediate between the couplets try to follow both of them before determing the specimen as undescribed from the Region, because the character may be a variable one.
4. The specimens used in the present study are mostly the long preserved ones and sometimes considered markedly changed in colour. Take into consideration the fact in regard to the brown antenna, leg and gaster.
5. Notice especially that AW of A3 is measured always from the widest side, not always in dorsal view.
6. Length of gastral petiole (or P or G1) is the total length, measured from the extreme base of basal condyle to the apex.

KEY TO THE SPECIES

not included: tomi

* Frons with shield-shaped enclosure, sometimes lateral carinae of the enclosure indistinct (see Part I of the present paper)

\- Frons without the enclosure 1

1 Gastral petiole clavate, gradually widening apically, appr. as long as 2 following segments united or much shorter 2

\- Gastral petiole distinctly flask-shaped, with parallel-sided part anteriorly and apical swelling rather sudden, longer than 2 following segments united 68

2 Gastral segments 1, 2, 3 each with a fovea at apex in middle, rarely petiole without fovea (head thick, subquadrate in both dorsal and frontal view).. 3

\- Gastral segments 1, 2, 3 without fovea 15

3 Frons and mesoscutum strongly punctured, PIS smooth and shining, CV1 ≤ CV2 (clypeus black) 4

\- Frons and mesoscutum microcoriaceous and superimposed with fine punctures, half mat, CV1 = CV2×3–4 5

4 Antenna and legs normal, both wholly or largely black (sometimes fore and mid legs partly brown to ferruginous), widely spread over Oriental Region buddha Cameron, 1889, ♀

\- Antenna and fore leg markedly modified, both partly maculated with white buddha Cameron, 1889, ♂

5 Legs black, at most partly brown to ferruginous (petiole without fovea) ... 6

\- Legs broadly yellow, only partly brown or black 9

6 ♀ 7

\- ♂ 8

7 IODs≒10:3, clypeus: Fig. 3 (fore tarsus brownish, punctures on SAT comparatively finer), 8.5 mm, Malaya and Laos bifoveatum sp. nov.

\- IODs≒10:1, clypeus: Fig. 13 (Fore tibia and tarsus, sometimes also mid Tl brown to ferruginous, punctures on SAT comparatively large), 7–7.5 mm, Laos biputeolum sp. nov.

8 IODs≒10:3, A3=AW×1.5, A4–8 distinctly swollen out beneath, 9–10 excavated beneath (A13: Fig. 5 or 6, clypeus: Fig. 4, fore tibia and tarsus ferruginous, the former brown in front), 7 mm, Laos bifoveatum sp. nov.

\- IODs≒10:2, A3=AW×2.3, flagellar joints not swollen out beneath, A9–10 not excavated (A13: Fig. 15, clypeus: Fig. 14, fore tibia and tarsus sometimes pale brown), 7–7.5 mm, Laos biputeolum sp. nov.

9 ♀ 10

\- ♂ 13

10 Petiole without fovea, those on G2 and 3 very feeble, only hardly defined, SAT nasiform (fore leg except arolium, mid leg till middle of Tl ambur yellow, hind leg broddly ferruginous, gaster ambur yellow, partly variegated with brown, IODs=10:4.5, OOD:POD≒1:4, A3,4,5=10,7,7, CV1≒CV2×4, clypeus: Fig. 22, area dorsalis enclosed with furrow, distinctly raised, see also couplet 19), 7.5 mm, Laos gressitti sp. nov.

— G1,2,3 distinctly foveolate at apex, SAT flattened, smoothly connected with ASR, PAF inconspicuous 11

11 Fore and mid legs, except arolia, and hind trochanter completely yellow, propodeual sternite long and distinct, Rl longer than CV2 and reaching almost wing apex (IODs=10:3, medio-apical area of SAT obliquely inclined, A3=AW×3, A11 longer than width, clypeus: Fig. 26, apex broadly yellowish, bases of G2,3,4 distinctly reddish yellow), 7 mm, Laos flavipes sp. nov.

— Fore and mid legs and hind trochanter not completely yellow, propodeal sternite short, not conspicuous (Rl=CV2, not reaching wing apex (A11 as long as wide, bases of G2,3,4 somewhat ferruginous) 12

12 IODs≒3:1, apical margin of clypeus dark brown, medio-apical area of SAT perpendicularly falling to interantennal area, A3,4,5 equal in length (legs black, knees, fore and mid tibiae with apical spurs, fore tarsus, mid Tl and base of hind tibia yellow, area dorsalis transversely finely closely striate) 7–8 mm, Laos maculipes sp. nov.

— IODs≒2:1, apical margin of clypeus broadly yellowish, medio-apical area of SAT obliquely inclined, A3,4,5=10,7,6.5 (legs and area dorsalis similar) 7.5 mm, South India indianum sp. nov.

13 Gastral petiole without fovea, comparatively short, =AW×3, head beneath,

underside of fore coxa, trochanter and femur densely covered with long pubescence (microsculpture on mesoscutum very weak, R1 markedly long, reaching wing apex, IODs≒10:2, clypeus: Fig. 50, A3≒AW×3, A8-13: Fig. 50, sternite 6 with a pair of hair-tufts before apex, fore and mid legs, except brownish underside of both femora and whole of mid tarsus, and hind tibia at base yellow), 6 mm, Singapore singaporense sp. nov.

— Gastral petiole with fovea, >AW×4, head beneath and underside of fore leg without long pubescence (mesoscutum strongly microcoriaceous, with punctures large, R1 moderately long, not reaching wing apex, IODs≒2:1, A3=AW×1.5-1.7, A8, not A10, excavated at base beneath), 6-7.5 mm 14

14 Apical margin of SAT perpendicularly inclined to interantennal area, A1 and 2 only partly brownish beneath, clypeus narrowly dark brown at apical margin (A3=A2, A13: Fig. 31, distinctly longer than A11+12), Laos and Viet-Nam maculipes sp. nov.

— Medio-apical area of SAT obliquely inclined to interantennal area, A1 and 2 yellow beneath, clypeus broadly ferruginous at apex (A3 > A2, A13: Fig. 40, only slightly longer than A11+12), Laos suumi sp. nov.

15 Mesoscutum microcoriaceous or very finely and very closely punctured, mat or half mat 16

— Mesoscutum without microsculpture (at least 10× magnificaioon), smooth and shining (often with plumbeous shine) 63

16 Propodeum with lateral carinae 17

— Propodeum without lateral carinae 61

17 Gaster at least partly ferruginous or reddish above 18

— Gaster black, at most partly brownish beneath 45

18 SAT without carina on medial line, at most only with a shining spot (SAT not nasiform) 19

— SAT with a medial carina, or stoutly keeled as a whole 21

19 Body remarkably slender, petiole =AW×6 (Gaster and legs largely ambur yellow, IODs=10:4.5, A3≒AW×2.7, OOD:POD≒1:4, clypeus: Fig. 22, apical half ambur yellow, area dorsalis margined with furrow, distinctly elevated, CV1=CV2×4, G2 and 3 each with a very feeble fovea at apex in middle, see also couplet 10), 7.5 mm, Laos gressitti sp. nov., ♀

— Body not so slender, petiole not so long 20

20 Length 8-9 mm, SAT roundly tuberculate, fairly high, PAF present, shallow and up-curved (clypeus acutely bidentate at apex in middle, IODs=10:9, A3,4,5 subequal in length, A3≒AW×2, area dorsalis weakly margined with furrow, gaster and legs largely ferruginous), Assam and Malaya fletcheri Turner, ♀

— Length about 5 mm, SAT low tuberiform, nearly flattened, PAF absent (clypeus: Fig. 60, IODs=10:7, A3,4,5≒10,6,6, A13 slightly longer than A11+12, area dorsalis distinctly enclosed with furrow, gaster dark red, basally and apically black, fore and mid legs partly ferruginous, hind leg wholly brown) Malaya maai sp. nov., ♂

21 SAT flattened, antero-laterally fused to ASR, without PAF, medianly highly and acutely carinated, carina enlarged upwards to frontal elevation (Fig. 66) (clypeus: Fig. 68, IODs≒10:6, A3,4,5=10,7,7, A3=AW×3.5, gaster ferruginous, posteriorly brownish, fore and mid legs largely, hind leg partly ferruginous), 8-9 mm, Malaya and Laos kedah sp. nov., ♀

— SAT nasiform 22

22 Gaster with last 2 segments only ferruginous red (head in frontal view roundly convergent below, OOD:POD=1:2, SAT fairly high nasiform, frontal furrow weak but distinct) 23

— Other part of gaster, at least partly, ferruginous or red 24

23 IODs≒5:3, clypeus: Fig. 73, A3=AW×3.5, A12 normal (trochanters brown to whitish, SAT on anterior margin carinate - Fig. 69 - , RC B-type), 10 mm, South India rubrocaudatum sp. nov., ♀

— IODs=5:4, clypeus: Fig. 75, A3=AW×2.7, A13 thick and large, =A9+10+11+12 (trochanters black, fore tibia and tarsus ferruginous, mid tibia and tarsus brown, SAT-ASR similar), 7 mm, South India rubrocaudatum sp. nov., ♂

24 SAT high nasiform (narrow and keel-like as a whole) 25

— SAT low to moderately high nasiform 32

25 ♀ 26

— ♂ (SAT with a deep excavation on each side of its anterior part) 31

26 All trochanters ferruginous or ambur yellow 27

— Trochanters more or less, at least some of them partly, brown or black (petiole black above) 29

27 Petiole except apical part black, clypeus till apical margin dark brown

or black, SAT on each side of apical part just behind transverse carina deeply excavated (Fig. 89) (clypeus: Fig. 88, IODs=2:1, A3=AW×3.5, G2–4 ferruginous, 5–6 variable in colour, legs black or brown and variegated with ferruginous yellow), 12–13 mm, South India nilgiriense sp. nov.

— Petiole ferruginous, clypeus on apical marginal area brown to ferruginous, SAT not excavated on each side behind ASR 28

28 SAT high narrow nasiform, apical margin transversely distinctly carinated, seen to see through PAF as in Fig. 82 (IODs=5:3, clypeus: Fig. 85, A3=Aw×3.7, gaster ferruginous, sometimes posteriorly dark, fore and mid legs largely, hind leg partly ferruginous), 8–10 mm, Malaya nasutum sp. nov.

— SAT comparatively low broad nasiform, apical margin not carinate, seen to see through PAF: Fig. 86 (IODs=2:1, clypeus typically: Fig. 87, A3=AW×3–3.5, coloration similar), 7–8 mm, Malaya malayanum sp. nov.

29 SAT on each side of anterior part and behind transverse carina deeply excavated, clypeus strongly produced anteriorly (Fig. 100) (IODs=5:3, A3=AW×3.5, OOD:POD=1:3, area dorsalis enclosed with furrow, all trochanters black, mid T1 at base whitish, gaster from apex of petiole to base of G4 reddish, often with blackish marks above, fore tibia and tarsus largely and bases of mid and hind tibiae more or less ferruginous), 10–12 mm, Northern Highland of India punjabense sp. nov.

— SAT without excavation on sides, clypeus not so strongly produced anteriorly (apical margin of clypeus bluntly bidentate in middle) 30

30 Length 12–13 mm, mid and hind trochanters ferruginous, clypeus: Fig.97, (IODs=3:2, A3=AW×4, area dorsalis enclosed with furrow, dorsal side of petiole except apex always black, rest of gaster wholly ferruginous, often posteriorly blackish, fore and mid tibiae, hind tibia at base and fore tarsus brown to pale brown), India trochanteratum Cameron

— Length 7–9 mm, mid and hind trochaters more or less brown or dark brown clypeus: Fig. 84 (IODs=2:1, A3=AW×3.5, area dorsalis with lateral furrows, gaster and legs markedly variable in colouration), Malaya, Assam, Laos pendleburyi sp. nov.

31 Head in frontal view subquadrate, antenna without excavation beneath, smoothly incrassate apically (IODs=10:9, A3=AW×3, A13=A9–12 united, apical margin of clypeus: Fig. 90, G2–5 each at base and apex and whole of 6 and 7 brownish red, fore and mid tibiae, fore tarsus and mid T1 ferruginous), 7.5 mm, South India nilgiriense sp. nov.

— Head in frontal view roundly convergent below, A6 distinctly excavated beneath and produced at apex, thence apically joints thickened (IODs=5:4, A3=AW×2.7, A13 slightly shorter than A9–12 united, but longer than A10–12, clypeus: Fig. 101, gaster from apex of petiole to apex of G4 ferruginous red, tibiae and tarsi of fore and mid legs ferruginous), 9 mm, North India punjabense sp. nov.

32 ♀ 33

— ♂ 43

33 Legs markedly slender and long (hind tibia longer than HW – 5/4 –, mid T1 longer than half HW, petiole also slender, =Ma×6, IODs=5:2, clypeus: Fig. 109, A3=AW×3.5, gaster and legs honey yellow, G6 largely black, mid tarsus apically and hind tibia and tarsus largely brown), 8 mm, laos longipes sp. nov.

— Legs not so long (hind tibia in length less than HW, mid T1 shorter than half HW) 34

34 IODs=5:4, gaster black, with a pair of ferruginous marks at base of G3 (antenna and legs brown, but fore leg largely and mid and hind legs partly pale yellowish, head in frontal view roundly convergent below, A3=AW×3.5, A3,4,5=10,9,8, clypeus triangularly produced anteriorly), 6 mm, India testaceicorne Cameron

— IODs=3:2 – 2:1, gaster not maculated as such 35

35 Gastral petiole largely black above 36

— Gastral petiole wholly or largely ferruginous 40

36 IODs=3:2, clypeus with apical margin simply rounded out, without medial protuberance, trochanters honey yellow and broadly maculated with brown (rest of gaster ferruginous, posteriorly more or less brown, fore and mid legs largely, hind leg partly ferruginous, rest of legs brown, A3=AW×3, OOD very narrow), 10 mm, Laos truncatum sp. nov.

— IODs=2:1, clypeus at apical margin medianly produced, trochanters completely honey yellow 37

37 SAT without anterior transverse carina (Fig. 125), medial protuberance of apical margin of clypeus large, without incision in middle (Fig. 126) (gaster from apical area of petiole posteriorly completely ferruginous red, fore and mid legs, except bases of coxae, wholly or largely and hind leg partly ferruginous, area dorsalis enclosed with fine deep furrow, IODs≒2:1, OOD: POD=1:3, A3≒AW×4, RC C-type), 8 mm, Laos ferrugatum sp. nov.

— SAT with anterior transverse carina, covering and fused into ASRs, medial protuberance of clypeus comparatively small 38

38 Al dark brown, paler beneath, clypeus with apical area black to dark brown, apical margin: Fig. 129, IODs=10:5 (head in frontal view subquadrate but with sides fairly rounded, OOD very narrow, fore and mid legs largely brown, gaster from apex of petiole posteriorly red, with large blackish marks above), 8 mm, South India nathani sp. nov.

— Al ferruginous, apical margin of clypeus broadly ferruginous and different in form, IODs=10:4 (head in frontal view more distinctly quadrate, fore and mid legs largely ferruginous or yellow) 39

39 Apical margin of clypeus: Fig. 139, A3=AW×2.5, OOD,Od,POD≒1,4,3, bright parts of antenna and legs ferruginous (lateral carinae of propodeum on medial third distinct), 7 mm, Laos banvaneum sp. nov.

— Apical margin of clypeus: Fig. 133, A3=AW×3.7, OOD,Od,POD≒1,6,3, bright part of antenna and legs cream yellow (lateral carina of propodeum very weak, in some light very obscure) undatum sp. nov.

40 Clypeus without medio-apical protuberance, simply rounded out at apex, scutellum nearly as long as wide, propodeum with a marked elevation at base, similar in form and elevation to postscutellum, but slightly larger than this, (area dorsalis distinctly margined with deep furrow, medial excavation markedly broad, finely and closely striated, legs wholly ferruginous, IODs=10:5, SAT: Figs. 134-136, without anterior transverse carina, clypeus: Fig. 137, A3=AW×3.5, OOD very narrow), 8 mm, Laos curvicorne sp. nov.

— Clypeus with medio-apical prominence or triangularly produced as a whole, scutellum distinctly wider than long, postscutellum and basal elevttion of propodeum much wider and narrower than in curvicorne, SAT with anterior transverse carina, gaster wholly ferruginous, often partly obscurely brownish) ... 41

41 Clypeus stoutly produced anteriorly (Fig. 153) (A3=AW×3.5, IODs=2:1, OOD: POD≒1:2, mid tibia ferruginous), 8 mm, Malaya pahangense sp. nov.

— Clypeus triangularly produced as in Figs. 148, 149 42

42 IODs=2:1, disc of clypeus roundly raised at base, not tectate, OOD:Od: POD=1:5:3, A3=AW×3.5, mid and hind legs largely ferruginous (gaster at most apical 3 segments brownish), 7-9 mm, Thailand and Laos ferrugineum sp. nov.

— IODs=5:3, disc of clypeus distinctly tectate till apical margin, OOD:Od, POD=1,2,2, A3=AW×3.8, mid and hind legs broadly dark brown (gaster posteriorly broadly brown), 8 mm, Malaya pagdeni sp. nov.

43 Antenna: Figs. 114, 115, A13=A10+11+12, Clypeus: Fig. 112, fore and mid legs slightly modified (A13 long, parallel-sided, curved, twisted, truncate at apex and deeply excavated beneath, IODs=10:7, gaster and legs ferruginous, except petiole above, black bases of coxae and brown underside of hind femur) 10 mm, Laos truncatum sp. nov.

— Antenna different, A13=A9+10+11+12, apical margin of clypeus different in form, legs normal 44

44 Antenna: Figs. 138, 139, strongly curved at A9-10, A8-11 excavated beneath and A11 produced at apex, thence apically incrassate, clypeus: Fig.137 (IODs=10:5, gaster and legs ferruginous, but petiole largely black and posterior portion brownish, hind femur partly and hind tarsus nearly wholly brown) 7-7.5 mm, Laos curvicorne sp. nov.

— Antenna: Figs. 151, 152, A5 swollen out beneath, A6 excavated at base and produced at apex beneath, thence apically thickened, clypeus: Fig. 150, A3=AW×4, IODs=10:7, legs somewhat more broadly dark on femora, (gaster lacking), presumably 7 mm or so, Laos ferrugineum sp. nov.

45 Head thick, subquadrate in both dorsal and frontal views, gastral petiole short, at most only slightly longer than G2, in ♀ mandible with a tooth on inner margin near apex, in ♂ antenna 12-jointed 46

— Combined characters not as above 49

46 SAT flattened, extended to ASR into subquadrate plane, sides nearly longitudinally carinated (SAT without medial carina, clypeus - Fig. 172 - wider at base than long in middle - 7:6 -, disc strongly roundly elevated at base, supraclypeal area markedly depressed, IODs=4:3, A3=AW×1.7, OOD:POD≒2:3, area

dorsalis without lateral furrows, rarely with feeble ones, legs partly ferruginous), 6.5–7 mm, Laos — bishopi sp. nov., ♀

— SAT gently roundly raised, without lateral carinae 47

47 Propodeum with area dorsalis and sides smooth and polished (area dorsalis distinctly margined with furrow, median furrow broad and distinct, SAT medianly very shortly carinate, clypeus longer than wide at base, apical margin: Figs. 167–168, mesoscutum very finely and closely punctured, IODs=10:4, Rl very long, CV1=CV2×2.5, fore tibia and tarsus, mid tarsus and base of hind tibia ferruginous), 4–5 mm, Malaya — medipolitum sp. nov., ♀

— Propodeum with area dorsalis finely reticulate and with sides rugosostriate (IODc broader, Rl very short) 48

48 Antenna brown to dark brown above and ferruginous beneath, fore and mid tibiae ferruginous, SAT with a short medial carina on top (apical margin of clypeus medianly roundly produced, punctures on mesoscutum and sculpture on propodeum comparatively large or coarse), 5–6 mm, Ceylon, Bengal, Deesa — mandibulatum Richards

♀. Head in frontal view as long as wide, IODs=10:8, Al2 apically narrowly rounded, medio-apical prominence of clypeus with apex subtruncate, W:L of clypeus 10:8.

♂. Head in frontal view wider than long, IODs=10:6, Al2 apically acutely pointed, medio-apical prominence of clypeus rounded (Fig. 164), L:W=10:7.

— Antenna black above, fore and mid tibiae at base widely black, SAT with a fine impressed line medianly on top (apical margin of clypeus medianly bluntly bidentate, punctures on mesoscutum and sculptures on propodeum distinctly finer and more delicate), 5 mm or so, India, Viet-Nam and Laos — pygmaeum Cameron

♀. Head in frontal view as long as wide, IODs=10:7, Al2 with apex bluntly pointed, slightly bent, clypeus: Fig. 163, L:W=10:10.5.

♂. Head in frontal view slightly wider than long, IODs=10:6, Al2 with apex acutely pointed, more distinctly bent, clypeus: Fig. 155.

49 SAT a gentle rounded swelling, or nearly flattened 50

— SAT distinctly nasiform 51

50 Length 9–10 mm, PAF distinctly present, moderately deep, flat-bottomed (antenna in ♀ normal, A3=AW×2, in ♂ modified, A6–7 markedly excavated beneath and produced at apex of 7, in ♂ fore and mid tarsi also slightly modified, clypeus in both sexes medianly triangularly produced, with apex emarginate, legs in ♀ brown to dark brown, in ♂ partly ferruginous; fore and mid tibial spurs whitish, CV1≒CV2×2, area dorsalis with lateral furrows), India (Simla) — nodosicorne Turner

— Length 6–7 mm, PAF lacking or very shallow, anterior transverse carina of SAT forming overhang (A3=AW×1.3, Al3=A8–12 united, distinctly bent, legs brown to dark brown, all spurs whitish, clypeus bluntly bidentate at apex in middle, area dorsalis without lateral furrows, CV1≒CV2×3), Asia Minor, N. Iran (Europe and Siberia) — attenuatum Smith, ♂*

51 SAT high nasiform (sides acutely inclined, anterior margin carinated).... 52

— SAT low to moderately high nasiform (sides obliquely inclined) 55

52 ♀. SAT thick and stout (Figs. 173–174), with fine medial carina on top, with a small impression at its upper end, clypeus: Fig. 175, disc roundly raised (IODs=10:9, OOD:POD=2:3, A3=AW×2.7, CV1≒CV2×3, area dorsalis without lateral furrow, obliquely finely closely striate, black, mandible at apex brownish red, palpi and tarsi of legs dark brown), 9 mm, Nepal, Assam, N. India (Europe to Japan) — fronticorne Gussakovskij

— ♂. 53

53 Legs black, area dorsalis not enclosed with furrow, obliquely finely closely striate (clypeus: Fig. 176, A3=AW×1.3, IODs=4:3), 7–7.5 mm, Nepal, Assam, N. India — fronticorne Gussakovskij

Al3=BW×3.3, =A9–12 united, Assam — ssp. assamense ssp. nov.

Al3=BW×2.3, All+12, 10+11+12, N. India — ssp. brevicorne ssp. nov.

— Tibiae and tarsi of fore leg largely and of mid leg partly ferruginous, area dorsalis enclosed with furrow 54

54 A6 excavated at base beneath and produced at apex, thence apically flagellum thickened, clypeus: Fig. 183, SAT not stout keel-formed as a whole, not excavated on each side of apical part: Figs. 181, 182 (A3=AW×3.3, Al3=BW×2, bent at apex and ≒A9–12 united, IODs=10:8, OOD:POD=1:2), 6.5 mm, Malaya and Viet-Nam — sextum sp. nov.

— A6 very weakly indistinctly excavated at base beneath (Fig. 190), cly-

peus: Fig. 188, SAT stoutly narrowly keeled as a whole and deeply excavated on each side of anterior part: Figs. 191, 192 (A13<A10–12 united, A3=AW× 2.5, IODs=10:8, OOD:POD=3:5,, 7 mm, N. India himachalense sp. nov.

55 ♂ (antennal flagellum without excavation at any joint beneath) 56

— ♀ 57

56 Femora of legs black, A13=A11+12, IODs≒2:1, area dorsalis very weakly enclosed with the fine furrow (OOD:POD≒1:2, clypeus: Fig. 203, wholly black and disc tectate), 5 mm, Malaya parvulum sp. nov.

— Femora of legs largely honey yellow, A13≒A10+11+12, IODs=4:3, area dorsalis distinctly enclosed with fine furrow (OOD:POD≒1:2, clypeus: Fig. 210, anteriorly broadly ferruginous), 5.5 mm, Laos venustum sp. nov.

57 Mid and hind trochanters largely, fore trochanter partly and mid Tl whitish, clypeus with medio-apical protuberance markedly large: Fig. 73 (SAT-ASR: Figs. 69–72, IODs=5:3, OOD:POD=2:3, area dorsalis enclosed with furrow, CV1≒ CV2×4, caudal 2 segments obscurely reddish - see also couplet 23), 11 mm, S. India rubrocaudatum sp. nov.

— Trochanters brown to dark brown, medio-apical protuberance of clypeus not so large 58

58 Head in frontal view with sides distinctly convergent below, medio-apical protuberance of clypeus comparatively broad, with apex bilobate, fore tibia ferruginous in front, over 8 mm 59

— Head in frontal view subquadrate, medio-apical protuberance of clypeus small and triangular, apex minutely bidentate, less than 7 mm 60

59 SAT moderately high, with sides longitudinally deeply excavated (Figs. 195–197) (clypeus: Fig. 198, area dorsalis distinctly enclosed with furrow, disc and medial furrow transversely, sides of propodeum obliquely, strongly closely striate), 9 mm, N. India himachalense sp. nov.

— SAT low, with sides smooth, not excavated (clypeus: Fig. 218, area dorsalis with fine weak lateral furrows, very delicately transversely striate, sides of propodeum smooth and polished, only with some very faint striae), 8 mm, N. India and N. E. Burma brevicarinatum sp. nov.

60 Antenna robustly clavate, A3=AW×2.5, A7 as long as wide, IODs=5:2 (clypeus: Fig. 220, lateral furrows of area dorsalis weak and indistinct, only on basal part defined), 7 mm, Viet-Nam bidenticulatum sp. nov.

— Antenna slenderly clavate, A3=AW×3.3, A7 slightly longer than wide, IODs 2:1 (clypeus: Fig. 221, area dorsalis distinctly marked off with fine furrow) 6 mm, Malaya pusillum sp. nov.

61 Wholly black except mandible and palpi (IODs=5:4, OOD:POD=1:2, A3=AW×2.3, clypeus: Fig. 223, SAT anteriorly with 4 elongated foveae - Fig. 222 -, area dorsalis without lateral furrows, obliquely closely rugoso-striate), 9 mm, Kashmir attenuatum kashmirense ssp. nov. ♀

— Gaster medianly red, fore and mid legs and hind legs partly ferruginous (head in frontal view subquadrate, OOD:POD=1:3, RC B-type, Rl moderately long, length 6–7 mm) 62

62 SAT fairly high nasiform, narrowed anteriorly, apical margin with transverse and uprising triangular carina (IODs=10:3.5, OOD very narrow, clypeus: Fig. 133, A3=AW×3.7, gaster from apex of G1 to G4 red, with a large blackish mark on each tergite and sternite 3 - see also couplet 39), Laos undatum sp. nov.

— SAT anteriorly flattened, without distinct medial carina, the area rugoso-punctate, anterior marginal edge running down along ASR, not forming a transverse carina: Fig. 224 (IODs=10:3, OOD not so narrow, A3≒AW×2.5, G2–4 dark red and ferruginous beneath), Laos minutum sp. nov.

63 Hair golden (collar of pronotum orange yellow, legs broadly and gaster partly ferruginous, petiole subflask-shaped, propodeum with lateral carinae, area dorsalis without lateral furrows), 10–13 mm, Laos, Malaya
♀. Clypeus: Fig. 235, A3=AW×3.7, A12 normal, IODs=1:1, OOD:POD=1:1
♂. Clypeus: Fig. 229, A3≒AW×2, A13≒A5–12 united, IODs=1:1, OOD:POD=1:1 antennatum sp. nov.

— Hair silvery 64

64 Gaster black, petiole slender and long, about 6 times as long as its maximum width 65

— Gaster at least partly red, petiole at most 4 times as long as its maximum width 66

65 ASR abnormally highly elevated like a column, bearing a large fovea in front (Figs. 707, 708), subalar area of mesopleuron with pent-roof struc-

ture, propodeal sternite present, 6.5 mm, Borneo and Malaya
appendiculatum Tsuneki, ♂

— ASR not column-like (cf. Fig. 237), subalar area without pent-roof structure, propodeal sternite absent (clypeus subtriangularly produced, apex subtruncate, propodeum with lateral carinae, area dorsalis coarsely rugoso-reticulate, CV1=CV2×2, IODs=2:1, OOD:POD≒2:5, tibiae partly and tarsi largely pale brown), Pakistan
mediator Nurse
♀. 8–10 mm, A3=AW×3, A12 normal, =BW×1.8
♂. 7–9 mm, A3=AW×2.3, A13 slightly shorter than A11+12, curved and acutely pointed at apex

66 Gastral petiole subflask-shaped, wholly ferruginous except a brownish patch on apical portion above (IODs=2:1, SAT low nasiform, anteriorly nearly flately expanded, PAF very shallow – Figs. 371–374 –, gaster ferruginous and posteriorly brownish, fore and mid legs nearly wholly and hind leg broadly ferruginous, – see also couplet 82), Malaya
pilosum sp. nov. ♀

— Gastral petiole short, thick, subsessile, black above (Fig. 239) (IODv greater than IODc, OOD:POD≒1:2, propodeum with lateral carinae, area dorsalis with lateral furrows, fore and mid legs broadly ferruginous), 6 mm, Malaya and Laos
crassiventre sp. nov. .. 67

67 ♂. A3=AW×1.5, A10 excavated at base beneath and produced at apex, A13=A11+12, IODs=10:5, G2 and 3 except ferruginous bases black, hind tibial spurs and hind T1 and 2 at base whitish (SAT-ASR: Figs. 240–243, clypeus: Fig. 244, RC B-type, CV1=CV2×4.5)

— ♀. A3=AW×1.8, A9 nearly as long as wide (9–12 ?), G2–4 yellowish red, 2 with a large black mark above, hind tibia and tarsus broadly pale brown (clypeus: Fig. 250, IODs=10:6, SAT-ASR and venation similar)

68 Mesoscutum distinctly microcoriaceous and superimposed with punctures (that bearing indistinct microsculpture or only under high magnification observable microsculpture is included in the following section) 69

— Mesoscutum without microsculpture, simply punctured 78

69 Propodeum with lateral carinae 70

— Propodeum without lateral carinae 76

70 Hair on clypeus silvery (punctures on mesoscutum comparatively large and distinct, very close) 71

— Hairs on clypeus golden or brassy 72

71 SAT high narrow nasiform (Figs. 69–72), IODs≒5:3, medio-apical prominence of clypeus markedly large (Figs. 73, 75), G5–6 red, G1 with Ma:Mi=2:1, in ♂ A13=BW×2, =A10–12 united, IODs≒5:4 – see also couplet 23 and 57), 8–10 mm, S. India
rubrocaudatum sp. nov.

— SAT low broad tuberiform (Figs. 716, 717), IODs=5:4, clypeus almost without medio-apical prominence, gaster wholly black, G1 with Ma:Mi=4:1, in ♂ A13=BW×2.5, =A9–12 united, – see also couplet 158), 8–9 mm, Thailand
spangleri sp. nov.

72 ♀ (apical margin of clypeus as in Fig. 252, vertex depressed much below level of upper eye margins, IODs=10:9–10, OOD very narrow, SAT roundly, comparatively highly raised, with short median carina, PAF deep, flat-bottomed, ASR highly bicarinate, G2 and 3 ferruginous, with a large blackish mark on each, ground colour of legs ferruginous yellow) 73

— ♂ (clypeus less produced anteriorly, with apical margin gently waved, hairs brassy, often close to silvery, depression on vertex less marked, IODs 10:9, OOD:POD=1:2, SAT with dorsal side more flattened, ASR highly raised, PAF deep) 75

73 Antenna wholly ferruginous, SAT-ASR seen obliquely from left side to see through PAF: Fig. 251 (petiole ambur yellow and dorsal side from spiracles posteriorly and apical swelling wholly dark brown, G6 also dark brown, mid tarsus except T1 and hind femur and tibia partly, tarsus wholly brown to dark brown), about 17 mm, Malaya
selangor sp. nov.

— Antenna except basal part black, SAT-ASR: Fig. 255 74

74 Petiole ambur yellow, posterior half black, G6 pale brown, hind femur, tibia and tarsus each in part brown to dark brown, 13–14 mm, Singapore, Malaya and Laos
maculiventre sp. nov.
a. A1–2 yellow ..... Penang form
b. A1–3 yellow ..... Singapore form

— Petiole and G6 black, mid leg till knee, except articulations, and T2–5 dark brown, hind leg except bases of tibia and T1 black, 13 mm, Laos
maculiventre sayabouricum ssp. nov.

75 SAT-ASR seen obliquely from side to see through PAF: Fig. 263, SAT anteriorly roundly curved, elevation gently rounded, apical margin of clypeus: Fig. 264 (HW:IODv=100:25, A3≒AWx3.3, Al3≒A9-12 united, Al-2 yellow, rest black, petiole and legs till knees black or dark brown, legs apically paler, but hind leg except tibial base dark brown), till apex of petiole 6 mm (the rest lost), Malaya tekuense sp. nov.

— SAT-ASR: Fig. 257, SAT anteriorly similar in outline, but dorsal surface nearly flat on each side of medial carina, clypeus: Fig. 259 (HW:IODv= 100:22, A3 and Al3 similar, Al-4 yellow, rest brown, petiole except sides dark brown, mid tarsus apically and hind leg brown, but trochanter and base of tibia yellowish), 9 mm, Singapore maculiventre sp. nov.

76 Hair silvery; legs black, tibial spurs, fore tarsus and mid T1 pale yellow, gaster black, G2 and 3 largely red (vertex not depressed, HW:IODv=100: 32, OOD:POD≒1:1, IODs=10:7, A3=AWx4.5, clypeus: Fig. 274, SAT low nasiform, without apical transverse carina, SAT-ASR seen obliquely from side: Fig. 271, area dorsalis with weak lateral furrows), 13 mm, S. India longipilosum sp. nov., ♀

— Hairs golden or brassy (legs ferruginous and yellow, maculated partly with brown or black, gaster black marked with yellow) 77

77 Vertex strongly depressed below level of upper eye margins, very narrow, HW:IODv=100:19, OOD also markedly narrow, :POD≒1:3, IODs≒1:1, A3=AWx4, clypeus: Fig. 267, anteriorly without transverse carina, medio-apical inclined area smooth, SAT-ASR seen obliquely from side: Fig. 266, PAF V-shaped in cross section, microsculpture on mesoscutum strong, RC C-type (Al-2, fore and mid legs, hind coxa, tibia largely, T2-3 or 4 yellow), 12-14 mm, Malaya pulchellum sp. nov., ♀

— Vertex not strongly depressed, HW:IODv=100:25, OOD:POD variable, IODs≒ 10:8, A3=AWx3, Al3: Fig. 418, clypeus: Fig. 417, SAT-ASR: Fig. 414, PAF oviform in cross section, medio-apical area of SAT obliquely inclined, carrying a round fovea in middle, microsculpture on mesoscutum very weak and indistinct, RC B-type (colouration generally similar, but mid T2-5 brown, hind T1-5 dark brown), 11-12 mm, Malaya fumi sp. nov., ♂

78 Gaster wholly, at least from apex of petiole apically ferruginous, often posteriorly brownish 79

— Gaster black or middle part only ferruginous or reddish 100

79 ♀ 80

- ♂ 94

80 Petiole wholly ferruginous, often with a brownish mark on posterior portion 81

— Petiole except apex black 83

81 SAT nasiform, separated from ASR by a deep flat-bottom furrow (Fig. 276) (IODs≒3:2, clypeus: Fig. 277, antenna till apex of A3 pale brown, petiole without brownish patch, legs ferruginous and till near knees black or dark brown), 10-11 mm, Singapore and Laos rufigaster sp. nov.

— SAT anteriorly flatly extended, PAF lacking or very broad and shallow (petiole posteriorly with a brownish patch) 82

82 IODs≒2:1, PAF absent (Figs. 371-374), area dorsalis distinctly enclosed with fine furrow (clypeus: Fig. 375, pronotal lamina broadly rounded, apex very weakly angulated, mesoscutum fairly shining), 12.5 mm, Malaya pilosum sp. nov.

— IODs≒5:4, PAF present, shallow, with bottom line up-curved (Figs. 376-378) area dorsalis without lateral furrows (clypeus: Fig. 379, pronotal lamina: Fig. 380, mesoscutum half-mat), 11-12 mm, Singapore, Malaya and Laos penangense sp. nov.

a. All trochanters, fore and mid femora and Al to base of A3 ferruginous, hairs pale brassy ..... Malayan form

b. All trochanters and femora largely or wholly brown to dark brown, hairs on clypeus silvery ..... Laotian form

83 PAF shallow or moderately deep, with bottom line up-curved 84

— PAF deep, flat-bottomed 86

84 PAF very shallow and broad, seen obliquely from side: Fig. 355 (IODs= 5:4, clypeus: Fig. 357, legs from coxa till near knees black), 11 mm, Laos laosianum sp. nov.

— PAF moderately deep 85

85 IODs=2:1, clypeus: Fig. 352, PAF: Fig. 350 (legs from apex of coxae nearly completely amber yellow), 10.5 mm, Laos mico sp. nov.

— IODs=10:9, clypeus: Fig. 369, PAF: Fig. 367 (legs with bases of tibiae and fore tarsus ferruginous, rest brown to dark brown), 17 mm, Malaya *paeninsulicola* sp. nov.

86 IODs smaller than 2:1 (area dorsalis enclosed with fine furrow, all trochanters ferruginous) 87

— IODs larger than 2:1 (5:4 - 3:2) 89

87 IODs≒5:2, clypeus: Fig. 321 (SAT low broad nasiform, with medio-apical inclined area flat, comparatively large, with a minute hollow on it, A3=AW×5.5), 12 mm, Laos *nigrifemur* sp. nov.

— IODs≒3:1, clypeus with apical margin different 88

88 A3=AW×5.5, SAT without anterior oblique flattened area, perpendicularly inclined to interantennal area, OOD:POD=1:2 (PAF: Fig. 288, clypeus: Fig. 289), 8.5 mm, Singapore *tomi* sp. nov.

— A3=AW×4.5, SAT with a minute oblique flattened area at apex, OOD:POD=1:3 (PAF: Fig. 325, clypeus: Fig. 327), 10 mm, Laos *angustum* sp. nov.

89 Anterior oblique flattened area of SAT without fovea on it 90

— Anterior oblique flattened area of SAT with a distinct fovea on it 92

90 Clypeus: Fig. 333, legs from base till knees black (anterior flattened area of SAT - Figs. 329–332 - forming a weak step before obliquely inclining forwards, lateral furrows of area dorsalis distinct, but anteriorly weaker, antenna nearly wholly black, IODs=10:8.5, vertex fairly strongly depressed), 13 mm, Laos *laosense* sp. nov.

— Clypeus: Fig. 336 or 337, fore and mid legs nearly wholly ferruginous (anterior flattened area of SAT smoothly obliquely inclined, lateral furrow of area dorsalis shallow and very weak) 91

91 IODs=7:6, ASR roundly inclined to PAF, surface only weakly striate, antenna nearly wholly ferruginous, hairs brassy, 16 mm, Singapore *varipilosum* Cameron

— IODs=5:3 - 3:2, ASR steeply inclined to PAF (Fig. 334), dorsal surface strongly bicarinate, antenna except basal part black, hairs silvery or silky white, 13 mm, Laos *cagrum* sp. nov.

92 Mesopleural scrobe lacking or very shallow, 16–22 mm (vertex strongly depressed below level of upper eye margins, clypeus as in Fig. 296, propodeum with or without lateral carinae, HW:IODv=100:22–23, IODs=5:4 - 3:2, trochanters, fore and mid legs except apical parts ferruginous), Assam, Malaya and Laos *khasiae* Cameron

— Mesopleural scrobe distinct (vertex not strongly depressed) 93

93 PAF: Fig. 294, clypeus: Fig. 296, 13–14 mm, Malaya, Thailand and Laos *yumi* sp. nov.

— PAF: Fig. 322, clypeus: Fig. 324, 12 mm, Malaya *laevidorsum* sp. nov.

94 Petiole wholly ferruginous 95

- Petiole except apex black 96

95 SAT-ASR: Fig. 276, antenna: Fig. 279, fore and mid trochanters and femora ferruginous, 7.5–8.5 mm, Singapore and Laos *rufigaster* sp. nov.

— SAT-ASR: Fig. 376, antenna: Fig. 381, fore and mid legs till knees black), 8–10 mm, Singapore, Malaya and Laos *penangense* sp. nov. = ruficlava Baroni

96 SAT-ASR: Fig. 355 (A13: Fig. 359, clypeus: Fig. 360 or 361, propodeum without lateral carinae, area dorsalis without lateral furrows, antenna nearly wholly, legs till knees black), 8.5–9.5 mm, Laos *laosianum* sp. nov.

— PAF deep 97

97 SAT medio-anteriorly roundly and vertically inclined to interantennal furrow, without oblique area, ASR highly bicarinate, without concave smooth area on inner side, seen from back side the carinae roundly raised (Figs. 338–341) (clypeus: Fig. 342, A13: Fig. 343, genitalia and sternite 8 very characteristic - Figs. 346–349), 12 mm, Malaya *fulviventre* sp. nov.

— SAT at medio-anterior area obliquely flattened and shining, with a round fovea on it, ASR highly bicarinate, seen from dorsal side posterior carina subtriangularly raised, with top somewhat deviated inwards, bearing a concave shining area on inner side (Figs. 291–295) 98

98 Head in frontal view with vertex not markedly depressed (SAT-ASR: Figs. 291–295, clypeus: Fig. 296, A13: Figs. 297, 298, genitalia: Fig. 299, apical part of paramere comparatively narrower - Figs. 300, 301), 9.5–13.5 mm, Laos and Malaya *yumi* sp. nov.

— Head in frontal view with vertex fairly strongly depressed below level of upper margins of eyes 99

99 Frontal elevations moderately high, distinctly microreticulate and punc-

tured, medial carina of SAT acute (triangular process of paramere of genitalia long and acute, apical part of paramere comparatively broader than in yumi, ref. Figs. 307–317), 13–16 mm, Assam, Laos and Malaya khasiae Cameron

— Frontal elevations weak and weakly indistinctly microreticulate and punctured, medial carina of SAT broadly ridged, triangular process of paramere broader and shorter, ref. Figs. 318–320), 12 mm, Singapore simile sp. nov.

100 Hairs on head distinctly golden or brassy 101
— Hairs silvery 113
101 Propodeum with lateral carinae 102
— Propodeum without lateral carinae 109
102 ♀ 103
— ♂ (collar orange or brownish yellow, vertex not depressed) 108
103 Pronotum at least on collar ferruginous 104
— Pronotum black 106
104 Prothorax completely ferruginous (SAT: Figs. 394–396, clypeus: Fig. 397, petiole except apical swelling ferruginous, antenna and legs largely yellow), 13–15 mm, Malaya concinnum sp. nov.

— Collar and tubercle of pronotum, sometimes anterior margin and prosternum also ferruginous 105
105 Gastral petiole=AW×5–6, prosternum black (SAT-ASR: Figs. 388, 389; apical margin of clypeus broadly rounded, medianly subtruncate, petiole except base and sides black, antenna with basal part only yellow), 12–18 mm, Assam, Laos and Malaya fulvocollare Cameron

— Gastral petiole=AW×3, prosternum ferruginous (SAT-ASR: Fig. 228, clypeus; Fig. 235, petiole similar in colour), 12 mm, Laos, Malaya antennatum sp. nov.

106 Gastral petiole ferruginous, legs except coxae nearly wholly ferruginous, mesoscutum with strong plumbeous shine, nearly mat (OOD:POD=1:2, IODs=10:8, clypeus: Fig. 402, A3=AW×4.5, SAT-ASR: Figs. 399–401, mesopleuron with half-developed pent-roof structure, G2 and G3 broadly yellowish), 12 mm, Malaya bellum sp. nov.

— Gastral petiole black, legs, at least hind femur, black, mesoscutum considerably shining (mesopleuron without pent-roof structure) 107
107 Vertex markedly depressed, clypeus: Fig. 407, SAT nasiform, medio-anteriorly with roundly inclined and shining area which is foveate in middle, mesoscutum distinctly closely punctured (OOD:POD=2:3, IODs=1:1, lamina: Fig. 408, A3=AW×5, SAT-ASR: Figs. 403–406, G2 ferruginous, legs ferruginous, variegated with black), 13 mm, Malaya speciosum sp. nov.

— Vertex not strongly depressed, clypeus simply rounded out, SAT low nasiform, anteriorly smoothly inclined, the area not shining, nor carring fovea, covered with hair, mesoscutum weakly, more sparsely punctured (OOD:POD, IODs similar, A3=AW×4.5, SAT-ASR: Fig. 409, gaster more richly maculated with black), 14 mm, Malaya ornatigaster sp. nov.

108 Al3 as long as 5 preceding joints united (Fig. 390), Gl=AW×4–5, 13–14 mm, Assam, Laos, Malaya fulvocollare Cameron

— Al3 as long as 8 preceding joints united (Fig. 230), Gl=AW×3, 11–12 mm, Laos and Malaya antennatum sp. nov.

109 ♀ 110
— ♂ 112
110 Collar ferruginous, clypeus: Fig. 413 (ASR-SAT: Figs. 410–412, Al–4 yellow, gaster black and richly maculated with yellow, legs largely ferruginous) 15–16 mm, Malaya (incl. Is. Penang) shakha sp. nov.

— Pronotum black, except discoloured posterior part of collar, clypeus with apical margin broadly rounded (PAF shallow, widely open, bottom line up-curved, antenna black, at most Al–2 only yellow) 111
111 Antenna black, Al or Al–2 yellow, clypeus simply rounded out (Fig.426), (A3≒AW×5, SAT-ASR: Figs. 424, 425, vertex strongly depressed below level of upper margins of eyes), 16–17 mm, Malaya smithi sp. nov.

— Antenna black, Al–2 somewhat brownish, clypeus with medio-apical area recurved (Fig. 431) (A3=AW×4, SAT-ASR: Figs. 429–430, vertex not strongly depressed), presumably 16–18 mm, Malaya martium sp. nov.

112 Antenna black, Al–2 completely ambur yellow (IODs=10:8, A3=AW×3, IODs=10:8, OOD:POD=1:1, SAT-ASR: Figs. 414–416, Al3: Fig. 418, clypeus: Fig. 417 – see also couplet 77), 11 mm, Malaya fumi sp. nov.

— Antenna black, Al–2 narrowly ferruginous beneath (IODs=10:9, A3=AW×3.6, others similar), 12 mm, Malaya fumi var.

113 Gaster on median area reddish 114
— Gaster black 154
114 Propodeum with lateral carinae 115
— Propodeum without lateral carinae 146
115 ♀ 116
— ♂ 133
116 Fore and mid Tl light ferruginous to white (vertex not markedly depressed 117
— Fore tarsus only light ferruginous to white 119
— Fore tarsus brown to black 120
117 IODs=1:1, apical margin of clypeus: Fig. 437 (OOD linear, SAT high tuberiform, apical margin transversely roundly edged, SAT-ASR: Fig. 435, PAF deep flat-bottomed, area dorsalis distinctly margined with furrow, apex of Gl to base of G4 ferruginous red, trochanters black, tibial spurs whitish), 13-15 mm, Laos, Thailand and Malaya (Penang) ngum sp. nov.
— IODs: 5:4 - 2:1, apical margin of clypeus different 118
118 IODs=5:4 - 4:3, apical margin of clypeus: Fig. 448 (SAT-ASR seen obliquely from left side: Fig. 446, PAF shallow, with bottom line up-curved, area dorsalis with weak lateral furrows, transversely finely closely striate), 12-13 mm, Laos, Singapore striolatum sp. nov.
— IODs≒2:1, apical margin of clypeus rounded and medianly recurved, often recurved area minutely incised in middle (SAT-ASR: Figs. 451-453, PAF deep, flat-bottomed, area dorsalis with distinct lateral furrows, disc sparsely punctured), widely spread over Oriental Region errans Saussure
119 IODs=1:1, SAT-ASR: Figs. 454-456, apical margin strongly hung over interantennal area (clypeus: Fig. 457, A3=AW×3.2, antenna black), 13 mm, S. India operculum sp. nov.
— IODs≒3:2, SAT-ASR: Figs. 459-460, medio-anteriorly smoothly inclined, without fovea, covered with hair (Clypeus: Fig. 461, A3=AW×4.3, Al and 2 beneath and at apex ferruginous), 12-13 mm, Malaya langkawiense sp. nov.
120 Apical margin of clypeus medianly produced 121
— Apical margin of clypeus without medial protuberance 130
121 SAT flattened, medianly broadly roundly impressed, without medial carina, apical margin acutely edged, strongly reflected, completely covering PAFs (Figs. 532-536) (IODs=1:1, clypeus: Fig. 537, A3=AW×4.5, area dorsalis with broad shallow but distinct lateral furrows), about 10 mm, Laos lobatifrons sp. nov.
— SAT with apical margin not reflected, not completely covering PAFs 122
122 PAF shallow, widely open, V-shaped in cross section, with bottom-line up-curved 123
— PAF deep, narrow U-shaped in cross section, flat-bottomed 125
123 A3=AW×3, ASR nearly as long as wide, frons broadly flattened, almost without medial furrow, fore tibia and tarsus and hind tibia at base pale brown (SAT-ASR: Figs. 471-473, clypeus: Fig. 474, IODs=1:1, area dorsalis with lateral furrows), 8.5-10.5 mm, Laos, Singapore, S. India membranaceum sp. nov.
— A3=AW×4, ASR distinctly wider than long, frons with shallow median furrow, legs nearly wholly black (PAF: Fig. 631, IODs=10:9, OOD:POD=2:3) ... 124
124 SAT medio-anteriorly without transverse carina (Fig. 633), mesoscutum without plumbeous shine, smooth and polished, with sparse fine punctures, 11-12 mm, India and Malaya vardyi sp. nov.
— SAT medio-anteriorly with transverse carina (Fig. 641), mesoscutum with strong plumbeous shine, not polished, punctures comparatively large and close, 11-12 mm, Laos daicoccum sp. nov.
125 ASR at latero-posterior area with one or two hollows (Figs. 539-541).... 126
— ASR without hollow latero-posteriorly 127
126 SAT-ASR: Figs. 539-542, HW:IODv=100:29, OOD:POD=5:8, frons with microsculpture weak, punctures sparse and indistinct, tibial spurs brown, pronotal lamina triangular, with apex bluntly rounded, 11-12 mm, S. India nigripes sp. nov.
— SAT-ASR: Figs. 559-560, HW:IODv=100:24, OOD:POD=1:5, frons with microsculpture distinct and punctures close and distinct, tibial spurs whitish, pronotal lamina triangular, apex distinctly angulated, 10-11 mm, Laos nishidai sp. nov.
— SAT-ASR as in nigripes, HW:IODv=100:26, OOD:POD=2:5, frons with microsculpture distinct, punctures distinct, sparse, on mesoscutum fairly close, tibial spurs whitish, but longer hind one brown, pronotal lamina with apex pointed, 8 mm, Singapore bakerianum sp. nov.

127 Area dorsalis without lateral furrows, RC B-type, clypeus (Fig. 470) tectate, with distinct medial ridge line (SAT-ASR: Figs. 468–469, medio-apical area without marginal carina, smoothly inclined, IODs=10:8, A3=AW×4, CV1=CV2×7, all tibiae at base ferruginous, G2–3 red), Laos sedonense sp. nov.

— Area dorsalis enclosed with furrow, RC C-type, clypeus not pectate 128

128 Apical margin of SAT completely acutely carinate, hanging over PAFs (SAT-ASR: Figs. 497–501, clypeus: Fig. 502, IODs=10:9, OOD:POD=1:3, A3=AW×3, legs black, often fore leg partly brown, G2–3 red), 15–16 mm, S. India anamalaiense sp. nov.

— Apical marginal carina medianly interrupted, in some light appearing weakly edged, not hanging over PAFs and interantennal area 129

129 14–16 mm, disc of clypeus strongly roundly elevated, apical margin markedly reflected, mesoscutum finely sparsely punctured, PIS smooth and shining, lateral furrows of area dorsalis not strong, but distinct, legs black (SAT-ASR: Figs. 516–518, clypeus: Fig. 519, IODs=1:1), Assam, Nepal, S. India orientale Cameron

— 10–11 mm, disc of clypeus only gently riased, mesoscutum finely closely punctured, under high magnification PIS delicately microcoriaceous, not shining, at least fore leg partly brown (SAT-ASR: Figs. 511–513, clypeus: Fig. 514, IODs=5:4, A3=AW×4), India, Thailand, Singapore matheranicum sp. nov.

130 Clypeus rounded out, without medial emargination, SAT anteriorly and antero-laterally smoothly inclined (lateral furrows of area dorsalis weak and indistinct, A3=AW×4, IODs=10:8, G2 red, G1 at apex and G3 at base dark red, tibial spurs pale brown), about 13 mm, Malaya terbakarinum sp. nov.

— Apical margin of clypeus medianly more or less distinctly emarginate, SAT anteriorly, at least in part, acutely edged 131

131 Anterior transverse carina of SAT complete (Fig. 484) (all tibiae at base pale brown, area dorsalis enclosed with deep distinct furrow, SAT as a whole broad tuberiform, but with a short high nasiform elevation in middle—Figs. 480–484—, IODs=10:9, OOD:POD≒1:2, A3=AW×4.5, antenna and legs dark brown, gaster from apex of G1 to base of G4 red), 12 mm, Singapore and Laos melanocorne sp. nov.

— Anterior transverse carina of SAT medianly not complete 132

132 Anterior carina of SAT interrupted in middle (Fig. 465), clypeus: Fig. 466, SAT-ASR: Figs. 463–465, carinae of ASR not particularly developed, frons without microsculpture, shining, with strong distinct punctures, fore tibia in front broadly ferruginous (IODs=1:1, A3=AW×6, area dorsalis enclosed with furrow), 17–18 mm, Laos and Singapore nigricorne sp. nov.

— Anterior carina of SAT medianly weak, disturbed, clypeus: Fig. 565, SAT-ASR: Figs. 561–564, apical carina of ASR remarkably developed, frons microcoriaceous and superimposed with comparatively large distinct punctures, fore tibia at extreme base narrowly brownish (IODs=10:9, A3=AW×5, area dorsalis with lateral furrows), 14 mm, S. India lamellatum sp. nov.

133 Fore and mid T1 at least, light ferruginous to white 134

— Fore tibia and tarsus only pale brown 138

— Fore tarsus dark brown to black 139

134 Al3 as long as 5 preceding joints united (IODs=3:2, OOD:POD≒2:5, A3=AW×3, clypeus: Fig. 449, SAT-ASR: Fig. 452, mesoscutum with punctures comparatively large, PIS≒PD, lateral furrows of area dorsalis distinct), 8–9 mm, widely spread over Oriental Region errans Saussure

— Al3 shorter than 4 preceding joints united 135

135 Al3 slightly longer than 3 preceding joints united 136

— Al3 longer than 2, but shorter than 3 preceding joints united, in some condition appears as long as 2 preceding joints united 137

136 Mesoscutum smooth, polished and very finely sparsely punctured, antenna black (clypeus: Fig. 440, IODs=10:9, OOD:POD=2:3, SAT-ASR as in Figs. 433–436, SAT anteriorly bluntly edged, A3=AW×2.8, RC C-type), 12 mm, Laos ngum sp. nov.

— Mesoscutum under high magnification weakly microreticulate, half-mat, comparatively largely closely punctured, A1–2 ferruginous, 3–4 pale brown (clypeus: Fig. 614, IODs=10:8, OOD:POD=2:3, SAT-ASR: Figs. 610–613, A3=AW×3.3, RC C-type), 10 mm, Laos apicatum sp. nov.

137 SAT-ASR characteristic: Figs. 585–590 (clypeus: Fig. 591, Al3: Fig. 592, mesoscutum half-mat, finely sparsely punctured, IODs=10:7, OOD:POD=1:2, A3=AW×3, RC C-type, lateral furrows of area dorsalis very weak), 8 mm, Malaya kepongianum sp. nov.

— SAT-ASR different: Figs. 602–604 (clypeus: Fig. 605, Al3: Fig. 606, mesoscutum shining, more largely and closely punctured than in kepongianum, IODs 10:8, OOD:POD=1:2, A3=AWx2.2, RC C-type, lateral furrows of area dorsalis distinct, striate), 9 mm, India yogator sp. nov.

138 SAT-ASR as in kepongianum (Figs. 585–590) (clypeus medio-anteriorly weakly recurved, Al3: Fig. 598, IODs=10:7, OOD:POD≒2:3, A3=AWx2.5, lateral furrows of area dorsalis very weak), 10 mm, Laos vientianense sp. nov.

— SAT-ASR different (Figs. 471–473) (clypeus medianly slightly produced and emarginate in middle, Al3 appr. as long as 3 preceding joints united, IODs=10:9, OOD:POD≒1:2, lateral furrows of area dorsalis very weak, median part of gaster pale brown), 6.5 mm, Singapore membranaceum sp. nov.

139 PAF shallow, widely open, V-shaped in cross section (Figs. 621, 639), ASR anteriorly expanded, lamellate and smooth 140

— PAF deep, U-shaped in cross section 141

140 Al3 appr. as long as 4 preceding joints united (Fig. 625), SAT medio-anteriorly smoothly inclined to interantennal area (Figs. 620, 623) (clypeus: Fig. 624, Al3=BWx3.2, IODs=10:8.5, OOD:POD=1:1, A3=AWx2), 10 mm, India and Malaya vardyi sp. nov.

— Al3 appr. as long as 3 preceding joints united (Fig. 643), SAT medio-anteriorly transversely carinated (Figs. 638, 641) (clypeus: Fig. 642, Al3=BW 2.2, IODs=10:9, OOD:POD=1:1, A3=AWx2.7), 9 mm, Laos daicoccum sp. nov.

141 SAT at anterior margin transversely acutely edged, hanging over PAFs and interantennal area 142

— SAT at anterior margin bluntly edged at least medio-anteriorly, not hanging over PAFs 145

142 Al3 appr. as long as 3 preceding joints united, A3=AWx3 (SAT-ASR: Figs. 487–490, clypeus: Figs. 491–493, Al3: Fig. 494 and =BWx2.4, IODs=10:8, OOD: POD=3:4, A3=AWx3, area dorsalis with distinct lateral furrows), 10 mm, Singapore and Laos melanocorne sp. nov.

— Al3 appr. as long as 4 preceding joints united, A3=AWx2 or shorter 143

143 ASR without fovea on latero-posterior area, fore T4–5 brownish white, mesoscutum with PIS mat (SAT-ASR as in Figs. 497–501, clypeus: Fig. 505, Al3: Fig. 506 and =BWx3.3, A3=AWx2.3), 10 mm, S. India anamalaiense sp. nov.

— ASR with fovea on latero-posterior area, fore T4–5 black, mesoscutum with PIS shining 144

144 Tibial spurs, at least longer hind one, brown, microsculpture on frons very weak, surface nearly mat, with punctures indistinct and sparse (paramere of genitalia split into 2 lobiform layers that are closely folded over each other, IODs=10:8, OOD:POD≒2:3), 10 mm, S. India nigripes sp. nov.

— Tibial spurs all whitish, microsculpture on frons distinct, with punctures fairly strong and close (paramere not split at apex, simple lobiform layer, measurements similar), smaller, 7–7.5 mm, Laos nishidai sp. nov.

145 IODs=10:9, A3=AWx3.3, SAT-ASR: Figs. 573–576 (Al3: Fig. 578, OOD:POD≒ 4:3, clypeus: Fig. 577, pronotal lamina: Fig. 579), 15 mm, Singapore menkei sp. nov.

— IODs=4:3, A3=AWx2.3, SAT-ASR: Figs. 676, 679, 680 (Al3 longer than 3, but shorter than 4 preceding joints united, OOD:POD≒3:4, clypeus weakly rounded out, medio-apical area feebly trilobate, pronotal lamina: Fig. 670, lateral carinae of propodeum and lateral furrows of area dorsalis very weak or lacking, variable in many characters), 8–13 mm, widely spread over Oriental Region petiolatum Smith

146 G2–3 dark red, IODs=4:1, ASR laterally compressed (Figs. 699–703) (OOD: POD=1:2, A3=AWx4, Al–2 and fore and mid legs largely ferruginous – see also couplet 154), 7.5 mm, Malaya lumpurense sp. nov.

— G2–3 bright red, sometimes marked with black above, IODs=3:2 or much larger, ASR not laterally compressed, more than 10 mm 147

147 ♀ 148

— ♂ 151

148 Supraantennal structure: Figs. 650–653, SAT with apical margin roundly curved and acutely edged, produced over PAFs, clypeus: Fig. 654 (HW:IODv= 100:23, OOD:POD≒1:2, IODs=3:2, clypeus gently tectate, A3=AWx5.5, RC C-type, CV1=CV2x6, area dorsalis enclosed with shallow furrow, antenna black, not ferruginous beneath, fore tibia in front on basal half, all tibiae at base, fore tarsus and mid T1–2 ochre yellow, gaster from apex of G1 to base of G4 red), 12–13 mm, Laos, Viet-Nam, Malaya and South India prominens sp. nov.

— Supraantennal structure: Figs. 675, 677, SAT without carina on apical

margin at least at medio-anterior area 149

149 Pronotal lamina produced in tooth (Fig. 669) (vertex depressed, IODv comparatively narrow, PAF moderate in depth, V-shaped in cross section, mid tibia on outer side wholly and mid tarsus largely ferruginous, gaster from apex of G1 to apex of G4 red), 16–20 mm, Singapore, Malaya, Thailand bicolor Smith

— Pronotal lamina triangular (Figs. 670, 671) (vertex not depressed, IODv comparatively broad, PAF either V- or U-shaped in cross section, mid tibia and tarsus broadly brown to black, gaster usually from apex of G1 to base of G4 red), 12–20 mm 150

150 PAF deep, flat-bottomed, U-shaped in cross section, Ceylonese population 12–16 mm bicolor ceylonicum ssp. nov.

— PAF moderate in depth, bottom line up-curved, V-shaped in cross section, specimens from other localities petiolatum Smith

151 SAT fairly high nasiform, apical margin transversely roundly and acutely edged, slightly produced over PAFs (SAT-ASR: Figs. 656–658, ASR strongly tricarinate, carinae of both sides closely approached each other at interantennal area - Fig.656 -, posteriormost ones fused together to form a transverse carina, HW:IODv=100:25, OOD,Od,POD=1,3,2, IODs≒4:3, clypeus: Fig. 659, A3=AWx3, A13: Fig. 660, =BWx2.7, pronotal lamina broad triangular, lateral furrows of area dorsalis very weak, almost lacking on posterior portion, antenna and legs dark brown, apices of A1 and 2 narrowly ferruginous, bases of all tibiae, spurs, fore tarsus light ferruginous, apex of petiole and G2 red, broadly marked with black), 9.5 mm, Laos prominens sp. nov.

— SAT moderately high nasiform, seen vertically apical margin triangular, medianly rounded, not transversely edged, at least at median area 152

152 A3=AWx2.8–3.3, pronotal lamina produced in tooth (gaster from apex of G1 usually till apex of G4 red, mid tibia usually broadly ferruginous, A13 longer than 3 but shorter than 4 preceding joints united, shorter apical lobe of paramere of genitalia broad triangular in form), 13–16 mm, Singapore, Malaya Thailand bicolor Smith

— A3=AWx2.0–2.5, pronotal lamina triangular (gaster from apex of G1 usually till G3 or base of G4 red, mid tibia at base only ferruginous), 10–16 mm 153

153 A13 as long as 3 preceding joints united,(shorter apical lobe of paramere of genitalia broad triangular), Ceylonese population bicolor ceylonicum ssp. nov.

— A13 longer than 3, often as long as 4, preceding joints united (shorter apical lobe of paramere of genitalia elongated triangular), populations of other localities petiolatum Smith

154 Propodeum without lateral carinae, IODs=4:1 (area dorsalis without lateral furrows, head in frontal view subquadrate, SAT narrow and high nasiform, ASR widely expanded anteriorly, somewhat laterally compressed, PAF V-shaped in cross section, A1=A3, A3=AWx4, OOD:POD=1:2, clypeus: Fig. 704, RC B-type, antenna dark brown, A1–2 ferruginous, legs broadly ferruginous - see also couplet 146), 7.5 mm, Malaya lumpurense sp. nov.

— Propodeum with lateral carinae, IODs larger than 3:1 155

155 ASR highly raised like a column, having a large fovea in front (head thick, frons on posterior half smooth and polished, clypeus: Fig. 706, HW: IODv=100:26, OOD,Od,POD≒1,6,4, IODs≒2:1, A3=AWx2, A13: Fig. 705 and = A11+12, collar thick, with a large median tubercle, mesoscutum medio-posteriorly depressed and striated, mesopleuron with pent-roof structure, area dorsalis enclosed with furrow, propodeal sternite present, wholly black, mandible apically dark brown - see also couplet 65), 5–6 mm, Malaya, Borneo appendiculatum Tsuneki, ♂

— ASR different 156

156 PAF lacking or very shallow, widely opened V-shape in cross section, often with sinus rounded 157

— PAF deep, U-shaped in cross section, at least near bottom 162

157 SAT-ASR: Figs. 710–713, median carina lacking, instead an impressed line present (head thick, upper half of frons smooth and shining, clypeus: Fig. 714, disc broadly roundly elevated, HW:IODv=100:26, IODs=10:9, OOD(very narrow),Od,POD=1,6,4, A1=A3, A3=AWx3.5, CV1=CV2x3, RC B-type but close to C-type, collar medianly tuberculate, mesoscutum medio-posteriorly depressed and crenate, mesopleuron without pent-roof structure, area dorsalis similar to appendiculatum, propodeal sternite present, fore tibia, tarsus and mid tarsus pale brown to ferruginous, tarsi apically darker, mesoscutum finely, more closely punctured than in appendiculatum), 5.5 mm, Laos and Thailand bilobatum Tsuneki, ♀

— SAT-ASR different 158

158 SAT broad tuberiform, mat, wider than long, without median carina, but with an impressed line, ASR broad and short, shining, PAF narrow and shallow (Figs. 716–718), petiole markedly broadly swollen at apex, Ma:Mi=4:1 (HW:IODv =100:30, OOD:POD≒2:5, IODs≒5:4, A3=AW×1.5, Al3: Fig. 720, clypeus: Fig. 719, CV1=CV2×3.5, mesoscutum weakly microcoriaceous, sometimes fairly distinct, area dorsalis with weak indistinct lateral furrows, legs black, tibial spurs white, tarsi brownish) (see also couplet 71), 6–7 mm, Thailand spangleri sp. nov., ♂

— ASR more widely expanded anteriorly and more distinctly separated from SAT, petiole not so widely swollen at apex 159

159 SAT low broad tuberiform, with a distinct elevation or mound in middle (Figs. 726–728) (HW:IODv=100:22, OOD:POD≒1:2, IODs≒1:1, clypeus: Fig. 729, A3=AW×5, area dorsalis enclosed with distinct furrow, fore tibia except inner side, other tibiae at base, fore tarsus, mid tarsus on basal half pale ferruginous, petiole markedly long, more than HW×2, hairs on sides of frons in some light appears brassy), 13 mm, Singapore ridleyi sp. nov., ♀

— SAT low broad nasiform, carinated on top, without peculiar mound in middle 160

160 ♀. SAT-ASR: Fig. 731–734 (OOD:POD≒1:3, IODs≒10:9, A3=AW×3.5, area dorsalis distinctly margined with furrow, smooth and polished, antenna black, not brownish beneath, legs black, fore tibia on inner side and tarsus brown, RC C-type), about 10 mm, Laos and Malaya yebissum sp. nov.

— ♂ 161

161 Al3=A8–12 united, =BW×3.5 (Fig. 737) (OOD:POD≒2:3, IODs=10:8.5, clypeus: Fig. 738, A3=AW×1.7, RC C-type, area dorsalis as in ♀, antenna and legs with spurs black or dark brown), 9 mm, Laos yebissum sp. nov.

— Al3=Al0–12 united, =BW×2.2 (SAT-ASR as in Figs. 471–473, OOD:POD≒1:2, IODs=10:9, A3=AW×2.5, RC C-type, clypeus gently rounded out, with a minute protuberance in middle, area dorsalis with weak lateral furrows, fore tibia on inner side and tarsus pale brown, G2–3 brown to dark brown, sometimes reddish – see also couplet 138), 7–7.5 mm, Singapore membranaceum sp. nov.

162 All trochanters, bases of tibiae, spurs, fore tibia and tarsus, mid tarsus at least T1 pale ferruginous to white (in ♂ trochanters with brown maculae) (OOD:POD≒1:3(1:2), IODs≒10:5(7), apical margin of clypeus recurved and minutely incised in middle (more weakly roundly produced), A3=AW×5(2.5), area dorsalis strongly margined with furrow, SAT-ASR as in Fig. 453 (in ♂ PAF shallower)), 10 (6) mm, Malaya incl. Penang errans Saussure var.

— Trochanters black or dark brown 163

163 ♀ 164

— ♂ 169

164 IODs=10:7–8 165

— IODs≒1:1 167

165 Fore tibia wholly black, tibial spurs white, clypeus: Fig. 745 (OOD:POD≒1:3, A3=AW×4.5, area dorsalis with indistinct lateral furrows, very weakly defined on posterior portion, SAT-ASR: Figs. 743–744, RC B-type) 9–11 mm, Laos atrum sp. nov.

— Fore tibia at base on inner side pale brown, tibial spurs dark brown, clypeus different in form of apical margin 166

166 Frons with very weak microsculpture, comparatively largely, fairly closely punctured, surface shining, apical margin of clypeus: Fig. 751, SAT-ASR: Figs. 747–749, SAT not edged behind PAF (area dorsalis enclosed with furrow, OOD:POD≒1:2, A3=AW×5, fore tarsus brown), 13 mm, Malaya pullatum sp. nov.

— Frons distinctly microcoriaceous, surface mat, apical margin of clypeus: Fig. 756, SAT-ASR: Figs. 753–755, SAT behind PAF broadly edged (area dorsalis without lateral furrows, OOD:POD≒1:2, A3=AW×6, fore T5 pale brown), about 17 mm, Malaya kutuense sp. nov.

167 Frons very weakly microsculptured, shining, apical margin of clypeus: Fig. 485 (OOD:POD≒1:3, IODs=10:9, A3=AW×4, area dorsalis with distinct lateral furrows) about 13 mm, Laos (see also couplet 131) melanocorne sp. nov., var.

— Frons distinctly microcoriaceous, mat, apical margin of clypeus different in form 168

168 Apical margin of clypeus: Fig. 519, PAF deep, flat-bottomed, disc of area dorsalis sparsely punctured (SAT-ASR: Figs. 516–518, OOD:POD≒2:3, IODs=1:1, A3=AW×4.5, area dorsalis with lateral furrows varied in strength, sometimes median part of gaster brownish or reddish beneath), 13–15 mm, Assam, Nepal,

Malaya (see also couplet 129) orientale Cameron

— Apical margin of clypeus: Fig. 760, PAF with bottom line up-curved, area dorsalis obliquely finely closely striate (SAT-ASR: Fig. 758–759, OOD:POD≒1:3, A3=AW×4, IODs≒1:1, marginal furrow of area dorsalis very weak), 12 mm, Laos breviclypeatum sp. nov.

169 Fore tibia and tarsus and all tibial spurs pale ferruginous to whitish, rest of legs strongly brownish, SAT-ASR characteristic: Figs. 585–590 (sometimes gaster medianly more or less brownish or reddish) 170

— Legs dark brown to black 171

170 A13=A11+12, = Fig. 592 (SAT-ASR: Fig. 585–590, clypeus: Fig. 591, IODs=10:7, OOD:POD≒1:2, A3=AW×3, RC=C-type, R1 comparatively long, reaching almost the wing apex, lateral furrows of area dorsalis very weak, striate), 8 mm, Malaya kepongianum sp. nov.

— A13=A10+11+12, =Fig.598 (SAT-ASR: Fig. 599, OOD:POD≒2:3, A3=AW×2.5, all others similar, A1–2 brown above and ferruginous beneath), 10 mm, Laos vientianense sp. nov.

171 A13=A9–12 united, =Fig.767, all tibial spurs white, SAT anteriorly transversely edged, ASR with a large hollow latero-posteriorly (OOD,Od,POD=1,2,2, IODs=10:8.5, A3=AW×2.3, A13=BW×2.8 – Fig. 767, clypeus: Fig. 766, mesoscutum distinctly sparsely punctured, PIS with very feeble microsculpture, area dorsalis with weak lateral furrows), 8.5 mm, Laos albispinosum sp. nov.

— A13=A10–12 united, mid and hind tibial spurs dark brown, SAT only on antero-lateral areas alone edged, ASR without hollow at latero-posterior area 172

172 12–15 mm, head from above markedly wider than long, W:L(inner orbit)=100:45, OOD,Od,POD=1,1,1, clypeus: Fig. 522 (SAT-ASR: Figs. 520, 521, IODs≒1:1, A3=AW×2.7, area dorsalis enclosed with distinct furrow, disc punctured, A13: Fig. 523, =BW×2.6), Assam, Nepal and Malaya orientale Cameron

— 8 mm, head thicker, W:L=100:54, OOD,Od,POD=1,2,2, clypeus: Fig. 777 (SAT-ASR: Figs. 775–776, IODs=10:9, A3=AW×2.8, lateral furrows of area dorsalis indistinct, disc closely striate, A13: Fig. 778, =BW×2.5), Laos sayabouryense sp. nov.

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Trypoxylon buddha: Tsuneki, SPJHA, 8: 1, 33, 1978 (syn. & redescr.).

Specimens examined:
1 ♀, Krchi, no date & loco (BMNH); 1 ♀, N. India (Kangra Valley, 4000 ft), VI. 1890, Dudgeon (BMNH); 4 ♀, W. India (Deesa), IV, VII. 1898, VIII. 1901, C. G. Nurse (BMNH); 1 ♀, Burma (Myitkyina), 30. VIII. - 1. X. 1914, Fletcher (BMNH); 13 ♀ 3 ♂, Malaya (Kuala Lumpur): 2 ♀, 12. II, 22. X. 1928, H. T. Pagden; 1 ♀, 7. VIII. 1928, N.C.E. Millar; 18. VI. 1 21, 23. V. 1922, 12. IV. 1924, 2. IV. 1926, 31. V. 1926, (♂), 17. VII. 1926, 20. VII. 1926, 20. I. 1927, 13. III. 1927, 12. VII. 1931 (♂), 8. IX. 1933, 16. IV. 1934 (♂), 10. XI. 1938, H. M. Pendlebury (BMNH); 1 ♀, Laos (Vientiane Prov., Vill. de Tha Ngone, 9-16. I. 1926, Native Collector (BPBM).

12. TRYPOXYLON BIFOVEATUM sp. nov.

Similar in form to buddha, but frons and mesoscutum microsculptured and not so strongly punctured as in this species.

♀. 8.5 mm. Black; mandible and palpi ferruginous, tegula transparent yellowish brown, mid tibial spurs pale brown, fore and mid tarsi somewhat brownish, wings apically slightly fuscous. Hair scarce, on clypeus silvery, mixed with scattered long pale brownish hair, on mesopleuron silky white, dorsal surface of head and thorax with short inconspicuous pubescence, almost glabrous.

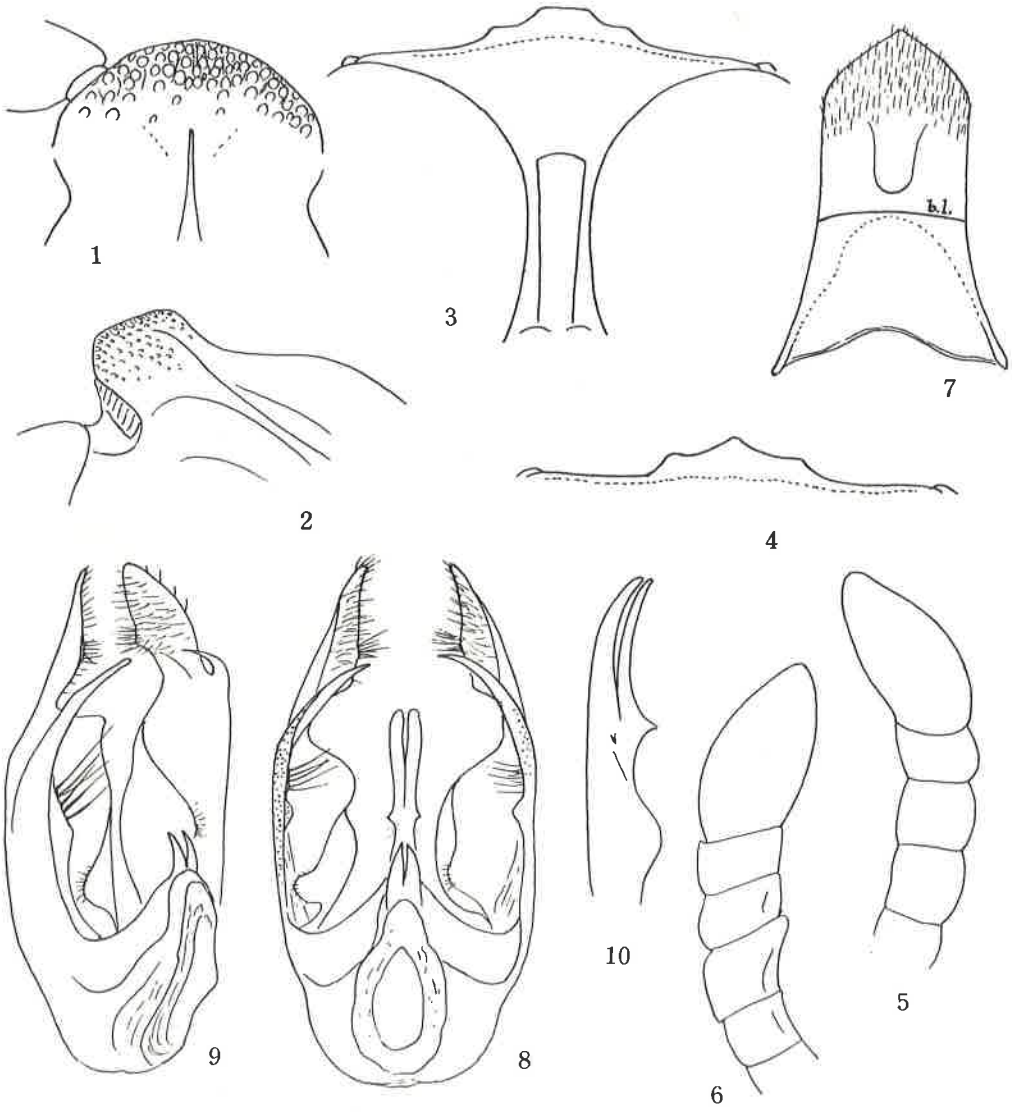
Head very thick, subquadrate both from above and in front, HW, HL, A3, P = 100, 76, 8, 174, OOD very narrow, almost linear, Od slightly longer than POD, A3 = AW x 2.8 flagellum strongly thickened apically, each joint gradually shorter and thicker till A11, A12 = A3 × 2 in width and A10+11 in length, IODc very narrow, as wide as A6 at apex, IODs ≒ 3:1, frontal furrow at base shallow and indistinct, then enlarged and deepened in lenticular, with distinct fine bottom line in middle, surface on both sides gently elevated, each elevation longer than wide, SAT low, roundly expanded (Fig. 1, vertical view), without median carina, apical margin roundly curved, hanging over ASRs and interantennal area, surface microcoriaceous and coarsely punctured, especially on marginal area, seen obliquely from above and left side: Fig. 2; clypeus: Fig. 3, disc flat, apical margin reflected, supraclypeal area very slender and long, longer than clypeus in middle. Occipital carina higher below, but weaker, strongly emarginate and nearly disappeared behind buccal cavity. Collar of pronotum medianly narrow and minutely tuberculate and strongly incrassate laterally, posterior part not discoloured, lamina on side rounded, inconspicuous, mesopleuron without pentroof structure, subalar pit markedly deep; propodeum with distinct lateral carinae, but longitudinal series of short striae along them weak, area dorsalis with weak but distinct lateral fuurows, medial furrow shallow and broad, GSR roundly raised. Gastral petiole clavate but long, P, Ma, Mi, 2 (Ma), 3 (Ma) = 100, 16, 8, 50 (16), 44 (20), petiole without fovea, segments 2 and 3 each with a fovea at apex in middle. In fore wing RC B-type, but close to C, Rl moderately long, CV1 ≒ CV2 × 3.5, CV2 ≒ TCV, with angle rounded and over 90°.

Vertex, frons and mesoscutum very weakly microcoriaceous, half mat and sparsely superimposed with very fine punctures, area dorsalis nearly smooth, median furrow feebly striate.

♂. Similar to ♀ in general, but

(1) Clypeus less produced anteriorly, apical margin with a short tooth in middle (Fig. 4). (2) Markedly different in the structure of antenna: A3 = AW × 1.5, A3, 4, 5 subequal in length, A4-8 distinctly roundly swollen out beneath, 9-10 gently roundly excavated beneath and produced at apex of A10, thence apically joints markedly thickened, A13 appr. as long as 3 preceding joints united and distinctly bent at apex (Figs. 5 and 6. (3) Fore tibia on inner side and T1 pale ferruginous (rest of T pale brown). (4) Punctures on SAT comparatively finer. Head form, ocellar location, IODs, microsculpture, form of SAT and pronotal collar, structure of propodeum, GSR, gastral segments and venation similar to those of ♀. Measurements: HW, HL, IODv, A3, A13, P = 100, 74, 29, 11, 24, 148; OOD, Od, POD = 1.5, 5, 4; IODs = 10:2.7; A3 = AW × 1.4; A13 = BW × 2.1; P, Ma, Mi, 2 (Ma), 3 (Ma) = 100, 17, 8, 48 (22), 44 (24). Sternite 8: Fig. 7, peculiar in form, it is bent at nearly a right angle backwards on the line shown with b.l. in the figure, apical area covered with short pubescence, not fringed with long hair. Genitalia seen from beneath: Fig. 8, obliquely from left side: Fig. 9, paramere bifurcate at apex, dorsal layer is a lamellate lobe, covered sparsely with pubescence beneath, on inner margin near base with a densely pubescent somewhat swollen area, ventral lobe is slender and better chitinized, having at base a strong-

ly bristled area; inner margin of paramere broadly expanded and rolled ventrally, the margin of the expansion irregularly waved. Volsella very short, attenuate apically. Penis valve without shoulder and sickle-shaped appendages, seen obliquely from side: Fig. 10.



Figs. 1-10. Trypoxylon bifoveatum sp. nov. 1-3 ♀, 4-10 ♂.

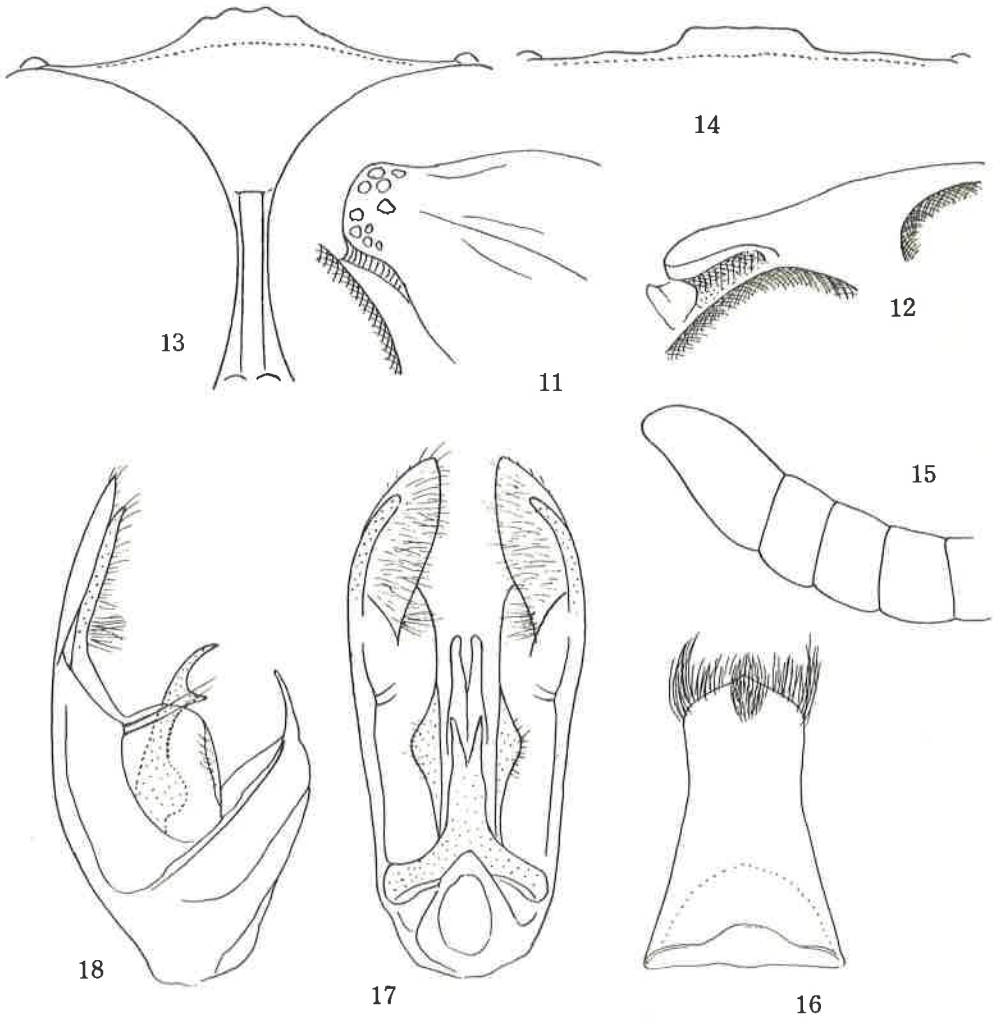
Holotype: ♀, Malay Penins., Pahang (Fraser's Hill, 4200 ft), 14. VII. 1936, H. M. Pendlebury (BMNH).
Paratypes: 1 ♂, Laos (Vientian Prov., Ban Van Eue), 15. V. 1966, native collector (BPBM); 1 ♀, Laos (Sayaboury Prov., Sayaboury), 15. I. 1966; 1 ♀, the same place, 29. III. 1966, both native collector (BPBM).

Remarks. In the paratype females from Laos IODc relatively somewhat narrower, IODs = 10:2.5 and fore tibiae and tarsi more brightly brownish, nearly ferruginous and mid tibial spur also pale brown.

13. TRYPOXYLON BIPUTEOLUM sp. nov.

Very closely resembling preceding species, differing in the following characters only:

♀. 7-7.5 mm. (1) Base and apex of femur, tibia and tarsus of fore leg pale brown, metatarsus especially paler, the rest of the leg brown, mid leg also strongly brownish and spur and basal half of metatarsus markedly pale. (2) IODc remarkably narrow, narrower than A3 at base, IODs = 10:1. (3) Clypeus (Fig. 13) with apical marginal area distinctly reflected. (4) Antenna similar in form, but relatively somewhat longer and thinner, A3 = AW × 3.0, but A13 more than twice as thick as A3 at maximum. (5) Collar of pronotum with anterior margin nearly transverse, not broad V-shaped, this is due to that anterior inclination is not concavely excavated as done in the preceding species. (6) Punctures on SAT much coarser. Otherwise, including form of head, structure of SAT (Fig. 11, seen obliquely from above, Fig. 12, in profile), propodeum and gastral petiole very similar to bifoveatum.



Figs. 11-18. Trypoxylon biputeolum sp. nov. 11-13 ♀, 14-18

♂. Similar to ♀, but (1) legs dark brown, not pale on fore and mid pair, (2) IODc slightly wider, as wide as A3 at apex, IODs = 10:2, (3) clypeus: Fig. 14, (4) antennal joints at basal part relatively shorter, A3 = AW× 2.3, A3, 4, 5 ÷ 10, 8, 6.5, at apical part slightly constricted between joints, with hairs longer and A13 somewhat longer than 2 preceding joints united and curved apically (Fig. 15).

Eight sternite: Fig. 16, apical fringe of pubescence somewhat blackish, on medial part of fringe the pubescent area slightly extended posteriorly, densely covering there (Fig. 16). Genitalia seen from beneath: Fig. 17, similar in general to those of bifoveatum, but wider apical lobe of paramere more densely pubescent, with inner margin of the main body not so strongly expanded, hairs on outer margin near middle replaced with 2 long bristles, volsella longer (Fig. 17), seen in profile thicker (Fig. 18); penis valve generally similar, but without a pair of spine-like processes on upper swollen area (Fig. 18, dotted area, can be seen through semitransparent expansion of inner margin).

Holotype: ♀, Laos (Vientian Prov., Ban Van Eue), 31. XII. 1965, native collector (BPBM).

Paratypes: 2 ♂, the same locality, 15, 30. XI. 1966, native collector (BPBM); 2 ♀, the same locality, 30. III. 1966, 15. V. 1966, native collector (BPBM).

Remarks. The form of the clypeus in the males differs from either of the females treated and rather close to that of bifoveatum, but the relative width of IODc (in the male as a rule wider than in the female) and the form of pronotum show that they are not the male of this species.

CV1 = CV2 × 3, CV2 slightly longer than TCV. forming a rounded angle of appr 110° between them, apical process of CV2 vestigial (♀ ♂), Rl long, appr. as long as hind tarsal joint 3, reaching close to wing apex.

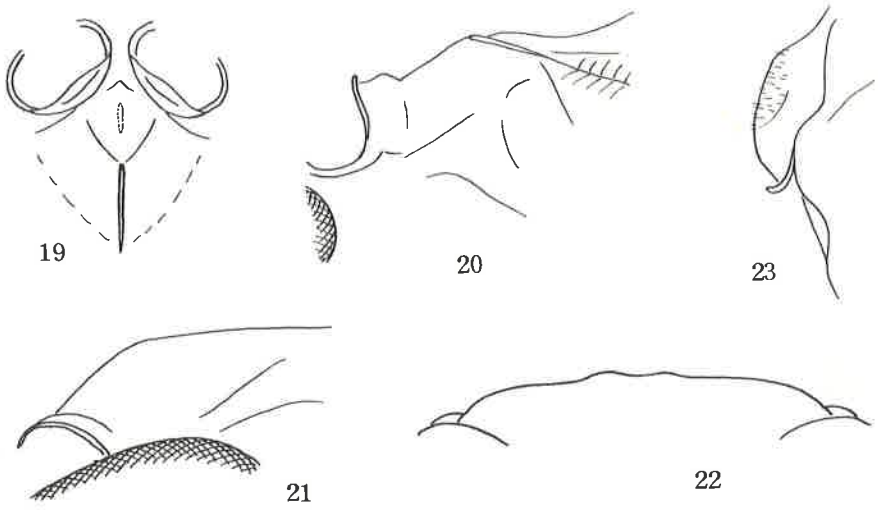
14. TRYPOXYLON GRESSITTI sp. nov.

Gaster markedly slender and long and similar in this respect as well as in the delicate microsculpture on head and thorax to the group of preceding species, but head is not so thick, not cubic, SAT simply nasiform, foveae on gastral tergites 2 and 3 very feeble and vestigial, legs slenderer and longer and antenna, legs and gaster widely yellow in colour.

♀. 7.5 mm. Black; yellow are Al-3, clypeus on apical half, mandible, palpi, pronotal tubercle, tegula and basal plates of wings, fore leg completely, mid leg till middle of Tl, base of hind tibia; orange ambur yellow: gastral segments 1-3 and hind leg till apex of femur; pale to moderate brown: A4,5 and 6-apex beneath, apex of clypeus, mandible apically, a large mark on apical swellnng of gastral petiole, irregular-shaped marks on posterior part of G2 and greater part of G3, a fleck on hind coxa, hind femur above. Rest of gaster reddish brown or dark brown, rest of legs dark brown; G3 with a black streak beneath. Pronotal collar with posterior part discoloured. Hair on eye incisions, inner orbits, clypeus, collar, tubercles, lateral margins of mesonotum, depressed parts of pleurons and lateral areas and apical inclination of dorsal aspect of propodeum silvery, conspicuous.

Head from above W:L = 5:3, with sides rounded, seen in front also with sides rounded, not convergent below; frontal elevations raised from sides of fore ocellus below, oval in form, with lower apex nearly pointed, medial furrow broad, moderately deep, SAT low broad nasiform, covered with hair, sides flatly tectate, dorsal ridge anteriorly shortly carinate, posteriorly finely impressed, the impression continued posteriorly to frontal furrow; apical margin of SAT seen vertically: Fig. 19, medio-apical area obliquely inclined, but with a weak triangular carina about middle of the inclination (do.), SAT seen obliquely from above and side: Fig. 20, in profile: Fig. 21, PAF shallow and broad, ASR not highly raised, weakly bicarinate; clypeus: Fig. 22. HW, IODv, A3, P = 100, 30, 21, 140; OOD, Od, POD ÷ 1, 5, 4; IODs = 10:4.5; A3 = AW× 2.8 and = Al2; A3, 4, 5 ÷ 10, 7, 7: P, Ma Mi, 2 (Ma), 3 (Ma) = 100, 18, 9, 54 (21), 50 (27). Collar of pronotum raised towards middle and minutely tuberculate there, in dorsal view markedly incrassate towards sides, hence anterior margin appears emarginate, lamina on side indistinct (Fig. 23), mesopleuron without pentroof structure; propodeum with distinct lateral carinae, area dorsalis enclosed with furrow, the furrow anteriorly obsolete, GSA roundly raised. Gastral petiole without fovea, G2 and 3 each with a feeble fovea, a rather flatted minute area; legs very slender and long, each joint markedly longer than usual (e.g. hind coxa appr. twice as long as its maximum width, hind tibia distinctly longer than HW - 10:13, in biputeolum 10:10 ; mid

metatarsus as thick as A3 at base); CV1 = CV2 × 4, CV2 = TCV, angle about 120°.



Figs. 19–23. Trypoxylon gressitti sp. nov., ♀.

Frons and scutellum microreticulate and distinctly superimposed with fine punctures, mesoscutum distinctly microreticulate, but punctures superimposed very minute and indistinct, only impressed points at the crossings of fine impressed lines observable under high magnification. On propodeum longitudinal series of strioles along lateral carinae very weak and incomplete, median excavation and lateral furrows of area dorsalis posteriorly transversely striate, sides obliquely finely and very closely striate all over.

♂, unknown.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Eue, 750 m, forest stream bed), 10–11. IV. 1965, J. L. Gressitt (Malaise trap) (HPBM).

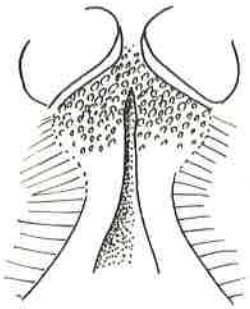
15. TRYPOXYLON FLAVIPES sp. nov.

♀. 7 mm. Similar in colour and general structure to T. gressitti, but head subcubic, antenna not so strongly clavate, SAT not nasiform, IODc narrower, legs more broadly yellow and not so slender, gaster broadly brown to dark brown, apical fovea on G 1–3 distinct and especially note-worthy is that propodeal sternite is present.

Black; yellow are Al completely, 2 except above, 3 beneath (slightly brownish), apical part of clypeus, mandible (apically reddish), palpi, pronotal tubercle, fore leg, mid leg except brown patches on T 1–3, hind leg on apex of coxa, trochater, both ends of femur, base broadly of tibia and articulations of tarsus; tegula and basal plates of wing semitransparent pale brown, rest of legs and gaster brown to dark brown sides of petiole, bases of G2–4 reddish ferruginous. Hairs silvery, on thorax conspicuous on collar, sides of mesoscutum, postscutellum and mesopleuron.

Head thick, subquadrate in frontal view, W:L = 3:2 in dorsal view, SAT seen vertically: Fig. 24, medio-apical area obliquely smoothly inclined to interantennal area, median carina lacking, instead extention of frontal furrow as an impressed line till near apex reaching, seen obliquely from above and left side (hair removed): Fig. 25; clypeus flattened, apical margin: Fig. 26, supraclypeal area narrow and long. HW, HL, IODv, P = 100, 68, 32, 168; OOD, Od, POD ≒ 1, 5, 4; IODs = 10:3.3; CV1 ≒ CV2 × 4, CV2 down-curved, shorter than TCV, TCV straight, RC B-type, R1 markedly long, almost reaching wing apex. A3 ≒ AW × 3, A3, 4, 5 ≒ 10, 9, 8, A11 longer than wide. Collar comparatively thick, anterior margin gently roundly emarginate, with a minute tubercle in

middle, posterior part discoloured, lamina on side: Fig. 27; mesopleuron normal, propodeum with distinct lateral carinae, area dorsalis without lateral furrows, but posterior margin distinct by the deep broad top of median furrow of posterior inclination, median furrow distinct, broad, striate, GSR indistinct, propodeal sternite considerably long, margined on each side with a carina. Gastral petiole clavate, but slightly longer than G1 and G2 united; P, Ma, Mi, 2 (Ma), 3 (Ma) = 100, 18, 8, 44 (19),40 (24).



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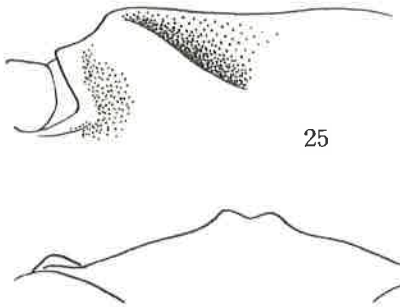

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Figs. 24–27. Trypoxylon flavipes sp. nov., ♀.

Frons and mesoscutum weakly microcoriaceous and closely superimposed with somewhat large punctures, therefore the surface less smooth than species 12–14 above described; lateral series of striae on propodeum incomplete, posterior inclination transversely closely striate on posterior portion, sides obliquely but incompletely striate.

♂, unknown.

Holotype: ♀, Laos (Vientiane Prov., Gi Sion Vill., de Tha Ngone), 10–30. I. 1966 native collector (BPBM).

Paratype: 1 ♀, Laos (Vientiane Prov., Tha Ngone), 3. I. 1966, native collector (BPBM).

16. TRYPOXYLON MACULIPES sp. nov.

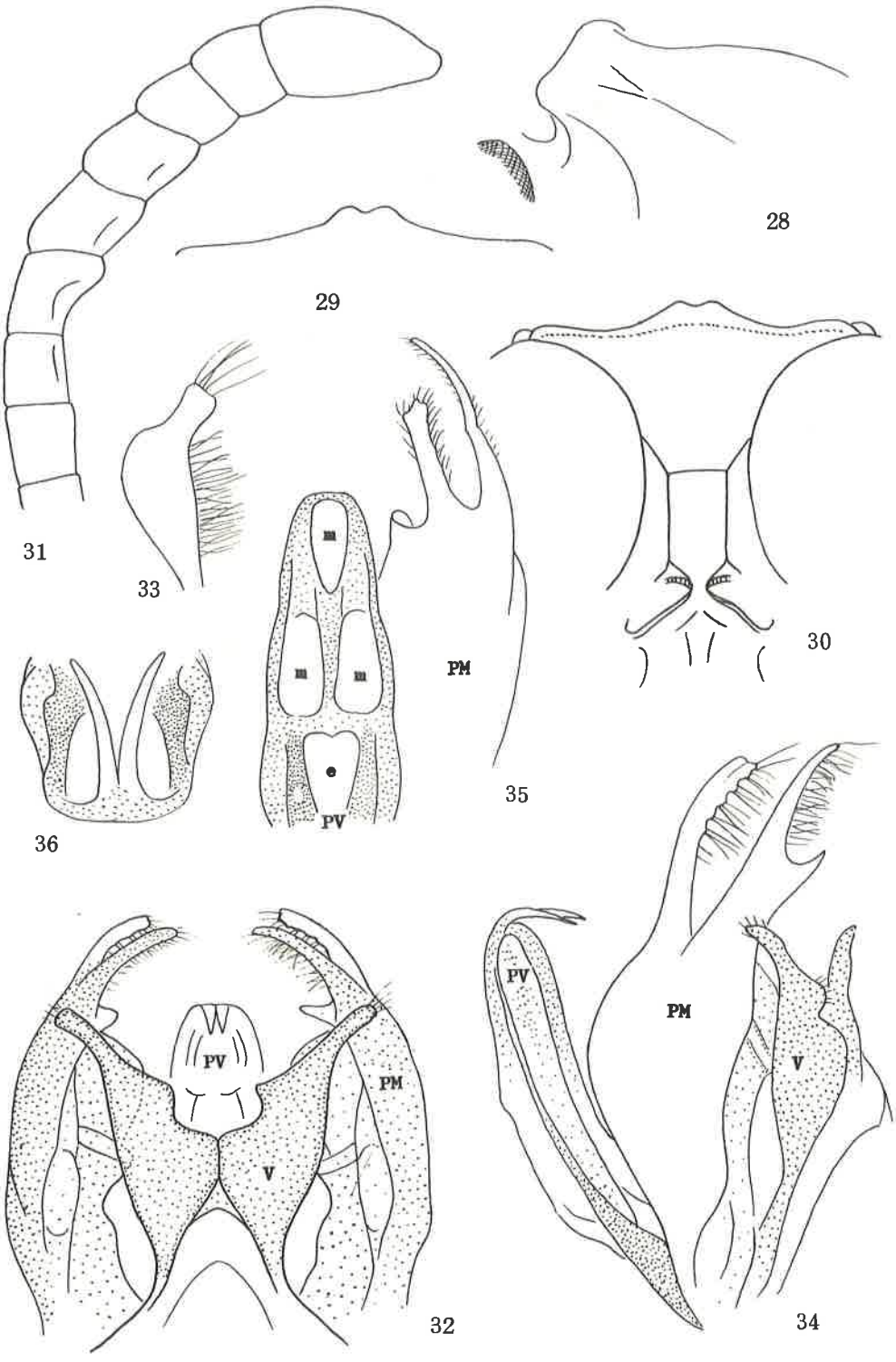
♀, 7–8 mm. Similar in general structure and punctuation to T. flavipes, but in the present species antennae more strongly clavate and gaster wholly and legs broadly black.

Black; mandible, palpi, base and apex of fore femur, fore tibia and tarsus wholly except arolium, mid tibia (often with a brownish streak) and T1 or T1–2 and hind tibia at base broadly ferruginous, partly yellow; apical margin of clypeus, apical portion of mandible and articulations of legs brownish, rest of legs black to dark brown.

SAT at apex slightly broader than in flavipes, medio-apical margin bluntly edged, somewhat produced over interantennal area and perpendicularly inclined there, seen obliquely from side: Fig. 28, seen vertically as in basal part of Fig. 30 (♂), dorsal surface without median carina, but with a deep impressed line. Clypeus: Fig. 29; antenna comparatively thick, A3 ≒ AW × 2, A3, 4, 5 subequal in length. HW, HL, IODv, P = 100, 66, 31, 170; OOD, Od, POD ≒ 1, 5, 4; IODs ≒ 3:1. Occipital carina complete, but disappeared behind buccal cavity. Thorax-complex as in flavipes, but pronotal lamina on side not developed, broadly rounded, only very shortly toothed at middle. P, Ma, Mi, 2 (Ma), 3 (Ma) = 100, 22, 11, 52 (24), 48 (30); foveae on G1–3 similar to those of flavipes. CV1 ≒ CV2 × 3.5, CV2 ≒ TCV, RC B-type, R1 moderate in length, slightly shorter than TCV.

Punctuation and microsculpture on frons and mesothorax similar to those of the preceding species.

♂. Similar in general to ♀, but antenna more strongly clavate and partly modified, clypeus less produced anteriorly (Fig. 30), with disc flat, supraclypeal area long, SAT perpendicularly inclined to interantennal area; A3 = AW × 1.5, A4–6 subequal in length, 6 as long as wide, from 7 to 8 roundly excavated beneath and produced at



Figs. 28-36. Trypoxylon maculipes sp. nov. 28, 29 ... ♀, 30-36... ♂.

apex of 8, thence apically strongly thickened, A13 slightly shorter than 3 preceding joints united and curved apically (Fig. 31).

HW, HL, IODv, P = 100, 66, 31, 136; OOD, Od, POD ≒ 1, 5, 4; IODs = 2:1, A3, 4, 5 ≒ 10, 7, 7; P, Ma, Mi, 2 (Ma), 3 (Ma) = 100, 22, 11, 60 (30), 54 (38).

Genitalia (from one of the paratypes) remarkably robust and volsella and paramere well chitinized and black, except dorsal one of the apical lobes and marginal membraneous areas; seen from beneath: Fig. 32 (basal part omitted), volsella markedly developed, in lateral view with back side covered with hair (Fig. 33, right one seen from right side), paramere bifurcate at apex, ventral lobe at base with a flattened tooth-shaped process, the total structure seen from left side: Fig. 34, penis valve strange in structure, with apical processes bent ventrally at about right angle, seen from dorsal side: Fig. 35 (m semitrassparent membrane, d strongly chitinized castaneous area, e empty space), seen from apex: Fig. 36.

Holotype: ♂, Laos (Wapikhamth ng Prov., Wapi), 15. III. 1967, native collector (BPBM).

Paratypes: 1 ♂, Viet-Nam (50 km SW of Pliku, 250 m), 14. V. 1960, S. & L. Quate (BPBM); 3 ♀, Laos (Wapikhamthong Prov., Wapi), 30. III, 15. IV. 1967, native collector (BPBM); 4 ♀, Laos (Sayaboury Prov., Sayaboury), 12. II (1♀), 13. IV (3♀). 1966, native collector (BPBM); 1 ♀, Laos (Vientiane Prov., Ci Sion Vill. de Tha Ngone), 10-30. I. 1966, native collector (BPBM).

Other specimen: 1 ♀, Laos (Vientiane Prov., Gi Sion Vill. de Tha Ngone), 19-26. XII. 1965, native collector (BPBM) (gaster, antennae and legs turned into complete brown, possibly through long exposure to Cyanide vapour).

17. TRYPOXYLON SUUMI sp. nov.

♂. Apparently very similar to the preceding species, slight differences: Antenna and legs more broadly yellow maculated, SAT on anterior margin not overhang, but smoothly inclined to interantennal area, A13 somewhat shorter and more rounded. However the difference in genitalial structure is surprisingly large.

Length 6.7 mm. Black; yellow are A1 and 2 (with a large brown mark above), mandible (apically brown), palpi, tegula (with a discoloured spot), fore and mid trochanters (brownish above), base and apex of fore and mid femora, fore and mid tibiae largely, hind tibia broadly at base, fore tarsus, mid basitarsus and articulations of all segments of legs. Pronotal tubercle white, A3-5 slightly brownish beneath, clypeus anteriorly pale brown. Hairs on clypeus and supraclypeal area silvery, parallel.

Head in frontal view subquadrate, but on lower portion roundly convergent below. HW, HL, IODv, A3, A13, P = 100, 72, 36, 12, 21, 112; OOD, Od, POD ≒ 1, 5, 5; IODs = 2:1; A3 = AW × 1.7; A3, 4, 5 ≒ 10, 6, 7; A13 = BW × 1.7. Frontal structure similar to that of maculipes. SAT (Fig. 37, vertical view, 38, obliquely from left side) without median carina, instead with a median impressed line extended from frontal furrow as in maculipes, but at medio-apical area obliquely, nearly smoothly inclined anteriorly (Fig. 37), clypeus and supraclypeal area: Fig. 39, disc flattened; A6-13: Fig. 40, except relatively shorter A13 very similar to that of the compared species; occipital carina complete, but behind buccal cavity turned towards buccal carina and jointed to it, the area deeply depressed. Pronotum roundly raised towards middle and tuberculate there, from above medianly narrow and markedly incrassate towards both sides, lamina on side roundly curved, but in middle minutely pointed (Fig. 41). Subalar area of mesopleuron normal, propodeum with distinct long lateral carinae, area dorsalis without distinct lateral furrow, but the area raised above surrounding areas and its presence is distinct, median furrow posteriorly roundly enlarged, without area apicalis, GSR simple; propodeum strongly extended posteriorly as in allied species and provided with propodeal sternite. Gastral petiole clavate. P, Ma, Mi, 2 (Ma), 3 (Ma) = 100, 26, 13, 64 (38), 58 (46). RC B-type, R1 fairly long (as long as CV2), but not reaching wing apex, CV1 ≒ CV2 × 3, TCV incurved, slightly longer than CV2, both smoothly roundly connected with each other, without pointed remnant of CV, angle roundly about 120°.

Sternite 8 strange in form and apical hair (Fig. 42, from ventral or outer side) with marginal area broadly transparent, dotted area ferruginous, latero-apical tufts of long hair fine, consisting of only a few, fringe of pubescence at apex sparse and very fine, though considerably long, medio-apical area broadly depressed, bearing about 10 punctures whence long bristles shooting out. Genitalia seen from beneath: Fig. 43, obliquely from left side: Fig. 44, from apex and dorsal side: Fig. 45, markedly different from those of maculipes (though fundamental structural scheme is similar), despite that in the external appearance the present species is very close to it.

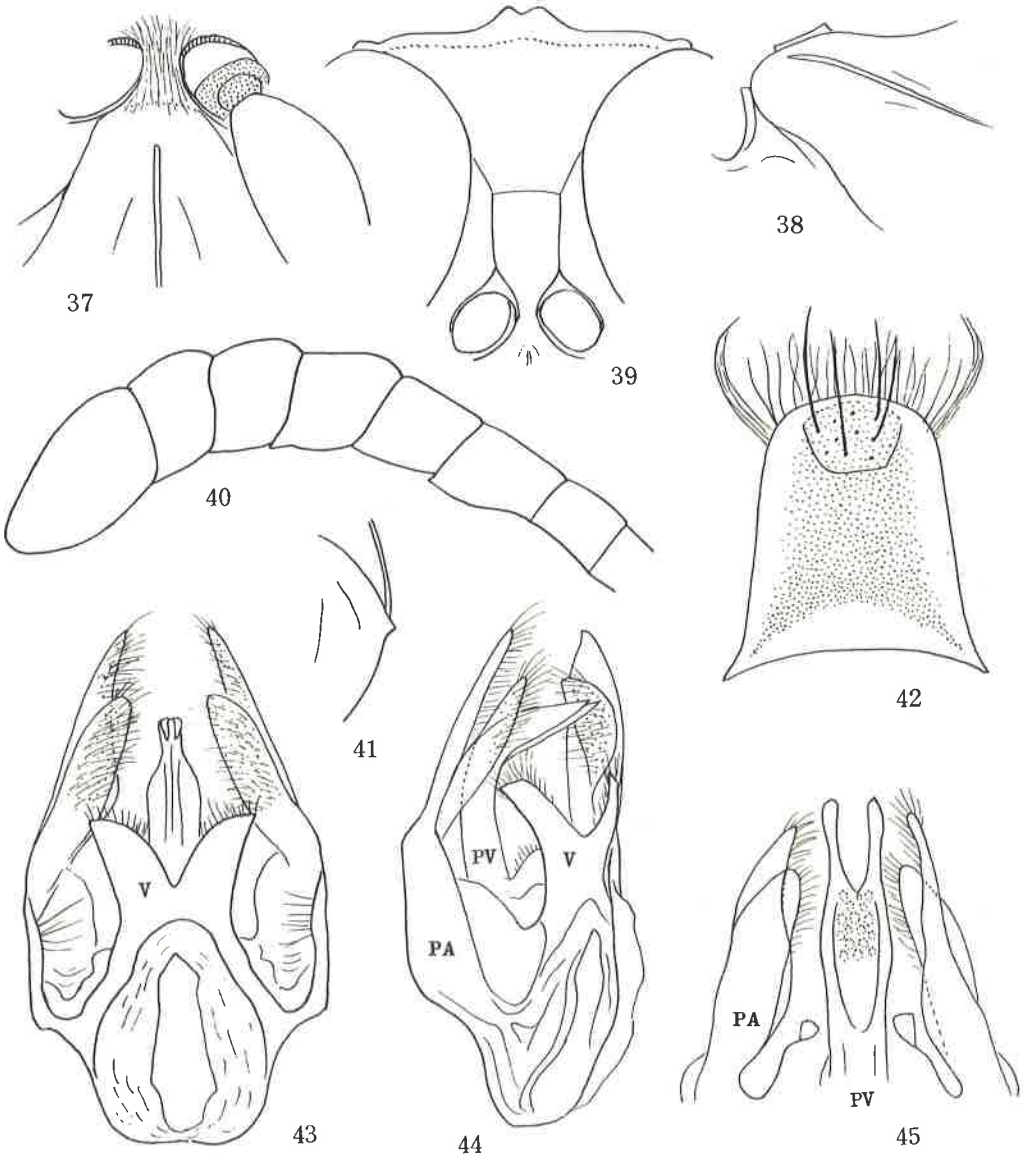
The fact is very surprising and instructive.

Frons and mesoscutum distinctly microcoriaceous and closely superimposed with deep punctures, propodeum with series of striae along lateral carinae, striae weak and covered with hair, not conspicuous, area dorsalis transversely finely closely striate, sides shining and obliquely finely closely, but not strongly punctured, obliquely depressed anterior area finely closely striate, not shining.

♀, unknown.

Holotype: ♂, Laos (Sayaboury Prov., Sayaboury), 13. IV. 1966, native collector (HPHM)

Remarks. We are tempted to combine the present species with T. flavipes described earlier which is sympatric, without the male known and has SAT medio-anteriorly smoothly inclined. However, to do so the following disagreements are serious



Figs. 37-45. Trypoxylon suumi sp. nov., ♂.

objection: In the present species R1 is not so markedly long, frons and mesoscutum are much more strongly microreticulate, with punctures superimposed somewhat larger, irregularly close and general appearance of the surface condition is much coarser. Furthermore, the yellow areas on the antennae and legs are much less developed and the striae on the propodeum are stronger and much more distinct, but these are not so important as those above mentioned.

From the specimen the left fore wing is missing, the gaster is detached and the caudal segment is dissected and together with genitalia and sternite 8 glued on to the triangular card point. But the foveae on G1-3 are well observable.

18. TRYPOXYLON INDIANUM sp. nov.

♀, 7.5 mm. Closely resembles T. maculipes ♀, with characters very similar, but

(1) Clypeus more weakly bidentate at apex in middle (Fig. 46), apical margin broadly pale brown.

(2) A1 and 2 ferruginous yellow, each with a large brownish mark above, A3-7 brown beneath (darker apically).

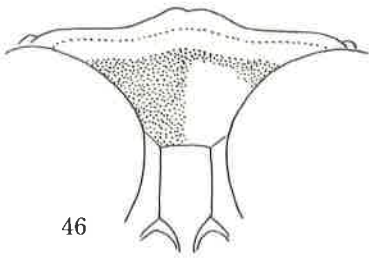
(3) SAT at medio-apical area not transversely ridged, not produced over interantennal area, but smoothly obliquely inclined forwards.

(4) Antennal joints 3, 4, 5 with relative length appr. 10, 7, 6.5.

(5) IODc a little broader, IODs = 10 : 4.5.

Measurements: HW, HL, IODv, A3, P = 100, 66, 30, 16, 134; OOD, Od, POD = 1, 5, 5; IODs = 10 : 4.5; A3 = AW × 3. P, Ma, Mi, 2 (Ma), 3 (Ma) = 100, 21, 11, 58 (25) 52 (31). RC B-type, R1 fairly long, as long as CV2, CV2 a little shorter than TCV, both gently curved, forming a round angle of about 110°, CV1 = CV2 × 4.

Pronotal lamina on side not well developed (Fig. 47); mesoscutum and mesopleuron microcoriaceous and closely punctured, area dorsalis transversely finely, but distinctly and closely striate.



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♂, unknown.*

Holotype: ♀, S. India (Dohnavur, 350', Tinnevelly Dist.), 5. X. 1938 (B. M. - C. M. Expedition to S. India, 1938) (BMNH).

19. TRYPOXYLON SINGAPORENSE sp. nov.

♂. Somewhat similar to T. maculipes, ♂, but SAT quadrate and strongly produced between bases of antennae, flagellar joints of antenna longer, ferruginous basally, IODc very narrow, as wide as A3 at apex, apical margin of clypeus not bidentate in middle, frons and mesoscutum not so distinctly, closely punctured, area dorsalis with distinct lateral furrow and gastral petiole shorter and without apical fovea.

Length 7.5 mm. Black; yellow-ferruginous are A1 and 2 except a brown patch above, anterior margin of clypeus broadly, mandible (apically reddish brown), palpi, pronotal tubercle, tegula, fore and mid legs, coxa, trochanter and base of tibia of hind leg; fore and mid femora beneath, mid tarsus except base of T1 and rest of hind leg brown to dark brown. Underside of head, prothorax, fore coxa, -trochanter and femur covered with frizzled long whitish pubescence, those on femur shorter apically; gastral sternite 6 with a pair of tuft of long hairs before apical margin.

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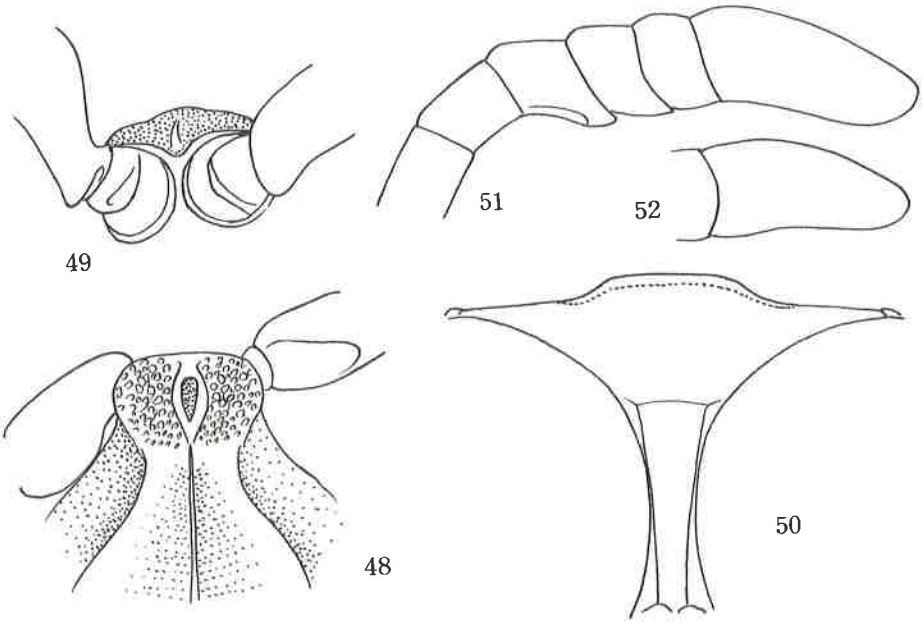
* In the structure of SAT and in the punctuation on frons and mesoscutum the present species is fairly close to T. flavipes (♂). However, in this species IODs = 10 : 3. In the group to which both the species belongs it is a rule that in the female relative IODc is much smaller than in the male. From the viewpoint it seems unjustice to combine them as opposite sexes of the same species.

Head subcubic, SAT in vertical view: Fig. 48, dorsum with a minute oval impression in middle, apical margin produce over interantennal area, roundly curved surface of overhang strongly coarsely punctate (Fig. 49, seen obliquely from beneath); clypeus: Fig. 50. HW, IODv, P = 100, 28, 105. IODs = 10 : 1.7; A3 ÷ AW × 3, A3, 4, 5 ÷ 10, 10, 9, flagellum gradually thickened apically, from A9–10 roundly excavated beneath and produced at apex of 10, A13 as long as 3 preceding joints united, very thick, not bent (Fig. 51, in other direction: Fig. 52). Occipital carina disappeared beneath head behind buccal cavity where the surface deeply roundly depressed. Collar of pronotum



Figs. 48–52. Trypoxylon singaporense sp. nov., ♂.

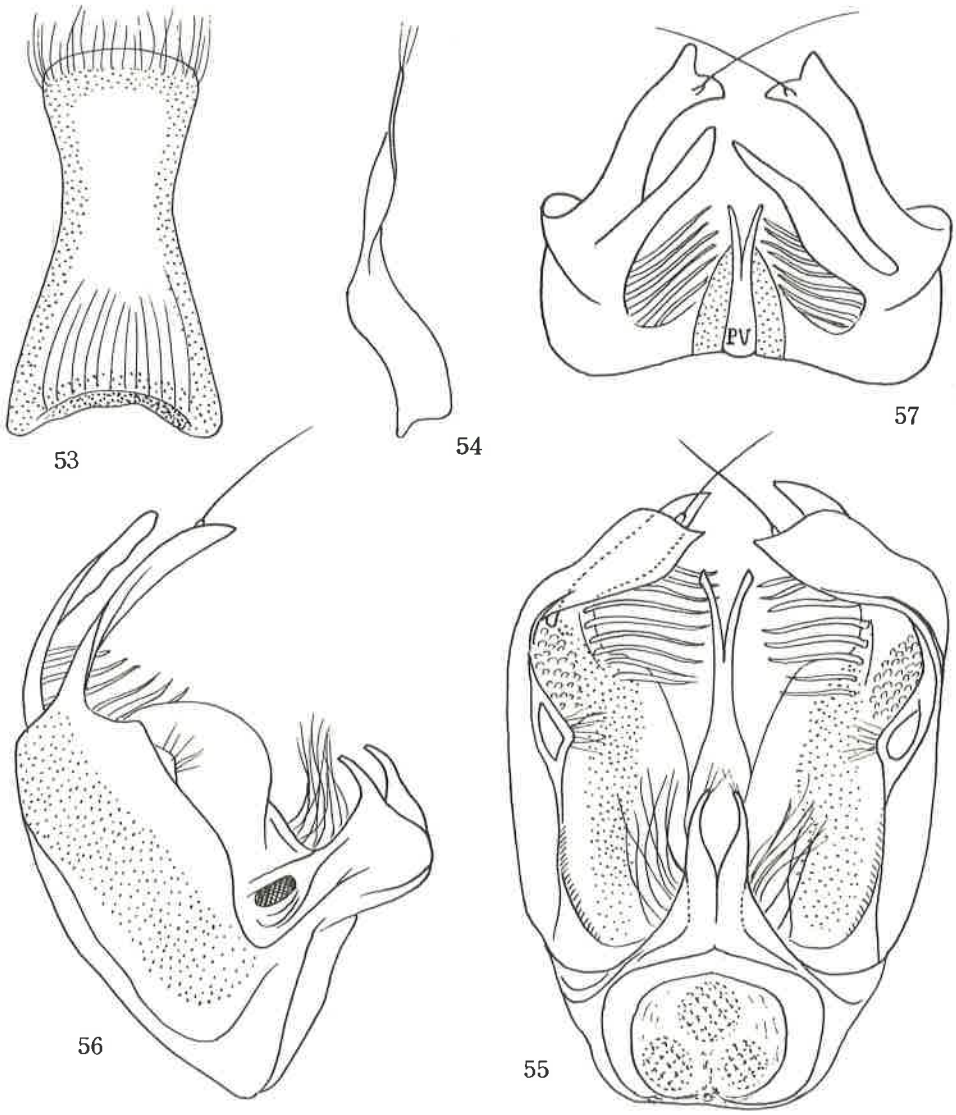
with anterior part narrow, top surface transverse, posterior part broad and discoloured, mesopleuron normal, propodeum with lateral carinae, area dorsalis with distinct lateral furrows, GSR highly roundly elevated, posterior part of propodeum fairly markedly produced beyond base of hind leg, but without propodeal sternite. Gastral petiole short, clavate. P, Ma, Mi, 2 (Ma), 3 (Ma) = 100, 34, 17, 60 (38), 54 (46), apical fovea on 2 normal, on 3 shallow and weak. RC B-type, Rl very long, as long as CV2, reaching wing apex, CV1 ÷ CV2 × 3, CV2 slightly longer than TCV.

Microsculpture on frons rather weak, superimposed punctures anteriorly somewhat close, but sparser posteriorly, on mesoscutum microsculpture very weak, almost invisible even under 70× magnification, punctures very fine and sparse; lateral series of striae along lateral carinae of propodeum incomplete and not strong, furrows of area dorsalis finely striate; sides smooth and polished.

Sternite 8: Fig. 53, it is unconfirmed whether the basal streaks are hairs appressed or mere impressed lines, but possibly the former; the sternite seen from side Fig. 54, the body is considerably bent at about middle of its length. Genitalia seen from beneath: Fig. 55, from left side: Fig. 56, from apex (dorsal side): Fig. 57. Paramere deeply bifid at apex, the dorsal lobe on inner margin provided with a fringe of thick curved hair, the hair slightly flattened, ventral lobe broader than the dorsal and seen vertically emarginate at apex, with a distinct tubercle bearing a long thick bristle before apical margin (Figs. 55–57); outer margin of basiparamere produced at about middle into a blunt triangular swelling, carrying a sparse tuft of short hair on top; volsella also with a series of long curved bristles arising from the dorsal keel (Figs. 55 and 56). Penis valve slender, without shoulder and sickle-shaped appendages and apical part not bent ventrally (Figs. 55 and 57).

♀, unknown.

Holotype: ♂, Singapore, date unknown, C. F. Baker leg. (USNM).



Figs. 53–57. Trypoxylon singaporense sp. nov., ♂.

20. TRYPOXYLON FLETCHERI Turner, 1918

Trypoxylon fletcheri Turner, Ann. Mag. Nat. Hist., (9) 1: 369, 1918 (♀, India).
Trypoxylon fletcheri: Tsuneki, SPJHA, 8: 67, 1978 (redescr., figs.).

Specimens examined: 1 ♀ (Holotype), India: Assam (Shillong, 5000 ft), X. 1916, T. Bainbrigge-Fletcher leg. (BMNH). 2 ♀, Malaya (Kedah Peak, 3300–3500 ft), 15 and 23. III. 1928, H. M. Pendlebury (BMNH).

Remarks. In both specimens newly examined fore and mid femora broadly and hind femur partly black. In one of them G4 and G5 are strongly blackish (in the other the gaster is lacking). SAT seen vertically was not given in Pt. II of the present paper.

It is as Fig. 58. ASR transversely finely closely striate, SAT low tuberiform, without ridge on anterior margin, without median carina on top, but with a minute impression near medio-apical margin.

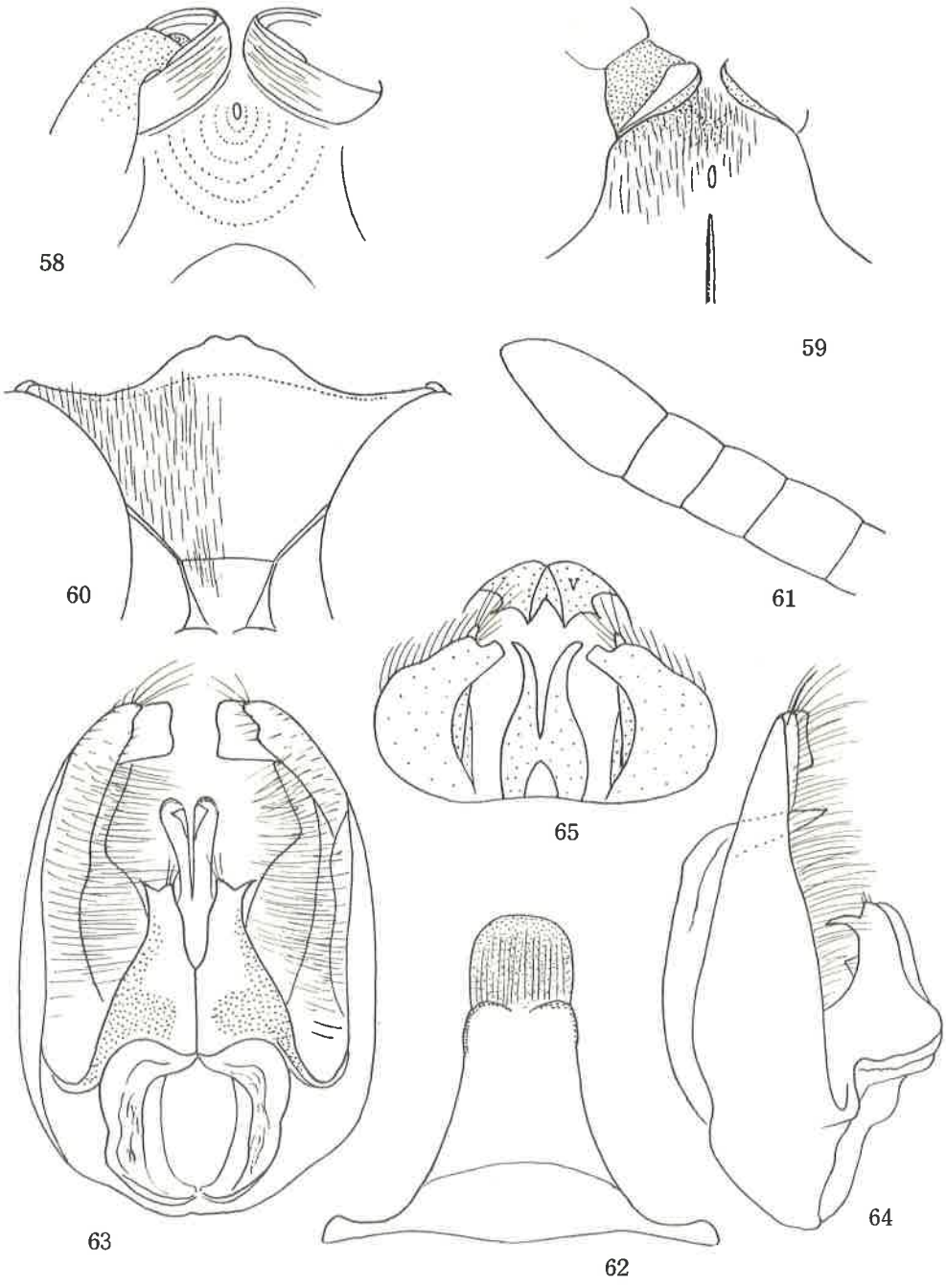


Fig. 58. SAT-ASR in Trypoxylon fletcheri Turner, ♀.
Figs. 59-65. Trypoxylon maai sp. nov., ♂.

21. TRYPOXYLON MAAI sp. nov.

♂. 5.3 mm, head in frontal view subquadrate, SAT low tuberiform, IODs = 10:7, clypeus: Fig. 60, antennal flagellum without notch, A13 = A11 + 12, mesopleuron with insufficiently developed pentroof structure, propodeum with lateral carinae, area dorsalis with distinct lateral furrows, petiole short, clavate, slightly shorter than G2+ G3; G2,G3 and base of G4 dark red, legs dark brown, fore and mid tibiae and fore tarsus ferruginous yellow, hair silvery.

HW, HL, IODv, P = 100, 63, 32, 86; OOD, Od, POD ≒ 1, 3, 2; frontal elevations weak, medial furrow shallow, surface nearly flat, SAT (Fig. 59, vertical) not particularly raised, broadly gently roundly tectate, almost covering ASR, on dorsum with a very short carina in middle; clypeus (Fig. 60) gently tectate, median ridge broadly rounded, supraclypeal area nearly equilateral triangle in form, antenna gradually thickened apically, A3 = AW × 2.7, A3, 4, 5 ≒ 10, 6, 6; A6 as long as wide; A10–13: Fig. 61. Collar of pronotum with anterior part linear, turning into a transverse carina, gently roundly emarginate in front and slightly widened towards sides, posterior part broad, discoloured, lamina on side rounded, slightly angulate at apex; subalar area on mesopleuron roundly swollen, with outer margin edged, with lower part deeply roundly excavated, the ridge slightly produced as a carina, but not expanded into pentroof structure. GSR roundly raised. P,Ma,Mi,2(Ma),3(Ma) = 100,40,18,56(52),56(66), CV1≒ CV2 × 3.5, CV2=TCV, RC B-type, R1 moderately long, only slightly shorter than TCV.

Black; antenna basally pale brown, semitransparent, darker above and towards apex, A1 and A2 ferruginous beneath, clypeus at apical margin dark brown, mandible ferruginous, palpi ochre yellow, pronotal tubercle pale yellow, tegula pale brown, both semitransparent, gaster from apex of petiole to G4 dark reddish brown, legs strongly brownish, fore and mid tibiae, fore tarsus and mid T1 largely ferruginous. Hairs silvery, on clypeus parallel.

Frons distinctly microcoriaceous, somewhat sparsely superimposed with fine punctures, mesoscutum without microsculpture, finely, very closely punctured, area dorsalis obliquely and transversely coarsely striate, series of strioles along lateral carinae of the segment defined on posterior part only, sparse, sides smooth and polished, on dorsal part sparsely striate and punctate.

Sternite 8: Fig. 62 (seen from inside), basal part markedly reflected, apical dotted area longitudinally striate, but whether the striae are fine impressed lines or hairs seen through the sclerite is unconfirmed, possibly the latter. Genitalia from beneath: Fig.63, ferruginous in colour, only on outer margin and dotted areas brownish seen from left side: Fig. 64, from apex: Fig. 65, paramere bifid at apex, the layers closely folded together, inner margin of the main body expanded, lamellate, the inner surface closely covered with long stiff hair, somewhat yellowish in colour, volsella strange in from, penis valve simple, apical part bent inwards.

♂, unknown.

Holotype: ♂, Malaya (Pahang, King George V National Park, Kuala Tranggan), 15–17. XII. 1958, T. C. Maa (BPBM).

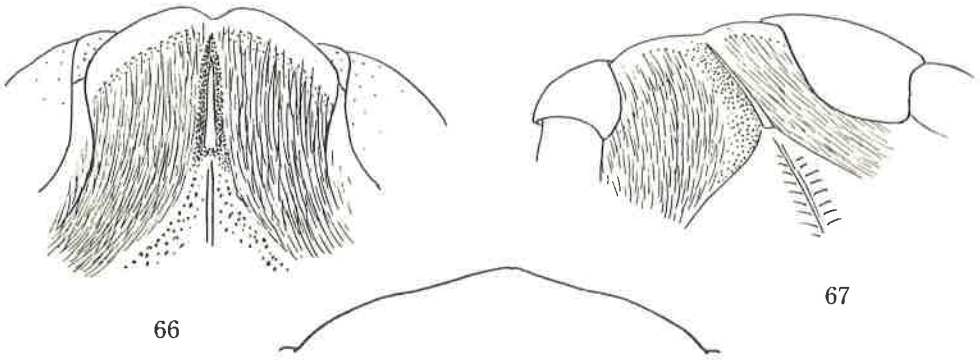
Remarks. The antennae, gaster and legs of the specimen are strongly brownish and partly semitransparent. This may be due to the long exposure of the specimen to the cyanide vapour.

22. TRYPOXYLON KEDAH sp. nov.

♀, 8–9 mm. Black, antenna basally, clypeus anteriorly, mandible, palpi, fore and mid legs nearly wholly, hind leg partly, tegula and basal plates of wing and gaster largely ferruginous; pronotal tubercle yellow, at base brown. Head in frontal view with sides rounded, only slightly narrowed below, IODs ≒ 5:3, apical margin of clypeus: Fig. 68, mesoscutum microcoriaceous and finely, very closely punctured, propodeum with lateral carinae, area dorsalis with distinct lateral furrows, petiole clavate, as long as G2+3, RC C-type, R1 = TCV × 1/2.

HW,HL,IODs,P = 100,56,28,125; OOD,Od,POD = 1,3.3,3; frontal elevations gently flatly inclined towards median line, SAT in vertical view: Fig. 66, except medial carina covered with silvery hair, posterior portion tectate, anteriorly nearly flattened, seen obliquely from side: Fig. 67. A3 = AW × 3.5; A3,4,5 ≒ 10,7,7; occipital carina low, disappeared beneath head behind buccal cavity. Anterior margin of collar broadly roundly emarginate, lamina on side slightly angulate at apex, not particular-

ly produced, posterior part discoloured. GSR ambur yellow, somewhat roundly elevated. Petiole clavate, P,Ma,Mi,2(Ma),3(Ma) = 100, 21,11, 52(28),50(35).



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Figs. 66–68. Trypoxylon kedah sp. nov.,♀.

Mesoscutum distinctly microcoriaceous and closely superimposed with punctures, half mat; lateral series of striae on dorsal aspect of propodeum lacking, medial broad round furrow of area dorsalis transversely weakly sparsely striate.

♂, unknown.

Holotype: ♀, Malaya (Kedah Peak, 3000–3300 ft), 12. III. 1928, H. M. Pendlebury (BMNH).

Paratypes: 1 ♀, Malaya (Selangor Ulu, Gombac, 300 m), 18. V. 1958, T. C. Maa (BPBM); 1 ♀, Laos (Sayaboury Prov., Sayaboury), 13. IV. 1966, native collector (BPBM)

Remarks. Al,A2 ferruginous, with brown mark above, from A3 apically brown to dark brown, A3 paler beneath. Petiole at base above and frequently a mark on apical portion above brown, sometimes a mark on G2 and G3 above also brown, apical 2 segments always dark brown. Mid T2 and T3 brown in holotype, but in 2 other specimens completely yellow, in hind leg apex of coxa, trochanter wholly, both ends of femur, base widely and inside of tibia ferruginous or ambur yellow, In the Laotian specimen except base and inside of coxa wholly ambur yellow.

23. TRYPOXYLON RUBROCAUDATUM sp. nov.

The present species is easily separable from allied congeners by the characteristic colour of the gaster, namely, of the black gaster the last 2 segments are red. The female is, moreover, distinct in the well-developed medial protuberance at apical margin of the clypeus.

♀, 10–11 mm. Black, apical 2 segments of gaster red, sides of basal 2 segments somewhat ferruginous, mid T1 and T2 except each apex and hind T1 at extreme base white sometimes apices of coxae and trochanters of mid and hind legs also largely white, articulations of legs brown to pale brown, sometimes whitish. Hair silvery.

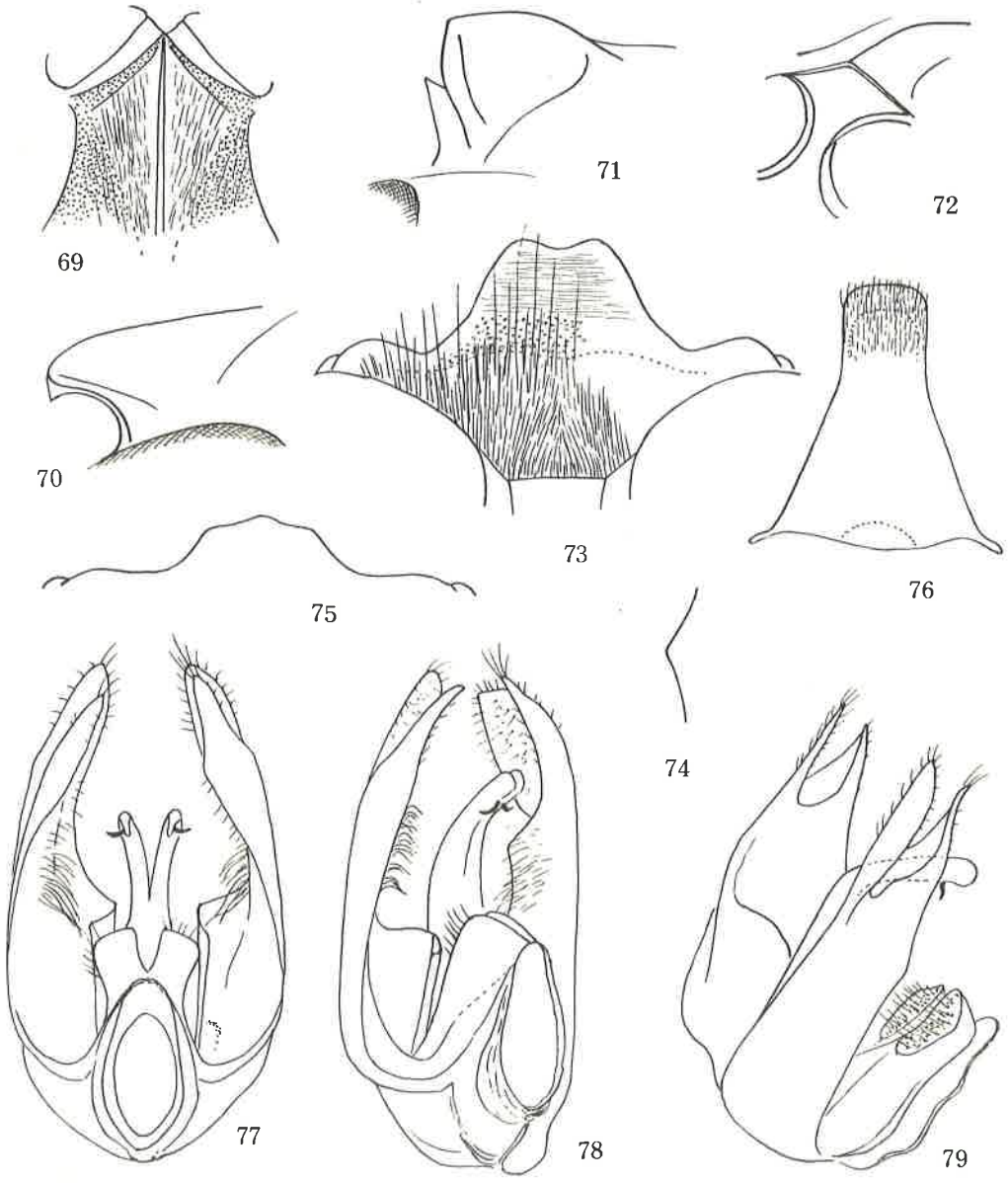
Head from above transverse, occipital margin strongly emarginate, HW,HL,IODv,P= 100,56,32,114; OOD,Od,POD ÷ 2,5,4; IODs = 10:5.5, frontal elevations weak, medial furrow weak, SAT fairly high narrow nasiform, acutely ridged on top, apical margin distinctly carinated (Fig. 72) and at medio-apical end vertically inclined to interantennal area (Figs. 69–72: vertical, lateral, through PAF and obliquely from beneath), clypeus: Fig. 73, disc at base gently elevated; antenna gradually thicker apically, A3 = AW x 3.5; A3,4,5 ÷ 10,6,5.5, All twice as thick as A3 at base, but A12 (=A10+11) attenuate smoothly towards apex. Pronotal lamina on side: Fig. 74 (left), mesopleuron normal, propodeum with lateral carina, series of strioles accompanied weak, sparse, area dorsalis with distinct lateral furrows, GSR simple. The form of P is rather intermediate between clavate and flask-shaped, but subequal in length to G2+G3. P,Ma,Mi, 2(Ma),3(Ma) = 100,28,16,46(42),45(48). CV1 = CV2 x 4, CV2 slightly shorter than TCV, sometimes subequal, RC B-type, but somewhat close to C-type, R1 not long, about half

the length of TCV.

Frons and mesoscutum distinctly microcoriaceous and on frons weakly, on mesoscut m strongly, both closely superimposed with fine punctures; median furrow of area dorsalis transversely striate.

♂, 6.5–7 mm. Similar to ♀ in general, but (1) Fore tibia and tarsus ferruginous, mid tibia in front and base of hind T1 pale brown, sometimes mid tibia and tarsus wholly and hind tarsus partly pale brown, articulations of legs always brownish. (2) IODs = 10:8. (3) Clypeus less produced anteriorly: Fig. 75. (4) A3 ≒ AW × 2.7, Al3 nearly as long as 4 preceding joints united (strictly slightly shorter) and twice as long as wide at base, shortly, weakly curved at apex. (5) CV2 ≒ TCV, CV1 ≒ CV2 × 3.

Sternite 8: Fig. 76 (from inside), yellowish ferruginous in colour, apically somewhat darker, latero-basal processes reflected inwards. Genitalia seen from beneath:



Figs. 69–79. Trypoxylon rubrocaudatum sp. nov. 69–74 ♀, 75–79 ♂.

Fig. 77, pale yellow in colour, seen obliquely beneath and side: Fig. 78, obliquely from above and side: Fig. 79, ventral one of apical two lobes of paramere is not simply lamellate (Fig. 79), volsella is also not simple (Figs. 78, especially 79), penis valve is without shoulder, but with a pair of sickle-shaped appendages before apex. The fact is worthy of special notice, in relation to the evolution in the form of the penis valve.

Holotype: ♀, South India (Madras State, 3500 ft, Anamalai Hills, Kadamparai), V. 1963, P. Susai Nathan (RMNH).
Paratypes: 3 ♀ 2 ♂, the same as in holotype.
Other specimen: 1 ♀, the same, but head is lacking.

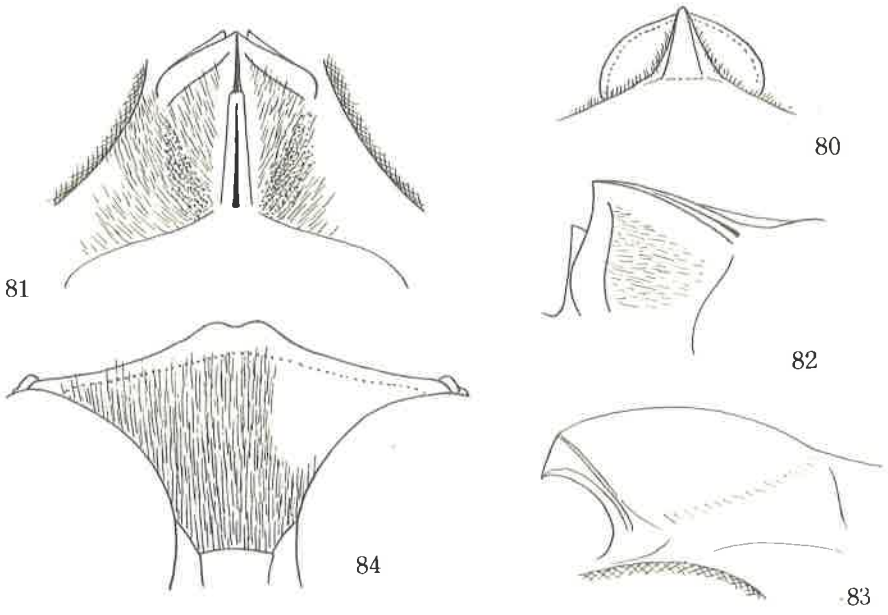
Remarks. In one of the female specimens the caudal reddish colour is very obscure.

24. TRYPOXYLON PENDLEBURYI sp. nov.

♀, 7-9.5 mm. Mesoscutum microcoriaceous, petiole claviform, sometimes close to flask-shaped, always short, subequal to G2+G3, hairs silvery, IODs = 2:1, SAT high narrow nasiform, clypeus bidentate at apex in middle, propodeum with lateral carinae, area dorsalis with lateral furrows, gaster variable in colour from wholly ferruginous to largely blackish, legs brown, variegated with ferruginous.

Black; ferruginous are A1-2 beneath and at apex, mandible, pronotal tubercle posteriorly, tegula, fore tibia and tarus. Anterior margin of clypeus narrowly dark brown. As to the colour of gaster and legs see remarks.

Head from above transverse, HW,HL,IODv,P = 100,64,31,114; OOD,Od,POD ÷ 1,5,4; IODs = 2:1; head seen in front with lateral margins rounded, slightly narrowed downwards; frontal elevations weak, median furrow feeble, on lower part disappeared, sur-



Figs. 80-84. Trypoxylon pendleburyi sp. nov., ♀.

face flat. SAT strongly keeled as a whole, seen from dorsal side: Fig. 80, seen vertically: Fig. 81, obliquely from side to see through PAF: Fig. 82, in profile: Fig. 83; apical margin transversely roundly expanded (Fig. 80) and acutely edged at the margin, almost covering ASR (Figs. 81 and 82). Clypeus: Fig. 84, medianly gently elevated; A3 = AW × 3.5, A7 longer than wide, 8-11 as long as wide (in lateral view all slightly longer than wide). Pronotal collar with anterior margin gently emarginate, anterior part medianly carina-like, without tubercle in middle, poster rt broad and discoloured, lamina on side only obtusely angulated at apex, not c ious.

Mesopleuron normal. P,Ma,Mi,2(Ma),3(Ma)=100,26,15,54(36),44(44); RC=B-type, Rl short, TCV:CV2 variable, CV1≒CV2x2.5-3.

Punctures on mesoscutum fine and very close, connected with each other by microstrioles.

♂, unknown.

Holotype: ♀, Malaya (Pahang, Cameron Highland, 4000-6000ft), 9. VI. 1935, H. M. Pendlebury (BMNH).

Paratypes: 2 ♀, the same place (4500-5000 ft and 4800 ft), 18. VI, 6. VI. 1935 H. M. Pendlebury (BMNH); 3 ♀, the same locality (but Fraser's Hill, all 4200 ft), 23, 26. VII. 1931, 2. VII. 1936, H. M. Pendlebury (BMNH); 2 ♀, Malaya (Perak, Larut Hill 4500 ft), 20, 22. II. 1932, H. M. Pendlebury (BMNH); 1 ♀, India (Assam, Shillong), IV. 1903, R. E. Turner Coll. (BMNH); 1 ♀, Laos (Vientiane Prov., Ban Van Ene), 28. II. 1966, native collector (BPBM).

Other specimen: 1 ♀, India (Assam, Shillong), IV. 1903, R. E. Turner Coll.(BMNH - head is missing).

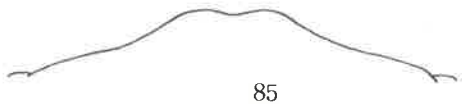
Remarks. Variation in colour: Petiole: In 3 specimens wholly ferruginous above, but with a brown mark behind middle. In 9 specimens basal 3/4 of dorsal side is black to dark brown; 3/4 or 1/2 or 1/3-4 of ventral side black, sides and apical portion ferruginous.

Rest of gaster: In 4 specimens wholly ferruginous, posterior portion somewhat brownish. In 1 specimen G5 only blackish; in 3 specimens G5 and G6 blackish; in the remaining 4 scattered black marks present, caused possibly by the irregular condition and movements of visceral substance before dessication - sclerite is semitransparent.

Legs: In most of the specimens bases of mid and hind tibiae ferruginous, in some uniformly brown. In 3 specimens mit tibia only or plus mid tarsus ferruginous; in 2 hind metatarsus at base ferruginous. Articulations always pale, but varied in extention. In 3 specimens from Assam bright parts of legs are broader and the ground brown colour is pale. However, in none of the specimens any of the trochanters is completely ferruginous and the gastral petiole is completely ferruginous.

25. TRYPOXYLON NASUTUM sp. nov.

♀, 8-10 mm. Very closely allied to the preceding species, but, (1) medio-apical protuberance of clypeus much broader (Fig. 85) and more broadly ferruginous, (2) IODc relatively slightly wider, IODs≒5:3, (3) Al and 2, apical half of clypeus, fore leg except extreme base of coxa, mid leg till near apex of Tl except base of coxa, hind leg on apex of coxa, whole of trochanter, base and apex of femur, broad basal ring of tibia, and Tl except apex bright ferruginous; gaster wholly light castaneous. Pronotal tubercle broadly yellow at apex. Measurements: HW,HL,IODv,P=100,62,26,102; OOD,Od,POD≒1,7,4; A3=AWx3.7; A3,4,5≒ 10,7,6; P,Ma,Mi,2(Ma),3(Ma)=100,32,15,56(46),54(54). Structure of SAT similar.



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♂, unknown.

Holotype: ♀, Malaya (Cameron's Highlands, 4600 ft), 30. V. 1931, H. T. Pagden (BMNH).

Paratype: 1 ♀, the same data.

Other specimen: 1 ♀, Malaya (Pahang, Fraser's Hill, 4000 ft), 11. VII. 1936, H. M. Pendlebury (BMNH - head is missing).

Remarks. The colour of Al and A2 is nearly yellow and the gaster posteriorly appears more or less blackish.

26. TRYPOXYLON MALAYANUM sp. nov.

♀. Very similar in colouration to the preceding species and in the structure to pendleburyi, but differs from both in that SAT is distinctly lower, with lateral inclination gentler, anterior margin not carinate, seen from side to see through PAF: Fig. 86 (cf. Fig. 82), head seen in front with sides not narrowed downwards, rather subquadrate, A3 usually somewhat shorter.

Frontal furrow weak, but distinct; clypeus: Fig. 87. HW,IODv,P=100,28,104; OOD, Od,POD≒1,6,3; IODs=2:1; P,Ma,Mi,2(Ma),3(Ma)=100,30,12,50(48),40(58). RC B-type, CV1= CV2×4.

♂, unknown.

Holotype: ♀, Malaya (Kedah Peak, 3300 ft at light), 24. III. 1928, H. M. Pendlebury (BMNH).

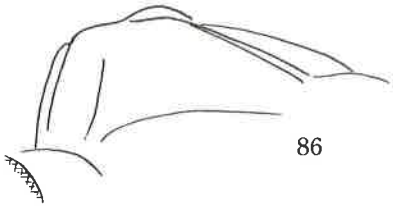
Paratypes: 10 ♀, the same place (2 ♀, 2000-3000 ft, 10.III.1928; 1♀, 3000-3300 ft, 12.III.1928; 2 ♀, 3000ft, 13.III.1928; 1 ♀, 3300-3950 ft, 14.III.1928; 1 ♀, 2500-3000 ft, 24.III.1928; 3 ♀, 3500 ft, 29.III.1928, H. M. Pendlebury (BMNH). 1 ♀, Malaya (Selangor, Bukit Kutu, 3300-3500 ft) 24.IX.1932, H. M. Pendlebury (BMNH). 1 ♀, Malaya (Pahang, Fraser's Hill, 4200 ft), 15.VII.1936, H. M. Pendlebury (BMNH).

Remarks. The specimens are timeworn and considered to have considerably faded in colour, but the following variations are observed in the colouration of the legs:

Except for black bases of coxae and dark brown (with black spots) arolia, fore and mid legs are wholly ferruginous as a rule. However, in some specimens fore and mid femora partly and mid tarsus apically somewhat brownish. In hind leg apex of coxa, trochanter, both ends of femur, base broadly of tibia and T1 except apex are always ferruginous and base of coxa black. While the remaining parts vary from brownish black, dark brown, brown, pale brown to complete ferruginous except brownish apical part of tarsus.

Apical margin of clypeus is typically as given in Fig. 87, but medial minute emargination is sometimes lacking and width of medial prominence is more or less variable and in some specimens somewhat close to that of nasutum (Fig. 85). Similarly relative length to width of A3 is slightly variable, in widest view (as always the case in my measurements) the multiplier to apical width varies from 3 to 3.5.

At any rate, the most important character to separate the present species from closely resembling relatives is that of SAT.



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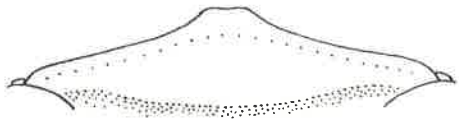

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Figs. 86-87. Trypoxylon malayanum sp. nov., ♀

27. TRYPOXYLON NILGIRIENSE sp. nov.

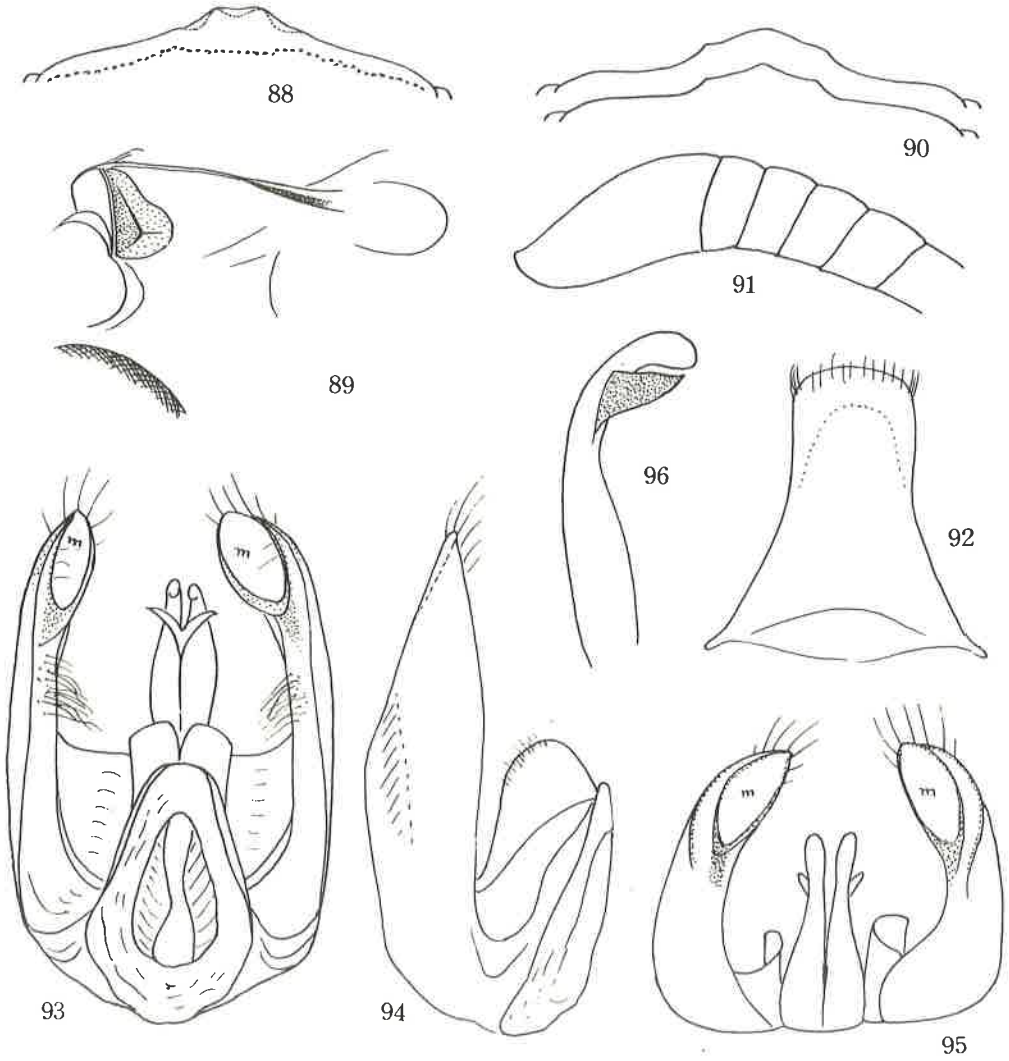
♀, 12-13 mm. Black; Al and 2 and base of 3 light castaneous, but Al ferruginous beneath, clypeus till apex black, mandible ferruginous, at apex brown, palpi ochre yellow, pronotal tubercle posteriorly yellow, tegula and basal plates of wings ferruginous; coxae black, their extreme apices and trochanters pale yellow, tibiae and tarsi of fore and mid legs, base of tibia and base of T1 of hind leg also pale yellow, but mid tibia and some of fore and mid tarsal joints somewhat brownish above, rest of legs (in paratype female mid tibia and tarsus largely) dark brown to black. Gaster from apex of petiole apically reddish ferruginous, but G5 appears broadly darkened. Hairs silvery.

Head from above transverse, with occipital margin markedly roundly emarginate, seen in front only slightly wider than long, with lateral margins roundly convergent below, convergency stronger below. HW,HL,IODv,A3,P=100,53,30-32,20,110; OOD,Od,POD≒ 1,4,3; IODs=10:5; A3≒AW×3.4, A3,4,5≒ 10,7,6. Apical margin of clypeus: Fig. 88 (apical areas enclosed with dotted lines are excavated in paratype female), disc weakly elevated, with hairs parallel all over. Frontal elevations weak, median furrow also weak, in paratype female almost lacking, instead a round shallow excavation present on lower portion behind medial carina of SAT, the carina narrow, acute and at the posterior end deeply incised from behind by a narrow impression, SAT thin and high nasiform, deeply excavated on each side behind ASR which is separated from the excavation by a highly raised transverse carina, the carina rising up towards the apex of median carina of SAT, but reaching it slightly behind its anterior end, seen from side (somewhat from above): Fig. 89. Occipital carina low, disappeared behind buccal cav-

ity. Collar of pronotum transverse, anterior part subcarinate, slightly widened laterally, posterior part broad, discoloured, lamina on side very slightly raised, subtriangular, with apex broadly rounded, not conspicuous. Mesopleuron on subalar are without pentroof structure; propodeum with lateral carinae, on anterior and posterior portions it is broadly vanished, area dorsalis with latrral furrows, GSR comparatively broad and thick, transversely striate, not raised high. Petiole claviform, not long, P,Ma,Mi,2(Ma),3(Ma)= 100,28,14,54(47),54(53). RC B-type, Rl moderate in length, CV1= CV2x4, CV2 shorter than TCV, angle between them appr. 120°.

Mesoscutum distinctly microcoriaceous and very closely superimposed with fine punctures, furrows of area dorsalis transversely striate, lateral series of strioles coarse and sparse; sides obliquely, somewhat irregularly microstriate and on posterior portion sparsely mixed with somewhat large punctures.

♂. Smaller, 7-7.3 mm. Similar to ♀ in general, but gaster from apex of petiole posteriorly ferruginous red and G2, 3, 4, each dark-banded across middle or at apex, but G5 broadly black at base (but possibly the marks are variable). HW,IODv,P=100,36, 98; OOD,Od,POD=2,3,4; IODs=10:9, A3=AWx2.7, A3,4,5=10,7.5,7, 7 as long as wide, 8-12 wider than long, 13 (Fig. 91) as long as 4 preceding joints united, slightly bent at apex. Clypeus: Fig. 90 (with variations, upper from Karikal, lower from Anamalai).



Figs. 88-96. Trypoxylon nilgiriense sp. nov. ♀(88-89), ♂.

P,Ma,Mi,2(Ma),3(Ma)=100,30,16,52(50),45(64). Sternite 8: Fig. 92, apical fringe of pubescence very sparse. Genitalia seen from beneath: Fig. 93, in profile: Fig. 94, from apex: Fig. 95, penis valve in lateral view: Fig. 96. Characteristic is that paramere carries a shallow pouch at apex, the back of which is formed of semitransparent membrane (m in Figs. 93, 95), volsella is not elongate spatulate and penis valve without shoulder, but with a pair of sickle-shaped appendages before apex. Presumably the pouch at apex of paramere is a result of fusion of the two lobes bifurcated. The fact is suggested by the state of genitalia in T. punjabense later treated.

Holotype: ♀, South India (Nilgiri Hills, Gudalur, 3500ft), IX. 1960, P. Susai Nathan (RMNH).

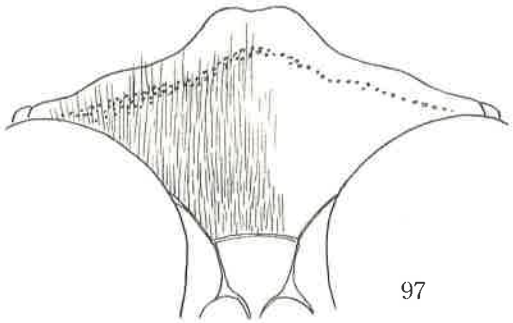
Paratypes: 1 ♀, South India (Pondicherry, Karikal), date and collector unknown (USNM); 1 ♂, South India (Madras State, 3500 ft, Anamalai Hills, Kadamparai), V.1963 P. Susai Nathan (RMNH); 1 ♂, South India (Pondicherry, Jarikal), ?, ? (USNM).

28. TRYPOXYLON TROCHANTERATUM Cameron, 1902

Trypoxylon trochanteratum Cameron, Entom., 35:313, 1902 (♀, India: Assam, Khasia Hills)
Trypoxylon trochanteratum: Tsuneki, SPJHA, 8: 47, 1978 (♀, redescription, figs.)

Specimens examined: 5 ♀, Assam (Khasia Hills) (syntypes of the species, 2 ♀ (BMNH) and 3 ♀ (UMO); 2 ♀ (no data, only Cameron Coll.), pinned with the same pin (BMNH).

Remarks. In my redescription it was given that trochanters ferruginous beneath and brown to dark brown above. This is certainly true in regard to fore leg (in some specimens dark brown even beneath), but mid and hind trochanters are, when vertically seen, always wholly ferruginous or ambur yellow. Clypeus in the newly examined specimens (Fig. 97) gently tectate on disc, with hairs parallel all over. In these specimens gaster is broadly black, only G1, G2, base of G3 beneath and apex of G1, G2, base of G3 above ferruginous red, G3-6 with scattered reddish obscure marks only.



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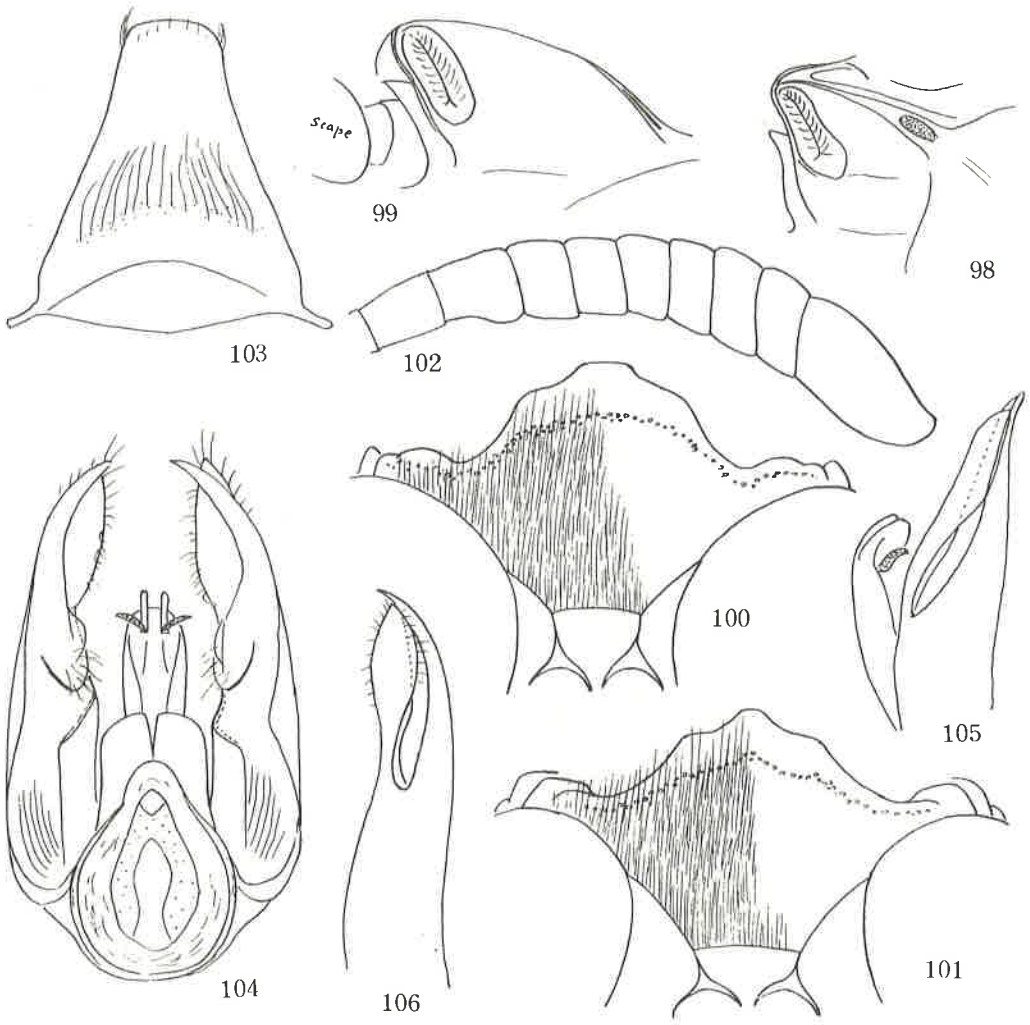
29. TRYPOXYLON PUNJABENSE sp. nov.

Closely allied to T. nilgiriense, differs from it in the form of apical margin of clypeus (♀ ♂) and in the detailed structure of paramere of genitalia in the male. To separate simply from it the difference in the colour of the legs is of use.

♀, 11-13 mm. Black; clypeus till apex black, mandible ferruginous, apically darkened, palpi ochre yellow, pronotal tubercle on posterior margin yellowish, posterior part of collar discoloured, dusky yellow, tegula semitransparent pale brown. Gaster from apex (and sides) of petiole to base of G4 reddish ferruginous, frequently marked with dark brown on tergites. Articulations of legs, fore tibia and tarsus largely, sometimes bases of mid and hind tibiae and base of mid T1 pale brown. Hairs silvery.

HW,HL,IODv,P=100,56,32,112; OOD,Od,POD÷1,4,3. Head seen in front with sides roundly convergent below, IODs=10:6, frontal elevations low, surface sometimes nearly flattened and weakly furrowed in middle, but more frequently it is broadly roundly, not deeply concave, SAT high thick nasiform, seen vertically anterior margin triangularly produced and acutely carinated, behind the carina on each side a deep obliquely elongated excavation present, median carina of SAT broad, carrying a deep elliptic hollow at base and acutely attenuate apically, SAT seen obliquely from side: Fig. 98, in profile: Fig. 99; clypeus: Fig. 100, A3=AW×3.5, A3,4,5÷10,8,6. Occipital carina low, incomplete, disappeared behind buccal cavity. Pronotal collar with anterior part subcarinate, broadly roundly emarginate in front, without medial tubercle, lamina on side weakly produced in obtuse triangle, with apex bluntly rounded. Mesopleuron without pent-roof structure. Propodeum with lateral carinae, area dorsalis with lateral



Figs. 98–106. Trypoxylon punjabense sp. nov., ♀ (98–100), ♂.

furrows. P,Ma,Mi,2(Ma),3(Ma)=100,28,15,54(38),46(50). In fore wing RC B-type, but close to C-type, Rl very short, CV1=CV2×4, CV2=TCV, TCV fairly strongly sinuate, angle between them about 120°.

Frons and mesoscutum strongly microcoriaceo s and closely superimposed with fine punctures, half mat, area dorsalis comparatively coarsely, at base obliquely and on disc transversely rugoso-striate and rugoso-reticulate, median broad furrow transversely closely rugoso-striate, outside the area and posterior inclination till lateral carinae strongly micro-reticulate and covered with dense hair, sides smooth and polished, posterior portion weakly irregularly reticulate.

♂, 9 mm. In colour similar to the bright-coloured form of ♀ (reddish gastral tergites without brown mark, mid T4 and T5 pale brown and T1 whitish), in punctuation and sculpture also similar to ♀, in structure also generally similar, but

HW:IODv=100:34, OOD,Od,POD≒2,3,3; IODs=5:4, A3=AW×2.5, A3,4,5=10,8,6. A5–13: Fig. 102, A6 excavated beneath, A13 shorter than 4, but longer than 3 preceding joints united. Clypeus: Fig. 101. Sculpture on propodeum similar to ♀ in pattern, but much coarser and stronger. P,Ma,Mi,2(Ma),3(Ma)=100,27,16,54(38),52(52); RC C-type, Rl short, but somewhat longer than in ♀, CV1=CV2×2.7, CV2 slightly longer than TCV, TCV sinuate, angle about 120°.

Sternite 8 (Fig. 103) and genitalia (Fig. 104) closely resemble those of nilgiri-

ense. In the present species, however, paramere does not form a pouch at apex, but shows distinctly two lobes bifurcated, though they are closely overlapped each other (Figs. 104, seen from beneath, 105, apical part of left paramere seen obliquely from dorsal side, 106, ditto seen from dorsal side). Volsella and penis valve are also similar, but the latter (in Figs. 104–106) relatively somewhat broader and apical area strongly compressed laterally. By the detailed observation it is confirmed that the ventral one of the two apical lobes of paramere has three aspects, namely, outer, ventral and dorsal, the latter two are front and backsurface of the membrane stretched from the ventral margin of the outer aspect.

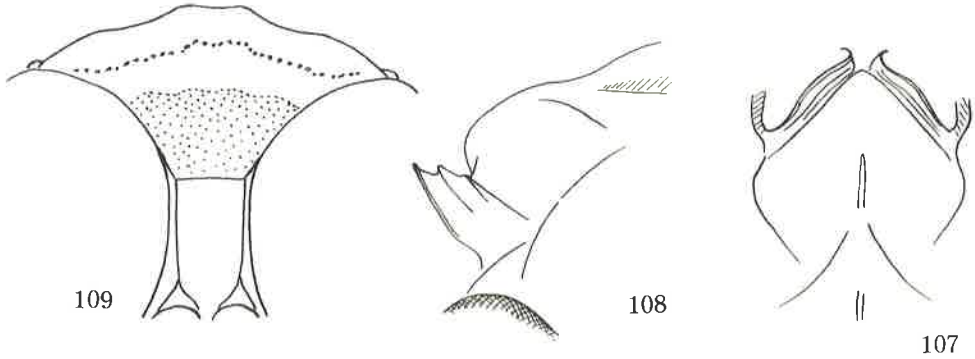
Holotype: ♀, North India (Kangra Valley, 4500 ft), VI. 1899, G. C. Dudgeon (BMNH).

Paratypes: 1 ♂, the same as holotype (BMNH); 3 ♀, Simla, VIII. 1898, C. G. Nurse (BMNH); 2 ♀, Simla, VII. 1918 and 1-7. IX. 1918, Brunetti (BMNH); 2 ♀, Naini Tal, 7000 ft, V. 1900 (BMNH); 1 ♀, North India (Smith Coll.) (BMNH); 1 ♀ (P. Cameron Coll.) (BMNH); 1 ♀, India (Mussorie), VI. 1909, E. Brunetti (BMNH).

Other specimens (gaster or head lacking): 1 ♀, Simla (P. Cameron Coll.); 3 ♀, Kangra Valley, 4500 ft, XI. 1899, G. C. Dudgeon (BMNH).

30. TRYPOXYLON LONGIPES sp. nov.

♀, 8 mm. Characteristic in the markedly long and slender legs. Black; antenna dark brown, A1-3 pale brown and ferruginous beneath. Light ferruginous to pale brown: apical area of clypeus broadly, mandible (apex dark brown), palpi, pronotal tubercle, tegula and basal plates of wings, gaster largely and legs broadly; petiole with a pair of small brown marks near apex, G4 at apical part and G5 nearly wholly blackish; mid tarsus from apex of T1 apically, except articulations, pale brown, hind femur somewhat pale brownish, -tibia except base and -tarsus wholly somewhat dark brown, ferruginous area on legs slightly semitransparent and mid legs with ground colour pale yellow. Hairs silvery, normal in distribution, on clypeus parallel.



Figs. 107-109. Trypoxylon longipes sp. nov., ♀

HW,HL,IODv,P=100,60,30,152; OOD,Od,POD≒1,6,4; frontal elevations gentle, median furrow weak and broad, but distinct and narrow on lower portion behind SAT (constant?). Head seen in front subquadrate, IODs=10:4, SAT low broad nasiform, without excavation on anterior sides, not carinated on apical margin, seen vertically: Fig. 107, seen to see through PAF: Fig. 108; clypeus: Fig. 109, dotted area black. A3=AW×3.5, A3,4,5≒10,7,7. Collar of pronotum anteriorly broad-triangularly emarginate, with a minute tubercle in middle, densely covered with silky white hair, posterior part apparently not discoloured, lamina on side indistinct, mesopleuron without pentroof structure; propodeum with distinct lateral carinae, area dorsalis enclosed with distinct furrow, raised above sourrounding areas and broadly furrowed in middle, GSR simple, propodeal sternite present. Gastral petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100,18,8,58(23),40(30). Legs remarkably slender and long, fore and mid metatarsi as thick as A3 at base. In fore wing RC B-type, R1 moderately long, slightly shorter than TCV, CV2≒TCV, forming blunt angle between them, CV1=CV2×4.

Mesoscutum weakly microcoriaceous and very closely superimposed with very fine punctures, mesopleuron microcoriaceous, but without punctures superimposed, area dor-

salis transversely finely closely striate, on disc striae weak, rest of dorsal aspect closely covered with hair, series of striae along lateral carinae present, but striae very short and sparse; sides obliquely very finely and very closely striate, surface fairly well shining.

♂, unknown.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Bue), 29. III. 1966, native collector (BPBM).

31. TRYPOXYLON TESTACEICORNE Cameron, 1907

Trypoxylon testaceicorne Cameron, J. Bombay Nat. Hist. Soc., 17: 1009, 1907 (♀, India).
Trypoxylon testaceicorne: Tsuneki, SPJHA, 8: 57 (redescrip. of holotype, figs.), 1978.

Some supplements. Antenna dark brown, paler beneath, apical margin of clypeus ferruginous, a pair of marks at base of G3, fore leg largely and mid and hind legs partly yellowish white, trochanters pale brown. IODs=5:4, A3=AW 3.5, P,Ma,Mi,2(Ma), 3(Ma)=100,28,18,70(32),56(50), clypeus triangularly produced, with apex pointed,mesoscutum microcoriaceous and punctured, propodeum with lateral carinae, area dorsalis with lateral furrows. Gastral petiole clavate, but enlargement towards apex weak.

Length 6 mm, ♂ unknown. India (Deesa).

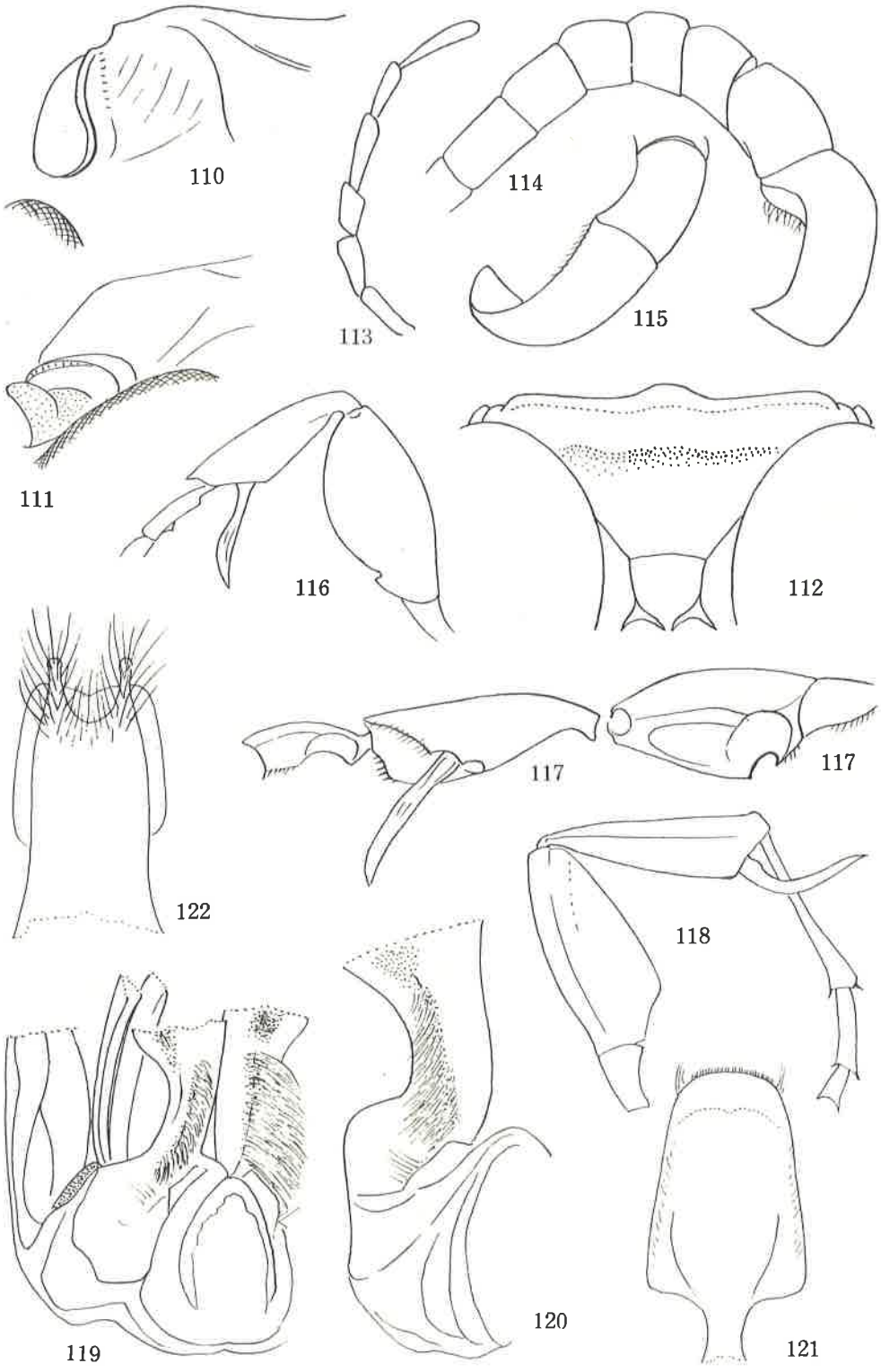
Remarks. No specimen of this species could be discovered among the examined material from India and the adjacent areas.

32. TRYPOXYLON TRUNCATUM sp. nov.

♂, 10 mm. Characteristic in the structure of antenna and legs. Black; bright ferruginous are antenna (brown above, but on A13 pale), apical marginal area of clypeus (extreme margin brown), mandible (apically brown), mouth parts, tubercle of pronotum (rather yellow), tegula and basal plates of wings, gaster from apical 1/4 of petiole posteriorly (posterior portion brownish), fore and mid legs except bases of coxae and arolia, hind leg from apex of coxa to end segment except underside of trochanter and femur (brown). Fore femur with a brown patch above and mid trochanter also with a brown spot above. Stigma and veins of wings pale castaneous. Hairs silvery, on dorsum of frons and mesoscutum greyish white.

HW,HL,IODv,P=100,56,27,96. OOD,Od,POD≒2,6,5. IODs=10:7. A3=AW×2.2. A3,4,5≒ 10,9,8.5. A8-13: Fig. 114, A13 curved, twisted, strongly hollowed beneath, lamellate, with a tuft of hair at base beneath on outer margin, seen from vertically: Fig. 115. Head in frontal view subquadrate, slightly narrowed below, frontal elevations moderately raised, rather small, suboval in outline, distinctly separated from each other by a fairly deep median furrow, SAT nasiform, moderately high, sides flatly obliquely inclined, PAF very weak, seen to see through PAF: Fig. 110, in profile: Fig. 111; clypeus: Fig. 112, disc nearly flat, with hairs parallel; occipital carina complete, not emarginated posteriorly behind buccal cavity; maxillary palpus semitransparent white, somewhat characteristic in the relative length between segments(Fig. 113). Pronotal collar transverse, densely pilose, anterior part with a minute tubercle in middle, posterior part discoloured, lamina on side triangular, obtusely rounded at apex, subalar area of mesopleuron without pentroof structure. Propodeum with distinct lateral carinae, area dorsalis with lateral furrows, GSR roundly elevated; gastral petiole short, clavate, P,Ma,Mi,2(Ma),3(Ma)=100,36,15,62(58),50(68). Fore and mid femora markedly incrassate, and flattened and slightly excavated on inner side (Fig. 116, fore left, posterior view; Fig. 118, mid left, anterior view), fore femur at base beneath roundly carinated across and deeply excavated beyond the carina, the carina on lower (posterior) margin roundly incised and toothed at apex (Fig. 117, right, obliquely from inside-beneath and also Fig. 116), mid femur somewhat produced and angulated near base beneath and inner side flattened and slightly excavated (Fig. 118, right, from inside); tibiae also somewhat modified, with spurs abnormal (Figs. 116, 117, 118), but hind leg normal. RC B-type, R1 short, CV1≒CV2×4, TCV longer than CV2, angle between them appr. 120°.

Frons microcoriaceous and very closely, somewhat rugosely superimposed with comparatively large punctures, on mesoscutum microsculpture weak, punctures slightly smaller than on frons, but much more closely imposed, surface less shining than on frons, mesopleuron also microcoriaceous, but hair-bearing punctures superimposed very small, rather difficult to see under 50 magnification. Propodeum on lateral areas with sur-



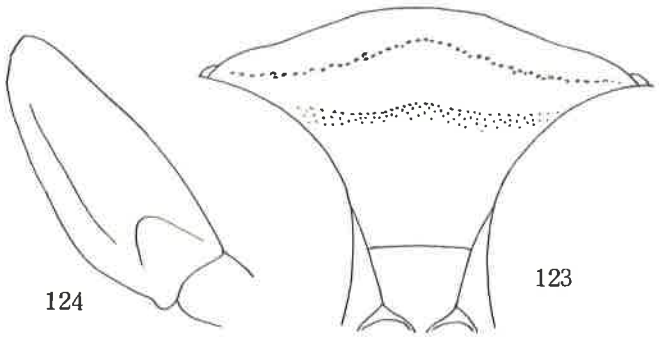
Figs. 110-122. Trypoxylon truncatum sp. nov., ♂.

face condition similar to that of mesopleuron, area dorsalis including broad medial furrow smooth and shining, sides also smooth and polished, posteriorly scattered with minute points.

Genitalia. Apical area happened to be destroyed and the important parts wer lost. It was made clear, however, that volsella at least is very abnormal. It is broadly flattened and, further, enlarged apically and provided with a weak longitudinal carina at about middle which is densely covered with long silky yellow pubescence, below the dense fringe a row of a few hair are appressed to the surface (Figs. 119, obliquely from left side; 120, left half from beneath). Sternite 8: Fig. 121 and sternite 7: Fig. 122, both quite strange in form, especially the former in the basal- and the latter in the apical structure.

♀, 10 mm. In colouration and sculpture generally similar to ♂, but antenna dark brown, paler beneath; A1-3 ferruginous, brown above; fore and mid trochanters above, obscure marks on fore and mid femora above and mid T3-4 pale brown, hind trochanter and femur both largely, apical part of hind tibia and T1-3 deep brown.

HW,HL,IODv,P=100,54, 24,106; OOD,Od,POD≒1,6,4; OOD very narrow, IODs=10: 6,7; antenna normal. A3= AWx3; A3,4,5≒10,8,7. Clypeus: Fig. 123. SAT similar to that of ♂. P, Ma,Mi, 2(Ma),3(Ma)=100,34,17,56 (54),56(60). All femora of legs exceptionally thick, in fore and mid legs nearly as thick as in ♂, though the excavation and tooth are absent in fore femur, but in mid femur somewhat similarly angulated at base beneath (Fig. 124). CV1 = CV2 x 4.



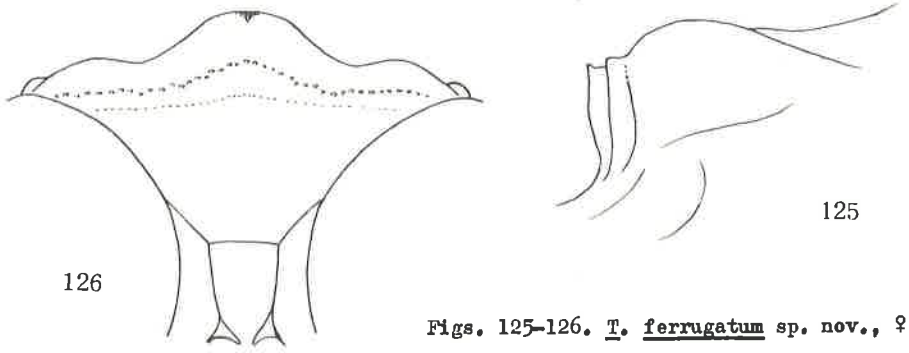
Figs. 123-124. T. truncatum sp. nov., ♀

Holotype: ♂, Laos (Vientiane Prov., Gi Sion Vill. de Tha Ngone), 10-30. I. 1966 native collector (HPBM).

Paratype: 1 ♀, Laos (Savannakhet Prov., Savannakhet), 15. IV. 1967, native collector (HPBM).

33. TRYPOXYLON FERRUGATUM sp. nov.

♀, 8 mm. A1 and 2 ferruginous, 3 pale brown, apically black; ferruginous are clypeus anteriorly, mandible, pronotal tubercle posteriorly, tegula and basal plates of wings, fore and mid legs except coxal bases and arolia, and trochater, both ends of femur, tibia at base broadly and bases of T1 and T2 of hind leg. Mid T2-5 brown. Rest of legs dark brown. Gaster from apical part of petiole till apex reddish ferruginous. Hairs silvery.



Figs. 125-126. T. ferrugatum sp. nov., ♀

Head from above transverse, HW,HL,IODv,P= 100,50,28,92. OOD,Od,POD≒1,5,3; IODs

2:1. Frons gently raised, surface nearly flat, median furrow weak, SAT moderately high nasiform, acutely carinated on median line, two longitudinal parallel carinae present on medio-apical part of SAT, running down vertically to interantennal area, PAF very shallow, seen to see through it SAT-ASR: Fig. 125. Clypeus: Fig. 126, disc on medial are tectate, with ridge broadly rounded. A3≒AW×4, A3,4,5≒10,7,6, occipital carina disappeared behind buccal cavity. Pronotal collar with anterior margin gently roundly emarginate, anterior part subcarinate and slightly enlarged laterally, posterior part discoloured, lamina on side slightly produced in a round curve, medial area weakly angulated, not conspicuous; mesopleuron normal; propodeum with lateral carinae, area dorsalis with lateral furrows, GSR simple. P,Ma,Mi,2(Ma),3(Ma)= 100,36,16,56(50),44 (58), petiole clavate. In fore wing RC C-type, Rl considerably long, but not reaching wing apex, TCV longer than CV2, angle between them appr. 100 , CV1≒CV2×3.5.

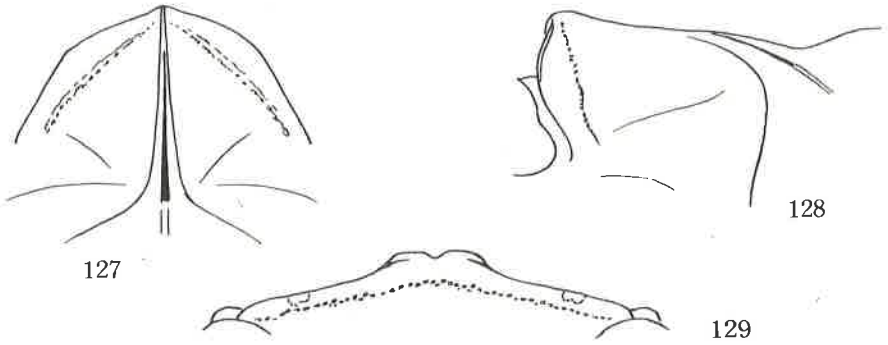
mesoscutum microcoriaceous and very closely superimposed with fine punctures, lateral and median furrows of area dordalis transversely sparsely striate, disc sparsely punctured.

♂, unknown.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Eue), 29. III. 1966, native collector (HPBM).

34. TRYPOXYLON NATHANI sp. nov.

♀, 8.0 mm. Black; Al brown above, A2 dark brown above, both paler beneath, apical margin of clypeus with an ambur-coloured spot near each side (Fig.129), mandible ferruginous, apex brown, palpi ambur yellow, pronotal tubercle yellowish brown on posterior margin, tegula and basal plates of wings semitransparent brown, gastral petiole on sides and apex, G2 except a large brown mark above, base and apex of G3, posterior margin of 4, and 5 and 6 nearly wholly ferruginous red; apices of coxae, trochanters



Figs. 127-129. Trypoxylon nathani sp. nov., ♀

wholly pale yellow, fore and mid femora and tibiae, all at base and apex, fore tarsus largely and hind tibia at base ambur yellow, mid tarsus and rest of hind leg dark brown to black. Hairs silvery, on clypeus parallel all over.

HW,HL,IODv,P=100,54,28,100. OOD very narrow, Od:POD=7:4, OOD relatively l, frontal elevations weak, surface nearly flat, median furrow very feeble; SAT in dorsal view: Fig. 127, apical margin triangularly raised and carinated, in lateral view dorsal in the same plain as frons, seen to see through PAF: Fig. 128; clypeus: Fig. 129. IODs≒2:1, A3=AW×3.7; collar of pronotum seen from above anteriorly gently roundly emarginate, anterior part subcarinate in middle area, posterior part discoloured, lamina on side weakly angulate at apex, not conspicuous, mesopleuron normal; lateral carinae of propodeum and lateral furrows of area dorsalis distinct, GSR simple; gastral petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100,34,16,46(49),44(57). In fore wing RC B-type, but close to C-type, Rl moderately long, CV1≒CV2×5, CV2:TCV≒1:2, angle more than 120°.

Mesoscutum microcoriaceous and fairly closely superimposed with fine but distinct punctures, series of striae along lateral carinae of propodeum weak and indistinct, area dorsalis including disc transversely somewhat sparsely, not strongly stri-

ate.

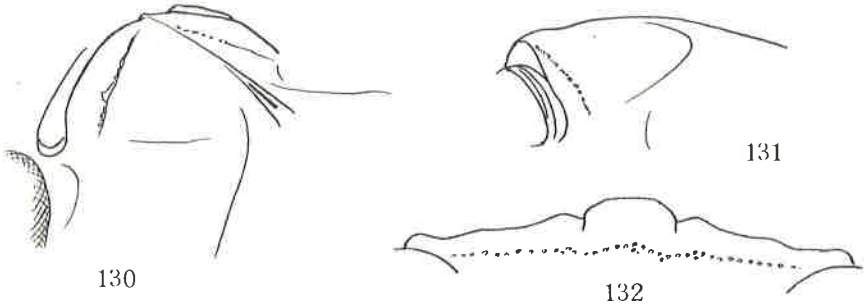
♂, unknown.

Holotype: ♀, South India (Anamalai Hills, Cinchona, 3500 ft), V. 1964, P. Susai Nathan leg. (RMNH).

35. TRYPOXYLON BANVANEUM sp. nov.

♀, 6.7 mm. Black; antenna dark brown, basally brown and A1 and 2 ferruginous beneath, clypeus anteriorly ferruginous, extreme margin chestnut brown, mandible pale brown, basally ferruginous, palpi ochre yellow, pronotal tubercle on posterior margin yellow, tegula and basal plates of wings semitransparent brown, gaster from apex of petiole to G4 reddish ferruginous, apical margin of 5 brown. Fore and mid legs ferruginous, in fore leg coxa largely black, trochanter in front, a vague line above of femur a spot at apex of T1 and 2 above brown, in mid leg a streak on femur, T2-5 brown, hind leg dark brown, apex of coxa, trochanter wholly, base and apex of femur, broad basal ring of tibia and bases of T1 and 2 ferruginous or pale yellow.

HW,HL,IODv,P=100,64,35,104, OOD,Od,POD÷1,6,4; head in frontal view subquadrate IODs=10:4, frontal elevations gentle, surface nearly flat, medial furrow very weak, SAT obliquely from side: Fig. 130, in profile: Fig. 131; apical margin of clypeus: Fig. 132, medial prominence appears to arise from somewhat behind apical margin, but this is due to thickening of the area, disc gently roundly tectate, hairs parallel. A3=AW× 2.7, A3,4,5=10,8,7, occipital carina incomplete, vanished behind buccal carina. Pronotal collar anteriorly transverse, anterior part subcarinate, posterior part discoloured, without tubercle in middle, seen in front dorsal margin nearly straight, only gently curved up; mesopleuron normal; propodeum with lateral carinae weak and inconspicuous, lateral furrows of area dorsalis distinct, GSR simple. Gastral petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100,32,15,56(28),46(56). In fore wing RC B-type, Rl moderately long, CV1=CV2 × 3.5, TCV longer than CV2, forming angle of about 100 between.



Figs. 130-132. Trypoxylon banvaneum sp. nov., ♀

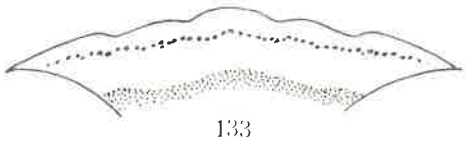
Mesoscutum distinctly microcoriaceous and closely superimposed with fine punctures, mesopleuron smooth above and finely sparsely punctured below, lateral series of striae of propodeum fine, close and weak, lateral furrows of area dorsalis finely punctured, medial furrow transversely striate, striae extending on to disc.

♂, unknown.

Holotype: ♀, Laos (Vientiane Prov., Bam Van Bue), 15-31. V. 1965, native collector (BPBM).

36. TRYPOXYLON UNDATUM sp. nov.

♀, 7.0 mm. Very closely resembling preceding species, differing mainly in the form of apical margin of clypeus (Fig. 133, cf. Fig. 132) and in the relative length of antennal joints. HW,HL,IODv,P=100,60,29,94. IODv as against HW distinctly narrower than in banvaneum and OOD very narrow, Od relatively very great (OOD,Od,POD÷1,6,3), frons and SAT similar in structure, IODc somewhat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shorter, IODs=10:3.4; A3÷AW×3.7, A3,4,5=10,7,6, bright colour of antenna and legs much more yellowish and fore and mid legs with brownish areas much narrower, but G2 and G3 each darkened with a broad brown mark. Lateral carinae of propodeum much weaker, but longitudinal series of transverse strioles somewhat more distinct, the striae fine and close, with outer ends in a longitudinal line, thus showing the presence of very weak elevation just outside the series.

♂, unknown.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Eue), 30. II. 1965, native collector (BPBM).

37. TRYPOXYLON CURVICORNE sp. nov.

By the simply rounded-out clypeus, the PAF-lacking SAT, subquadrate scutellum and the presence of a peculiar elevation at base of propodeum the present species is easily separable from the closely allied congeners. Furthermore, the form of antenna, ♂, is very characteristic. In the dried specimens it is always curved up as given in Fig. 138. This is due to that A8-11 broadly excavated beneath and produced at apex of A11 (Fig. 139), A13=BW×3.2 and as long as 4 preceding joints united.

♂, 7-7.5 mm. Black; antenna dark brown, ferruginous beneath, clypeus with apical margin narrowly castaneous brown, with a yellowish patch near each side, mandible and palpi ferruginous, tubercle and discolored posterior part of pronotum, basal plate of wings and legs nearly wholly ferruginous; gaster ferruginous red, petiole above and beneath, obscure band on G2 and 3 pale brown, sometimes on petiole considerably dark, apical margin of G4-6 blackish, 7 light brown to ferruginous; extreme bases of coxae, a line on fore femur beneath, obscure line on hind femur above, hind tibia apically on outer side and hind tarsus wholly brown to dark brown. Hair silvery, on thorax silky white.

HW,HL,IODv,P=100,52,30,118, OOD,Od,POD÷2,3,3, frontal elevations weak, gently inclined towards shallow median furrow, surface nearly flat, head in frontal view wider than long, with sides rounded, not convergent below. IODs=2:1, SAT moderately high nasiform (Fig. 135, profile), anterior portion laterally expanded, smoothly connected with ASR without PAF (Fig. 134, vertical), medio-apical area of SAT provided with a short, triangularly raised, weak, transverse carina (Fig.136, seen obliquely from beneath), lateral inclinations of SAT densely covered with silvery hair, medial line is only a ridge of the inclinations, not particularly raised up as done in similar SAT in kedah (cf. Fig. 67). Apical margin of clypeus: Fig. 137. A3=AW×2.2, A3,4,5÷10,6,5.5, A13 from dorsal side BW 3.1, slightly curved as a whole, not bent at apex; occipital carina complete, though weaker behind buccal cavity where it is very close to buccal carina. Collar of pronotum transverse, without tubercle in middle, lamina in a smll triangle, acutely angulated at apex (Fig. 140), mesopleuron normal, postscutellum quadrangular, markedly roundly raised, propodeum with lateral carinae, nearly completely running from spiracle to apex, lateral furrow of area dorsalis also distinct. Quite peculiar is a smooth elevation just behind postscutellum and in front of area dorsalis, similar in outline, size and elevation to postscutellum (as if two postscutellum present), whence basal oblique striae and medial furrow of area dorsalis begin. GSR simple. Gastral petiole comparatively slender, medianly narrowed, but apical swelling gradual, P,Ma,Mi,2(Ma),3(Ma)=100,23,12,46(30),50(36), legs normal. In fore wing RC B-type, but close to C-type, Rl moderately long, approaching close to wing apex, CV1=CV2×3.5, TCV slightly longer than CV2, angle formed by them appr. 120°.

Frons and mesoscutum distinctly microcoriaceous, punctures superimposed close on both, but slightly larger and stronger on frons. Area dorsalis at base obliquely striate, posteriorly transversely, moderately closely striate, striae extended on to disc, lateral series of striae weak and indistinct; sides smooth and polished.

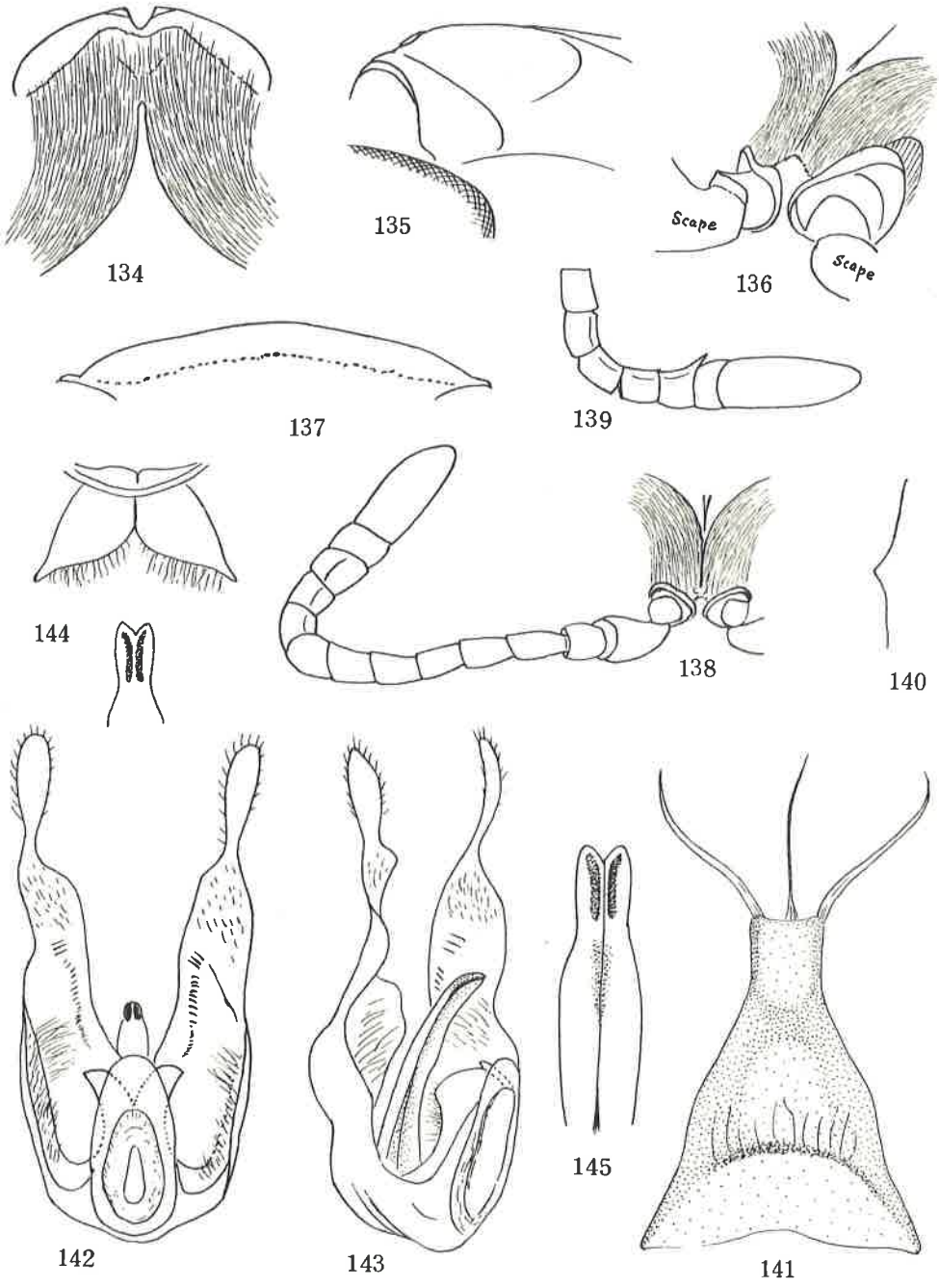
Sternite 8: Fig. 141, latero-apical long hair bands are apparently fused into a pair of whips, while medial one still consists of several hairs. Genitalia seen from beneath: Fig. 142, obliquely from left side: Fig. 143, volsella and penis valve seen from apex: Fig. 144, penis valve from dorsal side: Fig. 145. Paramere is a slender lamella, complicately pubescent and shortly bristled on the vental surface, volsella on posterior (dorsal) aspect covered with sparse pubescence, penis valve without shoulder and sickle-shaped appendages.

♀, 8 mm. Except antenna and some measurement values similar to ♂, the form of clypeus also similar. A3=AW×3.5, A3,4,5=10,8,7. HW,HL,IODv,P=100,50,28,126. IODs=10:5.

Holotype: ♂, Laos (Sayaboury Prov., Sayaboury), 13. I. 1966, native collector (BPBM).

Paratypes: 1 ♂, Laos (Savannakhet Prov., Savannakhet), 15. IV. 1967, native collector (BPBM); 2 ♀, Laos (Vientiane Prov., Ban Van Eue), 30. III. 1966, 30. XI. 1966, native collector (BPBM).

Remarks. In one of the females the basal elevation of the propodeum is not so strongly raised as in others.



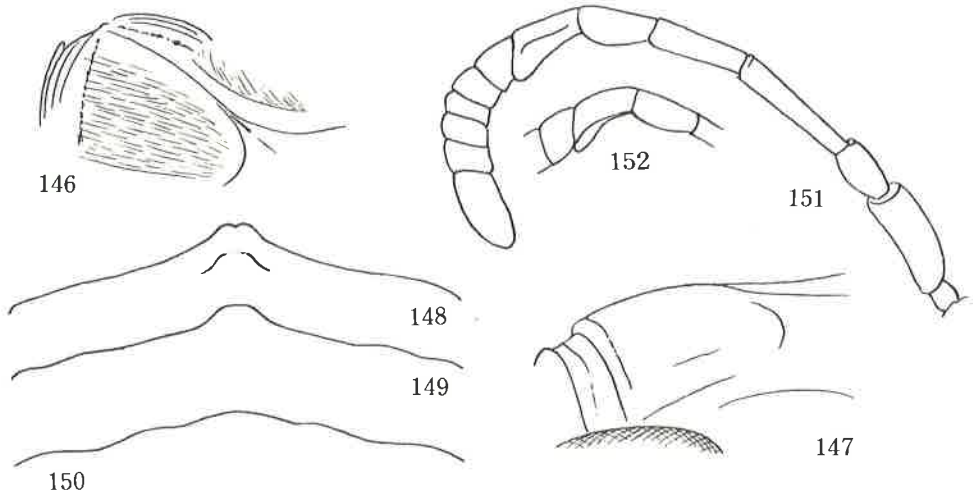
Figs. 134-145. Trypoxylon curvicorne sp. nov. 134-137,140 ♂♀, others ♂.

38. TRYPOXYLON FERRUGINEUM sp. nov.

♀, 7-9 mm. Black; antenna basally, legs largely and gaster wholly ferruginous. Al-3 ferruginous, 4 pale brown, 5-12 brown, dark brown to black, clypeus with apical third ferruginous, extreme margin castaneous, mandible at base orange yellow, apically glossy brown, palpi ochre yellow, pronotal tubercle posteriorly yellow, posterior part of collar discoloured, semitransparent pale yellow, tegula and basal plates of wing ferruginous, gaster sometimes apically brownish; coxae except apices black, femora usually with a dark streak or a line above, sometimes hind femur except base brown to dark brown, hind tarsus from apex of metatarsus apically brown to dark brown. Hair silvery.

HW,HL,IODv,P=100,54,30,88; OOD,Od,POD≒1,5,3, frontal elevations weak, surface nearly flat, sometimes medianly weakly furrowed, but oftener broadly roundly and shallowly concave on lower portion. Head in frontal view with sides rounded, slightly convergent towards clypeus; IODs=2:1, SAT moderately high, distinctly nasiform, anterolaterally smoothly connected with ASR, without PAF, but from sides of medio-apical area a weak furrow runs down obliquely posteriorly. SAT seen obliquely from side: Fig. 146, in profile: Fig. 147, medio-apical margin sometimes transversely carinated, sometimes carina weak and indistinct; clypeus with apical margin as in Fig. 148, medio-apical prominence sometimes minutely weakly emarginate or incised (Fig. 148), but sometimes entire (Fig. 149), A3=AWx3.5, A3,4,5≒10,7,6. Occipital carina incomplete, gradually vanished behind buccal cavity. Pronotal collar medianly narrow and enlarged towards sides, without tubercle in middle, posterior part broad and discoloured, lamina not produced, inconspicuous, scutellum wider than long, mesopleuron normal, propodeum with transverse medio-basal elevation, but it is narrower and lower than postscutellum, lateral carinae distinct, but not on basal and apical areas, area dorsalis with lateral furrows, GSR simple. Gastral petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100, 36,19,58(56),60(72), in fore wing RC B-type, Rlmoderate in length, CV1≒CV2x4.5, CV2 shorter than TCV, angle between them appr. 120 .

Frons and mesoscutum microcoriaceous,punctures superimposed fine and close, area dorsalis at base obliquely, posteriorly transversely striate, disc near base sparsely punctured, without striae, series of striae along lateral carinae sparse, not strong, sides smooth, on anterior area obliquely weakly striate, on posterior area sparsely punctured, in Laotian specimens completely smooth and polished.



Figs. 146-152. Trypoxylon ferrugineum sp. nov. 150-152 ♂.

♂. Similar to ♀ in general, but antenna basally more broadly ferruginous and pale brown, A5 roundly swollen out beneath and A6 strongly excavated at base beneath and markedly produced at apex (Fig. 151, dorsal view, Fig. 152, lateral view), thence apically joints shorter and thicker till A12, A13 longer than 3 but shorter than 4 preceding joints united; besides the above antenna is characteristic in that A3 is exceptionally long (HW:A3=100:24, in ♀ 100:20), relative length between A3...A13 = 10, 7,5,5,2.5,2.5,2.5,2.5,2,3,9. Clypeus much less produced anteriorly than in ♀ (Fig. 150) and IODv broader, namely IODs=3:2. Regret gaster is lacking.

Holotype: ♀, Thailand NW (Chiannai: Doi Suthep, 1278 m), 29. III. - 4. V. 1958, T. C. Maa (BPBM).

Paratypes: 1 ♀, the same place and time as in holotype; 8 ♀ 1 ♂, Laos (Vientiane Prov., Ban Van Bue): 1 ♀, 10-11. IV. 1965; 3 ♀ 1 ♂, 31. XII. 1965; 1 ♀, 30. III. 1966; 1 ♀, 15. V. 1966; 2 ♀, 30. II. 1967, all native collector (BPBM).

Remarks. In the specimens captured in Thailand the body is slightly larger, SAT slightly lower and broader and OOD is somewhat broader (in Laotian specimens OOD is very narrow and Od is relatively broader). Further, the punctures on frons somewhat larger than those on mesoscutum.

39. TRYPOXYLON PAHANGENSE sp. nov.

♀, 8 mm. Black; antenna black, A1 and 2 orange yellow, 3 also yellow, but apically brown, clypeus on apical area and mandible pale chestnut brown, tubercle of propodeum posteriorly brown, tegula semitransparent brown, gaster ferruginous red, posteriorly brownish, legs ferruginous, coxae except apices and arolia black. Fore and mid femora more or less brownish, the former with a blackish streak in front beneath, hind femur and tibia more broadly and more deeply brown, tarsus dark brown. Hair silvery.

HW,HL,IODv,P=100,56,30,114; OOD,Od,POD=1,3,2; frons gently raised and weakly inclined towards medial line. Head in frontal view with sides rounded and slightly convergent below, comparatively high (W:L=100:87), IODs=2:1, SAT moderately high nasiform, similar in structure to that of preceding species (apical margin obliquely triangularly raised and carinated), apical margin of clypeus: Fig. 153, disc distinctly tectate, median ridge rounded, hairs parallel; A3=AWx3.5, A3,4,5=10,6,6. Collar as in preceding species, but the carinate range of anterior part much broader, lamina triangular, weakly produced, apex bluntly rounded, inconspicuous, scutellum wider than long, mesopleuron normal, medio-basal elevation of propodeum wider and shorter than postscutellum, obliquely inclined posteriorly, not so remarkable as in curvicorne, but the elevation of area dorsalis marked, with medial furrow broad and deep and lateral furrows also distinct, hence the surface strongly sinuate in cross section, lateral carinae distinct and long, running from near spiracle till apex, GSR weakly roundly raised, nearly simple, P,Ma,Mi,2(Ma),3(Ma)=100,27, 11,45(40),42(49), tergite 2 basally broadly depressed and apically strongly swollen, in fore wing RC C-type, R1 moderately long, reaching fairly close to wing apex.

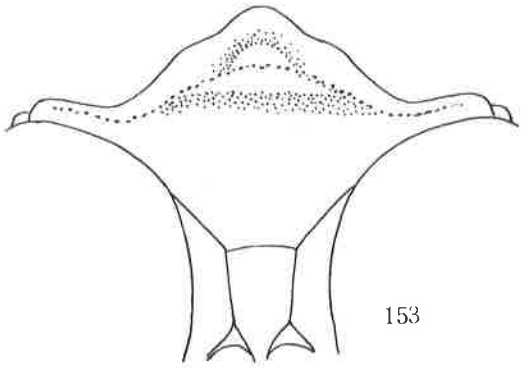


Fig. 153. T. pahangense sp. nov. ♀

Frons and mesoscutum distinctly microcoriaceous and closely superimposed with fine punctures, punctures similar in size on both areas, median furrow of propodeum transversely striate, lateral series of strioles indistinct, sides smooth and polished, only on posterior portion sparsely punctured.

♂, unknown.

Holotype: ♀, Malaya (Pahang, Cameron's Highlands, 5000-6000 ft), 6. IX. 1935, H. M. Pendlebury (BMNH).

40. TRYPOXYLON PAGDENI sp. nov.

♀, 8mm. Very similar to T. ferrugineum, but differs from it in the following characters:

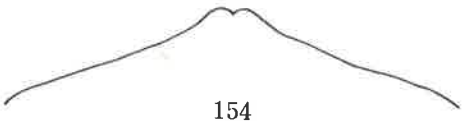
(1) IODc relatively larger, namely IODs=5:3 (in ferrugineum 2:1).

(2) Clypeus similar in appearance (Fig. 154), but disc is distinctly tectate till apical margin, not roundly raised at base.

(3) OOD broader, OOD,Od,POD=1,2,2 (in ferrugineum OOD very narrow, OOD,Od,POD appr. 1,5,3.

(4) A3 relatively longer, =AWx4 (in ferrugineum AWx3.5).

(5) Generally more blackish: Pronotal tubercle dark brown, all coxae except apex (ferruginous), all femora except base and apex, mid and hind tibiae except basal ring, mid and hind tarsi except base of T1 dark brown (mid apical joints pale), gaster from G3 apically dark brown.



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HW,HL,IODv,P=100,50,31,92; P,Ma,Mi, 2(Ma),3(Ma)= 100,32,16,50(50),47(62). CV1= CV2x4.5. Frons roundly raised on each side of medial furrow, the furrow broad and shallow, widely open, SAT low broad nasiform, anteriorly carinate and medio-apical area smoothly inclined anteriorly, PAF from side of medio-apical area shallowly runs down obliquely backwards, as in other allied species (cf. Fig. 146). RC B-type, R1 short.

♂, unknown.

Holotype: ♀, Malaya (Pahang, Tanah, Rata, 4750 ft), 15. VIII. 1947, H. T. Pagden (BMNH).

41. TRYPOXYLON PYGMAEUM Cameron, 1900

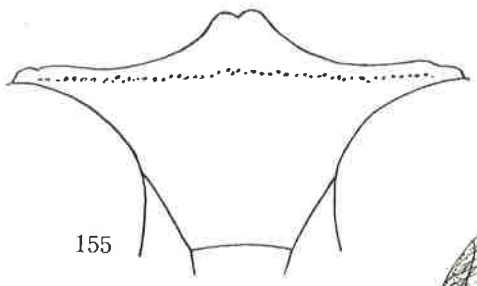
Trypoxylon pygmaeum Cameron, Mem. Manch. Lit. Phil. Soc., 44 (15): 79, 1900 (♀, India, Barrackpore, in reality ♂).

Trypoxylon pygmaeum: Tsuneki, SPJHA, 8:41, 1978 (♂, redescription of holotype, figs.).

Specimens examined: 1 ♂ (holotype) (UMO). 1 ♀, Viet-Nam (30 km NW of Pleiku, 300 m), 10. V. 1960, S. & L. Quate (BPBM); 1 ♂, Laos (Sayaboury Prov., Sayaboury), 13. IV. 1966, native collector (BPBM).

Observation of the newly examined male.

Well agrees in characters with the holotype. HW,HL,IODv,P=100,76,36,80; OOD, Od,POD=1,2.5,3; IODs=5:3, SAT with a fine furrow in middle in place of median carina. Clypeus: Fig. 155, width at base to length in middle 10:12, disc broadly roundly



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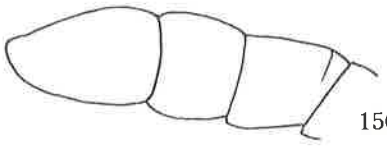

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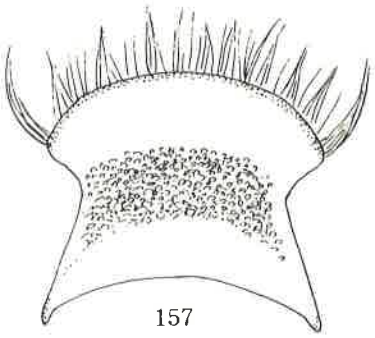

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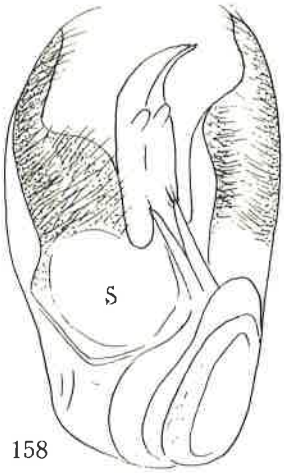

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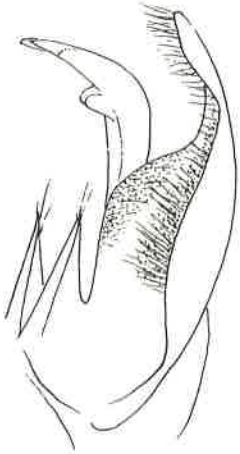

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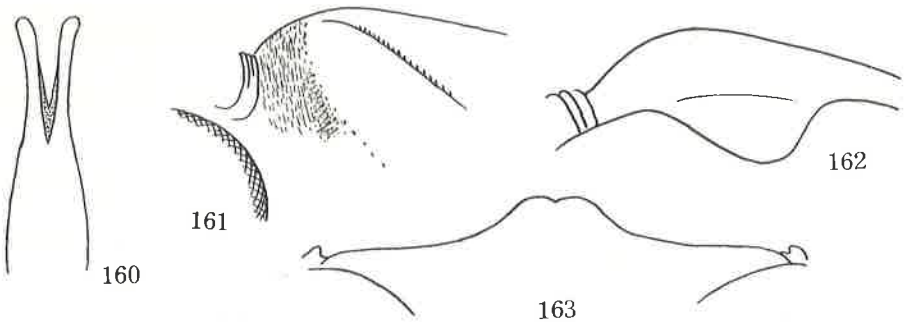
Figs. 155–159. Trypoxylon pygmaeum Cameron, 1900, ♂



Figs. 160–163. Trypoxylon pygmaeum Cameron, 160, ♂; 161–163, ♀

elevated, supraclypeal area markedly depressed, A3=AWx1.3, Al2(=ultimate joint): Fig. 156. Length 4.3 mm. Sternite 8: Fig. 157, quite strange in form. Genitalia seen obliquely from left side: Fig. 158 (ventral side), ditto from right side: Fig. 159, paramere simply narrowed at apex, with inner margin expanded, half rolled and connected at its basal end with volsella near its apex (this is quite exceptional), ventral surface covered with hair, but its basal area (S in Fig. 158) broadly glabrous, shallowly roundly depressed and smooth and shining, volsella slender, attenuate apically, carrying a few hairs at apex, penis valve without shoulder (Fig. 160, dorsal view), apical part bent ventrally (Fig. 159), laterally compressed, with a pair of short lamellate appendages at base of apical part, not sickle-shaped in form, but rounded in outline.

Description of ♀ (hitherto unknown). Length 5.5 mm. Similar in general to ♂, but head seen in front longer (appr. as long as wide), IODc slightly wider (IODs=10:7, in ♂ 10:6), medio-apical prominence of clypeus larger (Fig. 163), antenna similarly thickened apically, but not so pointed at apex of Al2 and not bent, A3 slightly longer, AW 1.5, mandible thicker and the tooth on inner margin near apex much stouter. SAT (Figs. 161, obliquely from left side, 162, in profile) with a median furrow as in ♂. IIW,IIL,IODv,P=100,76,34,80, OOD,Od,POD≒1,4,6, P,Ma,Mi,2(Ma),3(Ma)=100,44,26,60(54), 60(72). RC B-type, Rl short, CVl=CV2x3, TCV:CV2 ≒ 3:2; apex of tibia and Tl–4 of fore leg, all tibial spurs, apex of tibia and base of Tl of mid leg pale ferruginous. Oblique striae on sides of propodeum fine, close, weak and not so strongly rugose as in mandibulatum. Antenna wholly black.

Remarks. The structure of male genitalia shows that it is not as yet well developed, paramere simple at apex, volsella not as yet completely separated from paramere and penis valve without shoulder and the appendages near its apex are still short, rounded, not as yet sickle-shaped.

In the male specimen from Laos the medio-apical prominence of clypeus is much smaller than in the holotype specimen from Bengal. In the latter the range of prominence is amply 1/5 the total apical width of the clypeus, while in the present specimen it is appr. 1/8 — /9 the total apical width. Antenna wholly, legs more widely black.

42 TRYPOXYLON MANDIBULATUM Richards, 1933

Trypoxylon mandibulatum Richards, Proc. Ent. Soc. London, 1933 (B), 2: 214, 1933 (♀, Ceylon, ♂, Bengal).

Trypoxylon mandibulatum Tsuneki, SPJHA, 8: 42, 73 (redescriptions of holo- and allotypes, figs.).

Specimens newly examined: 1 ♂, India (according to Mr. Vardy's annotation it was under T. testaceicorne); 1 ♀, India (Deesa), VIII. 1901, C. G. Nurse (head lacking), with label "Trypoxylon pygmaeum (Cam.) ?".

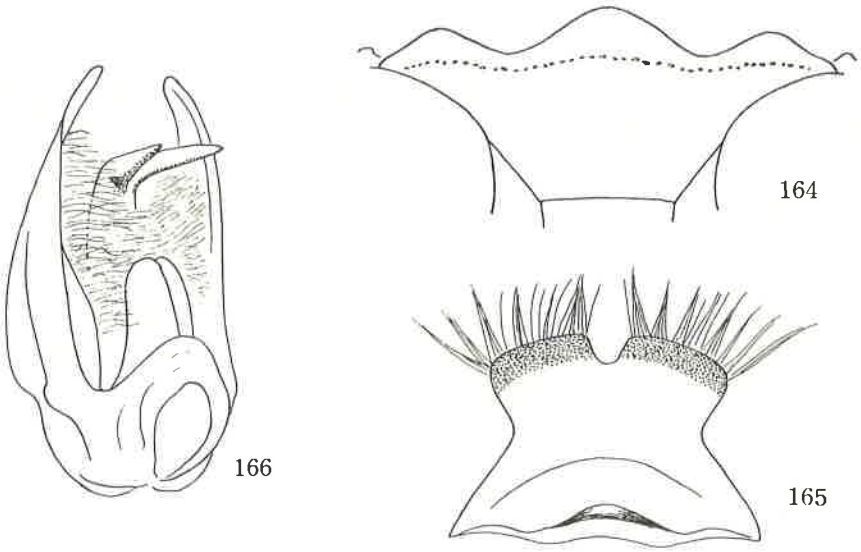
The present species can easily be separated from closely allied pygmaeum by the colour of antenna and tibiae. More exactly it is different from pygmaeum in the punctuation of mesonotum, in the sculpture of propodeum (dorsal aspect and sides) and in the structure of clypeus (form of apical margin and relative length in middle to width at base) as already given in detail in the redescription of the type specimens. Furthermore, in the present species SAT bears a short median carina, while in pygma-

eum SAT carries a median longitudinal impressed line.

In the male specimen examined, measurements: HW,HL,IODv,P=100,76,38,76; A3÷AW× 1.5, Al2=BW×1.5, and slightly longer than A11, roundly attenuate apically, P,Ma,Mi, 2(Ma),3(Ma)=100,30,22,68(34),80(48); CV1=CV2×2.5, CV2=TCV, with an angle of about 90 between, RC distinctly B-type, Rl short, attenuate apically; in this specimen gastral segments from apical area of 1 to 3 distinctly pale castaneous brown. Clypeus: Fig. 164; sternite 8: Fig. 165, similarly short and broad as in pygmaeum, but here apical margin deeply incised in middle; genitalia seen obliquely from beneath and side: Fig. 166, very similar to that of pygmaeum, but in the present species volsella completely separated from paramere and the lateral appendages of penis valve at base of apical bent part pointed (but similarly very short and vestigial). Paramere similar in structure and pilosity, volsella somewhat more elongated and penis valve bent ventrally before apex and bent part laterally compressed.

In the head lacking ♀, P,Ma,Mi,2(Ma),3(Ma)=100,36,22,76(36),72(52), venation similar to that of ♂.

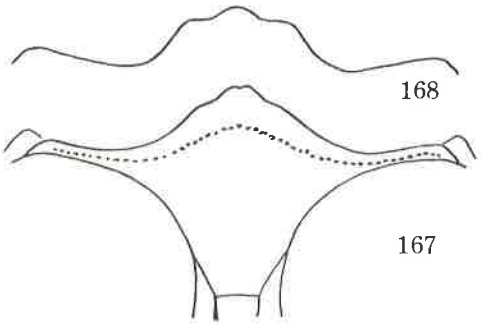
Remarks. In the male the apical margin of the clypeus differs from that of allotype male in that the lateral prominences are markedly large and strong (Fig. 164, cf. Fig. 163 of Pt. II).



Figs. 164–166. Trypoxylon mandibulatum Richards, ♂

43. TRYPOXYLON MEDIPOLITUM sp. nov.

Closely allied to pygmaeum and mandibulatum, can be separated from pygmaeum by the ferruginous fore tibia and from both by the different form of clypeus, the smooth and polished area dorsalis, the very much longer Rl, the much narrower IODc and by the very fine punctures on mesoscutum.



♀, 4–5 mm. Black; Al and 2 brown above and ferruginous beneath, fore tibia and tarsus, mid tarsus, fore and mid tibial spurs and base of hind tibia ferruginous yellow, mid tibia and articulation of legs brown to pale brown, pronotal tubercle posteriorly brownish. Hair silvery. HW,HL,IODv,P=100,76,40,80; OOD,Od,POD=1, 2,3, IODs=10:4, P,Ma,Mi,2(Ma),3(Ma)=100, 36,28,68(52),64(68); CV1=CV2×2.5, RC B-type, Rl very long, =CV1×2/3, or radial

vein 2/5, reaching almost the wing apex, CV2≒TCV, forming an angle of about 120° between. Frontal furrow broad and shallow, surface nearly flat, SAT with a short median carina on top, antenna strongly clavate, A3=AW×2.3, clypeus: Fig. 167, apical margin in one of paratypes: Fig. 168, in the other intermediate between the two, IODc distinctly shorter than the length of clypeus in middle (appr. 4:9), structure of mandible unobservable. Collar transverse, without medial tubercle on anterior part, posterior part discoloured, lamina indistinct. Propodeum with distinct lateral carinae, area dorsalis distinctly enclosed with furrow.

Frons microcoriaceous and sparsely superimposed with fine punctures, mesoscutum microcoriaceous, punctures very fine and very sparse, on median area broadly without puncture; area dorsalis and sides of propodeum smooth and polished, medial impression weakly sparsely striate, lateral series of strioles weak and sparse.

♂, unknown.

Holotype: ♀, Malaya (Perak, Larut Hills, 2000–3000 ft), 5. II. 1932, H. M. Pendlebury (BMNH).

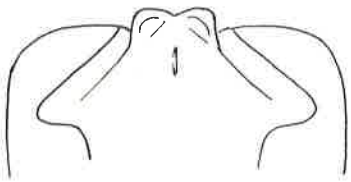
Paratypes: 2 ♀, the same data (BMNH).

44. TRYPOXYLON BISHOPI sp. nov.

Belongs to the group of pygmaeum Cameron, but can easily be separated from other species of the group by the much larger and more stoutly built body and quadrate SAT that hangs over interantennal area.

♀, 6.5–7.0 mm. Black; antenna dark brown or black, A1 and 2 always brown beneath, sometimes 3–5 also brown beneath and in such a case 1–5 each also pale brown at apex, legs dark brown, fore tibia and tarsus, mid and hind tibiae at base, all tibial spurs and frequently base and apex of mid and hind femora somewhat broadly ferruginous yellow, sometimes mid tibia broadly ferruginous, articulations always pale brown. Mandible at base yellowish, apically ferruginous and dark brown, palpi ochre yellow, clypeus at apex in middle brownish, sometimes fairly broadly so, pronotal tubercle posteriorly ferruginous, tegula semitransparent brown. Hair silvery, on clypeus parallel, with a transverse row of very long sparse hair at apical margin of the hair-bearing area.

Head from above subquadrate, relatively much longer than in other allied species, HW,HL,IODv,P=100,86,40,96; OOD,Od,POD≒2,2,3, frons gently raised, very weakly fur-



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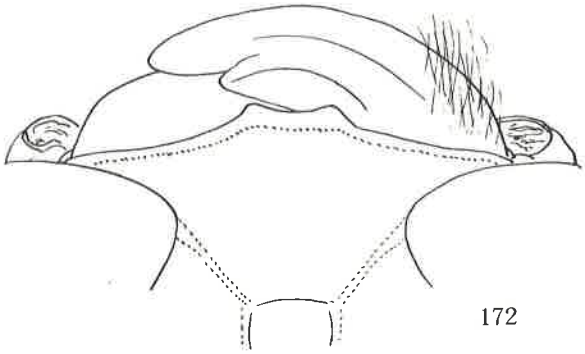

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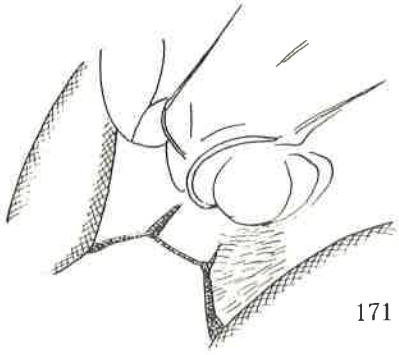

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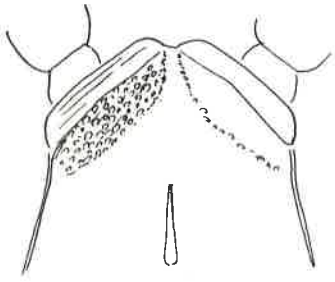

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rowed in middle, surface nearly flat, SAT flat, subquadrate, roundly covering ASR and the covering area distinctly reflected and acutely carinated at the margin, the carina extended posteriorly, forming the lateral margins of SAT which is slightly divergent backwards (Fig. 170). SAT without median carina, but with an impressed line posteriorly, seen from dorsal side: Fig. 169, seen vertically: Fig. 170 (punctured and striated areas reflected), seen obliquely from beneath: Fig. 171, supraclypeal area markedly depressed, clypeus: Fig. 172, at base roundly raised, but surface of main part nearly flat and transversely impressed behind apical glabrous area which is reflected, mandible stoutly built, in all the specimens not completely folded beneath clypeus (possibly can not do so), on inner margin b fore apex provided with a tooth (Fig. 172); antenna clavate, but not so strongly so as in allied species, A3=AW×1.7, A3,4,5≒10,9,9, occipital carina incomplete, absent behind buccal cavity where the surface deeply excavated. Structure of thorax as in other allied species; lateral carinae of propodeum complete except a short distance before apex, lateral furrows of area dorsalis sometimes present, fine but distinct, but sometimes completely absent. Gastral petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100,42,20,60(54),64(72), in fore wing RC B-type, Rl very short, CV1=CV2×3.5, TCV≒CV2, venation very constant. IODs=4:3.

Frons strongly microreticulate and distinctly, closely, partly subrugosely punctured, mesoscutum similarly sculptured, but punctures slightly smaller and sparser, area dorsalis at base obliquely, on posterior portion transversely, strongly rugosostriate, sometimes whole the surface obliquely striate, sometimes mixed with some longitudinal striae, density and rugosity more or less variable, outsides of the area and posterior inclination minutely and closely rugoso-punctate, series of striae along lateral carinae distinct, but sparse.

♂, unknown.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Eue), 15. IX. 1967, native collector (BPBM).

Paratypes: 3 ♀, Laos (1 ♀, Ban Van Eue, 29. III. 1966; 2 ♀, Sayaboury Prov., Sayaboury, 2. III. 1966, 13. IV. 1966), all native collector (BPBM).

45. TRYPOXYLON NODOSICORNE Turner, 1917

Trypoxylon nodosicorne Turner, Mem. Dept. Agr. Ind., Ent. Ser., 5 (4); 203, 1917 (♂, India).
Trypoxylon simlaense (Cameron): Turner, Ibid., p. 203, 1917 (♀. nom. nud.).
Trypoxylon simlaense (Cameron): Richards, Trans. Ent. Soc. London, 82: 315, 1934 (♀, nom. nud.).
Trypoxylon nodosicorne: Bohart & Menke, World Sphecid., p. 347, 1976.
Trypoxylon simlaense (Cameron): Tsuneki, SPJHA, 8:61, 1978 (nom. nud. = ♀ of nodosicorne, descr. and figs.).
Trypoxylon nodosicorne: Tsuneki, Ibid., 8:66, 1978 (♂, redescr. with 13 figs, includ. 3 of genitalia).

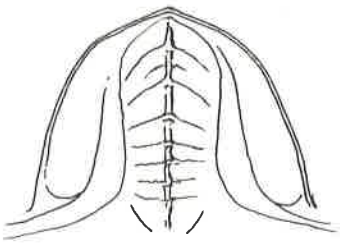
Specimens examined: 1 ♂ (holotype), India (Hazara Dist. Dungagari, 8000ft), 21-24. V. 1913 (Fletcher (BMNH). 2 ♀, India (Simla), VIII, IX. 1898, C. G. Nurse (BMNH), 1 ♀, India (Simla), VIII. 1918, E. Brunetti (BMNH); 1 ♀, India (Simla, Himachal Prad, or Simla, Calcutta E. Brunetti (BMNH).

Remarks. Detailed redescription of the holotype including those of genitalia and the description of the female of the species (= so-called simlaense Cameron) were already given in Pt. II of the present paper.

46. TRYPOXYLON FRONTICORNE Gussakovskij, 1936

Trypoxylon fronticorne Gussakovskij, Trav. Inst. Zool. Acad. Sci. URSS, 3: 659, 1936 (♀ ♂, S. Europe, **Transcaucasia, Siberia to Pacific**).
Trypoxylon pennsylvanicum japonense Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., II, '6 (1): 29, 1956 (Japan and Korea) (SYN. NOV.).
Trypoxylon fronticorne: Beaumont, Ins. Helvet. Faun., 3, Hym. Sphecid., p. 85, 1964 (Suisse, Central Europe).

Specimens examined: 1 ♀, Nepal (2 miles S.W. Urelli, 6000-7000 ft), 18. V. 1954 J. Quinlan (BMNH); 1 ♀, Nepal (Bohaihunde, 20 km N of Trisuli (Nawakot\ 2100 m), 15-



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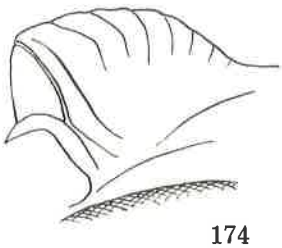

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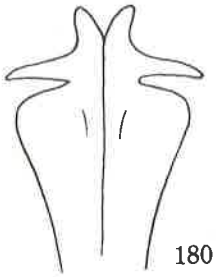

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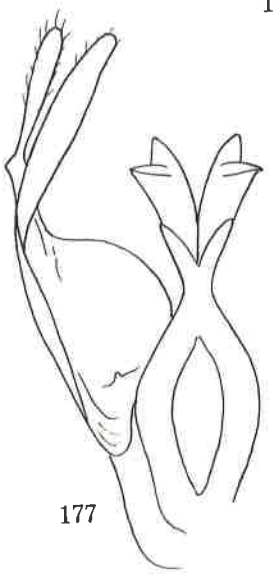

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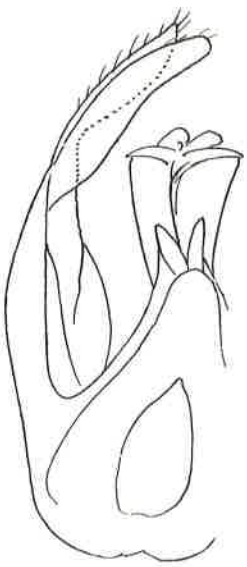

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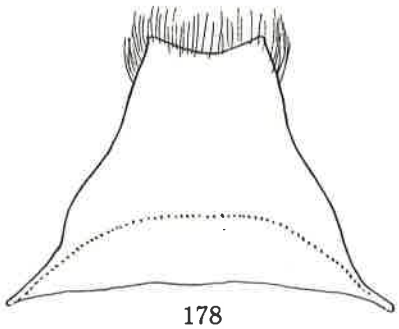

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Figs. 173-178: Trypoxylon frontiocorne japonense.

Figs. 179-180: Trypoxylon pennsylvanicum.

Table 1. Measurements on Trypoxylon frontiocorne and T. pennsylvanicum

Loc.	Sex	L	IODv	P	OOD	Od	POD	IODc	A3	A4	A5	A13	Ma	Mi	2	3
Nepal	♀	9.0	34	100	3	3.5	3.5	7.5	2.9	9	9	-	25	14	52	48
Nepal	♀	9.0	34	100	2	4.0	3	7.5	2.9	9	9	-	26	14	56	54
Assam	♀	9.0	34	104	2	3.0	3	8.0	3.0	9	9	-	26	13	52	50
Assam	♀	7.5	34	96	3	4.0	4.5	8.0	2.8	9	8.5	-	29	16	48	-
Assam	♂	7.0	40	100	4	3.5	4	7.0	1.5	11	11	3.3	25	14	48	48
Simla	♂	7.3	38	100	4	3.0	5	7.5	1.5	12	12	2.3	26	14	50	48
Japan	♀	11.0	29	108	1	2.0	2	9.0	2.9	9	9	-	30	15	54	50
Japan	♀	8.7	30	104	2	3.0	3	8.0	3.0	9	9	-	30	18	50	50
Japan	♀	7.5	30	94	2	3.0	4	8.0	2.4	9	9	-	30	16	54	46
Japan	♀	8.5	32	95	2	3.0	4	9.0	2.9	9	9	-	30	16	50	50
Japan	♀	8.5	31	94	2	4.0	5	9.0	2.9	9	9	-	38	20	60	58
Korea	♀	9.0	35	94	2	3.0	4	8.0	2.5	9	8	-	32	16	54	56
Japan	♂	8.0	34	100	3	3.0	4	6.5	1.5	13	11	2.3	28	11	54	50
Japan	♂	7.0	36	98	2	3.0	3	7.5	1.4	12	14	2.7	31	20	52	46
Japan	♂	6.5	40	94	4	3.5	5	7.3	1.3	10	10	2.6	37	20	58	54
Japan	♂	8.0	36	93	2	2.3	3	7.0	1.3	11	12	2.5	32	18	54	50
Japan	♂	7.5	36	98	2	2.0	3	7.5	1.5	10	10	2.7	30	17	50	50
USA	♀	8.5	27		2	5	4	11.0	2.7							
USA	♀	8.0	31		2	4	4	7.5	2.7							
USA	♀	9.0	31		2	4	4	8.0	2.7							
USA	♂	7.0	36		3	4	4	7.0	1.5			2.6				
USA	♂	7.5	31		3	5	5	9.0	1.0			2.3				
USA	♂	7.5	30		2	3	3	9.0	2.0			2.0				

17. XI. 1965, L. W. Quate (BMNH); 2 ♀ 1 ♂, India: Assam (Shillong), V. 1903; VI, VI. 1903, Turner Coll. (BMNH); 1 ♂, India (Simla), IX. 1898, C. G. Nurse (BMNH).

Geographical differences in characters. Of the specimens above listed the two males differ markedly in the relative length of Al3, namely, in the Assam specimen it is as long as 4 preceding joints united and appr. 3.3 times as long as wide at base, while in the Simla specimen it is longer than 2, but distinctly shorter than 3 preceding joints united and about 2.3 times as long as wide at its base. However, they are consistent in that tibial spurs are black, superimposed punctures on mesoscutum are sparse, always PIS wider than PD (much sparser in the Simla specimen) and A4=A5 and distinctly longer than A3.

The present species occurs also in Japan and on this occasion comparison was attempted. In the Japanese population tibial spurs always pale brown to white (longer hind one somewhat darker), superimposed punctures on mesoscutum are much closer, always PIS narrower than PD and in most specimens A3=A4=A5 (rarely 3<4=5) and, further, Al3 is always longer than 3, but shorter than 4 preceding joints united.

As for the females there is no note-worthy difference between the specimens from Nepal and Assam. The superimposed punctures on mesoscutum are sparse and the tibial spurs are black. In these respects, however, they differ from the females of the Japanese population in which punctures on mesoscutum are always much closer as in the male and tibial spurs are pale brown to brown, though not white as in the male.

All the specimens dealt with here differ from the typical race in that SAT on dorsal surface distinctly transversely striate (Figs. 173, seen from back side, and 174, seen in profile). In the typical specimens SAT without transverse striae and area dorsalis obliquely irregularly striate. In the Nepalese and Indian specimens area dorsalis obliquely rugoso-striate and in the Japanese specimens mostly simply obliquely striate (sometimes rugoso-striate, but in general rugosity is very weak). In the typical male Al3 is as long as 3 preceding joints united, though it may vary more or less.

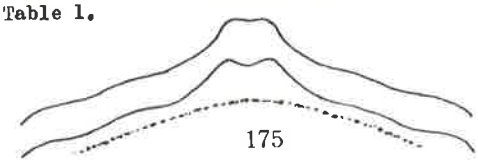
Judging from the differences above mentioned, especially in the male, they seem to represent geographical races of the species:

1. Specimens from Assam and Nepal
   Trypoxylon fronticorne assamense ssp. nov.
   Holotype: ♂, Assam, above listed (BMNH).
2. Specimen from Simla
   Trypoxylon fronticorne brevicorne ssp. nov.
   Holotype: ♂, Simla, above listed (BMNH).
3. The Japanese population
   Trypoxylon fronticorne japonense Tsuneki, 1965 (STAT.NOV.)

On the relationships between the Japanese population and Trypoxylon pennsylvanicum Saussure, 1867

The Japanese polulation of the present species was once treated by me as a subspecies of T. pennsylvanicum Saussure. On this occasion I reexamined comparatively the specimens of the two populations and could reconfirm that they are closely related to each other. The difference is rather slight even in the structure of the male genital organs (Fig. 177, cf. Fig. 179 in pennsylvanicum). The main difference lies in that SAT in japonense is thick and robust, with sides nearly perpendicularly inclined (Figs. 173, 174), while in pennsylvanicum SAT similarly highly raised, but with the sides obliquely flatly inclined and the ridge not so thick and robust. In the male genital organs, to speak more precisely, in japonense penis valve slightly narrower and inner expansion of paramere more strongly developed (Fig. 177, from beneath, basal ring removed, cf. Fig. 179 in pennsylvanicum basal ring present and Fig. 180, penis from dorsal side). The 8th sternite (Fig. 178 in japonense) and clypeus (Fig. 175 in fronticorne japonense, ♀, with variation, Fig. 176, do. ♂) are also similar in structure. In one view they can certainly be placed within the same specific category. But in the present study stress is laid upon the structure of supraantennal area and the male genital organs and they are separated at the species level.

Remarks. In order to give the relationships between the populations of the present species and pennsylvanicum measurements of some of the characters are shown in Table 1.



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Remarks. In Table 1 L (=Length) is mm, IODv and P are ratio to HW as 100, OOD,Od,POD is relative width between them, IODc is ratio to IODv as 10, in A3 "=AWx" is omitted, A4 A5 is length ratio to A3 as 10, in A13 "=BWx" is omitted, Ma Mi 2 3 is ratio to P as 100.

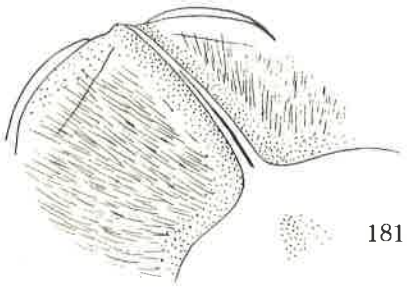
47. TRYPOXYLON SEXTUM sp. nov.

♂, 6.5 mm. Considerably resembling T. ferrugineum ♂ in the characters of head and thorax-complex, including the form of antenna. In the present species, however, IODc relatively much broader, SAT higher and A13 distinctly curved at apex.

Black; ferruginous are A1 and A2 narrowly beneath, mandible, palpi, pronotal tubercle, tegula, fore tibia and tarsus, mid tibia in front and tarsus largely, bases of hind tibia and T1. Antenna dark brown, basal several joints and A13 brown, legs also dark brown, articulations and rest of mid tibia pale brown; fore tibial spur ferruginous, mid and hind ones dark brown. Hairs silvery, on clypeus parallel.

Head transverse, in frontal view roundly convergent below. HW,HL,IODv,P=100,34, 54,96, OOD,Od,POD=1,2,2, IODs=5:4, frontal elevations weak, median furrow shallow, on anterior portion surface nearly flat, SAT high nasiform, apical margin seen from dorsal side roundly curved up and acutely carinated, median ridge narrowly flattened and attenuate apically, bearing a fine impressed line in middle (Fig. 181, seen obliquely from side and above), PAF none, but behind latero-apical margin obliquely broadly shallowly furrowed (Figs. 181, 182 in profile); clypeus: Fig. 183, disc broadly and roundly tectate, A3=AWx3.3, A3,4,5,6,7=10,7,6,5,3, A5 slightly swollen out beneath (but less strongly so than in ferrugineum), A6 excavated at base beneath and produced at apex, thence apically joints thicker and shorter (as in the compared species), A13 =BWx2, longer than 3, but shorter than 4 preceding joints united and distinctly bent apically (Fig. 184); occipital carina disappeared behind buccal cavity. Pronotal collar anteriorly broadly roundly emarginate, anterior part subcarinate, medianly weakly tuberculate, posterior part discoloured, lamina on side indistinct. Propodeum with lateral carinae, not reaching apex, area dorsalis with distinct lateral furrows, posteriorly weaker, GSR thick, simple; gastral petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100, 30,16,52(44),44(56). In fore wing MC B-type, Rl short, CV1=CV2×3.2, CV2 slightly shorter than TCV. Sternite 8: Fig. 185 (ventral view), with a line of sparse long hair at base, apical margin not fringed with hair, but on each side provided with a tuft of sparse short hair. Genitalia seen from beneath: Fig. 186, from left side: Fig. 187, paramere bifurcate at apex into two lobiform layers, closely overlapping, with inner margins of the layers quite undiscernible, main body with inner margin expanded and fringed with long hair, volsella short, also with a tuft of short hair at apex,penis valve without shoulder, each apical lobe laterally compressed, with a distinct sickle-shaped appendage at its base.

On frons microsculpture somewhat stronger and superimposed punctures slightly larger than on mesoscutum, though on both PIS as large as PD. Area dorsalis with disc sparsely and weakly punctured, median broad and lateral fine furrows sparsely striate,



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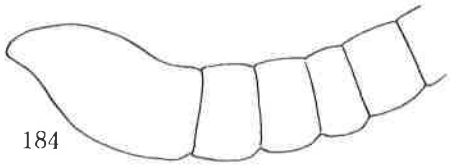

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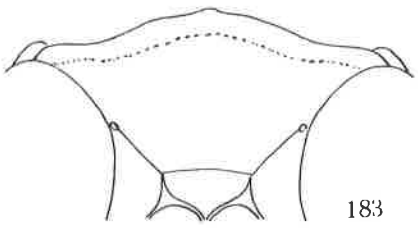

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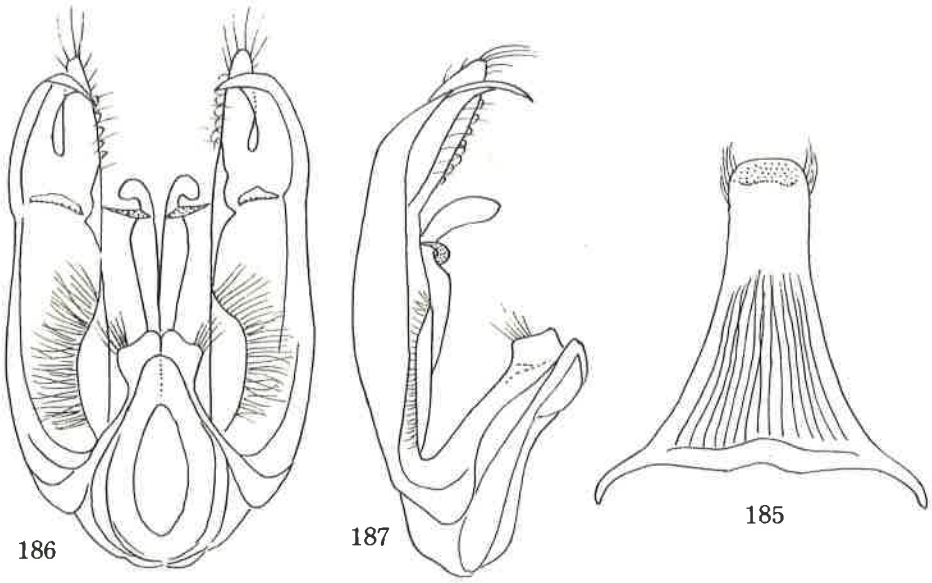

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rest of dorsal aspect and posterior inclination covered with very minute hair-bearing points, series of strioles along lateral carinae indistinct; sides on upp r portion very weakly obliquely rugoso-striate, on lower portion smooth and polished.

♀, unknown.

Holotype: ♂, Malaya (Perak, Larut Hills, 4500 ft), 20. V. 1932, H. M. Pendlebury (BMNH).

Paratype: 1 ♂, Viet-Nam (Fian, 900-1000 m), 11.VII - 9. VIII. 1961, N. R. Spencer (BPBM)

48. TRYPOXYLON HIMACHALENSE sp. nov.

♂, 7 mm. Very similar to the preceding species, but clypeus more strongly produced apically (Fig. 188), A3 in widest view much shorter, A6 much more weakly excavated beneath (Fig. 189), SAT higher, narrowly and stoutly keeled as a whole, with a deep hollow on each side of anterior portion, with apical triangle more acutely produced anteriorly (Figs. 191, seen obliquely from side and above, 192 in profile) and genitalia more stoutly built and more deeply split at apex.

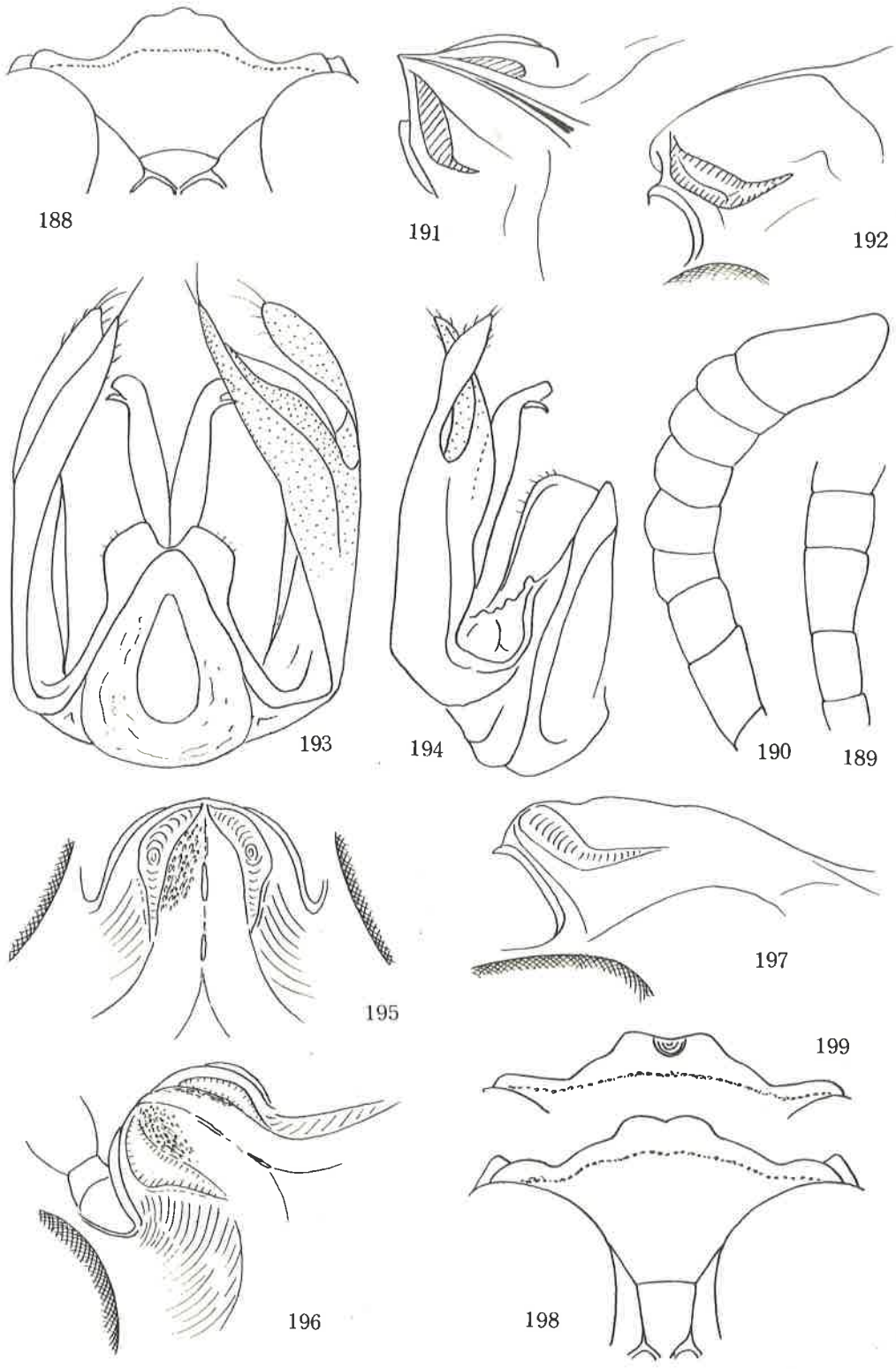
Coloration generally similar to sextum, but antenna wholly dark brown, only apices of A1 and 2 pale brown, G1-3 pale brown on sides (constant?) and mid tarsus more broadly ferruginous. Hairs silvery, on clypeus parallel all over. Punctures and microsculpture on mesoscutum stronger and distinct, area dorsalis at base obliquely, on medial broad furrow transversely strongly striate, sides also more broadly and more distinctly obliquely rugoso-striate.

HW,HL,IODv,P=100,54,36,96, OOD,Od,POD÷1,2,2, IODs=10:8, A3=AW×2.5 (in narrowest view ×3.0), A13=BW×1.7, very slightly longer than 3 preceding joints united (Fig. 190), petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100,32,17,58(46),50(58). In fore wing RC B-type, R1 short, CV1=CV2×3.2, CV2 slightly shorter than TCV, forming an angle of about 100° between.

Genitalia from beneath: Fig. 193, from left side: Fig. 194. Paramere deeply bifurcate into two lobiform layers at apex, the ventral one with Y-shaped ridges in cross section, volsella not well developed, short, penis valve laterally compressed, with moderately developed shickle-shaped appendages, but without shoulder. Hairs on parameres and volsella short, sparse, without fringe of long hairs on inner margin of the main body of paramere.

♀. Medium-sized species, characteristic in the coarsely rugoso-punctate, highly raised and laterally long and deeply excavated SAT.

9 mm, black; mandible, palpi, pronotal tubercle posteriorly, tegula, fore tibia



Figs. 188–199. Trypoxylon himachalense sp. nov., 188–194, ♂; 195–199, ♀

and tarsus, mid tibia posteriorly pale brown, rest of legs including mid and hind tibial spurs dark brown, articulations somewhat pale. Hairs silvery, on clypeus parallel and mixed with scattered long erect hairs.

HW,HL,IODv,P=100,62,34,124; OOD,OD,POD=1,2,2; head in frontal view with sides rounded, slightly narrowed below; frons gently raised, with shallow median furrow, on anterior portion broadly shallowly excavated, IODs=2:1, SAT seen obliquely from backward: Fig. 195, obliquely from side and above: Fig. 196, in profile: Fig. 197; clypeus: Fig. 198, in paratype not incised at apex in middle, but with a round hollow there as given in Fig. 199; occipital carina unobservable beneath head, but at least running towards there; collar with anterior part without tubercle in middle, with posterior part discoloured, lamina on side broadly rounded, slightly produced; mesopleuron normal. Propodeum with strong lateral carinae, accompanied with a series of coarse striae, area dorsalis with distinct lateral furrows, GSR simple. Petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100,26,14,52(36),45(44), P in lateral view strongly constricted at apex, dorsum of G2 and G3 also distinctly swollen before apex.

In fore wing RC B-type, but somewhat close to C-type, Rl short, CV1=CV2×3.3, TCV slightly longer than CV2, forming an angle of about 120° between.

Microsculpture on frons and mesoscutum strong, on frons PIS=PD, on mesoscutum PD PIS, punctures subrugosely confluent. Area dorsalis at base obliquely (in paratype almost longitudinally), median furrow and posterior portion of disc transversely strongly and closely striate, outside the area finely closely rugoso-punctate, posterior inclination finely, very closely striate, sides transversely, somewhat obliquely finely and closely striate.

Holotype: ♂, N. India (Simla, Himachal Prad, or Simla, Calcutta), 6. VIII. 1918, E. Brunetti (BMNH).

Paratypes: 1 ♀, the same place, 1-7. IX. 1918, E. Brunetti (BMNH); 1 ♀, the same locality, 1. VIII. 1918, E. Brunetti Coll. (BMNH).

Remarks. In ♀ SAT highly raised (but less so than in ♂), acutely inclined laterally, lateral surface at mid height from anterior margin deeply excavated into a longitudinal furrow (Figs. 195-197), dorsal area thick, not thoroughly carinated in middle and very coarsely rugoso-punctate, apical margin seen obliquely from above roundly raised (Fig. 195, in ♂ triangularly raised) and accompaniedlin front with a pale brown narrow ASR, lateral furrows on both sides of SAT turned upwards along apical margin towards mid point and meet each other, but separated by a short median longitudinal carina. In ♂ the furrow is somewhat shallower than in ♀ and the posterior extention not so marked as in ♀, punctures on SAT slightly smaller and less rugose.

IODs markedly different between the sexes, but this is a rather rule in this genus, while it seems rather exceptional that in the present species clypeus more strongly produced anteriorly in ♂ than in ♀.

49. TRYPOXYLON PARVULUM sp. nov.

♂, 5.0 mm. Characteristic in that Al3 is short as in the females of the allied species.

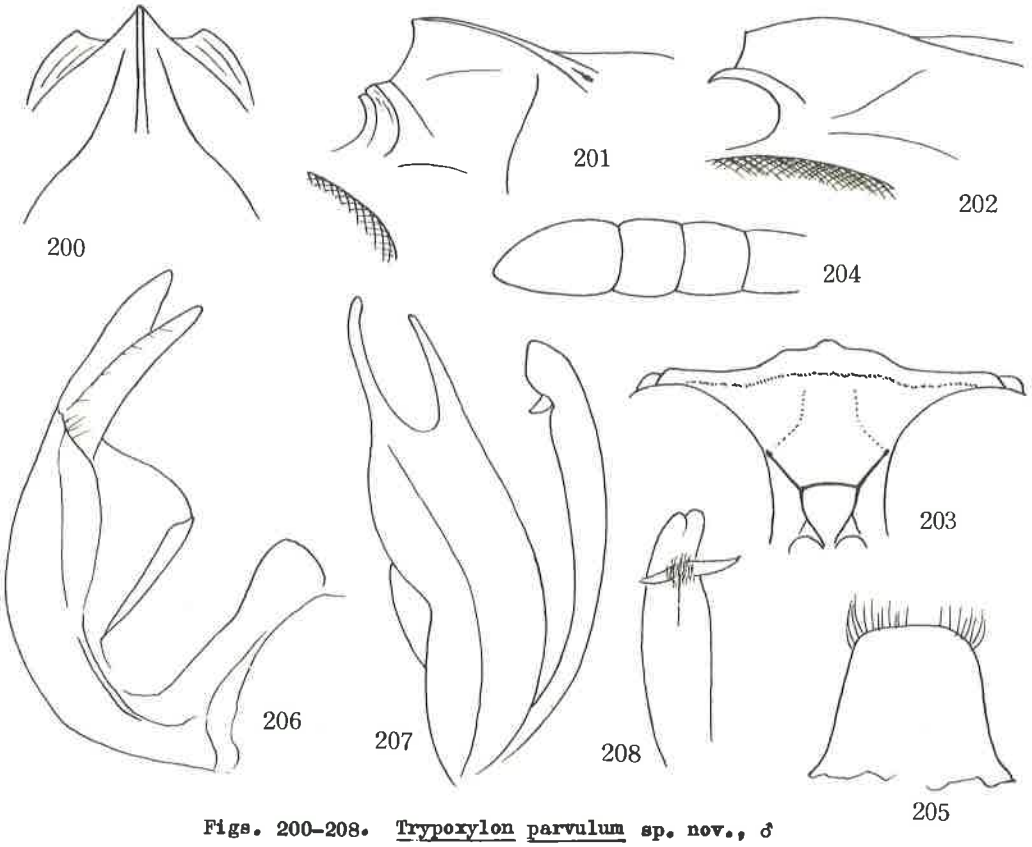
Black; antenna dark brown, Al and 2 ferruginous beneath and brown above; clypeus till apex black, mandible ferruginous, apically dark, palpi ochre yellow, basally brownish; legs dark brown, fore tibia and tarsus and mid Tl-3 at each base light ferruginous, rest of the tarsus pale brown, fore tibial spur ferruginous, mid and hind ones dark brown; pronotal tubercle and tegula brown, posterior part of collar discoloured, dusky yellow.

HW,HL,IODv,P=100,60,34,96, OOD,Od,POD=1,2,2; head in frontal view subquadrate, IODs=10:5.5, frons with median furrow weak, on lower portion surface nearly flat, SAT moderately high, seen from dorsal side: Fig. 200, weak PAF present, seen to see through it: Fig. 201, in profile: Fig. 202. Clypeus: Fig. 203, A3=AW×2.5, A3,4,5=10,7,7, Al3=BW×1.5, as long as 2 preceding joints united, not bent (Fig. 204). **Occipital carina incomplete, no trace of the carina beneath head, surface behind buccal cavity concave, smooth and polished. Collar with anterior part carinate, shallowly, broad-triangularly emarginate in front, posterior part broad; mesopleuron normal.** Propodeum with lateral carinae very feeble, not distinct, area dorsalis almost without lateral furrow, GSR simple. Gastral petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100,36,18,60(50),50(62), CV1=CV2×3, TCV slightly longer than CV2, angle minutely rounded, appr. 120°, RC B-type, Rl moderately long.

On mesoscutum microsculpture weaker and punctures slightly smaller than on frons,

on both punctures rather sparse; area dorsalis on peripheral areas circularly striate (constant?), on central area transversely coarsely striate, sides smooth and polished.

The contents of apical part of gaster decomposed with the cot accumulated and genitalia and 8th sternite could not be taken out in the complete state. So far as observed: Apical part of sternite 8: Fig. 205. That the outer margins of basal part are curved outwards seems to indicate that the sternite is not long. Left paramere seen from left side: Fig. 206, right paramere and penis valve in dorso-lateral view: Fig. 207. It is certain that paramere deeply bifurcate at apex into two lobes and inner margin of main body expanded, lamellate and half-rolled; outer margin only slightly expanded; penis valve without shoulder, but with sickle-appendages at base of apical part that is not bent ventrally, comparatively short and not compressed laterally. Volsella short, similar to that of himachalense or venustum. (Fig. 208)



Figs. 200–208. Trypoxylon parvulum sp. nov., ♂

♀, unknown.

Holotype: ♂, Malaya (Taiping Hill, 4300 ft), 11. IX. 1931, H. T. Pagden (BMNH).

50. TRYPOXYLON VENUSTUM sp. nov.

♂, 5.5 mm. Similar to the preceding species, but legs far more broadly yellow, IODc relatively broader, Al3 longer and area dorsalis more distinctly enclosed with furrow and can easily be separated from it. Further, genitalial structure is distinctly different between the two species.

Black; Al-3 orange yellow, more or less brown above, clypeus anteriorly, mandible nearly wholly, pronotal tubercle largely and tegula yellow. Legs honey yellow, fore and mid femora more or less brownish above, hind femur, tibia except base and tarsus except base of each joint pale castaneous brown, mid tarsus apically also brownish, coxae except apical yellow black. Hairs silvery, on clypeus parallel.

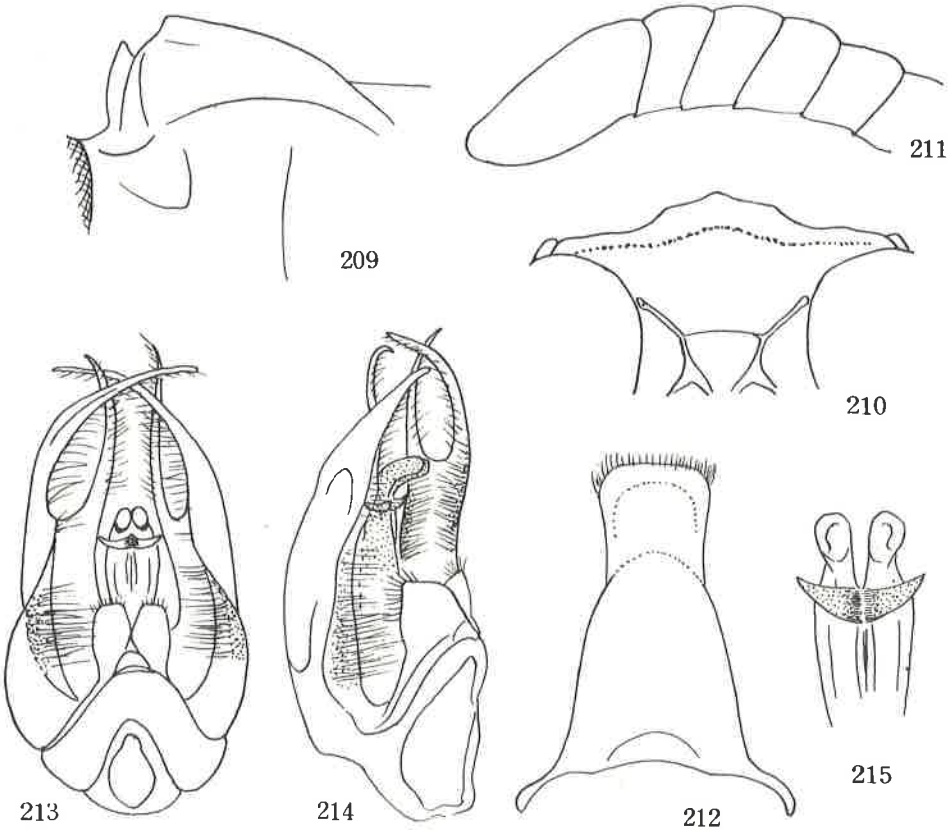
HW,HL,IODv,P=100,62,34,84; OOD,Od,POD=1,2,2; head in frontal view with sides rounded, slightly convergent below; IODs=4:3, frons and SAT similar to those of parvulum, but seen obliquely from side (Fig. 209) ASR somewhat more highly raised and more closely located to apical angle of SAT; clypeus: Fig. 210, disc flattened, only on apical portion gently roundly elevated, A3=AW×2.5, A3,4,5≒10,8,7, A6 showing a weak tendency to be excavated beneath, Al3=BW×2.2 and ≒Al0+11+12; occipital carina incomplete. Collar of pronotum transverse, otherwise similar to that of parvulum; lateral carinae of propodeum weak, rather obscure, but lateral furrows of area dorsalis distinct; gastral petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100,40,19,50(50),42(58), in fore wing RC B-type, Rl moderate in length, CV1=CV2×3, CV2≒TCV.

Sternite 8: Fig. 212, characteristic in form and in the state of apical fringe of hair. Genitalia seen from beneath: Fig. 213, seen obliquely from left side: Fig. 214, paramere deeply split into two slender lobes at apex, the lobes fairly closely fringed with hair, main body also closely covered with hair on its ventral side, especially the hair at the level of volsella is thick and bristle-like and yellowish in colour; volsella short and sparsely fringed with short hair at apical margin, penis valve without shoulder, but with a pair of sickle-shaped appendages that are comparatively broad, apical part of penis valve bent ventrally and laterally compressed, seen from ventral side: Fig. 215. (A8-13: Fig. 211)

On mesoscutum punctures similar in size and distribution to those of frons, but microsculpture weaker, area dorsalis transversely striate on medial and lateral furrows, disc also, but more feebly striate, sides smooth and polished.

♀, unknown.

Holotype: ♂, Laos (Bolouens Plateau, 1 km S of Thateng, 1020 m), 22-24. VII. 1960, R. E. Leech (HPBM).

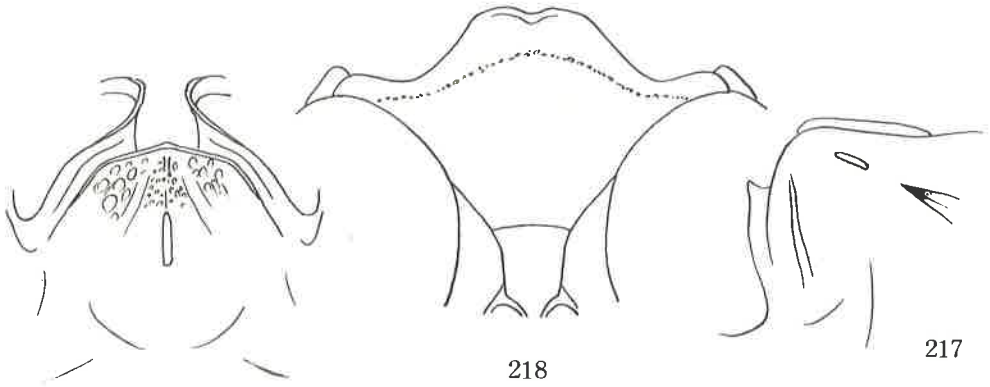


Figs. 204-215. Trypoxylon venustum sp. nov.

51. TRYPOXYLON BREVICARINATUM sp. nov.

♀, 8 mm. Black, mandible and palpi ferruginous; posterior part of tubercle, tegula, apices of A1 and A2, tibiae and tarsi of fore and mid legs together with tibial spurs pale castaneous, apical margin of clypeus somewhat brownish, rest of legs dark brown (including hind tibial spurs). Hair silvery, on clypeus parallel.

Head in frontal view with sides roundly convergent below, HW,HL,IODv,P= 100,58, 34, 112, OOD,Od,POD÷2,5,4, IODs=2:1, frons gently raised, surface nearly flat, with shallow median furrow, SAT low broad nasiform, apical margin roundly raised and carinated, dorsum with median carina short and thick (Fig. 216, seen vertically), anterior area obliquely coarsely rugoso- unctate, seen obliquely from side: Fig. 217; clypeus: Fig. 218, disc at base raised and broadly roundly tectate as a whole, antenna stourtly clavate, A3=AW×2.8, A3,4,5÷10,7,6, occipital carina incomplete. Collar of pronotum with anterior part narrow, broadly roundly emarginate in front (anterior inclination transversely concave), posterior part discoloured, lamina inconspicuous, mesopleuron without pentroof structure. Propodeum with distinct lateral carinae, area dorsalis distinctly enclosed with furrow; gastral petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100,26,13, 50(40),40(46). In fore wing RC C-type, R1 moderate in length, CV1÷CV2×3, CV2÷TCV, angle about 120°.



216 218 217

Figs. 216–218. Trypoxylon brevicarinatum sp. nov., ♀

Microsculpture on frons and mesoscutum distinct, punctures fine, similar in size on both areas, but sparse on frons and dense on mesoscutum, area dorsalis at base obliquely, the rest (disc and furrows) transversely closely striate, striae distinct, series of strioles along lateral carinae weak and sparse, intervals delicately microstriate and -punctate, outer sides of area dorsalis similarly microsculptured, not shining.

♂, unknown.

Holotype: ♀, India (Darjeeling), 13–18. IX. 1913, E. Brunetti (BMNH).
Paratype: 1 ♀, N. E. Burma (Kambatt, 7000 ft), 9. V. 1934, R. Malaise (BMNH).

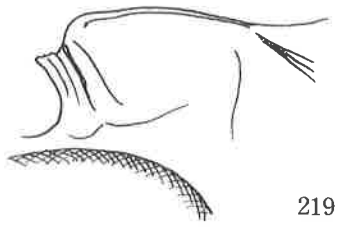
52. TRYPOXYLON BIDENTICULATUM sp. nov.

♀, 7 mm. The present species is characteristic in the form of head, clypeus and antenna and in the ratio of IODs.

Black; A1 ferruginous, pale brown above, A2 brown, at apex pale, clypeus till apex black, mandible, palpi, fore tibia apically (in some light wholly) ferruginous, mid T1 except apex yellowish white, legs dark brown, under permeable light pale brown. Posterior part of pronotal tubercel and tegula pale castaneous. Hair silvery, on clypeus parallel.

HW,HL,IODv,P=100,60,34,96, OOD,Od,POD÷1,2,2, frons weakly raised, median furrow weak, surface flat, SAT moderately high nasiform, apical margin triangularly pro-

duced (in profile obliquely raised) anteriorly and carinated, medial ridge somewhat broad, rounded in cross section, strongly shining in covering hair, seen obliquely from side: Fig. 219. Head in frontal view subquadrate, IODs=5:2, clypeus: Fig. 220, disc gently roundly tectate, antenna strongly clavate, A3≒AWX2.5, A3,4,5≒10,6,5, Al3 amply twice as thick as A3 at maximum; occipital carina incomplete. Collar as in brevicarinatum, lamina broad triangular, apex bluntly pointed; mesopleuron normal. Propodeum with lateral carinae, but weak, lateral furrows of area dorsalis also indistinct, posteriorly completely disappeared and anterirrly very feebly impressed; gastral petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100,32,17,66(42),60(64), P in lateral view with dorsal side strongly constricted at apex. In fore wing RC B-type, Rl short, about half the length of TCV, Tcv nearly straight, CV1≒CV2X2.5, CV2 downcurved and ≒TCV.



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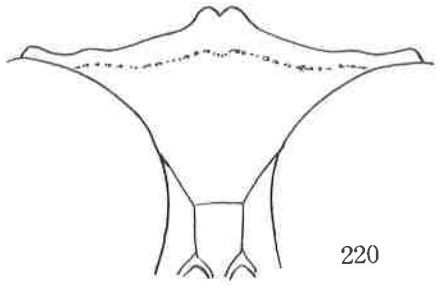


220

Figs. 219–220. Trypoxylon bidenticulatum sp. nov., ♀

Frons and mesoscutum distinctly microcoriaceous, punctures fine, generally sparse anteriorly partly subconfluent on frons, on mesoscutum punctures finer and much sparser area dorsalis anteriorly transversely, somewhat arcuately striate, remaining area smooth and polished, without series of striae on lateral margins of the segment, sides smooth and shining.

♂, unknown.

Holotype: ♀, Viet-Nam (Fyan, 1200 m), 11.VII. - 9. VIII. 1961, N. R. Spencer (BPBM).

53. TRYPOXYLON PUSILLUM sp. nov.

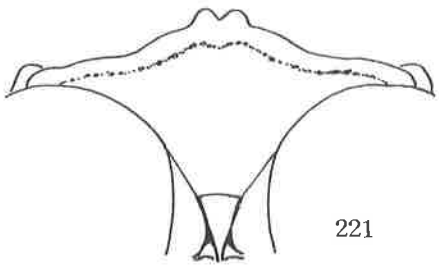
♀, 6 mm. Closely resembels T. parvulum described earlier in this paper and it is tempted to combine the present specimen with it, but the form of anterior margin of the clypeus is too different to do so and the presence of distinct lateral furrows of the area dorsalis is also inconvenient to combine them together.

Clypeus: Fig. 221, rather close to that of the preceding species, cf. also Fig. 203). HW,HL,IODv,P=100,60,33,98, OOD,Od,POD=1,2,2, A3=AWX3.3, P,Ma,Mi,2(Ma),3(Ma)= 100,27,14,66(40),58(52), CV1=CV2X3, RC B-type, Rl moderately long, CV2 slightly longer than TCV, angle about 120°.

♂, unknown.

Holotype: ♀, Malaya (Pahang, Cameron's Highlands, 5000–5500 ft), 12. VI. 1935, H. M. Pendlebury (BMNH).

Remarks. Antenna basally brown, Al and 2 ferruginous beneath, clypeus with apical margin castaneous, legs dark brown, apically somewhat paler, fore tibia with spur and tarsus pale brown, mid and hind tibial spurs dark brown.



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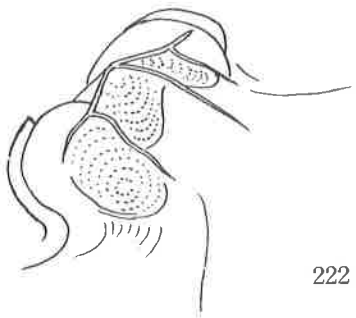
54. TRYPOXYLON ATTENUATUM KASHMIRENSE ssp. nov.

♀. 9 mm. Differs from the nominate species occurring in Europe in that SAT has



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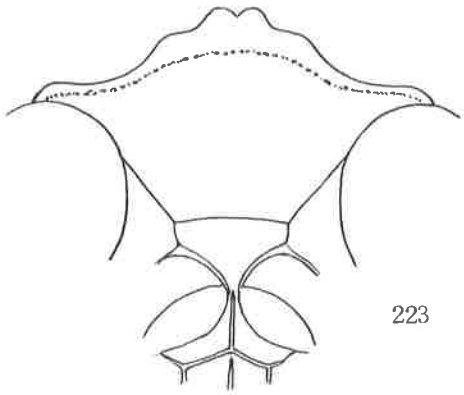

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Figs. 222-223. Trypoxylon attemuatum kashmirense ssp. nov.

an oblique (near to longitudinal) carina between anterior transverse and median longitudinal carinae and the spaces bordered by the carinae deeply excavated (the hollow with bottom roundly concave, smooth and shining - Fig. 222) and that the disc of clypeus not so strongly convex as in the nominate stock.

SAT seen obliquely from left side: Fig. 222, clypeus: Fig. 223. Measurement: HW,HL,IODv,P=100,50,34,112; OOD,Od,POD=3, 4,6; IODs=5:4; A3=AWX2.3; A3,4,5≒10,8,7. P,Ma,Mi,2(Ma),3(Ma)=100,25,13,50(32),50(44). RC=B-type, R1 short, CV1≒CV2X3, CV2=TCV, angle formed by them appr. 120°.

Microsculpture on frons very strong, with superimposed punctures very close and subrugosely confluent, surface nearly mat, on mesoscutum microsculpture weaker, superimposed punctures finer and much sparse, surface half mat.

♂, unknown.

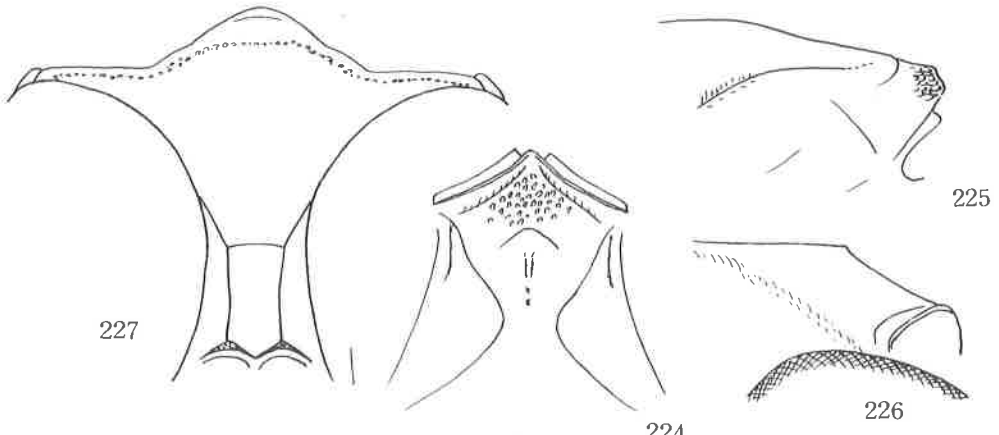
Holotype: ♀, Kashmir, 5-6000 ft. V. 1901, C. G. Nurse (BMNH).

55. TRYPOXYLON MINUTUM sp. nov.

♀, 5.0 mm. Black, ferruginous are Al and 2 (both with a brown fleck above), anterior margin of clypeus, mandible, palpi, tegula, fore and mid legs except coxae and part of mid tarsus and hind leg at apex of coxa, both ends of femur and base of tibia. Extreme apical margin of clypeus castaneous and A3 brown, paler beneath, pronotal tubercle yellow; G3 and 4 dark red above, ferruginous red beneath. Hair silvery, on clypeus parallel.

Head thick, HW:HL=100:68, in frontal view nearly quadrate, HW,IODv,P=100,34,110, OOD,Od,POD≒1,5,3, frons gently raised, surface nearly flat, with median furrow very feeble, frons narrowed triangularly in front into SAT, SAT roundly enlarged and flattened anteriorly with apical margin, seen vertically, triangular and distinctly carinated (Fig. 224), seen in profile from right side: Fig. 226. Clypeus: Fig. 227, disc broadly tectate. Antenna considerably thickened apically, A3=AWX2.5, A3,4,5≒10,8,7. Collar transverse, anterior part narrow, posterior part broad and discoloured, lamina on side inconspicuous. Propodeum without lateral carinae, area dorsalis wnclosed with distinct furrow; gastral petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100,28,12,42(40),30(48).

Frons comparatively weakly microcoriaceous, finely and sparsely punctured, sur-



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face fairly strongly shining, punctures anteriorly gradually closer and subrugosely confluent, SAT on anterior portion more grossly and strongly punctured, mesoscutum with microsculpture much weaker, with punctures fine and close, on antero-lateral areas punctures finer and weaker, propodeum smooth and shining, on area dorsalis median furrow transversely striate, striae sparsely and weakly extended on to disc, lateral furrows also striate; sides on upper portion scattered sparsely with comparatively large punctures.

♂, unknown.

Holotype: ♀, Laos (Sayaboury Prov., Sayaboury), 24. III. 1916, native collector (HPBM).

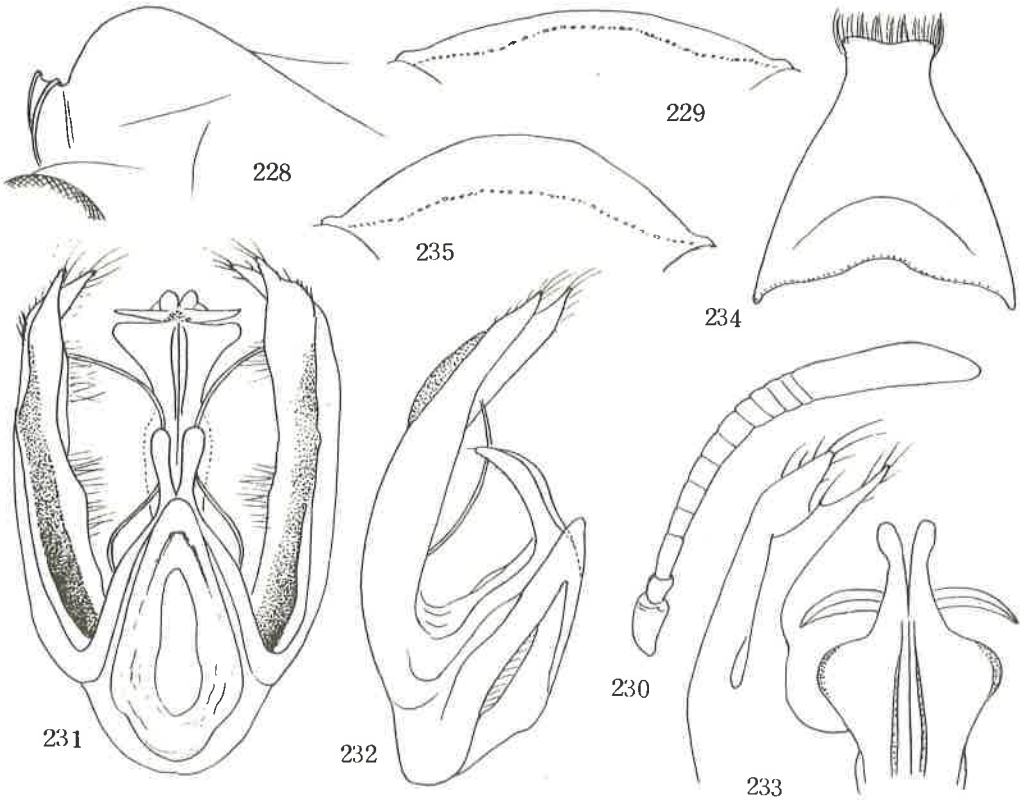
Supplements to SAT. SAT feen obliquely from side and above: Fig. 225, in profile Fig. 226, apical area obliquely gently inclined forwards and the verge to inclination roundly and not strongly edged. Seen obliquely from beneath the inclined area of SAT appear subquadrate and flat, with strong coarse punctures.

56. TRYPOXYLON ANTENNATUM sp. nov.

Very similar to T. fulvocollare Cameron, but can be distinguished from it by the much shorter gastral petiole (♀ ♂), the wholly yellow prosternum and fore coxae (♀ ♂) and by the different structure of the antennae (marked in ♂ and rather slight in ♀).

♂. 11-12 mm. Black; ferruginous are clypeus broadly apically, mandible, palpi, antenna from A1 to base of 5, prothorax except a black band across middle of dorsal and lateral aspects, tegula and basal plates of wings, gastral segments more or less (usually G1-3 and 5-7 considerably broadly - see remarks), fore leg except brown streak on femur above and parts of mid and hind legs (see remarks). Hair mainly brassy, on clypeus at base weakly convergent towards medial line and on propodeum at basolateral areas circled.

HW,HL,IODv,P=100,50,24,86, OOD,Od,POD≒ 1,2,1, frontal elevations gentle, median furrow shallow; head in frontal view with sides roundly convergent below, IODs=10:9 (sometimes 8.5), SAT low nasiform, elevation of ASR weak, bicarinate on top, PAF shal-



low, V-shaped in cross section, with bottom line up-curved, SAT-ASR seen obliquely from left side to see through PAF: Fig. 228, SAT anteriorly without transverse ridge, smoothly inclined, especially on medio-apical area the inclination forms a raised line and reaching anterior end of interantennal area, median carina of SAT long, reaching upwards near middle of the distance to fore ocellus, (to observe the detailed structure covering hair should be removed), clypeus weakly roundly produced anteriorly, apical margin: Fig. 229, A3=AW×2 (in narrowest view 2.5), A3,4,5÷10,6,6, Al3÷BW× 4.8, appr. as long as 8 preceding joints united (Fig. 230) and compressed dorsa-ventrally; occipital carina complete, minutely incised behind buccal cavity. Collar at middle of anterior part weakly tuberculate and gently inclined towards sides, lamina on side triangularly produced, not acutely pointed at apex, posterior part discoloured; subalar area of mesopleuron shows distinct tendency toward pentroof structure, flange acutely edged and slightly produced laterally, but not so broadly expanded as to form pentroof structure. Propodeum with lateral carinae, arising slightly behind spiracle, reaching completely the apex, lateral furrows of area dorsalis indistinct, very shallow and broad; area apicalis distinctly enclosed with carina, GSR roundly highly produced. Gastral petiole clavate, P,Ma,Mi,2(Ma),3(Ma)=100,32,14,50(46),62 (72); fore and mid femora thicker than usual, L:W of fore femur 23:9 (under the scale of HW 100), = 5:2 (in fulvocollare relatively 43:9.5 =5:1.1); in fore wing RC C-type, Rl very short, CV1=CV2×5, CV2 shorter than TCV, angle between about 100°.

Genitalia seen from beneath: Fig. 231, seen from left side: Fig. 232 (dotted area is penis valve), seen from apex: Fig. 233, paramere deeply bifurcate at apex into two lobes, inner margin of main body of paramere broadly roundly expanded (shown with doubled lines), volsella elongate, spatulate, penis valve with shoulder and a pair of sickle-shaped appendage before apex and from about middle basally slightly enlarged basally (dotted lines in Fig. 231); sternite 8: Fig. 234.

Frons microcoriaceous and closely superimposed with fine punctures, mesoscutum smooth, with punctures much finer and sparser, propodeum smooth and polished, lateral series of striae weak but distinct, posterior inclination on each side of medial furrow covered with fine hair-bearing punctures, posteriorly mixed with arcuate striae, area apicalis polished, sometimes with weak striae or punctures, sides scattered sparsely with fine hair-bearing punctures, punctures larger upwards.

♀. Similar to ♂; antenna till base of A4 ferruginous, fore leg wholly, mid leg till tibia and hind leg broadly ferruginous; antenna normal, very slightly thickened medially and tapered towards apex, A3÷AW×3.7, A3,4,5÷10,6.5,6, clypeus somewhat more strongly produced anteriorly (Fig. 235).

HW:IODv=100:22, IODs=10:10, OOD,Od,POD÷1,3,1. Length 12 mm.

Holotype: ♂, Laos (Vientiane Prov., Ban Van Eue), 30. III. 1966, native collector (BPBM).

Paratypes: 1 ♀, Malaya (Serdang, Selangor, in car), 29. IX. 1936, H. T. Pagden (BMNH); 6 ♂, Laos (the same locality), 30, II, 15-31. V. 1965; 29. IV, 15. XI. 1966, 15. V. 1967, all native collector (BPBM).

Remarks. Gaster ferruginous and variegated with black. Petiole: Dorsal side, wholly black - from spiracles to near apex black, sometimes for some distance from behind spiracles pale brown; ventral side, from about middle -1/4 from base - posteriorly black, except extreme apex; sides, usually wholly, sometimes except narrow area of posterior portion, ferruginous. G2: black except narrow base and apex of dorsal side - basal and apical rings ferruginous, variable in width, in the brightest instance medial blackish band turns to pale brown. G3: wholly black except base of dorsal side - wholly ferruginous except narrow apical margin, usually considerably broadly ferruginous. G4: always black, except apical margin. G5,6,7: variable from wholly black to wholly ferruginous.

The single female specimen examined belongs to a rather melanic form, petiole except base black (yellowish area at base longer beneath), G2 and G3 black and G5 and G6 largely yellowish.

In legs arolia always black; fore leg except brownish streak on femur always wholly ferruginous; mid coxa, tibia largely and Tl partly and hind tibia at base always ferruginous; hind coxa, mid and hind trochanters, femora and hind tibia variably maculated with brown, tarsi usually brown to dark brown; greater part of legs semi-transparent and the brownish colour tone varies according to the directions observed.

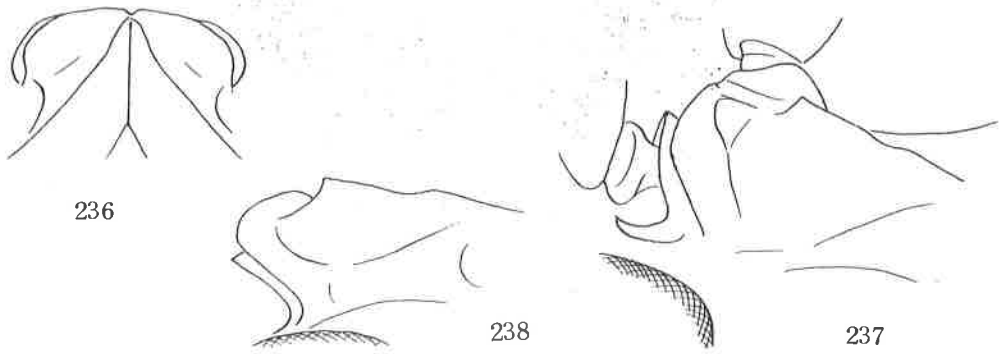
In the female fore and mid legs nearly wholly ferruginous and hind leg except tarsus and parts of femur and tibia broadly ferruginous.

57. TRYPOXYLON MEDIATOR Nurse, 1903

Trypoxylon mediator Nurse, J. Bombay Nat. Hist. Soc., 15 (1): 8, 1903 (♀ ♂, Quetta).
Trypoxylon mediator: Tsuneki, SPJHA, 8: 63, 1978 (♀ ♂, redescription with 13 figs, includ. 3 of genitalia).

Specimens examined: 10 ♀ 9 ♂, Pakistan (Quetta)(♀♀: VIII. 1902; VI,VI,VI,VII, VII,VII, VIII,VIII. 1903; ♂♂: V,V,V,V. 1902; VIII. 1902; V,VII,VIII. 1903; V,V. 1904), C. G. Nurse (BMNH).

Some supplements. In the present species the gastral petiole is considerably long, but it is not flask-shaped, but gradually widening posteriorly; the hair on head and thorax-complex is normal in distribution, but very dense, not silvery, but silky white and gives one an impression to be much softer than usual. RC B-type, Rl short, CV1=CV2 2. SAT moderately high nasiform, apical margin transversely broadly expanded, lamellate, covering ASRs and interantennal area (Fig. 236, vertically seen), median carina acute, suddenly ended far behind lamellate apical margin and the end seen from side triangularly acutely pointed (Fig. 237 seen obliquely from left side to see through PAF and Fig. 238 seen nearly in profile). Clypeus trapeziform in both ♀ and ♂. Measurements in ♀: HW,HL,IODv,P=100,50,32,124; OOD,Od,POD≒2,3,4; IODs=2:1, A3≒AW×3.5: P,Ma,Mi,2(Ma),3(Ma)=100,19,8,42(20),44(31). In ♂: HW,HL,IODv,P=100,50,33, 126; OOD,Od,POD≒2,3,3; IODs=5:3; A3=AW×1.8; Al3 slightly longer than Al2, markedly curved at apex; P,Ma,Mi,2(Ma),3(Ma)=100,16,7,40(18),42(29).



236 238 237

Legs brown, variegated with yellow, yellow area narrower in ♂ than in ♀. As to the male genitalia see Pt.II of the present paper.

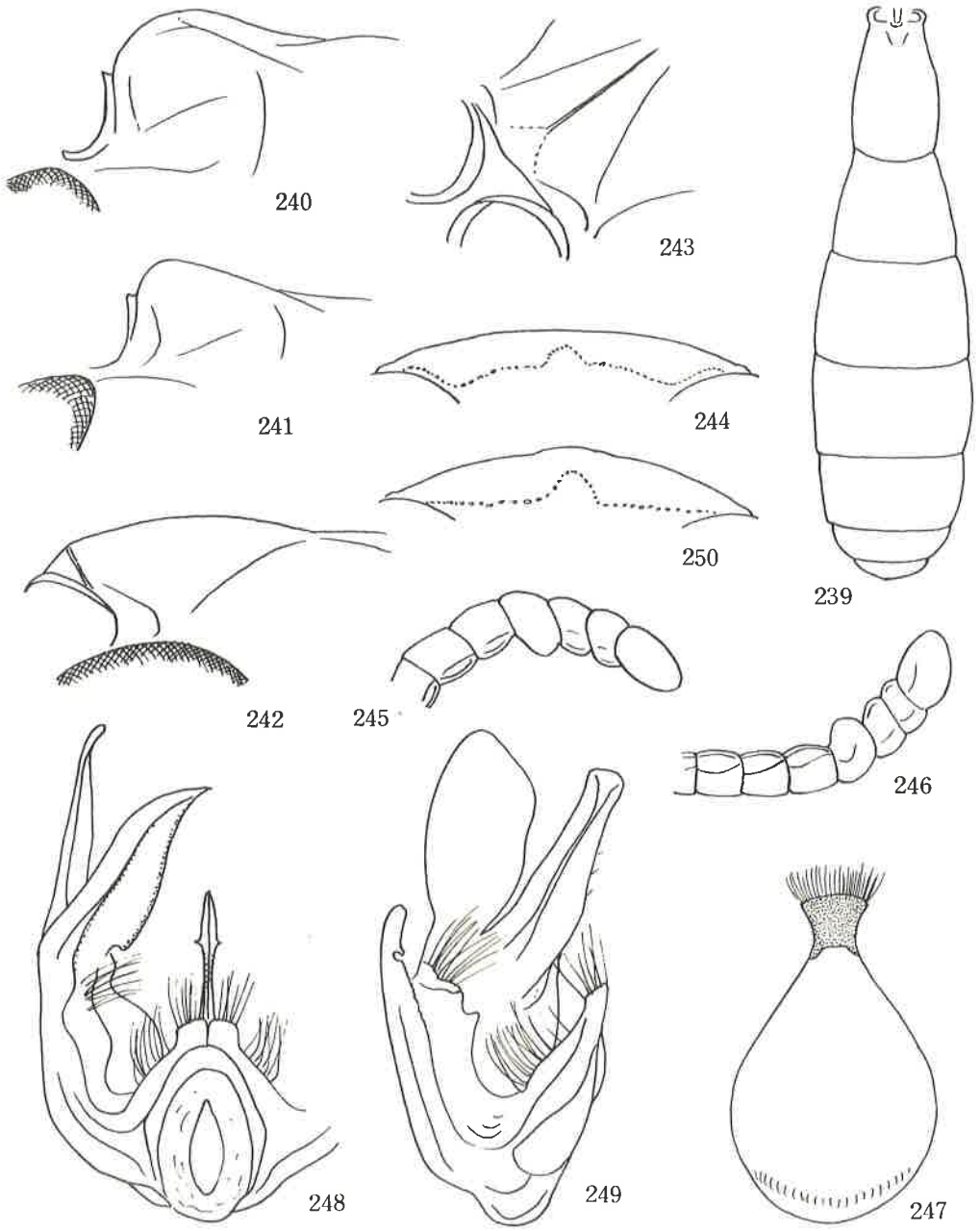
58. TRYPOXYLON CRASSIVENTRE sp. nov.

The present species is characteristic in that the 1st gastral segment is not petiolate, but sessile (Fig. 239); however, the gaster is, as a whole, slender and elongate as in other species of the genus.

♂, 6.0 mm. Black and shining; antenna dark brown, basally paler, Al, 2, 3 partly obscurely ferruginous above and distinctly ferruginous beneath, the colour extended apically as pale brown to brown (underside thickly covered with short pubescence and it is difficult to discriminate the true colour and reflection). Mandible, mouth parts, tegula and basal plates of wing, sides and apex of petiole, base of G2 and G3, apical lamellate margins of G3,4,5,6 and whole of 7, fore and mid femora in front (rest brown), fore and mid tibiae and tarsi ferruginous; hind tibia at base, all tibial spurs and greater part of hind metatarsus yellowish white; rest of legs except black coxae brown to dark brown; clypeus anteriorly and pronotal tubercle cream yellow; wings h hyaline, apically feebly clouded. Hairs silvery, on clypeus parallel.

HW,HL,IODv,P=100,54,31,60; OOD,Od,POD≒1,2,2; IODs=10:5; A3=AW×1.5 (from above 1.8); Al3=All+Al2. Head in frontal view subquadrate, but somewhat narrowed towards base of mandibles. Frons gently raised, anterior part nearly flat and feebly furrowed in middle, SAT moderately high nasiform, acutely and long carinated on ridge, apical margin roundly raised and carinated, covering ASR, seen obliquely from above and side: Fig. 240, the same but to see through PAF: Fig.241, in profile: Fig. 242, obliquely

from beneath: Fig. 243; clypeus: Fig. 244, basal half flat and weakly raised towards apex, A3,4,5=10,8,8, A3 at base thin and strongly incrassate apically, thence each joint subcylindric, only slightly and gradually thicker apically, A3-12 on apical half beneath provided with linear tyloidea, accompanied with the rectangular rhinaria on outer side and A10 markedly produced at apex beneath, the protuberance somewhat deviated anteriorly (Fig. 245 from above, Fig. 246 from beneath, antenna somewhat twisted). Pronotal collar with anterior part carina-like and widened laterally, posterior part discoloured, appears somewhat whitish, lamina roundly slightly produced, inconspicuous;



Figs. 239-250. Trypoxylon crassiventre sp. nov., 239-249 ♂, 250 ♀

mesopleuron on subalar area just beneath base of fore wing a round flat area present, facing upwards and irregularly arcuately striate, quite a strange structure; propodeum with distinct lateral carinae, area dorsalis with distinct lateral furrows, medial furrow moderately broad and deep, area apicalis unobserved, GSR simple; gaster: Fig. 239, P,Ma,Mi,2(Ma),3(Ma)=100,52,32,72(76),72(96). Legs normal, in fore wing RC B-type, Rl short, CVl=CV2×4.5, TCV:CV2÷5:3, angle about 120.

Sternite 8: Fig. 247, curious in form; genitalia seen from beneath: Fig. 248 (right paramere omitted), right half seen from inside: Fig. 249; paramere bifurcated at apex, dorsal lobe lamellate, semitransparent yellow, ventral one 3-keeled in cross section, volsella short, not well developed, with hair as given in Figs. 248,249,penis valve laterally compressed, with a pair of short sickles, but without shoulder.

Frons strongly microcoriaceous and closely superimposed with comparatively large distinct punctures, PIS≤PD, thorax-complex smooth and polished, mesoscutum very finely and sparsely punctured, prepectus and lower part of mesopleuron finely sparsely punctured, area dorsalis at base obliquely, median furrow transversely closely striate, series of short striae along lateral carinae not strong, posterior inclination closely covered with very minute pubescence-points.

♀, 6.2 mm. Very similar to ♂, but gaster from apex of G1 to apex of G4 ferruginous red, with a large brown mark on G2 above; hind femur wholly dark brown. Antenna normal, A3=AW×1.8, A3,4,5 ÷10,9,8, clypeus slightly more produced anteriorly (Fig. 250), IODs=10:6. Punctuatoon similar in general, but on frons punctures somewhat smaller, closer, partly subrugosely confluent, on mesoscutum also slightly closer.

Holotype: ♂, Laos (Vientiane Prov., Ban Van Eue, 750 m, forest stream bed), 10-11. IV. 1965, J. L. Gressitt (HPBM).

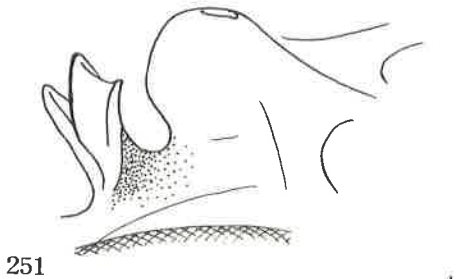
Paratype: 1 ♀, Malaya (Kuala Lumpur), 25. V. 1933, H. M. Pendlebury (BMNH).

Remarks. This species is considered to form a distinct group of the genus.

59. TRYPOXYLON SELANGOR sp. nov.

A species bearing golden-haired clypeus and separable from most of the similarly haired species by the microsculptured mesoscutum, and in this regard resembles coloratum Smith, but in the present species the microsculpture much more distinct and, furthermore, differs from coloratum in the structure of SAT-ASR and of subalar area of mesopleuron, in the relative width of IODs, in the presence of lateral carinae of propodeum and in the colour of the antenna.

♀, about 17 mm. Black; orange yellow are antenna completely, apical half of clypeus, mandible, mouth parts, pronotal tubercle, tegula and basal plates of wings, gastral petiole from base till spiracles and on sides and beneath except apical portion, G2 except a brown mark above and beneath, G3 wholly and G4 at base beneath (5,6 fairly brownish), fore leg except extreme base of coxa and arolium, mid leg except base of coxa and T2-5 and hind leg on apex of coxa, trochanter wholly and greater part of femur and tibia. Hair golden, on clypeus at base slightly convergent towards medial line and on baso-lateral areas of propodeum sinuate, but not curled.



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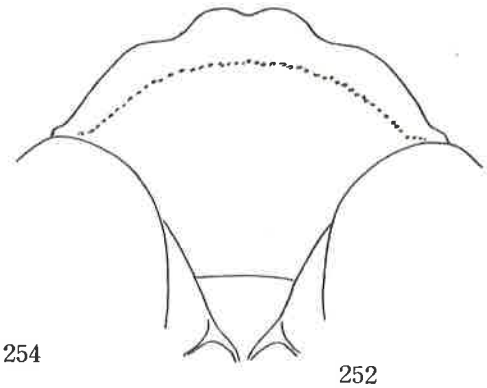

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HW,HL,IODv,P=100,48,20,184; OOD,Od,POD=1,6,2; IODs=10:9; A3=AWx6, A3,4,5÷10,7,6.5, Al3=BWx5. Head in frontal view with sides roundly convergent below, vertex somewhat depressed below level of upper margins of eyes, median furrow of frons broad and shallow, but distinctly separating the gently raised lateral elevations, SAT nearly semispherically elevated, but antero-lateral areas perpendicularly cut by PAF, median carina short, PAF deep, flat-bottomed, U-shaped in cross section, ASR highly raised, tricarinate on top (Fig. 251, seen obliquely from side to see through PAF), clypeus: Fig. 252, at base gently raised, apical margin reflected; occipital carina complete. Collar in frontal view with dorsal margin: Fig. 253, lamina on side strongly toothed, with apex acutely pointed(Fig. 254). Subalar area of mesopleuron with well developed pentroof structure, the roof externally broadly semitransparent, flat round wall covered by the roof provided with 4 transverse carinae. Propodeum with distinct lateral carinae, lateral furrows of area dorsalis indistinct (in some light appearing to be present), GSR simple, area apicalis not enclosed with carinae, median furrow of posterior inclination directly reaching GSR.

Gastral petiole flask-shaped, markedly slender and long, with a lenticular impression at apex in middle which has a longitudinal bottom line, a similar impression also present at apex of G2, but here it is slightly deviated from median line and with bottom line located somewhat oblique; possibly these are the result of mechanical shock. In fore wing RC C-type, Rl moderately long, reaching near the wing apex, CVl=CV2x9, TCV sinuate, twice as long as CV2, angle between them about 100°. P,Ma,Mi,2(Ma)3(Ma)=100,11,4,30(15),27(19).

Frons and mesoscutum rather smoothly but distinctly microreticulate and sparsely superimposed with fine punctures; area dorsalis at base obliquely, rest of the area wholly transversely finely and closely striate, series of striae along lateral carinae not strong, moderately close (not well visible due to close hair), rest of dorsal aspect covered with ha r-bearing points, sides transversely, very finely, very closely striate, mixed with sparse punctures, but anterior and lower areas smooth and polished.

♂, unknown.

Holotype: ♀, Malaya W. (Selangor, Ulu Langat, 300-390 m), 13. VI. 1958, T. C. Maa (HPBM).

60. TRYPOXYLON MACULIVENTRE sp. nov.

The present species differs from most of other allied species having golden-haired clypeus in that mesoscutum is distinctly microsculptured, the mesopleuron is provided with pentroof structure and the propodeum bears lateral carinae. In these characters it is similar to the preceding selangor, but can easily distinguished therefrom by the colour of antenna and by the structure of ASR and PAF.

♀, 13-14 mm. Black; Al-2 or 1-3 yellow, clypeus on apical half and gastral petiole on basal half yellow, anterior part of pronotal collar rarely with a yellow mark on each side; otherwise similarly coloured as in selangor (brown parts of mid tarsus and hind femur and tibia considerably variable), gastral segments 5-6 usually reddish ferruginous). Hair golden, on clypeus at base weakly convergent towards median line.

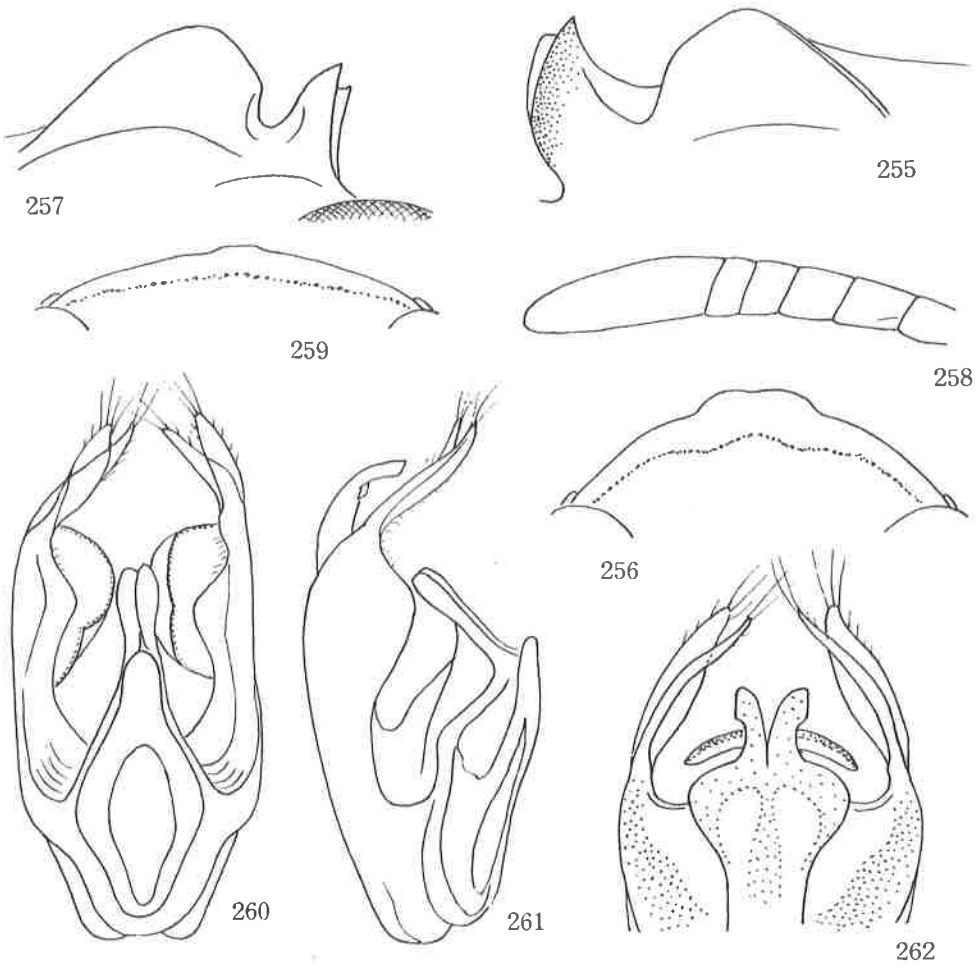
Measurements on holotype: HW,HL,IODv,P=100,48,10,86; OOD,Od,POD=1,8,4 (OOD is very narrow and difficult to compare), IODs=10:9, A3=AWx5, A3,4,5÷10,6,5, P,Ma,Mi, 2(Ma),3(Ma)=100,14,5,38(18),34(24), RC C-type, Rl moderately long, reaching near wing apex, CVl÷CV2x6, TCV:CV2÷5:3, TCV sinuate, angle formed by them appr. 100°.

Frons and SAT generally similar to those of selangor, but SAT slightly lower, with median carina longer and more distinct, PAF shallower, much more widely open and with bottom line upcurved (Fig. 255, seen obliquely from left side to see through PAF) clypeus (Fig. 256) generally similar, but medial incision weaker - variation very slight), occipital carina complete. Pronotum with similarly formed lamina, and characters of mesopleuron and propodeum as in selangor, strictly, however, lamellate carinae on the vertical wall of subalar area that is covered with pentroof structure of mesopleuron is more in number, namely 5 or 6, and sides of propodeum sometimes simply sparsely punctured, sometimes finely striate and sparsely punctured.

Sculpture and punctuation also similar, except that the punctures on mesoscutum much closer, PIS≤PD.

♂, 8.5-10 mm. Generally similar to ♀, but gaster more broadly black, SAT more flattened, with latero-apical areas more acutely edged add, furthermore, PAF narrower, nearly U-shaped in cross section (Fig. 257, seen obliquely from right side to see through PAF). Antenna and clypeus showing sexual characters:

A3=AW×3.7, A3,4,5≒10,5.5,5, Al3=BW×4, appr. as long as 4 preceding joints united (Fig. 258); clypeus: Fig.259, IODs=10:9, OOD,Od,POD≒1,4,2. Pentroof structure much better developed; gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100, 16,5,38(21),36(36), in fore wing CV1=CV2×3.5, TCV sinuate, TCV:CV2≒5:3, angle at the corner 100°, as a whole appr. 120°. Genitalia from beneath: Fig. 260, from left side:Fig. 261, from apex: Fig. 262 (in Fig. 260 penis valve is omitted). Paramere deeply bifurcate at apex, volsella spatulate, penis valve with shoulder and a pair of sickle-shaped appendages, but the shoulder not completely developed, with angles widely rounded (Fig. 262).



Figs. 255–262. Trypoxylon maculiventre sp. nov., 255–256, ♀, 257–262, ♂.

Holotype: ♀, Malaya (Penang, Batu Feringgi, Catchment area), 2. IX. 1968, H. T. Pagden(BMNH).

Paratypes: 1 ♀, the same place, 21. V. 1960, H. T. Pagden (BMNH); 1 ♀, Penang, C. F. Baker (USNM); 2 ♀ 1 ♂, Singapore, C. F. Baker (USNM).

Other specimen: 1 ♂, Singapore, C. F. Baker (head lacking)(USNM).

On local variations.

1. In the Penang specimens Al-2 yellow, from 3 apically distinctly black, without shifting area. While in the specimens from Singapore(♀♂) Al-3 distinctly yellow and from 4 apically black, without shifting area.

2. In a single female specimen from Laos the gastral petiole completely and G-4-6 wholly black, G2,3 at apex and beneath black and the remaining areas yellow; antennal colour as in Penang specimens; legs dark brown and broadly maculated with yellow; in mid leg whole of tibia and basal half of Tl, and articulations comparatively

broadly yellow, in hind leg bases of tibia and T1 yellow, tibial spurs ferruginous and the remaining areas black. Based upon such a marked difference in colouration the Laotian population is dealt with as a local race:

Trypoxylon maculiventre sayabouryicum ssp. nov.

Holotype: ♀, Laos (Sayaboury Prov., Sayaboury), 17. II. 1965, native collector (BPBM).

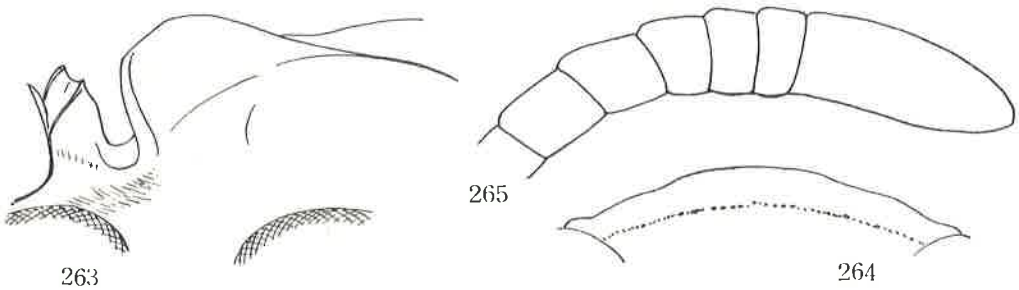
Remarks. In all the female specimens examined the structure of the supraantennal area (ASR, PAF and SAT) is very constant.

61. TRYPOXYLON TEKUENSE sp. nov.

♂. Presumably 9–10 mm (gaster from G2 apically lacking). The present species is similar in the general characters to the two preceding species, but it is in the characters of antenna rather similar to Penang form of T. maculiventre (structure as in the male of the Singapore form and the colour as in the female of the Penang form) and in the characters of supraantennal structure to T. selangor (taking into consideration of sexual variation of SAT) and appears as if it were a hybrid between the two species. But the gaster and legs are much more broadly black and differs from either of them. It can not be accepted to take the differences in the colour of antenna and legs as sexual variation and to combine it as the male with T. selangor, since the antennal colouration – apart from the colour of gaster and legs – in this group is very constant. It is, therefore, treated as a distinct species.

A1 and 2 yellow, from 3 apically black. Gastral petiole wholly black, though anteriorly brownish; base of fore coxa, mid and hind coxae except apices black, arolia dark brown; mid and hind trochanters largely, fore and mid femora except base and apex, hind femora wholly, mid tarsus from T2 apically, hind tibia except base and tarsus wholly dark brown, rest of legs with spurs brown to pale brown.

HW,HL,IODw,P=100,48,25,160. OOD,Od,POD≒1,4,2, IODs=10:9, A3=AW×3.3, A3,4,5≒10, 5.5, 5.5, A13=BW×2.8 and ≒ A9+10+11+12, P,Ma,Mi=100,14,5, RC C-type, R1≒CV2≒TCV 1/2, CV1=CV2×7. Head in frontal view distinctly wider than long, with sides roundly convergent below, vertex not depressed. SAT seen obliquely from above and side to see through PAF: Fig. 263, PAF deep, narrow U-shaped in cross section, with bottom line straight add flat, ASR highly raised, tricarinate on top, SAT deen vertically widrr at apex than long in middle, apical margin curved, with lateral areas edged, median carina long, apical margin of clypeus: Fig. 264; A8–13: Fig. 265. Pent-



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Figs. 263–265. Trypoxylon tekuense sp. nov., ♂

roof structure at subalar area of mesopleuron well developed as in preceding species, but the lamellate carinae on vertical area covered by the roof are 4 in number; propodeum with distinct lateral carinae, area dorsalis with lateral furrows somewhat defined on posterior portion only. Pronotum with lamina on side acutely toothed.

Frons and mesoscutum microcoriaceous, punctures superimposed on frons sparse, on mesoscutum very close, lateral series of strioles of propodeum posteriorly distinct, the striae close and longer posteriorly, area dorsalis at base obliquely coarsely and on posterior portion and median furrow transversely and closely, somewhat rugosely striate, sides finely, very closely but weakly striate, on upper portion miced with punctures. ♀, unknown.

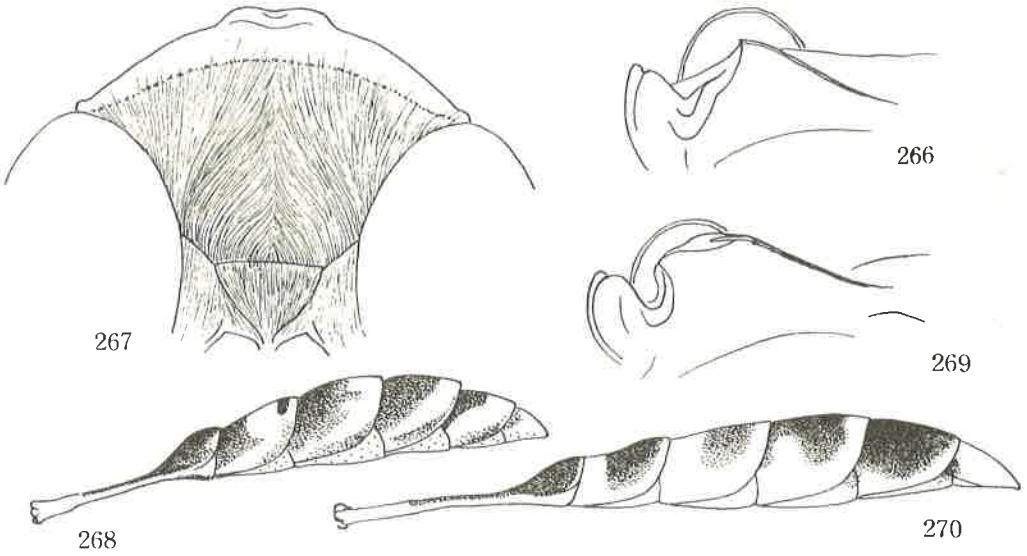
Holotype: ♂, Malaya (Pahang, Kuala Teku, 550 ft jungle), 7. XII. 1921, H. M. Pendlebury (BMNH).

62. TRYPOXYLON PULCHELLUM sp. nov.

The present species most closely resembles T. coloratum Smith, known from Borneo, among the hitherto described species having the golden-haired clypeus. It can be separated from this species, however, by the characters that gastral petiole is relatively much shorter, IODc is relatively distinctly broader, structure of SAT, ASR and PAF (Fig. 266) is quite different (cf. Fig. 269 in coloratum) and the yellow or black marks on gaster and hind leg are different in pattern (Fig. 268, cf. Fig. 270 in coloratum).

♀, 12-14 mm. Black; yellow are Al, A2 (brown above), mouth parts, tubercle of pronotum, tegula, gastral marks (Fig. 268, white parts), fore and mid legs except areolia and hind coxa, -tibia except apical half of outer side and T2-4. Apical margin of clypeus dark brown, mandible brown, apically black, gaster ferruginous to pale brown beneath (sparsely dotted in Fig. 268), hind coxa beneath, -trochanter, -femora except a black streak above and beneath brownish ferruginous; tibial spurs of fore and mid legs and shorter one of hind leg ferruginous, but the longer one of hind tibia dark brown. Hair on inner orbits and clypeus brassy, on clypeus at base strongly lyisinuately convergent towards median line, on propodeum dense, on baso-lateral areas cirled.

Hw,HL,IODv,P=100,44,19,134 (P in coloratum relatively 180), OOD,Od,POD=1,6,2-3, IODs=10:11, A3=AW×4, A3,4,5 ÷ 10, 6.5, 6. Head in frontal view with sides roundly convergent below, vertex markedly depressed below level of upper eye margins, frons gently raised, on anterior portion shallowly roundly excavated and with a shining median bottom line, SAT low (lower than in coloratum); clypeus: Fig. 267, disc at base



Figs. 266-268. Trypoxylon pulchellum sp. nov., ♀
Figs. 269-270. Trypoxylon coloratum Smith, ♀.

roundly raised, apical marginal area reflected. Occipital carina lowering beneath head and disappeared behind buccal cavity. Pronotal collar with anterior part very narrow, anterior inclination markedly oblique, with dorsal line seen in front broad triangular, posterior part discoloured, covered densely with golden hair, lamina on side obtuse triangular, slightly produced, but not toothed. Pentroof structure at subalar area of mesopleuron not so well developed as in selangor or in maculiventre, only from posterior part of the area posteriorly, including mesopleural flange, slightly expanded laterally (as in coloratum), vertical wall of the hollow (naturally covered with golden hair) not carinate, propodeum without lateral carinae, area dorsalis without lateral furrows, but the area well defined by its elevation, GSR distinctly roundly produced, area apicalis indistinct, gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,22,7, 34(32),36(39), RC M-type, Rl short, yet almost reaching wing apex, CV1=CV2×6, TCV very weakly sinuate, TCV:CV2=5:3, angle about 120°.

Frons microcoriaceous and sparsely superimposed with fine punctures, mesoscutum more weakly microsculptured and more finely and more sparsely punctured; propodeum

covered wholly (including area dorsalis and sides) with sparse hair-bearing points, but the hair is so long as to densely hide the ground punctuation.

♂, unknown.

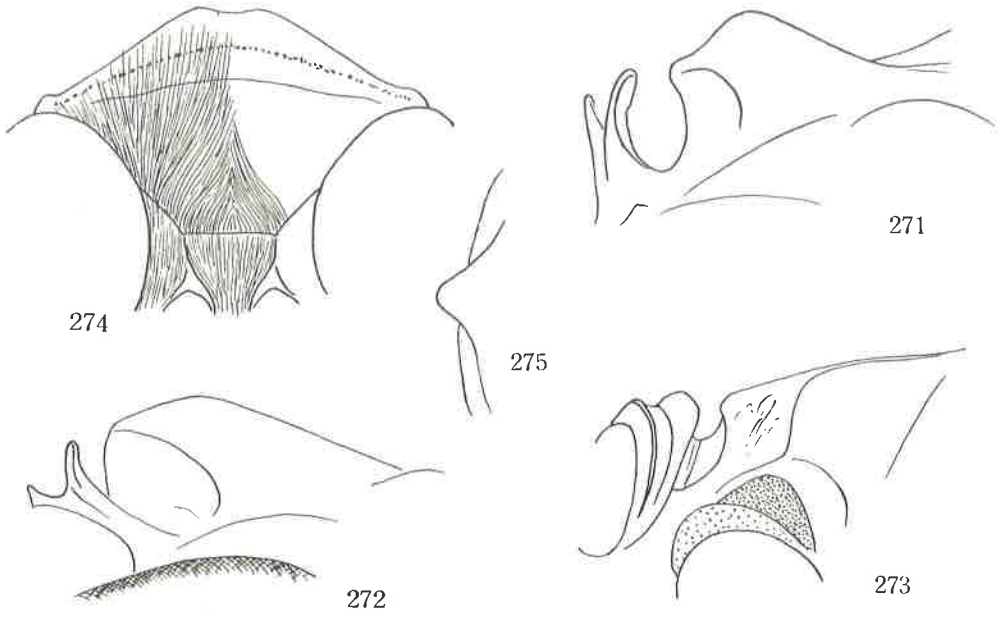
Holotype: ♀, Malaya (Selanger, Bukit Kutu, 3500 ft), 17. IV. 1926, H. M. Pendlebury (BMNH).

Paratypes: 3 ♀, Malaya (Kedah Peak, 3000, 3300,3900 ft), 13, 23, 28. III. 1928, H. M. Pendlebury (BMNH).

63. TRYPOXYLON LONGIPILOSUM sp. nov.

♀, 11.5 - 13 mm. Characteristic in having the mesoscutum distinctly microsculptured and sparsely and coarsely superimposed with comparatively large strong punctures.

Black; gastral petiole at apex, G2 except dorsal mark and G3 on basal half red; mandible reddish brown, tibial spurs except brown longer one of hind leg, fore T1-3, mit T1 except apex pale yellowish white. Hair silvery, on clypeus at base markedly convergent towards medial line.



Figs. 271-275. Trypoxylon longipilosum sp. nov., ♀

HW,HL,IODv,P=100,46,32,170, OOD,Od,POD=3,4,3 (in paratype 3,3,3), IODs=10:7, A3=AW×4.5. Head in frontal view roundly convergent below, vertex not markedly depressed. Frons gently raised on each side of broad shallow medial furrow, SAT moderately high nasiform, nearly equilateral triangle in vertical view, medial carina comparatively short, at anterior end it widely bifurcate into two branch ridges embracing a triangle of medio-apical oblique inclination between (Fig. 273, seen obliquely from beneath), ASR highly raised into 2 lamellate layers, the posterior higher and rounded, black in colour and the anterior subtriangular, with apex rounded and somewhat brownish, the tops of the two layers slightly deviated from each other (Fig. 273), PAF deep, flat-bottomed, oval in cross section, the structure seen obliquely from left side and above:to see through PAF: Fig. 271, in profile: Fig. 272, obliquely from beneath: Fig. 273; clypeus: Fig. 274, at base roundly raised and at apex broadly and strongly reflected; antenna only slightly thickened apically, A3=AW×4.5, A3,4,5=10, 7,6; occipical carina complete. Pronotal lamina stoutly produced (Fig. 275), meso-

pleuron without pentroof structure, but subalar pit deeply hollowed beneath and mesopleural flange slightly more produced than usual; propodeum without lateral carinae, but with a series of transverse strioles along lateral margins, lateral furrows of area dorsalis broad and shallow, roughly covered with rugosed striae, area apicalis with dorsal carina weak, but defined by its smooth and shining surface; GSR strongly roundly produced. Gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,16,5.5, 30(21),28 (28), RC B-type, Rl vestigial, CV1≒CV2×5, TCV bent at mid point and 5/3 the length of CV2, angle slightly less than 90°.

Microreticulation on frons so fine and delicate that it is rather difficult to descriminate meshes under 40 magnification, especially on anterior portion, superimposed punctures fine and very sparse, not distinct. On mesoscutum microsculpture also delicate, but punctures larger and stronger than usual, irregular in size, shape and density, giving a very coarse impression, mesopleuron similarly coarsely punctured, but microreticulation indistinct; area dorsalis at base longitudinally, median furrow transversely striate except apical portion, disc finely indistinctly punctured, posterior inclination transversely striate, sides sparsely punctured, on dorso-anterior portion mixed with oblique striae.

♂, unknown.

Holotype: ♀, South India (Madras State, 3500 ft, Anamalai Hills, Kadamparai), V. 1968, P. Susai Nathan (RMNH).
Paratype: 1 ♀, the same data.

64. TRYPOXYLON RUFIGASTER sp. nov.

♀, 10.5 mm. Characteristic in the colour of antenna, gaster and legs and in the structure of supraantennal area and clypeus.

Black; ferruginous to pale yellowish white* are Al, 2, 3, apical margin of clypeus, mandible, palpi*, tibiae* and tarsi* of all legs (fore tibia brown on inside), posterior part (discoloured) and tubercle of pronotum, tegula and gaster except brownish apical portion (broader beneath), rest of legs dark brown, hind bitia paler at base. Hair silvery, on clypeus at base somewhat convergent towards medial line.

HW,HL,IODv,P=100,48,28,102, OOD,Od,POD≒2,5,3, IODs=10:7. Head in frontal view with sides roundly convergent below, vertex not markedly depressed, frontal elevations gentle, median furrow broad and shallow, SAT low nasiform, medio-anteriorly obliquely inclined, the surface shallowly excavated and shining, ASR highly raised, bilobate, anterior lobe low, rounded semitransparent ferruginous, posterior one higher, subtriangular and black (similar to the preceding species), PAF deep, oviform seen to see through it (Fig. 276); clypeus simply roundly produced, at apex almost not reflected, supraclypeal area markedly depressed. Antenna weakly thickened apically, IODv:A3=10:8, A3=AW×6, A3,4,5≒10,6,5, occipital carina complete. Pronotum with lamina on side triangular, apex minutely rounded (Fig. 278), subalar area of mesopleuron posteriorly edged, with the flange somewhat expanded laterally, thus showing a distinct tendency towards the pentroof structure; propodeum with lateral carinae, accompanied with a series of striae, area dorsalis with distinct lateral furrows, area apicalis with marginal carina anteriorly weak, GSR obliquely highly raised, rounded and amber yellow in colour. Petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,22,10,54(29),48(43), RC C-type, Rl short, CV1≒CV2×6, TCV nearly straight, 5/3 of CV2, angle about 100°.

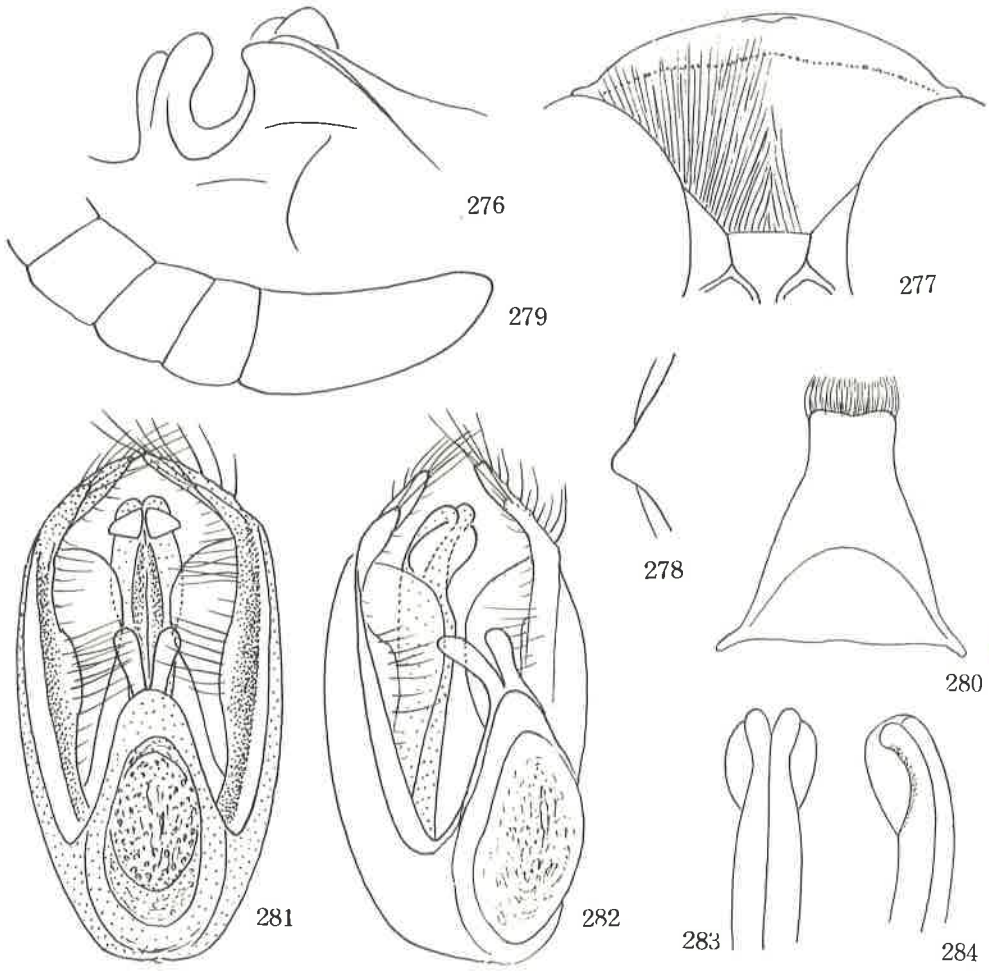
Frons microcoriaceous and distinctly fairly closely superimposed with fine punctures, mesoscutum smooth and polished, with strong plumbeous shine, weakly, indistinctly, rather sparsely punctured, area dorsalis at base sparsely crenate, median furrow transversely striate, posterior inclination posteriorly transversely striate, area spicalis polished.

♂, 7.5 - 8.3 mm. Colour generally similar to ♀, but fore and mid legs except bases of coxae and hind legs except greater part of coxa (black) and of femur (brown) wholly ferruginous, only fore and mid femora somewhat brownish above, Hairs silvery.

In structure and punctuation also similar to ♀ in general, but SAT at medio-apical area not smoothly obliquely inclined, but first horizontally triangularly expanded and then obliquely inclined to interantennal area, dorsal triangular area coarsely rugoso-punctate and anterior oblique area not excavated. However, the form of SAT, ASR seen to see through PAF much the same as Fig. 276, only the elevation somewhat lower. A3=AW×2.6, Al3: Fig. 279, slightly longer than 3 preceding joints united.

Sternite 8: Fig. 280, apical fringe of pubescence not particularly long on each side. Genitalia seen from beneath: Fig. 281, seen obliquely from left side: Fig. 282.

Paramere apparently simple at apex, but in reality it consists of two layers closely overlapped, the ventral one shorter and quite indistinct, inner margin of main body broadly expanded, lamellate, volsella spatulate, simple, penis valve quite curious in structure at apex, it is provided with a nearly transparent lunate membrane on each



Figs. 276-284. Trypoxylon rufigaster sp. nov., 276-278, ♀; rest ♂

side (Fig. 283, dorsal view; Fig. 284, latero-dorsal view) instead of a sickle-shaped appendage (best observed obliquely from dorsal side; Fig. 284), shoulder not developed, but the area slightly roundly expanded.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Eue, 750m, forest stream bed), 10-11. IV. 1963, J. L. Gressitt (BPBM).

Paratypes: 1 ♂, Singapore, coll. C. F. Baker (USNM); 1 ♂, Laos (Sayaboury Prov., Sayaboury), 12. XII. 1965, native collector (BPBM).

Remarks. Between the two male specimens the following slight differences are observed (numerals first given are values from Singapore specimen, those within parenthesis are from the Laotian):

Length 7.5 (8.3) mm. HW,IODv,P=100,26,103 (100,26,112). IODs=10:7 (10:7.5). P,Ma,Mi=100,24,9.5 (100,27,10). CV1=CV2×5 (CV2×5.5). Hind femur largely pale brown (largely dark brown). A3=AW×2.6 (ditto). A13=A10+11+12 (ditto).

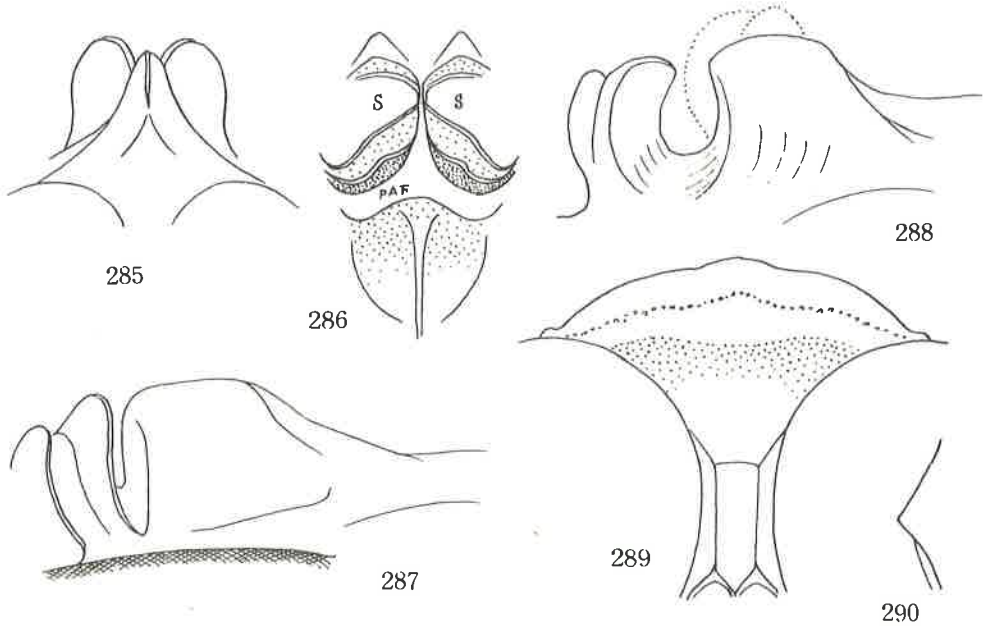
65. TRYPOXYLON TOMI sp. nov.

♀, 8.5 mm. Characteristic in the structure of supraantennal area and very narrow IODc and can be distinguished from other closely allied species.

Black; ferruginous are A1, A2 wholly, A3 on basal area (thence apically dark brown), clypeus broadly at apex, mandible, palpi (whitish), pronotal tubercle, tegula, gaster from apex of petiole till end (with blackish patches beneath), all trochanters, base and apex of femora, tibiae and tarsi of fore and mid legs (inside of tibiae and mid T5 pale brown) and base of hind tibia; tibial spurs ferruginous, but longer one of hind tibia alone brown, rest of legs dark brown, articulations of hind tarsus paler. Hair silvery, on clypeus at base somewhat convergent towards medial line.

HW,HL,IODv,P=100,48,25,160, OOD,Od,POD=1,3,2, IODs=10:3.3(=3:1), A3=AW×5.5, head in frontal view with sides roundly convergent below, vertex fairly distinctly depressed, with upper margins of hind ocelli in a same line with the upper eye margins, eye incisions comparatively narrow, frontal elevations distinctly roundly raised, median furrow moderately deep, SAT and ASR seen from dorsal side: Fig. 285, seen vertically: Fig. 286, S is antennal socket,dotted areas around it is ASR, sparsely dotted part ambur yellow, densely dotted part black, white area behind it PAF, roundly enclosed area is SAT, these areas seen in profile: Fig. 287, SAT high narrow nasiform, anteriorly perpendicularly inclined to interantennal area, ASR highly raised, bilobate on top, anterior lobe ambur yellow and the posterior black, PAF deep, flat-bottomed, seen to see through it: Fig. 289, PAF roundly excavated, oviform in cross section, as the anterior end of SAT is perpendicular, seen vertically PAF appears nearly T-shape (Fig. 286). Clypeus: Fig. 289, at base gently roundly raised. Pronotal collar with anterior part gently raised towards middle, posterior part discoloured; lamina on side triangularly produced (Fig. 290), mesopleuron without pent-roof structure, but flange slightly hanging over subalar pit. Propodeum with weak lateral carinae, area dorsalis with distinct lateral furrows, area apicalis except medio-anterior area distinctly enclosed with carinae, GSR obliquely roundly produced. Gastral petiole flask-shaped, P, Ma,Mi,2(Ma),3(Ma)=100,14,5,30(15),38(20), in fore wing RC C-type, R1 very short, CV1=CV2×4, CV2 down-curved, TCV nearly straight, slightly longer than CV2, angle about 120°.

Frons weakly microceriaceous, fairly shining, punctures comparatively somewhat large, anteriorly close and sparse posteriorly, thorax-complex smooth and polished, mesoscutum with plumbeous shine, punctures very fine, weak and sparse, propodeum with series of striae along lateral carinae, anteriorly weak and indistinct, posteriorly



285 286 287 288 289 290

Figs. 285–290. Trypoxylon tomi sp. nov., ♀

the striae distinct but short, sides strongly shining.

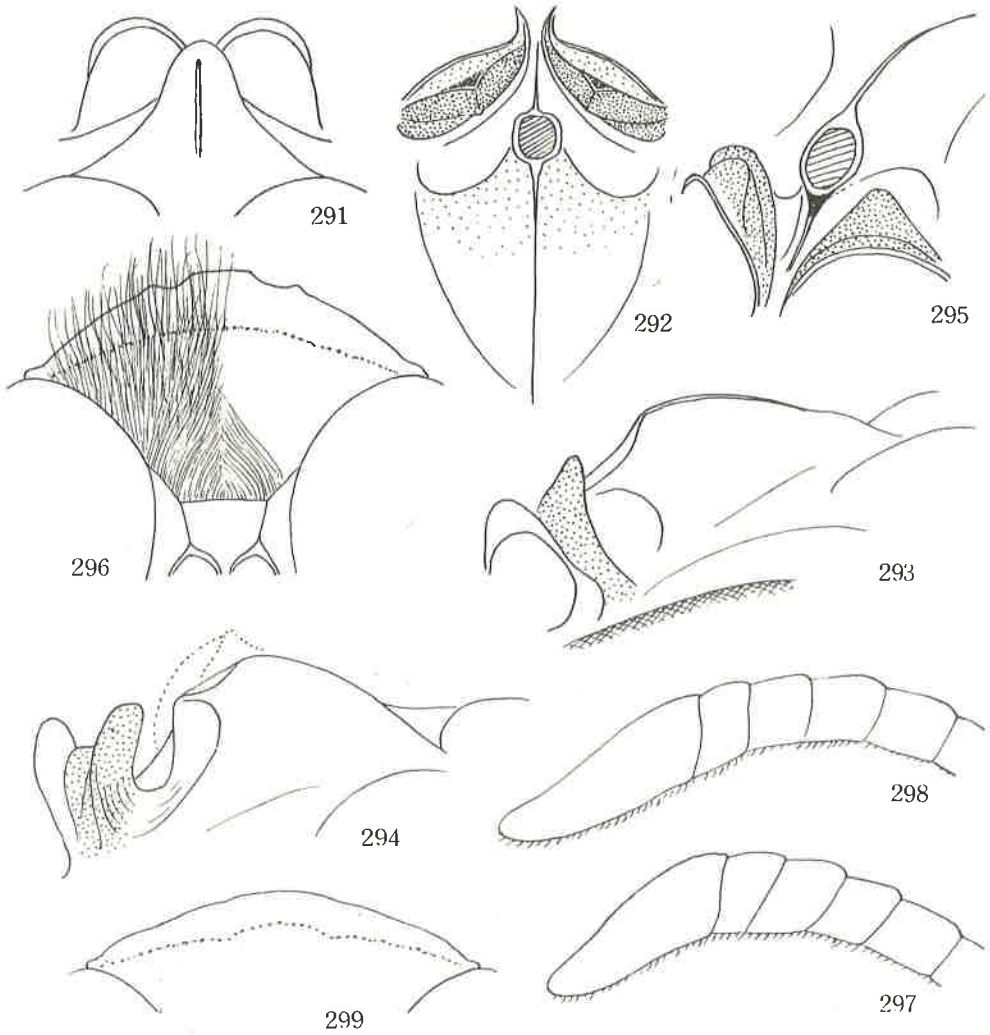
♂, unknown.

Holotype: ♀, Singapore, Coll. C. F. Baker (USNM).

66. TRYPOXYLON YUMI sp. nov.

♀, 13-14 mm. Closely related to the preceding species, but can be separated therefrom by the ferruginous underside of antennal flagellum, much broader IODc, less depressed vertex, different apical form of clypeus, anteriorly obliquely inclined and hollowed SAT and Y-shaped PAF.

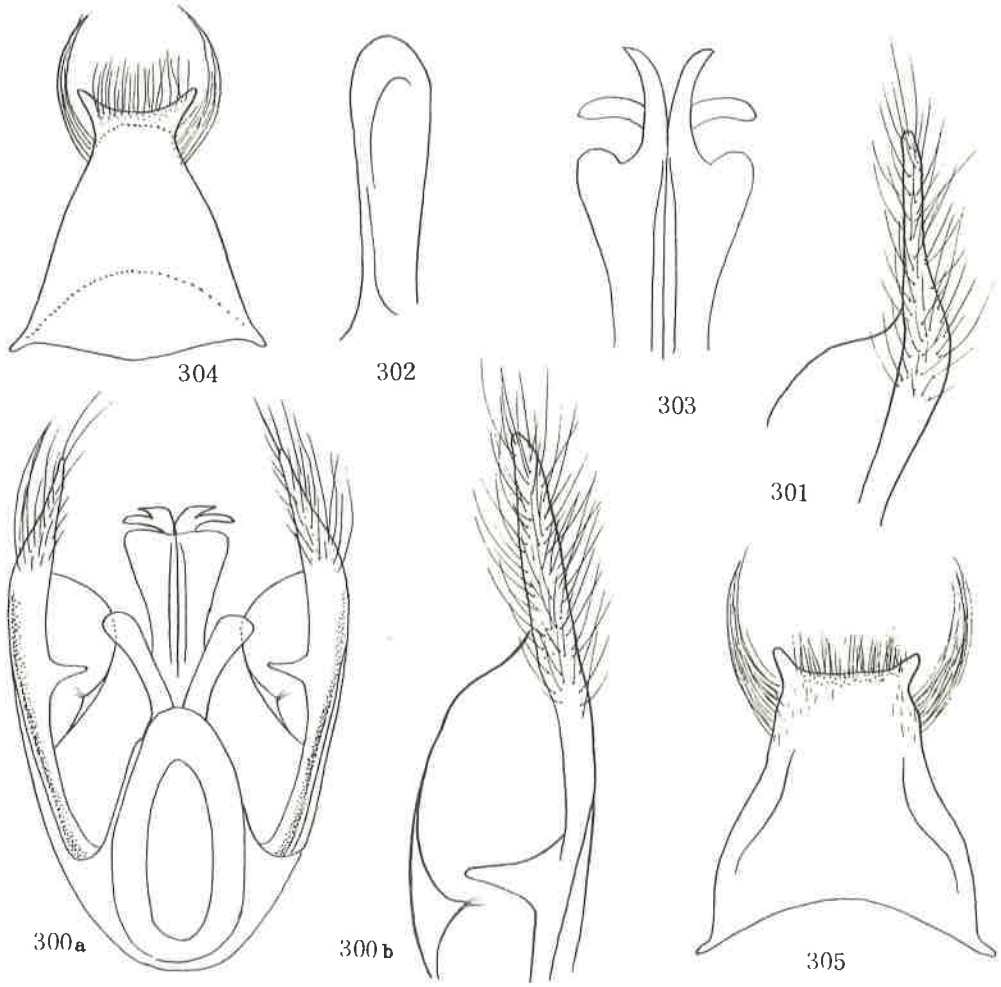
Black; antenna brown to dark brown, ferruginous beneath; light ferruginous are Al-3 (apically brownish), clypeus anteriorly, mandible, mouth parts, posterior part of collar (discoloured), tubercle, tegula and basal plates of wing, gaster from apex of petiole to caudal segment (slightly reddish and sometimes posteriorly brownish), fore and mid legs except bases of coxae and arolia (often with a brownish streak on each



Figs. 291-299. Trypoxylon yumi sp. nov., 291-296, ♀, rest ♂

femur), apex of coxa, trochanter, both ends of femur and base broadly of tibia of hind leg. Mid tarsus apically more or less brownish, hind tarsus at articulations and on T5 somewhat pale brown. Hair silvery, on clypeus at base sinuately convergent towards medial line.

In holotype HW,HL,IODv,P=100,46,26,162; OOD,Od,POD=2,5,3; IODs=10:6.5, A3=AWx5, A3,4,5=10,6,5.5; head in frontal view roundly convergent below, vertex not strongly depressed, with upper margins of hind ocelli slightly above level of upper eye margins, eye incisions narrow, frontal elevations roundly, moderately highly raised, medial furrow fairly deep, SAT nasiform, acutely keeled on top, apical margin obliquely inclined, inclined area broad lenticular in outline, with a large hollow that occupies nearly whole the area, ASR highly raised, bilobate on top as in tomi, seen from dorsal side similar in form, but the lobes slightly broader (Fig. 291, cf. Fig. 285, but the form more or less variable among the specimens), the structure seen vertically (Fig. 292) PAF in form of Y and round hollow on apical inclination very conspicuous, seen in profile: Fig. 293, seen to see through PAF: Fig. 294, seen obliquely from beneath: Fig. 295. Clypeus: Fig. 296, disc roundly raised; occipital carina incomplete, disappeared behind buccal cavity. Pronotal collar as in tomi, lamina on side and structure of subalar area of mesopleuron also similar. Propodeum with weak lateral carinae, area dorsalis also with weak lateral furrows, area apicalis without carina at medio-dorsal area, GSR simple. Petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,17,6,30 (22),30(31). In fore wing RC C-type (somewhat close to B-type), Rl short, CV1=CV2x7, TCV bent near mid point and produced inwards, longer than CV2, angle about 90°.



Figs. 300-305. Trypoxylon yumi sp. nov., ♂

Frons microreticulate and superimposed with comparatively large punctures, punctures on posterior portion sparse, but anteriorly close and rugosely confluent, mesoscutum smooth, with plumbeous shine, finely, somewhat sparsely punctured, PIS larger than PD, area dorsalis smooth, with sparse very fine hair pits, series of striae along lateral carinae fairly distinct and close, sides with sparse fine hair points.

♂, 9.5–13.5 mm. Generally similar to ♀, but antenna and legs more broadly dark brown to black, IODc relatively broader and clypeus (Fig. 299) and antenna(Figs. 297, 298) show sexual variation in structure.

Antenna most usually A1 and A2 ferruginous or yellow and brown above, 3 ferruginous to brown beneath and brown to dark brown above, rest of flagellum wholly dark brown to black, very rarely broadly ferruginous to pale brown beneath. Coxae black except apex, trochanters usually pale brown to ferruginous beneath and wholly or partly dark brown above, but sometimes completely black, femora black except ferruginous base and apex, hind tibia except paler base and tarsus wholly dark brown. Gaster variable in colour as in ♀, but petiole except apex always black.

A3 most usually AW×2.5 or so, A3,4,5÷10,7,7, A13 longer than 3 but shorter than 4 preceding joints united, but there are more or less variations (Figs. 297,298).

As described later in the remarks the present species is variable in many characters and in order to confirm the taxonomic significance of such variations genitalia of 7 out of 16 specimens are examined. The following is the summed up result:

Seen from beneath: Fig.300a, very similar in structure to those of khasiae Cam. Penis valve with shoulder and sickle-shaped appendages before apical area (Fig. 303, dorsal view) and paramere apically slender and simple, not bifurcate, with a long tooth-shaped process on outer margin near middle of its length, inner margin expanded, lamellate and half rolled inwards and at its lower inner corner triangularly produced and provided with a few short hairs (Figs. 300a or b). Volsella spatulate, apically rounded, without fringe of hair, but more or less variable in relative width; penis valve as Fig. 303. The structure is fundamentally the same as in khasiae. The only difference lies in that the apical part of paramere is slenderer, with hairs finer, more abundant and without tubercle at their bases.

The 8th sternite is also similar to that of khasiae, having a marked horn at each latero-apical corner, but general form is more or less varied (Figs. 304, 305), partly according to the condition of preparation.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Ene), 15. V. 1967, native collector (BPBM).

Paratypes: 1 ♀ 11 ♂, the same place (1 ♀ 1 ♂, 750 m, forest stream bed, 10–11. IV. 1965, J. L. Gressitt; 1 ♂, 20 km E of Phou-Kowkuei, 1–15. V. 1965, J. A. Rondon (BPBM); 2 ♂, 30. II. 1965; 1 ♂, 15–31. V. 1965; 1 ♂, 30. IX. 1965; 1 ♂, 15. I. 1966; 1 ♂, 15. III. 1966; 1 ♂, 30. III. 1966; 1 ♂, 15. V. 1967, all native collector (BPBM). 1 ♀ 2 ♂, Laos (Sayaboury Prov., Sayaboury): 1 ♂, 26. III. 1966; 1 ♀ 1 ♂, 15. IV. 1967, native collector (BPBM); 1 ♂, Laos (Borikhane Prov., Pakkading), 13. VII. 1965, native collector (BPBM). 1 ♀, Malaya (Kedah Peak, 3950 ft), 22. III. 1928, H. M. Pendlebury (BMNH).

Other specimen: 1 ♂, Laos (Vientiane Prov., Ban Van Ene), 15. I. 1965, native collector (antenna incomplete) (BPBM).

Remarks. Variation in ♀: Antenna sometimes nearly wholly ferruginous, of such specimens sometimes dorsal side pale brown. Gaster sometimes posteriorly brownish, the range and grade of brown variable. Hind leg sometimes with femur, tibia and tarsus broadly ferruginous, ferruginous area broader than brown area, without dark-brown coloration. The form of head in frontal view is with sides roundly convergent below, but the grade of curvature varies considerably. The depression on vertex also varies more or less. Typically the depression is very slight, but in some specimens it reaches considerable (but always less strong than in khasiae), in such specimens IODv is relatively smaller and OOD is narrower and in these respects somewhat close to khasiae. In IODs, however, they are constantly different from this species. Certainly IODv as against HW varies considerably. It is sometimes 100:23, but sometimes 100:26 and between the two extremities it varies gradually. OOD is also variable even under eye measurement. This is mainly based upon the variation in the relative size of hind ocellus and, therefore, the ratio of OOD:POD is comparatively constant, namely 1:2. Sometimes, however, OOD varies without connection with Od. Lateral carinae of propodeum are also variable. They are usually present, but sometimes they are very feeble and difficult to determine whether they are present or absent. There is certainly a problem whether all of these variations are really variations within a species, or some of them at least are based on the specific differences. But here they are provisionally dealt with as intraspecific variations.

Variation in ♀ and ♂. Lamina on side of pronotum is triangularly, not strongly produced, with apex usually more or less angulated, but sometimes it is obtusely or considerably rounded. Punctures on frons are fairly variable in density and rugosity.

Variation in ♂. Variations in colour of antenna and legs are similar to those of ♀ above mentioned. As to the variation in the presence and absence of the lateral carinae of propodeum the state is similar. Besides these, a considerable variation is observed in the relative length of antennal joints. The relative length of A3 in this group is usually comparatively constant, different from much variable relative length of gastral petiole etc. It seems, therefore, worth special recording. A3 is usually AW×2.5 or so, but in some it reaches 2.8, while in others it is only 1.8, 2.0, 2.2 or 2.3, namely very short and relatively thick, A3,4,5 also varies from 10,6,5 to 10,7,7. As to A13 it varies from BW×2.5 to BW×3.0, but the relative length to preceding joints is rather constant, namely, longer than 3 but shorter than 4 preceding joints united. However, it is also certain that in some condition it appears as long as 3 or 4 joints united. IODs also varies more or less, namely between 10:7.5 to 10:8 (= 4:3 - 5:4).

Marked variation in relative length of A3 makes us querry whether all of them belong to a same species or not (compare with the case of so-called bicolor Smith). In this instance, however, the structure of genitalia, so far examined, is always constant, apart from the mechanical change due to preparation. Basing upon this as well as upon the fact that variations in this instance are rather continuous, the present specimens are considered to belong to the same species.

The most serious problem concerning the present species is the relationships to the following khasiae.

67. TRYPOXYLON KHASIAE Cameron, 1904

Trypoxylon khasiae Cameron, Ann. Mag. Nat. Hist., (7) 13: 218, 1904 (♀, Assam, Khasia Hills).

Trypoxylon khasiae: Tsuneki, SPJHA, 8: 54, 1978 (redescription of holotype, figs.).

Specimens examined: 1 ♀, Assam, Rothney leg. (holotype). 12 ♀ 6 ♂:
9 ♀ 5 ♂, Laos (Vientiane Prov., Ban Van Hue), Dates: ♀: 15-31. V. 1965; 15. II. 1966; 29,30,30. III. 1966; 29. IV. 1966; 15. XII. 1966; 15,15. V. 1967, all leg. native collector (HPBM). ♂: 15-31. V. 1965; 15. III. 1966; 30. IV. 1966; 31. V. 1966; 30. II. 1967, leg native collector (HPBM).
1 ♀, Malaya (Is. of Penang), C. F. Baker (USNM).
1 ♀, Malaya (Perak, Batang Padang, Jor Camp, 1800 ft), 10. III. 1924, H. M. Pendlebury (BMNH).
1 ♂, Malaya (Pahang, 2000 ft Genting Simpah), 1. I. 1946, H. T. Pagden (BMNH).
1 ♀, Thailand (Changdao), 5-11. IV. 1958, T. C. Maa (HPBM).

In Part II of the present paper I described, basing upon the type specimen that the propodeum is without lateral carinae and keyed as such. However, according to the observations of the newly examined specimens it was made clear that this character is inconstant and in some specimens the carinae are certainly absent, but in others present and, further, in the case of presence they vary considerably in strength, sometimes distinct, but sometimes rather obscure. The species also varies markedly in the body length, especially in the female, namely from 14 to 23 mm, mostly 16-18 mm, and in the male from 13 to 16 mm, mostly 13-14 mm. The depression at vertex also varies more or less in degrees. This is more marked in the male and in the extreme case the state is close to that of comparatively stronger depression in yumi. Certainly the two species are very similar in structure, punctuation and coleuration to each other and in some specimens at the nearer ends of both variation ranges the separation of both species is sometimes not easy. By the detailed comparative observations, however, it was discovered that in khasiae (♀♂) mesopleural scrobe was lacking or very weakly concave, instead a minute tubercle present there. By this character combined with the state of depression on vertex most of the specimens are separable into the two species. However, in some male specimens of yumi the scrobe is not deep and the vertical depression is somewhat deep. In such a case to give final determination the examination of the genitalia is necessary.

In the female this species differs from yumi, apart from the three characters above mentioned, in the following distinctions also:

1. IODv relatively smaller (HW:IODv=100:22-23, in yumi 100:24-26).
2. Gastral petiole relatively longer (HW:P=100:180-194, in yumi 100:160-166).
3. IODs relatively greater (IODs=10:8 - very constant -, in yumi 10:6.5-7).

While OOD,Od,POD (mostly 2,5,3), A3,4,5 (mostly 10,6.5,6), structure of SAT, ASR and PAF, of clypeus and propodeum, tendency towards pent-roof structure at subalar area of mesopleuron and the colouration of antenna, gaster and legs with their variation tendency are generally similar.

On the male. The male of khasiae is much closer to yumi than the female. Observations on the vertical and mesopleural characters and the results of measurements made with the specimens determined by the structure of genitalial paramere are given in Table 2

Table 2. States and measurements on males of khasiae (Upper) and yumi (lower)

VD	MS	IODv	P	OOD	Od	POD	IODc	A3	A13	A13p	Ma	Mi	2(Ma)	3(Ma)
S	W	24	170	4	8	4	9	3.0	3.0	3-4	14	5	29(18)	31(29)
M	N	26	158	4	5	4	8	3.0	3.0	3-4	15	6	30(24)	30(28)
M	W	27	154	4	5	4	8	2.4	3.1	4	15	6	34(19)	34(26)
M	M	26	150	4	6	4	8	2.7	3.1	3-4	15	6	32(18)	32(24)
M	W	26	160	4	6	4	8	2.5	3.2	4	15	5	28(18)	30(25)
S	M	24	160	4	8	4	8	3.0	3.7	4	15	5	27(17)	27(26)
W	M	25	148	4	12	8	8	3.1	3.0	3-4	17	7	29(20)	30(28)
W	M	27	140	4	8	4	8	2.7	3.0	3-4	18	6	30(22)	30(32)
M	D	25	166	4	8	4	8	3.0	-	-	12	5	28(15)	28(22)
W	D	26	134	4	8	6	9	2.1	2.7	3-4	17	6	32(22)	32(32)
W	D	29	140	4	8	4	8	2.1	3.3	3-4	17	6	30(22)	32(32)
W	D	27	144	4	6	4	8	2.5	2.9	3-4	15	6	32(20)	32(25)
W	D	26	-	4	8	4	8	2.5	2.9	3-4	-	-	-(-)	-(-)

Remarks. The specimen of the first line is from Malaya, all others from Laos. VD = Depression on vertex. MS = Mesopleural scrobe. S = Strong. W= Weak. M = Moderate. N = None. D = Deep. A13p = Relative length to preceding joints (3-4 = longer than 3 but shorter than 4 preceding joints united; 4 = appr. as long as 4 prec. j. united). The following are omitted: HW (as 100): ...IODv and P. IODv (as 10) ... IODc. AW ... A3. BW ... A13. P (as 100): ... Ma, Mi, 2(Ma), 3(Ma).

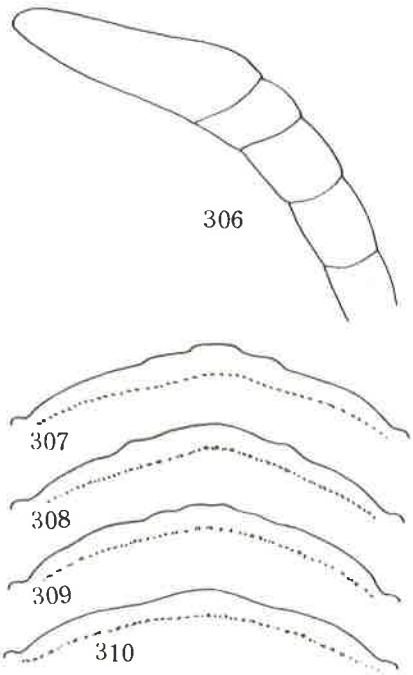


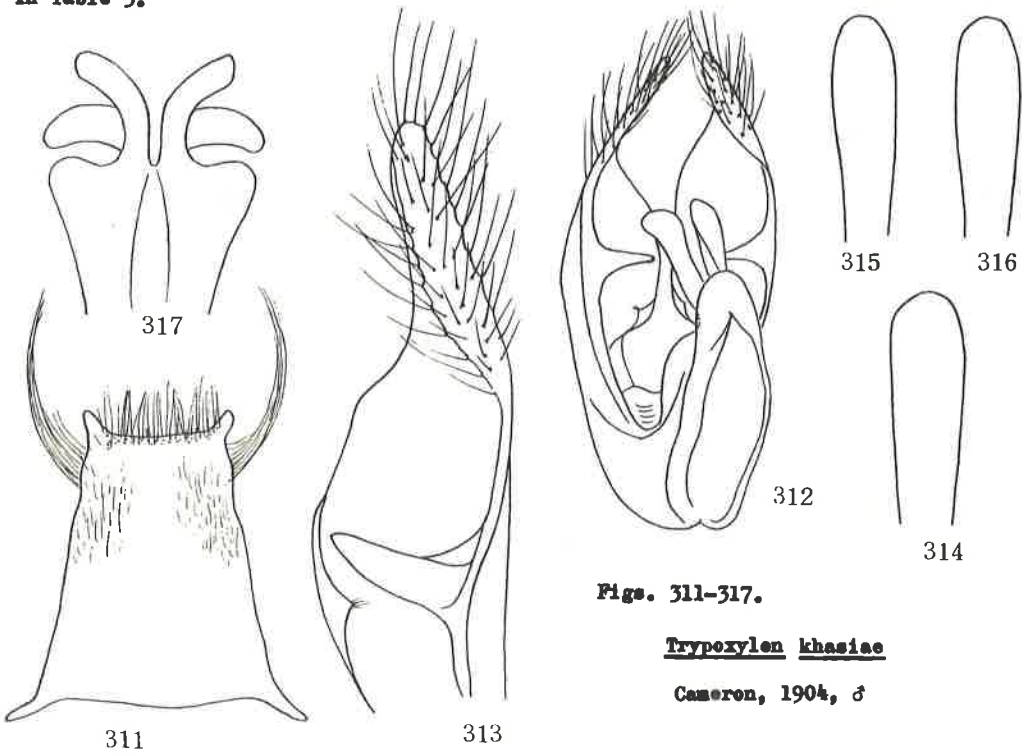
Table 3. Measurements on females of khasiae (upper) and yumi (middle, with vertex somewhat depressed, and lower, with vertex not depressed)

	Length	IODv	P	OOD	Od	POD	IODc	A3
	17.0	23	194	2	5	3	8	6.4
	23.0	24	190	2	5	3	8	7.0
	16.5	22	184	2	5	3	8	7.1
	15.0	23	180	2	5	3	8	7.0
	19.0	23	183	2	5	3	8	6.7
	17.5	23	180	2	5	3	8	6.5
*	18.5	23	184	2	5	3	8	6.8
	14.0	23	180	2	12	6	7.5	6.0
	14.0	23	176	2	12	6	7	6.9
**	13.5	22	164	2	8	4	8	5.0
***	13.0	23	180	2	10	4	8	6.9
	14.0	26	162	2	5	3	6.5	5.0
	13.5	25	164	2	5	3	6.5	5.5
	13.0	25	166	2	6	4	6.7	5.5
*	13.0	24	165	2	8	4	7.0	5.5

Remarks. Items are as in Table 2.
No asterisk... specimens from Laos.
*... Specimens from Malaya. **... Specimen from Thailand. ***... Specimen from Singapore.

Ultimate antennal joint in the Malayan specimen that is the most khasia-like one of all is as given in Fig. 306, in this specimen the hair covering the clypeus is somewhat brassy in colour. Variation in the form of apical margin of clypeus: Figs. 307 (Malayan ex.), 308-310 (Laotian ex.). Sternite 8 in the Malayan male: Fig. 311, genitalia (in 4 specimens examined) seen somewhat obliquely from beneath: Fig. 312, very similar in structure to those of yumi, but the apical part of paramere slightly broader, more strongly and less abundantly bristled and at the base of each bristle minutely tuberculate (Fig. 313, cf. Fig. 301); volsella strictly more or less varied in form (Figs. 314, Malayan ex., 315-316, Laotian ex.), penis valve in dorsal view: Fig. 317.

For comparison's sake, measurements of main characters in the females are given in Table 3.



Figs. 311-317.

Trypoxylon khasiae

Cameron, 1904, ♂

68. TRYPOXYLON SIMILE sp. nov.

♂, 12 mm. Closely resembles in appearance to some form of T. yumi. Detailed comparative observations reveal, however, that the frontal elevation in the present species is much weaker than in yumi, with the microsculpture and superimposed punctures are also weaker, SAT with median ridge not acutely carinated as in yumi, but thicker and broader, and the depression of vertex stronger (rather similar to khasiae). But the general colouration and the characters of antenna, clypeus, general appearance of SAT, ASR, PAF and propodeum similar.

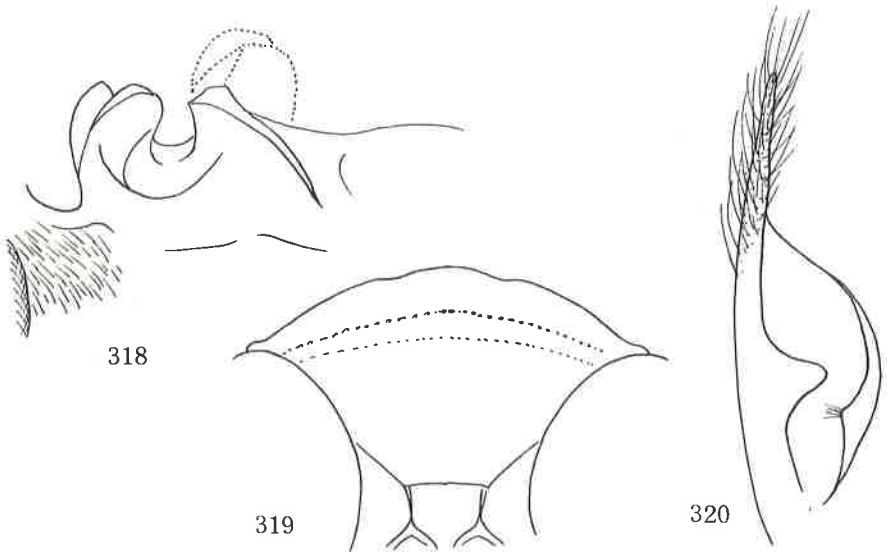
Antenna brown, A1, 2 and basal part of 3 orange yellow, flagellum slightly paler beneath. Body black, ferruginous are apical marginal area of clypeus fairly broadly, mandible, palpi, tubercle of pronotum, tegulae and basal plates of wings and from apex of petiole to end of gaster. Legs ferruginous yellow, coxae except apices black; trochanters largely, a streak on fore and mid femora, hind femur largely, apical part of mid tarsus and hind tarsis largely brown to dark brown.

HW,HL,IODv,P=100,46,23,150; OOD,Od,POD=3,6,4; IODs=10:9, A3=AWx3, A3,4,5=10, 7.5,7, Al3=Bwx3, and longer than 3 but shorter than 4 preceding joints united, in

form similar to yumi; P,Ma,Mi,2(Ma),3(Ma)=100,14,6,30(20),30(27), venation similar to that of yumi. SAT, ASR seen obliquely from side to see through PAF: Fig. 318, Clypeus: Fig. 319; genitalia generally similar to those of yumi, but the triangular process at outer margin of paramere shorter and broader (Fig. 320, left paramere)

♀, unknown.

Holotype: ♂, Singapore, C. F. Baker leg. (USNM).



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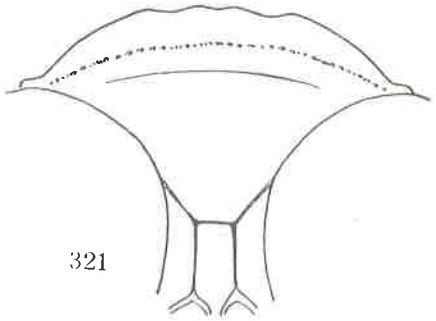
Figs. 318–320. Trypoxylon simile sp. nov., ♂

69. TRYPOXYLON NIGRIFEMUR sp. nov.

♀, 12 mm. Very closely allied to T. yumi, differs in the following characters only:

1. Head in frontal view with sides much more strongly convergent below.
2. IODc relatively smaller, namely, IODs=10:4.3–4.5.
3. Clypeus at base not raised, with hairs parallel, with undulation at apical margin weaker (Fig. 321).
4. All femora black or dark brown, mid and hind tibiae except base and hind tarsus black or dark brown.

Measurements (within parenthesis: paratype): HW,HL,IODv,P=100,50,25,160(100,24,25,162) OOD,Od,POD=1,3,2(1,3.5,2), IODs=10:4.3(4.5), A3=AW×5.5(5.0), A3,4,5=10,6.5,6(do.), P,Ma,Mi,2(Ma),3(Ma)=100,19,6,28(21),32(28) (100,18,6,26(22),38(32)). RC C-type (do.), R1 short (do.), CV1≒CV2 6 (do.), TCV slightly longer than CV2, angle about 100° (do.).



321

♂, unknown.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Eue), 15. I. 1966, native collector (HPHM). Paratype: 1 ♀, the same place, 28. II. 1966, native collector (HPHM).

Remarks. In the holotype dark coloured parts of antenna and legs are black, while in the paratype antenna pale brown and till base of 3 yellow, dark part of legs brown to dark brown.

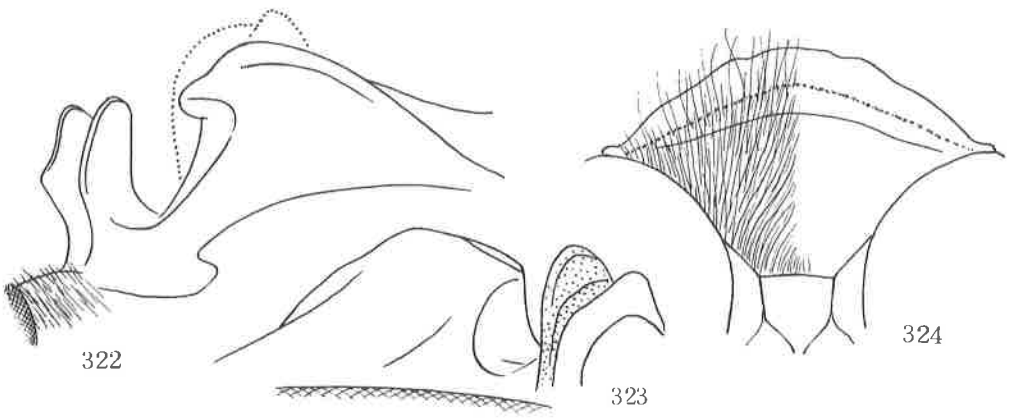
Among the listed males of T. yumi may be included the male of the present species. But the external characters related to the present species are considerably variable

and it is difficult to sort out the corresponding male.

70. TRYPOXYLON LAEVIDORSUM sp. nov.

Closely related to T. yumi, differs from it in the weaker undulation of apical margin of clypeus, in the stronger depression of vertex and in the form of the excavation of PAF. It is also similar to the preceding species, can be separated from it, however, by the deeper depression of vertex and by the different form of PAF.

♀, 12 mm. Black; antenna brown to dark brown, paler beneath, A1, A2 wholly and A3 at base ferruginous yellow. Ferruginous are clypeus anteriorly broadly, mandible, palpi, posterior part of pronotal collar, tubercle, tegula and basal plates of wings, gaster from apex of petiole till end (from G2 apically broadly somewhat darkened), apices of coxae, trochanters, fore and mid legs except parts of mid femur and tarsus, parts of hind femur and base of hind tibia; spurs ferruginous, but longer one of hind tibia brown. Hairs silvery, on clypeus at base strongly sinuately convergent towards medial line; on mesoscutum very fine and brownish, much less conspicuous than in yumi.



Figs. 322-324. Trypoxylon laevidorsum sp. nov., ♀

Head in frontal view with vertex markedly depressed, with sides roundly convergent below, HW,HL, IODv,P=100,48,25,170, OOD,Od,POD=2,5,3, IODs=10:6.5, A3=AW×5.7, A3,4,5=10,6,5.5. Supraantennal structure generally as in yumi, but PAF more widely open, seen to see through PAF: Fig. 322, SAT at anterior inclination below foveate area much steeper (Fig. 323, profile from right side). Frons gently raised, with medial furrow moderately deep; clypeus: Fig. 324, with disc at base distinctly elevated; occipital carina complete. Collar in frontal view gently raised towards middle and minutely tuberculate there, with posterior part discoloured, lamina on side distinctly produced in triangle, with apex minutely rounded; subalar area of mesopleuron with weakly developed pent-roof structure, posterior part of the area longitudinally carinated and slightly produced over subalar pit, scrobe not deep; propodeum with lateral carinae, accompanied inside with a series of fairly distinct close striae, the striae stronger and longer posteriorly, area dorsalis with lateral furrows distinct, smooth, medial furrow suboval, shallow posteriorly, area apicalis open at medio-dorsal area, GSR obliquely roundly elevated. Gastral petiole flask-shaped, markedly slender and long, P,Ma,Mi,2(Ma),3(Ma)=100,15,5,26(16),30(23). In fore wing RC B-type, somewhat close to C-type, CV1=CV2×6, TCV:CV2=5:3, TCV curved inwards, angle roughly about 90°.

Frons microcoriaceous and sparsely weakly, rather indistinctly superimposed with comparatively large shallow punctures, mesoscutum smooth and shining, with fine and sparse punctures, propodeum smooth and polished except series of striae along lateral carinae, only anterior narrow part of medial furrow sparsely crenate, posterior inclination posteriorly and sides on upper portion sparsely scattered with fine punctures.

♂, unknown.

Holotype: ♀, Malaya (Kedah Peak, 3000 ft), 1. I. 1932, H. T. Pagden (BMNH).

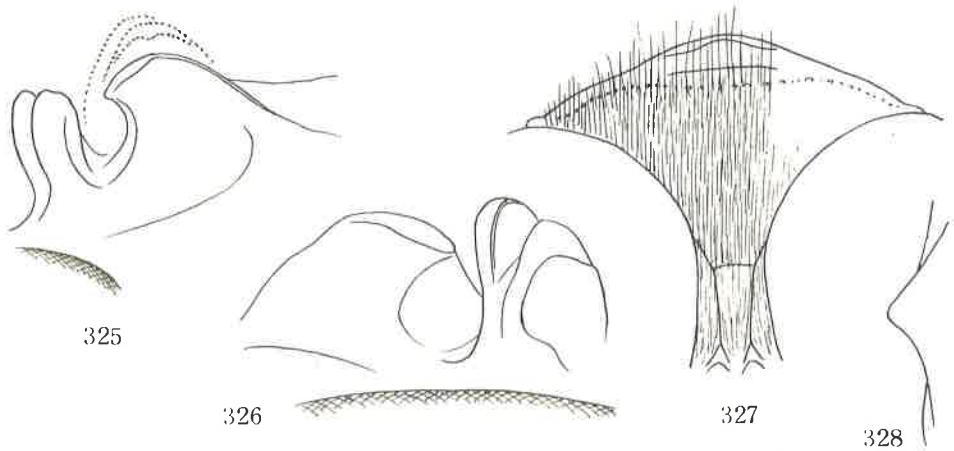
Remarks. This species may be a form of T. yumi.

71. TRYPOXYLON ANGUSTUM sp. nov.

♀, 11 mm. Generally similar to T. laevidorsum, especially in the form of PAF, but distinctly differs from it as well as from other allied species in that IODc is markedly narrow, namely, IODs=3:1.

Black; ferruginous are Al, A2 and part of A3, clypeus at apex broadly, mandible, palpi, tubercle, tegula and basal plates of wings, gaster from apex of petiole posteriorly (with vague blackish patches on posterior portion), coxae at apex, femora at base and apex, trochanters wholly of all legs, fore and mid tibiae except brownish streak on inside, fore and mid tarsi except arelia, base of hind tibia, articulations of hind tarsus; mid tarsus apically somewhat brownish, hind T2-4 pale brown. Hairs silvery, on clypeus parallel.

Head in frontal view with sides roundly convergent below, with vertex markedly depressed. HW, HL, IODv, P=100,50,25,180, OOD, Od, POD=1,7,4; frontal elevations moderately high, medial furrow in front of fore ocellus comparatively narrow and fairly deep, but on anterior portion open to broad transverse round excavation, SAT high narrow nasiform, with lateral inclination considerably steep, with medial ridge acutely and highly carinated, apical area obliquely inclined, broadly flattened, but without fovea, ASR highly raised, bilobate, anterior lobe ferruginous and posterior lobe black, the structure seen obliquely from side and above to see through PAF: Fig. 325, seen in profile (from right side): Fig. 326. Clypeus: Fig. 327, desc nearly flat, medial 3rd of apical margin distinctly reflected; A3=AW×5, A3,4,5÷10,6,5.5, occipital carina complete. Prenotal lamina broad triangular, slightly produced, with apex minutely rounded (Fig. 328). Subalar area of mesopleuron posteriorly edged and slightly produced sideways, but not expanded into pent-roof structure. Propodeum with lateral carinae, area dorsalis with distinct lateral furrows, area apicalis only on sides margined with carinae, GSR slightly roundly produced. Gastral petiole flask-shaped, G, Ma, Mi, 2(Ma)3 (Ma)=100,13,5,28(18),28(23), gaster markedly slender, in fore wing RC C-type, Rl short, CV1÷CV2×5, TCV: CV2÷3:2, TCV weakly sinuate, angle roughly 100°.



Figs. 325-328. Trypoxylon angustum sp. nov., ♀

Frons microceriaceous, punctures medium-sized, sparse, but on anterior portion close and partly rugosely confluent, mesoscutum with strong plumbeous shine, very finely, sparsely punctured, propodeum along lateral carinae series of striae present, fine, close and posteriorly somewhat strong, area dorsalis smooth and polished, sides shining, with fine punctures sparsely scattered.

♂, unknown.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Eue), 30. III. 1966, native collector (BPBM).

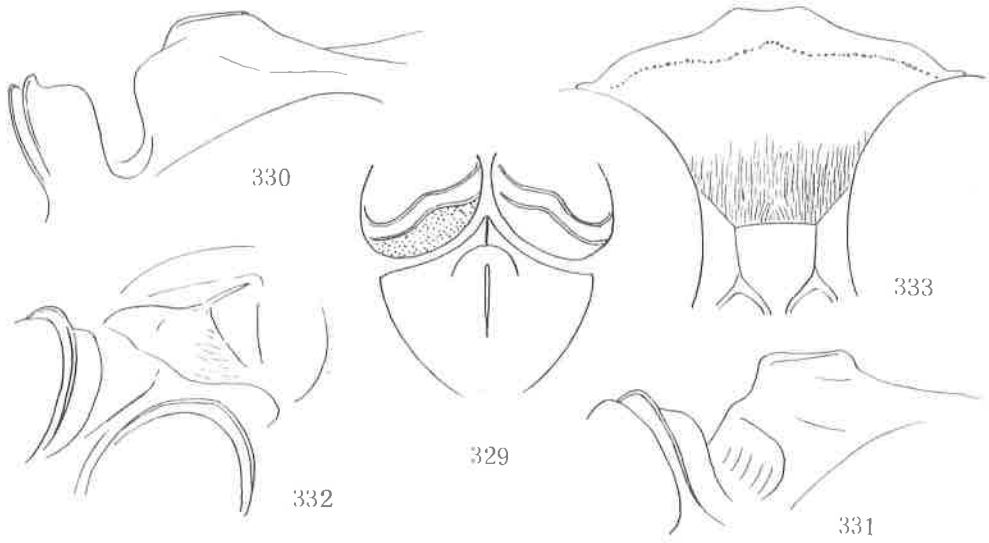
72. TRYPOXYLON LAOSENSE sp. nov.

Generally similar to the preceding species, but in the present species head in frontal view with lateral margins not convergent below, strongly rounded, IODc not so narrow (IODs=10:8), SAT wider below, with apical margin broadly rounded and PAFs forming a broader triangle.

♀, about 13 mm. The specimen is markedly changed in colour, possibly by long exposure to cyanide vapour, the black parts become castaneous brown and in some places the presumation of the original colouration is difficult. The following is mixed with presumation.

Black; antenna dark brown to black above, A1,2,3 ferruginous beneath, thence till 4 or 5 brown beneath, apical margin of clypeus narrowly brown. Ferrugineus are mandible, palpi, tubercle posteriorly, tegula and basal plates of wings, gaster from apex of petiole to end (strictly petiole with lateral surfaces pale brown and dark brown above and beneath except apex), fore tibia and tarsus, mid tibia in front and T1 and 2 except apices, hind tibia at base and all tibial spurs except longer one of hind leg which is broadly brownish.

HW,HL,IODv,P=100,54,20,178, very narrow IODv is remarkable, OOD very small, almost linear, Od:POD≒3:2 (OOD:POD=1:3-4), A3=AW×5, A3,4,5≒10,7,6. Frons moderately raised and inclined towards median furrow, the furrow fairly deep, narrow at base and widely open on anterior area, SAT moderately high broad nasiform, seen vertically: Fig. 329, on medio-apical area a small flat plane present, seen to seen through left PAF: Fig. 330, PAF deep, flat-bottomed, U-shaped in cross section, seen in profile: Fig. 331, seen obliquely from beneath: Fig. 332, carina on top of SAT short but strong; ASR formed of 2 layers, the anterior ferruginous and posterior black (Fig. 329) as usual in this group, the latter swollen out posteriorly, forming the main body of ASR (Fig. 330). Clypeus: Fig. 333, at base slightly raised, but as a whole nearly flat, apical margin broadly, not strongly reflected; occipital carina complete. Anterior part of pronetal collar gently somewhat roundly raised towards median weak tubercle, posterior part discoloured, lamina on side as in angustum, vestigial pent-roof structure on subalar area of mesopleuron also similar. Propodeum with lateral carinae,



Figs. 329-333. Trypoxylon laosense sp. nov., ♀

area dorsalis with distinct lateral furrows, area apicalis with enclosing carina widely interrupted on medio-dorsal area, GSR strongly roundly raised. Gastral petiole very slender and long, flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,13,5,32(16),28(20), in fore wing RC C-type, CV1=CV2×5, TCV:CV2≒4:3, TCV gently sinuate, angle about 100°.

Frons microreticulate, with punctures comparatively large and sparse, but anter-

iorly closer, partly subrugosely confluent, mesoscutum smooth, very finely sparsely punctured. Propodeum also smooth and shining, 3 furrows of area dorsalis transversely finely striate, disc finely sparsely punctured, series of striae along lateral carinae defined only on posterior half, sides on dorsal area somewhat largely and sparsely punctured.

♂, unknown.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Eue), 15-31. V. 1965, native collector (BPBM).

73. TRYPOXYLON VARIPILOSUM Cameron, 1901

Trypoxylon varipilosum Cameron, Proc. Zool. Soc. London, 2 (2): 28, 1901 (♀, Singapore).
Trypoxylon varipilosum: Tsuneki, SPJHA, 8: 44, 1978 (redescription of holotype, figs).

♀, 16 mm. Closely resembling khasiae Cameron, but in varipilosum hairs brassy, SAT on anterior oblique flat area without fovea, ASR posteriorly roundly inclined, not hollowed. Antenna wholly ferruginous and legs, except coxae, largely ferruginous. But colouration in khasiae varies considerably, difference in colour can not be used without condition as a separating clue.

Among the specimens of khasiae (♂♂) examined during the present study that which was captured in Malaya (Pahang: Genting Simpah) has the hairs somewhat brassy in colour. But in this specimen the structure of ASR and colour of antenna are typical to khasiae and can not be combined with varipilosum.

No specimen of this species could be discovered among the material from Singapore or Malaya.

74. TRYPOXYLON CAGHUM sp. nov.

The present species is closely related to varipilosum Cameron, but differs from it in that the body is much smaller, IODc is relatively smaller (IODs=5:3 - 3:2, in varipilosum 7:6), ASR shorter and distinctly bicarinate, antenna except basal part black (in varipilosum nearly wholly ferruginous) and the hair is silvery.

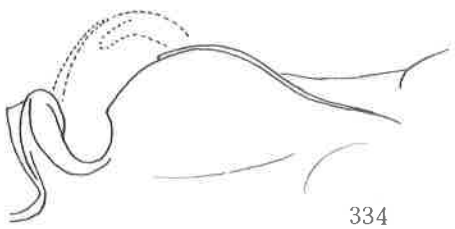
♀, 13 mm; black, yellow to ferruginous are A1-3, underside of the rest of antenna (brown above), apical margin broadly of clypeus, mandible, palpi, tegula, posterior part of collar (discoloured), basal plates of wings, gaster from apical swelling of petiole to apex, fore and mid legs except base of coxae and apical part of mid tarsus (brown) and hind leg on coxa largely, trochanter wholly, basal half of femur, tibia except apical brown part and articulations of tarsus.

HW,HL,IODv,P=100,48,24,200; OOD,Od,POD=1,4,2; IODs=10:6 (in paratype 10:7). Frontal elevations moderate in height, median furrow fairly deep, with distinct bottom line, SAT moderately high nasiform, PAFs forming narrower angle than in laosense, much the same as in yumi, SAT-ASR seen obliquely from side and above to see through PAF: Fig. 334, posterior lobe of ASR not so thickly expanded posteriorly as in laosense, seen in profile: Fig. 335, seen obliquely from beneath a small flat area on apical inclination distinct. Clypeus in holotype: Fig. 336, in paratype: Fig. 337, at base gently raised and there the hair weakly convergent medially, but as a whole surface nearly flat and hair nearly parallel. A3=AWx3, A3,4,5=10,6,5. Occipital carina complete, but very weak behind buccal cavity. Pronotal collar with anterior part raised towards middle and weakly tuberculate there, lamina on side as in angustum (Fig. 328), subalar area with incomplete undeveloped pent-roof structure as in preceding species. Propodeum without lateral carinae, but with a series of striae on each side of dorsal surface, varied in strength, area dorsalis with shallow broad lateral furrows, area apicalis incomplete, GSR simple. Gastral petiole slender and long, flask-shaped, P,Ma,Mi,2(Ma), 3(Ma)=100,15,6,30(16),30(21). In fore wing RC C-type, Rl short, attenuate apically, CV1=CV2x7, TCV:CV2=7:4, TCV weakly sinuate, angle about 100°.

Frons microreticulate, superimposed punctures fine, very weak and quite indistinct, mesoscutum with strong plumbeous shine, punctures also fine and weak, not well defined, propodeum except lateral series of striae smooth, but not shining, sides except lower area covered with fine hair-bearing points, shining.

♂, unknown.

Holotype: ♀, Thailand (Doi Suthep), 29-31. III. 1958, T. C. Maa (BPBM).
Paratype: 1 ♀, Laos (Vientiane Prov., Ban Van Eue), 15. II. 1966, native collector (BPBM).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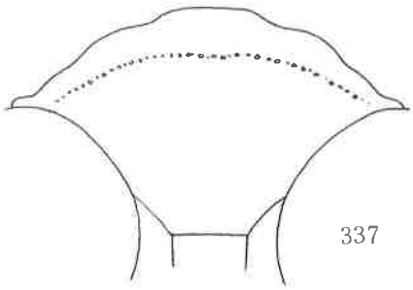
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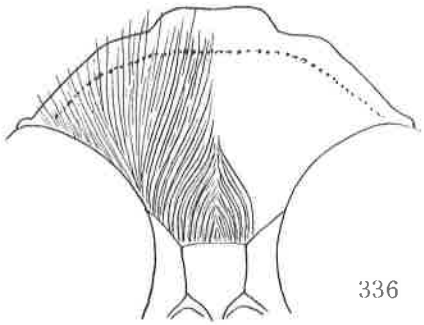
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Figs. 334-337. Trypoxylon cagrum sp. nov., ♀

75. TRYPOXYLON FULVIVENTRE sp. nov.

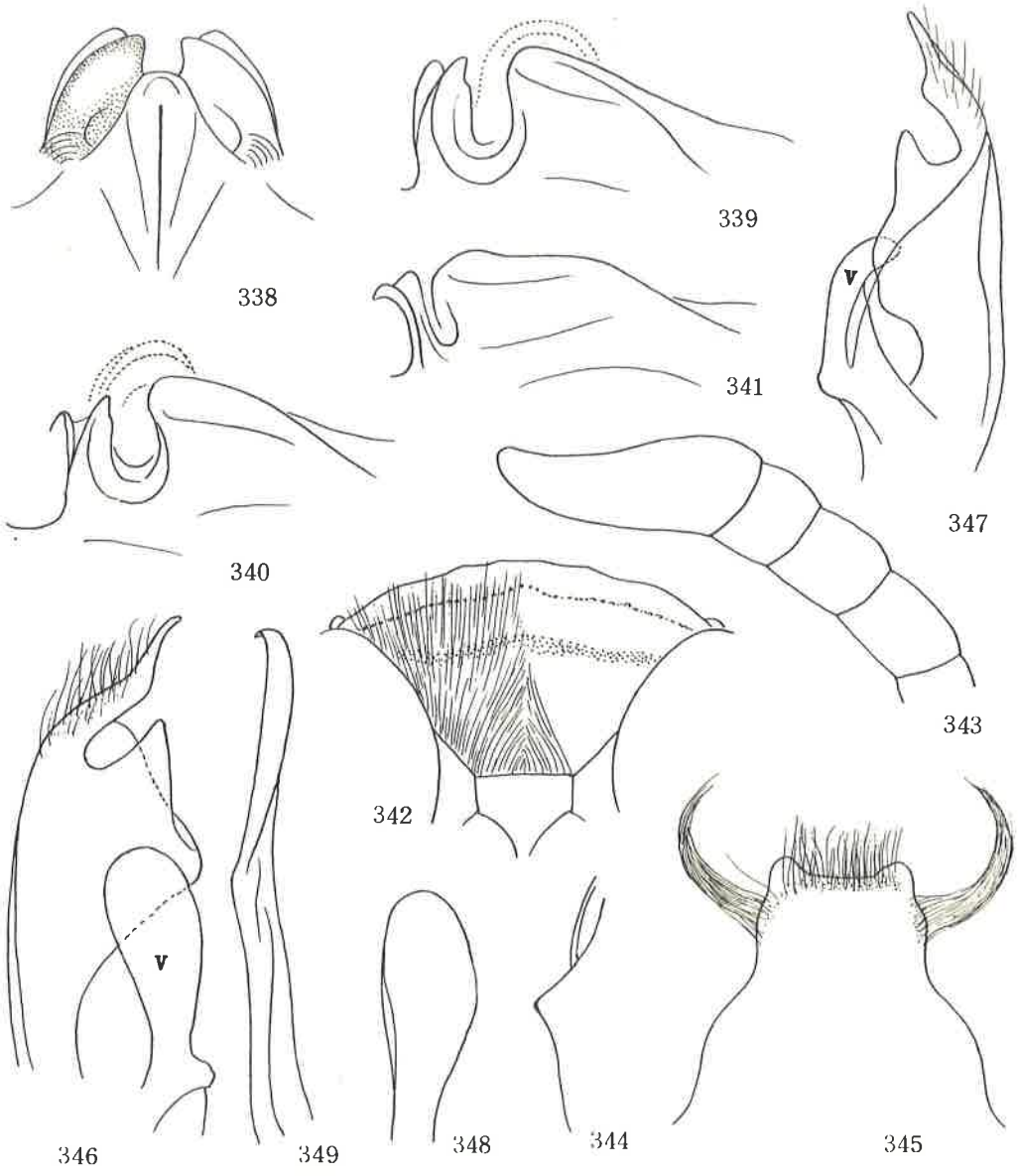
♂, 12 mm. Apparently very similar to T. yumi, but in the structure of sternite 8 and genitalia markedly different from this. In the detailed comparison it differs from yumi in the characters of frons, SAT-ASR, mesopleuron and propodeum.

Black, ferruginous are generally as in the compared species. Some comments:

Antenna brown to dark brown, A1 and 2 only yellow; gastral petiole from base till before apical swelling black, legs ferruginous, fore and hind coxae except apices and mid coxa at base black, mid T2-4, hind femur except broad base and narrow apex and hind tibia at apical portion pale brown, hind tarsus dark brown. Hair silvery, on clypeus at base slightly convergent towards medial line.

HW,HL,IODv,P=100,50,25,134, OOD,Od,POD=2,4,3, IODs=10:8, A3=AW×2.3, A3,4,5= 10,7.5,7.5, A13=BW×3, apically distinctly bent (Fig. 343), appr. as long as 3 preceding joints united. Elevations of frons distinctly weaker than in yumi, rather similar to those of simile, SAT moderately high thick nasiform, seen from back side: Fig. 338, Dorsal surface at some width nearly flattened, carrying an acute carina in middle, in dorso-lateral view (to see through PAF): Fig. 339, seen somewhat more in front: Fig. 340, seen in profile: Fig. 341, ASR highly raised, split into two lobes on top, the anterior pale brown and the posterior black, PAF deep, U-shaped in cross section, flat-bottomed, SAT anteriorly roundly falling to interantennal furrow which is not provided with a medial carina as observed in yumi and khasiae; clypeus: Fig. 342, disc at base gently raised and at apex weakly reflected; A9-13: Fig. 343; occipital carina complete, but weak behind buccal cavity. Collar of pronotum with anterior part narrow, not strongly widened laterally, subcarinate, in frontal view triangularly raised towards middle and minutely weakly tuberculate there, posterior part discoloured, lamina on side triangularly produced (Fig. 344), mesopleural scrobe shallow, but with a minute pit at the bottom, subalar area somewhat broadened laterally, with apex acutely edged, but not expanded into pent-roof structure; propodeum without lateral carinae, lateral furrows of area dorsalis very weak, only faintly defined, area apicalis indistinct, GSR simple, intercoxal carina gently curved up. Gastral petiole slender and fairly long, flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,17,6,34(21),36(30), in fore wing RC C-type, R1 short, CV1=CV2×5, CV2:TCV=2:3, angle less than 120°.

Sternite 8: Fig. 345, left paramere and volsella in ventro-lateral view: Fig. 346 (V... volsella), right paramere and volsella seen from outer side: Fig. 347, right volsella vertically seen: Fig. 348, right half of penis valve in dorso-lateral view: Fig. 349, without shoulder and sickle-shaped appendages before apex.



Figs. 338-349. Trypoxylon fulviventre sp. nov., ♂

Frons distinctly microreticulate and sparsely superimposed with fine punctures, punctures anteriorly closer, mesoscutum finely sparsely punctured, but on medial area punctures closer, propodeum finely sparsely punctured, without lateral series of striae, posterior inclination and sides posteriorly densely covered with silvery hair.

♀, unknown.

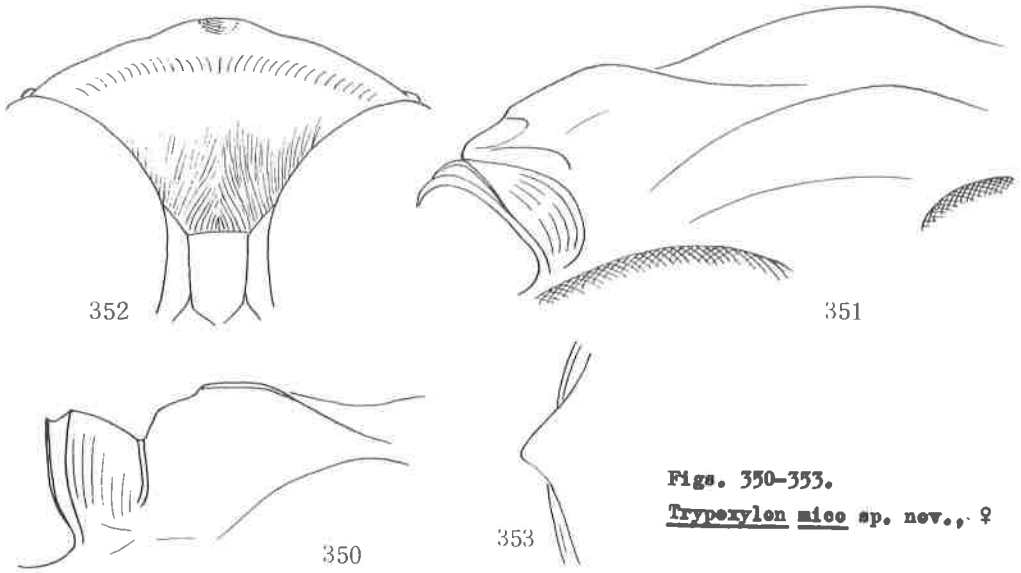
Holotype: ♂, Malaya (Kedah Peak, 3000 ft), 13. III. 1928, H. M. Pendlebury (BMNH).

76. TRYPOXYLON MICO sp. nov.

♀, 10.5 mm. Legs and gaster both largely ferruginous, SAT tectate, PAF V-shaped in cross section, clypeus with apical margin weakly undulate, IODs appr. 2:1, propodeum with lateral carinae, lateral furrows of area dorsalis weak, posteriorly disappeared, petiole flask-shaped, mesoscutum finely sparsely punctured.

Black, Al, 2 and base of 3 orange yellow, rest of 3 and 4 brown, clypeus apically broadly, mandible, pronotal tubercle, discoloured posterior area, tegula and basal plates of wings, gaster from apical portion of petiole apically, legs except greater part of coxae and arolia, orange yellow; gaster posteriorly broadly, mandible apically and hind femur on apical half above brown; palpi ochre yellow. Hairs silvery, on clypeus at base weakly convergent towards medial line.

Head in frontal view with lateral margins roundly convergent below, with vertex not depressed. HW,HL,IODv,P=100,52,29,150; OOD,Od,POD=2,4,3; IODs=10:4.5; A3=AW×3.2, A3,4,5=10,7,6; frontal elevations moderate in height, SAT rather shortly carinated in middle, carina not reaching apex, in front of apical end of the carina a small nearly flattened area present, SAT-ASR seen dorso-laterally to see through PAF: Fig. 350, PAF shallow, widely open, V-shaped, ASR thick, anteriorly weakly bicarinate, the structure seen in profile: Fig. 351, apical flattened area of SAT can be seen, the margin of the area edged, subcarinate; clypeus: Fig. 352, at base weakly roundly raised and at apex broadly and fairly strongly reflected, apical margin in middle markedly impressed; anter or part of collar medianly narrowed, subcarinate and minutely tuberculate, but laterally broadened and rounded, lamina on side: Fig. 353; mesopleural scrobe large and deep, subalar area posteriorly with outer margin edged, but not expanded. Propodeum with lateral carinae distinct, but not reaching apex, area dorsalis rather obsoletely margined with shallow furrow, but the furrows disappeared on latero-posterior areas, medial furrow shallow and strongly divergent posteriorly, area apicalis indistinct, GSR strongly roundly produced. Gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100, 22,7,30(26),35(38), in fore wing RC B-type, Rl short, CV1=CV2×6, CV2:TCV=3:5, TCV weakly sinuate, angle appr. 100°.



Figs. 350-353.
Trypoxylon mico sp. nov., ♀

Frons distinctly microreticulate and sparsely superimposed with fine punctures, punctures on anterior concave area behind SAT close, SAT closely punctured, anterior flattened area not shining; mesopleuron and side of propodeum, except antero-ventral smooth area, finely weakly, rather sparsely punctured, dorsal aspect of propodeum smooth and shining, with series of striae along lateral carinae, medial furrow of area dorsalis transversely weakly striate, posterior inclination posteriorly transversely closely striate. ♂, unknown.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Eue), 29. IV. 1966, native collector (HPBM).

77. TRYPOXYLON LAOSIANUM sp. nov.

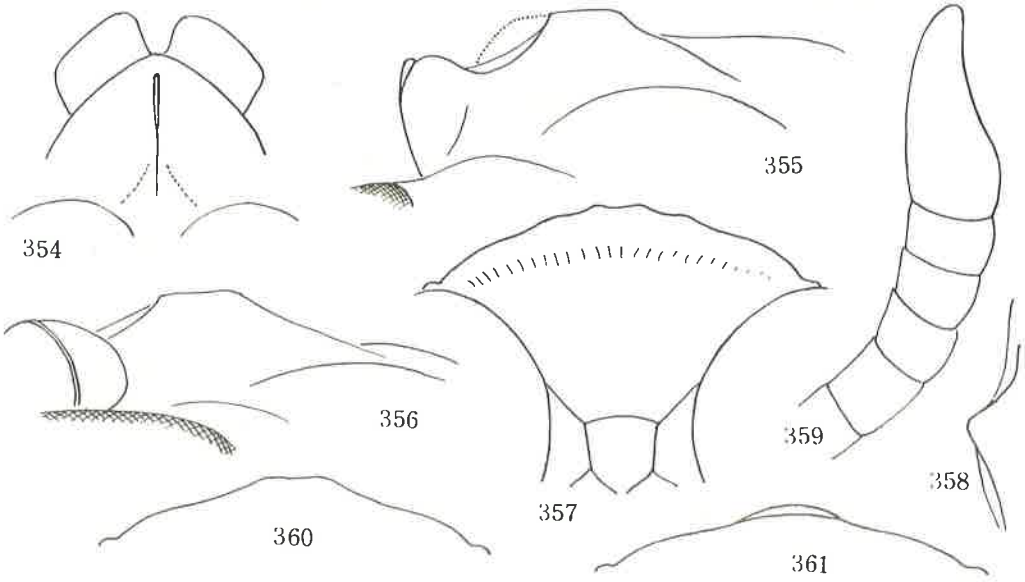
♀, 10-11 mm. Black, ferruginous: clypeus on apical margin, mandible, mouth parts, tubercle posteriorly, discoloured posterior part of collar, tegula, basal plates of wing, gaster from apical swelling of petiole till end, knees, fore and mid tibiae and tarsi, hind tibia except apical brown mark and hind Tl-3 at base and apex and 4 wholly; sometimes hind leg except base of tibia completely black, Al and 2 both at apex ferruginous and gaster posteriorly brownish. Hair silvery, on clypeus parallel.

Head in frontal view with sides roundly weakly convergent below, vertex strongly depressed, HW,HL,IODv,P=100,50,24,140, OOD,Od,POD=1-1.5,5,3 (OOD very narrow), IODs=10:8, A3,4,5≒10,7,6, A3=AW×5. Frontal elevations mediocre, raised as a mass including SAT, median furrow broad and shallow, but with a distinct bottom line, SAT in a low broad tubercle, with sides tectate and carinated on top (Fig. 354,seen from back side), medio-apical area in front of apex of median carina obliquely inclined, forming a triangular nearly flat area, ASR highly raised, thick, separated from SAT by a broad shallow up-curved furrow which is broadly rounded in cross section (Fig. 355, seen through left PAF), SAT-ASR seen in profile: Fig. 356; clypeus: Fig. 357, surface nearly flat and markedly reflected at apex, A3 long, Al2 only slightly longer than half length of A3; occipital carina complete, but very weak and low behind buccal cavity. Anterior part of collar raised towards middle, seen from above weakly enlarged laterally, lamina on side: Fig. 358; mesopleuron with subalar area and central scrobe normal; prepodeum without lateral carinae, area dorsalis practically without lateral furrows, but sometimes very vestigial furrows can be seen, area apicalis indistinct, GSR simple. Gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,21,6, 30(24),34(34). In fore wing RC C-type, Rl short, CV1≒CV2×6, TCV simple, TCV:CV2≒3:2, angle roughly about 110°.

Frons microcoriaceous and closely punctured, punctures laterally sparser, SAT finely closely punctured, mesoscutum with weak plumbeous shine, half mat and finely, sparsely punctured, punctures on medio-anterior area closer; prepodeum with a series of striae on each lateral margin, sometimes the series very weak, median furrow of area dorsalis always transversely striate, sides except shining antero-ventral area moderately closely covered with somewhat large punctures.

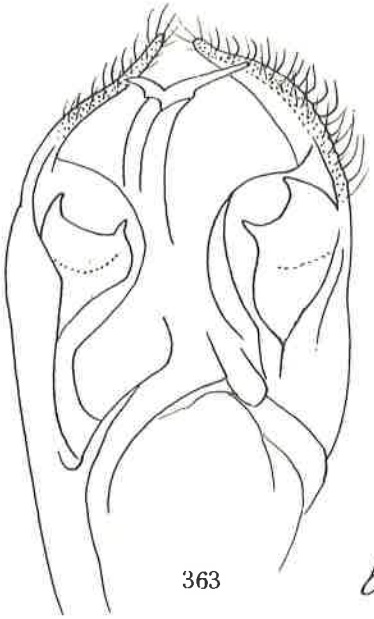
♂, 8.5-9.5 mm. Similar in general to ♀, but ocelli smaller and IODv appears relatively broader, antenna and clypeus showing sexual variation, gaster with 7 visible segments. A3 comparatively long, Al3 narrowed apically and curved at apex (Fig. 359), longer than 3 but shorter than 4 preceding joints united; clypeus with apical margin usually as Fig. 360, but sometimes medial emargination indistinct or even weakly rounded out (Fig. 361). HW,HL,IODv,P=100,48,25,128, OOD,Od,POD≒1,3,2, IODs=10:8.5, A3≒AW×3, Al3≒BW×2.3, A3,4,5≒10,6,6. Head in frontal view relatively somewhat wider than in ♀. Frontal and supraantennal structure similar to ♀, P,Ma,Mi,2(Ma),3(Ma)=100,22,8, 36(34),34(39), venation and punctuation also similar.

Series of striae on each side of dorsal aspect of prepodeum usually lacking, but



rarely present in a very weak and incomplete state.

Sternite 8: Fig. 362, with apical fringe of hair long. Genitalia seen from beneath and somewhat from left side: Fig. 363 (volsella and basal part of penis valve omitted), characteristic is that penis deeply bifurcate at apex, but without shoulder and sickle-shaped appendages, but with a pair of vestigial buds of appendages at some distance from apex (Fig. 365), paramere simple at apex, slender and long, slightly flattened, main body lamellately expanded on both inner and outer margins and rolled ventrally to form an apparent pouch, outer lobe at its apical portion bent inwards like a lid to cover half of the orifice of the pouch, apex of the bent part emarginate and toothed on each side (Fig. 363), volsella elongated parallel plates, each inclined outwards and the pair as a whole tectate (Fig. 364).



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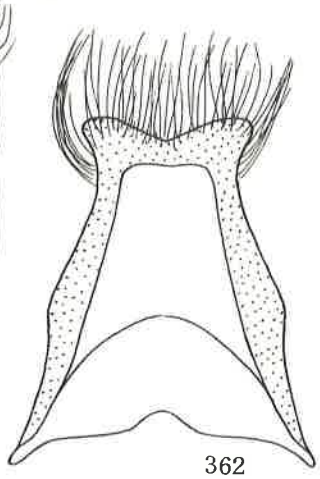

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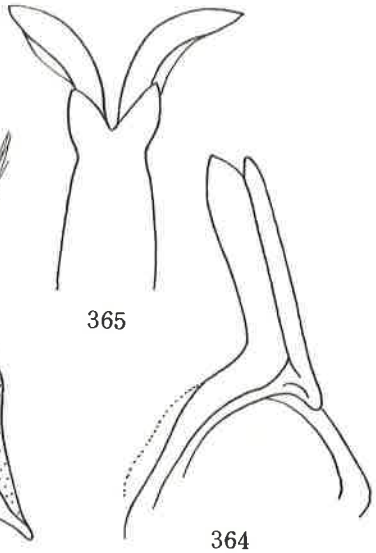

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Holotype: ♀, Laos (Vientiane Prov., Ban Van Eue), 15. V. 1966, native collector (BPBM) (both antennae detached and glued on to the data label).

Paratypes: 2 ♀ 4 ♂: 2 ♀ 3 ♂, the same place, (1 ♀) 15-31. V. 1965; (1 ♀) 30. VI. 1966; (1 ♂) 15. II. 1967; (1 ♂) 15. X. 1967; (1 ♂) 15-30. VIII. 1967, all native collector (BPBM). 1 ♂, Laos (Vientiane Prov., Vill. de Tha Ngone), 9-16. I. 1966, native collector (BPBM).

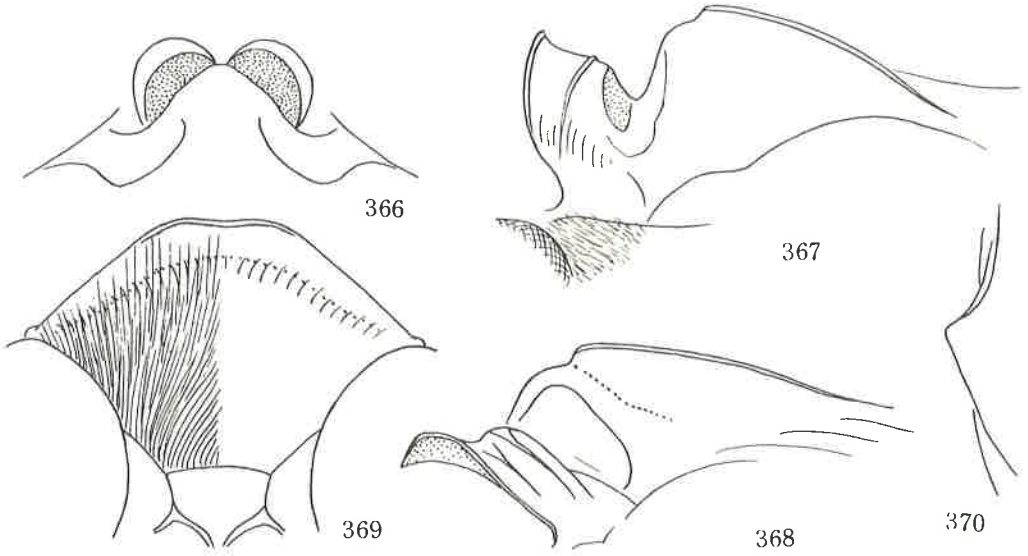
78. TRYPOXYLON PAENINSULICOLA sp. nov.

♀. Similar to the preceding species, but larger, clypeus broadly subtruncate on apical margin in middle, with disc at base distinctly raised, PAF moderately deep and sharply cut into V-shape, propodeum with distinct lateral carinae and distinct area apicalis. It is also similar to some form of T. petiolatum Smith, but is different from this in that RC is M-type and propodeum is distinctly carinated on lateral margins.

About 20 mm. Black, antenna basally dark brown, apices of A1, 2, 3 pale brown, clypeus with apical margin glossy brown. Ferruginous are mandible (apically brown to black), mouth parts, tegula and basal plates of wing, gaster from apex of petiole to caudal segment (posteriorly brownish), fore tibia except brown inside, fore tarsus except arolium, mid and hind tibiae at base, mid and hind T5 and tibial spurs except longer one of hind leg which is brown; articulations pale brown. Pronotal tubercle on posterior margin narrowly brownish. Hair silvery, at base of clypeus strongly convergent towards medial line.

Head in frontal view roundly convergent below, HW,HL,IODv,P=100,50,22,184, OOD, Od,POD=3,7,4, IODs=10:9.5, A3=AW×5.5, A3,4,5=10,6,5.5, frontal elevations weak, but medial furrow moderately deep and broad, SAT moderately high broad nasiform, long

carinated on top, with a small lunate flat area in front of apical end of medial carina, thence obliquely inclined anteriorly, ASR and SAT seen from dorsal side: Fig. 366, seen to see through PAF: Fig. 367, PAF fairly deep, but up-curved, in profile: Fig.368, ASR anteriorly pale brown, posteriorly black; clypeus: Fig. 369, disc at base distinctly elevated and at apex reflected, apical margin somewhat thickened, especially medial truncate area; occipital carina complete. Anterior part of collar comparatively thick, gently roundly incrassate laterally, without medial tubercle, posterior part discoloured, but only brown in colour, lamina on side: Fig. 370, with outer margin pale brown; mesopleural scrobe large but shallow, with a deep pit in middle, subalar area posteriorly distinctly edged on outer margin and slightly produced laterally, but not so marked as to be called pent-roof structure; propodeum with distinct lateral carinae, area dorsalis with broad shallow lateral furrows, the furrow obsolete anteriorly, medial furrow fairly deep, posteriorly enlarged and rounded at apex, area apicalis distinctly enclosed with carina, GSR strongly roundly elevated, elevated area pale brown in colour and shining. Gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,14,5,28(15), 30(22), in fore wing RC M-type, Rl very short, attenuate apically, CVl=CV2×6, TCV moderately sinuate, TCV:CV2≒3:2, angle about 120°.



Frons strongly microcoriaceous and closely superimposed with comparatively large punctures, SAT also closely covered with similar but weak punctures, ASR transversely weakly striate, mesoscutum shining, without plumbeous lustre, with sparse fine punctures, propodeum with series of strong striae along lateral carinae, lateral and median furrows of area dorsalis transversely striate, rest of dorsal aspect and posterior inclination covered with weak striae extended from the lateral series of striae, area apicalis smooth and polished.

♂, unknown.

Holotype: ♀, Malaya (Selangor, Bukit Kutu, 2300 ft), 26. IX. 1932, H. M. Pendelbury (BMNH).

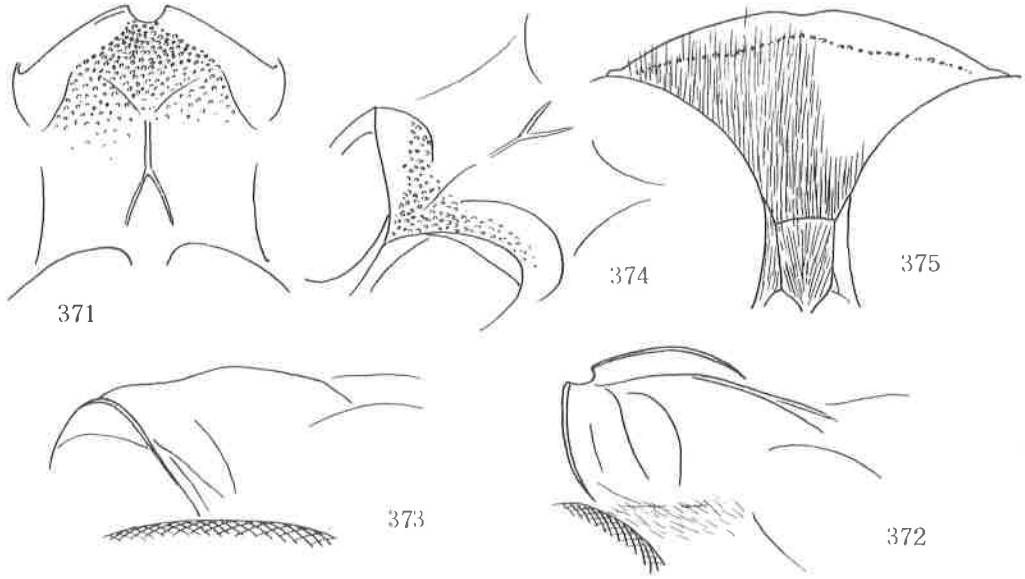
79. TRYPOXYLON PILOSUM sp. nov.

♀. Structure of SAT characteristic, by this character combined with IODs and form of clypeus it can easily be separated from other allied species.

Length 12.5 mm. Black; ferruginous or ochre yellow: Al, 2, base of 3, all beneath, clypeus on apical margin broadly, mandible (apex dark brown), mouth parts, discoloured posterior part of pronotal collar, tubercle, tegula and basal plates of wing, gaster except brown patch on petiole posteriorly and brownish stained posterior segments, fore and mid legs except extreme bases of coxae and hind leg except coxa largely, dorsal streak of femur, apical half of tibia on outer side and greater part of tarsus. Hairs

silvery, on clypeus parallel.

HW,HL,IODv,P=100,52,27, 116, OOD,Od,POD=1,3,2, IODs=10:5, A3=AWx4.5, A3,4,5= 10,6,6, head in frontal view with sides rounded, very slightly narrowed below, eye incisions comparatively narrow, vertex not depressed. Frontal elevations fairly strongly convex, elongated oviform in outline, median furrow deep, SAT low, on basal half tectate, with short median carina which is bifurcate upwards, running for a short distance embracing the ap cal end of frontal median furrow (Figs. 371 seen vertically, 374, seen obliquely from beneath), SAT on apical half flattened nearly smoothly extended to ASR (brown in colour), PAF very shallow and broad, gently curved in cross section (Fig. 372, obliquely from left side to see through PAF), the structure seen in profile: Fig. 373, seen obliquely from beneath: Fig. 374. Clypeus: Fig. 375, not strongly produced anteriorly, disc very slightly convex on basal half, with hair parallel, but apical margin fairly strongly reflected, occipital carina very low, simply edged, but complete (on lower portion covered with hair and difficult to observe). Anterior part of pronotal collar somewhat bread and slightly broader laterally, with a distinct, comparatively large tubercle in middle, lamina on side not produced, the margin simply rounded, only in middle of curvature slightly angulated; mesopleuron normal; propodeum with distinct lateral carinae, arising somewhat apart from spiracle and reaching apex, area dorsalis enclosed with fine deep furrow and medianly with a broad, fairly deep furrow, its lateral margins obltusely edged, area apicalis on dorsal side widely open and medianly elevated, GSR markedly roundly produced, the produced area ferruginous in colour, petiole with anterior 2/3 parallel-sided and apical 1/3 gradually widened, in profile the area roundly highly raised and constricted at apex, G2 also slightly raised apically and constricted at apex, G1,Ma,M1,2(Ma),3(Ma)=100, 27,12,58(36),52(48), in fore wing RC intermediate between B- and C-types, rather closer to C, R1 moderately long, CV1= CV2x4, CV2=TCV, TCV gently sinuate, angle slightly over 120°.



Frons weakly microreticulate and very closely punctured, punctures somewhat larger and deeper than usual and subrugosely confluent so that microsculpture between them very inconspicuous, SAT covered with dense hair, if denuded closely covered with finer weaker punctures, but anteriorly punctures stronger and distinct; anterior inclination of pronotal collar closely covered with hair-bearing fine and weak punctures, the hair so fine and delicate that under low magnification they are invisible, sides smooth and polished. Mesoscutum smooth and shining, with very fine sparse hair-bearing points, PIS mostly twice as large as PD; area dorsalis and sides of propodeum smooth and polished, rest of segment closely covered with fine hair-bearing punctures, punctures posteriorly slightly larger, area dorsalis also closely punctured.

♂, unknown.

Holotype: ♀, Malaya (Kedah Peak, about 3500 ft), 23. II. 1961, H. T. Pagden (BMNH).

80. TRYPOXYLON PENANGENSE sp. nov.

Somewhat similar to the preceding species, but IODs=5:4, frontal elevations much weaker, SAT anteriorly transversely carinated, PAF more distinct, with median carina not bifurcate at posterior end, area dorsalis without enclosing furrow and petiole distinctly flask-shaped.

♀, 11-12 mm. Black; following portions ferruginous to pale yellow: Al, 2, base of 3, apical margin of clypeus, mandible, mouth parts, tegula, basal plates of wing, lower margin of pronotal lamina, extreme apex of propodeum, gaster wholly (often with a blackish mark on apical swelling of petiole and brownish staining on posterior portion), fore and mid legs except greater part of coxae and arolia, apex of coxa, trochanter, base and apex of femur, tibia except brown area on outer margin beyond middle and greater part of tarsus of hind leg. Hair pale brassy, in some light appears silvery, on clypeus at base weakly convergent towards median line.

Head in frontal view with sides roundly and slightly convergent below, HW,HL, IODv,P=100,50,23,128, OOD,Od,POD=1,3,2, A3=AW×5, IODs=10:8, A3,4,5÷10,6,5.5, frons weakly raised, median furrow at base fairly deep, but on apical portion very shallow and broad, surface nearly flat, SAT low broad nasiform, highly carinated in middle, medio-apical area flattened, with surface arcuately rugoso-punctate (Figs. 377, 378), apical margin carinated, the carina extended laterally and turns into the posterior carina of ASR, ASR anteriorly bicarinate, anterior carina amber yellow and posterior black, PAF shallow, with bottom line glittering and curved down latero-posteriorly, seen obliquely from above and side: Fig. 376, in profile: Fig. 377, obliquely from beneath: Fig. 378, notice the medio-apical structure of SAT. Clypeus: Fig. 379, apical margin not strongly produced anteriorly, disc at base weakly raised and at apex weakly reflected; occipital carina complete. Anterior part of pronotal collar without medial tubercle, weakly incrassate laterally, posterior part discoloured, lamina on side triangularly produced (Fig. 380), mesopleuron normal; propodeum with distinct lateral carinae, area dorsalis practically without lateral furrows (posteriorly very weakly defined in oblique light), median furrow shallow, enlarged posteriorly, area apicalis with only lateral carinae, GSR subtriangularly highly elevated. Gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,22,6,34(26),38(38). In fore wing RC C-type, near to M-type, Rl moderate in length, with apex truncate, reaching almost wing apex, CV1=CV2×7, TCV:CV2≒7:4, TCV weakly sinuate, angle about 110°.

Frons distinctly microceriaceous and sparsely superimposed with fine flat-bottomed punctures, SAT posteriorly similarly microsculptured and punctured, but anteriorly in front of the end of median carina strongly rugoso-punctate (Fig. 378), mesoscutum with strong plumbeous shine, finely, fairly closely (PIS=PD 1-1.5) punctured, series of striae along lateral carinae of propodeum distinct, area dorsalis finely, very sparsely punctured, median furrow finely, closely and weakly striate.

♂, 8-10 mm. Similar to ♀ in general, but OOD≒POD, clypeus less produced and weakly undulate on apical margin (undulation inconstant in form, individually variable), antennal joints shorter except Al3 which is HW×4 and more than as long as 5 preceding joints united (Fig. 381), A3=AW×2.5, A3,4,5÷10,7,7 (more or less varied individually and according to the conditions).

Gastral sternite 8: Fig. 382, characteristic in form; parameres of genitalia seen from beneath: Fig. 383, left paramere seen from somewhat more inside: Fig. 384, the same seen from apex: Fig. 385, at apex not bifurcate, simple and slender, aparsely covered with stiff hair, outer side of main body not expanded, inner margin lamellately and broadly expanded and half rolled ventrally, the main body along outer side darkened and from there abundant hairs grow out, also the periphery of the expansion of the inner margin densely fringed with hairs, inner side of the expansion also covered sparsely with long hairs (Fig. 385), volsella simply spatulate (Fig. 386), penis valve with shoulder and a pair of sickle-shaped appendages before apex (Fig. 387, dorsal view).

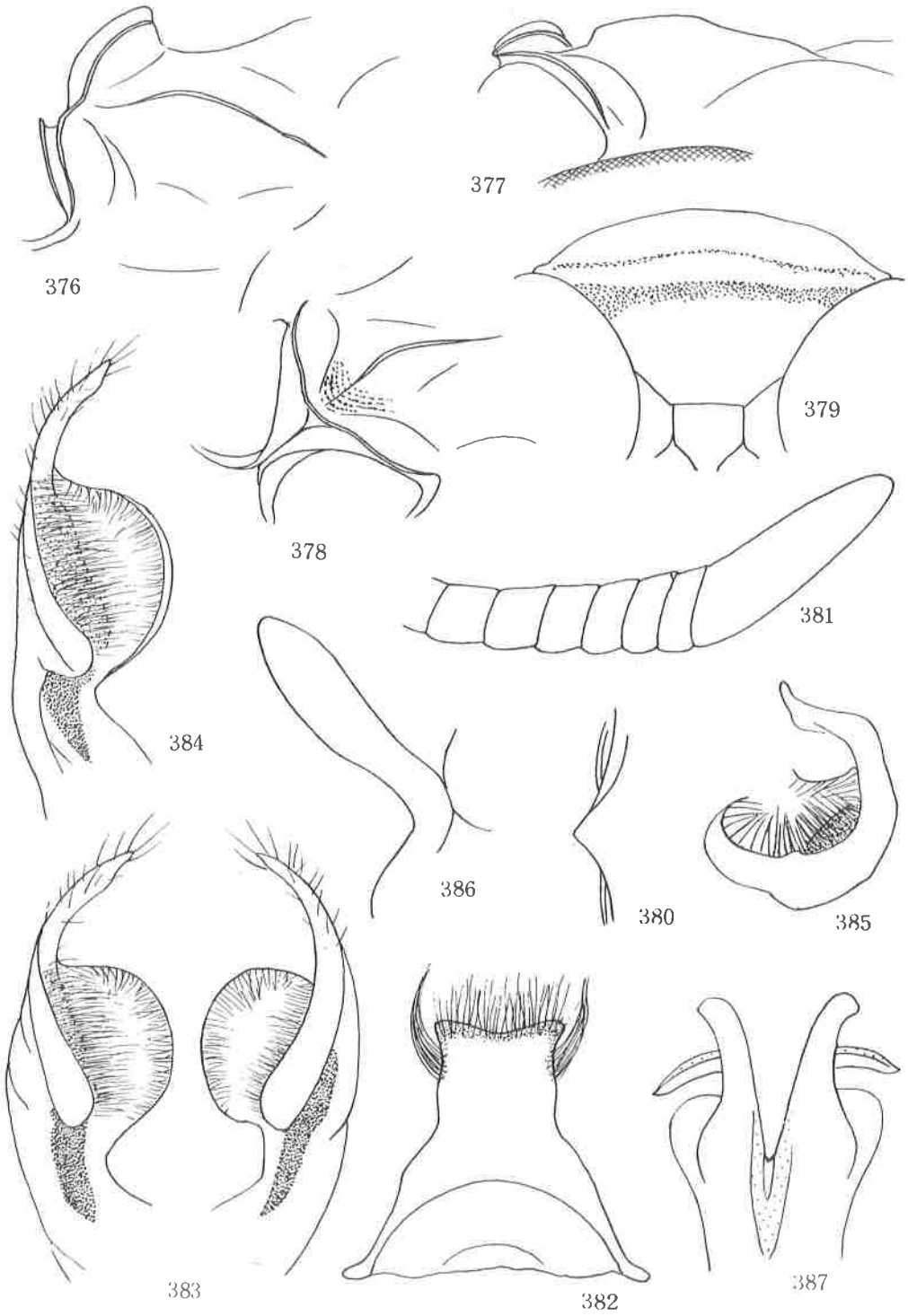
Punctuation generally similar.

Holotype: ♀, Malaya (Island of Penang: Sengei Keihil Catchment area), 20. IX. 1966, H. T. Pagden (BMNH).

Paratypes: 3 ♀ 6 ♂: 1 ♀, Singapore (S. S. Lavender Street), 30. V. 1911, ? (BMNH); 1 ♀, Singapore, C. F. Baker leg. (USNM); 1 ♀ 6 ♂, Laos (Vientiane Prov., Ban Van Eue), 15. XII. 1966 (♀); 15-31. V. 1965; 29,30,30,30, III. 1966; 30. III. 1967, all native collector (BPBM).

Other specimens: 2 ♀, Malay Peninsula (Kedah Peak, 3000-3300 ft), 10, 12. III. 1928, H. M. Pendlebury (BMNH) (gaster lacking).

Remarks. In the specimens from Malaya and Singapore all trochanters and fore and mid femora ferruginous and dark area of hind leg narrow and strongly brownish. While in the specimens from Laos all trochanters brown to black, fore and mid femora broadly darkened and femur and tibia of hind leg broadly and deeply black.



81. TRYPOXYLON FULVOCOLLARE Cameron, 1904

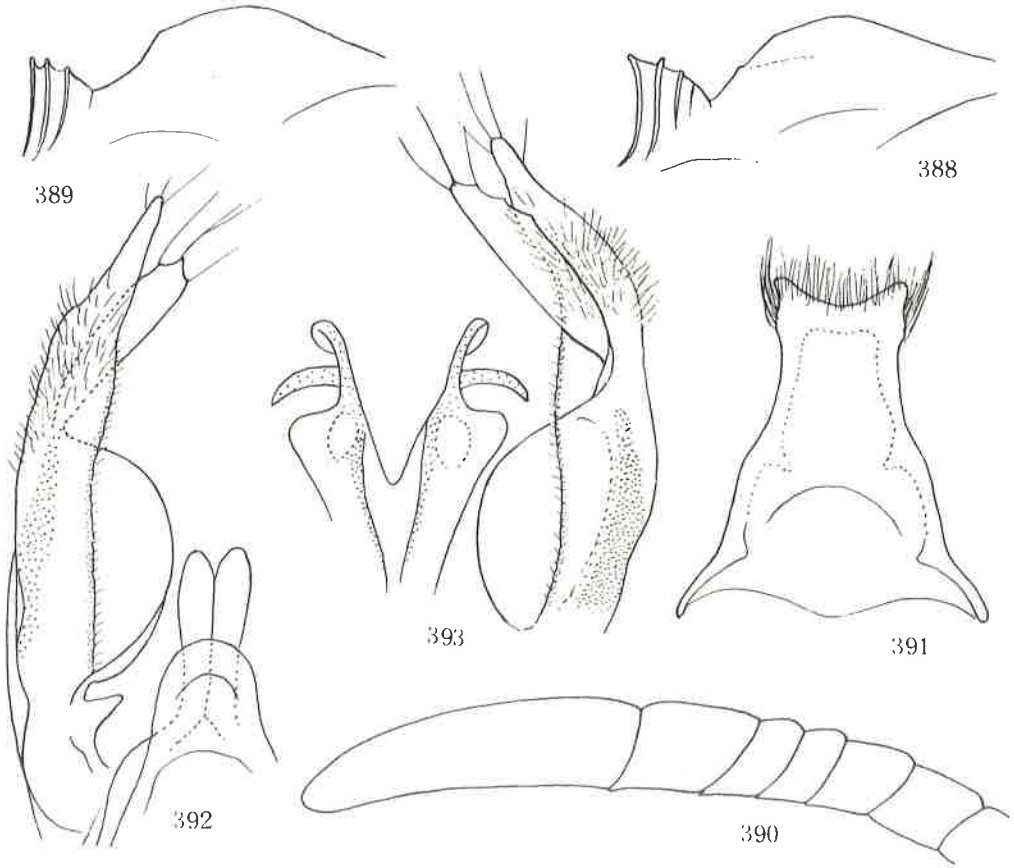
Trypoxylon fulvocollare Cameron, Ann. Mag. Nat.Hist., (7) 13: 217, 1904 (♀, Assam: Khasia Hills).

Trypoxylon fulvocollare: Tsuneki, SPJHA, 8: 52, 1978 (redescription of holotype, figs.).

Specimens examined: 1 ♀ (about 16 mm), holotype from Assam; 1 ♀ (16 mm), Malaya: Penang (Ryer, 1000–1500 ft), 15. XII. 1963, H. T. Pagden (BMNH). 1 ♀ (15 mm), Malaya (Kedah Peak, 3300 ft), 23. III. 1928, H. M. Pendlebury (BMNH). 1 ♀ (14 mm), Malaya (Bukit Kutu, 3000 ft, jungle), 31. I. 1930, H. T. Pagden (BMNH). 1 ♀ (18.5 mm), Laos (Vientiane Prov., Ban Van Eue), 15. IV. 1965, J. L. Gressitt (BPBM). 2 ♂, the same place, forest stream bed, 10–11. IV. 1965, J. L. Gressitt (BPBM). 4 ♂, the same locality, 15. V. 1965; 15–31. V. 1965 (2 ♂), 15. V. 1966, native collector (BPBM).

Remarks. In the Laotian female specimen the colour of the legs is much the same as in the holotype from Assam, while in those from Malaya ferruginous tint is much better developed: all coxae except extreme bases, all trochanters, fore and mid femora wholly, sometimes with a brown or dark brown streak above, hind femur except a dark brown streak above, all tibiae, but hind one more often brownish on outer side of apical half or third. Fore tarsus wholly, mid tarsus except T2–4 or 3–4, and hind tarsus largely black.

As to the antenna, in the holotype and the Laotian female A1-base of 5 ferruginous, in the Malayan 1-base of 4, or 1-3+4 beneath, or 1+2 only (specimen from Bukit Kutu) ferruginous. In the female specimens from Kedah Peak, Bukit Kutu and Laos the clypeus is roundly produced anteriorly, with medio-apical area of anterior margin more or less darkened, not broadly subtruncate as in holotype and the Penang specimen. The specimen from Bukit Kutu is exceptional in colouration: collar brownish ferruginous only on dorsal aspect, A1+2 only ferruginous yellow, fore and mid femora with a dark brown streak above, mid T3–4 only weakly darkened and hind T5 ferruginous (hind femur



above, tibia on posterior side medianly only dark brown and T1–4 black).

SAT-ASR seen to see through PAF in holotype specimen (escaped from the illustrations of my redescription): Fig. 388, in the specimen from Kedah Peak: Fig. 389.

Description of ♂. Length 13–14 mm. Generally similar to ♀. Hair brassy, sometimes strongly golden. Antenna black, A1-base of 4 ferruginous, but variable beneath from 5–10. A3=AW×2.2, A3,4,5÷10,6.5,6.5, A13=BW×3.5–4 and appr. as long as 5 preceding joints united, note-worthy is that A12 is as long as A10 and 11 united (Fig. 390). Measurements: HW,HL,IODv,P=100,44,23,124, IODs=10:9, P,Ma,Mi,2(Ma),3(Ma)=100, 20,8,30(26),44(44), RC=C-type, R1 short, CV1=CV2×7, TCV very gently sinuate, CV2 on apical half curved up, 3/5 the length of TCV, angle between TCV and basal part of CV2 about 90°. Gastral sternite 8 seen from inside: Fig. 391. Structure of genitalia is rather common in form, paramere deeply bifid apically and penis valve is provided with shoulder and a pair of sickle-shaped appendages. Left paramere and volsella seen from beneath: Fig. 392, left paramere and penis valve seen from dorsal side: Fig. 393.

82. TRYPOXYLON CONCINNUM sp. nov.

♀, 13–15 mm. Somewhat similar to fulvocollare, but is easily separable from it by the much more broadly developed ferruginous colouration.

Black; ferruginous are clypeus except extreme base narrowly, mandible, mouth parts, antenna except brownish medial third above, prothorax compeetely, tegula, basal plates of wing, scutellum, postscutellum, subalar area, pleural flanges, gaster fairly broadly and legs nearly wholly. Dark colour on gaster individually variable, in bright form: petiole from spiracles till near end above, G3 above and apically beneath and G4 and 5 on sides and beneath are brown; in the dark coloured form petiole similar, but more blackish in tone, a large mark on G2 and 3 above and beneath (sides only pale brown), G4 above except apex, a band across middle of G5 above, base of G6 above and G4–6 beneath dark brown to black. Legs in all the specimens only on mid and hind tarsi brown, extreme base of mid and hind coxae and arolia black. Hair brassy to golden, on clypeus at base weakly convergent medially (Fig. 397).

HW,HL,IODv,P=100,46,21,130, OOD,Od,POD÷2,5,3, IODs=10:10–11, A3=AW×5, A3,4,5 ÷10,7,6. Head in frontal view roundly, fairly strongly convergent below, vertex not depressed, frontal elevations weak, median furrow broad and shallow, anteriorly becoming indistinct, SAT low nasiform, medial ridge broad, shining and attenuate apically, apical end of SAT obliquely inclined, forming a smooth and shining area carrying a large hollow in middle (Fig. 396, seen obliquely from beneath), PAF deep, flat-bottomed, broad obiform in cross section (Fig. 394, seen obliquely from side and above to see through PAF), SAT-ASR seen in profile (left side): Fig. 395, ASR highly bicarinate, carinae lobiform, the anterior ambur yellow and posterior black, interspace narrowed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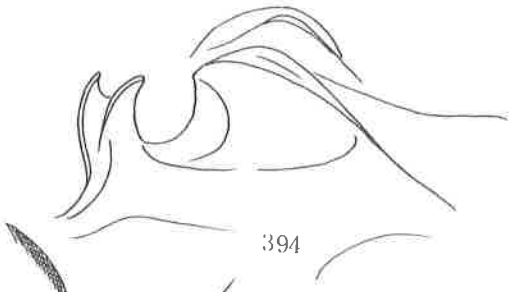
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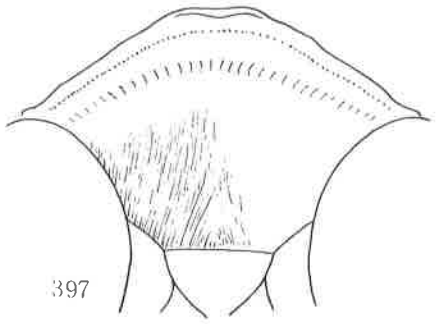
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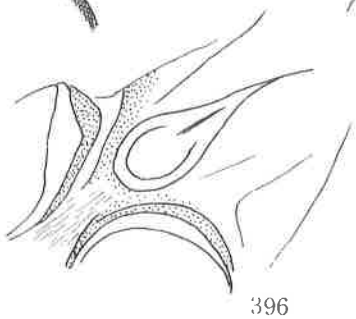
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outwards and widely open inwards, seen obliquely from beneath: Fig. 396; clypeus: Fig. 397, at base gently raised, behind apical margin transversely weakly furrowed, but apical margin in front of it not reflected, medianly somewhat thickened and shortly truncate, sometimes weakly emarginate; occipital carina complete. Anterior part of pronotal collar raised towards middle, broadly rounded there, not tuberculate, seen from above only weakly incrassate laterally, lamina on side: Fig. 398; subalar area of mesopleuron with half-developed pent-roof structure, but perpendicular area covered by it not striated nor carinated. Propodeum with distinct lateral carinae, area dorsalis without lateral furrows, but often very weakly defined on latero-posterior areas when the areas feebly striated; area apicalis enclosed only on lateral areas with carinae, GSR highly produced, amber yellow in colour, subtriangular in form, with apex rounded. Gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,22,6,3¼(29),35(39), in fore wing RC C-type, Rl not long, not reaching wing apex, CV1≒CV2×6, TCV:CV2≒4:3, the former curved inwards and the latter downwards or posteriorly, angle about 90°.

Frons covered with distinct microreticulation and fairly closely superimposed with fine punctures, SAT also closely covered with comparatively large but weak punctures bearing golden hair, median flat ridge and anterior inclination of SAT and whole of PAF and ASR smooth and polished, mesoscutum smooth and shining and finely, fairly closely punctured, medial furrow of area dorsalis transversely striate, series of striae along lateral carinae of propodeum present, but not strong, posterior inclination covered with hair-bearing points, sides except antero-ventral and dorso-posterior areas covered with punctures, punctures in middle area stronger and ventrally weaker.

♂, unknown.

Holotype: ♀, Malaya (Selangor: Bukit Kutu, 3500 ft), 19. IV. 1926, H. M. Pendlebury (BMNH).

Paratypes: 1 ♀, Malaya (Selangor: Anip. ang. Res.), 11. VI. 1922, H. M. Pendlebury (BMNH); 1 ♀, Malaya (Taiping: Larut Hills), 15. XI. 1922, H. M. Pendlebury (BMNH); 1 ♀, Malaya (Kuala Lumpur, Bc. Call. Agr. Dept), date and collector unknown (BMNH).

83. TRYPOXYLON BELLUM sp. nov.

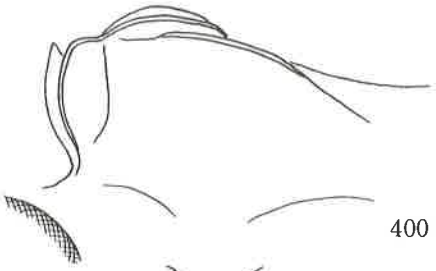
Hair brassy, general appearance similar to fulvocollare, but smaller, with pronotum completely black and the supraantennal structure different, having a transverse carina in front.

♀, 12 mm. Black; ferruginous are A1-2, base and underside of A3, clypeus anteriorly, mandible (apically dark brown), mouth parts, posterior discoloured part of collar, tubercle, tegula, basal plates of wing, gastral petiole except a brown mark at base of posterior swelling, G2 nearly wholly, tergite 3 except an obscurely outlined black band across middle, apical margins of 4 and 5, sides of 6 and from apex of coxa till end of all legs except black arolia. Hind femur with a dark brown streak above and beneath, -tibia apically on outer side brownish. Hairs at base of clypeus somewhat convergent inwards.

HW,HL,IODv,P=100,44,22,132, OOD,Od,POD≒1,4,2, A3=AW×4.5, A3,4,5≒10,7,7, IODs=10:8, frontal elevations slight, but median furrow fairly deep but broad, SAT low broad nasiform, anteriorly somewhat obliquely inclined, flattened and arcuately, coarsely punctate-striate, apical margin acutely edged, rather carinated, ASR bicarinate, posterior carina extended inwards and connected with the medio-apical edge of SAT, forming a wide transverse carina (Figs. 399, vertically seen, 400, obliquely from side and above), the carina medianly broadly depressed, PAF from the median depressed area of the apical carina runs shallowly down to the postero-lateral sides (Fig. 399), the furrow flat-bottomed and finally curved down on the slope, the structure seen in profile: Fig. 401. Clypeus: Fig. 402, at base gently raised and at apex markedly reflexed. Anterior part of pronotal collar raised towards middle and weakly tuberculate there, seen from above subcarinate as a whole and weakly incrassate laterally, lamina on side triangular, apical angle nearly 90°, with apex minutely rounded, subalar area of mesopleuron with dorsal side flattened, edged at outer margin, slightly produced, but not expanded into pentroof structure, less developed than in preceding species. Propodeum with weak lateral carinae, area dorsalis practically without lateral furrows, only very feebly defined in some light, area apicalis incomplete, broadly open dorsally, GSR roundly highly elevated, but not ferruginous; gastral petiole flask-shaped, P, Ma,Mi,2(Ma),3(Ma)=100,21,6,30(26),31(38), in fore wing RC=C-type, Rl moderately long, apex reaching very close to the wing apex, CV1=CV2×6.5, TCV:CV2≒5:3, TCV on lower half strongly curved inwards, CV2 weakly curved up apically, angle roughly about 110°.

Frons microcoriaceous, with punctures comparatively large but shallow and weak,

sparse, SAT anteriorly and ASR on posterior inclination coarsely punctate, punctures on the former somewhat arcuately subrugosely confluent (naturally covered with golden hair), mesoscutum with strong aeneous tone, nearly mat, and fairly closely but rather obscurely covered with fine, shallow punctures, median furrow of area dorsalis transversely striate, series of striae along lateral carinae distinct, close, on the rest of dorsal and posterior sides covered with fine hair-bearing punctures, sides on about oblique median third covered with distinct punctures, on the rest smooth and polished.



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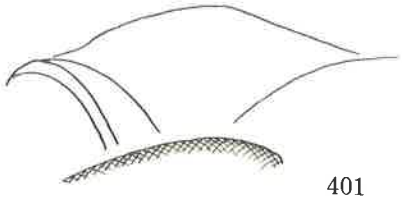

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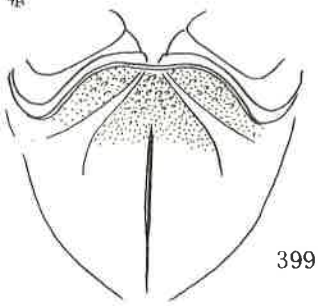

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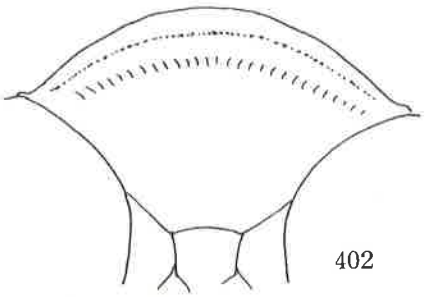


402

♂, unknown.

Holotype: ♀, Malaya (Pahang: Fraser's Hills, 4200 ft), 17. VI. 1931, H. M. Pendlebury (BMNH).

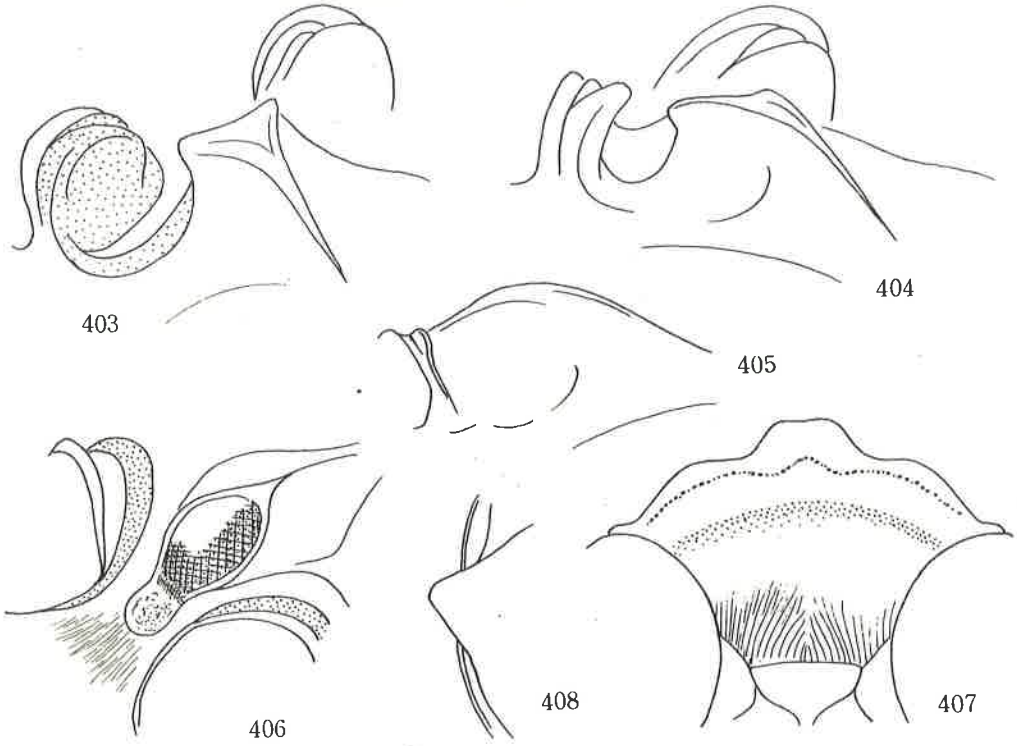
84. TRYPOXYLON SPECIOSUM sp. nov.

Considerably resembling preceding species, but is different in the spraantennal structure, in the form of clypeus and in the lustre of mesoscutum and easily separable therefrom.

♀, 13 mm. Black, yellow-ferruginous are Al, 2, extreme base of 3, clypeus anteriorly, mandible except brownish apex, mouth parts, discoloured posterior part of pronotal collar, tubercle posteriorly, apex of petiole, G2 largely, fore leg except base of coxa and arolium, mid leg except base of coxa and T2–4, hind leg except apex of coxa, femur above, apical third of tibia and T2–4. Femora of legs somewhat brownish, tegula transparent brown, with opaque yellow patch at the centre, G3–4 somewhat yellowish on apical margin, veins of wings on basal half dark brown, on the rest and stigma ferruginous. Hair brassy to golden, dense on head except vertex and frons, on neck region, posterior part of collar, posterior margin of tubercle, sides and apical margin of mesoscutum, postscutellum, mesopleuron except dorsal area, propodeum except antero-ventral part of sides and coxae in front, on clypeus at base narrowly convergent towards median line and on propodeum at baso-lateral areas curled.

HW,HL,IODv,P=100,46,23,144, occipital margin strongly emarginate, OOD,Od,POD= 2,6,3, IODs=10:10, A3=AW×4.7, A3,4,5=10,7,6, frons moderately elevated, median furrow fairly deep, but anteriorly nearly completely disappeared, surface almost flat, SAT low nasiform, with shining median carina, carina anteriorly widened, obliquely inclined to smooth area, surface of which broadly excavated, often the smooth area becomes two steps, anterior smaller, each carrying shallow but large fovea on it (Fig. 406, seen obliquely from beneath), ASR highly raised, bicarinate, anterior carina thin and ambur yellow in colour, posterior thick and black, PAF deep, oviform in cross section, flat-bottomed, the structure seen obliquely from above: Fig. 403, seen to see

to see through PAF: Fig. 404, in profile: Fig. 405, obliquely from beneath: Fig. 406. Clypeus: Fig. 407, characteristic in the form of apical margin, disc at base moderately elevated, at apex also moderately reflected; occipital carina complete. Collar of pronotum with anterior part subcarinate, weakly incrassate laterally, the ridge raised towards middle, but not tuberculate, nor angulate there, but considerably broadly flattened, lamina on side: Fig. 408; subalar area normal, as in preceding species. Propodeum with distinct lateral carinae, area dorsalis without lateral furrows, area apicalis widely open on dorsal side, GSR roundly highly elevated. Gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,22,7,28(32),34(44), in fore wing RC nearly M-type, R1 short, not reaching wing apex, CV1≒ CV2×6, TCV:CV2≒5:3, TCV strongly curved inwards, CV2 nearly straight, angle about 100°.



Frons distinctly microreticulate and finely closely rugoso-punctate, mesoscutum shining, finely, very closely punctured, on PIS under high magnification (64×) delicate microsculpture can be seen. Propodeum covered with strong hair-bearing punctures, without series of striae along lateral carinae, sides except antero-ventral smooth area finely and sparsely punctured.

♂, unknown.

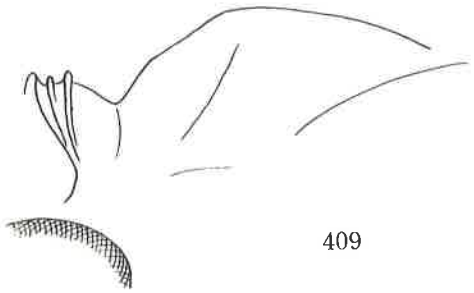
Holotype: ♀, Malaya (Kedah Peak, 3400-4000 ft), 27. II. 1961, R. Domrow (BMNH).

85. TRYPOXYLON ORNATIGASTER sp. nov.

Similar in appearance to the preceding species, but gaster more distinctly and more broadly yellow maculated and different in the structure of supraantennal area and in the form of clypeus.

♀, about 14 mm. Black; yellow are Al and 2 (both with a brown mark above), apical margin of clypeus broadly, mandible, mouth parts, posterior part of pronotal collar and tubercle posteriorly, gastral petiole at extreme apex, G2 and 3, both except broad band across middle, broad posterior marginal area of 4 and 5, all coxae at apex, fore and mid trochanters except brown mark above, hind one at apex, fore and mid fe-

more except a large elongate mark above, fore and mid tibiae wholly, hind tibia except a black mark in middle of outer side, all spurs, fore tarsus, mid T1-2 and 5 and claws. Hind femur and tarsus black, but T5 brown, veins of wings black, but externally and stigma ferruginous. Hair dense as in the preceding species, the states on clypeus and propodeum also similar.



409

HW,HL,IODv,P=100,48,23,128, OOD, Od,POD≒2,4,3, IODs=10:10, A3=AW×4.5, A3, 4,5≒10,6,6, frons weakly raised, nearly flat, median furrow fine but distinct, SAT very low, broad nasiform and medianly carinate, from apical end of the carina obliquely inclined anteriorly, forming a subtriangular flat area, the area covered with hair, not smooth and shining, ASR weakly elevated, transversely tricarinate, PAF shallow, widely open, V-shaped in cross section (Fig. 409, seen obliquely from left side and above to see through PAF). Clypeus simply rounded out anteriorly, not medianly produced on apical margin, disc at base weakly elevated and markedly reflected at apex. Anterior part of pronotal collar subcarinate and weakly incrassate laterally, in frontal view gently raised towards middle and broadly, not strongly tuberculate there, lamina on side as in the preceding species (cf. Fig. 408), subalar area of mesopleuron also similarly normal; propodeum with lateral carinae, area dorsalis without lateral furrows, median furrow broad and very shallow, area apicalis widely open on dorsal side, GSR highly raised, rounded. Gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,24,8,36(30), 44(45); in fore wing RC C-type, R1 short, CV1=CV2×7, TCV:CV2≒5:3, TCV widely curved inwards, angle at base roughly about 100° (in paratype about 90°).

Frons microreticulate and sparsely punctured, punctures anteriorly close, surface nearly mat, mesoscutum with fairly strong plumbeous shine, finely (more finely than on frons) sparsely punctured; propodeum covered with hair-bearing punctures, without series of striae along lateral carinae, sides except antero-dorsal area somewhat sparsely covered with fine punctures.

♂, unknown.

Holotype: ♀, Malaya (Pahang, Fraser's Hills, 4200 ft), 17. VI. 1931, H. M. Pendlebury (BMNH).

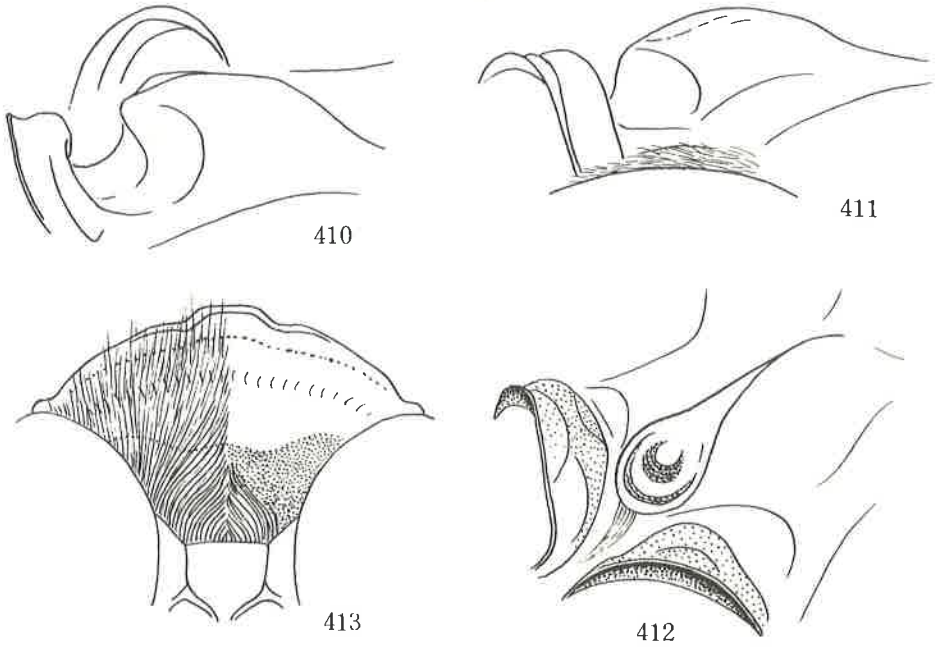
Paratype: 1 ♀, Malaya (Perak, Kramat Pulai), 23. IV. 1961, H. T. Pagden (BMNH).

86. TRYPOXYLON SHAKHA sp. nov.

♀, 15-16 mm. Similar in colouration to fulvocollare Cameron, differs from it, however, in the structure of SAT-ASR, subalar area of mesopleuron and lateral margins of propodeum, in the form of clypeus and in the much slenderer and longer gastral petiole. Black; ferruginous are A1-3 and 4 beneath (underside from A4 apically gradually darkened to brown or black), apical margin of clypeus broadly, mandible (apex reddish black), mouth parts, dorsal part of collar (posterior part discoloured), tubercle, lamina, apex of gastral petiole (shortly triangularly extended towards base on sides), G2 and 3, ventral base and apical margin of 4, apical margin of 5, whole of 6 (sometimes brownish red), fore and mid legs except extreme base of coxae and arolia, hind coxa (extreme base black), trochanter, femur at base broadly and at apex narrowly, -tibia, except a brown patch near apex and broad brownish inside, and all spurs and claws. Articulations of hind tarsus brownish. Hair golden, on clypeus at base strongly convergent towards medial line and on propodeum not curled.

HW,HL,IODv,P=100,50,22, 184, OOD,Od,POD≒1,4,2, IODs=10:7.5, A3=AW×6, A3,4,5 ≒10,6,5.5. Head in frontal view with sides roundly convergent belw and vertex distinctly depressed below level of upper eye margins, frontal elevations gently rounded, median furrow broad and comparatively deep, SAT closely resembling in structure to that of fulvocollare, median carina at apical end enlarged into a smooth and round area and broadly excavated (Fig. 412, seen obliquely from beneath), ASR highly raised, bicarinate on top, posterior carina thickened and roundly inclined and strongly excavated on posterior wall, SAT-ASR seen to see through PAF: Fig. 410, in profile: Fig. 411, PAF deep, flat-bottomed, oviform in cross section (Fig. 410). Clypeus: Fig. 413, at base distinctly raised and at apex reflected; occipital carina complete. Anterior part

of pronotal collar raised towards middle and weakly swollen there, seen from above moderately incrassate laterally, posterior part discoloured, lamina on side triangularly produced, appcal angle about 120°, apex minutely rounded, subalar area of mesopleuron with well-developed pent-roof structure, black and opaque, but the vertical wall covered by it simply punctured, not striate, nor carinate; propodeum without lateral carinae,



Figs. 410-413. Trypoxylon shakha sp. nov., ♀

area dorsalis weakly enclosed with furrow, the furrow sometimes very obsolete, medial furrow shallow, in form elongated obal, area apicalis incomplete, dorsally marked only with a few arcuate striae of posterior inclination, GSR simple, very slightly roundly elevated. Gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,13,4,21(16),24(22). In fore wing RC intermediate between B- and C-types, rather close to C, CV1=CV2×5, TCV:CV2≒5:4, TCV gently sinuate, angle about 120°.

Frons very minutely microreticulate, nearly mat and sparsely, indistinctly superimposed with fine and weak punctures, mesoscutum with fairly strong plumbeous shine, very finely and somewhat sparsely (PIS mostly 2-3 times PD) punctured; propodeum with longitudinal series of striae along lateral margins, anteriorly weak and posteriorly strong, median furrow of area dorsalis weakly striate, rest of dorsal side finely and sparsely punctured, posterior inclination more distinctly punctured and posteriorly transversely, somewhat arcuately striate.

♂, unknown.

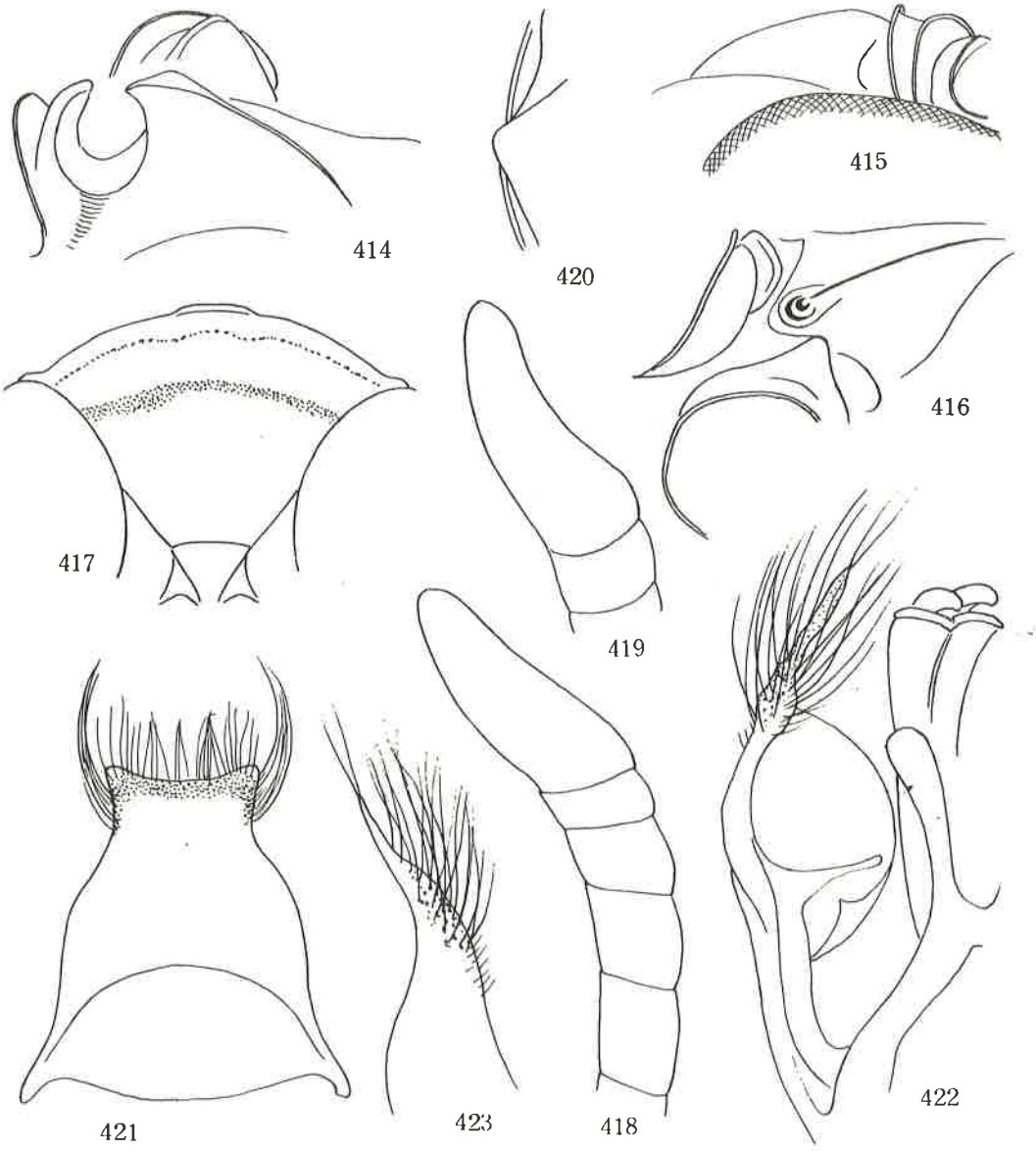
Holotype: ♀, Malaya (Penang: Batu Feringgi), 9. VII. 1957, H. T. Pagden (BMNH).
Paratypes: 1 ♀, Malaya (Kedah Peak, 3300 ft), 20. III. 1928, H. M. Pendlebury (BMNH); 1 ♀, Penang, C. F. Baker leg. (USNM).
Other specimen: 1 ♀, Malaya (Kedah Peak, 3300-3950 ft), 9. III. 1928, H. M. Pendlebury (BMNH) (head lacking).

87. TRYPOXYLON FUMI sp. nov.

♂. In the structure of supraantennal area and in the very slender gastral petiole as well as in the general characters this species closely resembles shakha (♀). In order to combine the two together as different sexes of the same species, however,

the differences in the colour of pronotum, in the type of RC of fore wing and in the microsculpture on mesoscutum and scutellum become serious obstacles. In the present species the pronotum is completely black, RC is B-type and mesoscutum and scutellum are under 40 magnification distinctly microreticulate. Furthermore, in the detailed structure of ASR they are distinctly different, namely, in shakha the posterior lobe of ASR is thickened and not reflected posteriorly, while in the present species the lobe is thin, lamellate and strongly reflected posteriorly. On the other hand, the present species is very close also to khasiae and yumi, including the structure of male genital organs, but differs from both in the colour of antenna, legs and vestiture and in the state of vertex and lateral carinae of propodeum.

Length 11-12 mm. Black, yellow are Al-2, clypeus anteriorly broadly, mandible, mouth parts, tubercle, discoloured posterior part of collar, tegula (transparent yellow, with an opaque yellow mark at the centre), basal plates of wing, fore and mid legs except arolia and mid T2-5(brown), hind coxa, trochanter, both ends and dorsal side of



Figs. 414-423. Trypoxylon fumi sp. nov., ♂

femur, tibia and all spurs except longer one of hind tibia that is brown. Hair golden to brassy, dense, on clypeus subparallel, on propodeum at baso-lateral areas markedly curled. Measurements are given in Table 3.

Table 3. Measurements on T. fumi in comparison with T. khasiae (♂)

Loco	HW	HL	IODv	P	OD	Od	PD	LODs	A3	A13	A3	A4	A5	P	Ma	Mi	2(Ma)	3(Ma)
Kedah	100	48	26	158	2	3	6	8.0	3.0	2.9	10	7.0	6.5	100	16	5	28(22)	30(30)
Selangor	100	48	24	160	1	2	1	8.3	3.3	3.3	10	6.5	6.5	100	15	6	30(18)	34(30)
Pahang*	100	46	24	170	1	2	1	9.0	3.0	3.0	10	8.0	7.0	100	14	5	29(18)	31(29)

Remarks. As to A3 AW× and as to A13 BW× is omitted. * A male of khasiae

Head in frontal view with sides roundly convergent below, vertex distinctly depressed below level of upper eye margins, frontal elevations moderately high, rounded, medial furrow also moderate in depth, SAT low nasiform, long carinated in middle, carina reaching posteriorly near middle of the distance to fore ocellus, at apical end it obliquely inclined, enlarged into a round flat area carrying a large fovea in middle (Fig. 416, seen obliquely from beneath), ASR highly raised, bilobate on top, anterior lobe ambur yellow, posterior black, forming between a flat lenticular shining area on inner side, seen vertically posterior lobe raised in subtriangle (do.) and its posterior wall deeply roundly excavated by PAF, seen from side it appears strongly reflected backwards (Fig. 414, SAT-ASR seen obliquely from side and above), PAF deep, broad, flat-bottomed, oval in form in cross section (Fig. 414), the form of SAT seen in profile: Fig. 415. Clypeus: Fig. 417, with disc only gently raised (hairs parallel) and rather weakly reflected at apex, A13 slightly longer than 3 preceding joints united (Fig. 418), seen in other direction: Fig. 419, occipital carina complete. Pronotum with anterior part subcarinate, only weakly widened laterally, in frontal view gently raised towards middle where somewhat broadly roundly swollen, posterior part discoloured, lamina on side: Fig. 420. Mesopleuron at subalar area provided with half-developed pent-roof structure, wholly black, the vertical wall covered by it only punctured, not carinated; propodeum without lateral carinae, area dorsalis without lateral furrows, area apicalis incomplete, GSR highly roundly elevated, the elevated part ambur yellow in colour. Character of gaster as given in Table 3. In fore wing RC B-type, R1 short, CV1=CV2×5.5-6, TCV weakly sinuate, longer than CV2, angle about 90-100°.

Genitalia similar in structure to those of khasiae and yumi, especially in the form of lamellate expansion of paramere - outer margin with long triangular process and inner margin with short triangular process, both near base - , but in the present species apical part of paramere covered with remarkably long bristles (Fig. 423, from beneath, 423, from outer side); sternite 8 also similar to some form observed in yumi (Fig. 421, ref. Fig. 305), but here the latero-apical teeth are markedly broader.

Frons compactly microcoriaceous, mat and finely sparsely and weakly punctured, mesoscutum comparatively largely, somewhat sparsely (PIS=PD×1-2) punctured, intervals under high magnification weakly microcoriaceous; propodeum sparsely covered with fine hair-bearing points, on disc of area dorsalis the points comparatively large.

♀, unknown.

Holotype: ♂, Malaya (Kedah Peak: Djeraj, 800 m), 19. II. 1963, M. A. Lieftink (RMNH).

Paratype: 1 ♂, Malaya (Selanger: Kepong Forest Reserv., 90-180 m), 12. III. 1958 T. C. Maa (BPBM).

Remarks. In view of the close resembrance in the structure of male genitalia this species may be a form of T. khasiae Cameron. Measurements are also generally similar to each other species. Based upon the marked external differences above mentioned, however, it is dealt with here as a distinct species. The slight but distinct differences in the structure of the 8th sternite and male genitalia seem also to support this determination.

88. TRYPOXYLON SMITHI sp. nov.

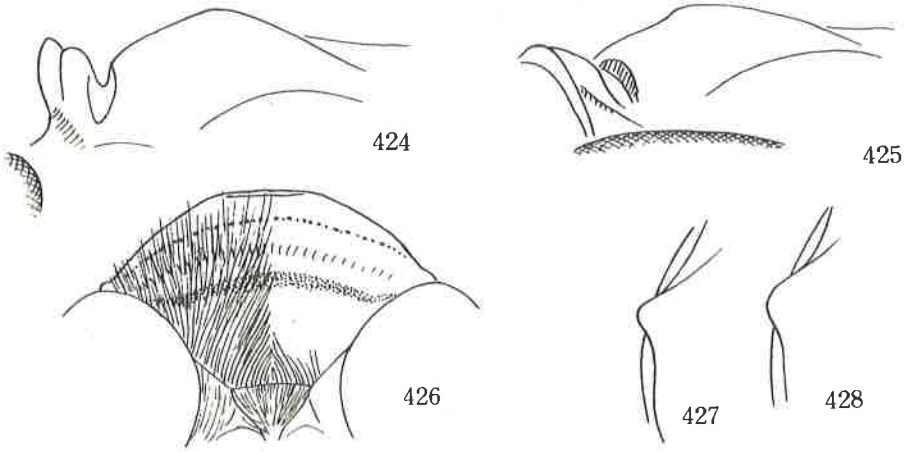
♀, 16-17 mm. Densely covered with golden hair, SAT low nasiform, smoothly inclined anteriorly, the place covered with hair, without glabrous shining and hollowed area, clypeus simply rounded out. Differs from fulvocellare Cameron by the colour of

pronotum and in the structure of PAF and propodeum.

Black, ferruginous to yellow are A1 wholly, A2 except above, apical margin of clypeus broadly, mandible, mouth parts, discoloured posterior part of pronotal collar, tubercle, tegula (semitransparent), gastral petiole except dorsal side from spiracles posteriorly and apical swelling wholly, G2 and 3, both at base and apex and at sides, G4 and 5 at apex and at sides and G6 except extreme base, fore and mid legs except black arolia and brown mit T3–4 and hind leg except stripes on femur above and beneath, median area on outer side of tibia and T1–5. Longer tibial spur of hind leg partly brown, hind T5 brownish; veins of wings basally brown to dark brown, apically and stigma yellow or ferruginous. Hair on clypeus at base convergent towards medial line, on propodeum at baso-lateral areas curled, ferruginous areas of G2–5 closely covered with brassy hair.

Head in frontal view roundly convergent below, vertex fairly strongly depressed below level of upper eye margins, HW,HL,IODv,P=100,40,19,154 (100,42,22,140), OOD, Od,POD=1,6,2 (1,4,2), IODs=10:11 (10:10), A3=AW×5, A3,4,5=10,7,6 (within parenthesis in paratype). Frons moderately raised and broadly shallowly furrowed in middle, median carina of SAT ending far behind interantennal area, the area between obliquely inclined and covered with hair, sides of SAT also covered with hair, ASR moderately raised, seen from side and above to see through PAF: Fig. 424, SAT-ASR seen in profile: Fig. 425; clypeus: Fig. 426, at base gently roundly raised and at apex broadly reflected, occipital carina complete. Anterior part of pronotal collar raised toward middle and weakly tuberculate there, seen from above only slightly incrassate laterally, lamina on side in holotype: Fig. 427, in paratype: Fig.428. Subalar area of mesopleuron with half-developed pent-roof structure, vertical area covered by it simply sparsely punctured; propodeum without lateral carinae, area dorsalis with lateral furrows indistinct, GSR subtriangularly highly elevated, elevated area amber yellow. Petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,21,7,34(30),38(40). In fore wing RC C-type, remarkably slender (wing itself is very slender at apical portion), R1 very short, CV1=CV2×6, TCV:CV2=3:2, both curved, angle roughly about 120°.

Frons microreticulate and distinctly, closely (PIS=PD) superimposed with comparatively large and deep punctures, punctures anteriorly closer, mesoscutum with weak plumbeous shine, more finely, weakly closely punctured, surface of propodeum completely covered with hair except antero-ventral smooth area of the sides, in paratype posterior margin of area dorsalis transversely striate and lateral series of striae only on posterior portion very weakly observed.



Figs. 424–428. Trypoxylon smithi sp. nov., ♀

♂, unknown.

Holotype: ♀, Malaya (Bukit Kutu, 3300 ft), 28. VII. (1933 ?), A. R. Sanderson (BMNH).

Paratype: 1 ♀, Malaya (Selangor, Bukit Kutu, 3500 ft), 20. IV. 1926, H. M. Pendlebury (BMNH).

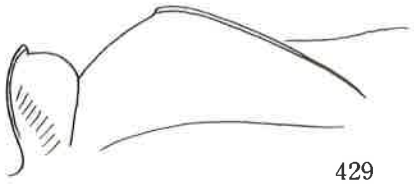
Remarks. In the holotype both antennae from joint 4 apically lacking and gaster dropped off and glued on to the data label. In the paratype left antenna is complete, but right is missing, wings haevily damaged and body is stained.

89. TRYPOXYLON MARTIUM sp. nov.

♀. Closely resembles the preceding species, but is different from this in the form of clypeus and in the colour of clypeus, antenna and tarsi of legs. Further, in the detailed structure, the form of PAF and pronotal lamina is also dissimilar.

Head + thorax-complex 6.5 mm (in all the specimens gaster is lacking), possibly may be 16–18 mm. Black, Al and 2 more or less pale brown beneath and brown to dark brown above; ferruginous are mandible (apically dark brown), mouth parts, posterior margin of tubercle, tegula and greater part of legs. Black or dark brown on legs: fore coxa except anterior side, mid and hind coxae except base, sometimes vaguely outlined short streaks on fore and hind femora and hind tibia, all arolia and all T5. Sometimes apical 3–4 joints of some of fore and mid tarsi also turn blackish. Hairs golden, dense, on clypeus at base strongly convergent towards median line and on propodeum at baso-lateral areas strongly curled.

Head in frontal view roundly convergent below, vertex moderately depressed (upper margins of eyes and ocelli nearly on the same line). HW,HL,IODv=100,44–46,22–23, OOD,Od,POD÷2,4(5),3, IODs=10:10(11), A3=AW×4.3–4.5, A3,4,5÷10,7,6. Frontal elevations weak, medial furrow weak or moderate in depth, SAT low nasiform, long carinated on ridge, apical margin obliquely inclined, covered with hair. SAT-ASR seen from above and side to see through PAF: Fig. 429, in profile: Fig. 430, characteristic in the form of ASR and PAF. Clypeus: Fig. 431, at base moderately raised and at apex distinctly reflected, medio-apical area somewhat incrassate. Occipital carina complete, but behind buccal cavity very feeble. Anterior part of pronotal collar as in smithi, posterior part discoloured, but not ferruginous, but only brownish, lamina on side minutely angulated at apex (Fig. 432), subalar area of mesopleuron with half-developed pentroof structure; propodeum (when dense hair is removed) without lateral carinae and without lateral furrows of area dorsalis, area apicalis also incomplete, GSR highly raised. In fore wing RC not so markedly slender as in smithi, B-type, R1 very short, CV1=CV2×6–7, TCV longer than CV2, curved inwards on posterior half, angle at base about 90°.



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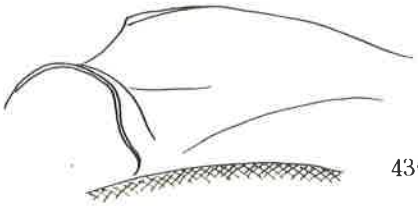

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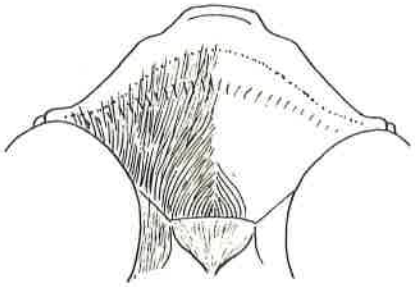

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Frons microreticulate and fairly closely and indistinctly superimposed with comparatively large shallow punctures, mesoscutum more finely and fairly closely punctured, sometimes on lateral areas rugoso-punctate, propodeum covered with hair-bearing punctures, sides very finely sparsely covered with hair-bearing points, except smooth antero-ventral area.

♂, unknown.

Holotype: ♀, Malaya (Kedah Peak, 3000–3300 ft), 12. III. 1928, H. M. Pendlebury (HMNH).

Paratypes: 1 ♀, the same place, 3000 ft, 12, III. 1928; 1 ♀, ditto, 13. III. 1928, both leg. H. M. Pendlebury (HMNH).

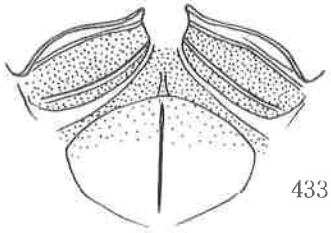
90. TRYPOXYLON NGUM sp. nov.

♀, 13–15 mm. Characteristic in the highly tuberculate SAT, obtusely bidentate

anterior margin of clypeus, as well as in the structure of propodeum and in the colouration of gaster and legs.

Black, gastral petiole at apex and apical side, G2 and 3 except each large black mark above, and base of 4 reddish yellow (sometimes blackish gastral contents are seen at underside through semitransparent sclerite, sometimes reddish colour strongly darkened). Pale ferruginous to pale yellow: Mandible (apically darkened), mouth parts, fore tibia in front, all tibial spurs, fore tarsus except arolium, mid T1 and 2 except apices and hind tibia at base. Tegula semitransparent brown, rest of fore tibia and base of mid tibia narrowly brown. Hair silvery, on clypeus at base weakly convergent inwards, but on the greater part of disc parallel.

Head in frontal view wider than long, with sides rounded, vertex moderately depressed, HW,HL,IODv,A3,P=100,50,19,25,196, IODv markedly narrow,and P very long, OOD, Od,POD≒1,6,3, OOD very narrow, IODa=10:10, A3=AW×4.5, A3,4,5≒10,7,6. Frons fairly



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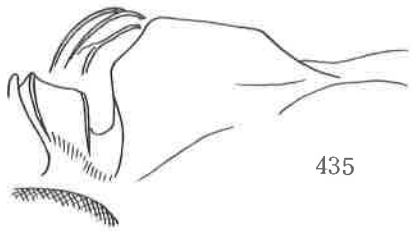

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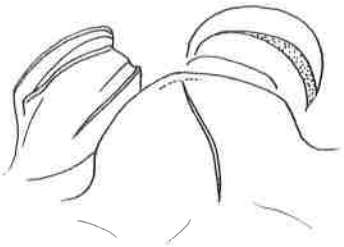

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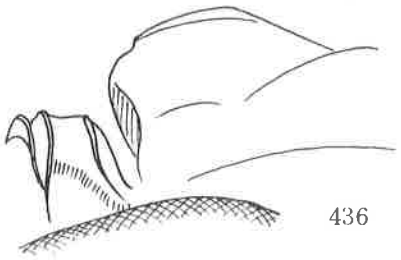

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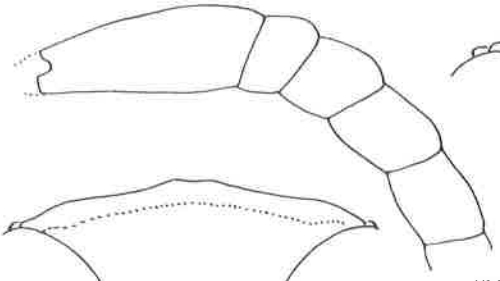

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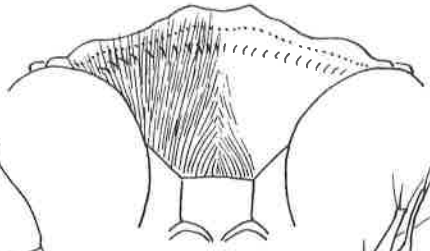

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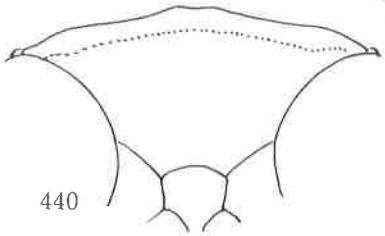

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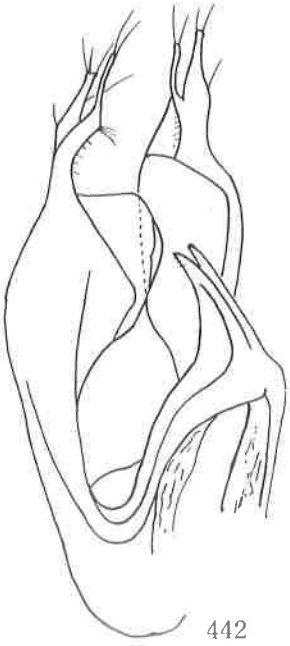

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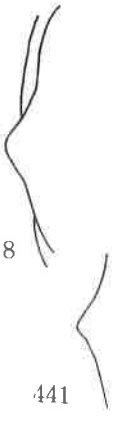

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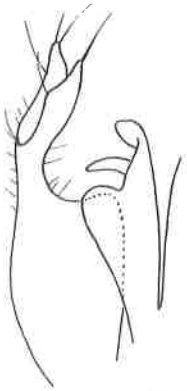

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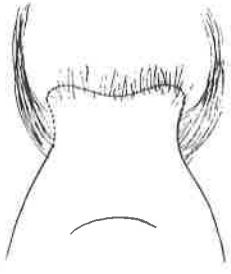

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strongly elevated, but median furrow rather shallow, only at base somewhat deep and at apex widened into flat area, SAT highly tuberculate, seen vertically: Fig. 433, apex of median carina encircled with a narrow flat shining area (SAT sparsely covered with very fine greyish pubescence), SAT-ASR seen obliquely from dorsal side: Fig. 434, to see through PAF: Fig. 435, in profile: Fig. 436; clypeus: Fig. 437, at base gently raised, apical margin broadly reflected; occipital carina complete, weakly incised behind buccal cavity. Anterior part of pronotal collar roundly raised towards middle and weakly tuberculate there, seen from above fairly strongly incrassate sideways, posterior part discoloured, pale chestnut brown, lamina on side: Fig. 438. Subalar area of mesopleuron posterior edged, but not expanded; propodeum with distinct lateral carinae and area dorsalis enclosed with fine but distinct furrow, area apicalis with dorsal part enclosed with weak subtriangular carina, GSR strongly roundly raised, raised part transparent, petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,13,4,30(14),30(18); in fore wing RC=C-type, rather close to M-type, Rl moderately long, about half the length of CV2, reaching very close to wing apex, CV1=CV2×5-6, TCV longer than CV2, both weakly curved, angle between them roughly about 110°.

Frons distinctly microcoriaceous and superimposed with comparatively large punctures, punctures distinct, posteriorly somewhat sparse, anteriorly close and sometimes subrugosely confluent, mesoscutum with fairly strong plumbeous shine and very finely, sparsely punctured, propodeum with laeral series of striae, anteriorly short and posteriorly longer, median furrow of area dorsalis transversely finely closely striate, rest of dorsal aspect covered with sparse fine hair-points, sides anteriorly smooth and polished, posteriorly finely, fairly closely striate.

♂, 12 mm. Similar in general to ♀ (including structure of SAT-ASR and propodeum) but mid tarsus more broadly white. Legs generally strongly brownish. Fore tibia in front brown. Pale yellowish white: All tibial spurs, fore tarsus except arolium, mid T1-3 except each apex, base of hind tibia (not mid tibia). Claws and their attaching areas of all T5 also considerably whitish, bases of hind T1-2 somewhat pale, Apex of gastral petiole (on sides father extended anteriorly) and G2-3 ferruginous red, but dark brown on dorsal side. HW:IODv=100:23, OOD,Od,POD≒2,4,3, IODs=10:9, A3≒AW×2.8, A3,4,5≒10,7,7, (both of Al3 with apical part damaged as given in Fig.439, possibly more than as long as 3 preceding joints united). Clypeus: Fig. 440, pronotal lamina: Fig. 441. Mesoscutum smooth and polished, with sparse fine punctures. RC B-type, Rl fairly long, CV1=CV2×4.5, TCV:CV2≒4:3, both weakly cirved, angle about 100°.

Paramere of genitalia on inner margin expanded and half rolled ventrally and inwards, outer margin triangularly produced inwards, opposing the lamella of inner margin, at apex bifid into narrow lobes, volsella simply spatulate, penis valve with shoulder and a pair of sickle-shaped appendages. Seen from beneath and slightly obliquely from side: Fig. 442, left paramere in ventral view: Fig. 443, right paramere and penis valve in dorsal view: Fig. 444. Sternite 8: Fig. 445.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Eue), 15. III. 1966, native collector (BPBM).

Paratypes: 1 ♂, Laos (Vientiane Prov.), 15. VIII. 1966, native collector (BPBM). 1 ♀, Laos (Sayaboury Prov., Sayaboury), 23. VIII. 1966, native collector (BPBM). 1 ♀, Penang (Batu Feringgi, catchment area), 6. XI. 1957, H. T. Pagden (BMNH). 1 ♀, Thailand (Chiangmai: Doi Suthep, 1278 m), 29. III. - 4. V. 1958, T. C. Maa (BPBM) (in this specimen the gaster is lacking).

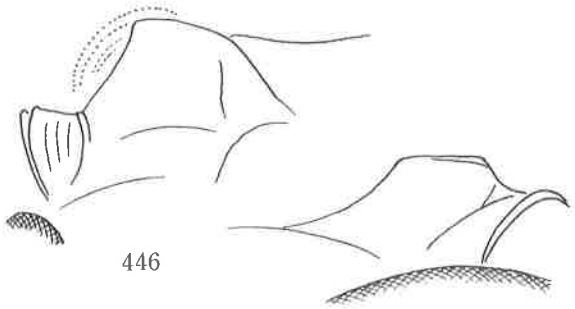
91. TRYPOXYLON STRIOLATUM sp. nov.

♀, somewhat similar to ngum, but in the present species fore and mid legs broadly whitish, the form of clypeus and SAT-ASR is dissimilar and area dorsalis is very finely and densely striate.

12-13 mm. Black; apex and sides of apical swelling of gastral petiole and G2-3 except a large blackish mark on each above yellowish red; pale ferruginous - pale yellowish white are mandible except reddish brown apex, mouth parts, knees, fore tibia except inner side, mid and hind tibiae at base, spurs, fore tarsus except arolium, mid tarsus except T3 (black), 4 (brown), a mark on 5 and arolium. Tegulae semitransparent brown, a pair of spots on all T5 at apex and claws pale brown. Hairs silvery, on clypeus at base strongly sinuately convergent towards medial line (Fig. 448).

Head in frontal view with lateral margins roundly, slightly convergent below, vertex not markedly depressed, HW,HL,IODv,A3,P=100,48,24,24,160, OOD,Od,POD≒1,4,3, IODs=10:8, A3=AW×4, A3,4,5≒10,6.5,6, Frons on each side of medial furrow moderately

roundly elevated, the furrow moderately deep, SAT low nasiform, obliquely narrowly inclined anteriorly, the area covered with hair, ASR not highly raised, but broadly produced anteriorly, with apical margin carinated, PAF shallow, widely open, V-shaped in cross section, SAT-ASR seen obliquely from side and above to see through PAF: Fig.446, in profile: Fig. 447, clypeus: Fig. 448, at base distinctly raised, raised area medially distinctly ridged, apical margin markedly reflected, medio-apical area somewhat incrassate; occipital carina complete, but weak behind buccal cavity. Collar in frontal view gently roundly raised towards middle and minutely tuberculate there, seen from above considerably incrassate laterally, posterior part not completely discoloured, lamina on side triangularly produced, angle roughly about 120°, with apex minutely rounded; subalar area of mesopleuron posteriorly edged on outer side, slightly produced, but not expanded; propodeum with lateral carinae, area dorsalis with weak lateral furrows, area apicalis incomplete, GSR nearly simple. Gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,18,6,30(22),32(32); in fore wing RC=C-type, Rl short, CV1=CV2×5-6, TCV moderately sinuate, TCV:CV2≒3:2, angle roughly about 120°.



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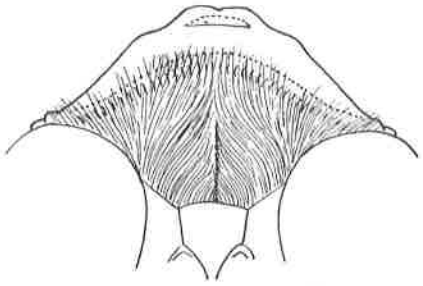

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Frons microcoriaceous and somewhat sparsely, rather indistinctly superimposed with fine, shallow and weak punctures, mesoscutum comparatively largely, sparsely punctured, interspaces under high magnification (40) weakly microcoriaceous; propodeum with lateral series of striae, the striae strong and close, while dorsal aspect and posterior inclination transversely, very finely and very closely striate, on area dorsalis the striae slightly stronger, sides fairly closely covered with somewhat large punctures, PIS= PD×1-2, antero-ventral area smooth and polished and posterior area transversely striate.

♂, unknown.

Holotype: ♀, Laos (Vientiane Prov., Vill. de Tha Ngone), 10-30. I. 1965, native collector (HPBM).

Paratype: 1 ♀, Singapore, C. F. Baker leg. (USNM).

Remarks. The paratype specimen from Singapore is somewhat different: IODs= 10:7.5 (=4:3), SAT slightly higher, pronotal lamina somewhat broader in apical angle, superimposed punctures on frons rather obsolete, only hardly defined and very sparse, and medio-apical area of clypeus somewhat less produced (but similar in pattern).

92. TRYPOXYLON ERRANS Saussure, 1864

Trypoxylon errans Saussure, Voyage de Novara, Hym., p. 84, 1864 (♀, Mauritius Is.).
Trypoxylon errans: Saussure, Hist. Madagascar, 20, Hist. Nat. Hym., p. 527, 1892.
Trypoxylon intrudens Smith (in Horne), Trans. Zool. Soc. London, 7 (3): 188, 1970 (♀,Mainpuri, N.W. Prov. India).
Trypoxylon errans: Tsuneki, SPJHA, 8: 28, 1978 (redescription, synonyms, figs.)

Specimens examined:

Mauritius Is. 2 ♀, no data except "Mauritius" (BMNH).
Rodrigues Is. 1 ♀, VIII-XI. 1918, H. J. Shell and H. P. Thomasset (BMNH).
Seychelles. (Mahe Is.), 8 ♀ 5 ♂: (4 ♀ 2 ♂), IX. 1938 (♀, 6464, 6465, 6465, 6500; ♂, 6464, 6465); (1 ♀) III. 1937 (5500); (1♀), VIII. 1938, all leg. Fitzgerald (BMNH). (2 ♀ 3 ♂), IX. 1908, Seychelles Expedition (BMNH).
Ceylon 6 ♀ 7 ♂: (2 ♀ 2 ♂), Smith Coll. only "Ceylon" (BMNH). (7 ♀ 5 ♂) Dr.

Thwaites, only "Ceylon", Mus. ref. No. 67-25, (BMNH). (1 ♀), Col. Dist. Nugegoda papiliyana, 16. III. 1975, P. B. Karunaratne (USNM).

India 11 ♀ 2 ♂: (1 ♂), Matheran, III. 1899, C. G. Nurse. (1 ♀) Deesa, VIII. 1901, C. G. Nurse. (1 ♀) Krach, date unknown. (2 ♀) Bengal (Calcutta), XII. 1908, XII. 1908, E. Brunetti. (1 ♀) Simla, VII. 1918, E. Brunetti. (6 ♀ 1 ♂) India, T. R. Bell (BM. 1934-394). (1 ♀) India, Smith Coll. (All BMNH).

Nepal 2 ♀: (1 ♀) Kathmandu, 1300-1400 m, 7-12. V. 1966, J. & M. Sedlacek (BPBM). (1 ♀) Watling, 4. X. 1965, C.I.E. 4832 ft (BMNH).

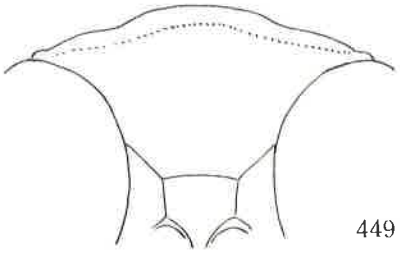
Burma 2 ♀: Rangoon, XI. 1945, R. A. Davis. - 1923, Archbald leg. (BMNH).

Thailand 3 ♀: (1 ♀) Chiangmai Prov. (Doi Suthep, 1278 m), 29. III. - 4. V. 1958, T. C. Maa (BPBM). (1 ♀), Chiangmai (Chiangdao, 450 m), 5-11. IV. 1965, T. C. Maa (BPBM). (1 ♀) Chiangmai, 4. V. 1952, D. & E. Thurman (USNM).

Cambodia 1 ♀, Kiri Rom, 700 m, 31. III. - 1-7. IV. 1961, N. R. Spencer (BMNH).

Malaya 10 ♀ 4 ♂: (1♀) Kedah Peak, 3500 ft, 23. II. 1961, H. T. Pagden (BMNH). (1♀) Taiping, 6. V. 1936, H. T. Pagden (BMNH). (1♀) Kuala Lumpur, 16. III. 1927, H. M. Pendlebury (BMNH). (1♀) Kuala Lumpur, Tonglin Road, 23. III. 1928, H. T. Pagden (BMNH). (2♂) Kuala Lumpur (at light), 26-27. II. 1924, H. M. Pendlebury (BMNH). (1 ♂ 1 ♀) Kuala Lumpur, date unknown, A. T. Stalton (BMNH). (1 ♂), Pahang, Kuala Teku, 550 ft, 26-27. II. 1927, H. M. Pendlebury (BMNH). (1 ♀) Penang (Batu Teringgi, Catchment area), 31. V. 1964, H. T. Pagden (BMNH). (1 ♀) Penang, date unknown, C. F. Baker (USNM). (1 ♀) Tanjong Mas Estate Sepang Selangor, 20. I. 1928, H. T . Pagden (BMNH). (1 ♀) Pahang, Sungei Tahan, 400 ft, 19. XII. 1921, ? (BMNH). (1 ♀) Kanpang Tua, 26. IV. 1930, H. T. Pagden (BMNH).

Remarks. (1) The male. The male of this species was already described in detail with the specimen from Formosa under the name, T. tanoi Tsuneki (Etizeiia, 22: 13, 1967). It is generally similar to ♀, but clypeus less strongly produced anteriorly with the median recurving weaker (Fig. 449) and antennal joints shorter except A13 which is very long, appr. as long as 5 preceding joints united.



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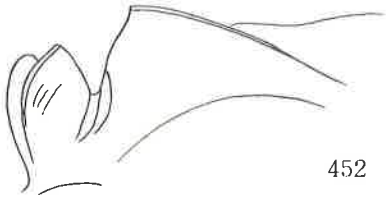

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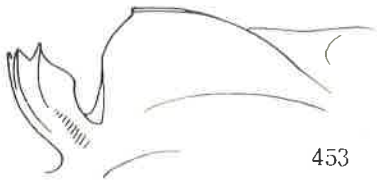

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I examined the genitalia of one each of the specimens from Mahe of the Seychelles, India and Malaya. They agree completely in structure with each other (Fig. 450, seen from beneath, right half omitted) and with those of tanoi illustrated already, in spite of the marked external differences below described. In this species paramere is simple at apex, volsella spatulate, also simple in structure and penis valve with shoulder and a pair of sickle-shaped appendages before apex.

(2) Variations. According to the observations of the specimens above listed there are marked variations in characters, especially remarkable in the relative length of the gastral petiole. The value of relative length of the petiole of a specimen to its own head width as 100 varies from 90 to 148 in the male and from 108 to 174 in the female (Table 5). The rough frequencies:

Table 4. Variation frequency of relative length of petiole to HW as 100.

	90 - 100	- 110	- 120	- 130	- 140	- 150	- 160	- 170	- 180	- 190
♂	2	3	1	4	2	4				
♀	-	1	1	2	1	10	20	3	2	-

The relative maximum and minimum widths of the petiole to its own length as 100 also vary markedly in both sexes, namely, in ♂♂ from 16 to 34 in the maximum and from 5.5 to 12 in the minimum, and in ♀♀ from 15 to 25 in the maximum and from 5 to 8 in the minimum, excluding one exception (Table 5). In the actual observations the difference between the extremities of these variations is so marked that they appear to belong to a different species respectively.

IODv as against HW also varies more or less, but the differences are rather slight. In these variations there is a certain tendency towards the local character, but in many cases exceptions are included andlgeneral conclusion can not simply be drawn.

Table 5. Measurements on Trypoxylon errans Saussure

Loco	Sex	B.L.	IODv	P	Ma	Mi
Mauritius	♀	10.5	28	144	20	6.0
"	♀	10.0	-	-	18	5.5
Seyohelles	♀	10.5	27	148	20	6.0
"	♀	10.0	27	152	18	5.5
"	♀	9.0	28	146	20	6.0
"	♀	10.0	28	150	20	5.5
"	♀	11.0	28	150	17	5.5
"	♀	10.5	27	148	19	6.0
"	♀	10.0	27	150	17	5.5
"	♀	11.0	28	150	17	6.0
Rodrigues	♀	9.5	29	156	17	5.0
Ceylon	♀	9.5	28	156	17	5.0
"	♀	9.5	28	156	17	5.0
"	♀	8.5	29	150	16	6.0
"	♀	9.5	-	-	18	6.0
"	♀	11.0	28	146	18	6.0
"	♀	10.0	-	-	18	6.0
"	♀	9.5	26	148	17	5.5
India Pusa	♀	10.0	30	140	21	7.5
" Krachi	♀	9.0	28	146	17	5.5
" Simla	♀	10.0	28	144	18	6.0
"Culcutta	♀	7.5	28	108	30	10.0
" "	♀	9.5	28	130	22	7.0
India	♀	10.0	29	126	24	8.0
"	♀	11.5	27	160	18	5.5
"	♀	10.0	28	150	19	6.0
"	♀	10.5	28	146	18	7.0
"	♀	10.0	27	152	17	6.0
"	♀	10.0	29	148	20	6.5
"	♀	10.0	30	150	18	6.0
Nepal	♀	10.5	29	158	15	6.0
"	♀	12.0	28	170	19	5.0
Burma	♀	8.5	27	174	16	5.5
"	♀	11.0	25	160	16	5.0
Thailand	♀	10.5	26	152	18	5.5
"	♀	10.5	27	154	17	6.0
"	♀	10.5	26	152	18	5.5
Cambodia	♀	11.5	28	154	16	5.5
Malaya	♀	9.0	27	126	21	7.0
"	♀	11.0	26	153	17	5.5
"	♀	10.5	26	154	17	5.5
"	♀	9.5	26	150	18	6.0
"	♀	12.0	25	162	18	6.0
"	♀	10.5	26	150	16	5.5
"	♀	9.0	26	115	25	8.0
Seychelles	♂	7.3	32	136	21	7.0
"	♂	8.0	30	100	30	10.0
"	♂	7.8	30	104	34	11.0
"	♂	8.0	30	104	24	8.0
"	♂	9.5	30	148	16	5.4
India	♂	9.0	32	130	19	7.5
"	♂	8.5	30	138	20	6.0
Malaya	♂	9.0	28	140	17	6.0
"	♂	7.5	30	122	22	7.0
"	♂	9.5	27	122	21	7.0
Ceylon	♂	8.0	30	142	16	5.5
"	♂	7.0	30	124	20	7.0
"	♂	6.5	31	112	22	8.0
"	♂	9.5	29	140	18	5.5
"	♂	7.0	32	124	23	9.0
"	♂	7.5	30	90	26	10.0
"	♂	6.5	34	94	26	12.0

Remarks. B.L. .. Body length. IODv and P .. Relative length to HW as 100.
Ma and Mi .. Relative width to length of P as 100.

The form of medio-anterior margin of clypeus in the female also varies more or less. In most specimens examined here the recurved median area minutely weakly incised or depressed in middle. (In the Philippine or Formosan specimens the area is not incised as a rule.) The colour of medial part of gaster varies also considerably. The blackish marks on tergites 2 and 3 vary in size and in tone and when well developed gaster appears nearly wholly black, while in the bright maculated specimens the black marks almost completely disappear and apex of petiole and basal half of G4 become also ferrginous.

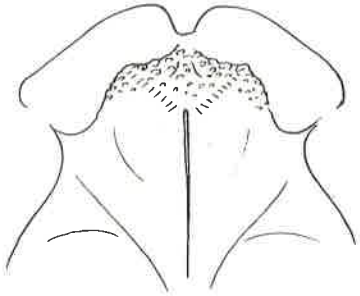
While in the structure of the supraantennal area variation is very slight. SAT and ASR seen obliquely from side and above to see through PAF in one each of the female specimens from Mauritius, India and Nepal is given in Figs. 451, 452 and 453 respectively. The comparatively large punctures on mesoscutum, presence of lateral carinae on propodeum and distinct lateral furrows of area dorsalis and bright colour of fore and mid legs, combined with the characters of SAT-ASR and the clypeus are the main clues to identify the present species.

93. TRYPOXYLON OPERCULUM sp. nov.

♀, 13 mm. Characteristic in the structure of supraantennal area and can easily be separated from other allied species. The form of clypeus, shorter A3 and colour of legs are also of use in its identification.

Black; ferruginous are mandible, mouth parts, tegula, fore tibia and tarus, bases of mid and hind tibiae and fore tibial spurs; rest of spurs dark brown; gaster from apex of petiole, including sides of apical swelling, to base beneath of G4 yellowish red. Hair silvery, on clypeus parallel.

Head in frontal view with sides rounded, vertex not depressed. HW,HL,IODv,A3,P= 100,54,24,18,164, OOD,Od,POD÷1,5,3, OOD very narrow, IODs=10:9.5, A3=AW×3.2, A3,4, 5 ÷10,7,6. Frons weakly raised, surface nearly flat, with very shallow and wide medial furrow, SAT low, bread tuberiform, anterior expanded and connected with ASR almost without PAF, ASR remarkably broadly expanded, transparent brown, smooth and polished, seen vertically: Fig. 454, seen obliquely from side and above: Fig. 455, apical margins of both ASRs connected with each other at the medio-apical depressed area of SAT, forming a waved transverse acute carina that hangs highly over interantennal area (Fig. 456, seen obliquely from beneath, S.. antennal socket), medial carina of SAT very obtuse; clypeus: Fig. 457, at base only gently raised and at apex at the anterior margin of haired area reflected, occipital carina complete, but weak behind buccal cavity and depressed. Collar of pronotum raised towards middle and weakly tuberculate there, seen from above considerably incrassate laterally, posterior part discoloured, brown-



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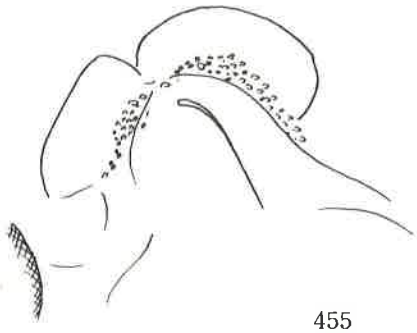

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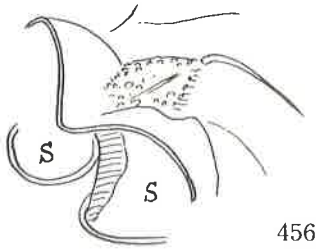

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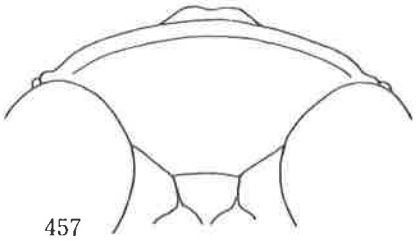

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ish, lamina on side: Fig. 458, subalar area posteriorly edged on outer margin, but not expanded laterally. Propodeum with lateral carinae, area dorsalis enclosed with weak furrow, medial furrow comparatively deep, posteriorly enlarged, area apicalis with medio-dorsal area widely open, GSR subtriangularly highly raised, with apex rounded, petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,20,5.5,30(26),30(30). In fore wing RC C-type, R1 moderately long, with apex reaching fairly close to wing apex, CV1=CV2×5, TCV only gently sinuate, CV2 weakly curved, angle between about 120°, cubital cell 2 and apical CV fairly distinct.

Frons microcoriaceous and closely superimposed with small flat-bottomed punctures punctures anteriorly and on SAT finer and closer, but on mid posterior part of ASR coarsely sculptured; mesoscutum with strong plumbeous shine, fairly closely covered with comparatively large but shallow and weak punctures, propodeum with longitudinal series of transverse striae along lateral carinae, fairly distinct, furrows of area dorsalis also striate, posterior inclination in front of area apicalis transversely arcuately striate, on other areas surface sparsely covered with fine hair-bearing punctures, sides smooth and polished and broadly scattered with fine shallow punctures, except antero-ventral area.

♂, unknown.

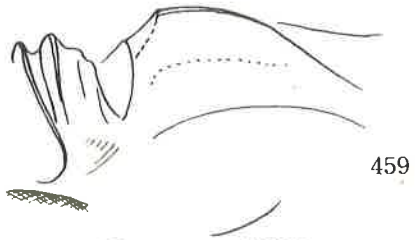
Holotype: ♀, South India (Anamalai Hills, Cinchona, 3500 ft), V. 1964, P. Susai Nathan (RMNH).

94. TRYPOXYLON LANGKAWIENSE sp. nov.

♀, 12-13 mm. Similar to errans, but somewhat larger, IODs=10:6.7, mid leg widely black, RC M-type and the form of clypeus and punctures on mesoscutum also considerably different.

Black; A1 and 2 dark ferruginous beneath and at apices; ferruginous are mandible, mouth parts, tegula, knees, fore tibia with apical spur and tarsus, bases of mid and hind tibiae and T5 of mid leg; tibial spurs pale brown, longer one of hind leg somewhat darker; gaster from apical swelling of petiole to G4 ferruginous red, side of petiole from spiracles posteriorly also reddish. Hair silvery, at base of clypeus weakly convergent towards medial line.

Head in frontal view with sides roundly, slightly convergent below, vertex not depressed. HW,HL,IODv,A3,P=100,48,27,24,134, OOD,Od,POD≒1,3,2, IODs≒3:2, A3=AW×4.3, A3,4,5≒10,7,6. Frontal elevations moderately roundly raised, medial furrow also moderately deep, SAT-ASR similar in structure to errans, seen obliquely from side and above to see through PAF: Fig. 459, but in the present species apical margin of SAT roundly edged (Fig. 460, seen obliquely from beneath). Clypeus: Fig. 461, disc at base weakly raised and at apex also weakly reflected. Collar of pronotum gently, nearly straightly raised towards middle, top rounded, seen from above considerably incrassate laterally, posterior part discoloured, pale brownish, lamina on side: Fig. 462; subalar area of mesopleuron with half developed pent-roof structure, lateral edge somewhat expanded



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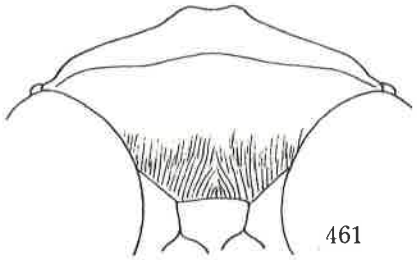

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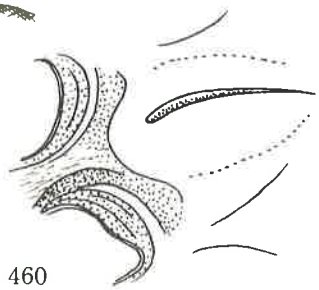

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Figs. 459-462. Trypoxylon langkawiense sp. nov., ♀

laterally. Propodeum with distinct lateral carinae, area dorsalis with distinct lateral furrows, area apicalis only on side enclosed with carinae, GSR roundly highly elevated, gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,19,6,32(28),33(34). In fore wing RC M-type, Rl moderate in length, but almost reaching wing apex, CV1=CV2 6, TCV weakly sinuate, CV2 nearly straight, angle about 120°.

Frons distinctly microcoriaceous and superimposed with flat-bottomed shallow punctures, PIS slightly larger than PD, mesoscutum fairly closely covered with comparatively large but weak punctures, PID≒PD, surface with strong plumbeous shine, propodeum with lateral series of striae fairly distinct, furrows of area dorsalis transversely striate, sides broadly smooth and polished and scattered with comparatively large punctures on dorsal and posterior areas.

♂, unknown.

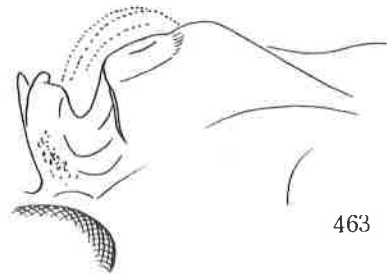
Holotype: ♀, Malaya (West coast, Langkawi Is.), 15. IV. 1928, H. M. Pendlebury (BMNH).

Paratype: 1 ♀, Malaya (Kedah Peak, 3000 ft), 13. III. 1928, H. M. Pendlebury (BMNH).

95. TRYPOXYLON NIGRICORNE sp. nov.

♀, 17-19 mm. In appearance resembling bicolor Smith, but in the present species IODs=1:1, propodeum with distinct lateral carinae, area dorsalis enclosed with distinct furrow, RC C-type, punctures on mesoscutum distinct, larger and closer, antenna not ferruginous beneath and legs more broadly blackish. Furthermore, detailed structure of supraantennal area and clypeus is also dissimilar.

Black; mandible ferruginous, at base black and at apex dark brown; ferruginous are mouth parts except basal areas, tegula, fore tibia at base and on basal half in front, tibial spurs and claws; gaster from apex of petiole (on sides broader) to G4 reddish yellow, rest of legs with ground colour dark brown, fore tarsus and bases of mid and hind tibiae slightly paler. Hair silvery, at base of clypeus weakly convergent towards medial line.



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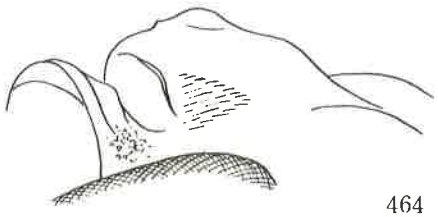

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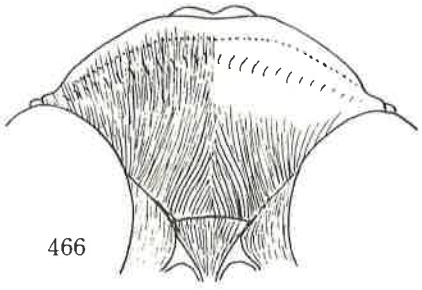

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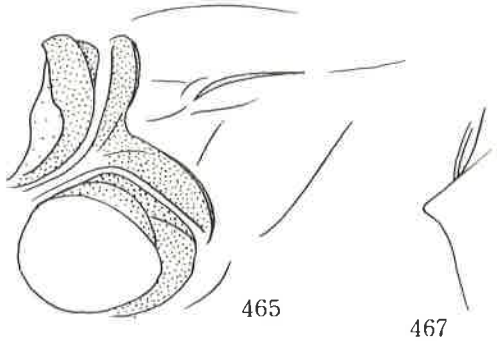

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467

Head in frontal view with sides roundly and distinctly convergent below, vertex considerably depressed. HW,HL,IODv,A3,P=100,50,22,28,170, OOD,Od,POD≒1,2,1, IODs=10:10, A3=AW×4.5, A3,4,5≒10,6.5,6.5; frontal elevations moderately high, rounded, median furrow moderately deep, with distinct bottom line, SAT (naturally covered with hair) low broad nasiform, meiial ridge acutely carinated, the area around apex of the

carina narrowly flattened and edged at anterior margin, the edge against ASR distinctly carinated (Figs. 463-465), ASR highly raised, bicarinate at apical margin, PAF deep, flat-bottomed (Fig. 463, seen obliquely from side to see through PAF), the structure seen in profile: Fig. 464, seen obliquely from beneath: Fig. 465.(the structure is very constant in all the specimens); clypeus: Fig. 466, shorter than in bicolor, at base gently raised and at apex distinctly reflected; occipital carina complete, not depressed behind mouth cavity. Collar straightly raised towards middle and weakly tuberculate there, posterior part half discoloured, glossy brown in colour and delicately pubescent, lamina on side triangular, apex toothed (Fig. 467); subalar area of mesopleuron posteriorly with half-developed pent-roof structure; area apicalis on propodeum distinctly enclosed with carina, GSR highly elevated, higher than semicircle, ambur yellow in colour; petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,14,5.5,28(16),30(22). In fore wing RC C-type, Rl rather short, not reaching close to wing apex, CV1=CV2×6, TCV fairly strongly sinuate, longer than CV2, angle at the corner nearly 90°, as a whole appr. 120°.

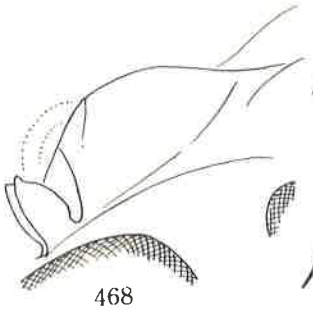
Frons weakly microcoriaceous, surface fairly shining and strongly closely superimposed with comparatively large punctures, punctures on central parts of elevations somewhat sparse; mesoscutum with strong plumbeous shine and closely covered with somewhat large punctures; propodeum with lateral series of distinct striae, area dorsalis at base obliquely shortly striate, on furrows sometimes weakly irregularly striate or crenate, sometimes without distinct striae, rest of the surface finely sparsely punctured, sides finely, weakly and sparsely punctured except antero-ventral smooth area, punctures posteriorly sparser, surface shining.

♂, unknown.

Holotype: ♀, Singapore, C. F. Baker leg. (USNM).
Paratypes: 2 ♀, ditto. 2 ♀, Laos (Vientiane Prov., Ban Van Eue), 20. IV. 1966, 15. XI. 1966, native collector (BPBM).

96. TRYPOXYLON SEDONENSE sp. nov.

♀, 18 mm. Closely related to the preceding species, differing mainly in the following characters: Head in frontal view with vertex not depressed, IODs=10:8, area dorsalis of propodeum not enclosed with furrow, SAT (Fig. 468, obliquely from side, Fig. 469, obliquely from beneath) with medio-apical area not transversely edged, but smoothly inclined to interantennal area, clypeus (Fig. 470) at base more highly raised and medianly with a distinct ridge, apical margin more strongly produced anteriorly, GSR nearly simple and black (pronotal lamina similar).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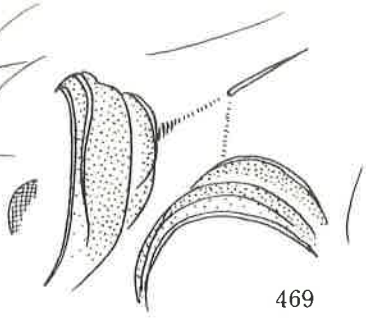
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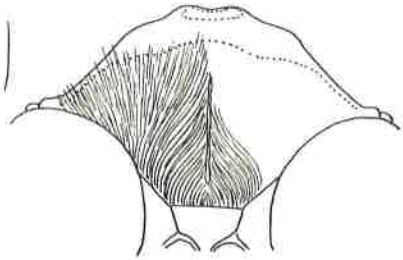
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Colouration generally similar, but gastral segment 4 only at extreme base reddish and fore tarsus except T5 and articulations black above. Further slight differences: IODv relatively somewhat broader, frontal elevations much lower, median furrow also shallower (but with a fine impressed line in middle), mesoscutum without plumbeous shine and more distinctly punctured, area apicalis on propodeum enclosed with carina, but the area smaller, subalar area posteriorly edged at the outer margin, but not produced laterally.

Measurements: HW,HL,IODv,A3,P=100,50,24,26,182, A3=AW×4.3, A3,4,5÷10,7,6.5, P,Ma,Mi,2(Ma),3(Ma)=100,14,5,26(17),28(26). RC B-type, Rl short, CV1=CV2×7, TCV strongly curved inwards at posterior 3rd, angle at the corner about 100°, as a whole roughly 120°.

♂, unknown.

Holotype: ♀, Laos (Sedone Prov., Pacse), 31. V. 1967, native collector (BPBM).

97. TRYPOXYLON MEMBRANACEUM sp. nov.

♀, 8.5–10.5 mm. Characteristic in the structure of supraantennal elevation, it is somewhat similar in appearance to that of operculum, but in the present species both ASRs are not connected with each other, but distinctly separated by the narrow and deep interantennal furrow.

Black, antenna basally somewhat brownish, clypeus with glabrous apical margin castaneous brown. Ferruginous to ochre yellow are mandible, mouth parts, both ends of fore femur, fore tibia on basal half, mid and hind tibiae at base, tibial spurs and fore T5. T5 of other legs also more or less ferruginous, legs generally somewhat brownish, in old specimens markedly so. ASR and tegula of wing transparent pale brown, gaster from apex of petiole to G3 yellowish red. Hair silvery, on clypeus parallel.

Head in frontal view with sides rounded, vertex not markedly depressed. HW,HL, IODv,A3,P=100,52,23,18,160, OOD,Od,POD=1,5,3, IODs=10:9–10, A3=AW×3–3.3, A3,4,5= 10,7,7. Frontal elevation weak, surface nearly flat, with very weak medial furrow, SAT and ASR in vertical view: Fig. 471, seen obliquely from side to see through PAF: Fig. 472, in profile: Fig. 473, SAT at median carinated area only obtusely raised, ASR widely expanded, smooth and polished, nearly ambur yellow in colour. Clypeus: Fig. 474, basal elevation weak, apical reflection rather mediocre; occipital carina complete. Collar of pronotum raised towards middle and weakly tuberculate there, seen from above anterior part not very narrow, not subcarinate and considerably incrassate laterally, posterior part discoloured, lamina on side: Fig. 475; subalar area posteriorly edged on outer margin, but not expanded into pent-roof structure; propodeum with lateral carinae, area dorsalis enclosed with very weak furrow (in specimens from Laos fairly deep and distinct), area apicalis incomplete, GSR subtriangularly highly raised, with apex rounded, ambur yellow in colour; petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,14,7,34(24), 36(34). In fore wing RC C-type, Rl not long, CVl=CV2×5, TCV slightly longer than CV2, both nearly straight, angle about 110°.

Frons distinctly microcoriaceous, closely superimposed with fine punctures, punctures partly subrugosely confluent, mesoscutum with plumbeous shine, with punctures comparatively large, but indistinct in outline, but fairly close, propodeum smooth and shining, but lateral series of short striae present, posteriorly more distinct.

♂, 6.5–7.0 mm. Generally similar to ♀, but smaller, with gaster less markedly red maculated, SAT and ASR similar in structure, but ASRs seen vertically with intermediat angle more broadly open, V-shaped (sinus minutely rounded), clypeus with apical outline similar, but less produced anteriorly, antenna showing sexual characters and gaster thicker. Measurements:

HW,HL,IODv.A3,P=100,52,26,12,122, OOD,Od,POD=2,5,4, IODs=10:9, A3=AW×2.2, A3, 4,5≒10,7,8, Al3=BW×2.3, appr. as long as 3 preceding joints united, P,Ma,Mi,2(Ma),3 (Ma)=100,24,8,34(38),36(50). In fore wing RC C-type, Rl not long, CVl=CV2×4, TCV:CV2≒ 3:2, both nearly straight, angle roughly about 120°.

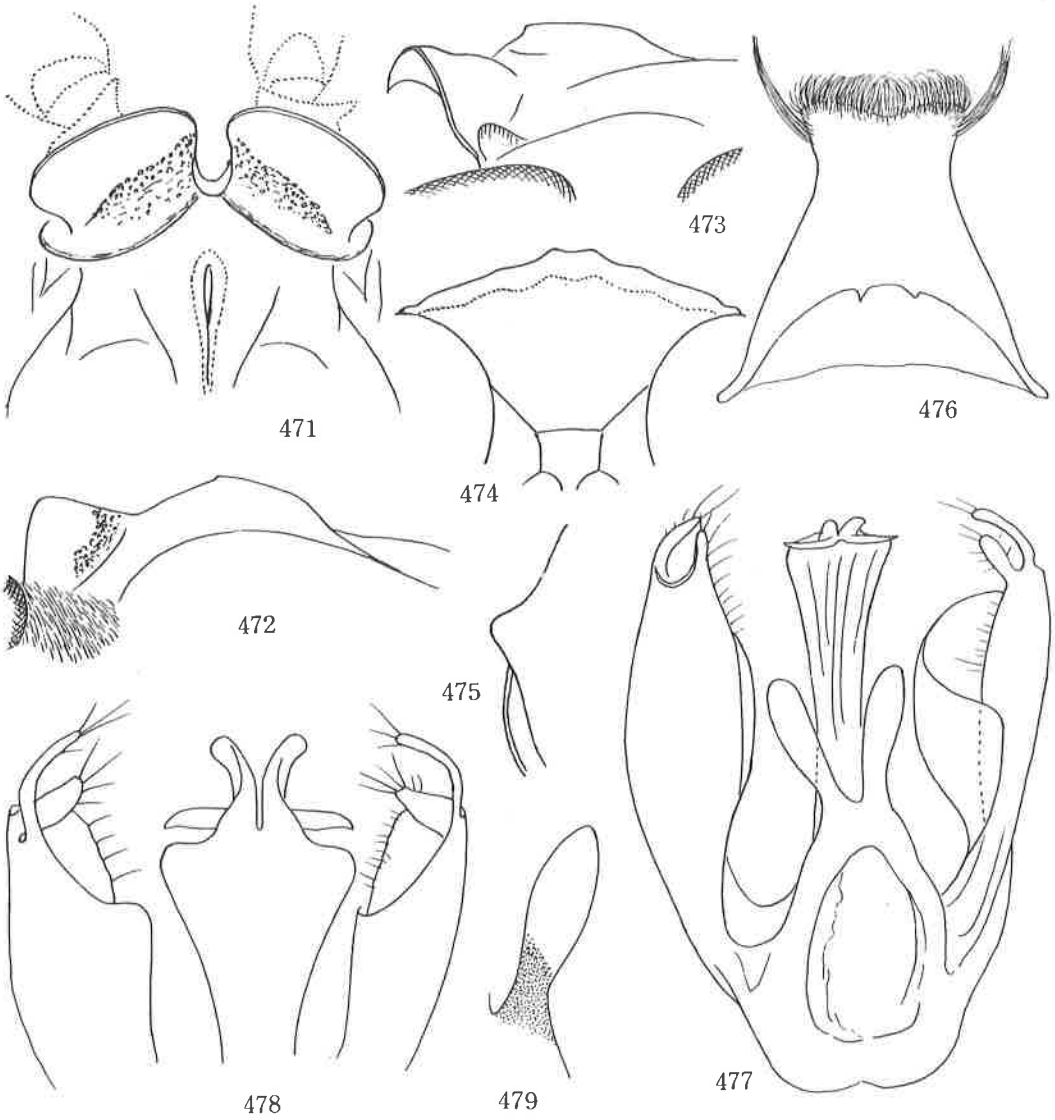
Sternite 8: Fig. 476, apical fringe of hair delicate, very fine and soft, markedly dense. Genitalia seen from beneath: Fig. 477, apical half seen from dorsal side: Fig. 478, paramere at apex asymmetrically bifid, both branches finger-shaped, sparsely fringed with hair, the dorsal longer and narrower, both curved, volsella spatulate, comparatively short, the right half seen from beneath: Fig. 479, penis valve with distinct shoulder and a pair of sickle-shaped appendages before apex.

Holotype: ♀, Singapore, C. F. Baker leg. date unknown (USNM).

Paratypes: 1 ♀ 3 ♂, ditto (USNM); 2 ♀, Laos (Vientiane Prov., Ban Van Eue), 30. II. 1965, 30. III. 1966, native collector (BPBM); 1 ♀, South India (Nilgiri Hills, devala, 3200 ft), IV. 1961, P. Susai Nathan (RMNH).

98. TRYPOXYLON MELANOCORNE sp. nov.

In structural characters the present species is very similar to T. nigricorne described earlier in this paper, but is much smaller in body size, IODv relatively greater (HW:IODv=100:26), vertex not depressed, A3 relatively shorter, IODs=5:4, anterior margin of SAT completely acutely edged and slightly reflected like a carina



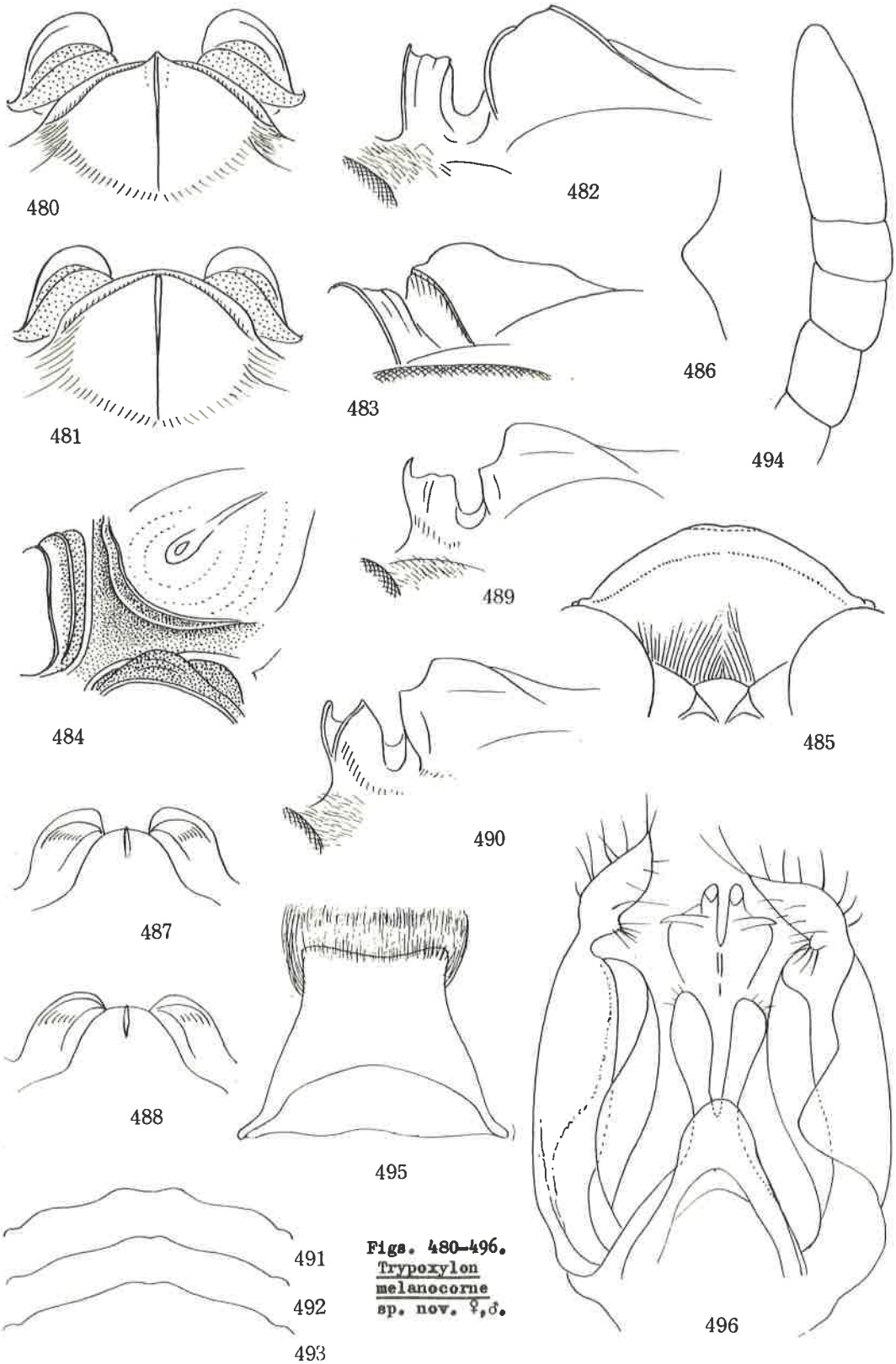
Figs. 471–479. Trypoxylon membranaceum sp. nov., 471–475 ♀, 476–479 ♂

and PAF much deeper.

♀, 12–12.5 mm. SAT low tuberculate, anteriorly transversely carinate, PAF deep, flat-bottomed, IODs=5:4, clypeus rounded out, with medio-apical margin subtruncate, legs brownish, fore tibia at base in front narrowly ferruginous, gaster medianly red.

Black; mandible ferruginous, mouth parts pale brown, palpi paler, tegula transparent brown, gaster from apex of petiole to G3 reddish yellow, sometimes the area largely black and only brownish beneath, fore tibia and tarsus, bases of mid and hind tibiae narrowly and tibial spurs somewhat pale brown. Hair silvery, on clypeus at base weakly convergent towards medial line.

In holotype HW,HL,IODv,A3,P=100,50,26,24,186, OOD,Od,POD=1,2,2, IODs=10:8, A3=AW 4.3, A3,4,5=10,7,6.5, P,Ma,Mi,2(Ma),3(Ma)=100,12,4,28(14),32(23). In one of paratypes from Laos (gaster medianly red) the values respectively: 100,48,26,25,202, 1, 2.5,2, 10:8.5, AW 4.3, 10,6.5,6, 100,12,4,28(13),28(22). In both gastral petiole markedly long and slender. Head in frontal view with lateral margins roundly, not strongly convergent below. Frontal elevations moderately high, median furrow broad, at



Figs. 480–496. Trypoxylon melanocorne sp. nov. ♀,♂.

base moderately deep, but on apical area widely open and nearly flat. SAT in holotype from Singapore low broad and medianly with small nasiform elevation (Fig. 480, dorsal view), in paratypes from Laos roundly raised as a whole (Fig. 481), in both apical margin in vertical view roundly curved and carinated, accompanied just behind with a fine transverse furrow, ASR highly raised, tricarinate, median carina often weak and indistinct, apical carina ambur yellow in colour, SAT-ASR seen obliquely from side to see through PAF: Fig. 482 (holotype), seen in profile: Fig. 483 (do.), seen obliquely from beneath: Fig. 484; clypeus: Fig. 485; occipital carina complete. Collar raised towards middle and weakly tuberculate there, seen from above somewhat thick, roundly raised and incrassate towards sides, posterior part discoloured, brown in colour, lamina on side: Fig. 486; subalar area posteriorly simply edged on outer margin. Propodeum with lateral carinae, area dorsalis enclosed with distinct furrow, area apicalis nearly complete, only on dorso-medial area narrowly incised, GSR highly raised, slightly brownish. Gastral petiole flask-shaped. In fore wing RC C-type, Rl short, CVl=CV2×5, TCV slightly sinuate, longer than CV2, angle roughly about 120°.

Frons weakly microcoriaceous, fairly strongly shining and closely, partly subrugosely superimposed with comparatively large distinct punctures, mesoscutum in holotype without plumbeous shine, in paratypes with strong plumbeous shine, surface smooth and in all fairly closely covered with comparatively large punctures, propodeum with lateral series of striae, area dorsalis on 3 furrows transversely striate, posterior inclination in front of area apicalis transversely somewhat arcuately striate.

♂, 9.5–10.0 mm. Similar in general to ♀, especially in the structure of SAT-ASR, but expansion of apical margin of ASR is more or less variable as given in Figs. 487–488, 489–490, ASR usually tricarinate, but sometimes bicarinae; colouration similar, but posterior part of collar not completely discoloured, only posteriorly castaneous brownish, tibial spurs brown. Clypeus with apical margin as in Figs. 491–493, more or less variable, A10–13: Fig. 494. Propodeum with strong lateral carinae, area dorsalis with comparatively deep furrows. Sculpture and punctuation as in ♀.

Sternite 8: Fig. 495, pubescence at apical margin markedly dense, without longer tuft on each side; genitalia seen from beneath: Fig. 496, apical lobiform lamella of paramere with a minute tubercle at base, carrying a few stiff hairs.

Measurements in one of the males: HW,HL,IODv,A3,Al3,P=100,47,29,19,22,170, OOD, Od,POD=3,5,4, IODs=10:8, A3=AW×3, Al3=BW×2.4, as long as 3 preceding joints united, P,Ma,Mi,2(Ma),3(Ma)=100,12,5,28(18),28(28). RC=C-type, Rl short, CVl=CV2×3.3 (in others 3.2, 4.0), TCV moderately sinuate, =CV2, angle roughly about 110°.

Holotype: ♀, Singapore, C. F. Baker leg. (USNM).

Paratypes: 1 ♀, Laos (800 m, Phou-Kowkuei), 16. IV. 1965, J. L. Gressitt (HPBM); 1 ♀, Laos (Sedone Prov., Pakse), 31. V. 1967, native collector (HPBM); 2 ♂, Laos (Vientiane Prov., Ban Van Eue, 750 m, forest streambed), 10–11. IV. 1965, J. L. Gressitt (Malaise trap)(HPBM); 1 ♂, Laos (800 m, Phou-Kowkuei), 15. IV. 1965, J. L. Gressitt (HPBM).

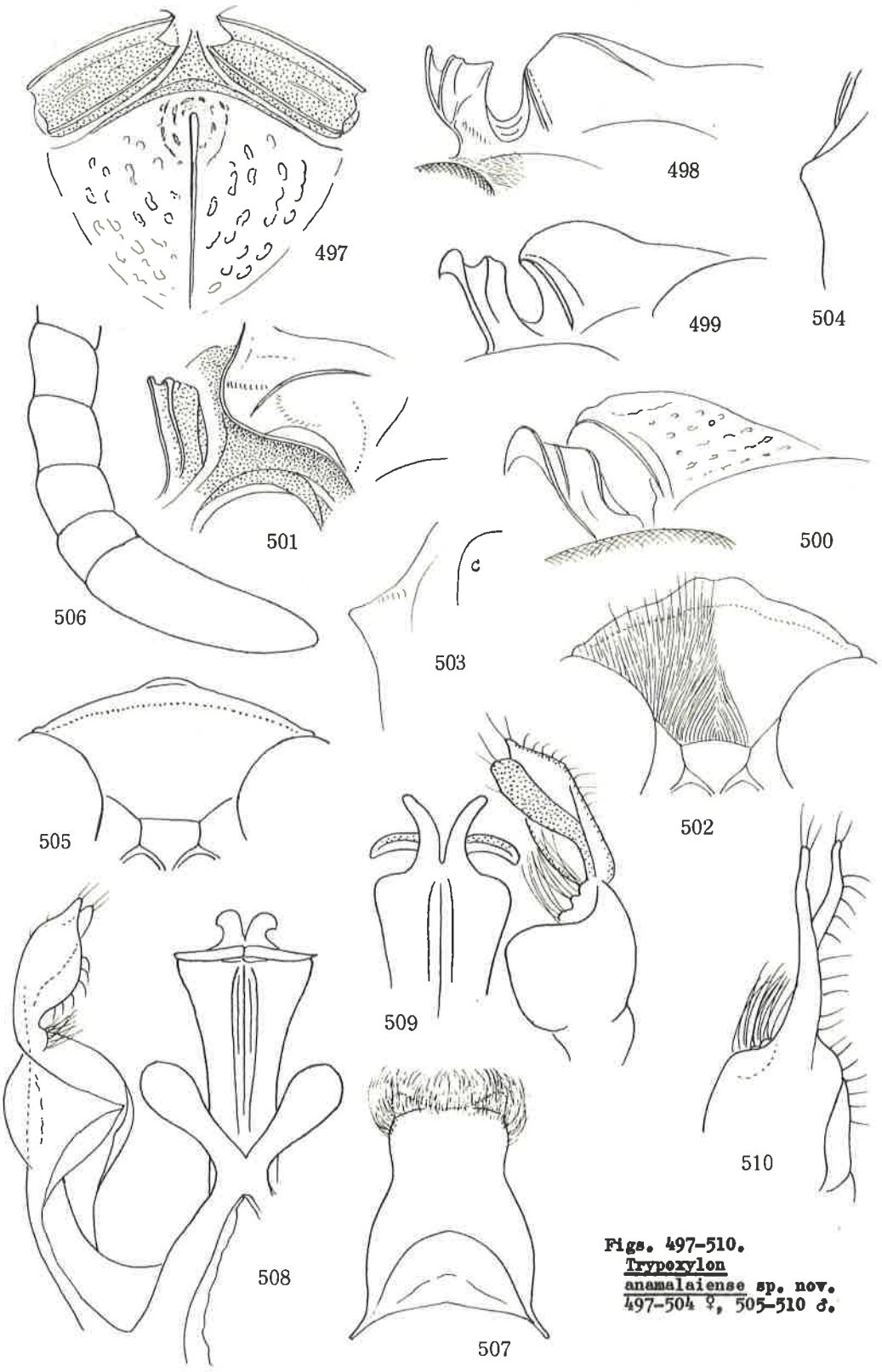
Remarks. In one female specimen from Laos (Sedone Prov.) gaster is nearly completely black, only medianly beneath brown.

99. TRYPOXYLON ANAMALAIENSE sp. nov.

♀, 14–16 mm. Somewhat resembles the preceding species, but a little larger, ground colour of legs pure black, SAT lower, with apical margin more strongly overhang, clypeus somewhat different in the form of apical margin, gastral petiole robuster and punctures on frons and mesoscutum much stronger. The present species is also closely related to orientale Cameron, but can be separated from it by the difference in the structure of SAT-ASR.

Black; mandible ferruginous at base black and at apex reddish dark brown, palpi ochre yellow, tegula transparent brown, gaster from apex of petiole (sometimes on sides only) to G3 or G4 yellowish red, sometimes with blackish marks above; fore leg with knee, base of tibia in front, spur, T4–5 and claws pale brown, a patch on mid T5 and all claws also brownish, rest of tibial spurs dark brown. Hair silvery, on clypeus at base weakly convergent towards medial line, in some specimens nearly wholly parallel.

Head in frontal view with sides roundly, weakly conveggent below, vertex not strongly depressed; measurements (within parenthesis in one of paratypes): HW,HL,IODv, A3,P=100,45,24,26,168(100,47,22,24,158), OOD,Od,POD=1,3,2(1,6,3...this is exceptional), IODs=10:9(10:9), A3=AW×4.5(5.0), A3,4,5=10,7,6(10,7.5,7), P,Ma,Mi,2(Ma),3(Ma) =100,19,6,28(25),28(30)(100,18,6,30(22),32(30)). Frontal elevations moderately high,



Figs. 497-510.
Trypoxylon
anamalaiense sp. nov.
497-504 ♀, 505-510 ♂.

medial furrow moderately deep, but on anterior portion opened to broad shallow depression, SAT moderately high, broadly tuberculate, shorter than apical width, apex curved, acutely edged and perpendicularly inclined anteriorly (Fig. 498, obliquely from side to see through PAF) or slightly overhanging (Fig. 499, ditto), ASR ring-form seen from above, on both margins strongly carinated, especially the anterior that is markedly expanded inwards (Fig. 497, seen vertically), PAF deep, flat-bottomed (Figs. 498,499), in profile: Fig. 500, obliquely from beneath: Fig. 501; clypeus: Fig. 502, at base only gently raised, in form very similar to orientale; occipital carina complete. Collar of pronotum nearly straightly raised towards middle and weakly tuberculate there, seen from above anterior part narrow and weakly incrassate laterally, posterior part sometimes half-, sometimes completely, discoloured, appearing somewhat castaneous or pale ferruginous, lamina on side triangularly produced, more or less varied in apical form (Figs. 503, 504), mesopleuron at subalar area normal, lateral edge of its posterior part very weak. Propodeum with lateral carinae, area dorsalis with broad shallow but distinct lateral furrows, area apicalis enclosed with carina, but on medio-dorsal area carina weak, GSR strongly elevated, ambur yellow in colour, gastral petiole flask-shaped, in fore wing RC C-type, Rl short, CV1=CV2×6-7, TCV:CV2≒3:2, both weakly sinuate, angle formed by them roughly about 90°.

Frons distinctly microreticulate and distinctly and fairly closely superimposed with compapatively large flat-bottomed punctures, PIS≦PD and smaller anteriorly, SAT more closely covered with shallow indistinct punctures, on flat area on top coarsely, arcuately rugose, mesoscutum with strong aeneous shine, with punctures comparatively large and fairly close, propodeum with distinct series of striae along lateral carinae, furrows of area dorsalis transversely striate, posterior inclination on posterior half covered with transverse striae extending from the lateral series, sides covered with distinct punctures with varied density, anterior portion obliquely finely closely striate, sometimes even antero-ventral smooth area also covered with delicate close striae and posteriormost area obliquely closely striate.

♂. 10 mm. Generally similar to ♀. Fore tibia on basal half in front and fore tarsus with T4 and 5 ferruginous as in some of ♀.

HW,HL,IODv,A3,Al3,P=100,46,27,15,28,126; OOD,Od,POD≒3,4,4, IODs=10:8.5, A3=AW×2.3, Al3=BW×3.3, A3,4,5≒10,7.5,7, P,Ma,M1,2(Ma),3(Ma)=100,19,7,33(24),36(37). RC close to M-type, Rl short, CV1=CV2×5, TCV:CV2=3:2, both nearly straight, angle about 90 . Suprantennal elevation similar in structure. Clypeus: Fig. 505, at base gently raised, with hair almost parallel, Al3: Fig. 506. Sternite 8: Fig. 507. Genitalia seen from beneath: Fig. 508, paramere considerably dark brown onouter side, at apex bifid, the state of splitting well observed in lateral view (Fig. 510) or dorsal view (Fig. 509), at base of dorsal branch some minute tubercles present whence marked bristles shooting out. Volsella spatulate, much broader than usual (in Fig. 508), penis valve with shoulder and a pair of sickle-shaped appendages.

Holotype: ♀, South India (Anamalai Hills, Cinchona, 3500 ft), V. 1964, P. Susai Nathan (RMNH).

Paratypes: 2 ♀, the same place and time, P. Susai Nathan (RMNH); 1 ♀, South India (Nilgiri Hills, Devala, 3200 ft), X. 1960, P. Susai Nathan (RMNH); 1 ♀, South India (Pondicherry State, Koaihal ?), V. 1967, ? (USNM); 1 ♂, South India (Muthikolam , Columbatore District), 23-26. IX. 1938, B.M.-C.M. Exped. to S. India (RMNH).

Remarks. The state of apical inclination of SAT is more or less varied as given in the description, the form of PAF also somewhat varied accordingly. OOD:POD is most usually 1:2, in one exceptional specimen it is 1:3, this is due to very narrow OOD. Area dorsalis on propodeum is always striated on the lateral and medial furrows and on the disc usually very finely and sparsely punctured, in one specimen bearing the exceptional OOD the place is transversely finely closely striate. In this specimen the SAT at apical margin strongly hangs over the interantennal area.

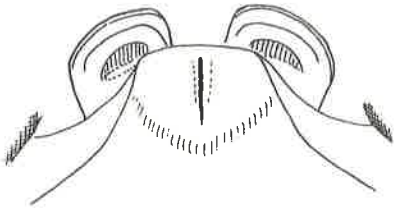
100. TRYPOXYLON MATHERANICUM sp. nov.

Closely resembles the preceding species, but smaller, with SAT not so acutely inclined anteriorly, with apical marginal carina broadly interrupted in middle and smoothly obliquely inclined there, A3 noticeably shorter, frontal medial furrow shallower and surface of mesoscutum mat, with feeble microreticulation under high magnification.

♀, 10-11 mm. Black; mandible ferruginous, at extreme base black and at apex brown, palpi and discoloured posterior part of collar ochre yellow; fore tibia in front

all tibial spurs and fore tarsus at least in part, sometimes mid tarsus also partly pale brown; generally legs more or less brownish; tegula transparent brown; gaster from apex of petiole to G3 reddish yellow, usually posterior part of G2 and 3 variably blackish. Hairs silvery, on clypeus nearly parallel.

Head in frontal view with lateral margins rounded and gently convergent below, in holotype HW,HL,IODv,A3,P=100,50,26,20,138, OOD,Od,POD≒2,6,5, IODs=10:7.7, A3= AW×3.7, A3,4,5≒10,7,6, frontal elevations moderately high, but median furrow very shallow, surface nearly flat, SAT similar in pattern to the preceding species (Fig. 511, vertically seen, Fig. 512, in profile), but much lower (Fig. 512), apical carina medianly interrupted (Fig. 513, seen obliquely from beneath) and there obliquely, either smoothly or with a weak step, inclined to interantennal area. Clypeus: Fig. 514, at base weakly raised and at apex distinctly reflected; occipital carina complete. Collar of pronotum roundly raised towards middle, without medial tubercle, anterior part narrow, sometimes acutely carinate across middle, usually the ridge rounded, lamina on side: Fig. 515, subalar area posteriorly edged on outer margin, but not expanded; propodeum with lateral carinae, area dorsalis enclosed with distinct furrow, area apicalis incomplete, GSR obliquely roundly raised, but not discoloured; gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,21,7,34(26),36(32). In fore wing RC=C-type, close to M-type, R1 short, but reaching close to wing apex, CV1≒CV2×5, TCV≒ CV2× 1.5, TCV weakly sinuate, angle roughly about 90°.



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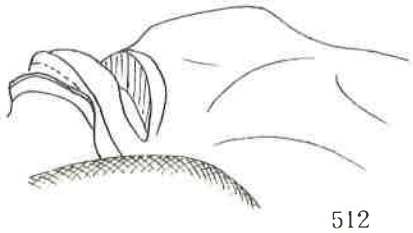

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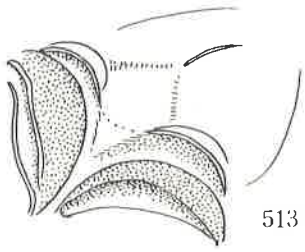

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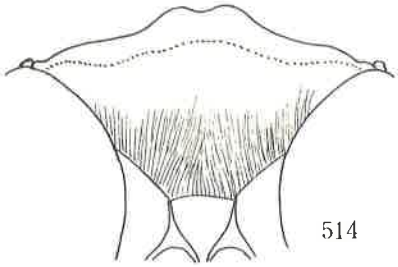

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Frons strongly microreticulate and moderately closely superimposed with distinct punctures, mostly PIS≒PD, SAT more finely, more closely punctured, mesoscutum with surface under high magnification delicately microcoriaceous, nearly mat, punctures comparatively large, but not clearly outlined, PIS 1-2 times PD, propodeum with series of striae along lateral carinae, furrows of area dorsalis transversely striate, sometimes striae extending on to the disc, sides smooth and polished, with sparse fine punctures scattered.

♂, unknown.

Holotype: ♀, India (Matheran), III. 1899, C. G. Nurse (BMNH).
Paratypes: 1 ♀, Singapore, V. 1949, N. L. H. Krauss (BPBM); 1 ♀, Thailand (Doi Suthep), 29-31. III, 1958, T. C. Maa (BPBM).

Remarks. In the holotype specimen SAT has a weak step at the medio-apical inclination, while in both paratypes the place is smoothly inclined. In the Singapore example IODv is relatively 22, OOD,Od,POD≒1,5,3, A3= 10.5 and AW×4, IODs=10:8. In the Thailand example IODv=25, OOD,Od,POD=1,3,3, A3= 10.5 and AW×4, IODs=10:7.7. P=136 and 116 respectively. In both, the clypeus much less produced anteriorly than in *anamalaiense*, the form of apical margin is much the same as Fig. 514.

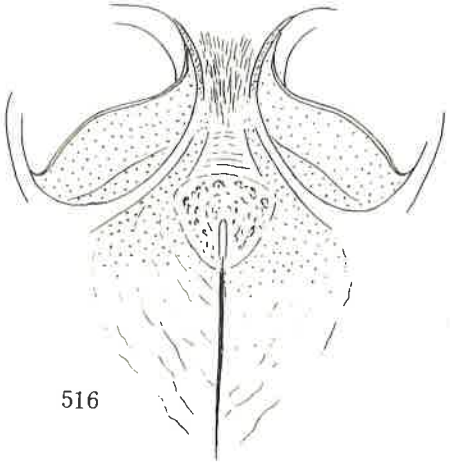
101. TRYPOXYLON ORIENTALE Cameron, 1904

Trypoxylon orientale Cameron, Ann. Mag. Nat. Hist., (7) 13: 218, 1904 (♀, Assam: Khasia Hills).
Trypoxylon orientale: Tsuneki, SPJHA, 8: 56, 1978 (redescription of lectotype, figs.).

Specimens examined: 1 ♀, lectotype (UMO). 3 ♀, Assam (Shillong) (Mus. ref.No. 5.03, 6.02, 1910-225, Coll. R. E. Turner, one of which 5. XII. 1905) (BMNH); 1 ♀, Assam (Khasia Hills) (Mus. ref. No. 96-135) (BMNH); 1 ♀, Assam (Shillong), Morendro Doonai, 1936 (RMNH); 2 ♀, Nepal (Taplejung Dist., Sangu, c. 6200 ft. mixed vegetation by stream in gulley) IX-X. 1961,(Brit. Mus. East Nepal Exp. 1961-62), R.L.Coe (BMNH); 1 ♂, Nepal (Bokaihunde, 20 km North of Trisuli - Namakot -, 2100 m), 13-17. XI. 1965, L. W. Quate (BPBM); 1 ♀, South India (Nilgiri Hills, Devala, 3200 ft), X. 1960, P. Susai Nathan (RMNH); 1 ♀, Malaya (Cameron's Highland, Tanah Rata, 4500 ft), 28. V. 1931, H. T. Pagden (BMNH); 1 ♂, Malaya (Cameron's Highland, Tanah Rata, 4600 ft), 25. V. 1931, H. T. Pagden (BMNH).

Distribution: Nepal, Assam (Shillong, Khasia Hills), Malaya (Cameron's Highland) and S. India (Nilgiri Hills).

Some supplements. SAT fairly high, roundly tuberculate, medianly longitudinally carinate on top, anterior area roundly inclined, sometimes with a weak step or shelf near base of inclination, surface of top area and anterior inclination irregularly punctate and rugose, but well shining, with covering pubescence scarce. PAF deep, flat-bottomed, ASR highly elevated and extended antero-laterally, with apical margin carinated, surface nearly smooth (Figs. 516, seen vertically; 517, seen obliquely from side and above to see through PAF; 518, in profile). Clypeus with apical margin more or less varied in form as given in Fig. 519. Pronotal lamina seen from dorsal side nearly toothed, but seen vertically with angle about 90°. Mesoscutum smooth and shining, with sparse fine punctures, punctures varied more or less in size, when very fine PIS 5-6 times as great as PD, when comparatively gross 1-3 times so; longitudinal series of striae along lateral carinae of propodeum distinct, lateral furrows of area dorsalis distinct, but rather broad and shallow and finely striate, area apicalis marked off with carina, but carina at medio-dorsal area weak, GSR highly raised, but not discoloured, petiole remarkably long and slender (Table 6). In fore wing RC M-type, Rl short, but reaching very close to wing apex, CV1≒CV2×5, TCV:CV2≒3:2, TCV varied in



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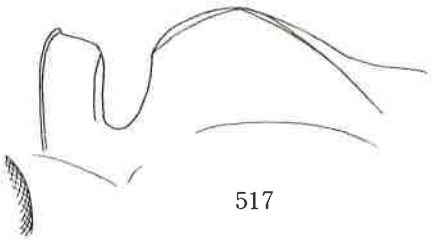

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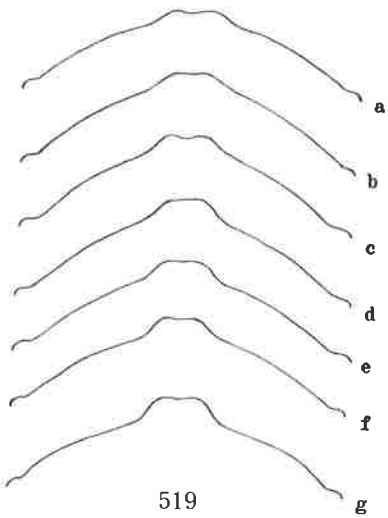

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sinuation, sometimes strongly sinuate, angle ner the corner roughly about 90 . In the specimens from Malaya (♀♂) and Nepal (♂) gastral red is completely disappeared.

♂ (hitherto undescribed). 12-13 mm. Similar in general to ♀. Head in frontal view much wider than long than in ♀, with lateral margins less strongly convergent below, frons with median furrow much shallower and the surface more flattened than in ♀. SAT low rounded tuberiform, top area more or less flattened and coarsely subrugosely punctate as in ♀, seen obliquely from side to see through PAF: Fig. 520, in profile: Fig. 521 (similar in both specimens from Malaya and Nepal). Clypeus (Fig. 522) less strongly produced than in ♀, elevation on disc gentler and larger than in ♀, with covering hair almost on all the area parallel. A3-12 shorter and 13 longer and modified as usual (Fig. 523), appr. as long as 3 preceding joints united. Pronotal lamina triangular, apical angle slightly larger than 90°, with apex pointed in Malayan specimen

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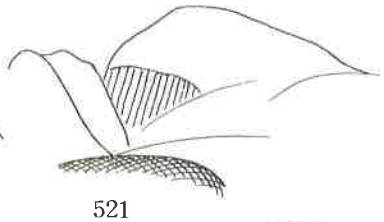

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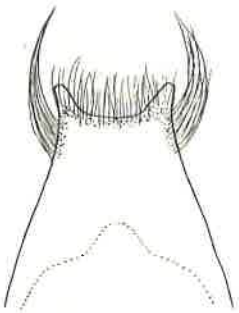

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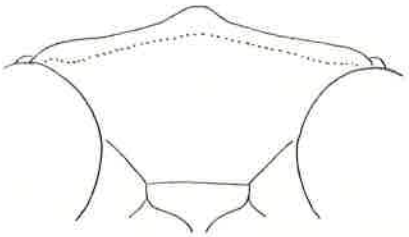

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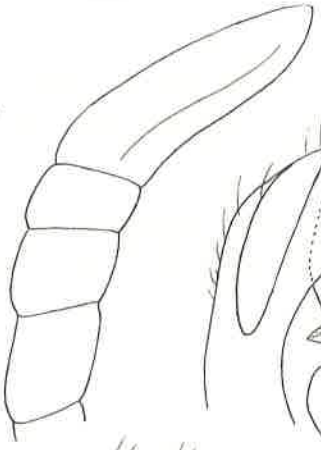

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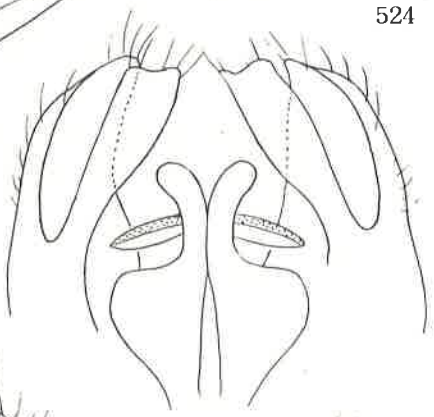

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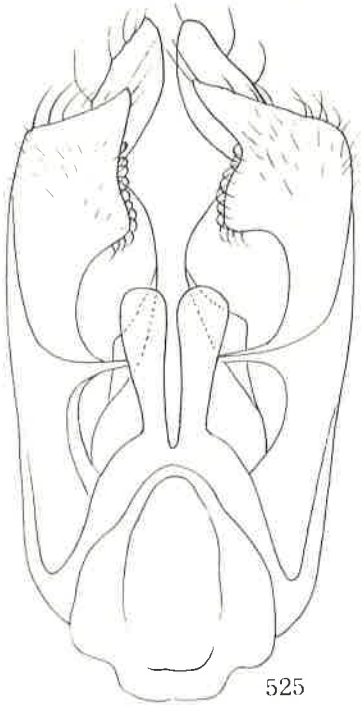

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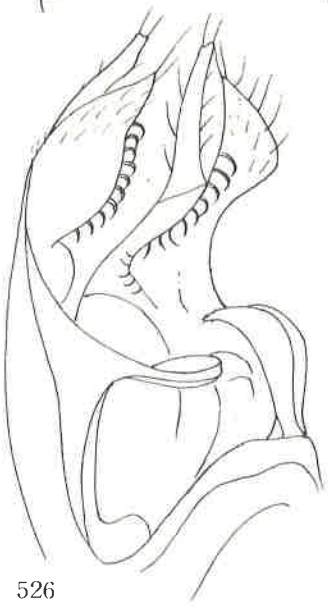

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and minutely rounded in Nepalese one, mesoscutum with (Nepalese) or without (Malayan) plumbeous shine, punctures somewhat sparse and comparatively large (in both similar in size and density, in ♀ Nepalese specimens much finer than in the Malayan). Propodeum with lateral carinae, accompanied inside with a strong series of striae, area dorsalis enclosed with distinct and striated furrow in the Malayan, while weak and rather indistinct and non-striated furrow in the Nepalese. GSR highly and roundly raised in both, apical area broadly discoloured, wings slightly clouded in both.

Table 6. Measurements on Trypoxylon orientale Cameron, 1904, ♀ and ♂

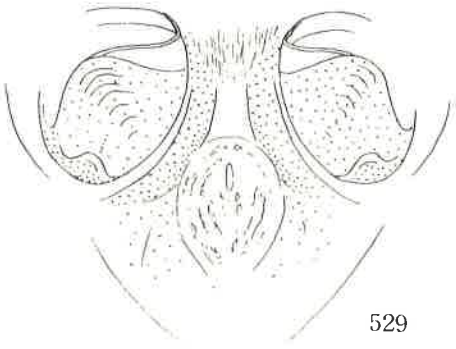
Loco	IODv	A3	P	OOD	Od	POD	IODc	A3	Ma	Mi
Assam: Khasia H.*	25	-	175	2	4	3	9.6	-	15	5
Assam: Khasia H.	27	26	182	2	4	3	9.3	4.7	14	5
Assam: Shillong	28	25	180	5	6	6	9.0	4.9	13	4
Assam: Shillong	28	26	176	2	3	3	9.7	4.7	14	4
Assam: Shillong	29	26	180	3	4	4	9.0	4.7	13	5
Assam: Shillong	25	26	180	2	4	3	9.5	4.7	13	4
Nepal	26	26	184	2	4	3	9.5	4.7	16	5
Nepal	26	26	176	2	4	3	9.3	4.7	16	5
Malaya	28	27	160	2	4	3	9.5	4.6	16	6
South India	28	24	-	2	4	4	8.5	3.3	-	-
Nepal (♂)	31	18	156	2	2	2	9.0	2.5	13	6
Malaya (♂)	30	16	160	2	2	2	9.5	2.6	16	5

Remarks. IODv,A3,P... relative length to HW as 100.
IODc... relative width to IODv as 10. A3... L/W.
Ma,Mi... relative width to petiolar length as 100.
*... Lectotype.

Measurements on main parts are given in Table 6, remaining parts: HL, Al3 (as against HW 100) = 46, 23 (45, 30), 2(Ma),3(Ma) (as against P 100) = 26(20),28(28) (24(20),34(30)); within parenthesis are values in Malayan specimen. RC C-type, Rl short, CV1=CV2 4.3-4.5, TCV strongly sinuate, TCV:CV2=3:2, angle about 90 or 100 . Sternite 8: Fig. 524, genitalia from beneath: Fig. 525, seen obliquely from side to see other aspect: Fig.526, seen in profile: Fig. 527, seen from apex (dorsal side): Fig. 528. Paramere bifurcate at apex into two lobiform layers, the ventral one carrying sparse hair on ventral surface and on inner margin fronged with short, strong. curved bristles (Figs. 525,526), inner margin of main body of paramere expanded and rolled ventrally, outer margin produced inwards at about mid point of its length into a flat broad shelf (Figs. 525,526), not a triangular process, but a plane. Apical part of penis valve provided with well developed shoulder and a pair of sickle-shaped appendages (Fig. 528).

Trypoxylon orientale keralae ssp. nov.

The South Indian specimen listed among those of orientale considerably different in some of the characters from those of Nepal, Assam and Malaya (cf. Table 6 and Fig. 519, g). In this specimen SAT narrower and shorter, with a broad rounded flat



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area on top where coarsely, somewhat rugosely punctate, ASR broader, subtriangularly raised, accompanied with a small elevation at latero-posterior corner (Figs. 529, 530, 531), PAF acute-V-shaped in cross section, flat-bottomed, the structure seen vertically: Fig. 529, obliquely from left side to see through PAF: Fig. 530, in profile: Fig. 531. Clypeus more strongly produced at apex im middle (Fig. 519, g, cf. do., a-f) and more highly and roundly raised on disc, hairs on thorax-complex shorter; mesoscutum with strong plumbeous shine, nearly mat, under high magnification surface feebly microcoriaceous, punctures comparatively large, but indistinct on outline, PIS 1-2 times PD. According to the measurements (Table 6) A3 shorter and thicker and IODc relatively somewhat smaller. Nevertheless, in general characters the specimen is considered to fall within the category of T. orientale, so it is dealt with here as a local race.

♂, unknown.

Holotype: ♀, South India (Nilgiri Hills), X. 1960, P. Susai Nathan (RMNH).

Remarks. From the specimen the gaster is lacking.

102. TRYPOXYLON LOBATIFRONS sp. nov.

♀. Length presumably about 9 mm (gaster from G3 apically lacking). Very characteristic in the structure of SAT and can easily be distinguished from other species.

Black; mandible ferruginous, at base black, palpi, tibial spurs ochre yellow, fore tibia brown, fore tarsus pale brown, tegula transparent brown, gaster at least from apex of petiole to G2 ferruginous (possibly G3 also ferruginous). Hair silvery, on clypeus nearly parallel.

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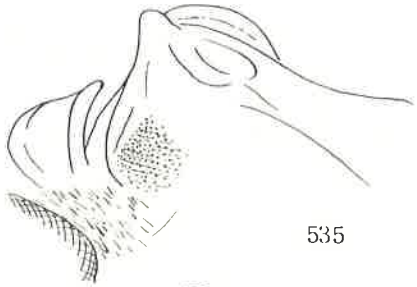

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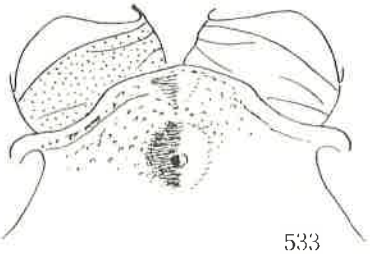

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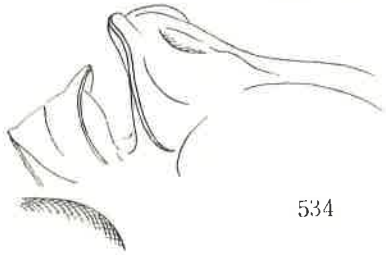

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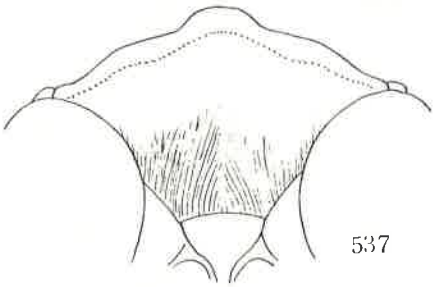

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Head in frontal view with sides rounded and slightly convergent below. HW,HL,IODv, A3,P=100,52,26,24,180, OOD,Od,POD≒1,2,2, IODs=10:10, A3=AW×4.5, A3,4,5≒10,7,6. Frons moderately raised, medial furrow at base only moderately deep, apically broad and shallow, on lower area frontal surface nearly flat, SAT broadly expanded laterally, surface flat, with a broad shallow rounded excavation in middle and highly raised towards apex; seen from dorsal side: Fig. 532, SAT-ASR seen vertically: Fig. 533, obliquely from side to see through PAF: Fig. 534, from somewhat more anteriorly: Fig. 535, seen in profile: Fig. 536, ASR anteriorly pale brown, PAF deep, flat-bottomed; clypeus: Fig. 537, medi-

anly broadly raised, apically weakly reflected. Occipital carina complete, deeply incised behind buccal cavity. Collar raised towards middle and weakly tuberculate there, discolouration of posterior part weak, only somewhat brownish, lamina on side triangularly produced, angle larger than 90° and rounded at apex; mesopleuron without pentroof structure, propodeum with distinct lateral carinae, area dorsalis enclosed distinctly with furrow, but the furrow not deep, area apicalis on dorsal side enclosed with arcuate carina, the carina somewhat stronger than the adjacent arcuately running striae. GSR obliquely subtriangularly highly raised, raised part pale brown. Petiole long and slender, flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,15,5,24(18),—(—). In fore wing RC C-type, CV1≒CV2×3, TCV≒CV2, both weakly curved, angle about 90°.

Frons distinctly microcoriaceous and distinctly, fairly closely punctured, PIS mostly as large as PD, mesoscutum considerably shining, but under high magnification feeble microreticulation defined, punctures fine but distinct, sparse; propodeum with lateral series of striae defined on posteiior portion only, furrows of area dorsalis transversely striate, posterior inclination in front of area apicalis transversely arcuately striate, rest of dorsal area smooth and polished; sides shining, with sparse fine punctures except antero-ventral area.

♂, unknown.

Holotype: ♀, Laos (Wapikhamthong Prov., Wapi), 31. V. 1967, native collector (BPBM).

103. TRYPOXYLON NIGRIPES sp. nov.

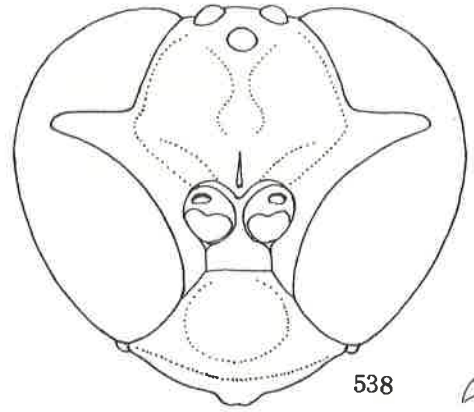
Somewhat similar to anamalaiense, but in the present species edged apical margin of SAT triangularly produced and ASR triangularly raised and carries a hollow on latero-posterior area.

♀, 10-12 mm. Black; mandible ferruginous, at base black and at apex reddish brown, palpi pale brownish yellow, tegula transparent brown, gaster from apex of petiole (on sides enlarged forwards) to G3 ferruginous, fore tibia and tarsus more or less brownish, sometimes nearly pale brown, sometimes bases of mid and hind tibiae and tarsi apically also pale brown, tibial spurs always pale, sometimes nearly whitish. Hair silvery, on clypeus mostly parallel.

Head in frontal view: Fig. 538, HW,HL,IODv,A3,P=100,50,29,22,180, OOD,Od,POD≒2,3,3, IODs=10:8, A3=AW×3, A3,4,5≒10,7,7, frontal elevations moderately high, medial furrow at base moderately deep, at apex widely open to broad shallow depression, SAT-ASR in vertical view: Fig. 539, seen obliquely from left side: Fig. 540, in profile: Fig. 541, obliquely from beneath: Fig. 542, ASR on inner side bearing a flattened triangular, brownish smooth and shining area (Fig. 539) and on postero-lateral side with one, sometimes two, comparatively large hollows; clypeus (in Fig. 538) similar in form to that of anamalaiense, at base gently roundly raised and thence forwards broadly roundly tectate, occipital carina complete, minutely incised behind buccal cavity. Collar roundly raised towards middle, and weakly tuberculate there, seen from above considerably incrassate laterally, posterior part discoloured, pale brown, lamina on side triangularly produced as in the compared species; subalar area normal. Propodeum with distinct lateral carinae, area dorsalis with weak, shallow but distinct lateral furrows, area apicalis incomplete, GSR highly raised, raised area discoloured; petiole flask-shaped, P,Ma,MI,2(Ma),3(Ma)=100,14,6,29(18),28(26). In fore wing RC C-type, Rl short, CV1=CV2×3.5, TCV≒CV2, angle roughly about 90°.

Frons microreticulate and closely punctured, PIS=PD, mesoscutum half mat, under high magnification weakly microcoriaceous, punctures fine and sparse, PIS mostly 2-3 times as large as PD, propodeum with distinct series ofstriae along lateral carinae, furrows of area dorsalis transversely striate, sometimes the striae extending on to disc, posterior inclination posteriorly transversely striate, sides mainly on dorsal area sparsely punctured, punctures more or less variable in strength, antero-ventral part always smooth and polished.

♂, 10-11 mm. Generally similar to ♀, IODv relatively slightly larger, IODs=10:8.5, joints of flagellum shorter and relatively thicker, but Al3 longer, usually shorter than 4, but longer than 3 preceding joints united, sometimes appearing as long as 4, clypeus less produced anteriorly, with medio-apical protuberance sometimes roundly entire, sometimes weakly emarginate in middle (Figs. 544, 545). Sternite 8: Fig. 546, apical margin densely covered with pubescence. Genitalia seen from beneath: Fig. 547, paramere apparently simple at apex, but seen in profile: Fig. 548, paramere bifid into two lobiform layers that are closely folded over each other, this is clearer



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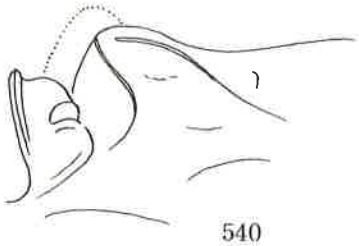

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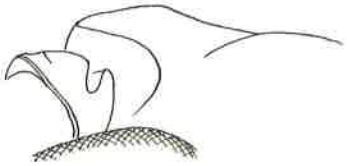

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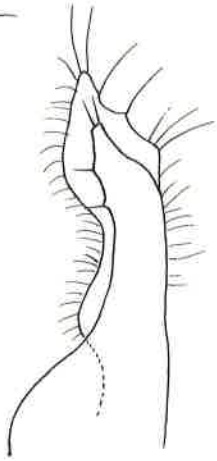

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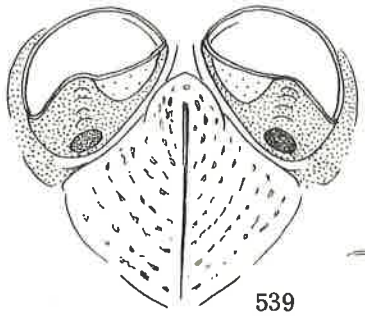

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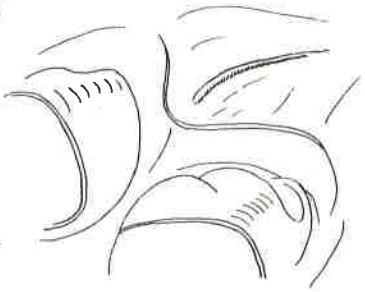

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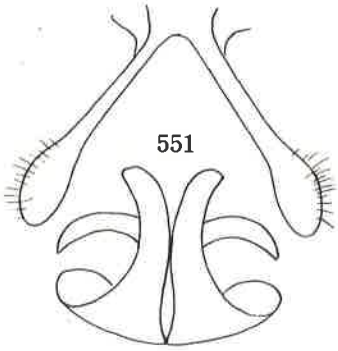

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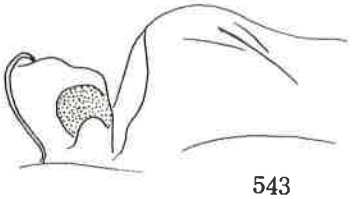

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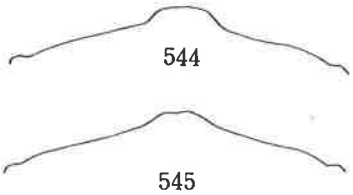

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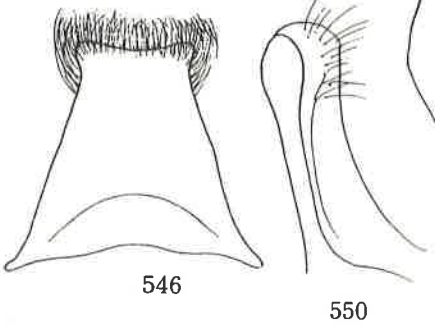

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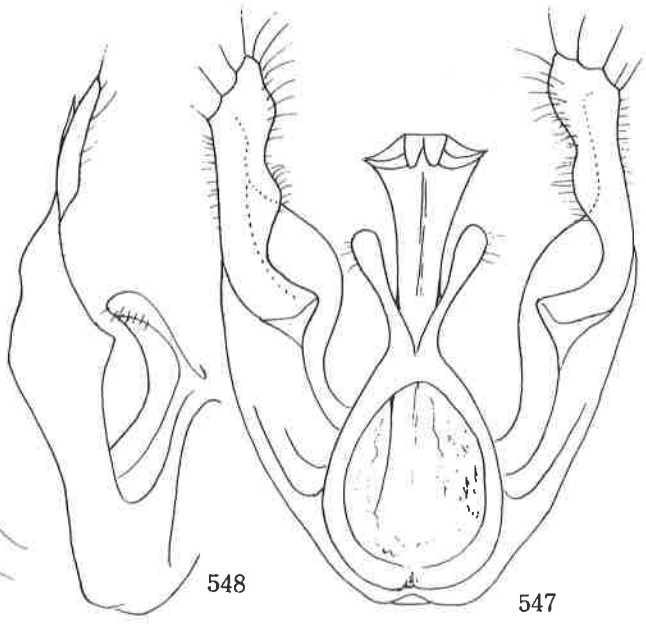

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when seen from back side (Fig. 549), but they are shallowly separated at the outer margin and deeply so at the inner margin, inner margin of basiparamere expanded inwards into lamellate half scroll and outer margin triangularly produced ventrally at its mid point of total length (Fig. 547), volsella spatulate, markedly enlarged apically (Figs. 547 and 551, when genitalia seen from apex), penis valve with shoulder and a pair of sickle-shaped appendages (Fig. 551). Fig. 550: right volsella from right side.

Holotype: India (Bombay), date and collector unknown (HNHM).

Paratypes: 1 ♀ 3 ♂, South India (Anamalai Hills, Cinchona, 3500 ft), V. 1964, P. Susai Nathan (RMNH).

104. TRYPOXYLON NISHIDAI sp. nov.

♂. Until the time when the genital organs were comparatively studied I believed that the present species belonged to T. nigripes having a slight tendency towards a local variation, not so marked as to be considered a subspecies. But the marked difference in the structure of the paramere and volsella of the genitalia revealed that it belonged to a separate species.

Genitalia apparently similar to those of nigripes, but in the present species paramere not bifid at apex, simply enlarged into a lobiform layer (Figs. 557, ventral view, 558 lateral view), volsella in ventral view also similar, but in lateral view much less robustly made (Fig. 558, cf. Fig. 550). Sternite 8 also somewhat different, in the present species apical emargination deeper and more angulated in middle (Fig. 556, cf. Fig. 546). But the external differences are very slight (Table 7 and Figs. 552-555, 559-560).

In length markedly smaller, 7-7.5 mm (in nigripes 10-11 mm), tibial spurs white (in nigripes longer hind one brown), microsculpture on frons distinct, with punctures fairly close (in nigripes microsculpture very weak, surface nearly mat, with punctures indistinct and sparse), punctures on mesoscutum comparatively larger and closer than in the compared species. SAT-ASR seen from side to see through PAF: Fig. 552, apical margin of clypeus (Figs. 553, 554) similarly varied in form, A9-13: Fig. 555.

♀. OOD very narrow, IODv relatively narrower accordingly (Table 7), tibial spurs white (in nigripes ♀ all brown), punctures and microreticulation on frons and punctures on mesoscutum similar to the conditions in ♂.

Holotype: ♂, Laos (Sayaboury Prov., Sayaboury), 15. I. 1966, native collector (BPBM).

Paratypes: 2 ♂, the same as holotype (BPBM); 1 ♀, Laos (Vientiane Prov., Ban Van Eue), 30. III. 1966, native collector (BPBM); 1 ♀, Laos (Vientiane Prov., Gi Sion Vill. de Tha Ngone), 7-21. II. 1965, native collector (BPBM).

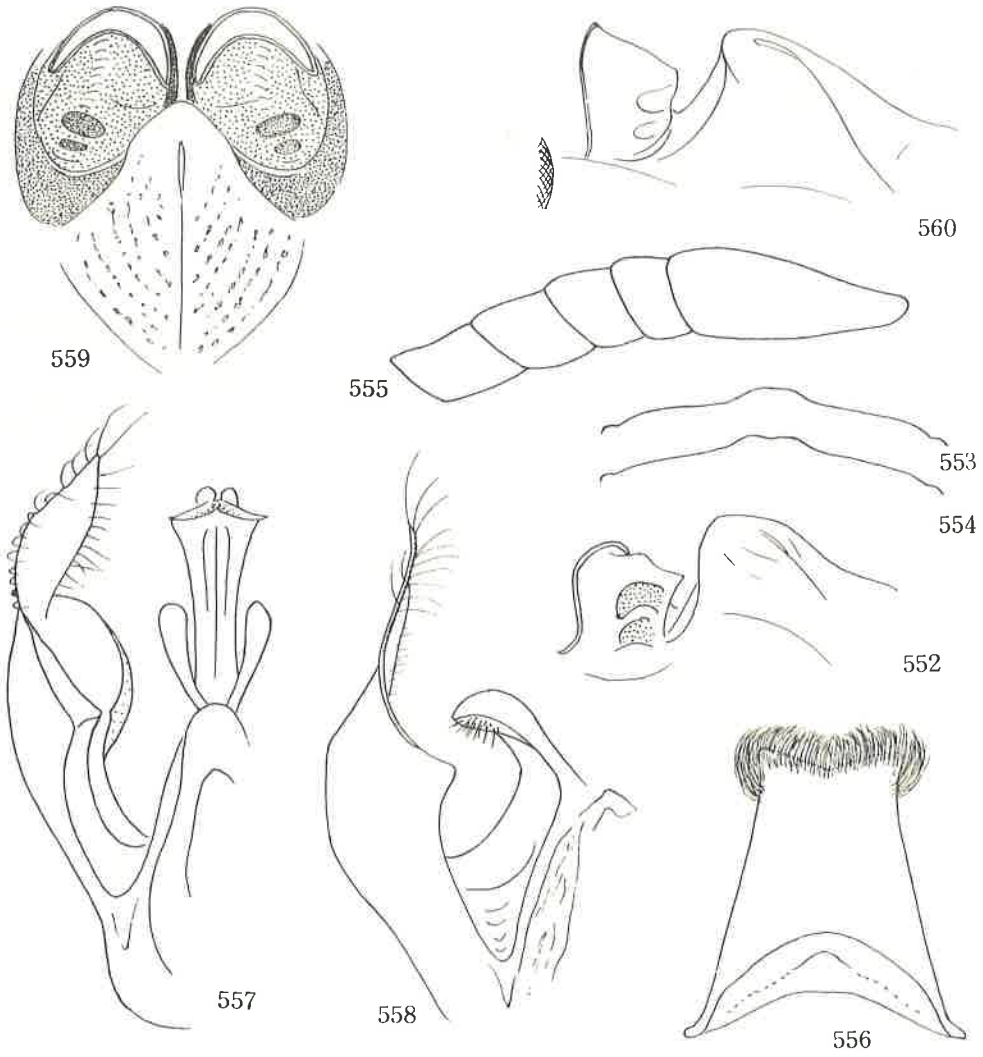
Table 7. Measurements on T. nigripes, nishidai and bakerianum

No.	Loco	Sex	B.L.	IODv	A3	A12	A13	P	OOD	Od	POD	TCV*CV1*
1	Bombay	♀	11.0	29	22	19	-	184	5	8	8	= 3.5
2	Anamalai	♀	11.5	29	24	19	-	182	5	8	8	5/4 4.2
3	Singapore	♀	8.0	27	21	22	-	167	4	11	9	5/4 3.8
4	Singapore	♀	8.0	26	22	-	-	-	4	12	11	= 3.2
5	Laos	♀	10.0	25	22	20	-	180	1	6	5	3/2 4.5
6	Laos	♀	11.0	24	22	20	-	182	1	7	5	5/4 4.0
7	S. India	♂	10.0	32	14	-	26	167	2	3	3	= 3.4
8	S. India	♂	10.5	33	13	-	26	190	2	3	3	= 3.4
9	S. India	♂	10.0	34	14	-	26	176	2	3	3	= 2.8
10	Laos	♂	7.0	32	14	-	-	160	4	7	6	= 3.0
11	Laos	♂	7.5	33	12	-	26	164	2	3	3	= 3.0
12	Laos	♂	7.0	31	14	-	26	158	2	3	3	= 2.7

* Relative length to CV2.

IODv,A3,A12,A13,P... Relative length to HW as 100.

Nos. 1,2,7,8,9 nigripes, Nos. 5,6,10,11,12 nishidai, Nos. 3,4 bakerianum.



Figs. 552-560. Trypoxylon nishidai sp. nov., 552-558, ♂; 559-560, ♀.

105. TRYPOXYLON BAKERIANUM sp. nov.

At first the specimens of this species from Singapore were also included within T. nigripes, but as the preceding nishidai was separated from that species they were reexamined in detail. The small body size was noticed from the first, but measure ments shows that IODv and ocellar disposition are rather intermediate between nigripes and nishidai (Table 7). The microsculpture and punctuation of frons are also interme- diate, namely, the former is distinct and the latter sparse. On mesoscutum punctures also intermediate in both size and density, but the ground surface is not mat as in the two, but fairly shining. Tibial spurs are whitish, but the longer hind spur is brown as in nigripes ♀.

As there is no male corresponding to the present females a defintte conclusion can not be given as to whether the Singapore polulation is a local lace of either nig- ripes or nishidai, or it belongs to another species. But it seens certain that the specimens belong to one of the three species above mentioned and as it is impossible to determine the relative affinity of the specimens to either of the first two, they are provisionally dealt with here as a separate species. ♂ unknown.

♂, unknown.

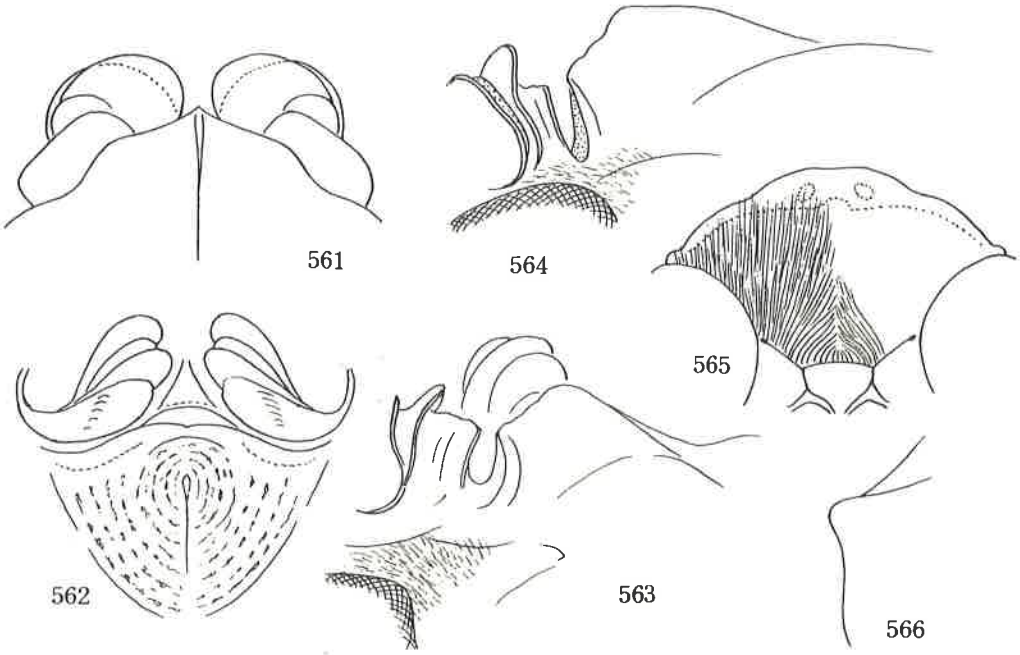
Holotype: ♀, Singapore, date unknown, C. F. Baker (USNM).
Paratype: 1 ♀, the same as holotype (USNM).

Remarks. In the holotype gastral segments 2–6 are detached and mounted on the card point and in the paratype petiole is lacking and segments 2–6 are mounted on the card.

106. TRYPOXYLON LAMELLATUM sp. nov.

Characteristic in the structure of ASR and in combination with those of SAT and clypeus easily separable from the closely allied other species (e.g. melanocorne).

♀, 14 mm. Black; mandible ferruginous, at base black, lower margin till apex narrowly lamellate, in some light the area appears brownish, otherwise not darkened till apex, palpi ochre yellow, tegula semitransparent dark brown, gaster from apex of petiole (on sides somewhat extending forwards) to base of G4 reddish yellow, with a blackish mark on G2, fore tibia and tarsus and mid tibia apically somewhat brownish, fore tibial spur pale brown, other spurs dark brown, Hair silvery, on clypeus at base convergent towards medial line.



Head in frontal view roundly, fairly strongly convergent below, vertex only slightly depressed. HW,HL,IODv,A3,P=100,44,25,26,184, OOD,Od,POD≒1,3,2, IODs=10:9, A3≒AW×5, A3,4,5≒10,6.5,6. Frontal elevations fairly strong and rounded, medial furrow broad and comparatively deep, widely opened V-shape in cross section, with bottom line distinct till SAT, SAT-ASR seen from dorsal side: Fig. 561, seen vertically: Fig. 562, obliquely from side and above to see through PAF: Fig. 563, in profile: Fig. 564, SAT moderately high, broad nasiform, shorter than wide at apex (Fig. 562), apex in vertical view nearly straight (do.), ASR highly raised, with apical margin remarkably highly bilamellate (Fig. 562, 563), posterior margin carinate (Figs. 563, 564), PAF deep, U-shaped in cross section, flat-bottomed, clypeus: Fig. 565, at base highly raised, roundly swollen, at apex from basal line of glabrous area distinctly reflexed, the area is pale castaneous brown, bearing a pair of small yellowish patches in middle; occipital carina complete, not incised behind mouth cavity. Collar raised towards middle and weakly tuberculate there, in dorsal view anterior part strongly incrassate sideways, posterior part half discoloured, brownish, lamina on side: Fig. 566; subalar area of mesopleuron posteriorly distinctly edged and carinated on outer margin, but not ex-

panded into pent-roof structure. Propodeum with strong lateral carinae, area dorsalis enclosed with deep furrow, area apicalis marked off with carina, at medio-dorsal part of which medial furrow of posterior inclination ending, GSR roundly highly raised, with apical area narrowly discoloured, gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3 (Ma)=100,12,4,30(16),28(22). In fore wing RC C-type, Rl short, CV1≒CV2×5, TCV:CV2≒ 3:2, TCV distinctly sinuate, angle roughly about 120°.

Frons weakly microcoriaceous, considerably shining, closely superimposed with comparatively large distinct punctures, mesoscutum with plumbeous shine, but smooth and fairly well shining, with sparse fine punctures, punctures far smaller than those on frons, propodeum with series of distinct striae along lateral carinae, lateral furrows of area dorsalis crenate, medial furrow transversely striate, posterior inclination posteriorly transversely striate, rest of dorsal aspect smooth and shining, with scattered fine hair-bearing points, sides smooth and polished and scattered very sparsely with fine punctures except antero-ventral smooth area.

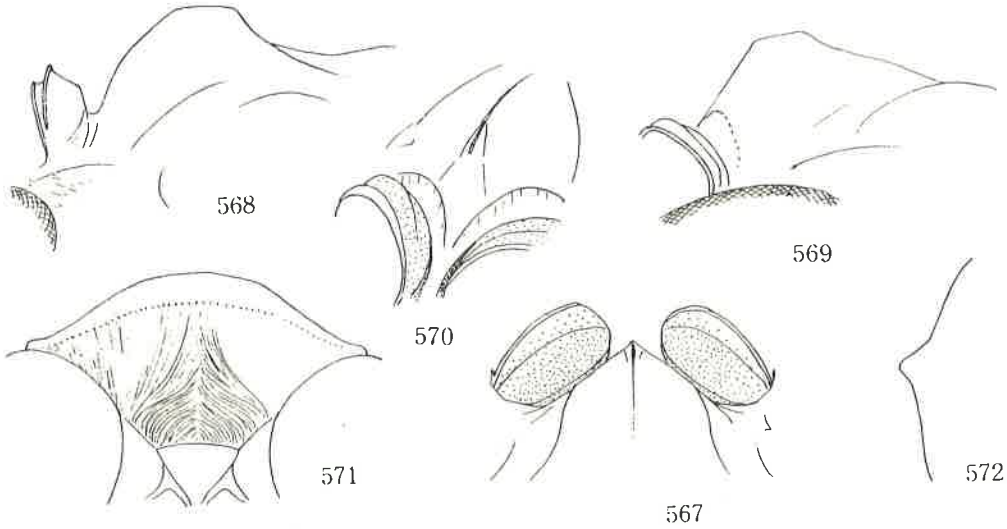
♂, unknown.

Holotype: ♀, South India (Kerala, Waldyar forests), date and collector unknown (USNM).

107. TRYPOXYLON TERBAKARINUM sp. nov.

Can be distinguished from the allied species by the combination of characters of SAT-ASR, IODs, clypeus and propodeum; colour of legs and gaster are also of use to separate the species.

♀, 13 mm. Black; mandible castaneous brown, at base broadly black, tegula transparent brown, gaster at apex of petiole narrowly, G2 and base of G3 reddish ferruginous, tergite 2 broadly blackish; tibial spurs and fore tarsus apically pale brown. Hair silvery, on clypeus at base convergent towards medial line.



Head in frontal view with sides roundly convergent below, vertex somewhat depressed. HW,HL,IODv,A3,P=100,46,27,25,160, OOD,Od,POD≒2,3,4, IODs=10:8, A3=AW×4, A3,4, 5≒10,7,6.5. Frons moderately raised, medial furrow broad and shallow, shallower and broader anteriorly, but with a glossy bottom line till near SAT, SAT-ASR seen from dorsal side: Fig. 567, seen obliquely from side to see through PAF: Fig. 568, in profile: Fig. 569, obliquely from beneath: Fig. 570. SAT moderately high short broad nasiform, apical oblique inclination transversely rounded and medianly with a triangular flat area, ASR highly raised, tricarinate on top, two of which are located at apical margin, PAF deep, narrow V-shaped in cross section, with bottom rounded. Clypeus: Fig. 571, at base strongly raised and thence anteriorly tectate, with a blunt ridge in middle, apical glabrous marginal area markedly reflected; occipital carina complete, very weakly incised behind mouth cavity. Collar roundly raised and medianly weakly swollen

and moderately incrassate sidewards, posterior part discoloured, lamina on side: Fig. 572; subalar area normal, only on lateral margin edged posteriorly, propodeum with strong lateral carinae, lateral furrows of area dorsalis shallow and weak, rather indistinct, dorsal carina of area apicalis in lateral view fairly well defined, in vertical view rather indistinct, due to confusion with parallel running striae, GSR roundly, but not strongly raised, not discoloured, petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma) =100,15,6,28(18),32(27). In fore wing RC between C- and B-types, Rl short, CV1≒CV2×6, TCV:CV2≒3:2, TCV weakly sinuate, angle near corner roughly about 100°.

Frons very minutely microcoriaceous, nearly mat, punctures shallow and fine, rather indistinct, in some light only defined, sparse, mesoscutum without plumbeous shine and smooth, polished, with fine deep, fairly close punctures, PIS 1-2 times PD. Propodeum with distinct lateral series of striae, area dorsalis at base weakly crenate, on median furrow transversely striate, rest of dorsal aspect finely sparsely punctured, sides smooth and shining, from median area posteriorly finely sparsely punctured, on posteriormost area transversely striate.

♂, unknown.

Holotype: ♀, Malaya (Pahang, Cameron's Highland, 4481 ft), 11. V. 1939, H. M. Pendlebury (BMNH).

108. TRYPOXYLON MENKEI sp. nov.

♂. Closely resembling T. ngum, but the colour of legs markedly different, SAT and PAF differ in some detailed structure and apical lobes of paramere of genitalia and apical form of sternite 8 are also different.

Length 12-15 mm. Black; mandible pale castaneous, palpi ochre yellow, tegula semitransparent brown, gaster from apex of petiole to base of G4 reddish ferruginous, legs strongly brownish, fore tibia and tarsus brown, fore tibia at base in front and fore tibial spur ferruginous. Hair silvery, on clypeus parallel.

Head in frontal view distinctly wider than long, with lateral margins rounded and slightly convergent below, vertex with ocellar area distinctly depressed, but postocellar area raised as a bank and in normal frontal view not depressed, when seen with hind ocelli at the top, vertex distinctly depressed below level of upper eye margins. HW,HL,IODv,A3,Al3,P=100,46,25,17,26,156, OOD,Od,POD≒2,3,2, IODs=10:9, A3≒AWx3, A3, 4,5=10,6,6, Al3=BWx3.5 and =A9+10+11+12. Frons moderately raised, median furrow except at base broad and shallow, but with a distinct glossy bottom line, SAT moderately high broad nasiform, broader than long, ASR-SAT seen from dorsal side: Fig. 573 (cf. Fig. 584, in ngum), seen obliquely from side to see through PAF: Fig. 574, in profile: Fig. 575, obliquely from beneath: Fig. 576 (cf. Figs. 435,436); clypeus: Fig.577, Al3: Fig. 578. Occipital carina complete. Pronotal collar raised nearly straightly towards middle and weakly tuberculate there, posterior part half discoloured, castaneous brown, lamina on side: Fig. 579; subalar area of mesopleuron normal, posteriorly simply edged on outer margin; propodeum with distinct lateral carinae, area dorsalis with distinct lateral furrows, area apicalis distinctly enclosed with carinae, only on medio-dorsal area narrowly interrupted by the apex of medial furrow of posterior inclination, GSR obliquely highly raised, lamellate, curved in lateral view and discoloured to ambur-yellow, gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,13,6, 34(15),32(28). In fore wing, RC C-type, but close to M-type, Rl short, CV1≒CV2×6, TCV:CV2≒3:2, TCV fairly strongly sinuate, angle near corner roughly about 90°.

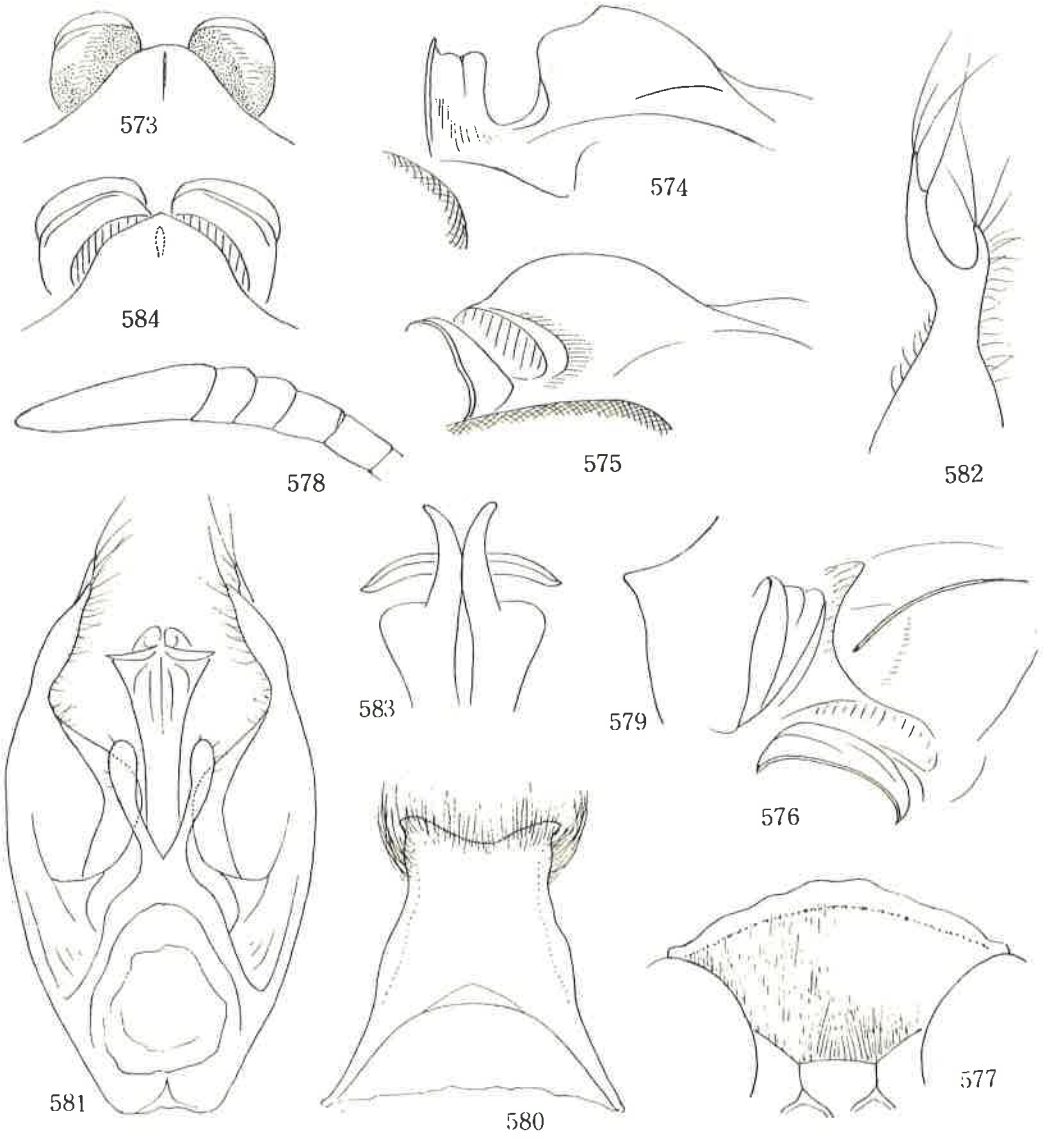
Sternite 8: Fig. 580, fringe of hair at apex uniform in length, not markedly longer on each side, genitalia in ventral view: Fig. 581, paramere bifurcate at apex, bifurcation quite strange as given in Fig. 582 (lateral view), main body of paramere on inner margin lamellate, expanded and rolled in ventrally, volsella spatulate, penis valve with well developed shoulder and a pair of sickle-shaped appendages (Fig. 583, dorsal view).

Frons weakly microreticulate and strongly closely superimposed with comparatively large deep distinct punctures, PIS= or < PD, only partly greater than PD, mesoscutum with strong plumbeous shine, finely, fairly closely (PIS mostly 1-2 times PD) punctured, propodeum with strong lateral series of striae, area dorsalis at base obliquely and on 3 furrows transversely striate, disc finely sparsely punctured, posterior part of posterior inclination transversely rugoso-striate, area apicalis shining, but surface not flat and smooth, sides broadly covered with fine sparse punctures, only on posteriormost area transversely rugoso-striate.

♀, unknown.

Holotype: ♂, Singapore, C. F. Baler leg. date unknown (USNM).

Paratypes: 5 ♂, ditto (USNM); 1 ♂, Singapore, date unknown, H. N. Ridley (BM-NH); 1 ♂, Laos (Vientiane Prov., Ban Van Eue), 15. II. 1966, native collector (BPBM).



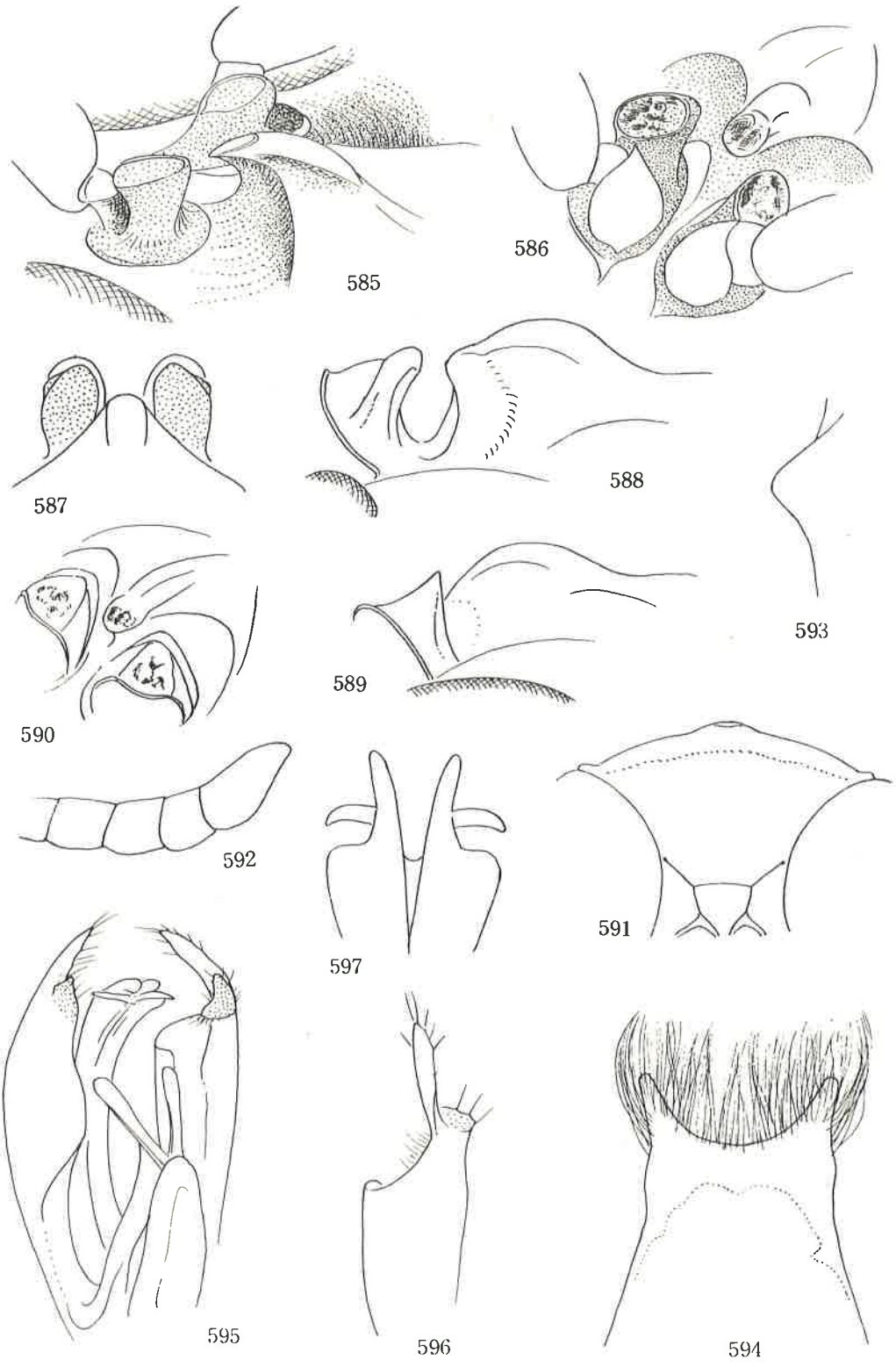
Figs. 573–583. T. menkei sp. nov., ♂; Fig. 584: T. ngum sp. nov., ♂

109. TRYPOXYLON KEPONGIANUM sp. nov.

Characteristic in the structure of SAT-ASR and Al3.

♂, 8 mm. Black; antenna dark brown, basally paler,, Al to base of A3 beneath nearly ferruginous, mandible ferruginous, apex reddish brown, palpi, greater part of pronotal tubercle, tegula (transparent), fore tibia (partly pale brown) and tarsus, mid and hind tibiae at base, all tibial spurs and mid metatarsi except apex light yellowish white; G2 and 3 broadly pale brown, gaster medianly and legs in general distinctly brownish. Hair silvery, on clypeus parallel.

Head in frontal view with sides rounded, almost not convergent below, vertex not depressed. HW,HL,IODv,A3,Al3,P=100,50,25,16,15,124, OOD,Od,POD≒2,6,3, A3=AW×3, Al3=



Figs. 585–597. Trypoxylon kepongianum sp. nov., ♂

BW×2 and =A11+12. Supraantennal structure very characteristic as given in Figs. 585 (seen obliquely from left side) & 586 (seen obliquely from beneath). Frons moderately raised, but with medial furrow very shallow, shining on fine bottom line, on anterior area nearly flat, SAT tuberiform, moderately high, shortly broadly carinated on top, the carina enlarged, obliquely inclined anteriorly, forming a round flat area and produced over interantennal area, the surface of which is polished and engraved with a few vaguely outlined coarse punctures (Figs. 585,586,590), ASR highly raised, seen vertically triangular, posteriorly roundly excavated by PAF and on top provided with an oviform shining area which is also irregularly weakly punctured, PAF deep, flat-bottomed. The structure seen from dorsal side: Fig. 587, obliquely from left side to see through PAF: Fig. 588, in profile: Fig. 589 and seen obliquely from beneath: Fig. 590. Clypeus: Fig. 591, A9-13: Fig. 592; occipital carina complete; collar of pronotum roundly raised, without medial tubercle, seen from above very narrow, keel-like and weakly widened laterally, posterior part discoloured, ochre yellowish, lamina on side: Fig. 593; subalar area posteriorly acutely edged on outer margin and slightly produced laterally, but not expanded into pent-roof structure; propodeum with distinct lateral carinae, area dorsalis practically without lateral furrows, in some light very weak furrow faintly defined, area apicalis broadly open above, GSR roundly highly raised, pale brown, petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,22,7,30(29),34(37). In fore wing RC intermediate between C- and B-types, Rl moderately long, attenuate apically, CV1≒CV2×5, TCV≒CV2, both nearly straight, angle between about 120°.(IODs=10:7)

Frons distinctly microcoriaceous and closely superimposed with shallow weak punctures, PIS=PD, mesoscutum and propodeum with strong plumbeous shine, half mat, the former finely weakly, fairly closely, but indistinctly punctured, the latter with weak series of striae along lateral carinae only on posterior half, area dorsalis transversely weakly striate, sides smooth and shining and sparsely scattered with weak punctures, only posteriormost area transversely closely rugoso-striate.

Sternite 8: Fig. 594, genitalia seen from beneath: Fig. 595, apical part of paramere seen from dorsal side: Fig. 596 (the hair at apical area glued together and the detailed structure can not be observed). Paramere at apex shortly bifid, the longer branch is a slender semitransparent lobe, the shorter subtriangle in form, yellowish, both sparsely fringed with hair, main body of paramere expanded on both inner and outer margins, rolling in ventrally, the wall of which partly thickened and darkened and appearing independent branches, penis valve at apical part provided with well developed shoulder and a pair of sickle-shaped appendages (Fig. 597, dorsal view).

♀, unknown.

Hllotype: ♂, Malaya (Kepong, 130-300 m), 13-21. III. 1966 (light trap), J. Sedlacek (BPBM).

110. TRYPOXYLON VIENTIANENSE sp. nov.

Very closely similar in general characters including SAT-ASR and male genitalia to the preceding species, but in the present species:

1. Al3 relatively much longer, distinctly as long as 3 preceding joints united (Fig. 598).
2. Medio-apical flattened (and somewhat impressed) area of SAT more broadly extended backwards (Fig. 599), in one of the specimens even the top area longitudinally impressed on each side of medial carina.
3. Paramere of genitalia more distinctly bidid at apex, the longer lobe distinctly broader than in kepongianum (Figs. 600, 601).
4. Paramere at the shifting area of expanded lamellate layer of inner side to longer apical lobe is provided with a curved carina which is remarkably fringed with long curved bristles (Fig. 600, genitalia seen obliquely from beneath and left side, and partly also in Fig. 601, apical part of paramere in dorsal view).

Measurements: HW,HL,IODv,A3,Al3,P=100,48,26,14,134, OOD,Od,POD≒2,6,3, IODs=10:7, A3=AW×2.5, A3,4,5≒10,7.5,7.5, Al3=BW×2.5, P,Ma,Mi,2(Ma),3(Ma)=100,21,8,30(30),32(38). RC C-type, Rl moderately long, CV1=CV2×5, TCV:CV2≒3:2.

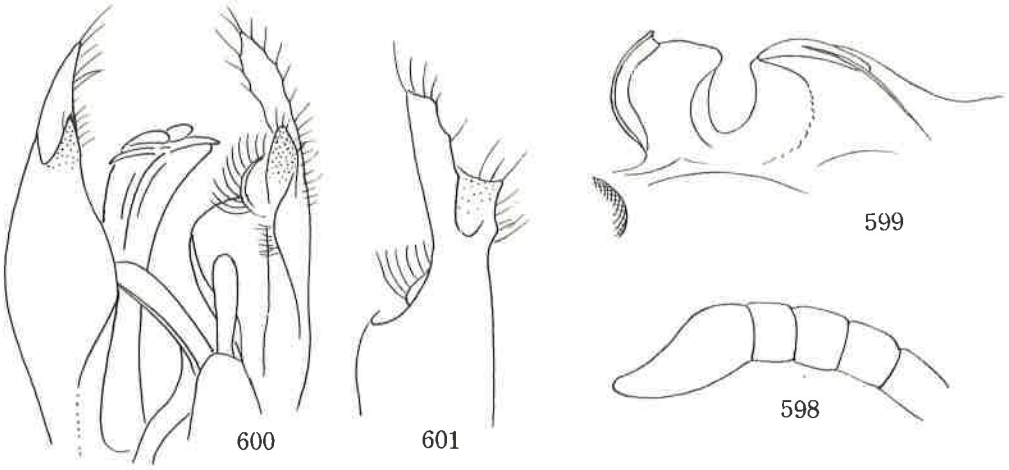
♀, unknown.

Holotype: ♂, Laos (Vientiane Prov., Ban Van Eue), 15-31. V. 1965, native collector (BPBM).

Paratypes: 2 ♂, the same place, 30. VI. 1966, 15. II. 1967, native collector (BPBM).

Remarks. At first the present species was considered to be a local race of the preceding species, but later it was raised to a separate species basing mainly upon the difference in the structure of paramere of the genitalia.

Besides the differences above listed, the present species is slightly darker in the colour of the legs than in kepongianum.



Figs. 598–601. Trypoxylon vientianense sp. nov., ♂

111. TRYPOXYLON YOGATOR sp. nov.

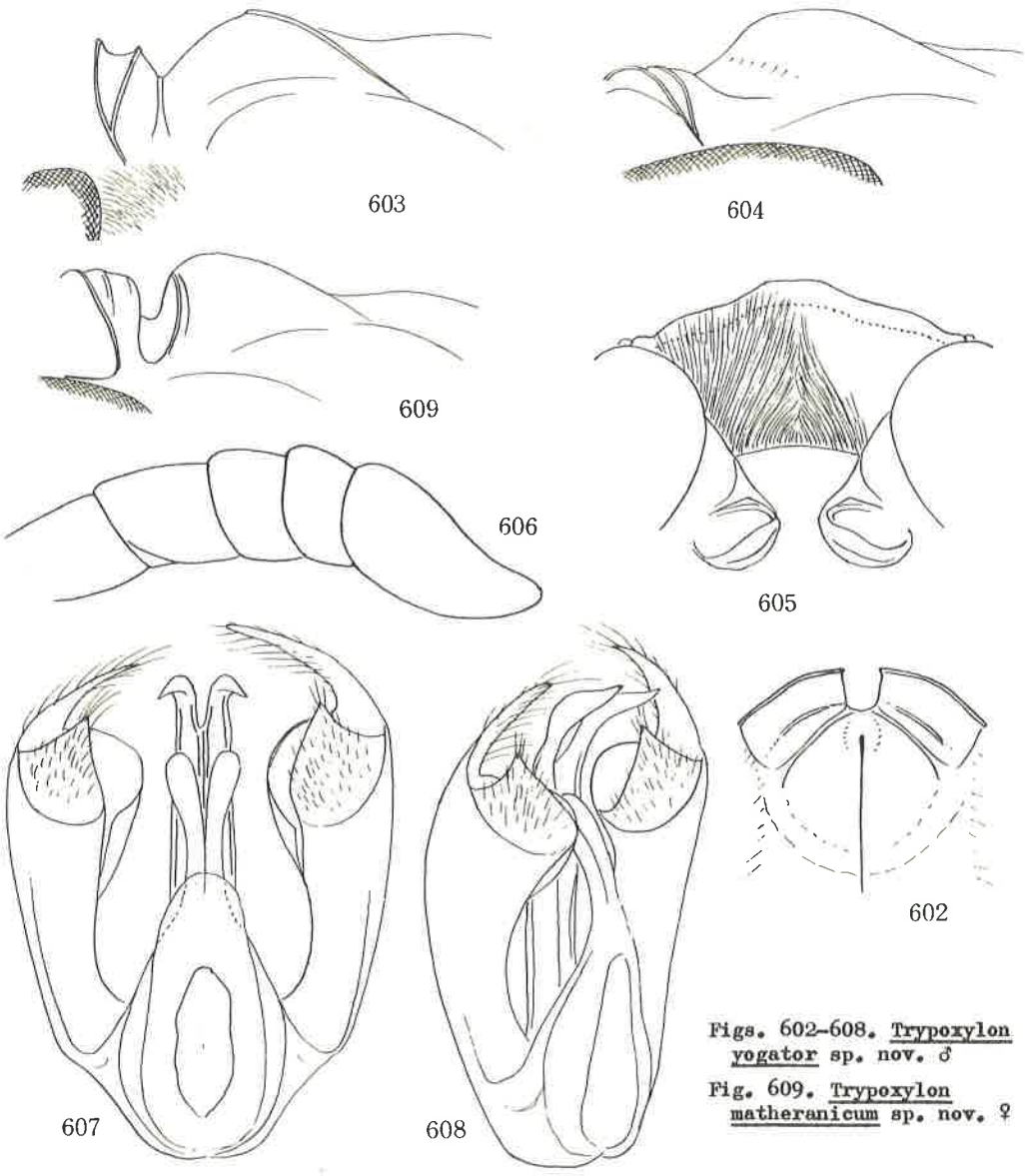
♂, 9mm. Closely resembling matheranicum ♀, differs from it in the detailed structure of SAT and in the colour of the legs.

Black, antenna dark brown, slightly paler beneath, A1 and 2 ferruginous at apex; mandible, tegulae, basal plates of wings, apex of petiole, G2 and 3 except broad brown band across middle of each, fore tibia in front, mid tibia at base, hind tibial spurs and hind T1 at base pale brown to ferruginous; mouth parts, fore tarsus, fore and mid tibial spurs and mid T1 and T2 at base yellowish white. Hairs silvery, on clypeus at base convergent towards medial line.

Head in frontal view much wider than long, with sides gently roundly convergent below, HW,HL,IODv,A3,A13,P=100,52,32,17,19,128, OOD,Od,POD÷1,2,2, IODs=10:8, A3÷AW× 2.2, A3,4,5÷10,8,8, A13=BW×2, longer than 2, but shorter than 3 preceding joints united (Fig. 606); frontal elevations moderately high, but medial furrow broad and shallow, on anterior portion surface nearly flat, SAT low, broad, rounded, upper portion somewhat tectate, anterior portion radiately smoothly inclined, medial carina distinct and fairly long, ASR highly elevated, bicarinate, SAT-ASR seen vertically: Fig. 602, obliquely from above to see through PAF: Fig. 603, PAF moderately deep, V-shaped in cross section, with bottom line upcurved, seen in profile: Fig. 604; clypeus: Fig. 605, at base roundly raised and at apex gently reflected, A9-13: Fig. 606; occipital carina complete, but weaker and depressed behind buccal cavity. Collar roundly raised towards middle and very weakly tuberculate there, seen from above slightly enlarged laterally, mesopleuron with subalar area normal, propodeum with lateral carinae, area dorsalis with lateral furrows, the furrows shallow and broad, but distinct, GSR moderately roundly elevated, not discoloured, gastral petiole flask-shaped, P,Ma,Mi,2(Ma), 3(Ma)=100,19,8,36(24),40(31); in fore wing RC C-type, R1 short, CV1=CV2×4.5, TCV:CV2÷ 7:5, TCV nearly straight, angle about 110°.

Genitalia seen from beneath: Fig. 607, seen obliquely from beneath and left side: Fig. 608, paramere with inner and outer margins expanded and lamellate, rolled ventrally, apex bifid into longer dorsal and shorter ventral layers, the latter broad triangular, covering the ventral half of top of the subsylindric pouch formed of the expanded lamellae, volsella long, spatulate, penis valve without shoulder and sickle-shaped appendages, apical portion somewhat laterally compressed and turned ventrally.

Frons distinctly microreticulate, somewhat sparsely superimposed with comparatively large shallow flat-bottomed punctures, PIS slightly larger than PD; mesoscutum



Figs. 602–608. Trypoxylon yogator sp. nov. ♂

Fig. 609. Trypoxylon matheranicum sp. nov. ♀

smooth and shining, almost without plumbeous shine and somewhat sparsely covered with comparatively large and deep punctures, PIS mostly PD 1–2, area dorsalis transversely finely closely striate, striae posteriorly weaker, but at apical margin the area is bordered with a few strong striae, series of striae along lateral carinae strong, but covered closely with white pubescence not well visible, sides polished, sparsely scattered with very fine punctures.

♀, unknown.

Holotype: ♂, India (Matheran), III. 1899, Coll. C. G. Nurse (BMNH).

Remarks. The present specimen may represent the male of T. matheranicum, because both are coincident in the structure of frons and propodeum, general form of SAT-ASR and clypeus, in the general tendency of colouration, and, furthermore, both holotypes are captured in the same place and possibly at the same time (III. 1899). In matheranicum, however, SAT at apical margin transversely acutely edged, PAF deep, U-shaped in cross section and flat-bottomed, and fore and mid tarsi brown, while in the present species SAT smoothly inclined anteriorly, PAF only moderately deep, V-shaped in cross section, with bottom line up-curved, and fore and mid tarsi except mid T3–5 whitish.

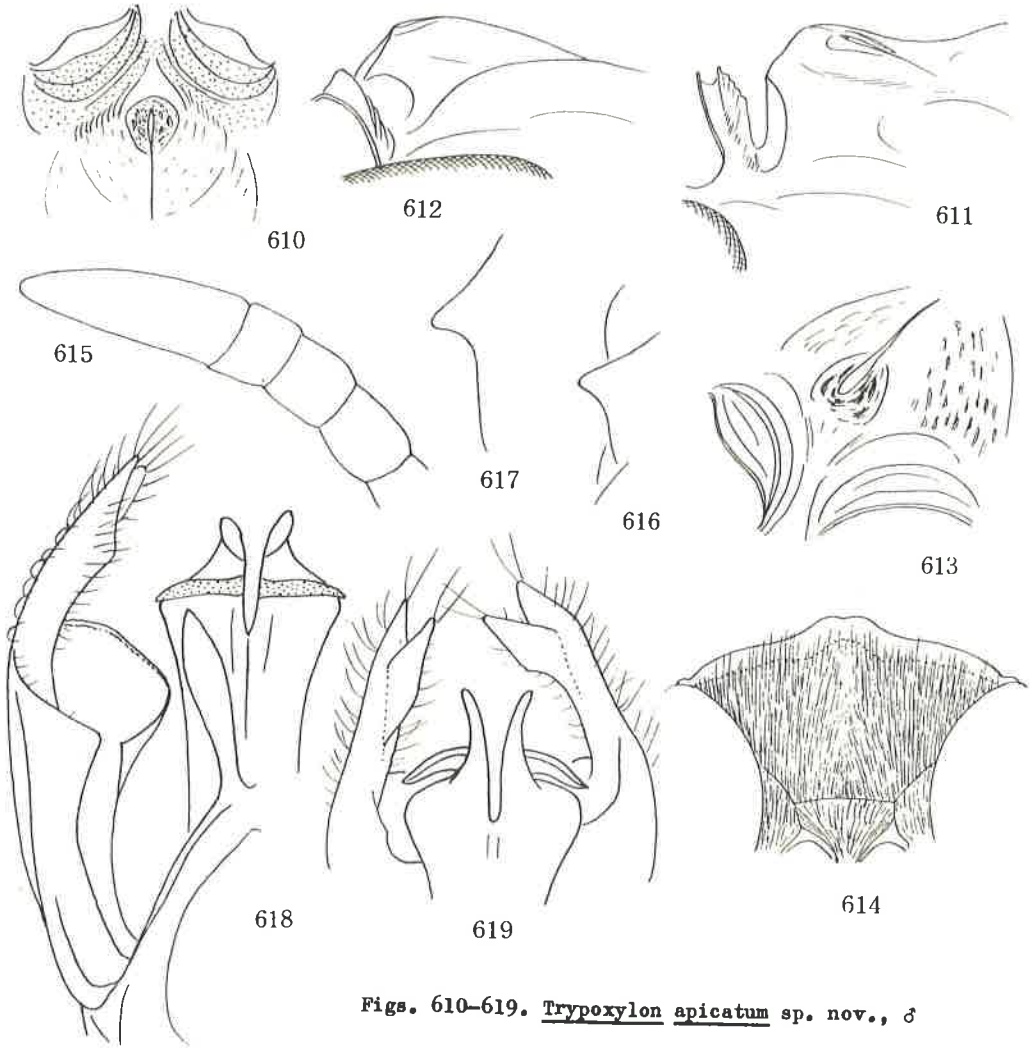
The colour of the legs may differ between the sexes of the same species, but the marked difference of SAT and PAF (compare Fig. 603 in yogator, ♂ with Fig. 609 in matheranicum ♀) makes me hesitate to combine them together.

112. TRYPOXYLON APICATUM sp. nov.

♂, 10 mm. By the structure of supraantennal and subalar areas, the form of clypeus, antenna and lamina on side of pronotum and general colouration, when combined, the present species is distinctly characterized.

Black; ferruginous are A1 and 2, apical margin of clypeus, mandible, palpi (rather whitish), G1 on side, at base beneath and at apex, and G2 and 3 except brown marks above and beneath; yellow are pronotal tubercle, tegula, fore leg except coxa, greater part of trochanter, broad median part of femur and arolium, mid femur at base and apex, -tibia wholly and -T1 except apex and hind tibia at base; fore and mid tibial spurs yellow, but apically brownish; antenna and legs more or less brownish, from A3 to middle area slightly pale brown, apically darker. Hair silvery, on clypeus at base weakly convergent towards medial line, but as a whole nearly parallel.

Head in frontal view with sides roundly, not strongly convergent below, vertex not depressed. HW,HL,IODv,A3,A13,P=100,46,25,18,24,142, OOD,Od,POD÷2,5,4, IODs÷10:8, A3=AW×3.3, A3,4,5=10,6,5.5, A13=BW×3 and =A10+11+12. Frontal elevations gentle, me-



Figs. 610–619. Trypoxylon apicatum sp. nov., ♂

dian furrow broad and comparatively deep, without shining bottom line, SAT tuberiform, considerably high, median carina widened anteriorly and surrounded by a small somewhat flattened, coarsely punctured and yet shining area, the place in front of the area obliquely inclined, forming a triangular flat but not shining area (Figs. 610, seen vertically, 613, seen obliquely from beneath), ASR highly raised, strongly bicarinate and posteriorly striate (Fig. 611, seen obliquely from beneath), PAF deep, flat-bottomed, V-shaped in cross section (Do.). Clypeus: Fig. 614, at base gently raised, at apex not strongly reflected, Al0-13: Fig. 615. Pronotal collar triangularly raised towards middle, mid point minutely rounded but not tuberculate, seen from above considerably incrassate laterally, posterior part discoloured, dark yellowish (covered densely with hair), lamina on side markedly toothed (Fig. 616, dorsal view, 617 vertical view), mesoscutum with parapsidal sutures represented by two raised lines, anteriorly thicker, postscutellum highly raised, with a deep furrow in front and posterior margin acutely inclined to base of propodeum, subalar area of mesopleuron expanded into pent-roof structure, overhanging subalar pit, but not discoloured. Propodeum with distinct lateral carinae, area dorsalis enclosed with broad shallow but distinct furrow, area apicalis indistinct on dorsal margin, GSR roundly highly raised, petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,15,5,32(19),32(27). In fore wing RC C-type, Rl moderately long, CV1≒CV2×5, TCV:CV2≒4:3, situation of TCV weak, angle roughly about 120°. Genitalia (left half) seen from beneath: Fig. 618, apical part seen from above: Fig. 619. Paramere bifid at apex, but the mode of splitting abnormal (Fig. 619), cylinric pouch of the main body of paramere incomplete (Fig. 618), volsella attenuate and pointed at apex, penis valve with shoulder and a pair of sickle-shaped appendages before apex, much broader than usual.

Microreticulation on frons comparatively fine, but surface not shining, superimposed punctures also finer than usual and weak and close, PIS≒PD, SAT on top area coarsely irregularly punctured, but shining, rest of SAT closely covered with hair-bearing punctures, half-mat; mesoscutum closely covered with moderately large distinct punctures PIS≒PD, in front of parapsidal sutures even PIS≺PD, PIS under 40× magnification filled with very weak microsculpture. Area dorsalis at base smooth and shining and rather coarsely crenate, median broad furrow transversely strongly striate, lateral furrows anteriorly minutely rugulose and posteriorly finely closely striate, series of striae along lateral carinae distinct, rest of dorsal and posterior aspects closely covered with hair-bearing punctures.

♀, unknown.

Holotype: ♂, Laos (Vientiane Prov., Ban Van Ene, 750 m, forest stream bed), 10-11. IV. 1965, J. L. Gressitt (BPBM).

113. TRYPOXYLON VARDYI sp. nov.

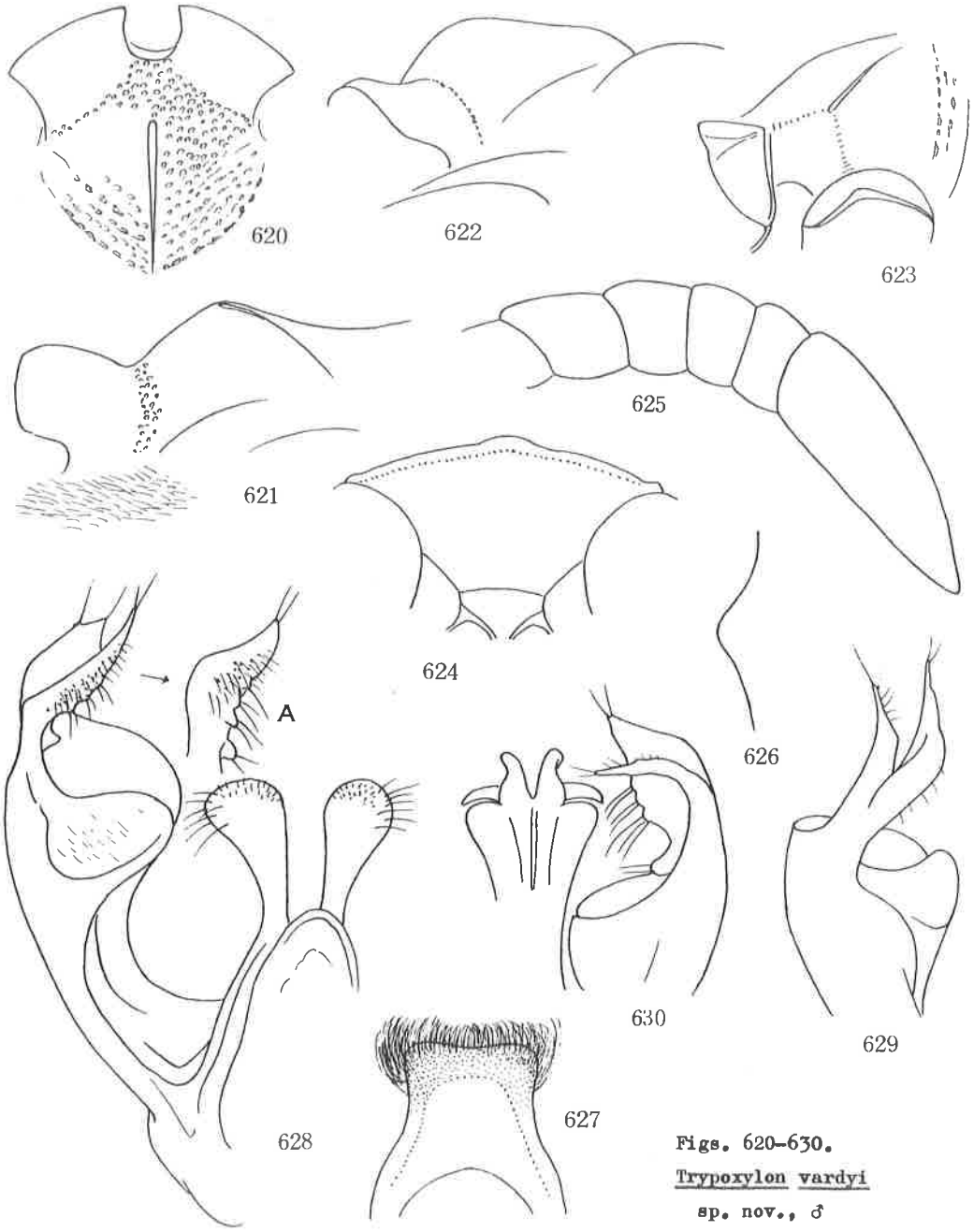
Closely resembles T. membranaceum, differing from it in ♂: in the relative length of Al3 and in the structure of genital organs; in ♀: in the form of head seen in front and in the relative disposition of ocelli. Generally the present species is more robustly made and somewhat larger.

♂, 10 mm. Black; mandible pale castaneous, at base broadly black, palpi and tibial spurs ochre yellow, tegula semitransparent brown, gastral segment 2 at base and on sides and 3 at base ferruginous, rest of the segments brown; legs slightly brownish, more marked on fore and mid tarsi apically. Hair silvery, on clypeus long and nearly parallel.

Head in frontal view with lateral margins rounded and gently convergent below, vertex not depressed. HW,HL,IODv,A3,Al3,P=100,46,30,14,28,144, OOD,Od,POD=3,4,3, IODs =10:8.5, A3=AW×2, A3,4,5≒10,7,7, Al3=BW×3.2 and ≒A9+10+11+12, A4-10 gently rounded out beneath. Frontal elevations moderately high, roundly raised, medial furrow also moderately deep, but broadly open on lower portion, the surface only very gently concave, SAT round tuberiform (Fig. 622), at base tectate, carina comparatively thick and long, ASR broadly expanded, anteriorly semitransparent brown, surface smooth and polished (Fig. 620, seen vertically), PAF shallow, only down curved (Fig. 621, seen obliqyely from side to see through PAF), SAT-ASR seen in profile: Fig. 622, seen obliquely from beneath: Fig. 623, ASR somewhat tectate and SAT on anterior inclination weakly edged and excavated beneath the edge (shown in Fig. 623). Clypeus: Fig. 624, from base to median area gently raised, apical glabrous marginal area narrow and weakly reflected. Al3: Fig. 625. Occipital carina complete, but very weak and depressed behind buccal cavity. Collar of pronotum nearly straightly raised towards middle and minutely tuberculate there, posterior part half discolouree, posteriorly brown, lamina on side:

Fig. 626. Subalar area normal; propodeum with lateral carinae, distinct on medial third, area dorsalis with distinct lateral furrows, the furrow anteriorly shallower and indistinct, area apicalis desressed, smooth and shining, dorsally enclosed with rugosed striae, GSR roundly produced, apically discoloured; petiole flask-shaped, P,Ma,Mi,2(Ma),3 (Ma)=100,15,6,32(20),32(34). In fore wing RC C-type, but close to M-type, Rl short, CV1=CV2×5, TCV only gently sinuate, TCV:CV2÷5:3, angle roughly about 100°.

Sternite 8: Fig. 627. Genitalia (seen from beneath, penis valve and right paramere omitted): Fig. 628, paramere bifurcate at apex, ventral layer seen vertically: Fig. 628,A, its ventral surface covered with hair and on inner margin provided with 4 tubercles bearing bristles at the top. Left paramere in latero-apical view: Fig. 629, apical parts of left paramere and penis valve seen from apex (dorsal side): Fig. 630, volsella



Figs. 620-630.
Trypoxylon vardyi
sp. nov., ♂

remarkably broad, apical enlarged area covered with spinules, on outer margin they are replaced with long bristles, penis valve with well developed shoulder and a pair of sickle-shaped appendages.

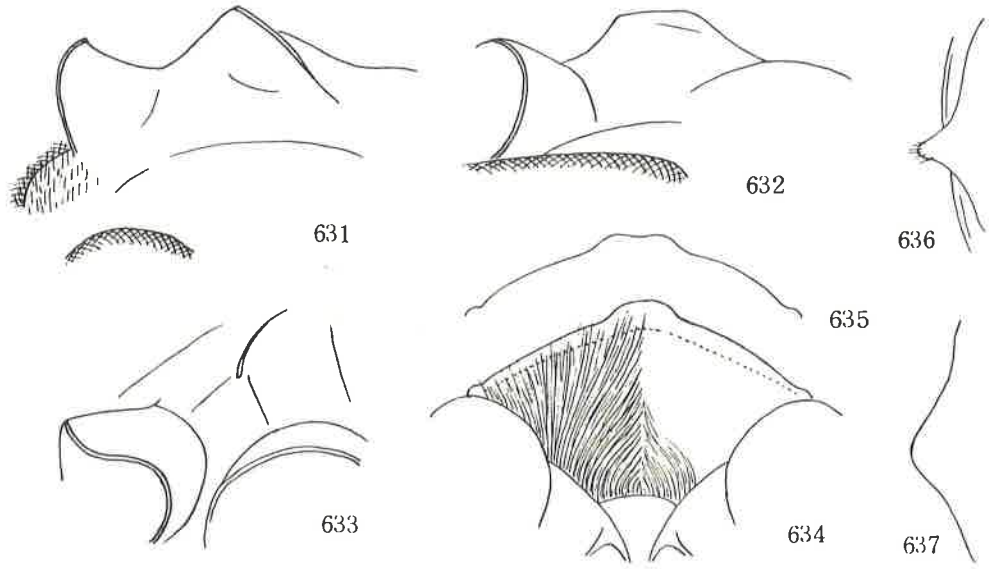
Frons strongly microreticulate and fairly closely superimposed with deep distinct punctures, mesoscutum with plumbeous shine, smooth and shining and finely very sparsely punctured, propodeum with strong lateral series of striae, median furrow of area dorsalis crenate at medial bottom line, posterior inclination posteriorly coarsely rugoso-striate, sides smooth and polished, on dorsal area scattered sparsely with comparatively large punctures, at apex transversely striate.

♀, differing from membranceum in that head seen in front distinctly wider than long, with sides fairly markedly convergent below (in membranaceum subquadrate, with sides rounded, not convergent below), SAT higher, A3 longer, OOD relatively broader and legs without ferruginous area.

Length 11-12 mm. Black; mandible ferruginous, at base black, apically reddish brown, mouth parts achre yellow, tegula transparent brown, gaster from apex of petiole to G3 red, with a large black mark on 2 and 3, sometimes fore tarsus apically pale brown, tibial spurs brown to pale brown, in some light appearing fairly whitish. Hair silvery, on clypeus strongly sinuately convergent towards median line (Fig. 634).

Measurements in Malayan specimen: HW,HL,A3,P=100,48,27,23,158, OOD,Od,POD≒2,3, 3, IODs=10:9, A3=AWx3.7, A3,4,5≒10,7,6, P,Ma,Mi,2(Ma),3(Ma)=100,16,5,24(22),28(30). Frontal elevations moderately high, rounded, median furrow broad and moderately deep, SAT low broad nasiform, ASR broadly expanded anteriorly, surface smooth and brownish. SAT-ASR seen obliquely from side to see through PAF: Fig. 631, in profile: Fig. 632 (dorsal curvature somewhat different from ♂, but possible variation), seen obliquely from beneath: Fig. 633. Clypeus: Fig. 634, at base raised and apically reflected, recurved part of apical margin sometimes entire, sometimes gently emarginate (Figs. 634 in Malayan ex. and 635 in S. Indian), occipital carina complete, minutely incised behind buccal cavity. Pronotal collar subtriangularly raised and weakly swollen in middle, seen from above not very narrow and consdderably incrassate sideways, lamina on side in Malayan specimen: Fig. 636, in S. Indian: Fig. 637, the difference remarkable. Subalar area of mesopleuron normal, posteriorly with side only edged; propodeum with distinct lateral carinae, area dorsalis with distinct lateral furrows, medial furrow fairly deep, enlarged posteriorly, area apicalis sometimes weakly carinated at dorsal margin, sometimes merely striated and sometimes without carina, GSR obliquely subtriangularly strongly raised; petiole flask-shaped. In fore wing RC C-type, Rl short, CV1=CV2x5, TCV:CV2≒3:2, TCV weakly sinuate, angle roughly about 100°.

Frons distinctly microcoriaceous, with punctures shallow, weak and sparse, SAT



Figs. 631-637. Trypoxylon vardyi sp. nov., ♀

covered fairly closely with hair-bearing punctures, mesoscutum with fairly strong aeneous shine, but surface smooth and polished, with sparse finely punctures, propodeum

with distinct series of striae along lateral carinae, furrows of area dorsalis transversely striate, posterior inclination transversely striate, sides smooth and shining, except antero-ventral part sparsely covered with fine punctures.

Holotype: ♂, N. India (Kangra Valley, 4500 ft), VI. 1899, G. C. Dudgeon, Coll. C. G. Nurse (BMNH).

Paratypes: 1 ♀, Malaya (Waterfall road, 11th m. Batu Feringgi), 13. XI. 1955, H. T. Pagden (BMNH); 1 ♀, South India (Kelara State, Walayar Forests, 700 ft), X. 1959, P. Susai Nathan (BMNH).

Remarks. In the South Indian female specimen IODv relatively 27, A3 11, P 144, IODs=10:9, OOD,Od,POD=2,4,3 and mesoscutum without plumbeous shine, with sparse and fine punctures.

114. TRYPOXYLON DAICOCCUM sp. nov.

Closely resembles the preceding species, even in the general structure of SAT-ASR and male genital organs, differs from it, however, in that SAT anteriorly with a distinct transverse carina, A13 in ♂ relatively shorter and apical part of paramere of genitalia different in detailed structure. It is also somewhat similar to membranaceum, but differs from this markedly in the structure of male genitalia.

♂, 9.0 mm. Black; mandible ferruginous, at base black and at apex castaneous brown, palpi ochre yellow, tegula transparent brown, gastral petiole at apex, G2 except brown mark above and basal half of 3 ferruginous red, rest of 3 brown, legs more or less brown, tibial spurs nearly white, fore tarsus pale brown towards apex. Hairs silvery, on clypeus parallel.

HW,HL,IODv,A3,A13,P=100,50,29,15,22,144, OOD,Od,POD≒1,1,1, IODs=10:9, A3=AW×2.7, A3,4,5≒10,7,7, A13=BW×2.2. Frontal elevations moderately high, median furrow moderately deep, SAT-ASR seen vertically: Fig. 638, obliquely from left side to see through PAF: Fig. 639, in profile: Fig. 640, obliquely from beneath: Fig. 641. ASR on apical area broadly ambur yellow, basally dark brown to black, surface smooth and polished, small round flat area around apex of median carina of SAT forms a step before inclining to interantennal area (Fig. 640, 641), below this inclination crossed by transverse carina (do.). Clypeus: Fig. 642, at base gently raised, at apex weakly reflected, A10-13: Fig. 643, occipital carina complete, but weak and deeply depressed behind buccal cavity; collar of pronotum raised towards middle and minutely tuberculate there, seen from above considerably incrassate laterally, posterior part half discoloured, posteriorly light glossy brown, lamina on side: Fig. 644. Subalar area of mesopleuron normal. Propodeum with distinct lateral carinae, area dorsalis with distinct lateral furrows, area apicalis only on sides carinated, GSR moderately roundly raised with apex discoloured; gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,16,7,32 (22),32(32), in fore wing RC C-type (apex broken), CV1≒CV2×4, TCV weakly sinuate, TCV: CV2≒4:3, angle about 100°.

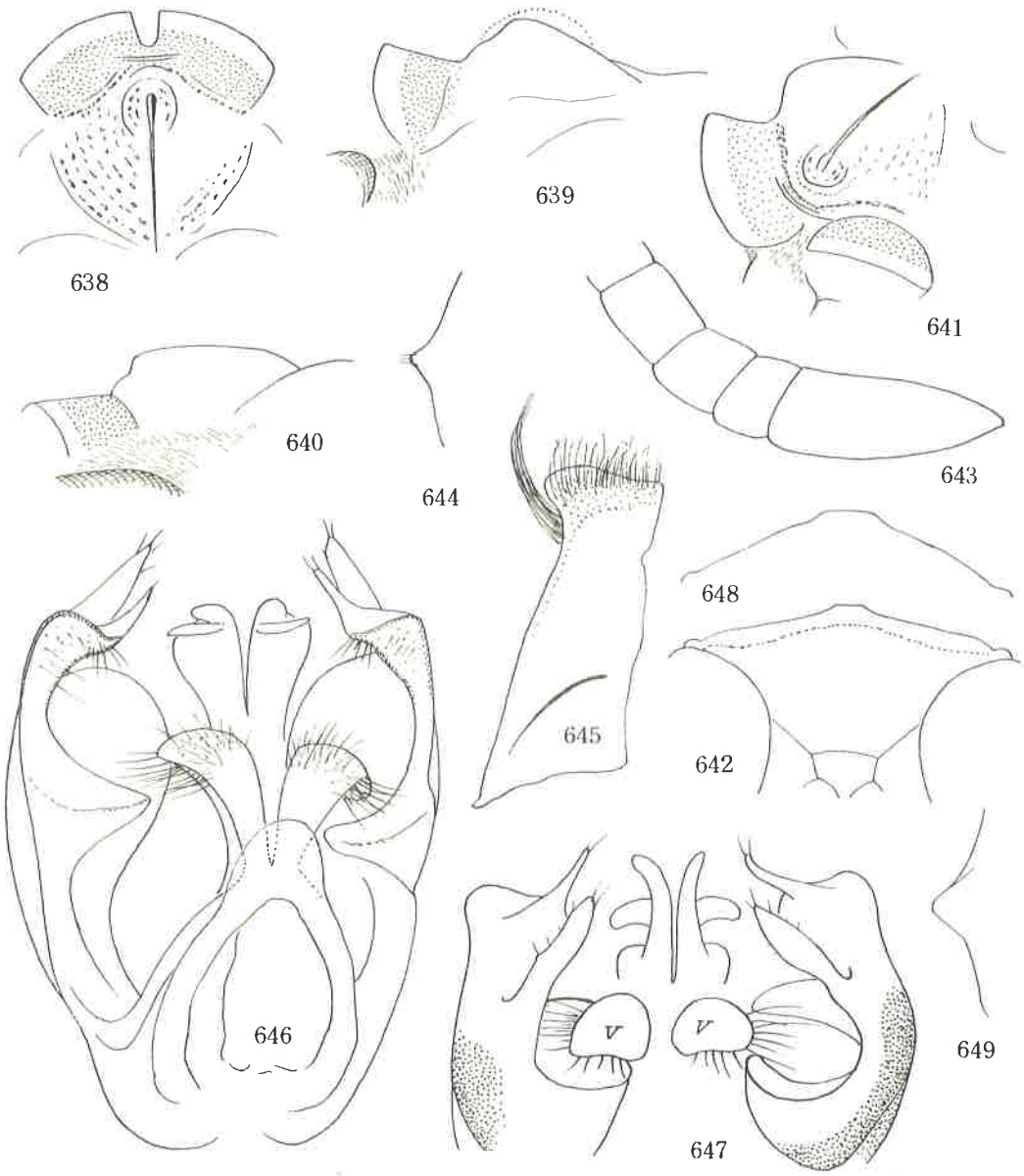
During dissection sternite 8 was broken, broken part (left half): Fig. 645, showing difference from that of vardyi in bearing a tuft of longer hair on each side at apex; genitalia in ventral view: Fig. 646, seen from apex (dorsal view): Fig. 647, paramere bifurcate at apex into two lobiform layers, ventral one curved inwards and recurved apically, with ventral surface covered with hair, without hair-bearing tubercles at its base, otherwise very similar to those of this species, volsella and penis valve also similar. (V in Fig. 647 showing volsella)

Frons distinctly microcoriaceous and fairly closely superimposed with distinct punctures, PIS≒PD, SAT more finely and closely punctured, punctures arcuately, somewhat concentrically arranged around top area (Figs. 638,641), mesoscutum smooth and polished, with sparse fine punctures scattered, lateral and median furrows of area dorsalis transversely striate, lateral series of striae strong and coarse, posterior inclination posteriorly transversely striate, sides smooth and polished, but on posterior half sparsely punctured. Apical margin of clypeus: Fig. 648, lamina: Fig. 649.

♀, 11-12 mm. Very similar to vardyi, but mesoscutum with very strong plumbeous shine, with punctures comparatively large and fairly close, PIS≒PD, but the punctures indistinct on outline. IODv relatively 25, A3=11, P=158, OOD,Od,POD≒2,4,3, IODs=10:9.

Holotype: ♂, Laos (Sayaboury Prov., Sayaboury), 12. II. 1966, native collector (BPBM).

Paratype: 1 ♀, Laos (Vientiane Prov., Gi Sion Vill. de Tha Ngone, 7-21. II. 1965, native collector (BPBM).



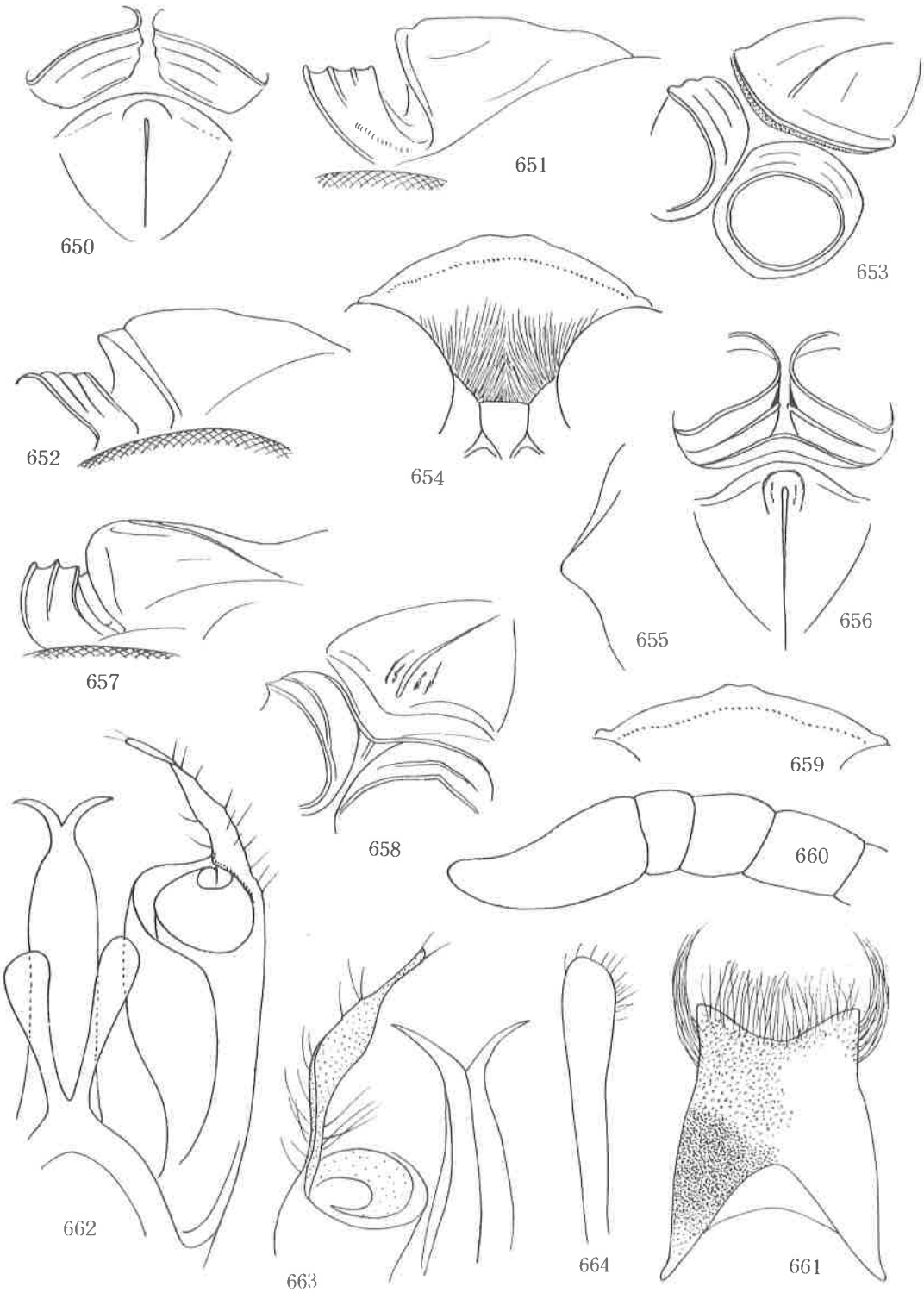
Figs. 638–649. Trypoxylon daicoccum sp. nov., 638–647, ♂; 648–649, ♀

115. TRYPOXYLON PROMINENS sp. nov.

In the structure of SAT-ASR and clypeus similar to T. melanocorne except that ASR with apical margin much more expanded inwards, but markedly different from this in the colour of legs and in the structure of propodeum, especially in ♂ extremely so in the structure of genital organs, and there is no doubt that both belong to a different species respectively.

♀, 12–13 mm. Black; Al, 2 and sometimes Al3 pale brown at apex, mandible ferruginous, at base black and at apex brown, palpi, knee, basal half of tibia in front and tarsus except brown patch on T5 of fore leg, base of tibia, Tl and 2 of mid leg and bases of tibia and Tl of hind leg and all tibial spurs whitish ochre yellow; apices of

all tibiae, mid T3 and 4, articulations of hind tarsus, claws and their attaching areas of all legs pale brown; all arolia dark brown to black, posterior part of collar half discoloured, castaneous brown, tegula transparent pale yellowish brown, gaster from api-



cal area of petiole to base of G4 reddish ferruginous, wing veins dark brown. Hairs silvery, on clypeus at base convergent towards medial line.

HW,HL,IODv,A3,P=100,48,23,24,152, OOD,Od,POD≒1,3,2, IODs=3:2(10:6.7), A3≒AWx3.5. Frontal elevations moderately high, median furrow moderately deep, SAT low nasiform, anteriorly flattened, with apical margin transversely roundly curved and acutely edged, ASR highly raised, anteriorly bicarinate, surface transversely striate, PAF deep, flat-bottomed, the structure seen vertically: Fig. 650, obliquely from side to seen through PAF: Fig. 651, in profile: Fig. 652, obliquely from beneath: Fig. 653. Clypeus: Fig. 654; occipital carina complete, not depressed nor weakened behind buccal cavity. Collar nearly straightly raised towards middle and tuberculate there, seen from above considerably incrassate laterally, lamina on side triangularly produced (Fig. 655); subalar area normal, outer margin of its posterior part acutely edged and carinate, but not expanded; propodeum without lateral carinae, area dorsalis with very weak lateral furrows, area apicalis not completely enclosed with carina, its lateral carinae weaker forwards, on dorsal part ob olete, GSR roundly raised, with the marginal area narrowly discoloured; petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,18, 6,32(22),33(30), In fore wing RC C-type, Rl short, CV1=CV2x5-6, TCV weakly sinuate, TCV:CV2≒5:3, angle at the corner roughly about 90°.

Frons distinctly microreticulate and fairly closely superimposed with small shallow punctures, PIS=PDx1-2, mesoscutum with fairly strong plumbeous shine, punctures not very fine, somewhat sparse, mostly PIS=PDx2-3, propodeum with distinct lateral series of striae, median and lateral furrows of area dorsalis transversely striate, posterior inclination posteriorly transversely rugoso-striate, sides scattered sparsely with very fine hair-points, mixed posteriorly with weak sparse striae.

♂, 9.5 mm. Generally similar to ♀, but fore tibia only at base yellowish white, mid tarsus wholly dark brown except apices of each joint where somewhat pale, claws brown to dark brown, G2-3 broadly blackish above. Hairs on clypeus parallel. RC of fore wing intermediate between C- and B- types, on side above of propodeum with a trace of lateral carina, feebly defined in certain light.

HW,HL,IODv,A3,Al3,P=100,50,25,16,22,130, OOD,Od,POD≒1,3,2, A3=AWx3, Al3=BWx2.7 P,Ma,Mi,2(Ma),3(Ma)=100,20,7,29(29),29(38). RC C-type, but near to B-type, Rl short, CV1≒CV2x4, TCV weakly sinuate, TCV:CV2≒5:3, angle about 90°. SAT-ASR seen vertically: Fig. 656, seen from left side to see through PAF: Fig. 657, seen obliquely from beneath: Fig. 658, clypeus: Fig. 659, Al0-13: Fig. 660, sternite 8: Fig. 661, markedly shorter than usual, with inner (=dorsal) surface distinctly microcoriaceous, form at base and at apex characteristic. Genitalia seen from beneath: Fig. 662 (left paramere omitted), seen from apex (dorsal view): Fig. 663 (left paramere omitted), volsella (right half): Fig. 664. Penis valve without shoulder and sickle-shaped appendages, paramere at apex not bidurcate, with a single narrow lobiform layer only, main body strongly expanded on both margins into lamellate layers and rolled to form a cylindric pouch, expansion is so strong that both layers deeply overlap each other, especially the ventral layer (expansion from the outer margin) very deeply rolled, the greater part of the top of this pouch is covered with the lid (dotted in Fig. 663) expanded from the upper margin of ventral layer, leaving a small rounded opening alone (Fig. 662 and 663). The structure is veyy curious.

Punctuation similar to that of ♀.

Holotype: ♀, Laos (Vientiane Prov., Gi Sion Vill. de Tha Ngone, 10-30. I. 1966, native collector (BPBM).

Paratypes: 1 ♀, Laos (Sedone Prov., Pakse), 31. V. 1967, native collector (BPBM), 1 ♀, Laos (Wapikhamthong Prov., Wapi), 31. V. 1967, native collector (BPBM), 1 ♂, Laos (Vientiane Prov., Ban Van Eue), 30. VI. 1966, native collector (BPBM), 1 ♀, Malaya (Kehah Peak, 3300 ft), 25. III. 1928, H. M. Pendlebury (BMNH), 1 ♀, South India (Anamalai Hills, Cinchona, 3500 ft), V. 1964, P. Susai Nathan (RMNH).

Remarks. Usually PAF of each side obliquely runs towards top of interantennal area and smoothly confluents to form a Y-shaped furrow (Figs. 650, 653). But in one of the females from Laos and in the male (from Laos) PAFs are interrupted at medio-anterior part of SAT to connect with interantennal furrow by a highly raised carina (or bank) extended from posterior ridge of ASRs, they confluent only each other and form a roundly curved furrow in front of SAT (Figs. 656, 658), in this case a longitudinal carina arises at mid point of the bank and runs down in middle of interantennal furrow. The difference is very marked and it is suggested that the specimens concerned may belong to a different species. But on examining two other females from Laos it is discovered that in one of them (paratype) the transverse carina or bank is only weakly developed, showing an intermediate state between the two above mentioned. Thus it was made clear that the difference in the state of the furrows concerned is only a variation within the characters of the species.

The male of this species does not agree with the female in the characters of the gastral petiole and radial cell of fore wing. In the male petiole is markedly short (compare the measurements of both sexes) and RC is nearly B-type. Future study on the variation of these characters is necessary.

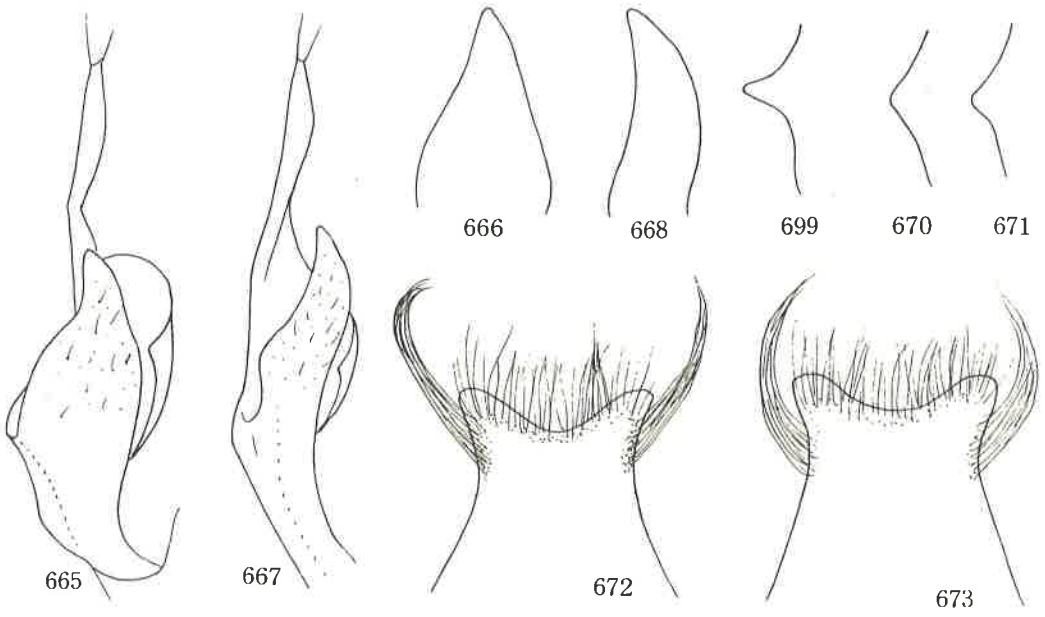
ON TRYPOXYLON BICOLOR SENS. TSUNEKI, 1978

In the preceding number of this series I provisionally included two forms within this species, one is a typical form having the brightly coloured legs, while the other is a form having less brightly maculated legs, including occasionally the wholly black legged male specimen. I further says that the lectotype specimen of T. bicolor Smith is slightly deviated from the normal ones (♂) in having A3 relatively somewhat longer and the shorter one of apical lobes of paramere of genitalia is slightly wider than in the usual specimens. The detailed comparative studies reveal that the second form above mentioned is a separate species from bicolor and the name, T. petiolatum Smith, 1857, must be revived for this form. The separation of the two species is everywhere comparatively easy and doubtless in the male, while in the female it is in certain localities very difficult and almost impossible, although in some other localities it is not always difficult as in the male. This is due to the local variations of the characters.

The process that has led to the above mentioned conclusion is related in the following:

(I) The specimens from Singapore (12 ♀ 29 ♂)

A number of specimens (9 ♀ 27 ♂) are collected by C. F. Baker and preserved in USNM and they are added with 1 ♀ from BPBM and 2 ♀ 2 ♂ from HMNH. These topotypical materials are sufficient to study the problem as to whether the characters shown by the lectotype and paralectotype specimens are normal to the species or aberrant. First I tried to divide the male specimens by the relative length of A3, the longer slender group and the shorter thicker one. They could clearly be divided into two groups. In the former A3 is, seen from the widest side AW 2.8-3.1 (from the narrowest side AW 3.0-3.5), while in the latter it is AW×2.1-2.5 (or AW×2.5-2.8). The former is the typical form including 20 ♂ and the latter is my "usual form" including 9 ♂. From 3 males of the typical form and 4 males of the usual form I took out the genital organs and comparatively examined. In the former the shorter one of the apical bifurcated lobes is short, wide, triangle in form (Figs. 665, 666), while in the latter it is longer, narrower and elongated curved triangle (Figs. 667, 668). The difference is very constant. In order to find out other external differences I tried some measurements



(Table 8) and detailed comparative observations. Taking into consideration the variations the main differences between the two groups can be summarized as follows (the second form within parenthesis):

Body length 12.5–16 mm (10.0–13.5 mm). A3=AW×2.8–3.1 (2.1–2.5). A13=BW×3.0–3.3 (3.4–4.0). Pronotal lamina produced in tooth, Fig. 669 (produced in triangle, Fig. 670, at most Fig. 671). Fore tibia ferruginous white, but middle area except outer half pale brown (wholly pale brown, but inner side, not folded side, is paler, rarely close to typical form). Mid tibia ferruginous white, at least at base, mostly as in fore tibia (wholly pale to dark brown). Fore tarsus yellowish white (brown to dark brown). Mid tarsus yellowish white at least on T1, varies on T1, T1–2...T1–5 (wholly brown to dark brown). Further, apical margin of sternite 8: Fig. 672 (Fig. 673).

Furthermore, a delicate difference is present in the state of a small flattened area around the anterior end of medial carina of SAT. It is less distinct and somewhat more anteriorly located in the typical form.

According to the differences in the male I attempted to separate the females into two corresponding groups. Of the differences those concerning antenna are of no practical use, but those of body size, pronotal lamina and colour of legs give good clues. Thus it was made clear that 3 females belonged to the typical form and the remaining 8 to the second form. The main differences (the second form within parenthesis):

Body length 16–19 mm (14–16 mm). Pronotal lamina toothed (not toothed as in Fig. 670). Fore tibia ferruginous white except folded side (ferruginous white, but mid area on outer side broadly brown). Mid tibia ferruginous white, but folded side black and outer side apically brown (bae and apex ferruginous, rest brown to dark brown). (Fore tarsus similar) Mid tarsus: T1–4 ferruginous white, 5 brown (similar but T3,4,5 each with a dark brown patch above). Further, gaster from apex of G1 to apex of G4 red (from apex of G1 to apex of G3 or to base of G4 red). Flagellum dark brown beneath (pale brown to ferruginous beneath).

Measurements on 3 specimens of both sexes of the two forms thus separated are given in Table 8 and the shapes of SAT–ASR seen obliquely from side to see through PAF are in Figs. 674 (typical ♂), 675 (typical ♀), 676 (second form ♂) and 677 (second form ♀). Variation in the shape of ASR under the same condition is in typical ♂: Fig. 678 (6/20), in typical ♀ none, in the second form ♂: Figs. 679 (1/9) and 680 (1/9) and in the second form ♀: Fig. 681 (2/8).

From the table it is perceived that the differences between the two forms concern mainly in ♂ with A3, A13 and P, and somewhat also with BL, HL and CV1 (=CV2×) and in ♀ with A3 and P. From the figures it is realized that the shape of SAT and ASR is in ♂ very similar between the two forms, but in ♀ different in the state of carinae on

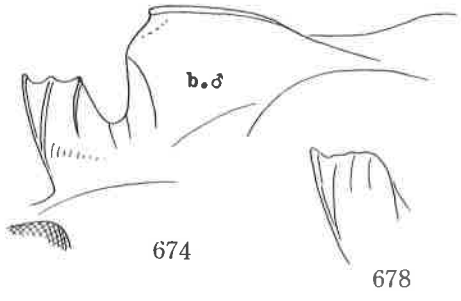
Table 8. Measurements on the typical and second forms (♂♀) of T. bicolor

F	BL	HL	VL	A3(L/W)	A13(L/W)	P	OD d PD	IODs	Ma Mi	2(Ma)	3(Ma)	CV1	TCV:CV2
	16	42	25	18(2.8)	26(3.2)	150	3 4 3	8.3	16 6*	32(20)	30(28)	5.8	5:3
b.♂	16	44	25	18(3.0)	26(3.2)	148	3 4 3	8.3	17 6	34(21)	32(29)	5.2	5:4
	15	46	26	18(3.0)	26(3.0)	148	3 4 3	8.5	15 6*	32(20)	30(28)	4.6	6:5
	13	49	28	16(2.2)	28(3.8)	160	3 4 4	8.0	18 6	30(20)	30(26)	5.4	3:2
p.♂	12	48	29	16(2.1)	27(3.4)	154	3 4 4	8.0	14 6*	28(17)	32(26)	4.0	6:5
	11	46	28	16(2.3)	28(4.0) (A12)	160	3 4 4	8.0	16 6*	26(21)	30(28)	4.2	4:3
	17	46	24	26(5.4)	17	166	2 4 3	7.5	18 6*	30(20)	37(29)	6.0	5:3
b.♀	19	46	24	28(5.5)	17	170	2 4 2	7.5	17 6	30(18)	30(22)	6.1	5:3
	18	47	24	28(5.0)	17	170	3*4 3	7.5	17 6	31(20)	34(28)	6.1	5:3
	13	48	27	26(5.1)	16	174	3*4 4	8.0	15 5	26(20)	28(27)	5.6	5:4
p.♀	14	48	26	26(5.1)	17	176	2 4 4*	7.5	16 5	26(16)	28(24)	5.1	5:3
	14	47	28	27(4.7)	17	174	2 4*3	7.0	16 6*	28(19)	30(26)	5.0	5:3
b.c.♂	13	48	29	16(2.0)	21(2.5)	149	3 4 4*	7.8	17 6	31(19)	33(26)	5.3	5:4*

Remarks. F..form. BL..body length. VL..IODv. OD,d,PD..OOD,Od,POD. BL mm. HL,IODv,A3,A13,P... relative length to HW as 100. Ma,Mi,2,3... relative width or length to P as 100. b... typical form (= bicolor s.str.). p... second form (= petiolatum). b.c... Ceylonese form (= b. ceylonicum)

3* is really 2.5, similarly 4* is 3.5, 5* is 4.5 and 6* is 5.5.

ASR and in the distance relation between both banks of PAF, namely in typical form distance between PAF and apex of medial carina of SAT is subequal to the distance between PAF and apical carina of ASR, while in second form the former is greater than the latter (the fact is confirmed on all other specimens of the two forms). Further, it is also made clear that PAF is much shallower in ♀ than in ♂, this is due to that PAF is markedly upcurved in ♀. Still further, it must also be added to the differences between the two forms that the vertex is somewhat more strongly depressed in the typical ♀ than in the second form ♀.



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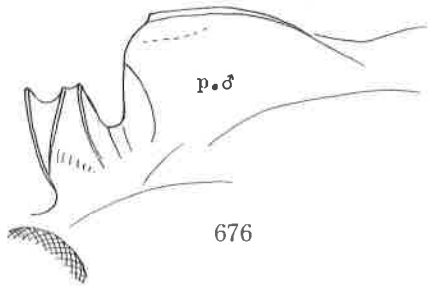

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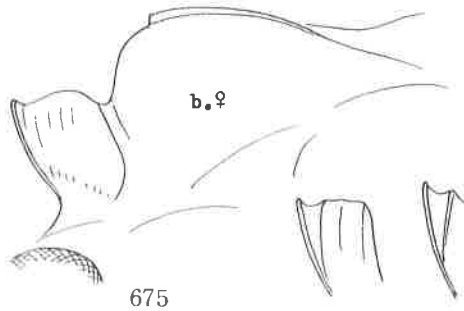

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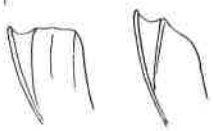

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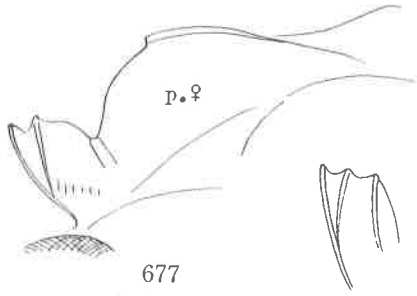

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In 2 out of 9 male specimens of the second form fore legs are wholly dark brown except somewhat pale brown inner side of the tibiae, mid and hind legs completely dark brown. This is the form corresponding to rejector Smith, cognatum Cameron and javanum Taschenberg. Some intermediate states of colouration are found among the remaining specimens, showing that my "black-legged form" is included in the second group and this group is certainly corresponding to petiolatum Smith, the earliest name of the synonyms. In the specimens from Singapore, as above mentioned, it is by no means difficult to separate petiolatum from bicolor s. str. in both sexes and judging by the sympatric occurrence without the intermediate form between them, it must be concluded that T. petiolatum Smith is not a form of T. bicolor, but is a distinct species.

Remarks. In all the males of bicolor s. str. PAF is flat-bottomed and curved down at each end and there is no specimen that has an up-curved PAF as in the paralectotype of T. bicolor. While in ♀ in both bicolor and petiolatum PAF is distinctly upcurved.

The form of clypeus, pronotum and propodeum, with the tendencies of their variations is similar to each other in both species (♀ ♂).

(II) The specimens from Malaya including Penang (31 ♀ 18 ♂)

The greater part of the specimens are those collected by H. T. Pagden and are preserved in BMNH. To these some ten are added from the collections of BMNH, USNM, HPBM and RMNH. They consist of 5 ♀ of T. bicolor Smith and 26 ♀ 18 ♂ of T. petiolatum Smith.

1. The females of T. bicolor

They well agree with the specimens from Singapore in the characters of IODv, vertex. SAT-ASR, pronotal lamina, in the colour of antenna, gaster and legs and in the

body size (17-18.5 mm). Main characters of the specimens are given in Table 9.

2. The specimens of T. petiolatum

♀. Length 12.5-14.5 mm. All tibiae at base yellowish white, on fore tibia widely extended till about middle of front side. The same colour varies from T1-4, 1-3 to 1-2, with the rest brown, in mid tarsus on 1-3 or 1-2, with the rest dark brown to black. SAT-AST similar in structure to those of Singapore relatives (covering whitish hair should be rubbed off), clypeus in most specimens medianly at apex broadly truncate, but sometimes rounded, when the area is beveled, with the basal line straight. Punctures on mesoscutum fine and sparse, surface with plumbeous shine, varied in strength. Lateral furrows of area dorsalis mostly weak and indistinct (in oblique light only defined), but sometimes fairly well-defined, but always not strong. Main characters of some sampled specimens are given in Table 9.

♂. Only 5 specimens have the fore legs (tiba and tarsus) formally maculated whitish, all the rest tarsal colour either maculated with pale brown or brown, or wholly pale brown to brown. A3 usuall AW×2.2-2.3 in length, A13 usually longer than 3, but shorter than 4 preceding joints united, sometimes completely as long as 4 combined. This is partly due to the curving condition of apical segments. Anterior flattened area of SAT as in the Singapore specimens.

Remarks. One male specimen from Is. of Penang is quite exceptional in external characters. It is 15 mm in length, with the gaster from apex of petiole to apex of G4 ferruginous red, fore and mid tibiae more broadly ferruginous or pale brown than usual and A3 comparatively long, =AW 2.6 and apparently close to bicolor (but fore tarsus brown except both ends of T1 and mid tarsus wholly dark brown). On examining the genital organs that are produced from caudal end it is confirmed that shorter apical lobe of paramere is distinctly that of petiolatum, showing that the colour of gaster and legs and relative length of A3 vary considerably in this species.

(III) The specimens from Tenasserim (3 ♀)

All belong to petiolatum, measuring 17, 15, 14 mm respectively, with relative width of IODv 26, 26 and 27. Vertex not depressed, pronotal lamina not toothed, ASR more acutely tricarinated than in Fig. 681; fore tibia except brown median area comparatively broadly and mid tibia at base and apex ferruginous, fore tarsus except pale brown T5 and mid T1-3 yellowish white (4-5 dark brown). Thus the specimens have fore and mid legs comparatively brightly maculated. Main measurements in Table 9.

(IV) The specimens from Thailand (2 ♀ 1 ♂), Viet-Nam (1 ♀) and Laos (21 ♀ 9 ♂)

Except for one male bicolor specimen from Thailand all belong to petiolatum.

(1) The specimen of bicolor ♂

Length about 14 mm. Except for the antenna (A3 and A13) and genitalia the specimen is considerably deviated from the typical specimens of bicolor ♂: Fore tibia except a brown streak in front and narrow extreme apex wholly dark brown, fore tarsus appears wholly pale brown, due to covering whitish hair, in reality much darker brown, mid tibia dark brown, near to black, only extreme base and apex somewhat brownish, fore and mid tibial spurs brownish white, mid tarsus dark brown, somewhat paler apically, hind leg dark brown, knee and tibial spur only pale brown. Pronotal lamina not strongly toothed as in topotypical specimens, only weakly produced as in Fig. 671, showing that non-toothed lamina is not always the decisive clue to identify a specimen with petiolatum. But antennal flagellum dark brown beneath and the gaster from apex of petiole to apex of G4 yellowish red. A3 (=AW×2.8), A13 and paramere of genitalia are typical to the species.

(2) The specimens of petiolatum ♂ (9)

Fore and mid tibiae typical in colour to the species (basal half in front and extreme apex of fore tibia and base and apex of mid tibia narrowly ferruginous), tibial spurs near white, fore tarsus in 5 specimens out of 9 nearly white, only T1,4,5 somewhat brownish, in the remaining 4 the colour of the joints much darker, especially T1 nearly black (appearing obscure dark, due to covering hair) and T2 and 3 also brownish. Mid tarsus dark brown, only articulations and T5 partly (base, claws and their bases) somewhat pale. A3=AW×2.3-2.5, A13=BW×3.2-3.5 and longer than 3 but shorter than 4 preceding joints united, but in 3 specimens as long as 4. Gaster from apex of petiole to base of G4 (beneath only) reddish yellow, with a brown mark on 2 and 3, varied in size and brightness (but never so broad as the segments become on apical margin only ferruginous). Pronotal laminae are typically triangular; lateral furrows of area dorsalis distinct in most of the specimens, but shallow and broad and weaker and indistinct apically, sometimes transversely striate, sometimes not. CV2 subequal to TCV in 2, slightly shorter in 4 and markedly shorter in 3.

(3) The specimens of petiolatum ♀ (24)

Length of the specimens ranges from 11.5 to 20 mm. Of these the largest 5 are in some characters bicolor-like: Fore tibia (ground colour black) on basal half in front and athorough broad streak on inner side (not folded side) ferruginous, mid tibia at base and apex ferruginous, in 2 of them basal paleness extending to about 1/3 or more, fore tarsus wholly (T5 pale brown) and mid tarsus basally (T1-2 -1-4) ferruginous and apically pale brown to brown. Antennal flagellum in most specimens dark brown beneath. Vertex somewhat depressed and IODv comparatively narrow (but both not so marked as in Singapore bicolor), anterior subflat area of SAT distinctly located on anterior inclination and antero-lateral inclination of SAT mostly longer than length of ASR that is, however, varied in form. A3 and P also tend to be longer than in other small specimens. Pronotal lamina not typically toothed, but more produced than usual, about intermediate between Fig. 669 and 671.

Whether the characters above mentioned are variations in bicolor or variations in petiolatum we can not simply say, especially as we know the somewhat intermediate characters in bicolor ♂ of Thailand. But here placing the stress on the structure of SAT-ASR (cf. Figs. 675 and 677) and taking into account the local variations of other specimens I placed the specimens rather provisionally under petiolatum Smith. The fact that no specimen of bicolor ♂ is captured in Laos seems to support also the present decision.

In other 19 specimens the length ranges from 11.5 to 15.0 mm. Fore tibia in 7 specimens maculates as in above mentioned large group, in 9 inner brown streak only on basal 2/3 nd in the remaining 3 only basal third. Mid tibia only at extreme base and apex ferruginous, but in one specimen basal pale mark extended till about a third. Fore tarsus in a considerably number of the specimens ochre yellowish white, with T5 or T4-5 pale brown, in the remaining brownish colour becomes darker. Mid T1-2 usually pale brownish white, 3-5 mostly pale brown. Antennal flagellum light ferruginous or pale brown beneath, pronotal lamina triangular, not toothed, lateral furrows of area dorsalis shallow and weak, defined in oblique lingt only, in 2 specimens completely disappeared. ASR mostly bicarinate, sometimes tricarinate, antero-lateral inclination of SAT always longer than length of ASR (cf. Fig. 677).

Appendix The specimens from South China (3 ♀)

There are 3 female specimens from S. China (Canton and Macao), all belonging to petiolatum, main characters are given in Table 9, ASR fairly acutely tricarinate.

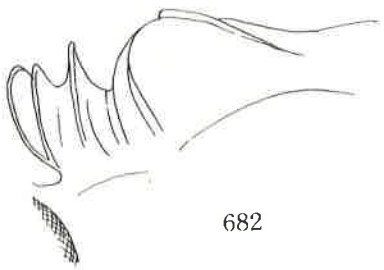
(V) The specimens from Nepal (1 ♀), India (12 ♀) and the Maldives

Main characters of the specimens are given in Table 9. Fore tibia in front ferruginous in variable extent, ASR mostly tricarinate, only rarely (3/14) bicarinate.

Two large specimens (19 and 17 mm) from South India were particularly examined. In both vertex slightly depressed, IODv narrower than usual (especially in one of them - Table 9 -), antennal flagellum near black beneath, but the colour of legs is petiolatum-fashon and the relation of SAT and ASR is also that of petiolatum, especially remarkable is that the carinae on ASR are very acute and SAT is less elevated than usual and in both specimens antero-lateral area of SAT acutely edged at the verge to PAF (Fig. 682).

In the specimen from the Maldives ASR with anterior margin acutely and highly carinated and roundly inclined posteriorly, surface weakly tricarinate and the length relation to SAT as usual. Mesoscutum with fairly strong plumbeous shine, punctures comparatively large but sparse, PIS roughly 2-4 times PD.

The specimen from Nepal is comparatively brightly maculated on fore tibia and fore and mid tarsi, and in colour of antenna and gaster and in structure of clypeus, pronotal lamina and propodeum normal, but in the structure of SAT somewhat aberrant,



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median area carrying carina is anteriorly highly raised to form an independent hill (Fig. 683, in profile), but ASR tricarinate as usual and antero-lateral verge to PAF is not carinated.

(VI) The specimens from Ceylon (13 ♀ 11 ♂)

A number of specimens are collected by F. Keiser and preserved in NHMB. These are added with several specimens from BMNH and USNM, summing up to 24 specimens.

Apparently they are petiolatum, length is medium to small, gaster mainly from apex of petiole to G3 red, pronotal lamina triangular, not toothed, vertex not depressed, IODv not small, SAT-ASR similar to those of petiolatum and in ♀ antenna ferruginous or pale brown beneath and in ♂ A3 relatively short, =AW×2.1-2.4 (but A13 relatively shorter). Placing aside A13, the characters above listed agree completely with those of petiolatum. However, in reality they are not petiolatum, but bicolor, because in the structure of paramere of genitalia they are no doubt members of this species.

To make the matter sure I dissected 4 male specimens and examined the genitalia. Certainly they are one and the same form and quite similar to those of the specimens from Singapore. Hereupon it has become clear that T. bicolor in a certain locality takes nearly completely the external form of T. petiolatum. However, there is one each of the external character in both sexes that shows that they are not petiolatum. It is in ♂ shorter A13 and in ♀ deeper PAF. A13 is shorter (Table 8, b.c.♂), only as long as 3 preceding joints united, in ♀ PAF fairly deep, flat-bottomed and U-shaped in cross section (Figs. 684-686). But these show at the same time that they are not bicolor s. str. Certainly there is no other way to examine the male genitalia to determine that they belong to bicolor. At any rate Ceylonese population is likely to be misidentified with petiolatum or its ally. Practical way to avoid this is to confirm the locality data.

There is no doubt, however, that the Ceylonese population of T. bicolor forms a distinct local race. Taxonomic treatment will be done in the following section.

Table 9. Measurements on Trypoxylon bicolor and T. petiolatum.

Loco	Sex	BL	IODv	A3	P
Malaya: Kedah Peak	♀*	17	24	28	170
M.: Kedah NR Jitra	♀*	18	25	29	166
M. "	♀*	16	24	27	172
M.: Bukit Merah	♀*	19	23	28	166
M.: Bembilan Is.	♀*	18	24	28	160
M.: Parit Buntan	♀	14	26	24	170
M.: Penang	♀	15	24	27	176
M.: "	♀	14	26	25	164
M.: "	♀	15	24	26	176
M.: "	♀	13	27	24	168
Thailand	♀	20	26	26	180
Laos: Ban Van Eue	♀	19	25	28	176
L.: "	♀	18	25	27	184
L.: "	♀	15	24	27	170
L.: Nam Kading	♀	18	25	27	178
L.: Gi Sion	♀	18	26	27	180
L.: "	♀	14	26	26	164
L.: "	♀	13	26	26	154
L.: Phou Kow Kuei	♀	13	27	26	160
L.: Ban Me Thout	♀	15	26	26	170
Assam: Kahsia Hills	♀	14	28	26	170
Nepal	♀	13	26	26	160
Sikkim	♀	13	26	26	162
Matheran	♀	13	27	25	160
Matheran	♀	12	28	26	156
Tenasserim	♀	15	26	27	162
Tenasserim	♀	17	26	28	168
Bengal	♀	15	26	26	188
S. India:Anamalai H.	♀	19	25	30	186
S. I.: Pondicherry	♀	17	24	28	186
S. I.: Madras	♀	14	27	27	158
India	♀	13	27	26	160
I.	♀	15	27	25	166
I.	♀	14	27	25	158

Loco	Sex	BL	IODv	A3	P
Maldives: Male Is.	♀	13	28	26	166
Ceylon	♀	12	25	24	150
C.	♀	14	25	24	152
C.	♀	14	25	24	154
C.	♀	14	26	25	152
C.	♀	14	26	24	162
C.	♀	14	26	24	156
C.	♀	13	26	25	160
C.	♀	14	25	25	166
C.	♀	14	26	24	156
C.	♀	13	27	25	158
C.	♀	14	25	26	154
C.	♀	11	27	20	142
C.	♀	12	26	24	160

Loco	Sex	BL	IODv	A3(L/W)	A13(L/W)	P
Ceylon	♂*	9	31	18(2.4)	21(2.5)	132
C.	♂*	11	29	16(2.3)	22(2.4)	144
C.	♂*	12	29	16(2.3)	22(2.7)	142
C.	♂*	11	29	15(2.0)	21(2.7)	146
C.	♂*	10	29	17(2.3)	22(2.7)	150
C.	♂*	10	30	16(2.3)	20(2.3)	140
C.	♂*	11	29	16(2.2)	22(2.7)	140
C.	♂*	12	30	16(2.2)	20(2.5)	146
C.	♂*	11	28	16(2.3)	22(2.4)	152
C.	♂*	11	28	15(2.1)	- -	140
C.	♂*	12	29	16(2.3)	21(2.5)	144
Malaya	♂	11	30	16(2.4)	27(3.6)	150
M.	♂	11	30	15(2.4)	28(3.3)	150
M.	♂	12	29	15(2.3)	28(3.8)	158
Penang	♂	15	26	17(2.3)	28(3.8)	150
P.	♂	12	28	18(2.2)	26(3.3)	130

Remarks. *..bicolor, others petiolatum.

116. TRYPOXYLON BICOLOR Smith, 1856

Trypoxylon bicolor Smith, Cat. Hym. Brit. Mus., 4: 377, 1856 (♂, nec ♀, Singapore and Java).
Trypoxylon bicolor: Tsuneki, SPJHA, 8: 1 (partim, all synonyms should be removed).
Trypoxylon bicolor: Tsuneki, ibid., p. 3 (paralectotype - ♂ - lacking antennae, but pronotal lamina, SAT-ASR show clearly that it is conspecific with lectotype).

Specimens examined: 3 ♀ 20 ♂, Singapore, date unknown, C. F. Baker leg. (USNM). 5 ♀, Malaya: (2 ♀), Kedah, N. R. Jitra, Catchment area, 8,9. IV. 1928, H. M. Pendlebury (BMNH); (1 ♀), Kedah Peak, 3300 ft, 30. VII. 1921, H. T. Pagden (BMNH); (1 ♀), W. Coast, Bembilan Is., P. Rumbia, 19. IV. 1926, E. Saimund (BMNH); (1 ♀), Bukit Merah, 23. II. 1930, H. T. Pagden (BMNH). 1 ♂, Thailand (Chiangmai Prov., Chiangdao, 450 m), 5-11. IV. 1958, T. C. Maa (BPBM).

♀. Length 17-19 mm. Main characters are already given in Table 8 and Fig. 675. Some supplements: Mandible ferruginous, apically reddish brown, palpi ochre yellow, basally dark brown, antenna black, flagellum dark brown beneath, posterior part of collar incompletely discoloured, posteriorly yellowish or brownish, tubercle sometimes brownish on posterior margin. Frontal elevations gently rounded, covering comparatively small area, hence elevation distinct, medial furrow comparatively deep and wide, SAT fairly high nasiform, acutely carinated on top, anterior inclination with a small round subfalttened area just in front of apical end of medial carina (partly including it), at verge to PAF not edged, seen in profile with dorsal margin roundly curved, PAF fairly deep, up-curved, ASR as in Fig. 675, apical margin carinate, surface transversely obscurely striate, the character is very constant in all the specimens observed, IODs=4:3, clypeus with apical margin medianly subtruncate, at base roundly raised, with hair strongly convergent towards medial line, at apex distinctly reflected; collar in frontal view raised towards medial area and weakly swollen there, lamina on side distinctly toothed (Fig. 669); propodeum without lateral carinae, but with distinct lateral series of striae, area dorsalis with shallow and weak lateral furrows, usually posteriorly more or less distinct and striate, anteriorly weaker and indistinct, sometimes the furrow as a whole very weak and indistinct, GSR simple, area apicalis small, lunate in form, defined by the transverse striae in front of it. RC B-type, somewhat near to C-type, CV1=CV2×4-6 (variable).

Punctures on mesoscutum fine and sparse, but not very fine and very sparse, PIS=PD×2-4.

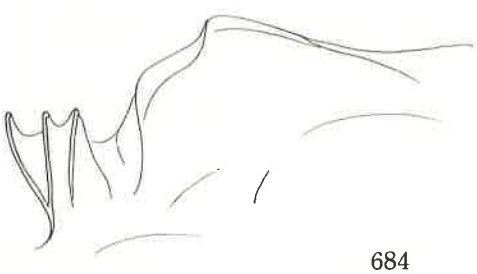
TRYPOXYLON BICOLOR CEYLONICUM ssp. nov.

Main characters of this subspecies are already given in considerable detail in the preceding section and also in Table 8. Some supplements:

♀, 11-15 mm, mostly 13 mm or so; Red on gaster from apex of petiole to base of G4, in all the specimens without dark mark on dorsal side, antennal flagellum dark brown beneath (6 instances out of 13) or light brown (7 instances), legs black (not brownish), variation in maculation: fore tibia wholly black (1 instance) or with a ferruginous mark at base in front (mostly about basal 2/3, 12 instances), mid tibia wholly black (6) or pale brown at base (7), hind tibia wholly black (4) or with a brownish or whitish mark at base (9); fore tarsus always wholly yellowish white, but always T5 somewhat brownish or with a brownish mark. Mid tarsus wholly black (1), T1 alone white (2), T1-2 white (6) and 1-3 white (4). Hind leg only at base of tibia white (in all). SAT-ASR seen obliquely from side to see through PAF in 3 instances: Figs. 684 (from somewhat more above than in others), 685, 686; ASR mostly tricarinate (Fig. 684, with frequency 11/13), rarely bicarinate (Figs. 685, 686, each 1 instance), antero-lateral verge to PAF not edged. Frontal elevations moderately high, rounded and comparatively large, larger and higher than in bicolor s. str., ♀, clypeus generally as in the typical form, but subcarinate in middle; occipital carina complete, median area behind buccal cavity longitudinally ridged till occipital carina. Pronotal lamina always triangular, not toothed. Lateral furrows of area dorsalis shallow and weak, but always easily defined, either striate or without striae.

♂, 9-11.5 mm. Generally similar to ♀. Red on gaster as in ♀, but in most specimens carrying a brownish or blackish mark on G2 and 3, in one specimen marks are so large that gaster appears to carry a narrow reddish band at apical margin of G1,2 and 3 only. Ground colour of legs black, fore tibia on basal 2/3 in front brown (10), nearly wholly black (1); mid tibia brownish at base (5) or wholly black (6); hind tibia pale brown or whitish at base (7) or wholly black (4); fore tarsus always ochre yellowish white and variably maculated: only T5 pale brown (3), only T1 greyish (1), wholly pale brown (4), T1-3 pale brown (1), T1-4 carrying a pale brown mark on each

(1), T3, 4, 5 carrying a pale brown mark on each (1). Mid tarsus also variable in maculation: Wholly dark brown (5), basal half of T1 whitish, thence apically brown to black (3), base of T1 and T5 whitish, rest brown (2), similar but rest black (1).



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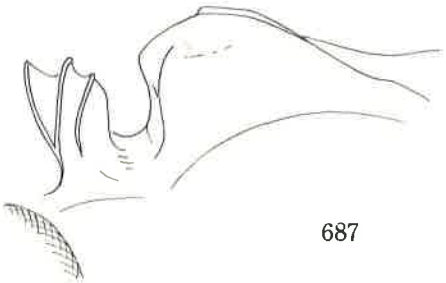

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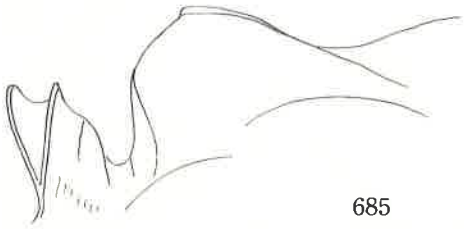

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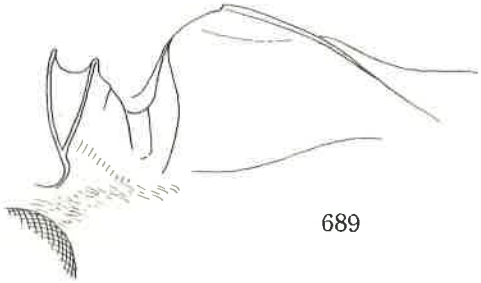

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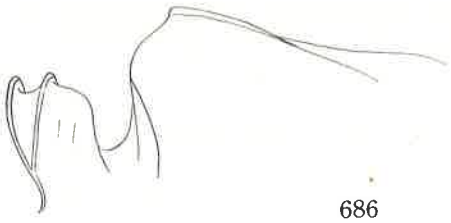

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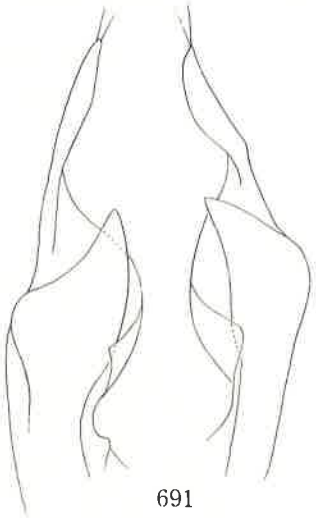

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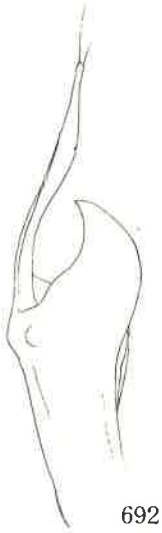

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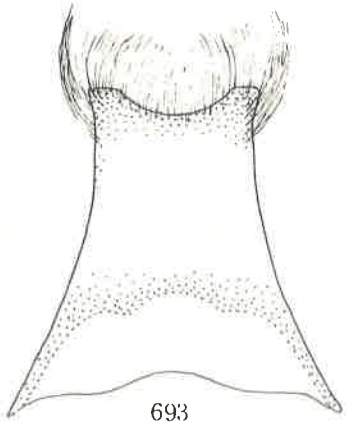

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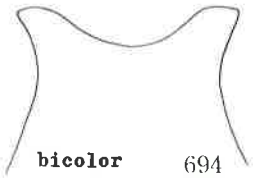
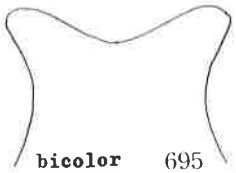
Figs. 684–693. Trypoxylon bicolor ceylonicum ssp. nov., 684–686, ♀; 687–693, ♂.

Al3 distinctly shorter than in typical race or petiolatum ♂ (Table 9), as long as 3 preceding joints united; clypeus gently rounded out and medianly broadly, not strongly recurved, disc at base slightly roundly raised, with hairs parallel; pronotal lamina always triangular, SAT-ASR seen obliquely from side to see through PAF: Figs. 687-689, carinae on ASR: ditto and Fig. 690, frequencies: bicarinate: 3/11, tricarinate: 7/11 and qudricarinate: 1/11. Paramere of genitalia seen from beneath: Fig. 691, left paramere seen from somewhat more side: Fig. 692, apical shorter lobe is distincly bicolor-fashon, volsella and penis valve similar to those of typical race. 8th sternite: Fig. 693, compare with the variation in typical race and petiolatum (Figs. 694, bicolor, Singapore; 695, ditto; 696, petiolatum, Singapore; 697, ditto but Laos; 698, ditto but Malaya). See also Table 9.


bicolor 694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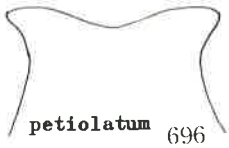
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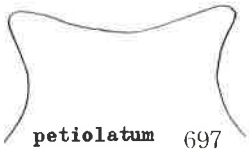
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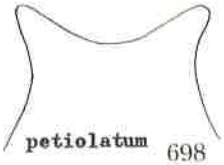

petiolatum 698

Holotype: ♂, Ceylon (Ambacotta), 14. XII. 1953, F. Keiser, (NHMB). (apical part of gaster is dissected, with genitalia and sternite 8 mounted on card point)
Paratypes: (all from Ceylon - Sri Lanka) 6 ♀ 8 ♂, Ambacotta, 14, 15. XII. 1953, F. Keiser (NHMB); 1 ♀, Kantalai, 29. VI. 1953, F. Keiser (NHMB); 1 ♀, Peradiniya, 22. XII. 1953, F. Keiser (NHMB); 2 ♀, Maha-Oya Dist., 24. VIII. 1963, Univ. London Ceylon Exped., Redinney (BMNH); 1 ♀, Colombo Dist., Seeduwa, 13. II. 1974, A. E.Stubbs & P. J. Chandler (BMNH); 1 ♀, Rad Dist., Panamure, 500', 15-21. X. 1970, O. S. Flint Jr. (USNM); 1 ♀, Kan Dist., Kandy, Udawattakele, 1-3. X. 1973, K. V. Krombein, F. B. Karunaratne, P. Fernando (USNM); 1 ♂, Mon Dist., Inginiyagala, Kondawattuan Tank, 2. VI. 1975, D. H. Messersmith, G. L. Williams & P. B. Karunaratne (USNM); 1 ♂, Van Dist., Parayanalankulam, Irrigation Canal, 25 miles NW Medawachchiya, 100 ft, 20-25. III. 1970, Davis & Rowe (USNM).

Remarks. In one of the specimens collected on Dec. 14, 1953 at Ambacotta RC is C-type, a rare exception in this character.

117. TRYPOXYLON PETIOLATUM Smith, 1857

Synonyms: T. rejector Smith, 1870; obsonator Smith, 1873 (ssp); accumulator Smith, 1875; javanum Taschenberg, 1875; tinctipenne Cameron, 1889; cognatum Cameron, 1897; erythrozonatum Cameron, 1902; responsum Nurse, 1905; obsonator tropicale Tsuneki, 1961.

Trypoxylon petiolatum Smith, J. Proc. Linn. Soc. London, Zool. 2: 105, 1857 (♀, Borneo: Sarawak).
Trypoxylon petiolatum: Tsuneki, SPJHA, 8: 6, 1978 (resedcrip. of lectotype).

Specimens examined: Singapore 8 ♀ 9 ♂: (6♀ 6♂), dates unknown, C. F. Baker (USNM); (1♀), 8.V.1900 (BMNH); (1♀) Balester Road, 6.IX.1911, R.M. Coll (BMNH); (1♂), 2.XII.1958, L.W. Quate (BPBM); (1♂), H.N. Ridley (BMNH); (1♂), VIII.1911, Changi (BMNH). Remarks. Of the male, colour of fore tibia: wholly black 1; with a minute brown patch at base in front, 3; with a medium-sized brown mark or streak, 3; similar, but the mark more ferruginous, 2. Fore tarsus: wholly dark brown, 2; brown 5; ochre yellow with pale brown patch on each joint, 2.

Malaya 26 ♀ 18 ♂: (13♀ 7♂) Kuala Lumpur: (8♀ 3♂), bred and emarged, 20,23,XI.1937, H.T.Pagden (BMNH); (4♀ 4♂), (♀): 29,I.1922; 14.VII.1929; 19.VII.1933; 17.IX.1934; (♂): 15.VI.1924 (on bamboo hedge); 24.IV, VIII.1932; 27.VIII.1933, H.M. Pendlebury; (1♀), EX. Agr. Dept. -,-. (BMNH). (3♀ 3♂), Selangor: (1♀), 16 miles f.Gombak near M. L., 24.XII.1960 (BMNH); (1♀), Ula Langal, 20.IX.1936, H.T.Pagden (BMNH); (1♀), Serdang, XI.1920, Pemberton (BMNH); (1♂), X. lines, 12.X.1929, H.T.Pagden (BMNH); (1♂), Subang, Forest Res., 90-120 m, 14.III.1958, T.C.Maa (BPBM); (1♂), Klang area, Batu Tiga, 7.IV. 1963, M.A.Lieftink (RMNH). (5♀) Perak: (1♀), Batu Gasah, 15.IV.1927, H.M.Pendlebury (BMNH); (1♀), Banden, 25.IX.1941,? (BMNH); (3♀), Parit Buntar, 30.VI.1929, 23.VIII.1931, 28.X.1931, H.T.Pagden (BMNH). (1♂) Pahang , Kuala Tahan, jungle, 21.XI.1921, H.M. Pendlebury (BMNH). (1♂), Kedah, NR, Jitra, Catchment area, 5.IV.1929, HM.Pendlebury

(BMNH). (5♀ 5♂), Penang: (1♂), 15.X.1913, G.B.Bryant (BMNH); (2♀), -, C.F.Baker (USNM); (4♂), Batu Feringgi, Catchment area, 2.IX.1954, 9.VII.1957, 18.IX.1957, 16.V.1961, H.T.Pagden (BMNH); (1♀), Telok Bahang (in car), 14.X.1957, H.T.Pagden (BMNH); (1♀) Tangieng Bungah, Catchment area, 27.X.1957, H.T.Pagden (BMNH); (1♀), Ayes I Tan Paservoir, 12.VII.1966, H.T.Pagden (BMNH).

Remarks. The Malayan males all belong to the black-legged form, namely: Fore tibia wholly black, 2; with a brown patch or streak at base, 13; with somewhat a large yellowish mark at base, 3. Mid tibia wholly black,2; narrowly brown at base and at apex, 16. Fore tarsus with T1, T5 dark brown and T2-4 pale brown, 3; pale brown,3; brown, 5; dark brown, 7. Mid tarsus brown, 1; dark brown, 6; black, 11. Variation in measurement: see Table 9.

Tenasserim 3 ♀: (1♀), Martapan, II.1894, C.T.Bingham (BMNH); (1♀), Thaungyin Valley, III.1894, C.T.Bingham (BMNH); (1♀), ? Yoonza Valley, IV.1891, C.T.Bingham (BMNH).

Thailand 2 ♀: (1♀), Chiangmai Prov., Fang, 13.IV.1958, T.C.Maa (BPBM); (1♀), Chiangmai, 5.III.1952, D.&L.Thurman (USNM).

Viet-Nam 1♀, Dak Song, 76 km SW of Ban Me Thuot, 870 m, 19.-21.V.1960, L.W. Quate (BPBM).

Laos 21 ♀ 9 ♂: (8♀ 1♂), Vientiane Prov., Ban Van Eue: (1♀ 1♂), forest stream bed, (7♀), 10-11.IV.1965, 15.I.1966, 15.II.1966, 15.II.1977, 30.II.1967, 30.III.1967, all native collector (BPBM); (9♀), Vientiane Prov., Gi Sion Vill. de Tha Ngone, 5-19. XII.1965, 19-26.XII.1965, 5.I.1966, 10-30.I.1966, 24-31.X.1966, native collector (BPBM); (2♂), Vientiane Prov., 19.VIII.1966, native collector (BPBM); (1♀ 3♂), Wapikhamthong Prov., Wapi, 30.III.1967, 31.V.1967, native collector (BPBM); (1♀), Sedone Prov. Pakse, 31.V.1967, native collector (BPBM); (1♂), Sayaboury Prov., Sayaboury, 15.IX.1966, native collector (BPBM); (1♂), Borikhane Prov., Pakkading, 100-200 m, 23.IV.1965, J.L.Gressitt (BPBM); (1♀), Namkading near Pakkading, 100 m, 21.IV.1965, J.A.Rondon (BPBM); (1♀), Phon-Kowkuei, 16.IV.1965, J.L.Gressitt (BPBM); (1♂), DongDok, 11.IX.1965, native collector (BPBM).

Remarks. Of the 9 specimens colour of legs: Fore tibia: with somewhat long ferruginous or yellowish patch, 5; with brown patch or streak at base only, 3; wholly black, 1. Mid tibia: pale brown at base, 6; wholly dark brown, 3. Fore tarsus: T1 grey, 2-4 whitish, 5 pale brown, 3; wholly pale brown,2; T1-2 whitich, 3-5 pale brown, 2; wholly dark brown, 2. Mid tarsus: only T1 at base pale brown, rest dark brown to black, 3; wholly dark brown to black, 6.

Thus, the black-legged form in the male is not always rare.

South China 3 ♀: (1♀), Canton, W.E.Hoffman (BPBM); (2♀), Macao, Coll. R.C.L. Perkins (BMNH).

Nepal 1 ♀, Phewa Tal, Nr. Pokhara, 2500ft, 10.V.1964, J.Quinlan (BMNH)

India 12 ♀: (4♀) loc.date unknown, T.R.Bell (BMNH); (1♀) Sikkim (Runjit Valley, 1000 ft), V.1844, C.T.Bingham (BMNH); (1♀), Assam, 29.X.1943, D.E.Hardy (USNM); (2♀), Matheran, III.1899, C.G.Nurse (BMNH); (1♀), Bengal, Calcutta, XII.1908, E.Brunette (BMNH); (1♀), Madras State, Coimbatore, XI.1960, P.Susai Nathan (RMNH); (1♀) Anamalai Hills (Cinchona 3500 ft), V.1960, P.Susai Nathan (RMNH); (1♀), Pondicherry State, Karikal, X.1967,- (USNM).

Maldive Is. 1 ♀, North Male Atoll, Male, 8.II.1951, W.W.A.Phillips (BMNH).

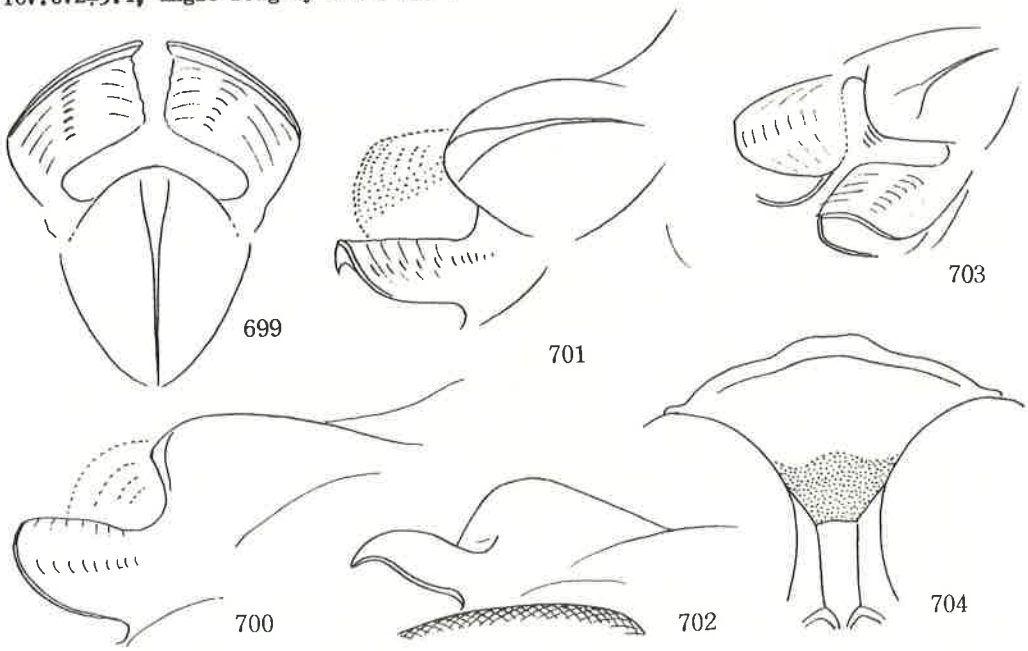
118. TRYPOXYLON LUMPURENSE sp. nov.

Characteristic in the very narrow IODc and highly raised and laterally compressed ASR.

♀, 7.5 mm. Black; ferruginous yellow are A1 and 2, apical margin of clypeus widely, mandible, palpi, pronotal tubercle, discoloured posterior part of collar, fore and mid legs largely and trochanter and base of tibia of hind leg; coxae black, fore femur above, mid femur largely and all arolia brown, hind tibial spur and articulations of hind tarsus also brown. Gaster on G2 and 3 somewhat dark reddish beneath, in fresh specimens the segments may be red. Hairs silvery, on clypeus parallel.

Head thick, seen in front subquadrate, slightly narrowed below, HW,HL,IODv,A3, P=100,62,30,20,164, OOD,Od,POD÷1,3,2, IODs=4:1, A3=AWx3.8, A1=A3, A3,4,5÷10,6,6, frons slightly raised, median furrow at base almost lacking, thence below narrowly, weakly defined, SAT moderately high nasiform, top anteriorly rounded, median carina also anteriorly enlarged, ASR high, strongly raised towards middle, hence in frontal view subtriangular, surface transversely closely striate, PAF broadly rounded in cross section, with outer side high and flatly inclined towards interantennal furrow, the

structure in vertical view: Fig. 699, seen obliquely from side to see through PAF: Fig. 700, ditto but from more above: Fig. 701, in profile: Fig. 702, obliquely from below: Fig. 703. Clypeus: Fig. 704, surface nearly flat, supraclypeal area more than twice as long as wide at apex, occipital carina complete, weaker and depressed behind buccal cavity. Pronotal collar with anterior part narrow, as thick as posterior part, gently roundly raised towards middle, without tubercle there, seen from above weakly incrassate laterally, lamina on side triangular, pointed at apex, but not toothed. Subalar area with half developed pentroof structure, outer edge slightly produced, but not expanded and curved down. Propodeum without lateral carinae, area dorsalis without lateral furrows, GSR roundly raised, discoloured towards apex. Gastral petiole flask-shaped, markedly slender, narrowed towards apical swelling and strongly swollen there. P,Ma,Mi,2(Ma),3(Ma)=100,22,6,27(28),31(34); in fore wing RC C-type, but somewhat close to B-type, Rl long, as long as CV2, reaching close to wing apex, TCV gently sinuate, TCV:CV2≒5:4, angle roughly about 120°.



Frons distinctly microreticulate and sparsely superimposed with fine punctures, mesoscutum finely, somewhat aparsely punctured, PIS=PD×2-3, puncture-interspaces under high magnification feebly microcoriaceous, propodeum with lateral series of striae, area dorsalis at base obliquely coarsely, posteriorly transversely finely closely striate, striae weaker posteriorly, sides smooth and polished.

♂, unknown.

Holotype: ♀, Malaya (Kuala Lumpur, in car), 23. VIII. 1936, H. T. Pagden (BMNH).

Remarks. The head of the specimen is somewhat crassed, possibly when caught in car. Gaster dropped off and mounted on the card point on which the specimen is pinned with micropin.

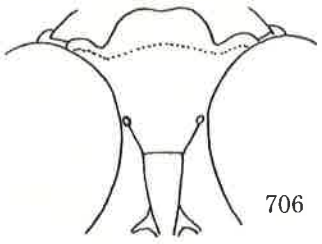
119. TRYPOXYLON APPENDICULATUM Tsuneki, 1974

Trypoxylon appendiculatum Tsuneki, Polsk. Pism. Ent., 44: 632, 1974 (♂, Borneo, figs. incl. head from above and in front, propodeum from above and profile, genitalia).

Specimen examined: 1 ♂, W. Malaya (Selangor, Subang Forest Res., 90-120 m), 14. III. 1958, T. C. Maa (BPBM).

♂, 5.5 mm (Bornean specimen 6.5 mm). Well agrees with original description and figures. Some supplements: HW,HL,IODv,A3,Al3,P=100,66,26,12,18,130, OOD,Od,POD≒1,6,

4 (OOD very narrow), IODs=10:4.5, A3=AW×2, Al3=BW×2, as long as 2 preceding joints united, in form as in Fig. 705, clypeus: Fig. 706, surface gently roundly elevated and medio-apical produced area broadly reflected, glabrous and shining, SAT-ASR seen obliquely from side to see through PAF: Fig. 707, column-like ASR with a large hollow in front (Fig. 708, seen obliquely from beneath). Collar markedly roundly incrassate laterally and medianly distinctly tuberculate, anterior inclination before the tubercle broadly roundly concave, posterior area not discoloured, lamina on side broadly rounded, almost not produced; subalar area with a considerably well developed pentroof structure (escaped in the original description), but its marginal area not discoloured, shining black. Propodeum with strong lateral carinae, area dorsalis enclosed with distinct furrow, area apicalis with particular structure as given with figures in the original description, propodeal sternite long and distinct, intercoxal area present (do.), GSR in posterior view: Fig. 709; gaster slender and long, petiole in the mode of apical swelling somewhat clavate, gradually widened, but petiolar area long. P,Ma,Mi,2(Ma), 3(Ma)=100,18,7,42(22),44(25). In fore wing RC B-type, Rl short, CVl=CV2×2.7, CV2 distinctly longer than TCV, TCV incurved, angle about 120°. (Genitalial structure already given in original description)



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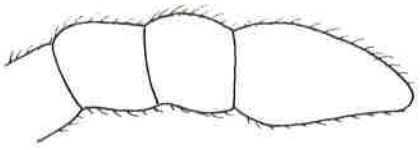

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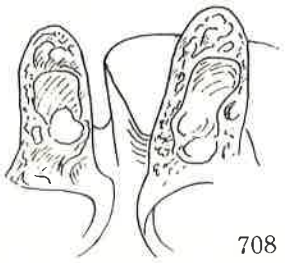

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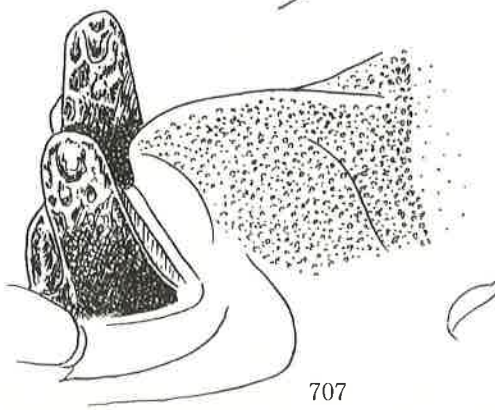

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709

Vertex and frons till base of SAT smooth and polished, with very fine and sparse punctures scattered, below there the surface finely closely punctured (Fig. 707), ASR very strongly and coarsely punctured (ditto), mesoscutum also smooth and polished, with punctures somewhat large and fairly close, propodeum with lateral series of striae, area dorsalis at base obliquely coarsely, on apical area including 3 furrows transversely finely, somewhat closely striate, sides smooth and polished, along intercoxal carina strongly crenate and apical area distinctly striate.

♀, unknown.

120. TRYPOXYLON BILOBATUM Tsuneki, 1961

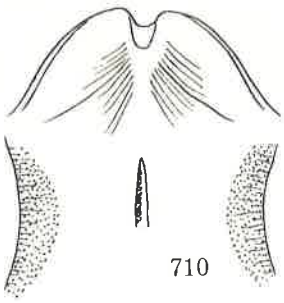
Trypoxylon bilobatum Tsuneki, Nature & Life S.E. Asia (Osaka), I: 385, 1961 (♂, Thailand, figs. - head in dorsal, frontal, lateral view, pro-, mesonotums, antenna, petiole).

Trypoxylon bilobatum: Tsuneki, Polsk. Pism. Ent., 44: 630, 1974 (5 ♀, Thailand).

Specimens examined: 2 ♀, Laos (Ban Van Eue), 15. V, 20. VI. 1966, native collector (BPBM).

Some supplements: HW,HL,IODv,A3,P=100,64,26,18,140, OOD,Od,POD=1,6,4 (OOD very narrow), IODs=10:9, A3=AW×5.5, Al=A3, A3,4,5≒10,7,6, P,Ma,Mi,2(Ma),3(Ma)=100,18, 8,40(20),40(30). RC=B-type, somewhat close to C-type, Rl short, CVl=CV2×2.7, TCV≒CV2, strongly incurved, angle about 120°. Supraantennal structure seen vertically: Fig.

710, SAT in middle with a longitudinal impressed line, but not carina, seen obliquely from above and side: Fig. 711, in profile: Fig. 712, obliquely from beneath: Fig. 713, clypeus: Fig. 714, disc gently roundly raised as a whole, apical marginal area glabrous and reflected, occipital carina shortly interrupted behind buccal cavity, where the surface slightly depressed. Pronotal collar very thick, at sides strongly incrassate and in middle grossly tuberculate, without concave depression in front of median tubercle, the furrow across middle broadly interrupted in middle, posterior part not discoloured, lamina on side: Fig. 715; subalar area of mesopleuron without pent-roof structure, on posterior part flange somewhat extended outwards and fringed with white hair.



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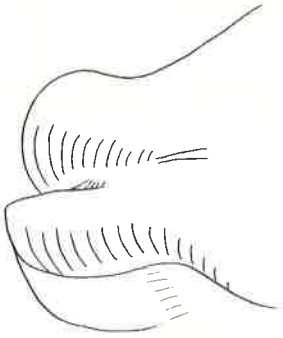

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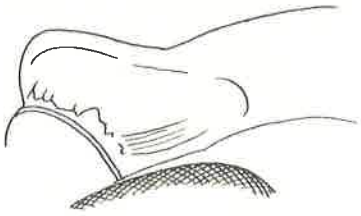

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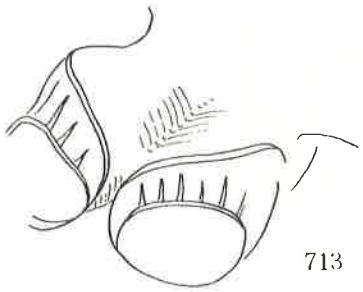

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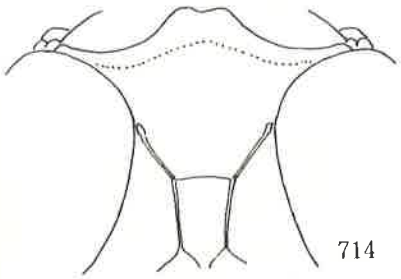


714

Propodeum with strong lateral carinae, area dorsalis enclosed with distinct furrow, medial excavation very large and fairly deep, hence the area of disc becoming a narrow longitudinal ridge, in one specimen the ridge carrying a distinct carina, median furr row of posterior inclination short, area apicalis not enclosed with carina on dorsal side, but strongly extended posteriorly, forming distinct sternite beneath, a broad distinct intercoxal area present on side. Gastral petiole flask-shaped, more than 5 times as long as wide at the maximum, apical swelling comparatively long, and somewhat gradual.

Vertex and frons without microsculpture, finely punctured, punctures sparser and finer upwards and much closer, stronger and somewhat larger below, the shift is gradual, not so sudden as in appendiculatum; mesoscutum on median area comparatively largely, strongly and densely punctured, punctures finer, sparser and weaker sideways, propodeum without lateral series of striae, area dorsalis at base obliquely, on apical area transversely, strongly and coarsely striate, posterior inclination posteriorly on sides also transversely strongly and closely striate, medianly and on apical extended area irregularly and strongly punctured, sides smooth and polished, with a few oblique striae on dorso-anterior area, posterior extended area with a large concave hollow, but in front of the hollow surface transversely coarsely rugoso-punctate.

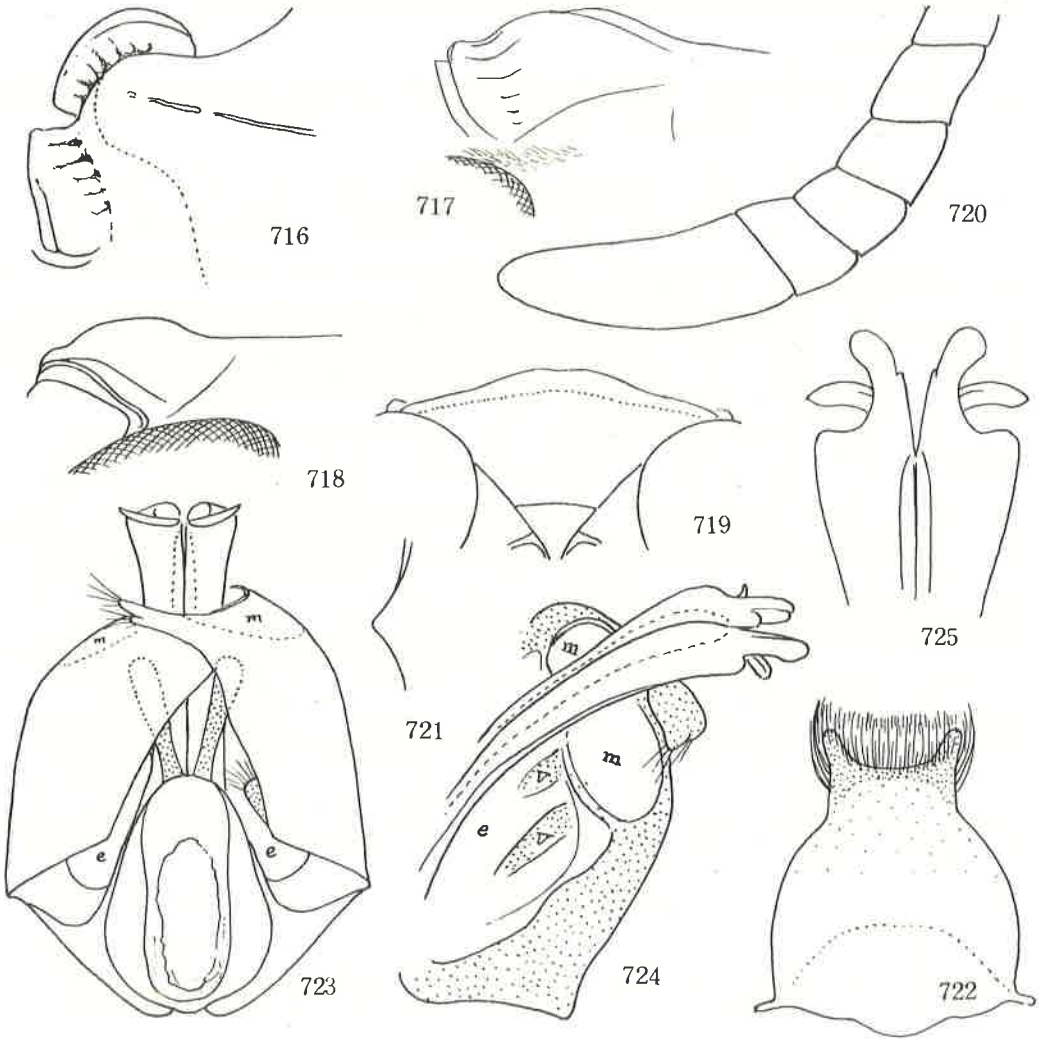
Length 5.5–6.0 mm.

121. TRYPOXYLON SPANGLERI sp. nov.

Characteristic in the structure of SAT-ASR and in the sculpture of mesoscutum, but much more so in the structure of male genital organs and somewhat also of sternite 8.

♂, 6–7 mm. Black, mandible glossy brown, broadly black towards base, palpi and tibial spurs brownish white, legs somewhat brownish, tarsi distinctly brown, posterior part of collar discoloured, dirty yellow, tegra transparent brown, basal plates of wing light brown. Hair silvery, on clypeus parallel.

Head in frontal view subquadrate, but distinctly wider than long and slightly narrowed below, vertex not depressed. HW,HL,IODv,A3,Al3,P=100,54,30,9,29,142, OOD,Od, POD=2,3.5,5, IODs=10:8, A3=AW 1.5, Al3=BW 2.5, appr. as long as 4 preceding joints united. Frons moderately raised, surface except base nearly flat, with very feeble median furrow, SAT low broad tuberiform, surface broadly rounded, only slightly raised than frontal area (Fig. 718, seen in profile), without carina in middle, but with a distinct median impressed line, seen obliquely from above and side: Fig. 716, verge of inclination towards ASR not ridged, but gently rounded, seen more laterally to see through apparent PAF: Fig. 717, apparent ASR and PAF in Fig. 716 are in reality only the extension of SAT, the true ASR is covered by it, narrow and smooth marginal area, apparent PAF gently curved in cross section, coarsely and shallowly foveate, foveae extended forwards on apparent ASR (Figs. 716, 717). Clypeus: Fig. 719, disc nearly flattened, apical reflection very feeble; occipital carina complete, apical part of antenna: Fig. 720. Collar with anterior part very narrow, rather acute ridge-like and slightly widened towards sides, in frontal view broadly rounded, not tuberculate in middle, lamina on side: Fig. 721. Subalar area of mesopleuron without pent-roof structure; propodeum with distinct lateral carinae, area dorsalis enclosed with distinct furrow, area apicalis not enclosed with carina anteriorly, GSR roundly raised, not dis-



coloured. Gastral petiole flask-shaped, markedly slender as compared with the posterior swelling, P,Ma,Mi,2(Ma),3(Ma)=100,26,6,28(39),32(46), minimum width 6 as compared with maximum width 26 is striking; in fore wing RC B-type, Rl short, CVl=CV2×3.5, TCV slightly longer than CV2 angle about 110°.

Sternite 8: Fig. 722, characteristic in form. Genitalia seen from beneath: Fig. 723 (m... membraneous area, e... empty), very curious in that penis valve highly produced over upper margin of parameres, like a person wearing mantle, paramere with outer margin expanded, brown in colour, and rolled inwards on ventral surface, while dorsal inner margin not expanded, leaving a broad empty spaces on both sides of penis valve (e in Figs. 723, 724), seen obliquely from left side and apex: Fig. 724 (v...volsella), apex of paramere deeply emarginate, embracing penis valve from the side, bearing a broad round semitransparent membraneous area (m in the figures) between the arms, ventral arm well chitinized, shortly bidentate at apex, carrying a few stiff hairs (Figs. 723,724). From lower inner angulated corner of ventral expansion a flat appendage produced inside (see right paramere of Fig. 723, dotted plate), with a fringe of hair at apex. Volsella spatulate mostly covered with the expansions of parameres, but can be seen from dorsal side also (V in Fig. 724). Penis valve: Fig. 725 (dorsal view).

Frons distinctly microreticulate and sparsely superimposed with fine shallow indistinct punctures, surface mat, mesoscutum fairly closely covered with comparatively large deep and distinct punctures, PIS 1-1.5 times PD, PIS under high magnification distinctly microcoriaceous; propodeum with strong series of striae along lateral carinae, posteriorly mixed with punctures and rugae, area dorsalis at base obliquely coarsely, on the remaining areas transversely finely closely striate, sides smooth and polished, with scattered somewhat large punctures along dorsal margin.

♀, unknown.

Holotype: ♂, Thailand (Nakhon, Ratchasima Prov., Nakhon Ratchasima, 60 km, Sakaerat Exp. Stat. 14 30' N, 101 55' E, 300-600 m), 2-4. III. 1971, P. & P. Spangler (USNM).
Paratype: 1 ♂, the same data (USNM).

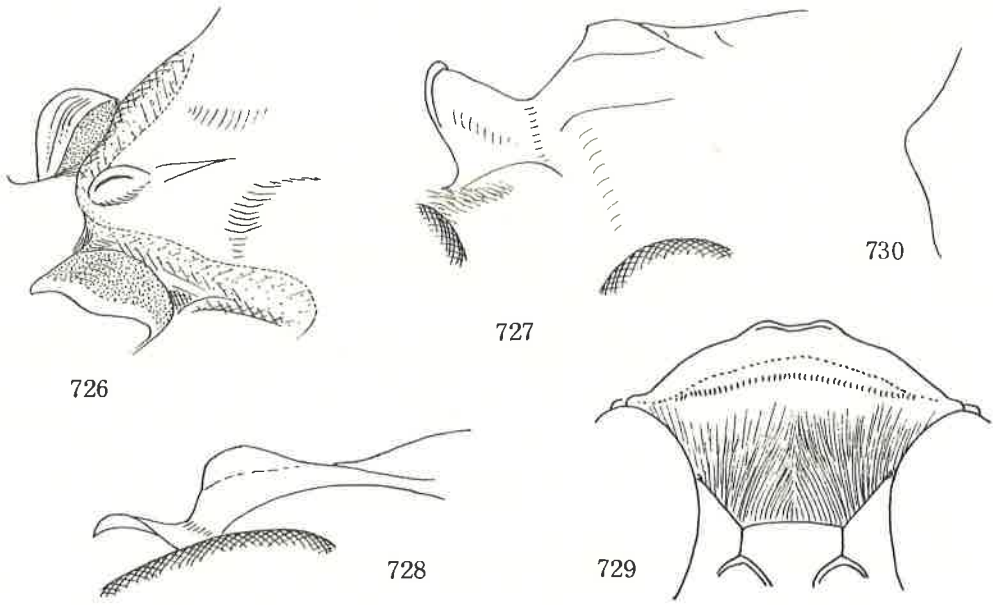
122. TRYPOXYLON RIDLEYI sp. nov.

Characteristic in the medianly minutely tuberculate SAT, broad interantennal area and exceptionally long and slender gastral petiole.

♀, 13 mm. Black; Al and 2 brown at apex, flagellum not brownish beneath, clypeus at apical margin and pronotal tubercle slightly brownish, tegula semitransparent brown; mandible, palpi, knees, fore and mid tibiae except inner and folded sides, hind tibia at base, tibial spurs, fore Tl-3 (4-5 lacking) and mid Tl ferruginous. Hairs silky white, in some light with a weak brassy tint.

Head seen in front distinctly wider than long, with sides strongly rounded, not convergent below. HW,HL,IODv,A3,P=100,50,22,26,230, OOD,Od,POD≒1,3.5,2, IODs=10:9.5, A3=AW×5. Frons weakly elevated, surface nearly flat, anteriorly broadly shallowly concave, medial furrow also weak, but with a half-shining bottom line that extends below on to the concave area, SAT only an extension of frons, almost not raised, without carina, but with a small tubercle in middle (Fig. 726, seen obliquely from above-side), seen obliquely from side to see through PAF: Fig. 727, in profile: Fig. 728, ASR anteriorly semitransparent brown, posteriorly black, surface transversely finely closely and weakly striate; clypeus: Fig. 729, at base raised and gently radiately inclined anteriorly, apical marginal area broadly reflected from behind hair-bearing puncture line. Pronotum in frontal view gently raised towards middle, not straight, but in a weak downcurved line and slightly swollen in middle, seen from above narrow, ridge-like as a whole, lamina on side: Fig. 730; subalar area of mesopleuron on posterior part edged at outer margin, but not expanded into pent-roof structure. Propodeum with lateral carinae, anteriorly weaker and indistinct, area dorsalis distinctly enclosed with fine and deep furrow, medial furrow also deep and comparatively narrow, area apicalis bordered at dorsal area by one of the arcuate striae covering posterior part of posterior inclination, GSR roundly highly raised, apical area discoloured. Gastral petiole markedly long and slender, more than twice as long as width of head; P,Ma,Mi,2(Ma),3(Ma)= 100,9,2.7,19(11),21(17). In fore wing RC C-type, Rl short, CVl=CV2×4.5, TCV gently sinuate, TCV:CV2≒5:4, angle roughly about 120°.

Frons microreticulate, and finely, sparsely but distinctly punctured, SAT covered with hair under natural condition, mesoscutum with weak plumbeous shine, nearly mat but without microsculpture and covered sparsely with fine but distinct punctures, pubescence arising from punctures at base greyish but apically distinctly yellowish. Pro-



Figs. 726-730. Trypoxylon ridleyi sp. nov., ♀

podeum with distinct series of striae along lateral carinae, area dorsalis with base and lateral furrows smooth, only medial furrow crenate, disc and outsides of the area covered with irregular hair-bearing punctures, sides anteriorly with sparse fine punctures, from median area posteriorly covered with weak close rugosed striae.

♂, unknown.

Holotype: ♀, Singapore, date unknown, H. N. Ridley (USNM).

Remarks. In the specimen the gastral petiole on both sides and segments 2 and 3 beneath somewhat castaneous brown.

123. TRYPOXYLON YEBISSUM sp. nov.

Somewhat similar to the preceding species, but medial tubercle of SAT not so conspicuous, ASRs more closed together at interantennal area, gastral petiole not so long and so slender, A3 relatively shorter, pronotal lamina more acutely angulated at apex and legs much more darkened.

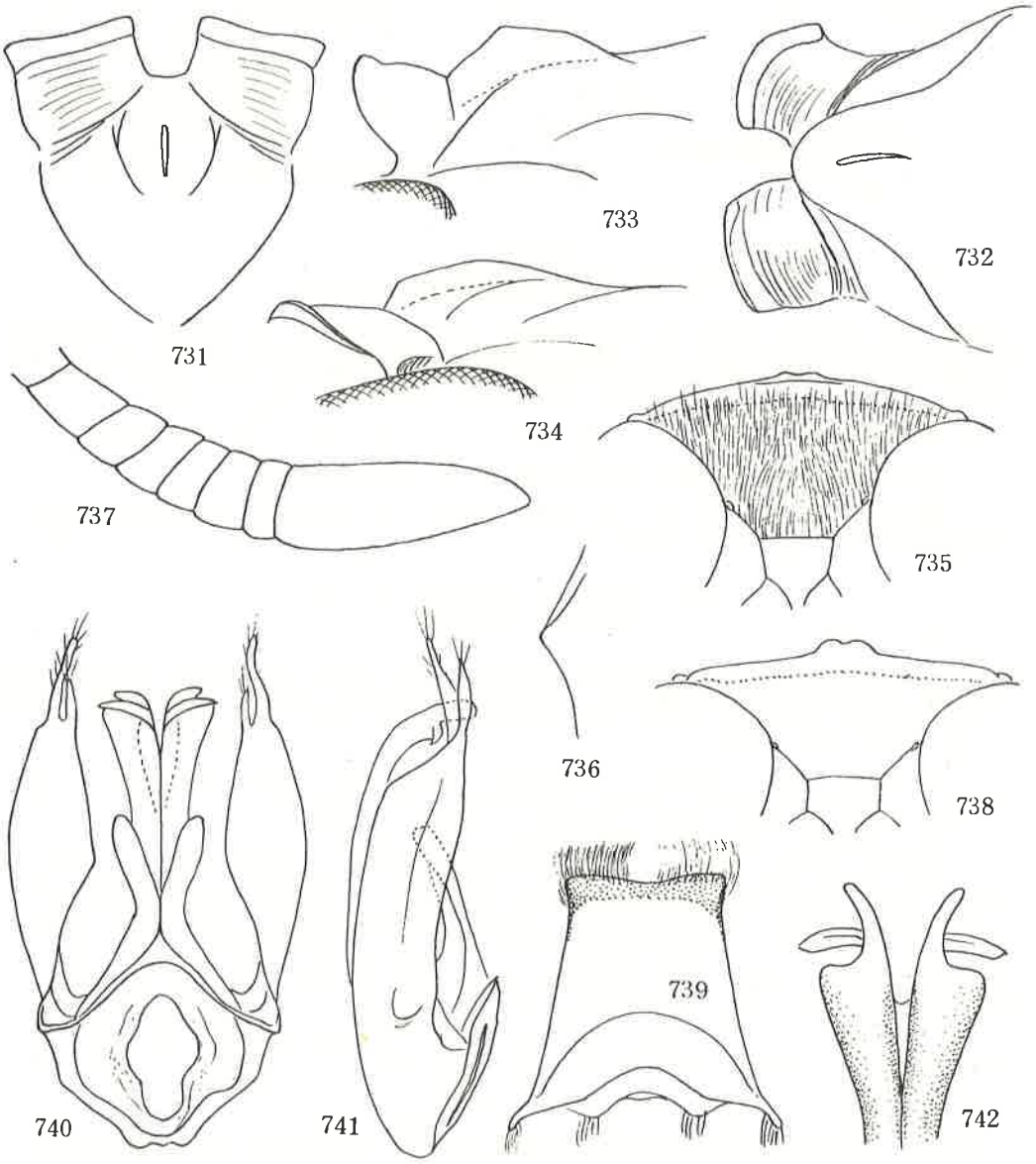
♀, 10 mm. Black; mandible ferruginous, palpi ochre yellow, but basal two joints of labial palpus dark brown, tegula transparent brown, fore tibia in front and fore and mid tarsi apically brown. Hair silvery, on clypeus parallel.

Head in frontal view with sides rounded, almost not convergent below. HW,HL,IODv, A3,P=100,54,26,20,166, OOD,Od,POD=1,4,3, IODs=10:8.5, A3=AW×3.5, frons moderately raised, median furrow weak, surface nearly flat, SAT-ASR similar in appearance to those of ridleyi, but medial tubercle larger, lower, less conspicuous, with a short shining carina on top, distance between inner apical ends of anterior margins of ASRs more closely approaching each other. SAT-ASR seen vertically: Fig. 731, seen vertically but somewhat from side: Fig. 732 (compare with Fig. 726), seen from side to see through PAF: Fig. 733, in profile: Fig. 734, ASR anteriorly broadly semitransvarent brown, and finely closely striate; clypeus: Fig. 735, basal elevation similar to that of ridleyi but covering hair nearly parallel (cf. Fig. 729), apical reflection at glabrous area only; occipital carina complete. Pronotal collar in frontal view roundly raised towards middle and minutely weakly swollen there, seen from above considerably incrassate laterally, lamina on side: Fig. 736, subalar area of mesopleuron without pent-roof structure; propodeum with lateral carinae, area dorsalis enclosed with distinct furrow,

median furrow broad and moderately deep, area apicalis bordered at dorsal area with arcuate striae covering posterior part of the segment, GSR roundly raised, apical area ambur yellow, intercoxal carina straight. Gastral petiole flask-shaped, P,Ma,Mi,2(Ma), 3(Ma)=100,14,6,28(22),28(30). In fore wing RC C-type, Rl moderately long, but not reaching wing apex, CVl=CV2×4.5, TCV:CV2÷3:2, TCV weakly sinuate, angle about 105°.

Frons distinctly microreticulate and closely superimposed with comparatively large distinct punctures, punctures sparser sidewards and upwards, mesoscutum with strong plumbeous shine, smooth and shining and somewhat sparsely covered with comparatively large but weak punctures; propodeum along lateral carinae anteriorly crenate, from about middle posteriorly with series of striae, the striae on posterior area extended inwards, forming transverse arcuate striae, area dorsalis smooth and shining, only at base weakly crenate, sides smooth and polished, with sparse fine punctures upwards and a few rugosed striae on posterior area.

♂, 9 mm. Similar to ♀ in general, but head seen in front relatively much shorter than in ♀, A3-12 shorter and Al3 longer, A3=AW×1.3, Al3=BW×3.5 and appr. as long as 6



Figs. 731-742. Trypoxylon yebissum sp. nov., 731-735, ♀; 736-742, ♂

preceding joints united (Fig. 737). Structure of SAT-ASR generally similar. Measurements: HW,HL,IODv.A3,A13,P=100,50,27,12,35,102, OOD,Od,POD≒2,5,3, IODs=10:8.5, P, Ma,Mi,2(Ma),3(Ma)=100,23,10,40(34),40(48). Gastral petiole relatively shorter and thicker and mode of apical swelling somewhat clavate. Clypeus: Fig. 738. Sternite 8: Fig. 739. Genitalia from beneath: Fig. 740, from left side: Fig. 741, the state of apical bifurcation is characteristic, volsella spatulate, thin and flat, penis valve in dorsal view: Fig. 742, with well developed shoulder and a pair of sickle-shaped appendages. Venation similar. Punctures on mesoscutum somewhat sparser.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Eue), 30. II. 1965, native collector (HPBM).

Paratypes: 1 ♂, the same locality, forest stream bed, 10-11. IV. 1965, J. L. Gressitt (HPBM); 1 ♀, Malaya (Kuala Lumpur, Nr:L.Gardens), 6. XI. 1934, H. M. Pendlebury (BMNH).

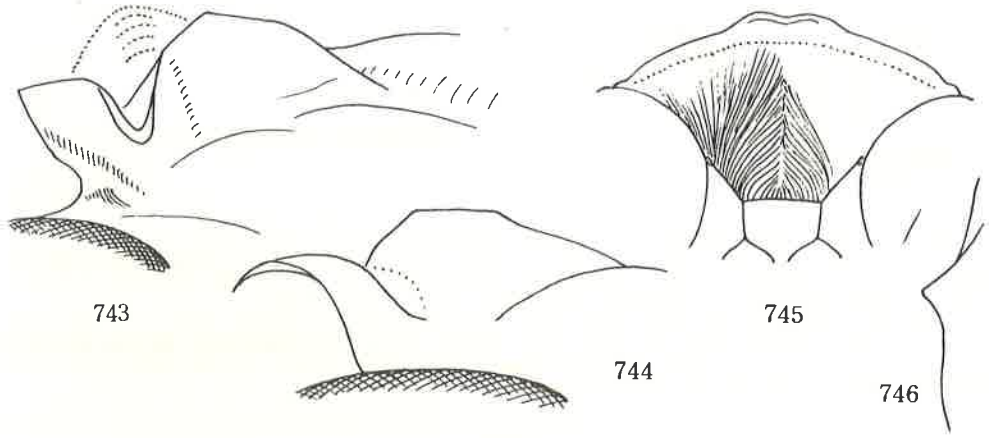
Remarks. In the Malayan paratype female HW,HL,IODv,A3,P=100,24,18,154, ocellar disposition similar, vertex less wide, as a result IODs=10:9.5, A3 relatively shorter = AW 3. Whether these are local variations or individual ones we can not say, since the material is too scanty.

124. TRYPOXYLON ATRUM sp. nov.

♀, 9-11 mm. Black; ferruginous to brown are mandible, mouth parts except dark brown basal two joints of both palpi, tibial spurs, T4 of fore and mid legs and all claws. Tegulae transparent brown, basal plates and veins of wing dark brown. Hairs silvery, on clypeus at base distinctly convergent towards medial line.

Head in frontal view with sides rounded, but tends to be subquadrate, only very slightly convergent below. HW,HL,IODv,A3,P=100,50,26,22,190, OOD,Od,POD≒1,4,3, IODs =10:8, A3=AWx4.5, A3,4,5≒10,7,7. Frontal elevations moderately high, rounded, but medial furrow shallow and weak, SAT moderately high, but broad nasiform, with a narrow subflattened circular area around apex of medial carina, PAF obliquely located, vairly, but not very, deep, V-shaped in cross section, flat-bottomed (Fig. 743, seen obliquely from side to see through PAF), ASR highly raised, without carina on the surface (do.), SAT-ASR seen in profile: Fig. 744. Clypeus: Fig. 745, at base roundly elevated, elevation not extended beyond middle, not tectate, apical marginal area broadly (including hairy area), strongly reflected; occipital carina complete, but weak behind buccal cavity, shortly incised there. Collar of pronotum strongly raised towards middle and minutely tuberculate there, anterior inclination medianly broadly concave, seen from anterior part median narrowed and markedly roundly enlarged laterally, hence anterior margin in a widely opened V-shape, posterior part not completely discoloured, lamina on side triangular, slightly produced and pointed at apex (Fig. 746), subalar area of mesopleuron normal. Propodeum with lateral carinae, area dorsalis practically without lateral furrows, in oblique light only feebly defined, area apicalis indistinct, GSR roundly, but not strongly raised; gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)= 100,-16,5,28(20),30(28). RC B-type, but somewhat inclined to C-type, R1 short, CV1= CV2 4, TCV very weakly sinuate, TCV:CV2=3:2, angle about 105°.

Frons microcoriaceous and finely sparsely punctured, mesoscutum fairly shining,



743 744 745 746

but under high magnification weak microreticulation can be seen, punctures comparatively large, but sparse, PIS roughly 2-4 times PD. Propodeum with distinct close lateral series of striae, on posterior inclination striae extended inwards, covering whole the area, area dorsalis without basal oblique striae, transversely finely closely striate, striae posteriorly stronger, especially on medial furrow, but anteriorly weaker, rather obsolete.

♂, unknown.

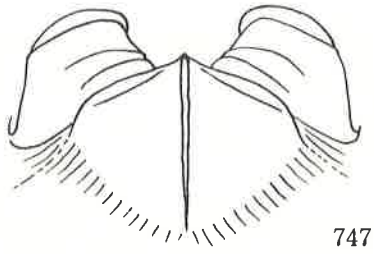
Holotype: ♀, Laos (Wapikhamtong Prov., Khong Sedone, Wapi), 30. VIII. 1967, native collector (BPBM).

Paratype: 1 ♀, Laos (Sayaboury Prov., Sayaboury), 15.II. 1966, native collector (BPBM).

Remarks. In paratype A3=AW×4, except somewhat smaller body size, otherwise similar to holotype.

125. TRYPOXYLON PULLATUM sp. nov.

Except for the black gaster the present species very closely resembles T. melanocorne and may fall within the category of this species, when its variation range is brought to light, or when its correct male is examined. Morphologically it seems better to treat it as a geographical race, but the distributional data - melanocorne: Singapore and Laos; pullatum: Malaya - do not support such a treatment. Basing on the differences below described it is provisionally dealt with as a separate species.



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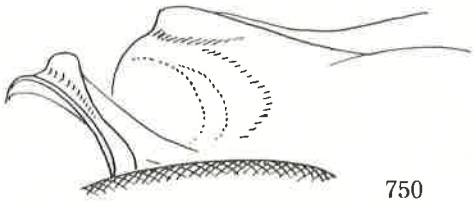

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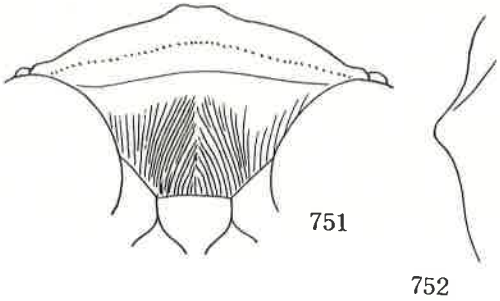

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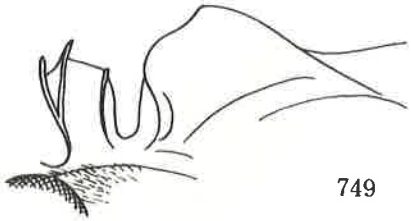

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Figs. 747-752.
Trypoxylon pullatum sp. nov., ♀

♀, 13.5 mm. Gaster black, G2 and 3 slightly brownish beneath, SAT on anterior margin not edged. SAT-ASR seen from dorsal side: Fig. 747 (cf. Fig. 480, 481), seen obliquely from side to see through PAF: Figs. 748 (in holotype), 749 (in paratype) (cf. Fig. 482), seen in profile: Fig. 750 (cf. Fig. 483); clypeus: Fig. 751 (cf. Fig. 485); pronotal lamina: Fig. 752 (cf. Fig. 486). From the comparison it can easily be perceived that the form of ASR in both dorsal and lateral views is markedly different from each other species. The difference in the form of apical margin of clypeus is

also remarkable and in this case more important than in ASR (in melanocorne medianly gently emarginate, in the present species medianly produced). Measurements:

	HW	HL	IODv	A3	P	P	Ma	Mi	2(Ma)	3(Ma)
In holotype	100	50	24	25	190	100	12	4	24(14)	26(24)
In paratype	100	50	24	25	190	100	11	4	- -	- -
In melanocorne ..	100	50	26	24	186	100	12	4	28(14)	32(23)

Table 10. Comparison of closely related 3 species (♀)

Item	nigricorne	melanocorne	pullatum
Distribution	Singapore, Laos	Singapore, Laos	Malaya
Body length	17-18 mm	10-13 mm	13-14 mm
ASR & PAF	Fig. 464	Fig. 482	Fig. 748
Clypeus	Fig. 466	Fig. 485	Fig. 751
Vertex	depressed	not	slightly
SAT, apical margin	laterally edged	wholly edged	not edged
IODv (HW,100:)	22	26	24
A3 (" ")	28	24-25	25
IODs	10:10	10:8-8.5	10:9

Of the differences above listed those of Clypeus and SAT are most important. While, the structure, sculpture and punctuation of frons, pronotum, propodeum and gaster and venation are very similar to those of melanocorne.

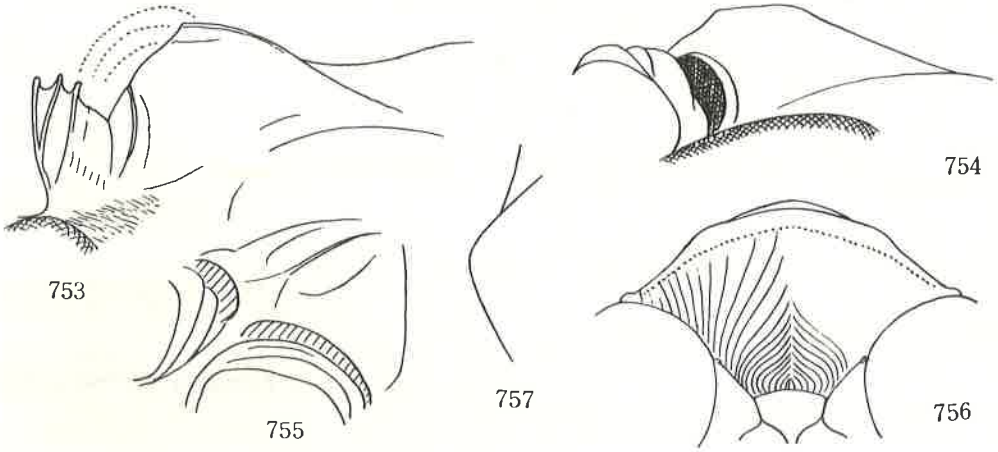
♂, unknown.

Holotype: ♀, Malaya (Selangor, Fraser's Hill), 15. VII. 1928, H. T. Pagden (BMNH).
Paratype: 1 ♀, Malaya (Pahang, Fraser's Hills, 4200 m), 17. VII. 1936, H. M. Pendlebury (BMNH) (gastral segments from 2 apically lacking).

126. TRYPOXYLON KUTUENSE sp. nov.

The present species is apparently similar to orientale Cameron, but is different from this in the structure of PAF and area dorsalis, in the form of apical margin of clypeus and in the ratio of IODs. It is also closely related to sedonense described earlier in this paper, but is separable therefrom by the differences in the structure of clypeus and SAT-ASR, in the form of pronotal lamina and in the colour of the gaster.

♀, about 17 mm. Black; mandible dark brown, palpi ochre yellow, tegula transparent pale brown, basal plates and veins of wing dark brown, gaster from apex of petiole to G3 with obscure irregular reddish marks scattered (whether originally red or black unknown); knees, bases of tibiae, fore tibia further on basal half in front, tibial spurs, fore T5, bases of claws and articulations of tarsal joints pale brown. Hairs silvery, on clypeus strongly convergent towards medial line.



Head in frontal view with sides roundly, not strongly convergent below. HW,HL, IODv,A3,P=100,48,24,26,186, OOD,Od,POD÷1,3.5,2, IODs=10:8.5, A3=AWx6, A3,4,5÷10, 7,6.5. Frons weakly raised, median furrow also weak, SAT low broad nasiform, acutely carinated on top, on medio-apical area smoothly inclined, but on latero-anterior areas at the verge to PAF acutely edged, seen obliquely from side to see through PAF: Fig. 753, PAF fairly deep, V-shaped in cross section, with bottom line gently up-curved, ASR acutely and highly tricarinate, the structure seen in profile: Fig. 754, obliquely from beneath: Fig. 755. Clypeus: Fig. 756, at base raised and raised area tectate, with median line distinctly ridged, apical margin broadly and strongly reflected; occipital carina complete. Collar roundly raised towards middle and weakly tuberculate there, seen from above strongly incrassate towards sides, posterior part on apical margin narrowly discoloured, brownish, lamina on side: Fig. 757, subalar area of mesopleuron normal, only outer margin weakly edged and dorsal surface somewhat flattened. Propodeum with distinct lateral carinae, area dorsalis practically without lateral furrows, only feebly defined under oblique light, area apicalis marked off dorsally by arcuate striae covering the area in front of it, GSR simple, intercoxal carina nearly straight; gastral petiole flask-shaped, very slender and long, P,Ma,Mi,2(Ma),3(Ma)=100, 14,5,30(19),26(23); in fore wing RC B-type, but somewhat close to C-type, Rl short, CV1=CV2x6, TCV weakly sinuate, TCV:CV2÷3:2, angle about 100°.

Frons very delicately microcoriaceous and sparsely superimposed with fine flat-bottomed punctures, surface mat; mesoscutum with weak plumbeous shine, rather sparsely covered with comparatively large punctures, PIS=PDx2-3, under high magnification delicate microreticulation can be seen on posterior portion, propodeum with strong series of striae along lateral carinae, area dorsalis at base weakly crenate, medial furrow on its median bottom line crenate, lateral marginal area posteriorly weakly transversely striate, striae strong and distinct on posterior margin at the verge to medial furrow of posterior inclination, side except antero-ventral smooth area broadly and fairly closely covered with fine punctures, PIS smooth and polished, posterior area alone transversely and strongly striate.

♂, unknown.

Holotype: ♀, Malaya (Selangor, Bukit Kutu, 3500 ft), 6. IX. 1929, H. M. Pendlebury (BMNH).

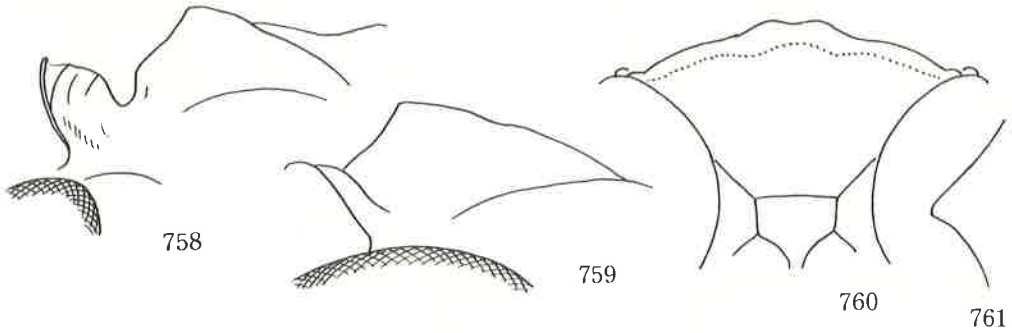
Remarks. The present species is, if the middle part of gaster is red under natural condition, very close to T. nigricorne described earlier in this paper (known from Singapore and Laos), but is different from this in that clypeus is medianly ridged and with apical margin not emarginate in middle, and area dorsalis of propodeum without lateral furrows, and strictly further SAT more highly raised.

127. TRYPOXYLON BREVICLYPEATUM sp. nov.

Characteristic in the weakly produced clypeus as in most of the male.

♀, 12 mm. Black; mandible brown, at base black, palpi ochre yellow, basally brownish, posterior part of collar discoloured, pale brown, tegula transparent brown, basal plates and veins of wings dark brown; fore tibia and tarsus somewhat brownish, fore and mid tibial spurs pale brown, hind ones dark. Hairs silvery, on clypues at base roundly convergent towards medial line.

Head in frontal view much wider than long (appr. 5:4), with sides strongly rounded, but not convergent below, HW,HL,IODv,A3,P=100,54,24,26,176, OOD,Od,POD÷1,5,3, IODs ÷10:9.5, A3=AWx3.7, A3,4,5÷10,7,6. Frons moderately highly raised, median furrow very weak, surface nearly flat, SAT low broad nasiform, apically obliquely truncate, forming a triangular but not shining area, verge to PAF posteriorly weakly edged, obliquely seen to see through PAF: Fig. 758, PAF fairly deep, U-shaped in cross section, with bottom -line up-curved, SAT-ASR seen in profile: Fig. 759, ASR highly raised, with top surface without strong carinae, only weakly striated, apical margin carinate. Clypeus: Fig. 760, gently broadly raised at base and weakly tectate, apical marginal area strongly reflected; occipital carina unobservable), Pronotal collar roundly raised towards middle and weakly swollen there, seen from above comparatively thick and incrassate laterally, lamina on side: Fig. 761; mesopleural flange not expanded into pentroof strrcture. Propodeum with distinct lateral carinae, area dorsalis with feeble lateral furrows, area apicalis not distinct, GSR highly and roundly elevated, with apical area discoloured, ambur yellow in colour, intercoxal carina nearly straight; gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,13,5,26(14),30(22). In fore wing RC M-type, Rl very short, almost none, CV1=CV2x4.5, TCV nearly straight, TCV:CV2÷3:2, angle about 110°.



Figs. 758–761. Trypoxylon breviclypeatum sp. nov.

Frons distinctly microreticulate and distinctly sparsely superimposed with fine flat-bottomed punctures, punctures on mesoscutum comparatively large, somewhat sparse, PIS=PD×1–3, under high magnification PIS filled with very weak microsculpture, propodeum except smooth sides wholly transversely finely closely striate, striae on posterior part of median furrow of area dorsalis weak, sides on dorsal part scattered with fine punctures.

♂, unknown.

Holotype: ♀, Laos (Vientiane Prov., Ban Van Eue), 29. III. 1966, native collector (EPBM).

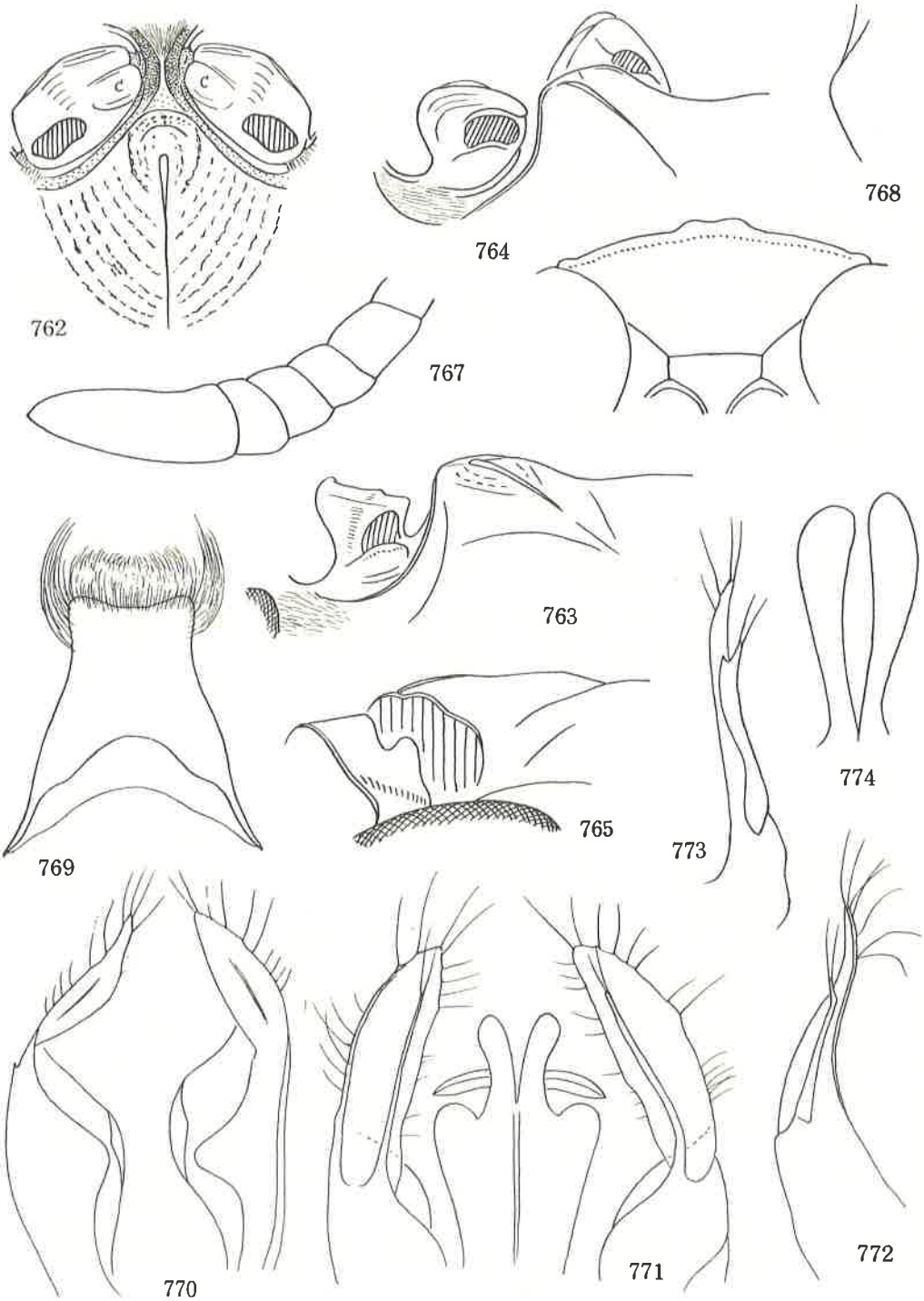
128. TRYPOXYLON ALBISPINOSUM sp. nov.

Characteristic in the structure of SAT and ASR (bearing a hollow latero-posteriorly) and black legs adorned with whitish spurs and spines.

♂, 8.5 mm. Black; mandible ferruginous, at base broadly black, mouth parts ochre yellow, bases of palpi dark brown, tegula and basal plates of wing yellowish pale brown, legs more or less brownish, especially articulations and fore and mid tarsi apically, gaster from apex of petiole to G3 brownish beneath, tibial spurs and spines of legs (especially those forming a line on outer side of hind tibia) white and conspicuous. Hair silvery, on clypeus parallel.

Head in frontal view wider than long (W:L=5:4), with sides roundly convergent below, HW,HL,IODv,A3,Al3,P=100,56,29,13,25,145; OOD,Od,POD≒2,4,4, IODs=10:8.5, A3=AW×2, Al3=BW×2.5, A3,4,5≒10,6,7, frons moderately elevated, median furrow moderately deep, lower area broadly shallowly concave, SAT on upper portion tectate, on lower portion flattened, median carina comparatively thick and short, ASR highly raised, extended anteriorly, seen from back-side triangular, SAT-ASR seen vertically: Fig. 762, ASR bearing a large deep hollow at latero-posterior corner and a gently concave smooth area at medio-posterior portion (C in Fig. 762), seen in profile with dorsal line nearly straight (Fig. 765), SAT anteriorly acutely edged, and marginal area slightly reflected, seen obliquely from above and left side: Fig. 764, seen from more side to see through PAF: Fig. 763, PAF deep, flat-bottomed, nearly U-shaped in cross section, interantennal area med anly longitudinally, distinctly edged and carinated (Fig.762); clypeus: Fig. 766, disc broadly roundly raised, apical margin not reflected, apical part of antenna: Fig. 767, Al3 as long as 4 preceding joints united; occipital carina weak, but complete. Anterior part of pronotal collar nearly straightly raised towards middle and weakly swollen there, seen from above thin, carina-like and only weakly incrassate laterally, posterior part discoloured and covered with long silvery hair, lamina on side: Fig. 768; subalar area of mesopleuron normal; propodeum with distinct lateral carinae, area dorsalis with shallow lateral furrows, area apicalis dorsally not bordered, but with lateral carinae highly elevated, GSR triangularly, markedly highly elevated, with apex rounded and broadly discoloured. Petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)= 100,16,7,27(18),32(20). Sternite 8: Fig. 769, with apical fringe of hair very soft and silky; genitalial parameres seen from beneath (somewhat from side): Fig. 770, main body expanded on both lateral margins and rolled as usual, apex apparently simple lobiform layer, but seen from dorsal side (Fig. 771), medianly longitudinally highly carinated, carina semitransparent, not reaching apex of the basal layer, at apex it is lifted, be-

coming free from the basal layer and slightly produced, carrying two bristles at apex, seen from outer side: Figs. 772 (left paramere from left side) and 773 (right one from right side), volsella: Fig. 774, simply spatulate, not incrassate basally as in nigripes, penis valve vertically seen from dorsal side: Fig. 771, characteristic is the markedly rounded shoulder. In fore wing RC B-type, R1 short, CV1=CV2x4, TCV and CV2 gently incurved, length ratio ÷3:2, angle roughly about 90°.



Frons distinctly microreticulate and closely superimposed with fine punctures, partly rugoso-punctate, SAT comparatively coarsely and concentrically punctured, surface more shining than on frons, mesoscutum with punctures comparatively large, somewhat sparse, PIS= PDx1-3, PIS under high magnification weakly microcoriaceous; propodeum with strong series of striae along lateral carinae, area dorsalis at base obliquely weakly, on median broad furrow transversely, on posterior portion more closely striate, disc very weakly but comparatively largely and sparsely punctured, posterior inclination posteriorly transversely arcuately striate, sides smooth and polished, posterior half sparsely covered with large but weak punctures, apical area transversely strongly rugoso-striate.

♀, unknown.

Holotype: ♂, Laos (Vientiane Prov., Gi Sion Vill. de Tha Ngone), 10-30. I. 1966, native collector (HPBM).

Remarks. The present species closely resembles T. nigripes and T. nishidai, not only in the external characters, but also in the structure of male genitalia, but can be separated from both by the following differences:

Table 11. Comparison between T. nigripes, nishidai and albispinosum.

Item	nigripes	nishidai	albispinosum
Paramere at apical part	Bilobed, folded outer margin not free, apical area & inner margin free (Fig. 549)	Not bilobate, simple layer (Fig. 558)	Dorsally in middle highly carinated, apical area raised and free (Fig. 772)
Volsella	Thick	Thick	Thin
Later.furrows of area dors.	Shallow but distinct	Shallow but distinct	Weak, very feeble
RC	B-type	C-type	B-type
Al3	> Preceding 3 < Preceding 4	≒ Preceding 4	≒ Preceding 4
A3	AW 1.7	AW 2	AW 2
CV1	≒ CV2x3	≒ CV2x3	≒ CV2x4
TCV:CV2	≒ 1:1	≒ 1:1	≒ 3:2
G 2 & 3	Ferruginous, marked dorsally with black	Ferruginous with blackish mark above	Black, slightly brown beneath

(Items are arranged in the order of importance)

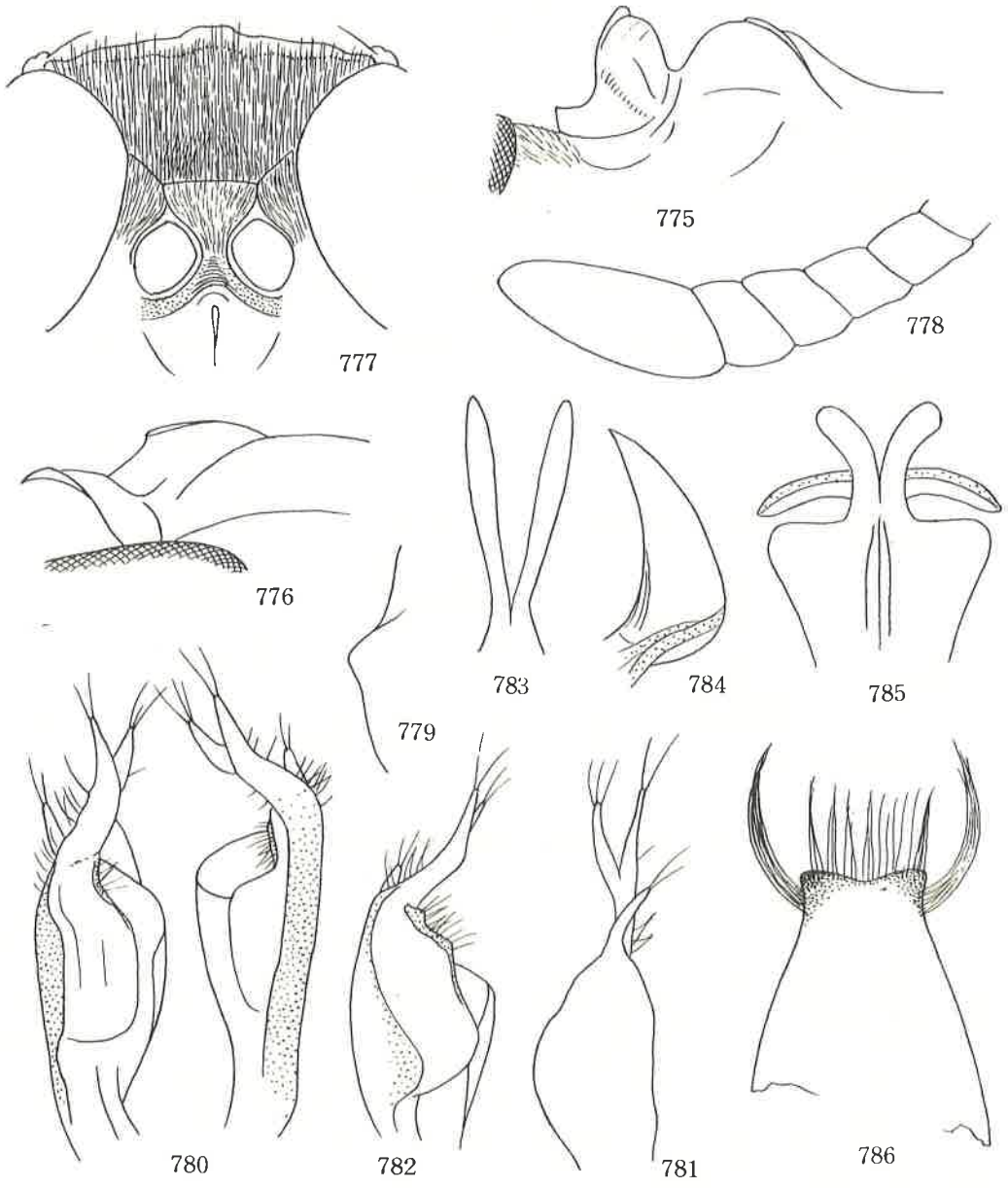
229. TRYPOXYLON SAYABOURYENSE sp. nov.

♂. Apparently similar to the preceding species, but can be distinguished from it by the dark brown tibial spurs, the simple ASR and the up-curved PAF. Further, the genitalial structure is markedly different.

Length about 8 mm. Black; mandible dark reddish brown, broadly black at base, palpi brown, tegula, basal plates and veins of wing dark brown. Legs more or less brownish, fore tibial spur apically and base of hind tibia comparatively broadly pale brown. Hairs silvery, on clypeus parallel.

Head in frontal view with sides rounded, very slightly convergent below. HW,HL, IODv,A3,Al3,P=100,54,28,16,26,170, OOD,Od,POD≒1,2,2, IODs=10:9, A3=AWx2.8, Al3= BWx2.6. Frons moderately raised, medial furrow broad and shallow, but with a fine impressed shining bottom line till base of median carina of SAT, SAT low broad nasiform, with a narrow curved flat area in front of apex of median carina, anteriorly and anterolaterally without edge, smoothly inclined to interantennal area and to PAF, ASR highly raised, at apical margin carinated, with surface smooth and weakly striated, PAF V-shaped in cross section, with sinum rounded, with bottom line from about mid point flatly inclined towards interantennal furrow, but latero-posteriorly cirved down along outer margin of ASR, SAT-ASR seen obliquely from left side to see through PAF: Fig. 775, seen in profile: Fig. 776; clypeus: Fig. 777, gently roundly raised at base and broadly roundly elevated on median line, apical marginal area glabrous, shining and distinctly reflected, Al3 longer than 3 but shorter than 4 preceding joints united (Fig. 778); occipital carina complete. Collar of pronotum roundly raised and tubercu-

late in middle, seen from above anterior part narrow ridge-like, not strongly incrassate laterally, posterior part not discoloured, apical margin only weakly brownish, lamina on side: Fig. 779; subalar area normal, propodeum with lateral carinae, area dorsalis enclosed with furrow, GSR roundly highly elevated; gastral petiole flask-shaped, P,Ma,Mi,2(Ma),3(Ma)=100,12,5,25(18),26(26). In fore wing RC C-type, R1 rather short, CV1≒CV2×4.5.



Figs. 775-786. Trypoxylon sayabouryense sp. nov., ♂

Parameres of genitalia seen from beneath: Fig. 780, apical structure strange, at ventral side bifurcate and at dorsal side simply extended, thus there are 3 branches at apex, the dorsal one shorter (Fig. 781, the right paramere seen from dorsal side, also Fig. 780 and 782, left paramere seen from left side), the ventralmost one bearing a well chitinized bristled area at its base, main body lamellately expanded on both mar-

gins, at the dorsal side stronger, rolled ventrally to form a cylindric pouch, volsella seen from beneath markedly slender (Fig. 783), but seen from side strongly incrassate towards base (Fig. 784, left half from left side), penis valve with well developed shoulder and a pair of sickle-shaped appendages as given in Fig. 785 (dorsal view), sternite 8: Fig. 786 (basal part broken).

Frons distinctly microreticulate and sparsely superimposed with fine flat-bottomed punctures, surface nearly mat except shining medial line, surface of body (including gaster) and legs smooth and strongly shining, mesoscutum without trace of microsculpture, finely sparsely punctured. Propodeum wholly, except marginal areas of median furrow of posterior inclination, transversely, finely and closely striate, sides smooth, polished and scattered sparsely with fine punctures, except antero-ventral area.

♀, unknown.

Holotype: ♂, Laos (Sayaboury Prov., Sayaboury), 13. IV. 1966, native collector (BPBM).

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