

SPECIAL PUBLICATIONS
OF THE
JAPAN
HYMENOPTERISTS ASSOCIATION

NO. 11

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

V. SPECIES FROM SUMATRA, JAVA AND
THE LESSER SUNDA ISLANDS

By R. TSUNEGI

M I S H I M A

SEPTEMBER 20, 1979

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

V. SPECIES FROM SUMATRA, JAVA AND
THE LESSER SUNDA ISLANDS

By K. TSUNEKI

(Asahigaoka 4-15, Mishima, Japan 411)

S y n o p s i s

Forty-four species are treated, including twenty new species and five new subspecies. *Trypoxylon melanocorne* Tsuneki, 1979 (nec Strand, 1922) is renamed *Trypoxylon atricorne* nom. nov.

The specimens investigated in the present Part are mainly derived from the collection of Rijksmuseum van Natuurlijk Historie, Leiden, Nederland and partly from British Museum (Natural History), London and Naturhistorisches Museum Basel, Schweiz, attaining in all as many as 454.

The material of Rijksmuseum was mainly collected by Dr. J. van der Vecht during his stay in Java and later visit to the Island, to whom I thank heartily for his kindness in entrusting his study on these variable and abundant specimens to me and in affording me detailed knowledge on the localities of many specimens collected by other persons with labels that are difficult to understand.

The collection of Museum of Basel is a part of the results of the exploration by Dr. A. Bühler and Dr. E. Sutter on the Islands of Sumba and Flores and of special interest from the point of view of geographical distribution.

Of the 44 species examined those commonly occurring in Sumatra, Java and Sumba (or Flores) are 4:

schmiedeknechti Kohl, *petiolatum* Smith, *errans* Saussure and *nesia-num* sp. nov.,

those commonly occurring in Sumatra and Java are 6:

bicolor Smith s. str., *hasiaie* Cameron, *maculiventre* Tsuneki, *striolatum* Tsuneki, *vardyi* Tsuneki and *membranaceum* Tsuneki,

occurring in Sumatra alone are 7:

fulvocollare Cameron, *fumi* Tsuneki, *ornatigaster* Tsuneki, *ngum* Tsuneki, *jacobsoni* sp. nov., *sumatraense* sp. nov. and *sibolangitum* sp. nov.,

in Java alone are 22:

interruptum Tsuneki, *fletcheri* Turner, *antennatum* Tsuneki, *orientale* Cameron, *kalimantan* Menke, *prominens* Tsuneki, *penangense* Tsuneki, *bakerianum fortius* ssp. nov., *atricorne* nom. nov., *cheesmanae* sp. nov., *naviforme* sp. nov., *vicinum* sp. nov., *walshae* sp. nov., *vechti* sp. nov., *javanense* sp. nov., *tjangkoedang* sp. nov., *clypeatum* sp. nov., *javanicum* sp. nov., *djampangense* sp. nov., *tjiangsannu* sp. nov., *betremi* sp. nov. and *viridaricola* sp. nov.

in Sumba (and Flores) alone are 6:

sumbanum sp. nov., urbanii sp. nov., buelleri sp. nov., sumbanicela sp. nov., penangense sutteri ssp. nov. and atricorne planum ssp. nov., while, one species (thaianum Tsuneki) is found in Sumatra and Sumba, but not in Java.

The species that are found in 3 Islands in common are, except for nesianum nov., widely spreading ones, while these which are found in both Java and Sumatra are all common to Malay peninsula (including Singapore and Penang).

The fact that comparatively numerous species are apparently endemic to Java seems partly due to that the investigation on the fauna of Sumatra is still insufficient. This is shown by the fact that of the 22 species occurring in Java alone 7 are known also from Malay Peninsula and when the exploration of the Peninsula is proceeded the number of the species common to both areas will further be increased.

However, the fact that a fair number of the species are apparently endemic to each Island indicates also the importance of the geographical factor on the process of evolution.

This is also shown by another fact that the number of the species common to the Indo-Malayan fauna and the fauna of the Islands as a whole is 22, while that confined to the Islands is also 22, of which 21 (excluding kalimantan Menke known from Borneo also) are new species and endemic to the Islands.

On the other hand, it seems quite strange that T. thaianum Tsuneki is not known from Java, despite that it is found in Sumatra and Sumba as well as in wide range of the Oriental Region, especially because that Java is the best investigated area of all the 3 concerned here.

The above is a statistic result of distribution of the species. But among the species that are treated as identical in the above statistics there are many that show more or less differences in some characters between the representatives of the Indo-Malayan and Sumatran or Javanese areas. Of these mention will be made in the remarks of such species.

The following are the concrete instances towards speciation:

1. T. penangense Tsuneki. A single female specimen from Java differs from those of Penang and Singapore in having the legs more broadly black, showing a tendency towards a local race, while a specimen (♀) of Sumba differs much more distinctly from the nominate race and is considered a different geographical race.

2. T. bakerianum Tsuneki. The Javanese specimens differ from the type from Singapore markedly in microsculpture and punctuation and separated as a subspecies, while T. urbanii occurring in Sumba is also closely allied to the Javanese race of bakerianum, but much more distinctly differs from this and was separated at the species rank.

3. Most interesting is the intraspecific difference appearing between specimens of West Java and East Java, e.g. of fletcheri, orientale, javanense and of vechti. Most remarkable is observed in orientale and they are separated as different subspecies.

In connection with the distribution of T. thaianum it seems also interesting that T. buddha has not been known from the Islands concerned here which is widely distributed over the Oriental Region.

While it is also worthy of notice that T. bicolor Smith s. str. occurs commonly in Sumatra and Java which is rare in Indo-Malayan region except southern part of the Peninsula and Singapore.

(See P.S. on P. 67)

ABBREVIATIONS

A1, A2 and so on ... Antennal joint 1, Antennal joint 2 ...
A10-12 ... A10+A11+A12 united.
ASR ... Antennal socket rim (raised upper part of antennal socket)
AW ... Apical width or Width at apex (always maximum width, in case of A3 very frequently in lateral view).
BW ... Basal width or Width at base (always maximum width near base).
CV1, CV2 ... Abscissa 1 of cubital vein, Abscissa 2 of cubital vein ...
G1, G2 ... Gastral segment 1, Gastral segment 2 ...
GSR ... Gastral socket rim, really the dorsal rim of socket of lifting muscle of gaster (sometimes simple and not raised, but frequently highly, roundly or subtriangularly 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 (always maximum width).
IAA ... Interantennal area.
IAF ... Interantennal furrow.
IOD ... Interocular distance or distance between eye.
IODc ... Minimum IOD at about base of clypeus (frontal view).
IODv ... Minimum IOD at vertex (dorsal view).
IODs ... Ratio of IODv to IODc, usually shown by IODv as 10.
L/W ... Ratio of length to width.
Ma ... Maximum width (in case of gastral petiole dorsal view).
Mi ... Minimum width (ditto, usually just behind basal condyle, but sometimes in front of apical swelling).
2(Ma), 3(Ma) ... Length of G2 (Maximum width of G2), ditto of G3.
OOD (or OD) ... Ocellular distance, namely the distance between inner margin of compound 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.
PIS ... Puncture interspace.
POD ... Postocellar distance, distance between inner margins of hind ocelli.
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 ... Tarsal joint 1, tarsal joint 2 ...
W:L ... Ratio of width to length.

FORMULAE

Formulae always show the relative length.

HW, HL, IODv, A3, Al3, P= ... measured under the standard of HW as 100.
P, Ma, Mi, 2(Ma), 3(Ma)= ... measured under the standard of P as 100.
A3, 4, 5=...measured under the standard of A3 as 10.

On the KEY TO THE SPECIES

1. When a character is variable or intermediate and fits for both of the couplet the species is put under both of the couplet.
2. AW of A3 and BW of Al3 are always measured from the widest side.
3. Length of gastral petiole (P or G1) is the total length, measured from the extreme base of basal condyle to the apex.

KEY TO THE SPECIES

- 1 Frons with shield-shaped enclosure, sometimes the lateral carinae of the enclosure partly indistinct scutatum-group (see Part I) 2
- Frons without enclosure 2
- 2 Gastral petiole clavate, gradually widening apically and comparatively short, always appr. as long as 2 following segments united or much shorter (G1, 2, 3 without fovea at apex) 3
- Gastral petiole flask-shaped, with long parallel-sided part anteriorly and apical swelling rather sudden, longer than 2 following segments united ... 19
- 3 Mesoscutum microsculptured and superimposed with fine punctures, or very finely and very closely punctured all over, surface mat or half mat, 4
- Mesoscutum without microsculpture, at least under low magnification, or not so finely and not closely punctured, PIS smooth and shining 16
- 4 Propodeum without lateral carinae (HW:HL=100:60, IODs=10:5, SAT low tuberciform, weakly carinated in middle - Figs. 1-5, clypeus: Fig. 6, gaster black; Al-2 beneath, all trochanters, fore tibia and tarsus pale yellow, area dorsalis enclosed with furrow, RC B-type, RI fairly long, but not reaching wing apex), 6.5 mm, Java (high altitude) cheesmanae sp. nov., ♀
- Propodeum with lateral carinae 5
- 5 Gaster black 6
- Gaster at least partly red, ferruginous or yellow 11
- 6 Head subquadrate in both dorsal and frontal views, gastral petiole very short, only slightly longer than G2 (SAT low, broad, tectate, with median carina, IODs=5:2(♂) or 3:1(♀), clypeus: Fig. 9(♂) or 12(♀), always distinctly narrower at base than long in middle, RC B-type, RI very long, reaching close to wing apex, area dorsalis enclosed with weak furrow, fore and mid tibiae and tarsi wholly or largely ferruginous), 4.5-5.0 mm, Sumatra jacobsoni sp. nov.
- Combined characters of head and gastral petiole different 7
- 7 Supraantennal area provided with highly raised ship-shaped carina, widely open upwards (Figs. 13-15) (head subquadrate in both dorsal and lateral views, G1 more than 1.5 times as long as G2, IODs=10:4, clypeus: Fig. 16, area dorsalis enclosed with furrow, transversely finely closely striate, pronotal tubercle posteriorly yellow, fore tibia and tarsus, mid T1 ferruginous yellow, RC B-type, RI moderately long, not reaching close to wing apex), 8 mm, Java naviforme sp. nov., ♀
- Supraantennal area without ship-shaped carinae 8
- 8 About 10 mm, lobust species, G2(Ma)=10(8), HW:HL=2:1, mesoscutum strongly microreticulate (petiole subflask-shaped, slightly longer than G2+3, clypeus: Fig. 95, HW:IODv=100:32, IODs=10:7, SAT low broad nasiform, distinctly carinated in middle, area dorsalis enclosed with furrow, antenna and legs black), Java clypeatum sp. nov., ♀
- Below 8 mm, slender species, G2(Ma)=10(4-5), HW:HL=3:2 or greater, mesoscutum very finely and closely punctured 9
- 9 ASR highly and strongly elevated (Fig. 19, dorsal, Fig. 20, vertical), with a large fovea in front (clypeus: Fig. 24(♀), 27(♂), IODs=10:7(♀), 10:6(♂), A3=AW×3.2(♀), ×2(♂), Al3: Fig. 28, mandible ferruginous, pronotal tubercle black, area dorsalis not enclosed with furrow, but very broad, occupying almost whole the dorsal surface, anteriorly obliquely, posteriorly transversely coarsely striate), 6 mm, Java vicinum sp. nov.
- ASR not so highly elevated 10
- 10 SAT-ASR seen from dorsal side: Fig. 32 (seen vertically: Fig. 33, SAT flattened, without medial carina, apical margin transversely rounded and carinate, clypeus: Figs. 36(♀), 37(♂), IODs=10:8(♀), 10:7(♂), A3=AW×3.5(♀), AW×2.7(♂), mandible ferruginous, pronotal tubercle yellow, area dorsalis indistinctly enclosed with very weak furrow, not so broad as in vicinum, obliquely coarsely rugoso-striate, medio-apical area with a few transverse striae), 7-8 mm, Java and Kangean Is. walshae sp. nov.
- SAT-ASR seen from dorsal side: Fig. 39 (seen vertically: Fig. 40, apical margin transverse, acutely carinate, covering PAFs and IAF, clypeus: Fig. 44, IODs=10:6.7 (=3:2), A3=AW×3, Al3=Al1+12, mandible yellow, pronotal tubercle posteriorly yellow, area dorsalis enclosed with fine furrow, normal in size, whole the area obliquely, strongly closely striate), 6 mm, Is. of

- Sumba sumbanum sp. nov., ♂
- 11 SAT a low rounded swelling, shortly indistinctly carinated in middle, PAF deep, flat-bottomed, smoothly connected with IAF, apical margin of clypeus bidentate in middle (IODs=10:8, A3=AW×2.2, mandible with a short tooth on inner margin near middle, area dorsalis practically without lateral furrows, mandible, palpi, basal half of gastral petiole and fore and mid tarsi ferruginous or yellow, rest of gaster and legs considerably variable in yellowish tinge), 7.5-9.0 mm, Java (India and Malaya) fletcheri Turner, 1918, ♀
- SAT nasiform, long carinated in middle, PAF or apparent PAF obliquely inclined from medio-apical part of SAT latero-posteriorly, not flatly connected with IAF (A3=AW×4 in ♀, area dorsalis distinctly enclosed with fine furrow) .. 12
- 12 Raised ASR narrow, only apical margin carinated, connected with medio-apical end of SAT by a short carina, thence apparent (or false) PAF runs obliquely inclining latero-posteriorly (Figs. 61, 72) 13
- Raised ASR somewhat broader, weakly bi- or tricarinated on top and separated from medio-apical end of SAT by the up-rising true PAF, there PAF connected with IAF without being interrupted by a bridge of carina, side of SAT obliquely inclined and PAF not deeply excavated (at least all femora and hind tibia black or dark brown), Java (vechti sp. nov.) 15
- 13 SAT narrow nasiform, with sides acutely inclined, hence false PAF appears broadly and strongly excavated (Figs. 71-74), gaster slender (clypeus: Fig. 75, IODs=10:4.5, from apex of G1 to G4 reddish ferruginous, fore tibia and tarsus, mid tibia partly and T1 and T5, base of hind tibia and of T1 ferruginous), 8.5 mm, West Java tjangkoedang sp. nov., ♀
- SAT moderately high nasiform, with sides obliquely inclined, false PAF not strongly excavated, Java (javanense sp. nov.) 14
- 14 ♂: IODs=10:9, clypeus: Fig. 63, A3=AW×3.7, A6 excavated at base beneath and produced at apex, A13=A9-12, distinctly bent, A1, 2 wholly, 3 partly beneath, gaster wholly, legs largely ferruginous, 8 mm
♀: IODs=10:5, clypeus: Fig. 70, antenna normal, in colour of antenna and gaster similar, but often gaster with posterior 2-3 segments blackish, 10-11 mm
javanense, western bright-coloured form
- ♂ unknown
♀: IODs=10:6, antenna black, basally dark brown, gaster from base to base of G3 ferruginous, rest black, 9.5 mm (otherwise similar)
- 15 ♂: IODs=10:8, clypeus: Fig. 50, A3=AW×2.7, A6 excavated at base beneath and produced at apex, A13=A9-12, distinctly bent, A1, 2 beneath, gaster from apex of G1 wholly or except apical portion and legs largely ferruginous to brown, 6.5-7.0 mm
♀: IODs=10:5.5, clypeus (mainly): Fig. 58, colouration similar, but G1 often dark brown above except apex, 9-10 mm vechti, dark form
- ♂: unknown
♀: IODs=10:5.5, clypeus (mainly): Fig. 59, colouration generally similar but G1 always largely ferruginous, 9-10 mm vecht, bright form
- 16 Hair on head and thorax-complex golden to brassy (SAT low tuberiform: Fig. 76, PAF shallow, with bottom line upcurved, IODs=1:1, clypeus with apical margin gently rounded out, medianly weakly emarginate, area dorsalis practically without lateral furrows, A3=AW×4, antenna basally, clypeus at apical area broadly, prothorax largely, tegula and greater part of legs ferruginous, gaster black and variegated with brown and yellow: petiole largely, mark or band on G2 and 3 brown, G2, 3, 5, and 6 or 6-7 with ground colour yellow, in ♂ A13=A5-12), ♀ 12-13 mm, ♂ 10-12 mm, Malaya, Laos, new to Java antennatum Tsuneki, 1979
- Hair silvery 17
- 17 Head transverse, HW:HL=2:1, gaster robust, G2(Ma)=10(7-9), G2-3 at least partly reddish, legs black and richly maculated with ferruginous yellow (IODs=3:2, clypeus gently rounded out and weakly recurved in middle, antenna claviform, A13=A8-12, mesoscutum distinctly, somewhat sparsely punctured, area dorsalis enclosed with furrow, with disc shining and sparsely punctured) 7.5-8.0 mm, widely spread over Oriental Region
- Head thick, HW:HL=5:3-4, gaster slender, G2(Ma)=10(5), gaster black and legs black or brown 18
- 18 ASR highly and peculiarly raised (Figs. 19-23, 26), bearing a large fovea in front and coarsely sculptured (clypeus: Fig. 27, IODs=2:1, A3=AW×2, A13

- slightly shorter than $A_{11}+A_{12}$), 5.5 mm, Java (see also couplet 9)
- SAT-ASR: Figs. 32-35 (clypeus: Fig. 36, IODs=10:8, $A_3=AW \times 3.5$, mesoscutum finely, fairly closely punctured), 8 mm, Java and Kangean Is. (see also couplet 10) vicinum sp. nov., ♂
 - 19 Mesoscutum distinctly microcoriaceous (propodeum with lateral carinae) ... 20
 - Mesoscutum simply punctured, PIS without microsculpture 26
 - 20 Hair golden or brassy (SAT-ASR: Figs. 77-81, posterior part of collar discoloured, yellowish, lamina on side toothed, subalar area with well developed pent-roof structure, area dorsalis enclosed with weak furrow, RC M-type; antenna basally, gaster medianly, fore leg nearly wholly and mid legs largely yellow or ferruginous, gaster often black maculated above), ♀ 13-14 mm, ♂ 8.5-10 mm, Malaya, Penang, Singapore and Laos, new to Java and Sumatra walshae sp. nov., ♀
 - Hair silvery 22
 - 21 ♂: IODs=10:7, clypeus: Fig. 84, $A_3=AW \times 3.5$, $A_{13}=A_9-12$ (A1-2 cream yellow, bright part of body and legs also cream yellow) maculiventre Tsuneki, 1979 ..
 - ♀: IODs=10:9, clypeus: Fig. 83, $A_3=AW \times 5$ (A1-2 distinctly cream yellow, thence apically dark brown, other bright parts of body and legs also cream yellow) maculiventre Sumatran form
 - ♀: IODs, clypeus and A_3 similar (A1-3 ferruginous, from A_3 apically gradually darkened, other bright parts of body and legs ferruginous, but hind leg on the average darker) maculiventre Javanese form
 - 22 A1,2 beneath, clypeus apically broadly and fore and mid legs also broadly yellow (clypeus as in Fig. 83, SAT tuberiform, not carinated at apical margin, IODs=10:9, $A_3=AW \times 5.5$, pronotal lamina nearly toothed as in Fig. 81, subalar area with distinct pent-roof structure, area dorsalis with weak lateral furrows, petiole black, from G2 apically lacking), presumably 12-13 mm, Sumatra maculiventre Tsuneki, aberratio, ♀
 - Antenna, clypeus, gaster and at least mid tibia largely black 23
 - 23 About 10 mm, leubst species, G1 intermediate between claviform and flask-form, comparatively thick and short, only slightly longer than HW and L:Ma=4:1, Ma:Mi=2:1 (legs wholly black, clypeus: Fig. 95, IODs=10:7), Java clypeatum sp. nov., ♀
 - 7-8 mm, slender species, G1 slender and long, about twice as long as HW and L:Ma=5-6:1, Ma:Mi=3:1 24
 - 24 IODs=5:3, fore tibia and tarsus, tibial spurs and mid T1 bright ferruginous, ASR with posterior aspect covered with the produced transverse carina of SAT (Figs. 85-89)(clypeus: Fig.90, $A_3=AW \times 2$, pronotal lamina very obtusely angulated, nearly rounded, area dorsalis without lateral furrows), 7 mm, Sumatra sumatraense sp. nov., ♀
 - IODs=1:1 or nearly, legs black, apically brownish, spurs whitish, ASR exposed, bearing a deep fovea on posterior aspect (PAF deep, flat-bottomed, U-shaped in cross section and at outer end curved forwards, collar markedly roundly emarginate in front, lamina triangular, with apical angle about 120°, area dorsalis enclosed with weak furrow, the furrow transversely finely and closely striate, RC C-type,, 7-8 mm 25
 - 25 Outer end of PAF smoothly open to inner orbital area (or scapal hollow), gaster in ♀ medianly ferruginous red, with brownish maculae, in ♂ wholly black; frons distinctly microcoriaceous and distinctly, fairly closely superimposed with fine punctures, tibial spurs all white, Java bakerianum fortius ssp. nov.
 - Outer end of PAF closed (Figs. 110-111), ♀: Gaster black, G2 at base and underside, and G3 at base beneath brown, frons more finely microcoriaceous, almost without puncture, tibial spurs considerably brownish), 8 mm, Is. Sumba urbani sp. nov., ♀
 - 26 Propodeum without lateral carinae 27
 - Propodeum with lateral carinae 35
 - 27 Gaster from apex of petiole to end ferruginous, often posteriorly more or less brown (fore and mid legs largely ferruginous, vertex depressed, SAT moderately high nasiform, rhombic in outline, verge to PAF-IAF edged, medio-apical inclination edged above, forming a small flat area, carrying a fovea on it; PAF deep, flat-bottomed, U-shaped or oval in cross section, ASR highly raised, bicarinate on top, mesopleural scrobe shallow but distinct, area

- dorsalis without lateral furrows, antenna wholly ferruginous, sometimes from middle of A₄ apically brown to dark brown, hair silvery, sometimes partly appears golden or brassy,
 ♀: 15-18 mm, clypeus; Fig. 112, IODs=10:8, A3=AW×5.5,
 ♂: 13-16 mm, clypeus less produced, IODs=10:8-9, A3=AW×3, A13=A10-12.
khasiae Cameron, 1904
- Gaster from G₂ to end not wholly ferruginous 28
- 28 Gaster black and partly ferruginous or red 29
- Gaster black and maculated with yellow (hair golden) 34
- 29 A₁ and 2 yellow (G₂, 3 and 6 red, other characters as in khasiae), 14 mm, Sumatra
khasiae Cameron, var., ♀
- A₁ and 2 black, sometimes slightly brownish beneath (gaster medianly reddish) 30
- 30 SAT moderately high nasiform, apical margin transversely rounded and acutely carinate, PAFs forming a deep transverse furrow before and beneath apical produced carina of SAT, the furrow is separated from IAF by a raised wall at upper part of IAA (gaster from apical swelling of G₁ to base or apex of G₄ red, legs black, only partly ferruginous or whitish, clypeus simply rounded out anteriorly and weakly emarginate in middle, IODs=4:3, A3=AW×5, subalar area of mesopleuron with half-developed pent-roof structure, area dorsalis enclosed with weak but distinct furrow), 13-14 mm, Laos, S. India and Malaya, new to Java
prominens Tsuneki, 1979, ♀
- SAT with apical margin not transversely carinated, PAFs not forming a transverse furrow, but obliquely connected with IAF, forming a Y-shaped furrow 31
- 31 ♀ 32
- ♂ 33
- 32 Lamina on side of pronotum distinctly toothed (fore tibia broadly in front, bases of other tibiae, all tibial spurs and fore and mid tarsi largely pale brownish white, G₁ at apex and G₂-4 ferruginous), 15-18 mm, Java and Sumatra (Singapore, Malaya, Thailand)
bicolor Smith, 1856, s. str.
- Lamina on side of pronotum triangular, not toothed (all tibiae at base narrowly, all tibial spurs, fore tarsus largely, mid T₁ or T₁-2 yellowish ferruginous, often fore tarsus apically brown flecked, from apex of G₁ to G₃ reddish ferruginous), 12-15 mm, Sumatra, Java, adjacent Islands, Sumba and Flores (widely spread over Oriental to parts of Palaearctic Regions)
petiolatum Smith, 1857
- 33 Lamina on side of pronotum toothed (fore tibia in front broadly, base narrowly of other tibiae, tibial spurs pale brownish white, G₁ at apex and G₂-4 reddish), 12-14 mm, Java and Sumatra (Singapore, Malaya, Thailand)
bicolor Smith, 1856, s. str.
- Lamina on side of pronotum triangular, not toothed (legs black, sometimes fore tibia somewhat, fore tarsus considerably brownish), 10-13 mm, widely distributed over Oriental and parts of Palaearctic Regions
petiolatum Smith, 1857 (black-legged form)
- 34 G₁ on sides and base beneath till spiracles, G₂ and 3 both broadly, apical margin of G₄ and of G₅, G₆ and G₇ wholly yellow (IODs=10:8, OOD:POD=1:1, A3=AW×3, A13 slightly shorter than A9-12, SAT-ASR; Figs. 113-114, clypeus: Fig. 115, A₁-2 yellow, fore and mid legs semitransparent cream yellow, arolia black, mid T₂-5 pale brown, hind femur except base and apex glossy dark brown, coxa except beneath, trochanter and tibia wholly yellow, tarsus except pale articulations dark brown), 12.5 mm, Malaya, new to Sumatra
fumi Tsuneki, 1979, ♂
- G₁ amber yellow, but from spiracles to near apex above black, G₂ and 3 broadly, apical margin of G₄ and 5 and whole of 6 yellow (IODs=10:6, OOD:POD=1:1, A3=AW×4.5, SAT-ASR similar, clypeus; Fig. 121, antenna and legs similar in colour, but hind T₁ largely yellow), 14 mm, Sumatra (Malaya)
fumi Tsuneki, 1979, ♀
- 35 Hair on head and thorax-complex golden or brassy 36
- Hair silvery 44
- 36 Anterior part of pronotal collar more or less ferruginous 37
- Anterior part of pronotal collar black 40
- 37 SAT low nasiform, in vertical view apical margin triangular, PAF shallow, V-shaped in cross section, bottom line upcurved, medio-apical area of SAT smoothly inclined to IAF, without fovea on it, clypeus simply rounded out ... 38
- SAT low broad tuberiform, rhombic in outline, PAF moderately deep, flat-bottomed, but at outer end curved down, V-shaped in cross section, medio-api-

- oal area of SAT with a large distinct fovea 39
- 38 Prosternum black, P=AW×5-6(♀), AW×4-5(♂) (IODs=10:10(♀), 10:9(♂), A3=AW×5 (♀), AW×2.3(♂), Al3=AS-12, Al and 2, and 3 beneath ferruginous, rest dark brown, gaster orange yellow, castaneous brown to brownish black are Gl from spiracles posteriorly above, a laterally interrupted broad band across middle of G2 and 3, and G4, 5, 6 except a broad band on each tergite, sometimes brown mark present near apex of underside of Gl, legs except bases of coxae and areolia ferruginous yellow, mid T3-4, hind femur and tibia somewhat obscurely broadly brown, hind tarsus dark brown above), ♀ 16-18 mm, ♂ 13-14 mm, Assam, Laos, Malaya and new to Sumatra *fulvocollare* Cameron, 1904
- Prosternum ferruginous, P=AW×3(♀♂) (IODs=10:10(♀), 10:9(♂), A3=AW×3.7(♀), AW×2(♂), see also couplet 16), ♀ 12-13 mm, ♂ 11-12 mm, Laos, Malaya and new to Java *antennatum* Tsuneki, 1979
- 39 Clypeus: Figs. 126-127(♀), 132-133(♂), IODs=10:8(♀), 10:9(♂) (antenna basally ferruginous, brown to dark brown apically above, Gl brown or dark brown above, G2, 3, 6 reddish ferruginous, G4, 5 brown or dark brown, rest black, fore and mid legs wholly (mid femur somewhat brownish), hind trochanter and greater part of tibia and all tibial spurs ferruginous), 12-16 mm, Java *javanicum* sp. nov.
- Clypeus: Fig. 140, IODs=3:2 (antenna, gaster and legs completely ferruginous), 10.5 mm, Is. Sumba *buehleri* sp. nov., ♀
- 40 Antenna wholly black (gaster medianly dark red, paler beneath, IODs=10:8, A3=AW×4.7, clypeus in fresh - senile specimens: Fig. 150, lateral carinae of propodeum obscurely defined, area dorsalis practically without lateral furrows, bases of all tibiae, fore tibia in front broadly, tibial spurs and fore tarsus ferruginous), 14-15 mm, Borneo, new to Java *kalimantan* Menke, 1976, ♀ (= *annulipes* Cameron, nec Taschenberg)
- Antenna basally yellow 41
- 41 Gaster medianly (G2 and 3) reddish yellow (see couplet 27), ♀ 15-18 mm, ♂ 13-16 mm, Assam, Laos, Thailand, Malaya, new to Java and Sumatra *khasiae* Cameron, 1904
- Gaster black, maculated and banded with yellow or reddish yellow 42
- 42 SAT short and broad nasiform, moderately high, with verge to PAF distinctly carinated and incrassate, ASR at apical margin only carinated, smooth and amber yellow (Figs. 151-155) (IODs=10:11, A3=AW×5, clypeus: Fig. 156, subalar area with half developed pent-roof structure, area dorsalis without lateral furrows, fore leg nearly wholly, mid tibia and base of T1, hind tibia at base and all tibial spurs ferruginous yellow), 17 mm, Java *djampangense* sp. nov., ♀
- SAT moderately high nasi- or tuberiform, with inclination to PAF smooth, ASR with top bi- or tricarinate, apical margin narrowly amber-yellow (clypeus smoothly rounded out, somewhat incrassate at medio-apical area, A3=AW×4, subalar area with half-developed pent-roof structure, RC M-type) 43
- 43 IODs=10:10, Gl black, SAT somewhat longitudinally elongate, tectate (Al-2 yellow, bright colour of gaster and legs yellow, hind tibia medianly broadly black), 16-17 mm, Malaya, new to Sumatra *ornatigaster* Tsuneki, 1979, ♀
- IODs=10:8.5, Gl on apical swollen part only black, SAT tuberiform, rounded conical, wider than long (Al-3 yellow, bright colour of gaster and legs reddish yellow, on legs mixed with yellow patches and streaks, hind tibia medianly broadly brown), 13 mm, Is. Sumba *sumbanicola* sp. nov., ♀
- 44 Gaster at least medianly red or ferruginous 45
- Gaster wholly black 59
- 45 Gaster wholly ferruginous red (SAT low broad tuberiform, shortly carinated in middle, apical margin extended, covering ASR, forming a waved and reflected transverse carina, apparent PAF from medio-apical part of SAT running down obliquely backwards, IODs=10:10, A3=AW×5, clypeus: Fig. 160, area dorsalis enclosed with furrow, RC M-type, legs except coxae, trochanters above and areolia completely ferruginous), 11 mm, Is. Sumba *penangense sutteri* ssp. nov., ♀
- Gaster with petiole and apical segments black 46
- 46 Al-2, or 1-2 and base of 3 yellow 47
- Antenna black 49
- 47 SAT with medio-apical margin obliquely inclined, forming a flat shining area and carrying a round fovea on it (see couplets 27 and 41) *khasiae* Cameron, 1904

- SAT with apical margin transversely roundly carinated 48
- 48 SAT moderately high nasiform, separated from highly raised ASR by a deep flat-bottomed and V-shaped furrow (clypeus: Fig. 165, IODs=10:5, A3=AW×4, area dorsalis enclosed with weak furrow, but anteriorly indistinct, mid coxa and trochanters, tibiae, tarsi of fore and mid legs, base of hind tibia and tibial spurs, apex of G1, whole of G2, 3, 6 and part of 4 and 5 beneath ferruginous red), 13.5 mm, N. Sumatra sibolangitum sp. nov., ♀
- SAT low broad nasiform, with sides gently roundly up-curved down, near to tuberiform, anteriorly flattened, extended, with apical margin forming a transverse carina, covering ASR and IAF (clypeus rounded out and medianly weakly truncate, A3=AW×4.5(♀), ×2.5(♂), AL3=AS-12, area dorsalis enclosed with weak furrow, knees, fore and mid tibiae, base of hind tibia, fore and mid tarsi (mid T2-5 somewhat brownish) and tibial spurs ferruginous, RC M-type), ♀ 11-12 mm, ♂ 8-10 mm, Laos, Penang, Singapore and new to Java penangense Tsuneki, 1979
- 49 Fore tibia at least partly in front and fore tarsus at least T1 yellowish white 50
- Fore tibia and tarsus brown to black 53
- 50 Fore T1 and 2 except apices and mid T1 except apex yellowish white, rest of the tarsi brown or dark brown (SAT moderately high tuberiform, apical margin truncate and verge to PAF carinae, PAF deep, flat-bottomed, clypeus medianly at apex obtusely bidentate: Fig. 170, A3=AW×4, IODs=10:10, area dorsalis distinctly enclosed with furrow, G2 and 3 brown, black above), 15 mm, Laos, Thailand, Penang, new to Sumatra ngum Tsuneki, 1979, ♀
- Fore tarsus wholly and mid tarsus at least largely yellowish white (fore tibia broadly in front ferruginous or yellowish) 51
- 51 Trochanters of all legs ferruginous, more or less brownish above (IODs=2:1 in ♀, 3:2 in ♂, clypeus rounded out and medianly recurved, in ♀ recurved area usually minutely notched in middle, punctures on mesoscutum distinct, fairly close, rarely PIS weakly microcoriaceous - under high magnification - SAT moderately high nasiform, subrhombic in outline, after gently, obliquely inclined distinctly edged at verge to PAF, PAF deep, flat-bottomed, ASR highly raised, bicarinate on top, A3=AW×4.5 in ♀, 2.3 in ♂, AL3=AS-12, area dorsalis distinctly enclosed with furrow, G1 in ♂ often markedly shortened), ♀ 9-10 mm, ♂ 7-9 mm, widely spread over Oriental Region errans Saussure, 1867 (= intrudens Smith, 1870)
- Trochanters black (IODs=3:2 - 5:4 in ♀, pronotal lamina toothed, area dorsalis enclosed with furrow) 52
- 52 Clypeus: Fig. 172, medio-apical part somewhat incrassate (SAT-ASR: Fig. 171, mid T3-5 brown to dark brown, area dorsalis transversely distinctly, finely and closely striate), 12-14 mm, Laos, Singapore, new to Sumatra and Java striolatum Tsuneki, 1979, ♀
- Clypeus: Fig. 174 (SAT-ASR: Fig. 173, mid tarsus wholly whitish, area dorsalis transversely weakly sparsely striate), 12 mm, Java tjianganum sp. nov., ♀
- 53 PAF shallow and broad, simply down-curved or widely opened V-shape in cross section (pronotal lamina triangular, with apex pointed, area dorsalis enclosed with furrow) 54
- PAF deep, narrow, flat-bottomed, nearly U-shaped in cross section 55
- 54 Clypeus: Fig. 175, A3=AW×4 (frons anteriorly broadly excavated, SAT-ASR relatively shorter, legs black), 11-13 mm, N. and S. India, Malaya, new to Sumatra and Java vardyi Tsuneki, 1979, ♀
- Clypeus: Fig. 176, A3=AW×3 (frons anteriorly broadly flattened, SAT-ASR relatively longer, legs brownish, paler on fore tibia and tarsus and hind tibia at base), 9-10 mm, Singapore, Laos, S. India, new to Sumatra and Java membranaceum Tsuneki, 1979, ♀
- 55 ♀ 56
- ♂ 58
- 56 Apical margin of clypeus medianly produced (SAT low broad tuberiform, but medianly long carinated and weakly edged at verge to PAFs, IODs=10:8, A3=AW×4.5-5, mesoscutum mat, without microsculpture, finely sparsely punctured, area dorsalis enclosed with fine furrow, RC C-type), 11-13 mm, W. Java orientale gedeh ssp. nov.
- Apical margin of clypeus medianly gently emarginate (SAT with apical margin broadly rounded and carinate, area dorsalis enclosed with furrow, RC

- C-type, but somewhat close to M-type), 11-12 mm, Laos and Singapore, new to Java
atricorne nom. nov. ... 57
(for *melanocorne* Tsuneki, 1979, nec Strand, 1922)
- 57 SAT tuberiform, carrying a small mound in middle (IODs=10:9, A3=AW×5),
Java *atricorne atricorne* Tsuneki
- SAT tuberiform, but broader, more flattened, without medial mound (IODs=
10:8, A3=AW×4), Is. Sumba *atricorne planum* sp. nov.
- 58 SAT nasiform, long carinated in middle, usually with a small round flat
step around apex of medial carina, apical margin triangular and edged at the
verge, lateral carina of propodeum weak, incomplete, RC B-type, RI very short
(IODs=10:8, A3=AW×2.2, AL3=BW×3.5 and ÷A9-12 - sometimes appears slightly
shorter than 9-12 but longer than 10-12 -, area dorsalis with shallow broad
and very weak lateral furrows), 12 mm, widely spread over Oriental Region
petiolatum Smith, 1857
(black-legged form)
- SAT tuberiform, shorter, with a short median carina, apical margin round-
ed and acutely edged: Fig. 181, lateral carina of propodeum distinct and
long, RC C-type, RI moderately long (IODs=10:8.5, AL3=AL0-12, area dorsalis
with deep distinct lateral furrows), 11-12 mm *atricorne* nom. nov.
- 59 Head thick, with W:L=3:2 -4:3, mesoscutum very finely and closely punc-
tured, less than 8 mm (gaster slender, mostly with G2=AW×2) 60
- Head transverse, W:L=2:1, or mesoscutum not so finely and closely punc-
tured, or larger than 10 mm 63
- 60 ASR very highly raised, seen from dorsal side; Fig. 19, seen vertically:
Fig. 20, having a large fovea in front (see also couplet 9) *vicinum* sp. nov.
- ASR different 61
- 61 ♀ (a single species)
SAT-ASR vertically seen: Fig. 33, clypeus: Fig. 36, A3=AW×3.5, IODs=
10:8, OOD:POD=1:3 (collar thick, medianly strongly tuberculate, area dorsal-
is enclosed with fine furrow, basal half obliquely, apical half transversely
coarsely striate, see also couplet 10), 7-7.5 mm, Java, Kangean Is.
walshae sp. nov.
- ♂ 62
- 62 SAT-ASR as in Fig. 33, clypeus: Fig. 37, IODs=5:3, A3=AW×2.7, AL3: Fig.
38, G2(Ma)=23(10) (other characters as in *walshae* ♀, see also couplet 10),
6.5 mm, Kangean Is. *walshae* sp. nov.
- SAT-ASR: Figs. 39-43, clypeus: Fig. 44, IODs=3:2, A3=AW×2, AL3: Fig. 45
G2(Ma)=17(10) (area dorsalis except median area obliquely fairly closely
striate, see also couplet 10), 6.5 mm, Is. Sumba *sumbanum* sp. nov.
- 63 ♀ (apical margin of clypeus produced in middle, at base roundly elevated
and at apex distinctly reflected, IODs=1:1, GSR roundly highly raised and
discoloured, RC C-type) 64
- ♂ 65
- 64 PAF deep, flat-bottomed, U-shaped in cross section, ASR black, not wide-
ly expanded anteriorly, area dorsalis practically without lateral furrows,
A3=AW×4, pronotal lamina triangularly produced, apex broadly rounded, meso-
scutum without plumbeous shine, punctures comparatively large and close,
PIS=PD and shining), 12-13 mm, E. Java and Is. Bali
orientale ardjuno ssp. nov.
- PAF shallow, broad, widely opened V-shape in cross section, ASR broadly
expanded anteriorly, apical area lamellate, brown in colour, area dorsalis
distinctly enclosed with fine furrow (clypeus: Fig. 198, A3=AW×4, PAF: Fig.
193, pronotal lamina triangular, apex nearly pointed), 11-13 mm, Sumatra,
Java, Sumba, Timor *nesianum* sp. nov.
- 65 PAF deep, U-shaped in cross section 66
- PAF shallow, V-shaped or gently down-curved in cross section 67
- 66 AL3=AL0-12, clypeus: Fig. 180, PAF: Fig. 179, lateral furrows of area
dorsalis very weak, almost lacking (IODs=10:9.5, mesoscutum without plum-
beous shine, wings apically considerably clouded), 10-12 mm, E. Java, Is.
Bali *orientale ardjuno* ssp. nov.
- AL3 longer than AL0-12, but shorter than A9-12, clypeus: Fig. 202, PAF=
Fig. 201, edge at berge of SAT hanging over PAF, lateral furrows of area
dorsalis broad but distinct, fairly deep, only at base indistinct (IODs=
10:8.5, mesoscutum with strong plumbeous shine, wings clearer), 9.5 mm,
Java *betremi* sp. nov.
- 67 Fore tibia except folded side and tarsus ferruginous yellow (PAF: Fig.

212, clypeus: Fig. 214, A3=AW×3, Al3=Al0-12, area dorsalis distinctly enclosed with crenate furrow, mesoscutum with plumbeous shine, covered sparsely with comparatively large punctures), 9 mm, Java

viridaricola sp. nov.

- Legs black or dark brown 68
68 A3=AW×2.3, Al3 distinctly longer than Al0-12 (area dorsalis enclosed with distinct furrow, mesoscutum finely sparsely punctured), 10-12 mm, Sumatra and Java (Sumba and Timor) nesianum sp. nov.
— A3=AW×1.8, Al3=Al0-12 (area dorsalis enclosed with very shallow, crenate furrow, punctures on mesoscutum closer, PIS≠PD), 8 mm, Laos, South India, Singapore and new to Java membranaceum Tsuneki, 1979

DESCRIPTIONS AND RECORDS OF THE SPECIES

1. TRYPOXYLON SCHMIEDEKNECHTI Kohl, 1906

Trypoxylon schmiedeknechti: Tsuneki, SPJHA, 7: 21, 1978 (ref., syn., subapp., redescr., figs.).

Trypoxylon schmiedeknechti: Tsuneki, SPJHA, 10: 5, 1979 (Ceylon).

Distr. Sumatra, Bangka, Java, Sumba (widely spread over Oriental and Australian Regions).

2. TRYPOXYLON THAIANUM Tsuneki, 1961

Trypoxylon thaianum: Tsuneki, SPJHA, 7: 49, 1978 (ditto).

Trypoxylon thaianum: Tsuneki, SPJHA, 10: 6, 1979 (Ceylon).

Distr. Sumatra, Krakatau, Sumba (ditto).

3. TRYPOXYLON INTERRUPTUM Tsuneki, 1978

Trypoxylon interruptum: Tsuneki, SPJHA, 7: 68, 1978 (♀, figs.).

Trypoxylon interruptum: Tsuneki, SPJHA, 10: 6, 1979 (Ceylon).

Distr. Laos, Thailand, Burma, Ceylon, Malaya, Java and Borneo.

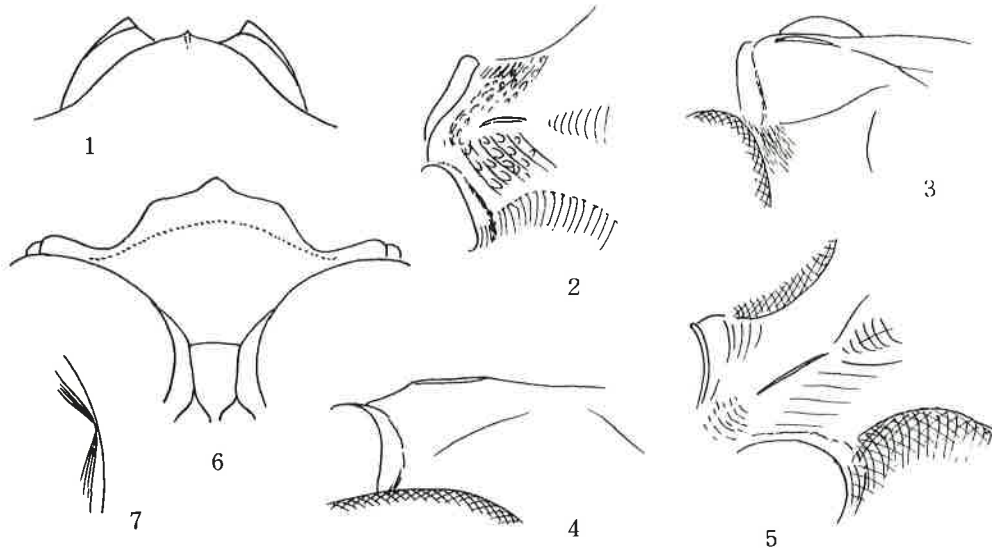
4. TRYPOXYLON CHEESMANAE sp. nov.

Small black species having the head somewhat thick, SAT in the fashion of the pygmaeum-group, antennae strongly clavate, mesoscutum microreticulate, gastral petiole claviform and characteristic in the medianly strongly produced and bluntly tridentate clypeus.

♀. 6.5 mm. Black, Al,2 brown, paler beneath, mandible, palpi, apices of coxae, trochanters wholly, both ends of femora narrowly, fore tibia and tarsus, mid tibia broadly except outer side and mid T1 at base ferruginous or whitish; fore tibial spurs ferruginous white, but mid and hind ones dark brown or black. Hair silvery, on clypeus parallel.

Head in frontal view subquadrate, with sides weakly roundly convergent below, eye incisions elongate triangular, sinus narrowly rounded. HW,HL,IODv,A3,P=100,64,34,16,110, IODs=10:4, OOD,Od,POD≠2,5,4, A3=AW×3, Al,2 thick, 2 nearly spherical, nearly twice as wide as A3 at apex, A3,4,5≠10,7,6. Frons gently raised, with median furrow broad and shallow, on anterior area surface nearly flat and weakly excavated behind SAT, SAT-ASR similar in structure to that of maai, flavipes, suumi, malayanum,

pendleburyi etc., in dorsal view: Fig. 1, in latero-vertical view: Fig. 2, obliquely dorso-lateral view: Fig. 3, seen in profile: Fig. 4, dorsal line of SAT almost level with frons, seen obliquely from beneath: Fig. 5, with surface of median area flat, carrying a short carina in middle and at sides gently obliquely inclined; clypeus: Fig. 6, median area of apical margin markedly produced in triangle, with disc gently roundly tectate. Antenna gradually strongly incrassate towards apex, A3 with BW: AW=1:2, BW of A3 : Ma of A2 = 1:4; occipital carina complete, but weak behind buccal cavity. Collar of pronotum with anterior part very narrow, rather carina-like and



Figs. 1-7. *Trypoxylon sheesmanae* sp. nov., ♀

only slightly widened towards sides and flatly inclined anteriorly, posterior part discoloured, lamina on side slightly produced, rounded at apex (Fig. 7, right side); subalar area of mesopleuron without pent-roof structure, propodeum without lateral carinae, but series of striae with outer margin in a longitudinal line and appears in some light to be a weak carina, area dorsalis enclosed with fine furrow, GSR roundly elevated, with marginal area brownish. Gastral petiole clavate in apical swelling, but at basal 2/3 subparallel-sided, P, Ma, Mi, 2(Ma), 3(Ma)=100, 26, 13, 48(36), 50(44); RC B-type, somewhat close to C-type, RI fairly long, only slightly shorter than TCV, considerably approaching wing apex, TCV $\frac{1}{2}$ CV2, CV1=CV2 \times 3.5.

Vertex and frons weakly microcoriaceous and superimposed with fine punctures, punctures at upper area sparse, but close and partly confluent anteriorly, on SAT punctures somewhat grosser and on sides of median carina surface obliquely rugose-punctate. On mesoscutum microsculpture more distinct and closely superimposed with fine punctures; area dorsalis at base and on lateral furrows crenate, on median wide impression and on disc transversely finely closely striate, posterior inclination fairly closely covered with fine hair-bearing punctures.

♂, unknown.

Holotype: ♀, Java, Tjibedas, 4000 ft, I. 1936, L. E. Cheesman (BMNH).

Paratypes: 1 ♀, the same data as holotype (BMNH); 1 ♀, West Java, Telagawarna Poertjak Pass, 1480 m, 4. V. 1930, M. A. Lieftinck (BMNH).

5. *TRYPOXYLON JACOBSONI* sp. nov.

States of the specimens:

Three specimens are pinned on the same plant pith using respectively a micro-pin, from outer side inwards ♂, ♀, ♂, each about 6 mm in length, all of them are more

or less injured by the noxious insects;

Outer ♂ (holotype): Right antenna from near base lacking, left A4 with a hole at base, all legs of right side are from base devoured, G1 with 2 holes near base, but the rest of gaster complete, bearing the genitalia and sternite 8 pulled out of caudal end (but details can not be observed).

Middle ♀ (paratype): Right antenna from middle of A1 apically lacking, left one with A1, 2, 4, 5, 6 widely eaten up above, but thence apically complete, gaster from middle of G1 apically missing, right middle tibia broadly devoured and T2-5 are lost, thorax is stained with resinous substance and wings are glued together.

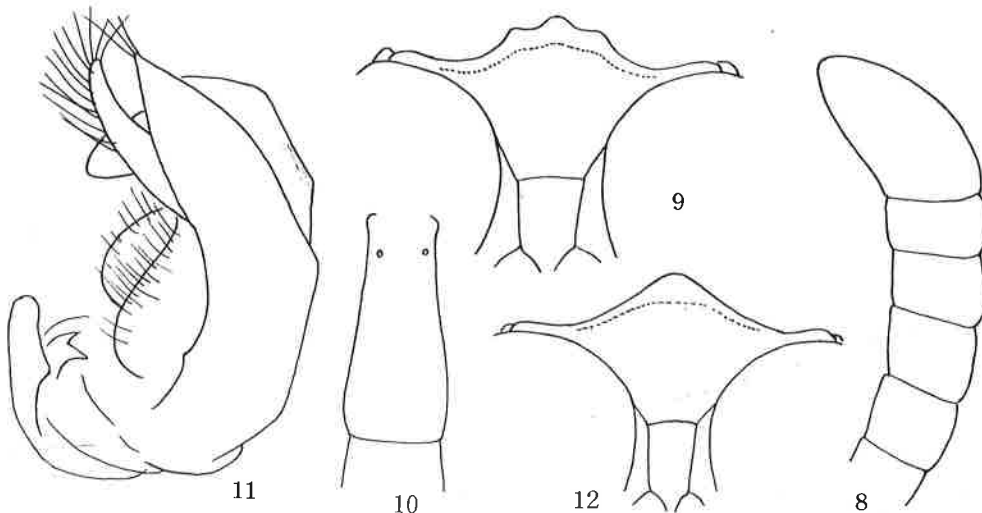
Inner ♂ (paratype): Both fore legs lacking and a large hole is present there, left middle T1, both hind tibiae are heavily devoured and right hind tarsus from apex of T1 missed.

♂. 5.5-6.0 mm. Black; ferruginous are A1-2 beneath, mandible, palpi, tegula and tibiae and tarsi of fore and mid legs (mid T3-5 brownish); hind tarsus strongly brownish. Hairs silvery, on clypeus not dense and parallel.

Head in frontal view subquadrate, only slightly wider than long (8:7), with corners rounded, not narrowed below, vertex not depressed; HW, HL, IODv, A3, A13, P=100, 64, 38, 14, 22, 84; IODs=10:4, OOD, Od, POD=3, 4, 5, A3=AW×2.2, A2 very thick and large, barrel-shaped, only slightly longer than wide and slightly shorter than A3, about twice as wide as A3 at apex, A9-13: Fig. 8; frontal structure including SAT-ASR similar to that of *cheesmanae*, but SAT gently tectate, both sides of medial carina gently inclined laterally, hence without special inclination at lateral areas as given in Figs. 2 and 5; clypeus: Fig. 9, disc gently roundly tectate, narrow apical glabrous area alone reflected; occipital carina interrupted behind buccal cavity, the area roundly depressed. Pronotum similar in structure to *cheesmanae*, but discolouration of posterior part of collar incomplete, only marginal area turned ferruginous; subalar area incrassate, but not expanded laterally. Propodeum with distinct lateral carinae, area dorsalis with shallow weak lateral furrows, medial furrow comparatively broad and deep, weakly divergent posteriorly, GSR nearly simple. G1 short and thick (Fig. 10), P, Ma, Mi, 2(Ma), 3(Ma)=100, 36, 24, 56(44), 60(54). In fore wing RC B-type, R1 markedly long, 2/3 the length of CV1, reaching close to wing apex, CV1=CV2×2.5, CV2≅TCV, CV2 down-curved, TCV nearly straight, angle roughly about 100°.

Genitalia: The specimen appears very fragile and the genitalia was observed in situ without detaching and rearranging. It appears as given in Fig. 11 (the best position). Paramere deeply bifurcate into 2 lobes at apex, inner margin of main body lamellately expanded, bearing hair, volsella can not well be observed, similarly the 8th sternite (two lobes at base in Fig. 11 may represent these respectively).

Frons and SAT distinctly microcoriaceous and fairly closely superimposed with very fine punctures, PIS slightly larger than PD (distribution fairly dense, but PD is very small), mesoscutum similarly microcoriaceous and punctured. Propodeum almost



Figs. 8-11. *Trypoxylon jacobsoni* sp. nov., 8-11, ♂; 12, ♀.

without lateral series of striae, striae short, weak, only partly defined, area dorsalis weakly crenate at base and weakly striate on medial furrow at base, other areas broadly smooth and polished, sides also smooth and polished, only posterior area closely covered with hair-bearing coarse punctures.

♀. Similar to ♂ in general. Head in frontal view slightly longer, completely as long as wide, IODc relatively somewhat narrower, IODs=3:1, head in dorsal view somewhat thicker, HW, HL, IODv, A3, P=100, 78, 38, 16, ?. Clypeus: Fig. 12, antenna similarly strongly incrassate towards apex, A12 thick, more straightly attenuate apically than A13 in ♂, and shorter, apprx. as long as 2 preceding joints united.

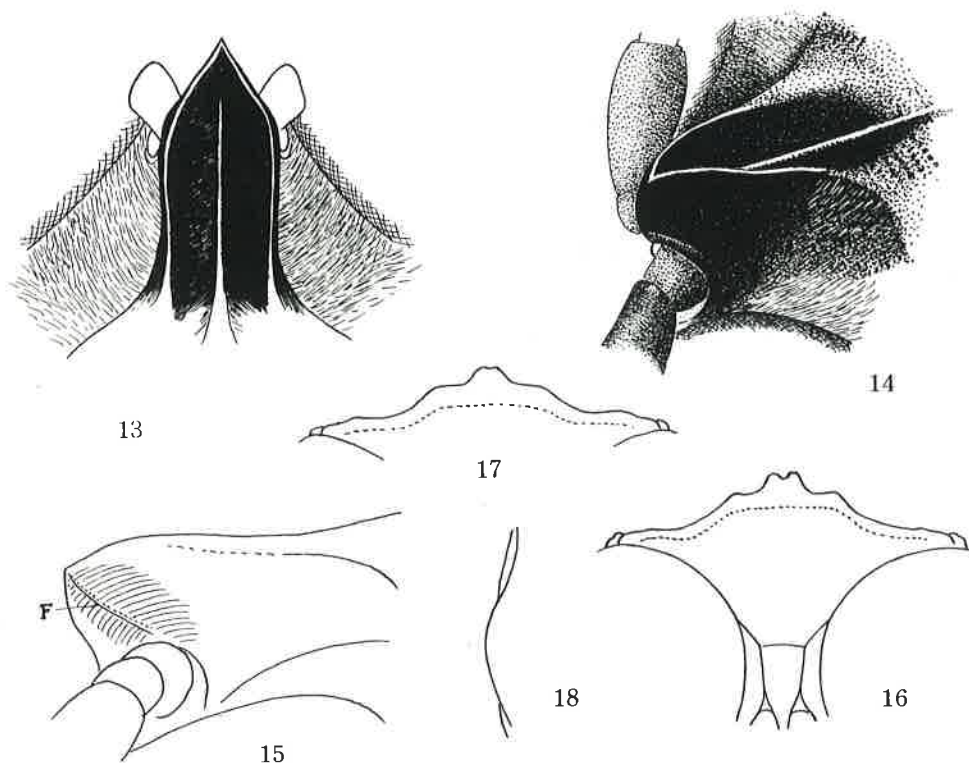
Sculpture and punctuation similar.

Holotype: ♂ (outermost specimen), Sumatra (Sungal Kumbang), IX. 1915, Edw. Jacobson (RMNH).

Paratypes: 1 ♀ 1 ♂, the same data (RMNH).

6. TRYPOXYLON NAVIFORME sp. nov.

♀. Very characteristic in the structure of supraantennal area (Figs. 13-15) and can easily be distinguished from the allied species.



Figs. 13-18. Trypoxylon naviforme sp. nov., ♀

Length 6.5 mm. Black; antenna basally and clypeus on apical margin brown, mandible, tegula, tibiae and tarsi of fore and mid legs, base of hind tibia, tibial spurs and articulation ferruginous, arolia black, palpi ochre yellow, nearly yellowish white, posterior margin of pronotal tubercle yellowish, posterior part of collar incompletely discoloured, only posterior margin dirty yellow. Hair silvery, on clypeus parallel, dense and appressed as usual, but sparsely mixed with long half erect hairs.

Head in frontal view quadrate, as long as wide, with corners rounded, very slightly narrowed below, vertex not depressed, eye incision comparatively broad, nearly parallel-sided, with sinus broadly rounded. HW, HL, IODv, A3, P=100, 64, 32, 20, 106, OOD, Od, POD=2, 6, 5, IODs=10:3.5, A3=AW×3, A3, 4, 5=10, 7, 6. Frons moderately raised, median furrow broad and shallow at base, but soon turning to shining bottom furrow of the ship-shaped structure located at the place of usual SAT, which is widely open upwards (Fig. 13, vertical view; 14, seen obliquely from side; 15, in profile - F is a bottom line of broad deep excavation at the anterior part of lateral wall of the structure); clypeus: Fig. 16 or 17, disc gently roundly tectate, antenna considerably incrassate towards apex, but not so marked as in *Jacobsoni*; occipital carina broadly interrupted behind buccal cavity. Pronotal collar with anterior part very narrow, only weakly enlarged towards sides, posterior part posteriorly dirty yellow, lamina on side inconspicuous, gently roundly produced (Fig. 18); subalar area of mesopleuron normal. Propodeum with distinct lateral carinae, area dorsalis enclosed with fine but deep furrow, GSR simple; gastral petiole clavate, P, Ma, Mi, 2(Ma), 3(Ma)=100, 30, 18, 60(40), 56(54), in fore wing RC B-type, Rl moderately long, half the length of TCV, TCV straight, and ≠CV2, CV2 gently down-curved, CV1≠CV2×3; hind coxal tubercle considerably produced.

Frons distinctly microcoriaceous and fairly closely superimposed with comparatively large but shallow punctures, PIS≠PD, punctures on anterior area partly obliquely confluent, inside of the ship-shaped structure longitudinally microstriolate, posteriorly microreticulate except smooth and shining bottom line, outer wall of the structure microreticulate; mesoscutum microcoriaceous and closely superimposed with very fine punctures; series of striae along lateral carinae of propodeum present, but the striae short and not strong, area dorsalis transversely finely closely striate, striae on disc somewhat weak, sides smooth and polished, but anterior half of dorsal side obliquely finely closely striate and posteriormost narrow area coarsely covered with hair-bearing punctures.

♂, unknown.

Holotype: ♀, Java (Nengkodjadar), I. 1911, E. Jacobsen (RMNH).

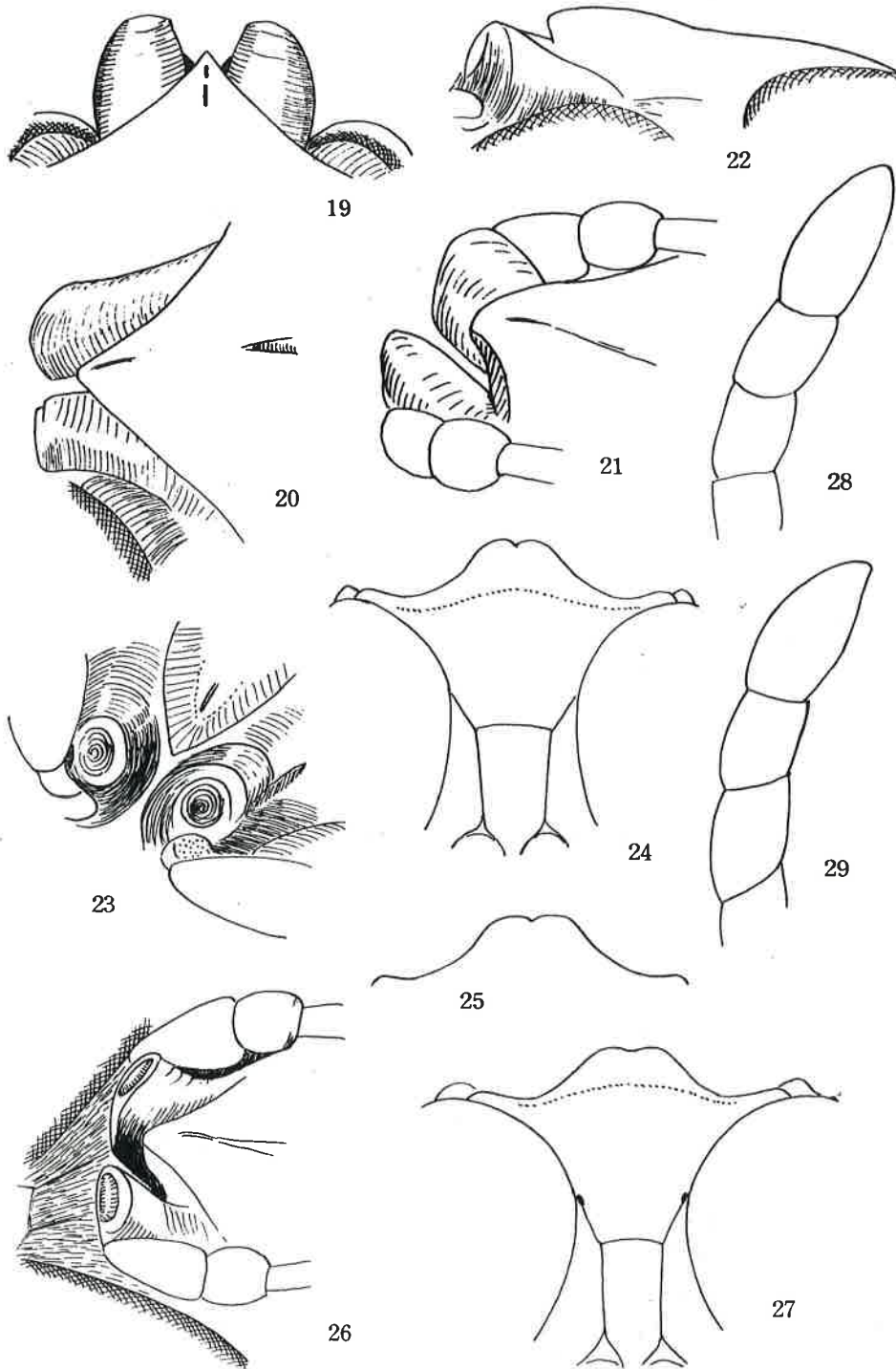
Paratype: 1 ♀, West Java (Gedeh Tjibedas, 1404 m), 22. V. 1935, J. van der Vecht (RMNH).

7. TRYPOXYLON VICINUM sp. nov.

Closely resembling *T. bilebatum* m. in the structure of SAT-ASR seen from dorsal side, but in the present species SAT obliquely subconically produced anteriorly, hence PAF distinct and highly raised ASR bearing a large fovea in front.

♀. 6-6.5 mm. Slender species, petiole long, with long parallel-sided area, but apical swelling is gradual and in length ≃G2+3, mesoscutum very finely and closely punctulate without distinct microsculpture. Black; mandible and palpi ferruginous, legs more or less brownish apically. Hairs silvery, on clypeus parallel.

Head in frontal view subquadrate, W:L=100:96, eye incision comparatively narrow, dorsal margin slightly raised apically, sinus rounded, vertex not depressed. HW, HL, IODv, A3, P=100, 72, 25, 15, 154, IODs=10:7, OOD, Od, POD=1, 8, 6 (OOD very narrow), A3≠AW×3, A3, 4, 5=10, 10, 10. Frons gently raised, medial furrow distinct at base, shallowed and narrowed anteriorly and soon disappeared, SAT-ASR in dorsal view: Fig. 19, in latero-vertical view: Fig. 20, seen obliquely from side to see through PAF: Fig. 21, in profile: Fig. 22, obliquely from beneath: Fig. 23, SAT bears a short median impressed line in middle; Clypeus: Fig. 24, in paratype: Fig. 25, disc broadly roundly raised at base and distinctly reflected at apex; antenna gently incrassate towards apex, AW of A3 : BW of A12 = 1:2, occipital carina complete, forming an angle behind buccal cavity. Collar of pronotum thick, verge to anterior inclination not edged, strongly roundly incrassate towards sides, posterior part not discoloured, seen in front dorsal margin gently up-curved and strongly tuberculate in middle, lamina on side broadly roundly, only weakly produced; subalar area of mesopleuron with outer margin acutely edged, surface gently roundly raised, but not expanded to pent-roof structure. Propodeum with distinct and complete lateral carinae, area dorsalis without lateral furrows, but the area distinctly convex and medianly with a broad and deep furrow, posterior inclination extended posteriorly beyond base of hind coxae, but the propodeal sternite very short, hardly defined without removing gaster. P, Ma, Mi, 2(Ma), 3(Ma)=100, 18, 8, 50(24), 44(32), Mi located at about mid point between spiracles and apical margin. In fore wing RC C-type, somewhat close to B-type, Rl short, TCV≠CV2, TCV in-

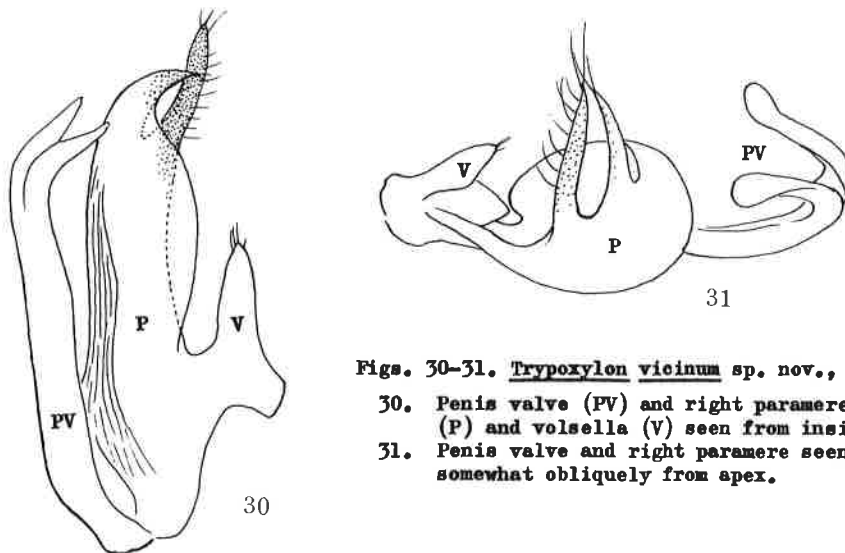


Figs. 19-29. *Trypoxylon vicinum* sp. nov., 19-25, ♀; 26-29, ♂.

curved, CV2 down-curved, angle rounded, at base about 90°, at distal portion about 120°, CV1=CV2×3.

Frons and SAT very delicately microcoriaceous and sparsely superimposed with very fine indistinct punctures, mesoscutum finely and very closely punctured, punctures more distinct than on frons, PIS<PD. Propodeum without lateral series of striae, area dorsalis from base to about middle area obliquely, strongly and fairly closely striate, median furrow transversely striate, sides smooth and polished, but posterior area transversely coarsely striate and punctate.

♂. 6.5 mm. Similar in general to ♀, but legs more distinctly brownish. Frons and SAT-ASR generally similar in structure, but median impressed line on SAT much longer, ASR appears more highly and more acutely raised than in ♀ (Fig. 26), IODc slightly narrower, clypeus somewhat less produced anteriorly (Fig. 27) and antennal joints at apical half slightly constricted at base and at apex; AL3 appr. as long as 2 preceding joints united (Fig. 28), in some direction distinctly curved at apex (Fig. 29). Pronotum similar. Propodeum at apical area more strongly constricted and narrowed (see Remarks). Measurements: HW,HL,IODv,A3,AL3,P=100,68,28,12,17,136, IODs=10:6, OOD,Od,POD=1,8,6, A3=AW×2.3, A3,4,5=10,8,10 (? constant), AL3=BW×2.3. P, Ma,Mi,2(Ma),3(Ma)=100,18,9,50(22),52(30). RC B-type, RI short, CV1=CV2×2.5, CV2 slightly longer than TCV, CV2 down-curved, TCV incurved, angle similar to ♀.



Figs. 30-31. *Trypoxylon vicinum* sp. nov., ♂

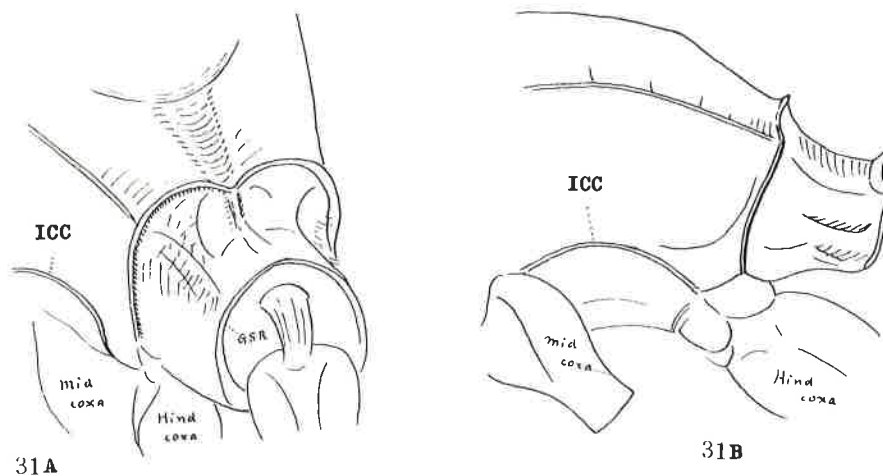
30. Penis valve (PV) and right paramere (P) and volsella (V) seen from inside.
31. Penis valve and right paramere seen somewhat obliquely from apex.

Paramere of genitalia bifurcate at apex into a slender, well chitinized black lobe and a broader, lamellate pale yellow layer, the former fringed on inner margin with hair, the inner margin of main body expanded into semitransparent layer and rolled as usual (Figs. 30, 31), volsella simple, laterally compressed, penis valve simple at apex, without shoulder and sickle-shaped appendages and turned ventrally (Figs. 30-31). In the natural condition when the genitalia produced out of the caudal end the black lobes appear like the ox-horn, stoutly curved inwards.

Holotype: ♀, West Java, Mt. Gedeh, Tapas, 700 m, 4. XI. 1928, J. van der Vecht (BMNH).

Paratypes: 1 ♀, Java, Pelaboean, Ratoe, X. 1909, Briant & Palman Coll. (USNM) 1 ♂, West Java, Depok, 17. I. 1937, J. van der Vecht (BMNH).

Remarks. In the present species the posterior area of propodeum just behind the apical end of median furrow of posterior inclination (namely corresponding to the area apicalis) somewhat constricted and bordered with a transverse carina, thence posteriorly narrowed and long extended beyond the base of hind coxae. This constriction and bordering carina are also observed on the sides. The structure is more distinct in the male than in the female (Figs. 31A, obliquely dorso-posterior view; 31B, lateral view, ICC ... Intercostal Carina). The apical constriction and more or less extension of propodeum are also observed in *cheesmanae* and *jacobsoni*, in the former



Figs. 31A and 31B. Trypoxylon vicinum sp. nov., Propodeum

marked and in the latter less so. In both, however, there is no bordering carina as distinctly observed in the present species.

In the holotype female from Mt. Gedeh the scutellum, postscutellum are broken by the pin and the right hind wing is lacking, left fore wing is detached and pinned on the pith; wings are all apically broken. From the paratype female the gaster is completely lost, left antenna from A5 apically, left mid T5, left hind tibia and tarsus and right hind tarsus lacking. While in the paratype male left Al3 is lost and gaster is detached and pinned on the pith support, of which apical 3 segments are dissected during the present study and together with genitalia mounted on the card point.

8. TRYPOXYLON WALSHAE sp. nov.

A small slender species belonging to the group in which head is fairly thick. pronotal collar thick, with a well developed tubercle in middle, mesoscutum very finely and closely punctulate and gastral petiole subflask-shaped clavate.

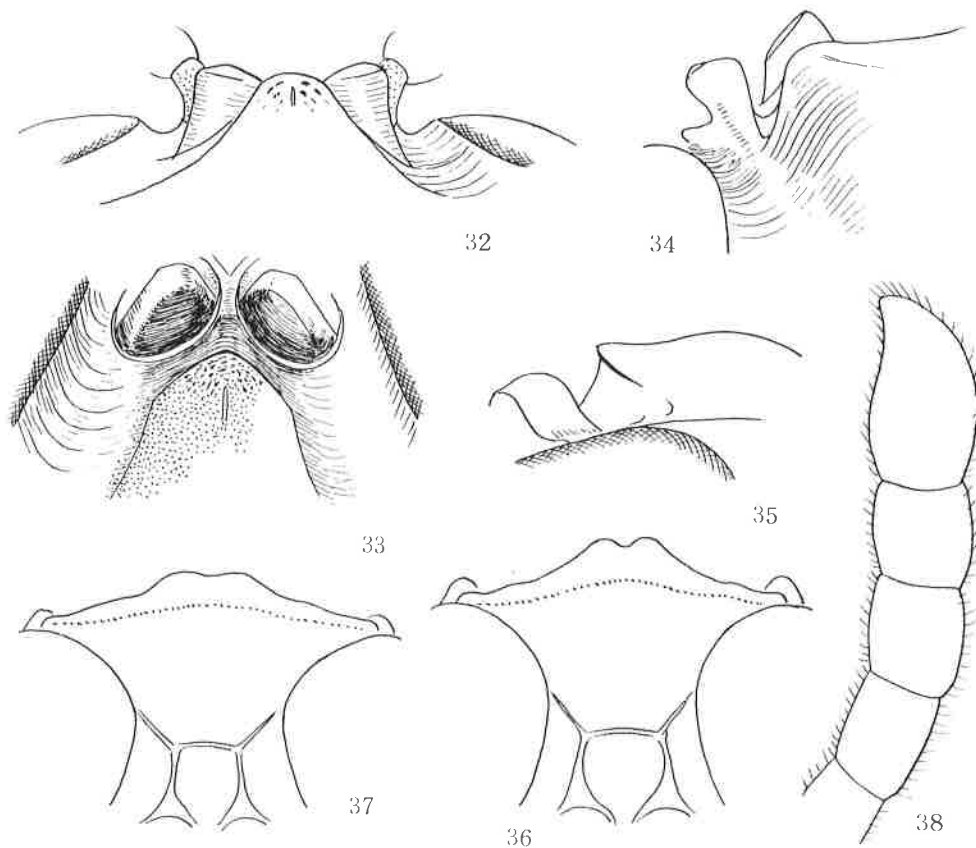
♀. 6.7-7.8 mm. Black, sometimes gaster medianly brownish; mandible and palpi ferruginous, prepetal tubercle posteriorly broadly yellow, tegula dark brown; legs broadly brownish, paler on fore tibia in front and fore tarsus. Hair silvery, on clypeus parallel.

Head in frontal view subquadrate (see Remarks), vertex not depressed, eye incision distinctly narrowed towards bottom. HW, HL, IODv, A3, P=100, 62, 26, 18, 132, IODs=10:8, A3=AWx3, A3, 4, 5=10, 8, 7, OOD, Od, POD=1, 5, 4. Frons gently raised, median furrow very weak, surface on anterior portion transversely gently roundly inclined towards inner orbits, SAT with dorsal line level with frons, apical margin obtused triangular, acutely edged, falling deep to PAFs and IAF, ASR acutely inclined to PAF, with inner and outer aspect forming tectate inclination, inner aspect nearly flat and obliquely inclined to IAF, PAF deep, acute V-shaped in cross section, flat-bottomed; SAT-ASR seen from dorsal side: Fig. 32, vertically seen: Fig. 33, obliquely from left side to see through PAF: Fig. 34, in profile: Fig. 35, scapal hollow markedly deep. Clypeus: Fig. 36, densely covering hair short, appressed, but on anterior margin of haired area mixed with a transverse series of long hair that produced beyond apical glabrous area anteriorly. Antenna not strongly incrassate apically, relative widths at base of A3 and Al2 appr. 1:2; occipital carina shortly interrupted behind buccal cavity where the surface deeply depressed. Collar thick, in frontal view with dorsal line gently rounded and medianly strongly tuberculate, in dorsal view strongly roundly incrassate towards sides, posterior part not discoloured, lamina on side inconspi-

cuous; subalar area of mesopleuron without pent-roof structure; propodeum with distinct lateral carinae, area dorsalis enclosed with fine furrow, the area raised, flattened and broadly excavated in middle and shining, apical part of posterior inclination constricted, narrowed, extended posteriorly beyond the hind coxal base, but without the bordering transverse carina and densely covered with hair, despite long extension propodeal sternite very short and indistinct (underside of the area consist mainly of whitish membrane), GSR simple, in a curved bridge as in Fig. 31A. Gastral petiole intermediate between clavate- and flask-shaped forms, it is considerably long, with fairly long parallel-sided area, but with apical swelling rather weak and gradual and in length $\approx 2+3$, P, Ma, Mi, 2(Ma), 3(Ma)=100, 20, 9, 44(22), 44(48), RC intermediate between B- and C-types, R1 short, CV1 \approx CV2 \times 3, TCV \approx CV2, TCV strongly incurved or bent, CV2 down-curved as usual, angle rounded, at base nearly 90°, at apex about 120°.

Frons microcoriaceous and finely punctured, sculpture weaker and punctures sparser upwards and stronger and closer, partly subrugosely confluent downwards, including SAT, SAT without median carina, instead with an impressed line, somewhat lenticularly enlarged; mesoscutum very finely and closely punctulate, PIS \neq PD, area dorsalis from base to sides obliquely coarsely striate or rugoso-striate, median broad impression transversely so, but sometimes partly rugoso-reticulate, series of striae along the lateral carinae present, but medianly weak and rather indistinct, posterior portion broadly and fairly closely covered with hair-bearing punctures, sides obliquely closely striate, but surface shining, posterior extended area closely covered with hair-bearing punctures.

♂. 6.3 mm. Colouration generally similar, but fore tibia at apex and fore tarsus paler, gaster completely black, in structure also similar in general, but IODc relatively somewhat smaller (quite exceptional and strange), clypeus less produced (Fig.



Figs. 32-38. *Trypoxylon walshae* sp. nov., ♀ 36, ♂ 37-38.

37) and antennal joints shorter, A9-13; Fig. 38. Head in frontal view slightly wider than long, W:L=100:88. HW, HL, IODv, A3, A13, P=100, 62, 26, 14, 14, 126, IODs=10:7, OOD, Od, POD=2, 7, 7, A3, 4, 5=10, 7, 7, A13=BW×1.8, ≠A11-12. Structure of pronotum and of propodeum similar. P, Ma, Mi, 2(Ma), 3(Ma)=100, 16, 10, 46(20), 44(28). Venation similar. Sculpture on frons and propodeum also similar, but mesoscutum very finely and very sparsely punctured without microsculpture, with surface smooth and polished, this is very strange. Genitalia are not examined.

Holotype: ♀, Kangean Is. Petapan, II. 1936, Mrs. M. E. Walsh (RMNH).

Paratypes: 1 ♂, the same data as holotype (RMNH); 1 ♀, Java, Prov. Semarang, djatingalih, VII. 1939, J. G. Betrem (RMNH).

Remarks. Holotype female is a complete specimen, measuring 7.8 mm in length. The paratype female is slightly smaller, 6.5 mm and from it left antenna from A7 apically and right fore wing from near base of RC are lost. It is slightly different from holotype in the form of head seen in front. From the paratype male left mid leg and both hind legs, all from femur apically lacking and moreover, both fore and hind wings are glued together.

9. TRYPOXYLON SUMBANUM sp. nov.

♂. 6 mm. Closely allied to the preceding species, but here the apical margin of SAT is much better developed, far produced anteriorly, covering nearly completely PAF.

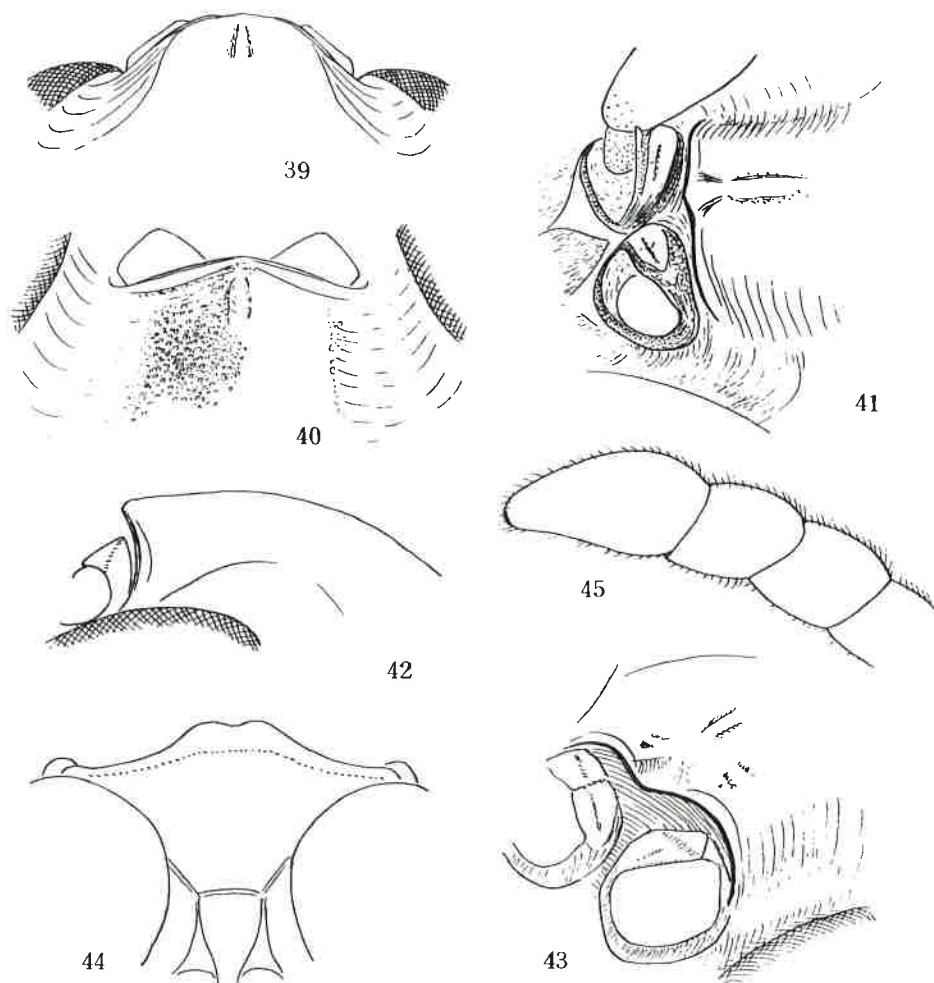
Black; mandible yellow, apically brownish, palpi ochre yellow, pronotal tubercle broadly yellow, black parts of legs strongly brownish, fore tibial spurs and tarsus semitransparent white, apically very slightly brownish, base of mid T1 also whitish, apex of mid tibia and base of hind tibia somewhat pale. Hair silvery, on inner orbits and clypeus short and thick, on clypeus parallel.

Head in frontal view wider than long, W:L=100:80, vertex not depressed, sides rounded, not narrowed below, eye incisions narrowed apically, upper margins on the same level. HW, HL, IODv, A3, A13, P=100, 63, 27, 14, 16, 130, OOD, Od, POD=1, 3, 3, IODs=10:6.5 (=3:2), A3=AW×2, A13≠HW×1.6. Frons gently raised, triangularly impressed in front of fore ocellus, medial furrow shallow, SAT roundly tectate, dorsal surface nearly flat and medianly with a wide impressed line or furrow, seen from dorsal side; Fig. 39, in vertical view; Fig. 40, apical margin almost transverse and covering PAFs, seen in profile; Fig. 42, seen obliquely somewhat from side and beneath; Fig. 41, seen obliquely from beneath; Fig. 43, apical margin of SAT distinctly carinated and PAF deep and narrow, ASR on inner inclination provided with a flattened and well shining area (Fig. 41), scapal hollow deep. Clypeus; Fig. 44, apical part of antenna (Fig. 45) very similar to that of *walshae*. Pronotal collar in frontal view with dorsal line roundly up-curved and medianly strongly tuberculate, with sides markedly convergent below, seen from above anterior part strongly roundly incrassate towards sides, posterior part not discoloured, only apical margin narrowly brownish; subalar area of mesopleuron normal; propodeum with distinct lateral carinae, area dorsalis enclosed with fine furrow, posterior part of posterior inclination narrowed and extended posteriorly and covered with dense silky white hair, but propodeal aternite very narrow, hardly defined, GSR in a simple narrow carina. Gastral petiole similar to that of the preceding species, P, Ma, Mi, 2(Ma), 3(Ma)=100, 20, 10, 40(24), 40(31), RC B-type, somewhat close to C-type, CV1≠CV2×3, TCV≠CV2, TCV strongly bent at mid point, CV2 down-curved as usual, angle at base about 90°, at apex wider. Genitalia are not examined.

Frons weakly microcoriaceous and on upper area sparsely punctured, punctures on lower area somewhat larger, closer and finally densely granulate, with surface mat; mesoscutum very finely and very closely punctured; on propodeum series of striae along lateral carinae present, striae fine and close, but the series posteriorly indistinct, area dorsalis obliquely strongly and fairly closely striate, on medio-apical area with a few transverse striae and intervals of oblique striae weakly crenated; sides smooth and shining, but anterior area very faintly closely covered with oblique striae, posteriormost area - side of narrowed and extended area of dorsal aspect - transversely, strongly rugoso-striate.

♀, unknown.

Holotype: ♂, East Sumba, Baing, Wai Lekabe, 23. VI. 1949. A. Bühler and E. Sutter (NHMB).



Figs. 39-45. Trypoxylon sumbanum sp. nov., ♂

10. TRYPOXYLON FLETCHERI Turner, 1918

Trypoxylon fletcheri: Tsuneki, SPJHA, 8:67, 1978 (ref. redescri. figs. ♀, Assam)

Trypoxylon fletcheri: Tsuneki, SPJHA, 9:31, 1979 (♀, Assam: Shillong. Malaya: Kedah Peak).

Specimens examined: 1 ♀, West Java, Mt. Gedeh, Tjibodas, 1400 m, 4. V. 1935, E. van der Vecht, B; 1 ♀, the same place, 1450 m, 19. III. 1950, J. van der Vecht; 1 ♀, East Java, Baoeng, 350 m, VIII. 1935, J. G. Betrem; 1 ♀, East Java, Idjen Mts. 1500 m, Kendeng, 26. VI. 1939, J. van der Vecht (all RMNH).

Remarks. The specimens from West Java are typical in colour, the gaster and the legs are broadly ferruginous, while those from East Java are melanic, having the gaster and the legs largely black:

Western form. Ferruginous are A1 and 2, both beneath, mandible, palpi, gaster (sometimes with an obscurely outlined black patch on posterior part), tibiae and tarsi of fore and mid legs and hind leg except basal half of coxa. Arolia black.

Eastern form (melanic form). Ferruginous are A1-2 beneath, mandible, palpi,

basal half of G1, fore and mid tarsi, hind tibia and T1 both at base and all tibial spurs. Mandible apically broadly and all tibiae dark brown, sometimes hind trochanter, fore and mid femora above (rest black) and base of hind tibia and T1 also dusky brown.

The Eastern form is distinctly a colour variation, but whether the form is surely connected with the locality or not is a problem to be solved in future, since the material examined here is too scanty.

11. TRYPOXYLON VECHTI sp. nov.

Closely resembles T. pagdeni occurring in Malaya, but is different from this in that SAT is not transversely carinated at apical margin.

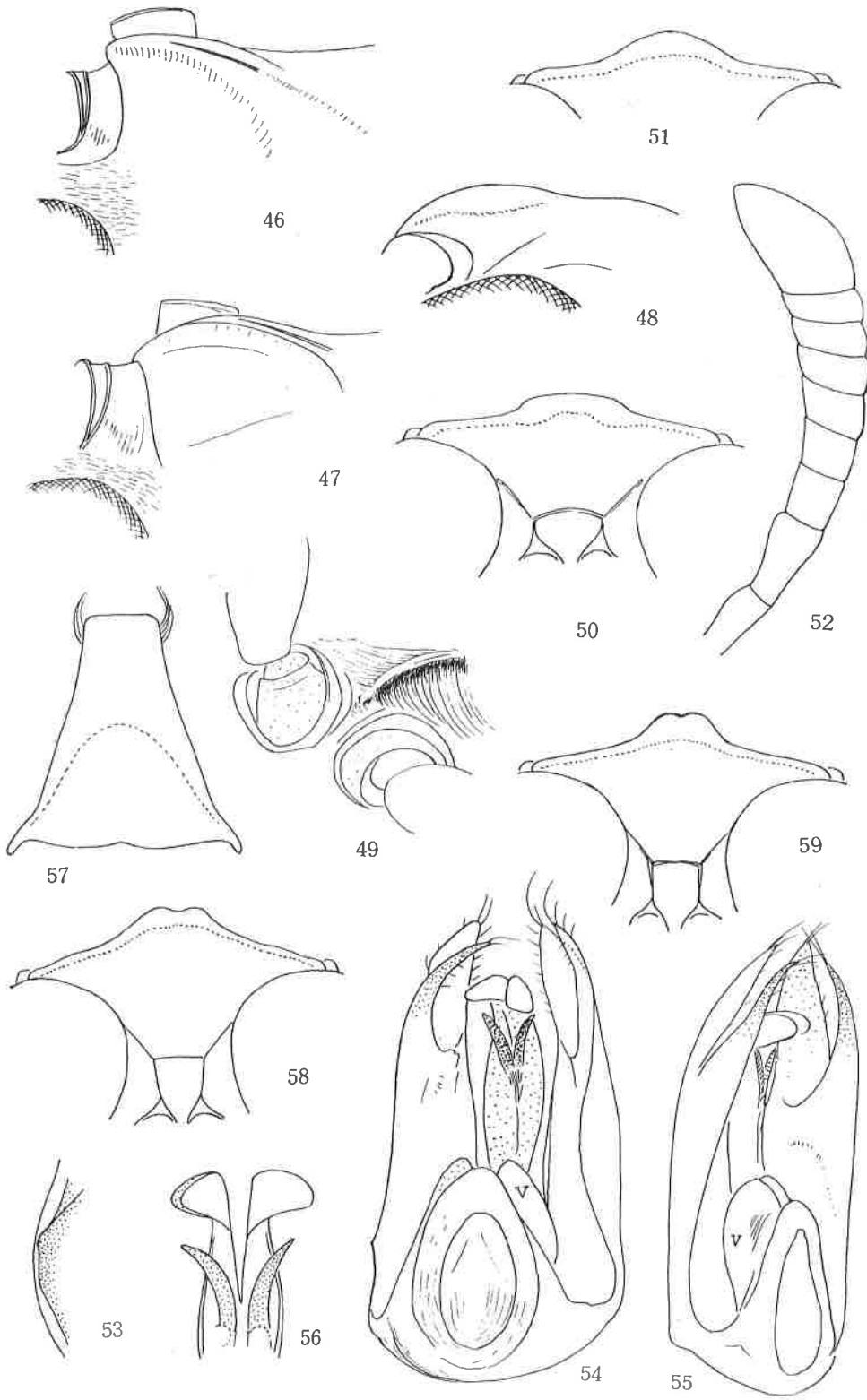
♂. About 8 mm, black, but black part of antenna and legs somewhat brownish. A1 and 2 pale brown, slightly ferruginous beneath; ferruginous yellow are mandible, palpi, posterior margin of pronotal tubercle, discoloured posterior part of collar (dark yellowish), tegula, gaster from apex of G1 to end (carrying uncertain blackish marks scattered, possibly postmortem change), apices of coxae, both ends of trochanters, knees, fore tibia and tarsus, mid tibia in front and at both ends, mid T1-5 except each apical ring, hind tibia at base and extreme base of hind T1. Hairs silvery, on clypeus parallel.

Head in frontal view wider than long (W:L=100:85), vertex not depressed, sides gently roundly convergent below, eye incisions comparatively broad and short, convergence strong, with sinus rounded. HW, HL, IODv, A3, AL3, P=100, 54, 33, 20, 20, 100, OOD, Od, POD=2, 5, 4, IODs=10:8, A3=AW×2.7, A3, 4, 5=10, 7, 6, A6 excavated at base beneath and produced at apex, AL3=BW×1.7 and ≠A9-12 (Fig. 51). Frons gently raised, medial furrow very shallow, surface except near front ocellus broadly flat, SAT moderately high nasiform, median carina long, slightly widened posteriorly, carrying a fine impressed line in middle (Fig. 46, dorso-lateral view), lateral inclination oblique, but in dorsal or ventral view gently down-curved (Fig. 49, seen obliquely from beneath), SAT-ASR seen to see through PAF: Fig. 47, PAF shallow and obliquely runs down latero-posteriorly, ASR short, bluntly bicarinate on top (ditto), median ridge of SAT in lateral view gently up-curved like an aquiline nose (Fig. 48), the structure seen obliquely from beneath: Fig. 49; clypeus: Fig. 50, disc gently roundly raised and very weakly reflected at apex; occipital carina broadly interrupted behind buccal cavity. Collar of pronotum in frontal view roundly up-curved, without median tubercle, in dorsal view anterior part very narrow and only weakly enlarged towards sides, posterior part discoloured, weakly yellowish; subalar area of mesopleuron normal. Propodeum with lateral carinae, arising behind spiracle and reaching posterior haired area, the area (corresponding to area apicalis) slightly constricted and narrowed, but not markedly extended posteriorly, GSR with a considerable breadth, up-curved, but posterior margin not elevated. Gastral petiole clavate, P, Ma, Mi, 2(Ma), 3(Ma)=100, 32, 15, 48(50), 44(60). RC C-type, R1 short, TCV≅CV2, CV1=CV2×3.7, TCV gently sinuate, angle about 120°.

Paramere of genitalia deeply bifid at apex into two layers, one is broad and lobiform, the other slender and slightly darkened apically, main body not strongly expanded to form a roll, volsella not spatulate, short broad, somewhat oviform layer (V in Fig. 54, almost vertically from beneath, V in Fig. 55, obliquely from left side), penis valve without shoulder, but sickle-shaped appendages well developed, which is quite strange in position (Fig. 56, from beneath, also in Fig. 54); sternite 8: Fig. 57, this is also characteristic in the apical form and latero-apical bundle of hair.

Frons delicately microcoriaceous and very closely superimposed with fine flat-bottomed punctures, surface mat, lateral inclinations of SAT similarly punctured, but without microsculpture, shining; mesoscutum strongly microcoriaceous, with punctures very close, but somewhat finer than on frons and not flat-bottomed; propodeum at base obliquely coarsely, median furrow of area dorsalis transversely finely and closely striate, disc of the area finely, fairly closely punctured, lateral series of striae absent.

♀. 9-10 mm. Black, A1, 2 ferruginous, brownish above, mandible, palpi, apices of coxae, both ends of trochanters (rest brown) and of femora, fore tibia and tarsus (arolium brown), mid tibia (folded side and outer side brownish) mid T1 except apex and T5 and base of hind tibia ferruginous; posterior part of collar discoloured, dark yellow, posterior margin of tubercle yellow, tegula transparent brown; gaster reddish ferruginous, but dorsal side of G1 black except apex (in specimens from West Java) or G1 wholly ferruginous, only with a brownish patch on apical swelling (mainly in specimens from East Java), G2-6 frequently irregularly maculated or banded with blackish tinge (considered postmortem change, variable in location and form, always indistinct



in outline, sometimes G4-6 appear dark brown).

Head in frontal view somewhat quadrate, vertex not depressed, sides gently rounded, weakly convergent below, curvature strong near clypeus (hence appears quadrate), structure of frons and SAT-ASR similar to those of ♂, but clypeus different in medio-apical form (Figs. 58, 59). HW, HL, IODv, A3, P=100, 46, 30, 22, 118, OOD, Od, POD=1, 4, 3, IODs=10:5.5, A3=AW×4, A3, 4, 5=10, 8, 7.5, P, Ma, Mi, 2(Ma), 3(Ma)=100, 28, 12, 48(38), 44(50). Pronotum, mesoscutum, subalar area, propodeum with structure and sculpture as in ♂. Venation also similar.

Holotype: ♂, West Java, Mt. Gedeh, 1450 m, Poentjak, 26. I. 1941, J. van der Vecht (captured on window)(RMNH).

Paratypes: 1 ♂, same loco, 9. V. 1948, J. van der Vecht (RMNH); 1 ♀, West Java, Middle Djampang, Bibidjilan, VII. 1937, M. E. Walsh (RMNH); 1 ♀, West Java, Mt. Gedeh, 3-7000 ft, IX. 1937, Lebak Sioe (RMNH); 4 ♀, West Java, Mt. Gedeh, 1450 m, Tjibodas, 4. IV. 1948, fly around wooden part of green house; 9. V. 1948, in wooden part of house; 20. VI. 1948, on window in house; 12. XII. 1948, all leg. J. van der Vecht (RMNH); 1 ♀, West Java, Mt. Gedeh, 1400 m, Telega Wasna, II. 1931, M. A. Liefertinck (RMNH); 1 ♀, West Java, Mt. Gedeh, 1400 m, Poentjak, 26. I. 1941, J. van der Vecht, on window (RMNH); 1 ♀, West Java, Mt. Megamendoeng, 25. IX. 1932, M. A. Liefertinck (RMNH); 2 ♀, Java, Buitenzorg (now Bogor), 1932, 1934, collector ? (RMNH); 5 ♀, Java, Nongkodjadar, I. 1911, E. Jacobson (RMNH); 1 ♀, same loco, 1902 m, I. 1934, J. G. Betrem (RMNH).

Other specimen: 1 ♀, Java, Nongkodjadar, I. 1911, E. Jacobson (gaster is lacking) (RMNH).

Remarks. In the specimens from Nongkodjadar (with one exception) and Bogor (Buitenzorg), though the latter situated in West Java, the gastral petiole is ferruginous and maculated with brown on its apical swelling. While in all others the petiole is black above except apical narrow area. In the latter group, however, some have the petiole more or less brownish on its median part, showing the intermediate state between the two. The colour of the dorsal side of the petiole is thus variable in the present species.

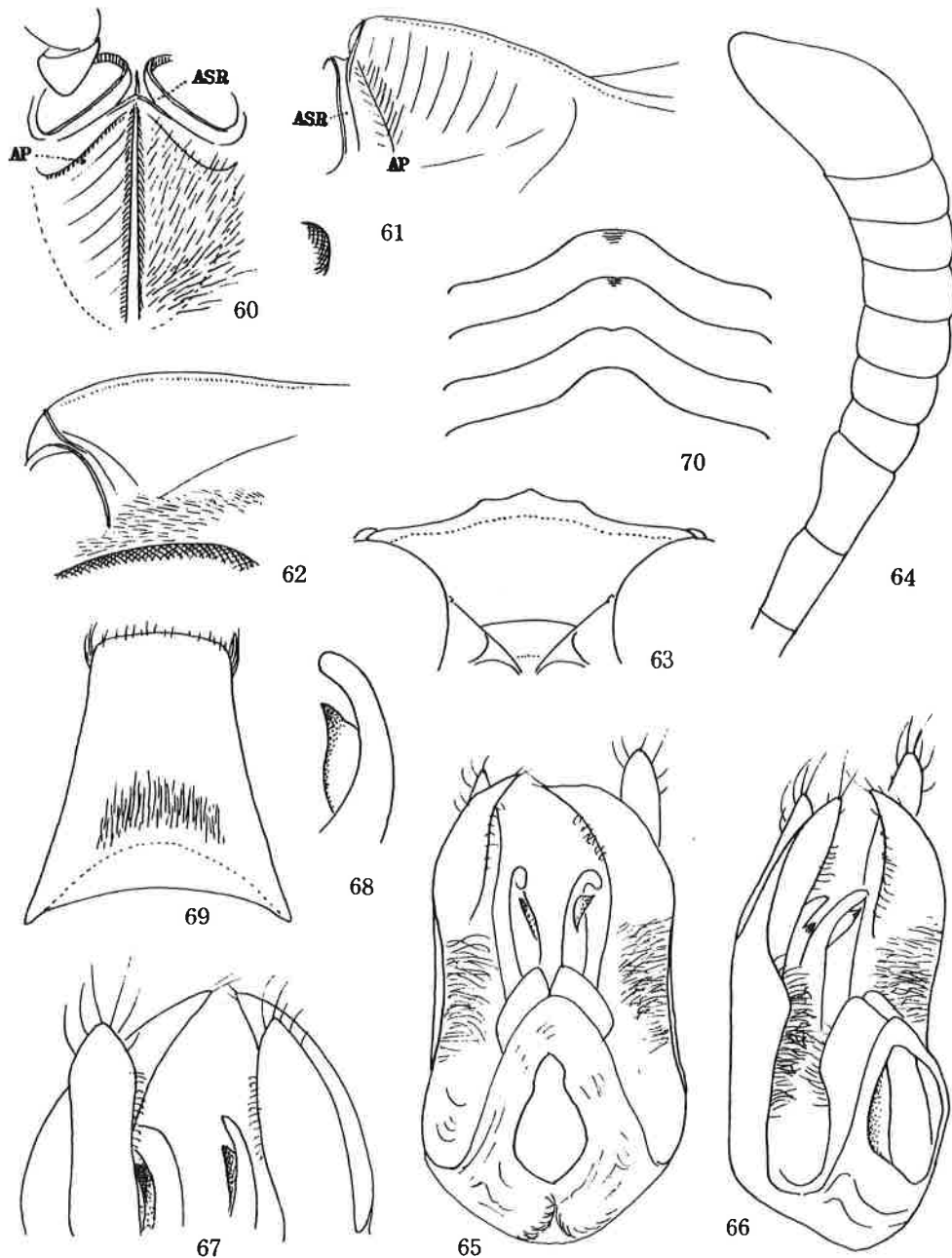
12. TRYPOXYLON JAVANENSE sp. nov.

Apparently resembles T. vechti, but is different from this in the detailed structure of SAT-ASR (real PAF completely covered by the extension of SAT and apparent PAF present) and in the form of clypeus. In colour it also differs from vechti in the wholly ferruginous gaster and hind legs, except brownish tarsus.

♂. 8 mm. Black; A1 and 2 somewhat dusky ferruginous, 3 brown above and dusky ferruginous beneath, thence apically turning to dark brown to black, but A13 with apical area brownish, mandible basally honey yellow, apically glossy brown, both semi-transparent, palpi ochre yellow, posterior part of collar discoloured, dark yellowish, tubercle with yellowish apical margin, gaster bright ferruginous, posteriorly somewhat brownish, legs ferruginous, black are all coxae except apices, brown to dark brown are fore trochanter largely, fore femur except both ends, mid femur above and beneath and hind T2-4 largely; arolia nearly black, mid and hind tibial spurs somewhat brownish. Hair silvery, on clypeus parallel.

Head in frontal view wider than long (W:L=100:82), with sides rounded, only slightly narrowed below, vertex not depressed, eye incision short, broad, strongly convergent towards bottom, upper margins of both sides not in a line, but distinctly inclined outwards, sinus rounded. HW, HL, IODv, A3, A13, P=100, 52, 33, 20, 24, 96, OOD, Od, POD=1, 2, 2, IODs=10:8, A3=AW×3.3, A3, 4, 5=10, 7, 6, A6 as long as A5, excavated at base beneath and produced at apex (Fig. 64), A13=BW×2 and ≠A9-12 (in some condition appears slightly longer) (Ditto). Frons gently raised, very slightly inclined towards median line till SAT, SAT moderately high long nasiform, long carinated in middle, carina slightly wider posteriorly and on posterior portion medianly with a fine impressed line. SAT-ASR seen vertically: Fig. 60 (AP ... apparent PAF), lateral inclination of SAT oblique and flat, beginning just at the side of median carina, medio-apical area of SAT transversely roundly carinated, carina soon connected with ASR (Fig. 60), thus true PAF is covered by the extension of SAT and apparent or false PAF (AP) runs down obliquely backwards arising from near medio-apical area of SAT (Figs. 60, 61, seen obliquely from left side to see through AP, see Remarks), the structure seen in profile: Fig. 62. Clypeus: Fig. 63, apical margin markedly different from that of

vechti, ♂, disc gently roundly tectate, reflection of apical margin not conspicuous. Antenna (A5-13): Fig. 64, very similar to *vechti*, ♂, occipital carina disappeared behind buccal cavity where the surface strongly depressed; pronotum very similar in structure to that of *vechti*, including lamina on side; subalar area of mesopleuron without pent-roof structure. Propodeum with lateral carinae, arising just behind lower end of spiracle and reaching densely haired area of posterior inclination, in lateral view strongly up-curved, area dorsalis enclosed with fine deep furrow, medial



Figs. 60-70. *Trypoxylon javanense* sp. nov. 63-69: ♂, 70: ♀

furrow comparatively broad, area apicalis only with lateral carinae distinct, the part is not long extended posteriorly beyond base of hind coxa, GSR broad, roundly up-curved, with posterior margin slightly roundly raised, honey yellow in colour. Gastral petiole clavate, P, Ma, Mi, 2(Ma), 3(Ma)=100, 32, 16, 50(48), 47(62), RC C-type, R1 about half length of TCV, TCV very weakly sinuate, slightly longer than down-curved CV2, angle between them roughly about 120°, CV1=CV2×3.7.

Genitalia seen from beneath: Fig. 65, somewhat obliquely from left side: Fig. 66, apical part seen from dorsal side: Fig. 67. General structure is similar to that of *vechti*, but in the present species paramere with both of apical two lobes much broader, with main body provided with rich long pubescence on ventral surface. Volsella short and transversely broad as in *vechti* and penis valve also as in this, namely without shoulder and with sickle-shaped appendages not produced sideways, but standing oblique (Fig. 68, lateral view). Sternite 8: Fig. 69 (from outer side).

Vertex microcoriaceous and finely closely, partly subrugosely punctured, mesoscutum with microsculpture stronger, but punctures finer and sparser; propodeum with feeble series of striae along lateral carinae, area dorsalis at base obliquely, on median furrow transversely striate, disc fairly closely but faintly punctured, posterior inclination posteriorly densely covered with hair-bearing punctures, sides smooth and polished and delicately obliquely closely striate except antero-ventral area, extreme posterior part transversely coarsely striate.

♀. 9-12 mm, mostly 10-11 mm. Closely allied to *vechti*, differences similar to the case of ♂, but here the clypeus is sometimes rather similar. Differences from ♂ are also similar to the case of *vechti*, namely the form of clypeus, antenna and relative width of IOD mainly.

Head in frontal view with sides roundly weakly convergent below, vertex not depressed (but slightly lower than level of upper eye margins), eye incisions narrower and longer than in ♂, but upper margins of both sides slightly inclined outwards as in ♂, not in a transverse line. Structure of frons, SAT-ASR, thorax and propodeum similar. Apical margin of clypeus considerably variable in form (Fig. 70, uppermost is in typical specimen in colour, lowermost in melanic one, medial two in bright coloured form having gaster posteriorly darkened). Measurements:

HW, HL, IODv, A3, P=100, 56, 28, 21, 116; OOD, Od, POD=2, 8, 5; IODs=10:5; A3=Aw×4; P, Ma, Mi, 2(Ma), 3(Ma)=100, 30, 14, 52(46), 47(56), venation similar.

In colouration, however, there are two markedly different forms, somewhat similar to the case of *vechti*, but here far more distinct.

(A) Bright coloured form. Al, 2 ferruginous beneath and pale brown above, clypeus apically pale brown. Gaster in the fresh specimens possibly completely ferruginous, in the actual specimens: (a) wholly ferruginous, only apically somewhat pale brownish, (b) from G3 apically pale brown, with ventral side broadly dusky, (c) from G3 apically brown to dark brown, with ferruginous patches irregularly scattered. Legs ferruginous, mid and hind femora and tibiae broadly dark brown; in the actual specimens mid and hind tibiae on outer side variously stained with brown and mid and hind tarsi irregularly scattered with dark brown patches.

(B) Dark coloured form. Antenna black, Al and 2 very faintly brownish, clypeus till apex black, mandible deep brown, tubercle posteriorly very narrowly ferruginous (in A broadly yellowish), G1 and 2 ferruginous, but G1 with a large brown mark on apical swelling and G2 with a broad brown band across middle, G3 at base ferruginous, rest black, G4-6 black. Legs brownish black, trochanters largely, both ends of femora narrowly ferruginous and fore tibia and tarsus pale brown.

Holotype: ♂ (bright coloured form), West Java, Megamendoeng, 800 m, 14. XI. 1939, J. van der Vecht (RMNH).

Paratypes: Bright coloured form: 3 ♀, same as in holotype; 2 ♀, West Java, Mt. Potuha Rontjabali, 1700 m, IX. 1941, J. van der Vecht (RMNH). Melanic form: 1 ♀, Java, Nongkdjadar, 1200 m, VIII. 1936, J. G. Betrem (RMNH).

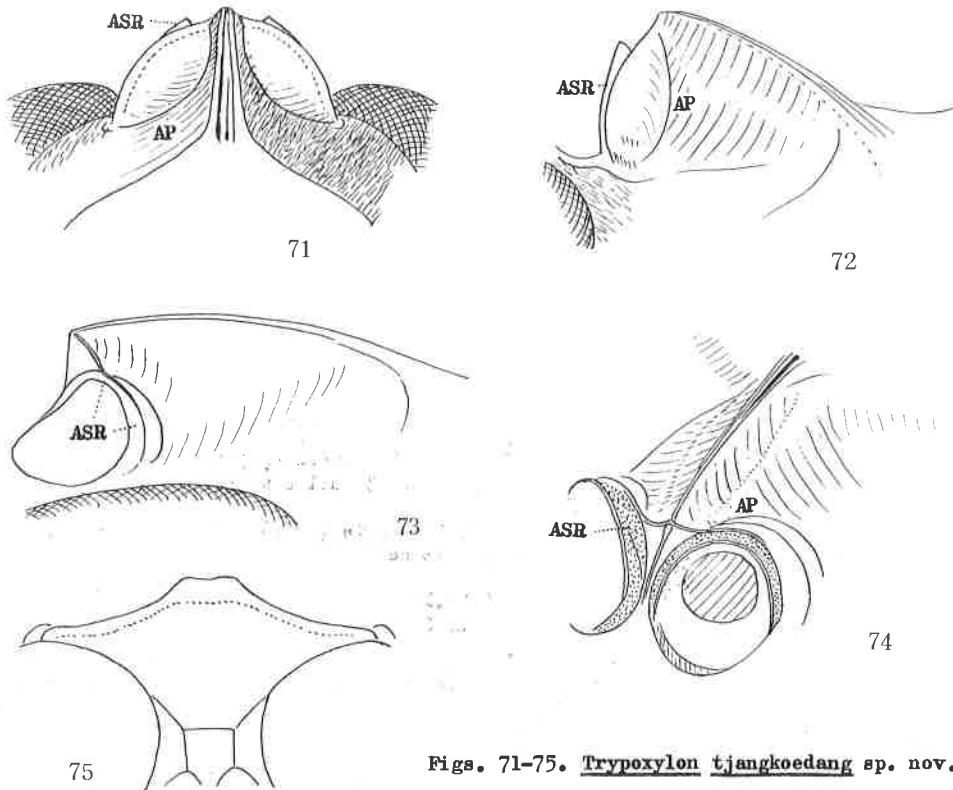
Remarks. (1) It is considered that the apparent or false PAF is the external indirect expression of the real PAF through the antero-lateral lamellate expansion of SAT that thinly covers the true PAF. (2) The connection of the colour forms with the localities is here reverse to the case of *vechti*, though in the latter the separation is rather incomplete, namely, here the bright is in the West and melanic is in the East.

13. TRYPOXYLON TJANGKOEDANG sp. nov.

Closely resembles the preceding species, especially the melanic form. In the present species, however, SAT is much narrower, acutely inclined laterally and rather keel-like as a whole, and gastral petiole is wholly black above.

♀ 8.5 mm. Black; dusky ferruginous are Al on basal ring, mandible, palpi, posterior margin of pronotal tubercle, discoloured posterior part of collar, tegula and basal plates of wing, apex of Gl, whole of G2,3,4, fore tibia and tarsus, mid tibia at base and apex, mid T1 at base and T5 and base of hind tibia. Dark parts of legs strongly brownish, especially on mid tibia. Hair silvery, on clypeus parallel.

Head in frontal view nearly quadrate ($W:l=100:92$), vertex not depressed, sides very slightly narrowed towards clypeus, eye incision not particularly narrowed apically, apex broadly rounded, upper margins of both sides not in a line, but distinctly inclined outwards. HW (right eye partly crushed), HL, IODv, A3, P=100, 58, 32, 22, 114, OOD, Od, POD=2, 6, 5, IODs=10; 4.5, A3=AW×4.5, A3, 4, 5, 12=10, 8, 6, 9. Frons moderately raised, median furrow absent, only a fine smooth and shining line present, from before fore ocellus broadly flattened, SAT keel-like as a whole, seen from dorsal side: Fig. 71 (AP, apparent or false PAF), median ridge anteriorly narrowed, linear, but widened posteriorly, surface flat and with a fine impressed line in middle; apical structure of SAT is, except that medio-apical end is much more acutely raised, similar to that of *javanense*; SAT-ASR seen obliquely from left side: Fig. 72 (AP, apparent PAF), in profile: Fig. 73, obliquely from beneath: Fig. 74; clypeus: Fig. 75, disc broadly, gently roundly tectate, occipital carina incomplete, broadly interrupted behind buccal cavity, there the surface depressed. Pronotal collar with anterior part very narrow, and slightly widened laterally, in frontal view dorsal line gently rounded, without medial tubercle; subalar area of mesopleuron normal. Propodeum with lateral carinae, area dorsalis enclosed with fine but distinct furrow, median furrow broad, with bottom down-curved in cross section, area apicalis not completely enclosed with carina, but it is well defined by its smooth surface, GSR broad, gently up-curved, posterior margin not elevated. Gastral petiole clavate, P, Ma, Mi, 2(Ma), 3(Ma)=100, 28, 13, 54(36), 60(50). In fore wing RC C-type, Rl short, CV1=CV2×3, TCV=CV2, TCV feebly sinuate, CV2 gently down-curved, angle roughly about 120°.



Figs. 71-75. *Trypoxylon tjangkoedang* sp. nov. ♀

Frons strongly microcoriaceous and closely, partly subrugosely superimposed with fine, tender punctures, mesoscutum similarly microcoriaceous and closely punctured, PIS≠PD, but not rugosely confluent. Propodeum with series of striae almost lacking along lateral carinae, area dorsalis at base crenate, medial furrow transversely finely closely striate, striae extended laterally covering feebly disc, outside the area and posterior inclination closely covered with hair-bearing punctures, area apicalis smooth, sides polished and on dorso-anterior area broadly covered with oblique fine striae, posteriormost area coarsely punctured and striate.

♂, unknown.

Holotype: ♀, West Java, Djampang Area, Mt. Tjangkoedang, XI. 1939, M. E. Walsh (RMNH).

Remarks. In the specimen the left antenna is completely lacking.

14. TRYPOXYLON ANTENNATUM Tsuneki, 1979

Trypoxylon antennatum Tsuneki, SPJHA, 9: 68, 1979 (♂ ♀, Laos, Malaya).

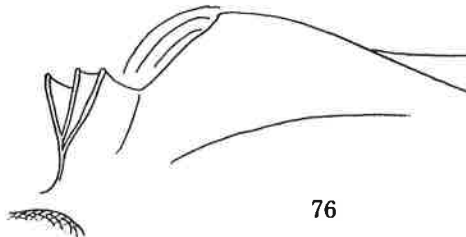
Specimens examined: 1 ♀, Middle Djampang, Java, VIII. 1936, M. E. Walsh (RMNH); 1 ♀, Mt. Halimoen, 4-5000 ft, XI. 1937, M. E. Walsh (RMNH).

Remarks. In one of the specimens both antennae are from A5 apically lacking, in the other the left antenna similar.

SAT-ASR in dorso-lateral view: Fig. 76 (in Fig. 228 in Pt. III of the present paper SAT is more highly drawn). In both specimens ASR is tricarinate on top. In fore wing RC C-type, R1:TCV=1:2, CV1=CV2×6, TCV incurved on posterior portion, TCV:CV2=3:2, angle roughly 100°.

G1 above from spiracle posteriorly castaneous brown, G2,3,6 yellow, G2 and 3 each with a brown band, on 2 across middle and on 3 on apical margin, G4 and 5 on posterior margin dusky yellow, 5 further with a brownish patch at base-lateral areas.

This species is new to Java.



15. TRYPOXYLON ERRANS Saussure, 1867

Trypoxylon intrudens (= errans): Tsuneki, SPJHA, 8: 28, 1978 (syn. redescr. figs.).

Trypoxylon errans: Tsuneki, SPJHA, 9: 114, 1979 (geogr. var. Ind. Reg.).

Trypoxylon errans: Tsuneki, SPJHA, 10: 20. 1979 (Ceylon).

Specimens examined: Java. 32 ♀ 8 ♂; 16 ♀ 3 ♂, Buitenzorg (now Bogor), 1.V. 1930, X.1930, IX.1930, II.1931, IV.1932, 14.X.1932, II.1933, 8.XI.1936, 5.XII.1936, 30.XI.1953, 10.XII.1953, J. van der Vecht (RMNH); 1956, 1956, Hamann (RMNH); I.1936, L. E. Cheesman (RMNH) (till here ♀, following: ♂) III.1932, III.1932, II.1933, J. van der Vecht (RMNH). 3 ♀, Piepers, dates? collector? (RMNH); 1 ♀, Batavia, XII.1907, E. Jacobson (RMNH); 1 ♂, Java, Hulié (RMNH); 4 ♀, Bandoeng, 760 m. XI.XII.XII.XII. 1937, E. Jacobson (RMNH); 5 ♀ 3 ♂, Malang, III.1933, all others IV.1933, J.G. Betrem (RMNH); 1 ♂, Tjibodas, ?, ? (RMNH).

Sumatra. 5 ♀ 2 ♂; 2 ♀, Is. Bras, ?, Heylaerts (RMNH); 2 ♀ 1 ♂, Is. Simalur, Sinabang, II.V.VI.1933, E. Jacobson; 1 ♀, Fort de Kock, X.1913, E. Jacobson; 1 ♂, Padang, VIII.1918, ?. (RMNH).

Sumba. 2 ♀. East Sumba, Melolo, 6.VI.1949, A. Bühler & E. Sutter (NHMB); E. Sumba, Wailakabe, 25. VI.1949, A. Bühler & E. Sutter (NHMB).

Remarks. In almost all the females the median rounded protuberance of the anterior margin of the clypeus is weakly incised in middle. The incision is only the extension of the impression behind it. In the males AL3 is always as long as 5 preceding joints united and the trochanters are largely brown, somewhat paler beneath and in fore leg pale part is broader than in others.

Gastral petiole is sometimes markedly abbreviated in the female. In one specimen from Piepers, Java, HW:P=100:110, gastral formula =100,27,10,36(32),44(46). In the normal female these are appr. 100:150 and 100,18,8,24(20),30(30) (but relative length

Table 1. Measurements on T. errans, ♂

HW	P	P	Ma	Mi	2(Ma)	3(Ma)	Loco
100	104	100	28	9	34 32	44 50	Malang
100	120	100	24	8	34 28	40 40	Malang
100	118	100	23	7	34 32	36 50	Malang
100	140	100	18	6	32 22	36 32	Java
100	126	100	20	7	30 26	32 42	Bogor
100	115	100	34	10	22 32	24 44	Padang
100	120	100	19	7	36 22	44 32	Simalur

In 2 others gaster is lacking

Bogor, 3 ♀ from Bandung, 1 ♀ from Malang and 1 ♀ from Fort de Kock) PIS on mesoscutum shows delicate microsculpture under high magnification.

and width of G₂ (3 considerably variable). In the male the abbreviated one is more frequent as given in Table 1.

Reddish ferruginous tint of G₂ and 3 variably stained with brown. Rarely the segments appear nearly completely dark brown or black, having brownish colouration on the ventral side only.

In 6 females (1 ♀, from

16. TRYPOXYLON MACULIVENTRE Tsuneki, 1979

Trypoxylon maculiventre Tsuneki, SPJHA, 9: 73, 1979 (♀ ♂, Singapore, Malaya and Laos)

Specimens examined. 1 ♂, North Sumatra, Sibolangit, 560 m, 4. I. 1955, J. van der Vecht; 1 ♀, Middle Sumatra, Padang, I. 1913, E. Jacobson; 1 ♀, South Sumatra, Kedaton, 150 m, 24. III. 1937, J. van der Vecht; 1 ♀, Sumatra, III. 1914, E. Jacobson & A. Kumanis (all RMNH). 2 ♀, West Java, Middle Djampang, Mt. Tjiseroeroe, III. 1935, Mrs. M.E. Walsh; 2 ♀, Java, Tapas, Mt. Gedeh, 800 m, IX. 1933, ?; 2 ♀, Middle Djampang, IV, VIII. 1935, M. E. Walsh; 1 ♀, West Java, Djampang area, Bibidjilan, XI. 1936, M. E. Walsh; 1 ♀, West Java, Buitenzorg (now Bogor), 30. VII. 1939, J. van der Vecht (cultured); 1 ♀, West Java, Tjisarvia, 1000 m, 11. I. 1931, J. van der Vecht (all RMNH).

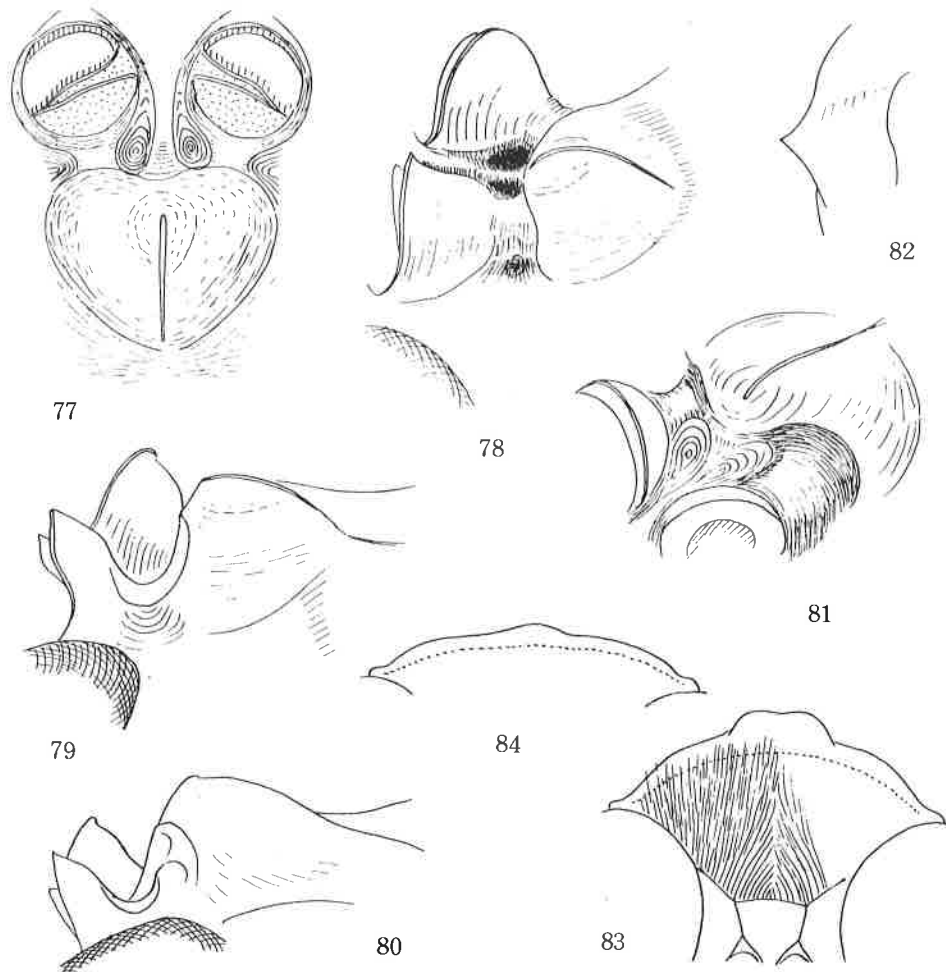
1 ♀, West Java, Radjamandula, 1200 ft., East Djampang, III. 1937, M. E. Walsh; 1 ♀, West Java, Bibidjilan, Middle Djampang, VII. 1937, M. E. Walsh; 2 ♀, West Java, Tjitalhao Vill. Mt. Djampang, IX. 1937, M. E. Walsh; 1 ♀, West Java, Djampang Mts., Tjimerang, XI. 1937, M. E. Walsh; 1 ♀, East Djampang, Mt. Besser, XI. 1937, M. E. Walsh; 1 ♀, West Java, Mt. Malang, 3-4000 ft., I. 1938, M. E. Walsh (all RMNH).

Supplemental description In the original description the explanation is somewhat insufficient. It will be supplemented in the following:

SAT roundly, not highly elevated, with a long median carina, apical margin roundly curved and medianly emarginated in dorsal view (Fig. 77), and edged at the verge to PAFs, SAT-ASR seen obliquely from above and left side; Fig. 78, from more below to see through PAF; Fig. 79, in profile; Fig. 80, PAF only moderately deep, but it is deeply excavated on both sides, leaving median area high like a bridge (Figs. 78 or 81, seen obliquely from beneath, or 77, the excavation is shown with concentric circle), especially marked is the round excavation on inner side (Figs. 77, 81). Medio-apical area of SAT acutely roundly inclined to IAA (Figs. 77, 78, 81), median line of IAA not furrowed to IAF, but by the deep excavation on both sides it turns into a narrow ridge (Figs. 77, 78, 81) and densely covered with golden hair. The hair on SAT fine and not close, but to observe the structure in detail it must be removed together with that of IAA. Clypeus: Fig. 83 (♀), 84 (♂), A13=A9-12, not curved (Fig. 258 in Pt. III), lamina on side of pronotum: Fig. 82. Subalar area of mesopleuron with lateral edge expanded into pent-roof structure, the expanded area lamellate and amber yellow in colour, vertical flat wall of subalar pit that is covered by the pent-roof is coarsely rugoso-striate with a few highly raised transverse carinae. Lateral carinae of propodeum not strong, lateral furrows of area dorsalis also weak.

A1, 2 always yellow or ferruginous, A3 in the Javanese specimens almost always, but in the Sumatran rather rarely, ferruginous or pale brown. Fore leg except base of coxa and arolium ferruginous or yellow, mid leg sometimes coloured as in fore leg, or only with femur brown streaked above, but usually with coxa nearly wholly, femur except both ends and T2-5 brown to black; hind leg sometimes coloured as in the dark instance of mid leg, but usually, except base of tibia, wholly or nearly wholly dark brown to black.

In the specimens from Sumatra bright coloured areas of antenna, clypeus, mandible and legs are lemon yellow, while in those from Java the areas are ferruginous and the legs are more broadly darkened. Gaster in a single Sumatran male with G1 black except yellow base till spiracles, G2 also black except yellow base and apex, G3 largely yellow and G4-7 wholly black (in Sumatran ♀♀ gaster lacking). In the Java-



Figs. 77-84. Trypoxylon maculiventre Tsuneki, 83: ♀, 84: ♂.

nese females G1 ferruginous, with dorsal side brown to black, usually paler towards base, G2 and 3 ferruginous and G2 black above, the remaining apical area black.

Hair golden or brassy, not dense on thorax-complex, not curled at baso-lateral areas of dorsal aspect of propodeum. In one specimen (♀) from Is. Simalur, Sumatra, however, the hair is distinctly silvery, although in other characters well agrees with other specimens, except that SAT is more gently inclined anteriorly including apical part of median carina and subflattened round area at its apex (ref. Figs. 77-81). But this is considered a slight variation and the specimen was treated as an aberratio:

1 ♀, Sibigo, Simalur, Sumatra, VIII. 1913, E. Jacobson (BMNH, gaster from G2 apically lost).

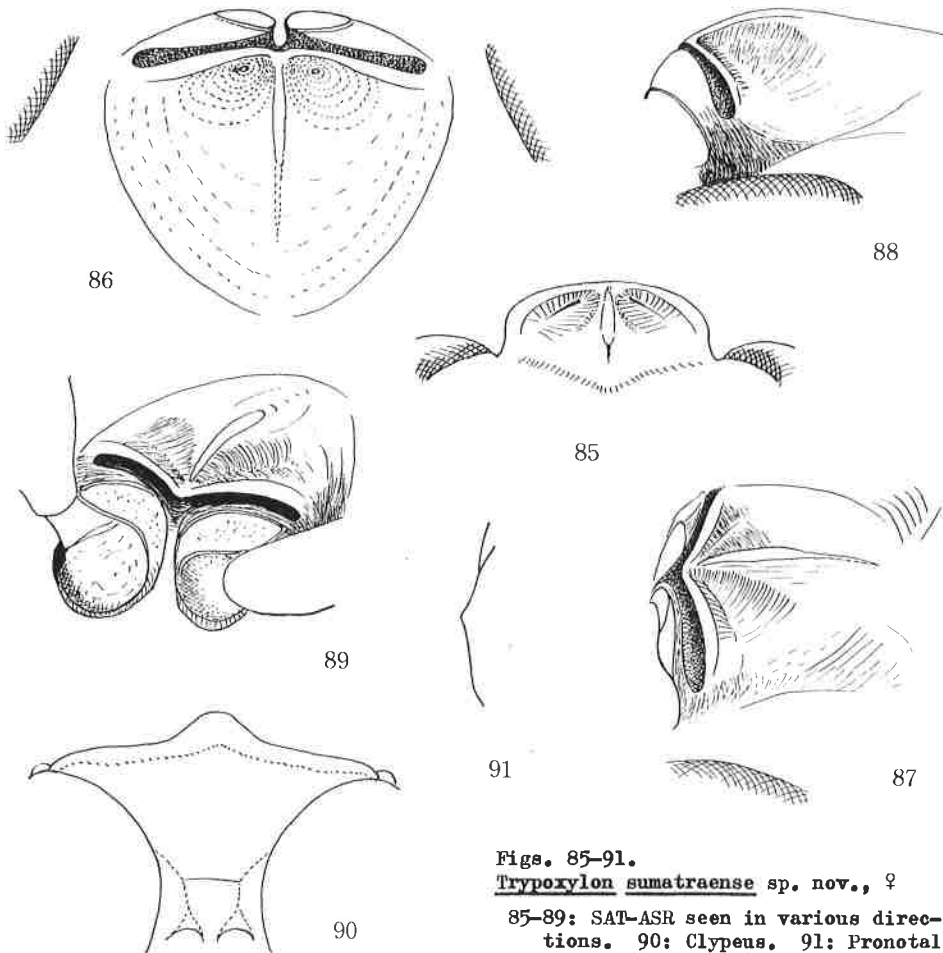
17. TRYPOXYLON SUMATRAENSE sp. nov.

♀, 7 mm. Characteristic in the structure of SAT-ASR and easily separable from the closely allied species.

Deep black, but black parts of antenna and legs slightly brownish. A1-4 at each apex (in A3 and 4 very narrowly) ferruginous. Mandible pale brown, but castaneous

at base, palpi ochre yellow, posterior part of collar half discoloured, posteriorly dusky yellow, tegula transparent brown; fore tibia and tarsus except arolium, base and apex of mid tibia with spur, mid tarsus except T2-3 and hind tibial spurs ferruginous; articulations of legs brown to pale brown. Hair silvery, on clypeus parallel.

Head in frontal view subquadrate, with sides weakly roundly convergent below, vertex not depressed, eye incisions broad and shallow, with upper margins not in a line, but inclined outwards. HW, HL, IODv, A3, P=100, 62, 28, 15, 174, OOD, Od, POD=1, 3, 3, IODs=10:6, A3=AWx2, A3, 4, 5=10, 8, 7. Frons gently raised, median furrow very indistinct, except narrow area in front of fore ocellus surface nearly completely flattened. SAT low tuberiform, medianly with a short thick carina, carinated area longitudinally elevated like an elongate mound, in vertical view apical margin broadly curved and carinated, bearing an oblique deep excavation between central raised area and verge to PAF. This is the so-called apparent or false PAF, the real PAF is deep, but except anterior area broadly covered by the overhanging apical margin of SAT and appears like a transverse narrow impression which is not open at the outer end, with the bottom line unobservable, the structure in dorsal view: Fig. 85, in vertical view: Fig. 86; ASR raised till level of apical margin of SAT, short, outer half bicarinate, inner half flatly inclined towards IAF and smooth and shining, SAT-ASR in latero-vertical view: Fig. 87, in lateral view: Fig. 88, in latero-ventral view: Fig. 89. Clypeus: Fig. 90, surface nearly flat. Antenna not very strongly, but fairly markedly incrassate towards apex, relative value of BW of A3 and of A12 = 3:5, comparatively short flagellar joints are characteristic. A3=AWx2 is worth noting. Occipital carina com-



Figs. 85-91.

Trypoxylon sumatraense sp. nov., ♀

85-89: SAT-ASR seen in various directions. 90: Clypeus. 91: Pronotal lamina (left side).

plete, very weakly triangularly depressed behind buccal cavity. Pronotal collar gently rounded upwards in frontal view, weakly tuberculate in middle, anterior part transversely narrowly ridged and not strongly incrassate laterally, lamina on side minutely weakly angulate (Fig. 91). Subalar area of mesopleuron normal. Propodeum with lateral carinae, area dorsalis without lateral furrows, medial furrow comparatively narrow and deep, area apicalis carinated only on each side, GSR highly raised, discoloured to amber yellowish. Petiole distinctly flask-shaped, $P, Ma, Mi, 2(Ma), 3(Ma) = 100, 21, 7, 30(28), 34(36)$, Mi located in front of apical swelling, not just behind basal condyle. In fore wing RC M-type, RL moderate in length, but reaching close to wing apex, $CV1 = CV2 \times 4$, TCV slightly longer than CV2, nearly straight, angle about 105° .

Frons strongly microcoriaceous and finely, very sparsely, rather indistinctly punctured, punctures behind SAT closer, in some light appearing mutually contiguous, mesoscutum also strongly microcoriaceous and more distinctly than on frons and more closely punctured. Series of striae along lateral carinae of propodeum defined, but striae short, not close, area dorsalis at baso-lateral areas only with 1 or 2 short striae, disc finely sparsely punctured on lateral areas, surface very delicately microcoriaceous, outside the area sparsely punctured, posterior part of posterior inclination closely covered with hair-bearing punctures, sides smooth and polished, but on posterior area strongly punctured and striated.

♂, unknown.

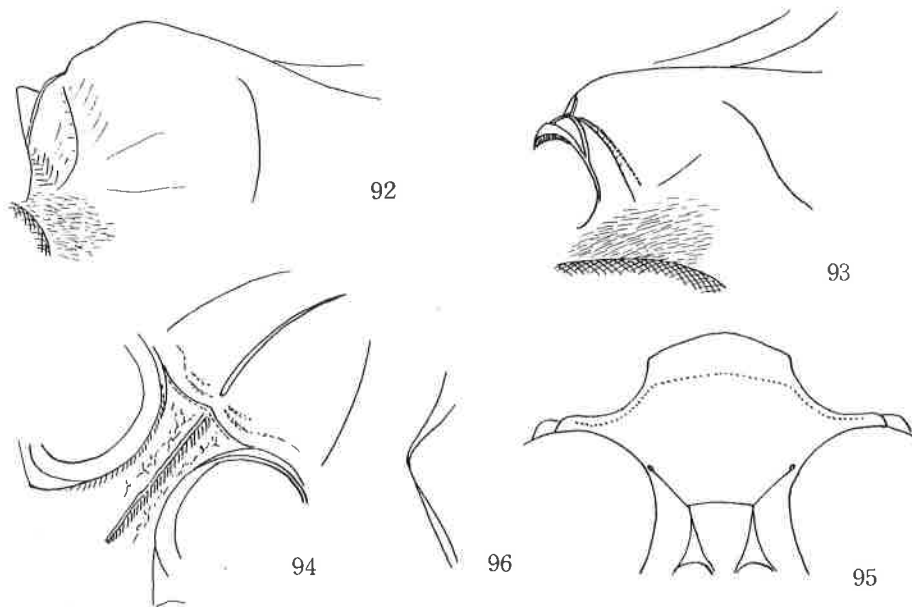
Holotype: ♀, North Sumatra, Sibolangit, 500 m, 4. I. 1955, J. van der Vecht (RMNH).

18. TRYPOXYLON CLYPEATUM sp. nov.

In the structure of SAT-ASR similar to javanense and tjangkoedang, but the present species is characteristic in the form of clypeus.

♀. 10.5 mm. Black; apical margin of clypeus, mandible, palpi and tegula of wing brown, posterior part of collar with marginal area alone discoloured and brownish. Hairs silvery, on clypeus parallel.

Head in frontal view with sides roundly convergent below, vertex not depressed, $W:L = 100:90$, eye incision narrowed outwards, sinus rather broadly rounded. $HW, HL, IODv, A3, P = 100, 54, 32, 20, 118$. $IODs = 10:7$. $OOD, OD, POD = 2, 5, 5$. $A3 = AW \times 3.3$. $A3, 4, 5 = 10, 8, 7$.



Figs. 92-96. Trypoxylon clypeatum sp. nov., ♀

Frons moderately raised, median furrow broad and shallow, SAT moderately high broad nasiform, with sides obliquely inclined and flat, long carinated in middle, carina widened posteriorly and medianly finely impressed, medio-apical margin weakly carinated, carina connected with posterior part of ASR just as in javanense, ASR not highly elevated, not widely expanded anteriorly, true PAF completely covered by the expanded layer of SAT, but apparent or false PAF from medio-apical part of SAT shallowly runs down obliquely backwards (Fig. 92, seen obliquely from left side to see through apparent PAF), SAT ASR seen nearly in profile: Fig. 93, somewhat obliquely from beneath: Fig. 94, IAA flattened, upper end separated from SAT by its apical marginal carina, which is less strong than in javanense, and medianly stoutly carinated, carina reaching below supraclypeal area, surface of IAA irregularly coarsely rugose, but shining (under natural condition the structure is covered by the hair). Clypeus: Fig. 95, medial protuberance markedly large, disc gently tectate; occipital carina appears widely disappeared behind buccal cavity (not well observed). Pronotal collar with anterior part narrow, slightly enlarged laterally, posterior part incompletely discoloured, lamina on side blunt triangular, apex rounded and only weakly produced (Fig. 96), subalar area edged on outer margin, but not expanded. Propodeum with distinct lateral carinae, area dorsalis enclosed with fine distinct furrow, but the furrow shallower and indistinct on posterior area, posterior inclination normal, area apicalis not well defined, GSR a broad band, up-curved, but with posterior margin not elevated. P, Ma, Mi, 2(Ma), 3(Ma)=100, 27, 12, 44(36), 46(47), P has parallel-sided area of considerable length before apical swelling, and can be included in the group of flask-shaped petiole, but the stalk area is comparatively thick and apical swelling is rather gradual and nearly as long as G2+3, hence it can also be included in the group of clavate petiole. Surely it is intermediate between the two groups, or it may be to be treated as a separate group (notice, the group here used is a rather conventional grouping for key, not the taxonomical unit). In fore wing RC intermediate between B- and C-types, R1 short, $CV1 \div CV2 \times 4$, $CV2 \div TCV$, TCV gently sinuate, angle about 130° .

Frons and SAT distinctly microcoriaceous and very closely, partly subrugosely superimposed with very fine punctures, mesoscutum similarly microsculptured and punctured, propodeum on dorsal surface also microcoriaceous, series of striae along lateral carinae very feeble and indistinct, area dorsalis at base obliquely coarsely striate, on median oval impression transversely finely closely striate, sides smooth and polished, but at mid height carrying a longitudinal series of arrow-shaped striae - $\rightarrow\rightarrow\rightarrow\rightarrow\rightarrow\rightarrow\rightarrow$ (constant ?) and on apical area transversely finely closely striate and scattered with fine hair-bearing points.

♂, unknown.

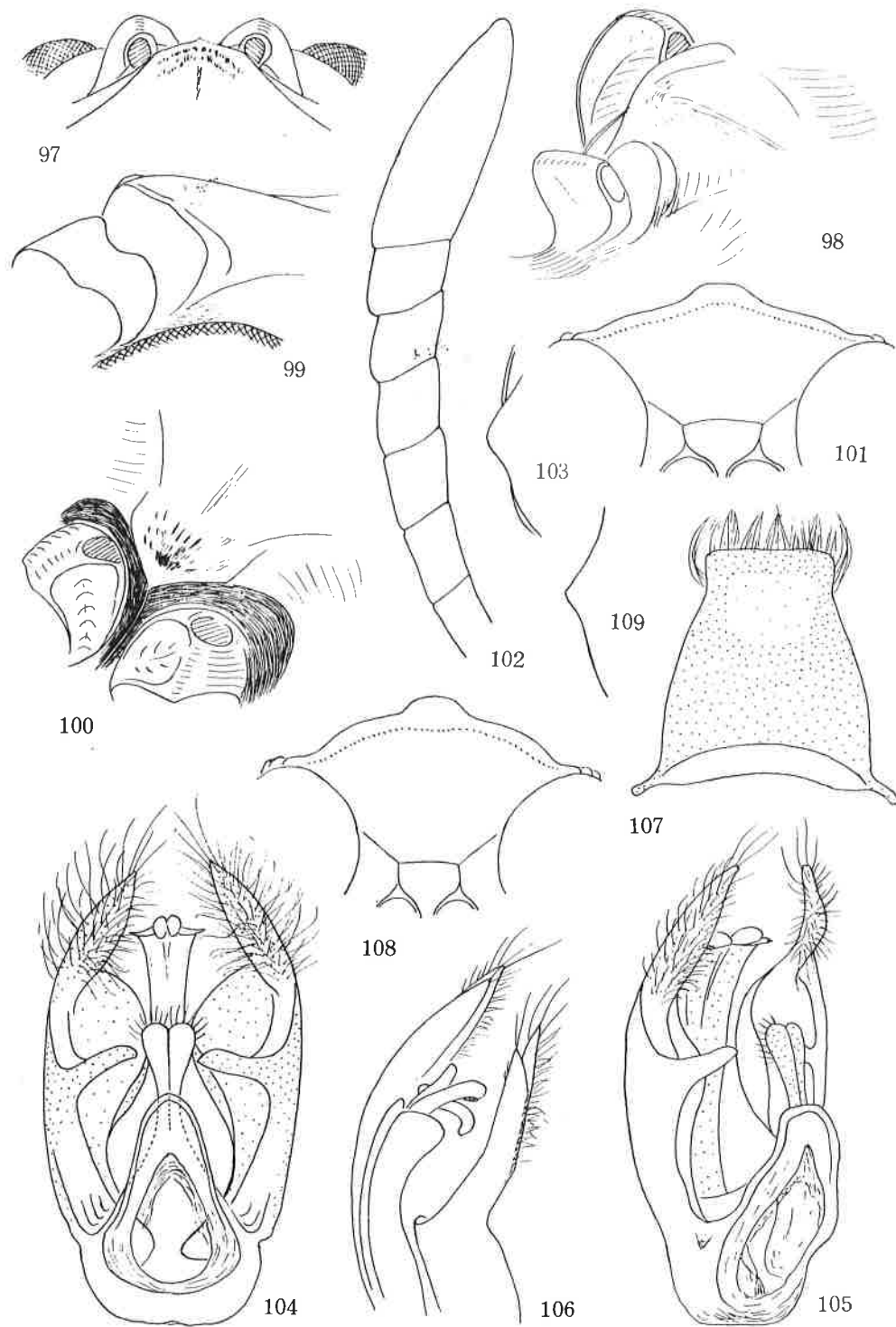
Holotype: ♀, East Java, Idjen Plateau, 1800 m, 27. VI. 1939, J. van der Vecht (RMNH).

19. TRYPOXYLON BAKERIANUM FORTIUS ssp. nov.

Except that the microsculpture on mesoscutum is far stronger and much more distinct and IODc as against IODv is somewhat larger the female specimens treated here are well consistent in characters with T. bakerianum known from Singapore. They are, therefore, dealt with as a geographical race of this species. While the male specimens that are unknown in bakerianum show distinct difference in the structure of the genital organs from those of nigripes and nishidai. Hereupon it was confirmed that bakerianum that was separated with a query from these species at the moment of description is doubtlessly a distinct species. Further, it was discovered during the recomparison of the specimens of the 3 species mentioned that the hollow of ASR in bakerianum is not located at the postero-lateral corner, but in middle of posterior inclination.

♂. 8.0 mm. Black, antenna, gaster and legs somewhat brownish, mandible dark brown, apically ferruginous, palpi ochre yellow, tegula ferruginous, fore tarsus pale brownish apically, all tibial spurs whitish.

Head in frontal view wider than long (100:85), with sides roundly, slightly convergent below, vertex not depressed. Frons moderately raised, medial furrow broad and shallow, SAT with dorsal surface broadly, nearly flattened, apical margin triangular and fairly acutely edged. SAT-ASR in dorsal view: Fig. 97, ASR subtriangularly raised, with a deep hollow on posterior aspect in middle, in latero-vertical view: Fig. 98, in lateral view: Fig. 99, in ventro-lateral view: Fig. 100, ASR with inner inclination smooth (Figs. 98, 100), the surface medianly transversely, somewhat irregularly excavated (Fig. 98). Clypeus: Fig. 101, disc gently roundly tectate. A7-13:



Figs. 97-109. *Trypoxylon bakerianum fortius* ssp. nov., 101-107, ♂; 108-109, ♀.

Fig. 102. Occipital carina complete, only minutely incised behind buccal cavity. Collar in frontal view with dorsal margin gently roundly, somewhat triangularly raised towards middle, but not tuberculate there, in dorsal view anterior part markedly incrassate laterally, lamina on side; Fig. 103. Subalar area of mesopleuron acutely edged at outer margin of posterior area, but not expanded. Propodeum with distinct lateral carinae, area dorsalis enclosed with distinct furrow, GSR markedly roundly elevated and narrowly discoloured at apex. P flask-shaped, P, Ma, Mi, 2(Ma), 3(Ma)=100, 18, 5, 24(20), 28(32). In fore wing RC C-type, R1 short, $TCV \div CV2$, $CV1 \div CV2 \times 2.7$ (see Table 2).

Genitalia: Figs. 104 (ventral), 105 (latero-ventral), 106 (apical part, dorso-lateral), characteristic is the inward process at the middle of outer margin of paramere, markedly different from the paramere of *nigripes* and *nishidai*, paramere with apical lobe densely covered with long hair on ventral surface, and apparently simple (Figs. 104, 105), but in dorso-lateral view apical part is distinctly bifurcate (Fig. 106). It is uncertain, however, whether they are long lobes and closely overlapped, or at apical part only split, though apparent marginal line runs for some distance towards base (Fig. 106), volsella spatulate, penis valve with shoulder and sickle-shaped appendages before apex. Sternite 8: Fig. 107, also somewhat different in the apical form from those of *nigripes* and *nishidai*.

Pronotum distinctly microcoriaceous and closely superimposed with fine flat-bottomed punctures, SAT more coarsely punctured, especially on anterior portion, Mesoscutum distinctly microcoriaceous and fairly closely punctured, but on median area punctures somewhat sparse. Propodeum with series of short striae along lateral carinae and area dorsalis at base obliquely, on the rest transversely finely closely striate, striae sometimes weak on disc; sides smooth and polished, but dorsal area sparsely punctured, posterior area irregularly rugose and punctate.

♀. Similar to ♂ in general, but G2 and 3 ferruginous and broadly banded with brown. Head in frontal view slightly longer, W:L=100:92. Clypeus longer (Fig. 109), antenna normal, pronotal lamina: Fig. 109. HW, HL, IODv, A3, P=100, 52, 26, 22, 182, IODs=10:9.5, A3=AW×3.7, A3, 4, 5=10, 7, 6.5, P, Ma, Mi, 2(Ma), 3(Ma)=100, 16, 6, 26(18), 32(26). G2 and 3, both at base broadly reddish. Comparative measurements in Table 2.

Table 2. Measurements on *T. bakerianum* spp.

ssp	Sex	Loco	B	L	IODv	P	Ocell	IODs	CV1	T:C	Remarks
f	♀	Malang	8.0	26	182	1 4 3	9.5	3.0	≠		ssp. f <i>b. fortius</i> b <i>b. bakerianum</i> BL Body length IODv, P When HW=100 Ocell OOD, Od, POD IODs When IODv=10 CV1 CV2× T:C TCV:CV2
f	♀	Malang	8.0	26	174	1 4 3	10.0	3.0	≠		
f	♀	Semarang	8.0	27	172	1 3 3	9.5	3.6	5:4		
f	♀	Batavia	?	25	—	1 4 3	10.0	3.0	≠		
f	♂	Malang	7.5	30	164	2 3 3	9.0	2.5	5:4		
f	♂	Malang	7.3	31	164	2 3 3	9.0	2.8	≠		
f	♂	Malang	?	33	—	2 3 3	8.5	2.7	5:4		
f	♂	Semarang	7.2	30	170	2 3 3	8.5	2.6	≠		
b	♀	Singapore	8.0	27	167	1 3 2	9.0	3.8	5:4		
b	♀	Singapore	8.0	26	—	1 3 3	9.0	3.2	≠		

Holotype: ♂, East Java, Malang, IV. 1933, J. G. Betrem (RMNH).

Paratypes: 2 ♀ 1 ♂, East Java, Malang, III, IV, IV. 1933, J. G. Betrem (RMNH); 1 ♀, Central Java, Semarang, VII. 1939, E. Jacobson (RMNH); 1 ♂, Central Java, Semarang, VII. 1939, Collector ? (RMNH).

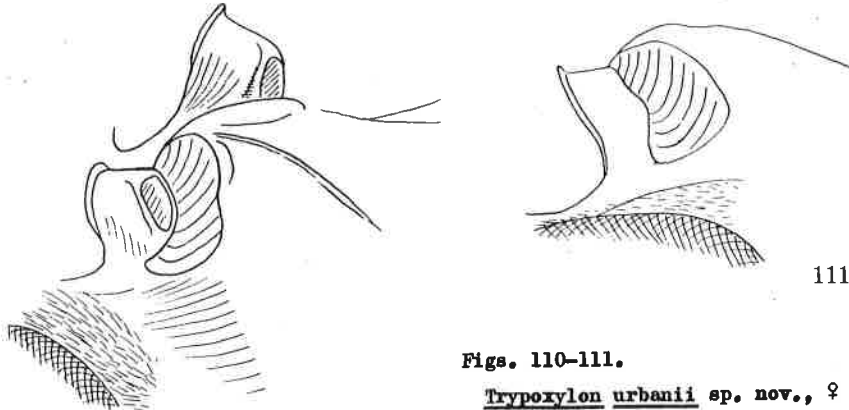
Other specimens: 1 ♂, East Java, Malang, IV. 1933, J. G. Betrem; 1 ♀, Djakarta, V. 1908, E. Jacobson (RMNH) (both RMNH, from both gaster is lost).

20. *TRYPOXYLON URBANII* sp. nov.

The present species is very close to *T. bakerianum fortius* and may be in subspecific relationships with this, in reality. However, in the present species the male is unknown and the final determination can not be given (cf. the cases of *nigripes*,

nishidai and bakerianum) and here it is treated provisionally as a distinct species.

The present species (♀) differs from bakerianum fortius in that PAF is closed at its outer end (Fig. 110, dorso-lateral view, 111, lateral view) and gaster is black except that G2 at base and beneath and G3 at base beneath brownish. Further slight differences are that frons more delicately indistinctly microcoriaceous and almost without superimposed punctures and that all tibial spurs more strongly brownish.



Figs. 110-111.

Trypoxylon urbanii sp. nov., ♀

110

111

Measurements: HW, HL, IODv, A3, P=100, 54, 30, 22, 200, OOD, Od, POD=1, 3, 3, IODs=10:9, A3=AWx4, A3, 4, 5±10, 8, 7. Head in frontal view W:L=100:92. P, Ma, M1, 2(Ma), 3(Ma)=100, 17, 6, 27(21), 28(30). Structure or form of Clypeus, pronotum, propodeum and wing venation similar to those of bakerianum fortius. Elevation of GSR is weak, gently rounded and without discolouration. Area dorsalis at base obliquely, on median and lateral furrows transversely striate, disc feebly sparsely punctured, sides smooth and polished, only posterior area transversely rugoso-striate and punctate.

♂, unknown.

Holotype: ♀, E. Sumba, Central District, Lindiwatju, A. Bühler and E. Sutter (NHMB).

21. 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 (redescr. ♀, figs.).

Trypoxylon khasiae: Tsuneki, SPJHA, 9: 84, 1979 (♀ ♂, Assam, Laos, Thailand, Malaya, descr. ♂, figs.).

Specimens examined:

1. N. Sumatra, Is. Simalur, Labuan Badjan, VI. 1913, E. Jacobson (RMNH).
2. S. Sumatra, Prov. Benkoelen, 250 m, 16-23. VI. 1938, M. E. Walsh (RMNH).
3. W. Java, Middle Djampang, Mt. Tjiseroe, 600-800 m, III. 1935, M. E. Walsh (RMNH).
4. W. Java, East Djampang, Mt. Tjigoeka, I. 1938, M. E. Walsh (RMNH).
5. W. Java, East Djampang, Mt. Besser, III. 1938, J. van der Vecht (RMNH).
6. W. Java, Mt. Gedeh, Tapos, 800 m, 29.III.-2.IV. 1935, J. van der Vecht (RMNH).
7. W. Java, Megamendung, Tjipajong, 28. VII. 1949, J. van der Vecht (RMNH).
8. W. Java, South Bantam Bajah, 300 ft, I. 1938, M. E. Walsh (RMNH).
9. Java, Noesa Kambangan, III. 1911, E. Jacobson (RMNH).

(Nos. corresponding to those of Table 3)

Variations:

- (1) Colour of hair. Usually the colour is silvery, but sometimes silky white,

pale brassy or brassy and very rarely golden. Sometimes the hair on the clypeus is silvery, while that on the thorax is brassy. Sometimes it can not be determined whether it is silvery or brassy, especially under the fluorescent light.

(2) Colour of antenna. Ground colour is ferruginous yellow. In specimen Nos. 2-7 and 9 from A4 apically (often from middle of A3 apically) slightly brownish, more or less darker apically, but always paler beneath; in No. 8 somewhat strongly darker apically and in No. 1 from A3 apically completely (above and beneath) castaneous.

(3) Gastral colouration. G1 always black, apical area only ferruginous, varied in extension, the rest varies as follows: (a) G2-6 completely ferruginous: Nos. 3-7; (b) G4-6 brown, G2-3 ferruginous: No. 2, (c) G4-5 dark brown to black, G2-3 and 6 ferruginous: Nos. 1 and 8. Darkening at apical portion may be a postmortem change, but in general the Sumatran specimens are darker in colour (No. 8 is an exception).

(4) Colour of legs. Ground colour is ferruginous or ambur yellow. Coxae on basal half and arolia always black. Fore femur sometimes with a brownish streak above, mid femur always brown or dark brown streak above, and mid T2-4 usually brown above. Hind femur and tibia markedly variable in the development of brown colour. In the bright instance (e.g. No. 6) femur above and T1-5 only brown and the rest ferruginous, but sometimes tibia apically also more or less brownish. Usually femur and tibia widely, except both ends, and T1-5 wholly brown or dark brown.

(5) Depression on vertex. In all the specimens vertex fairly markedly depressed (Table 3).

(6) Mesopleural scrobe. In no specimen mesopleural scrobe completely lacking. But always shallow and broad, with a minute pit in middle (Table 3). This is often the case in the Laotian or Malayan specimens.

(7) Lateral carinae of propodeum. In the specimens examined the carinae in question are in most of them intermediate between presence and absence, namely, at the outer ends of short striae forming a longitudinal series the outer area very feebly elevated and the border appears like a faint impressed line. It can be neglected, because it is so obscure, but it can also be considered to be a beginning of the carina. While in some specimens among the rest the carinae are completely unobservable, but in none of them the well-defined carinae can be observed.

(8) Body length. In the specimens examined are not included large-sized individuals as frequently met with among those from Assam and Laos (Table 3).

(9) Measured values. In Table 3 some characters of head, gastral petiole and wing, together with body length, mesopleural scrobe and hair, are indicated.

Table 3. Measurements and observations on the specimens examined (♀♀).

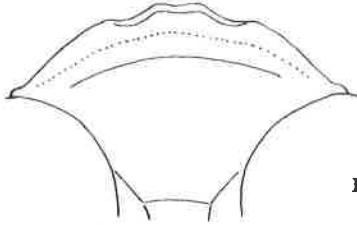
No.	BL	Ver	IODv	A3	P	Ocell	IODs	Ma	Mi	2(Ma)	3(Ma)	RC	CV1	T:C	Scrob	Hair
1	16	D	22	30	172	2 6 3	9.0	16	6	28(18)	34(24)	C	6.4	5:3	S P	Silv
2	16	D	22	30	172	1 4 2	8.0	15	5	26(16)	30(24)	C	6.0	5:3	S P	Bras
3	14	D	24	28	160	1 4 2	8.0	14	5	25(17)	27(22)	C	7.4	3:2	S P	Silv
4	15	-	-	-	170	- - -	-	15	6	32(16)	35(22)	C	7.0	5:3	S P	Bras
5	?	-	-	30	-	- - -	-	-	-	-	-	C	6.4	3:2	S P	Silv
6	?	D	22	30	-	1 4 2	8.0	-	-	-	-	C	6.8	5:3	S P	Silv
7	15	D	22	30	174	1 4 2	8.3	16	5	28(17)	36(26)	C	5.6	3:2	S P	Silv
8	14	D	23	28	180	2 7 3	7.5	15	6	25(20)	31(26)	C	6.0	5:3	S P	Gold
9	14	D	23	30	176	1 4 2	7.5	14	5	26(19)	27(27)	C	7.0	5:3	S P	Bras

Remarks. BL=Body-length; Ver =Vertex (D...Depressed); IODv, A3, P uner HW=100; IODs=10:z; Ma, Mi, 2, 3.. under P=100. CV1= CV2x; T:C=TCV:CV2; Scrob = mesopleural scrobe (S=shallow, P=with a pit); Hair: Silver, Brassy, Golden. (Nos. corresponding to those of the specimens examined.) Nos. 4 and 5 with head crashed; Nos. 5 and 6 with gaster lacking.

Relationships to *Trypoxylon yumi* Tsuneki, 1979

T. yumi is a very closely allied species to *T. khasiae* and sometimes the separation of both species is very difficult, unless the male genital organs are examined. Unfortunately among the present specimens not a single male is included. The determination must be done, therefore, mainly upon the basis of comparative measurements of the specimens.

According to the comparison of the above Table with Table 3 of Pt. III (p. 85) of the present paper, IODv of the present specimens is distinctly *khasiae*-like, while BL and P are rather like such *yumi* as have the vertex somewhat depressed. Ocellar disposition is particular. Mesopleural scrobe is rather closer to *yumi*. Judging from



112

the stability of the character, IODv together with the marked depression of vertex is more important than BL and P. Furthermore, the mesopleural scrobe is often present among the typical specimens of *khasiae*. Basing upon the fact mentioned the specimens of Sumatra and Java are ascribed to *khasiae* Cameron (possibly a geographical form).

Fig. 112. *T. khasiae* Cameron, ♀, clypeus.

22. TRYPOXYLON PROMINENS Tsuneki, 1979

Trypoxylon prominens Tsuneki, SPJHA, 9: 149, 1979 (♀ ♂, Laos, Malaya, S. India, figs.).

Specimens examined: 1 ♀, Java, Soekaboemi, 500-600 m, 1933, Verbeck (RMNH); 3 ♀ (all without gaster), Java, Middle Djampang, IV, VIII, VIII. 1935, M. E. Walsh (RMNH); 1 ♀, Middle Djampang, Mt. Tjimerang, IV. 1938, J. van der Vecht (RMNH); 1 ♀, West Java, Djampang Mts., Tjigaaha, I. 1938, M. E. Walsh (BMNH).

Remarks. (1) In 5 specimens out of 6 IAA raised upwards to form a bank in front of medio-apical transverse furrow of SAT, the furrow at each end connected with PAF, thus they form a deep transverse furrow at apical margin of SAT which is not connected with IAF. While in the remaining one (from Djampang) the elevation of the bank is weak and PAF half joins IAF. As to the former instance explanation was already given in the remarks of the original description as rare variation (Figs. 656-658 of Pt. III). But here it was confirmed that such an instance is rather common in the Javanese specimens and the Y-shaped furrow is rather rare. (2) GSR is always not markedly roundly elevated and discolouration at apical margin is not the case in the Javanese representatives. Mesoscutum mat, with very fine indistinct punctures.

23. TRYPOXYLON BICOLOR Smith, 1856

Trypoxylon bicolor Smith, Cat. Hym. Brit. Mus., 4: 377, 1856 (♂, nec ♀, Singapore, Java).

Trypoxylon bicolor: Tsuneki, SPJHA, 8: 1 (partim).

Trypoxylon bicolor: Tsuneki, Ibid., p. 3 (lectotype and paralectotype).

Trypoxylon bicolor: Tsuneki, SPJHA, 9: 158 (♀ ♂, Malaya, Thailand, Singapore).

Specimens examined:

1 ♀, W. Sumatra, loco ?, date ?, van Lansb. (RMNH); 1 ♀, S. Sumatra, Palembang Prov., Pager Alam, 750 m, M. E. Walsh (BMNH); 1 ♀, Is. Krakatau, IV. 1934, Dammersman (RMNH); 2 ♀, Is. Krakatau (P. Rakata), 22. VI. 1955, A. M. R. Wegner (RMNH).

1 ♀, W. Java, Middle Djampang, Mt. Tjisoeroe, 600-800 m, III. 1935, M. E. Walsh (RMNH); 1 ♀, W. Java, Middle Djampang, 1800 ft, 8.XI. 1939, M. van der Vecht; 1 ♀, W. Java, Djampang Tengah (Middle Djampang), Bibidjilan, XII. 1937, M. E. Walsh (RMNH); 1 ♀, Middle Djampang, Mt. Tjioeng, VIII. 1937, M. E. Walsh (RMNH); 1 ♀, W. Java, Soekaboemi, XI. 1937, M. E. Walsh (RMNH); 3 ♀, W. Java, Soekaboemi, 500-600 m, 1933, Verbeck (RMNH); 1 ♀, W. Java, Tjibarangbang, Djasinga, 150 m, 15. XI. 1936, J. van der Vecht (RMNH); 1 ♀, W. Java, South Bantam, Bajah, 300 ft, I. 1938, M. E. Walsh (RMNH); 3 ♀, W. Java, Saltri, I. 1938, XII. 1937, M. E. Walsh (RMNH); 1 ♀, W. Java, Mt. Malang, V. 1938, J. van der Vecht (RMNH); 1 ♀, W. Java, Djakarta, date ?, de Gabere (RMNH); 3 ♀, E. Java, Malang, III, IV, V. 1933, J. G. Betrem (RMNH); 1 ♀, Java, Piepers, ?, ? (RMNH); 1 ♀, Java, ?, ? (RMNH); 1 ♀, Java, ?, van Lansb. (RMNH); 1 ♀, Central Java, Ambarawa, E. W. A. Ludeking (RMNH);

1 ♂, W. Java, Djasinga, 6. II. 1938, J. van der Vecht (RMNH); 1 ♂, Oedjoeng Genteng Bay, III. 1938, J. van der Vecht (RMNH);

Remarks. In the Javanese male specimens (only 3 among 31) A13≠A9-12 united. Ground colour of fore and mid legs light ferruginous; fore tibia broadly in middle and fore tarsus apically above brownish and mid tibia and tarsus both broadly brown. Thus they have A13 relatively slightly longer and legs slightly darker than those of the specimens from Singapore. But in them A3 is relatively long, pronotal lamina distinctly toothed and gaster from apex of G1 to G4 reddish ferruginous and there is no doubt that they belong to *bicolor* Smith s. str. In the females also fore tibia on folded

side and medianly fairly broadly and fore tarsus apically brownish and mid tibia medianly broadly and T2-5 above dark brown to black. But the gastral segments broadly reddish as in ♂. In both sexes mesoscutum finely and sparsely punctured, punctures considerably well defined, with PIS more or less mat, area dorsalis on propodeum with very weak but easily defined lateral furrows. In fore wing RC B-type, but somewhat close to C-type, not so distinctly B-type as in petiolatum. Length ♂ 14-15 mm, ♀ 15-19 mm, mostly 17 mm or so.

24. TRYPOXYLON PETIOLATUM Smith, 1857

Trypoxylon petiolatum Smith, J. Proc. Linn. Soc. Lond., Zool., 2: 105, 1857 (♀, Borneo).
Trypoxylon bicolor: Tsuneki, SPJHA, 8: 1, 1978 (partim, except for bicolor s. str.).
Trypoxylon petiolatum: Tsuneki, SPJHA, 8: 6, 1978 (redescri. lectotype).
Trypoxylon petiolatum: Tsuneki, SPJHA, 9: 160, 1979.

Specimens examined:

2 ♀ 1 ♂, Simalur, Is. Pandjang, V. 1913, E. Jacobson (RMNH); 1 ♂, Simalur, Is. Babi, IV. 1913, E. Jacobson (RMNH); 1 ♂, Simalur, Sinabang, VII. 1913, E. Jacobson (RMNH); 1 ♀, Sumatra, Padang, IX. 1913, E. Jacobson (RMNH); 1 ♀, same loco, X. 1968, Leafmous (RMNH); 1 ♀ 2 ♂, S. Sumatra, Kedaton Wai Rilau, 150 m, 24, 24, 26. III. 1937, E. & J. van der Vecht (RMNH); 1 ♀, Djambi Exp. 1925, Selemoekoe, VIII. 1925, O. Posthumus (RMNH); 1 ♂, Palembang Prov. Pager Alam, 750 m, 23. V. 1935, M. E. Walsh (RMNH); 1 ♂, W. Sumatra, date ?, van Lansb. (RMNH). 3 ♀ 1 ♂, Banka Is., Pangkalpinang, III. 1930, 9. III. 1931, 9. III. 1931, 26. XI. 1935 (♂), J. van der Vecht (RMNH).
6 ♀, Buitenzorg (now Bogor) (2 ♀, Culture Garden, 230-250 m, 30. XII. 1934, 30. VII. 1935, J. van der Vecht; 2 ♀, Tjiboerial, 20. X. 1929, Lief tinck, 3. I. 1934, J. van der Vecht; 1 ♀, Mt. Tjampea, 2. II. 1934, J. van der Vecht; 1 ♀, 24. VII. 1939, J. van der Vecht) (RMNH); 5 ♀ 4 ♂, Soekaboemi (1 ♀ 1 ♂, 500-600 m, 1933, Verboek; 2 ♀ 3 ♂, W. Preanger, S. Soekaboemi, III. 1933, J. van der Vecht; 1 ♀, 1944, M. E. Walsh (till here RMNH), 1 ♀, 1933 (RMNH).); 1 ♀ 2 ♂, Radjamandala (XII. 1938, J. van der Vecht (RMNH); 2 ♂, 1200 ft, East Djampang, III. 1937, M. E. Walsh (RMNH).); 1 ♂, East Djampang, Mt. Roesa, XI. 1938, J. van der Vecht (RMNH); 2 ♀ 1 ♂, Middle Djampang, 600-800 m, III, IV. 1935, XII. 1937, M. E. Walsh (RMNH); 1 ♀, same loco, Bibidjilan, XI. 19-35, M. E. Walsh (RMNH); 1 ♀ 1 ♂, Tjibarembang, Djasinga, 15. XI. 1936, J. van der Vecht (RMNH); 2 ♀ 1 ♂, South Bantan Bajah, 300 ft, I. 1938, M. E. Walsh (RMNH); 1 ♀, Salatry, I. 1938, M. E. Walsh (RMNH); 1 ♀, Oedjoeng Genteng Bay, III. 1938, J. van der Vecht; 1 ♀, Prov. Semarang, Djatingalih, VII. 1935, J. G. Betrem; 1 ♀ 1 ♂, Ambarawa, date ?, E.W.A. Luideking (RMNH); 1 ♀, W. Java, Mt. Malang, 3-4000 ft, I. 1938, M. E. Walsh (RMNH); 8 ♀ 14 ♂, E. Java, Malang, III, IV, V. 1933, J. G. Betrem (RMNH); 1 ♂, Java, Sindanglaja, Balsius (RMNH); 1 ♂, Java, Muller (RMNH); 1 ♂, Java, 21. IX. 1928, ? (RMNH); 1 ♂, Java, Hulié (RMNH); 1 ♀ 3 ♂, Kangean Arch., Bujutan, 19, 23. VIII. 1954, A. Hoogerwelf (RMNH); 1 ♀, Verlateu Is., XII. 1933, Dammerman (RMNH).
5 ♀, W. Sumba, Pogobina, 14, 15, 16, 16. IX. 1949; 2 ♀ 1 ♂, W. Sumba, Waimangura, 19, 20, 23. VIII. 1949; 2 ♀ 2 ♂, W. Sumba, Rua, 28, 29, 30. 1949; W. Sumba, Kobi, 3. VIII. 1949; 3 ♂, W. Sumba, Bondo Kobi, 31. VIII. 1949; 1 ♂, W. Sumba, Rara, 5-9. VIII. 1949; 5 ♀ 2 ♂, C. Sumba, Langgaliru, 26. IX, 6, 6, 6, 8, 10, 10. X. 1949; 3 ♀ 1 ♂, C. Sumba, Lindiwatju, 3, 10, 10, 10. X. 1949; E. Sumba, Mau Marru, 18, 21. VII. 1949; 1 ♀, E. Sumba, Laluku, 4. VII. 1949; 2 ♀, E. Sumba, Melolo, 7, 10. VI. 1949; all leg. A. Bühler & E. Sutter (NHMB).
1 ♂, W. Flores, Reo, 7. XI. 1949; 1 ♀, C. Flores, Moni, 11. XI. 1949; Bühler & Sutter (NHMB).

On some characters.

(1) Colour of legs. ♀. Ground colour black, all tibiae at base (in fore leg somewhat broader), fore T1-2 (apices pale brown) or 1-4 (with 3 and 4 somewhat brownish above) yellowish white. In one large (17 mm) specimen from Is. Bangka fore T1-4 and mid T1-3 (base) yellowish white. ♂. Black-legged form occupies high percentage. In 14 male specimens from Malang, for instance, 7 have fore tibia and tarsus, as well as mid and hind ones, dark to deep brown, 3 have fore tibia fairly broadly pale brown in front and fore tarsus wholly brown and mid and hind tibiae brownish at base, while the remaining 4 have all tibiae black and somewhat pale in colour at base and tarsi black and fore tarsus somewhat paler than in mid and hind ones. The specimens from other localities also show similar tendency. Thus, in the Javanese and Sumatran specimens the black legged form is common.

(2) Colour of antenna. Black, but underside of flagellum in ♀ is usually brown to ferruginous, sometimes dark brown. On an average, however, the colour is distinctly brighter than in bicolor s. str. ♀.

(3) Colour of gaster. Ground colour black, but usually from apex of G1 to apex of G3 reddish ferruginous, rarely to base of G4 (♀ ♂), carrying a dark brown mark on each, varying in extension from none to nearly whole of the dorsal side.

(4) Relative length of A3 in ♀. $A3=AW \times 4-4.5$ and distinctly shorter than in bicolor ♀ in which $A3=AW \times 5-5.5$.

(5) RC of fore wing. Distinctly B-type in both sexes. In bicolor also B-type but, strictly saying, it is somewhat close to C-type.

(6) Specimens from Sumba and Flores. No fundamental difference can be discovered as compared with those from Java. Only the legs especially the tarsi, appear somewhat thicker than in the Javanese (♀ ♂). But there are variations among them and can not be taken up as a local character.

(7) Male genital organs. Taking into consideration the case of Ceylonese population (= bicolor ceylonicum) the male genital organs were examined with the specimens from Sumba, Java and Sumatra. No doubt they are all petiolatum-type.

25. TRYPOXYLON FUMI Tsuneki, 1979

Trypoxylon fumi Tsuneki, SPJHA, 9: 107, 1979 (♂, Malaya, figs.). See Remarks.

Specimens examined: 1 ♂, North Sumatra, Sibolangit, 500 m, 4. I. 1955, J. van der Vecht (RMNH); 1 ♀, Mt. Sibana, 9. V. 1902, van der Z. ex. (RMNH).

♂. Well agrees in characters with the type specimens. Length 12.5 mm. Black; yellow are A1 and 2, clypeus anteriorly broadly, mandible, palpi, posterior margin of tubercle, posterior part of collar (discoloured), tegula (semitransparent), G1 on sides and base beneath till spiracles, G2 (with a dark brown mark above and beneath), G3 (with a broad dark band around middle), apical margins of G4 (with an obscure yellowish patch at baso-lateral area) and 5, G6 and 7 wholly (both brownish), fore and mid legs except black arolia (femora in some light faintly brownish and mid T 2-5 pale brown), hind coxa (in some light slightly brownish), trochanter, both ends of femur and tibia wholly. Black parts of legs more or less brownish, articulations of hind tarsus pale brown. Hairs distinctly golden, on clypeus at base slightly convergent towards median line, but as a whole nearly parallel.

Measurements: HW, HL, IODv, A3, AL3, P=100, 48, 25, 20, 24, 156, OOD, Od, POD=1, 2, 1, IODs=10:8, $A3=AW \times 3$, $AL3=EW \times 2.7$, longer than 3 but shorter than 4 preceding joints united and distinctly curved (Fig. 116, 117 in other direction). P, Ma, Mi, 2(Ma), 3(Ma)=100, 14, 6, 32(23), 30(34). RC C-type, R1 short, $CV1 \neq CV2 \times 7$, $TCV:CV2 \neq 3:2$, angle about 100°. SAT-ASR in dorso-lateral view to see through PAF: Fig. 113, in ventro-lateral view: Fig. 114, structure of ASR and PAF characteristic, clypeus: Fig. 115, disc broadly roundly raised and markedly reflected at apex. Mesoscutum under high magnification fairly distinctly microcoriaceous.

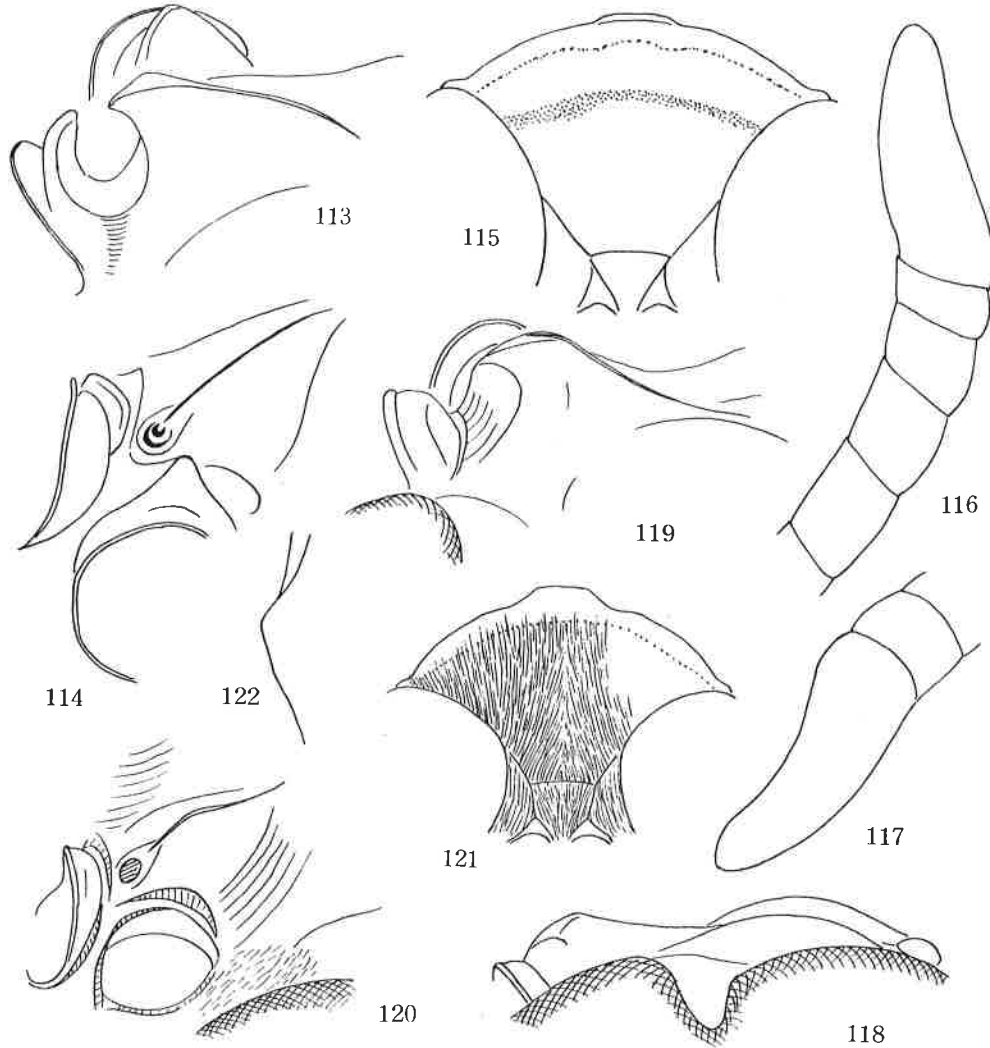
♀ (hitherto unknown). In my key to the Indo-Malayan species the female runs to fulvocollare Cam., but distinctly differs from this in the structure of SAT. It closely resembles also fumi m. in colour and in general characters, but differs from this in the structure of ASR and PAF (Figs. 119 and 120, cf. Figs. 113 and 114), and at first I hesitated to combine them together, because the specimens were collected in different localities and each sex is represented by only a single individual. Despite the fact I finally combined them together. This is based on the fact that in T. javanense nov. later described the structure of SAT-ASR differs between both sexes just as in the present case and in this species the specimens are abundantly collected from the same place and at the same time and there is no doubt that they represent the opposite sexes of the same species.

The specimen examined is heavily stained with resin and pollen and can not be cleaned completely and, moreover, its antennae and legs are considerably damaged and is not good for description. However, the important parts are still observable and so it will be described as detailed as possible.

Length about 14 mm. Black; ferruginous (changed from yellow?) are A1 and 2, clypeus anteriorly broadly, mandible (apical half brown), mouth parts, discoloured posterior part of pronotal collar, tubercle, tegula, G1 except from spiracles posteriorly above, G2 except a large dark mark above and beneath, G3 except a broad band around middle, broad apical margin of G4 and 5 and G6 wholly, fore leg wholly except black aro-

lium, mid leg except brown T2-4 (both T5 lacking), hind leg except dark brown underside of femur (tarsi lost) (coxae from extreme base completely ferruginous). Veins dark brown and apically paler. Hair possibly golden or brassy, on clypeus at base distinctly convergent medially, on baso-lateral areas of dorsal aspect of propodeum curled.

Head in frontal view wider than long, W:L=100:90, with sides strongly roundly convergent below, vertex not depressed, eye incisions narrow, in vertical view upper



Figs. 113-122. Trypoxylon fumi Tsuneki, 113-117: ♂, 118-122: ♀.

margins of both sides slightly raised outwards, head in dorsal view strongly transverse, appears very thin. HW, HL, IODv, A3, P=100, 44, 23, 28, 176, OOD, Od, POD=1, 2, 1, A3=AWx4.7, A3, 4, 5=10, 7, 6. Elevation of frons as compared with level of eyes only slight, but they are very marked as round elevations on both sides of medial furrow, because the depression of inner orbits and medial furrow are very strong; SAT tuberiform, moderately high, but appears markedly raised from level of frons (Fig. 118, lateral view), PAF moderately deep, V-shaped in cross section, with bottom line up-curved (Fig. 119, dorso-lateral view to see through PAF), ASR highly raised, apical margin carinated, dorsum smooth, roundly curved down posteriorly to PAF (Fig. 119), SAT long carinated in middle, carina curved in lateral view (Fig. 118), anterior margin of SAT at verge to PAF edged, at

medio-apical area roundly flattened, carrying a large round fovea on it (Fig. 120, oblique ventro-lateral view), clypeus: Fig. 121, at base roundly elevated and apical marginal area strongly reflected; occipital carina complete, not incised behind buccal cavity. Pronotal collar with anterior part narrow, rather carina-like, anterior margin in dorsal view roundly emarginate, thus the part slightly incrassate laterally, pronotum in frontal view with dorsal margin raised in broad triangle, in middle roundly angulated but not tuberculate, lamina on side: Fig. 122; subalar area of mesopleuron without pent-roof structure, but with outer margin acutely edged; propodeum without lateral carinae, area dorsalis possibly without lateral furrows (heavily stained), GSR like a broad and up-curved ferruginous band, but not highly elevated at apical margin. Gastral petiole long, flask-shaped, P, Ma, Mi, 2(Ma), 3(Ma)=100, 17, 6, 24(22), 26(28). RC M-type, Rl short, TCV:CV2=3:2, TCV nearly straight, CV2 down-curved, CV1=CV2x7.5.

Frons delicately, very minutely microcoriaceous, fairly closely superimposed with fine shallow, rather indistinct punctures, SAT smooth, polished, only on posterior portion somewhat closely punctured, mesoscutum finely, somewhat sparsely punctured at least at baso-lateral area; sculpture on propodeum almost unobservable, judging by the actual state, possibly without lateral series of striae and sides smooth and polished.

Remarks. (1) In the original description colour of gaster is escaped. In the holotype it is: ground colour dark brown to black, semitransparent ferruginous (partly appears even reddish, but in the natural state possibly it is yellow) are G1 on sides wholly and base beneath till spiracles, G2 except a large mark above and beneath, G3 except broad band behind middle, a patch on each side of G4, apical margin and a patch on each side of G5 and G6-7 wholly. In the paratype G1 except dorsal surface amber yellow, G2-3 as in holotype, but with colour more yellowish, G4, 5, 6 each on apical margin and G7 wholly dusky yellow. In the holotype other yellowish parts are semitransparent cream yellow. (2) The present female specimen is heavily damaged, lost parts: Left antenna completely, right antenna from A7 apically, left mid T5, right mid T4-5, left hind Tl-5 and right hind leg completely except coxa. Rest of right antenna dropped off and separated into 2 pieces and they are mounted on a card point and attached to the pin. Wings well laterally expanded but also stained thinly with resin. Gaster dropped off and glued on to the data label, it is also stained with resinous substance.

26. TRYPOXYLON FULVOCOLLARE Cameron, 1904

Trypoxylon fulvocollare Cameron, Ann. Mag. Nat. Hist., (7) 13: 217, 1904 (♀, Assam).
Trypoxylon fulvocollare: Tsuneki, SPJHA, 8: 52, 1978 (redescription of holotype, figs.).
Trypoxylon fulvocollare: Tsuneki, SPJHA, 9: 101, 1979 (♀ ♂, Assam, Laos, Malaya, figs.).

Specimen examined: 1 ♀, N. E. Sumatra, Tandjong Morawa, Serdang, date ?, B. Hagen (RNNH).

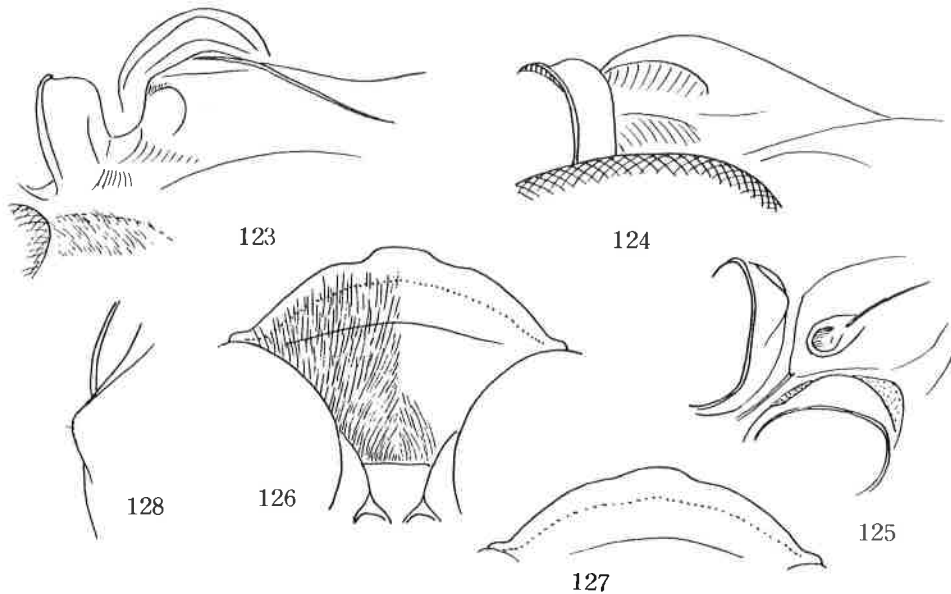
Observation. A large (about 18 mm) bright-coloured specimen. A1 and 2 wholly and 3 beneath ferruginous. On prothorax top of collar including posterior part and outer margin of lateral laminae only ferruginous. Gaster typically maculated with yellow, fore and mid legs except base of coxae and arolia ferruginous yellow (mid T3-4 brownish), hind leg ferruginous with following brown: a patch on trochanter beneath (pale brown above), a broad obscure streak on femur above and beneath, except both ends, outer side of tibia, tarsus with paler articulations.

SAT=ASR and clypeus typical, HW, HL, IODv, A3, P=100, 44, 20, 26, 156; OOD, Od, POD=1, 2, 1; IODs=10:10.5; A3=AWx5; A3, 4, 5=10, 5.5, 5; P, Ma, Mi, 2(Ma), 3(Ma)=100, 20, 7, 26(24), 38(36); RC M-type, Rl very short, CV1=CV2x7, TCV at lower third incurved, TCV:CV2=3:2, angle at base about 90°, at apex about 120°.

27. TRYPOXYLON JAVANICUM sp. nov.

♀. Resembles *shaka* in appearance that is known from Malaya, but differs from this in that antenna is more broadly ferruginous, gastral petiole only on dorsal side black, SAT somewhat lower with sides roundly inclined, pent-roof structure at subalar area not so well developed and propodeum with distinct lateral carinae.

Length 15-18 mm. Black; antenna variable in colour, in bright instance: wholly ferruginous, only slightly brownish apically above; in dark instance: from A4 apically above brown - dark brown - black, range of basal ferruginous area and grade of apical



Figs. 123-128. *Trypoxylon javanicum* sp. nov., ♀

brownish tone are widely variable. In most specimens from A4 or 5 apically gradually turning to brown to dark brown above, underside always pale. Other ferruginous areas: clypeus apically broadly, mandible (apically dark brown), palpi, pronotal collar on top including posterior part, tubercle, often outer margin of lamina, tegula and basal plates of wings, gastral petiole except dorsal side (apex ferruginous), G2 and 3 wholly, apical margins of G4 and 5 and whole of G6, fore leg except greater part of coxa and arolium (both black), mid leg except base of coxa, arolium (black), broad median area of femur (brown - dark brown) and T2-5 or 3-4 (brown) and hind leg on apex of coxa, whole of trochanter, both ends of femur, tibia except apical portion, and spurs; rest of femur and tibia of hind leg brown or dark brown. Hair golden, on clypeus at base curved towards medial line, on thorax-complex not dense and at baso-lateral areas of propodeum showing tendency to curl.

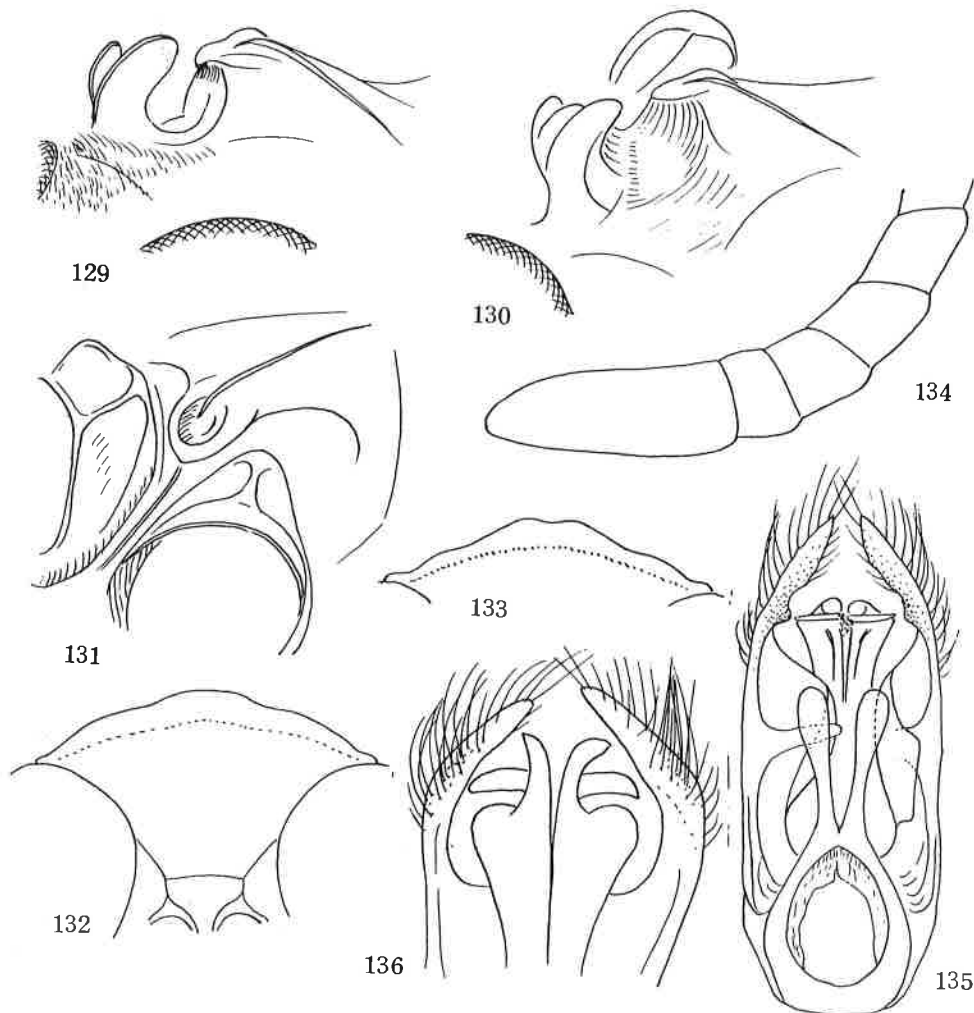
Head in frontal view strongly roundly narrowed below, roughly subtriangular, $W:l=100:88$, vertex strongly depressed, eye incisions markedly narrow and deep, upper margins slightly more raised than in a line towards apex, $HW, HL, IODv, A3, P=100, 48, 23, 30, 196$; $OOD, Od, POD=2, 5, 3$; $IODs=10:7.5$; $A3=AW \times 5.5$. Frontal elevation seen in profile only gentle as compared with level of eye, but the elevations on both sides of medial furrow, rounded in outline, are marked, due to deep excavation of the furrow, SAT moderately high nasiform, sides tectate, not flat, but somewhat roundly up-curved, median carina long, at anterior end enlarged to flat round smooth area, obliquely inclined, carrying a large fovea on it (Fig. 125, seen obliquely from beneath), verge to PAF at inner part (= margin of flat and foveate area) only edged, PAF moderately deep, flat-bottomed, but at outer end curved down (in some direction appears upcurved), U-shaped in cross section (Fig. 123, dorso-lateral view to see through PAF), ASR highly raised, not strongly extended anteriorly, distinctly carinate at apical margin, dorsum smooth and shining (Fig. 123), ASR-SAT in lateral view: Fig. 124, clypeus: Fig. 126, sometimes medio-apical prominence weaker (Fig. 127), at base roundly elevated and at apex reflected; occipital carina complete, not incised behind buccal cavity. Pronotal collar in frontal view roundly, subtriangularly raised and weakly tuberculate in middle, in dorsal view fore margin broadly roundly emarginate and anterior part gently incrassate laterally, lamina on side: Fig. 128; subalar area with half developed pent-roof structure, lateral margin a little produced and acutely edged, but not curved down, vertical wall of subalar pit that is half covered with produced margin of subalar area is flat, without rugosed high carinae crossing there. Propodeum with distinct lateral carinae, area dorsalis enclosed with shallow broad but distinct furrow, area apicalis enclosed with carina except medio-dorsal area, varying in width, sometimes nearly completely closed, sometimes widely open, GSR roundly and highly elevated and discoloured at apical area.

G1 distinctly flask-shaped, P, Ma, Mi, 2(Ma), 3(Ma)=100, 15, 5, 23(18), 26(24), RC C-type, but near to M-type, R1 very short, CV1=CV2×7, TCV:CV2≐5:3, TCV gently sinuate, angle roughly 105°.

Frons microcoriaceous and superimposed with fine punctures, punctures posteriorly sparse and anteriorly closer, surface nearly mat, SAT posteriorly covered with punctures, but fairly shining, anteriorly smooth; mesoscutum fairly closely covered with comparatively large punctures, in some specimens under high magnification PIS delicately microcoriaceous, in others not. Propodeum with series of striae along lateral carinae, anteriorly indistinct, but from about middle posteriorly distinct and close, area dorsalis at base with a transverse narrow smooth furrow which is only in median area crenate, median furrow transversely striate, disc finely, fairly closely punctured, punctures weak, indistinct in outline, sides smooth and polished, sometimes with indistinct weak striae or punctures on central area, posterior haired area covered with striae and punctures.

♂. In the key to the Indo-Malayan species it runs to fulvocollare — antennatum, but differs from either of them.

13-14 mm. In colour similar to ♀, except that antenna is wholly ferruginous (slightly brownish apically) and mid T1 brown. G7 ferruginous as on G6. In structure and



Figs. 129-136. Trypoxylon javanicum sp. nov., ♂

punctuation also generally similar. Head in frontal view similar in outline, W:L=100:84 vertex slightly broader, less strongly depressed, eye incisions broader, with upper margins somewhat inclined below towards apex. Measurements in 2 of them (one in parentheses) are as follows: HW, HL, IODv, A3, Al3, P=100, 50, 25, 21, 22, 174 (100, 50, 25, 20, 182); OOD, Od, POD=1, 2, 1 (do.); IODs=10:9 (do.); A3=AWx3 (do.); Al3=BWx3 (x2.8); P, Ma, Mi, 2(Ma), 3 (Ma)=100, 14, 5, 26(17), 26(22) (100, 13, 5, 26(15), -(-)). RC C-type, CVI=CV2x7, TCV incurved, TCV:CV2=5:3, angle at base nearly 90° (both do.).

Frontal elevations and medial furrow similar, SAT similar in raised state and medio-apical foveate area, but the side against ASR deeply excavated, hence PAF becomes U-shaped or rather oviform in cross section (Figs. 129, 130), ASR highly raised, bicarinate on top, posterior carina triangularly extended posteriorly and reflected, in dorso-lateral view: Fig. 129, similar but somewhat higher view: Fig. 130, in ventro-lateral view: Fig. 131; clypeus: Fig. 132, sometimes apical margin as in Fig. 133, apical part of antenna: Fig. 134. Pronotal lamina, mesopleuron, propodeum similar.

Genitalia seen from beneath: Fig. 135, paramere simple at apex, outer margin of its main body strongly produced inwards at about mid point of its length (Fig. 135, left paramere), just as in *khasia*-group, inner margin broadly expanded, lamellate and rolled ventrally (Fig. 135, right paramere), volsella spatulate, penis valve with shoulder and sickle-shaped appendage near apex (Fig. 136, dorsal view).

Holotype: ♀, West Java, Mt. Gedeh, Sitoegoeng, 1100 m, 16-20. IX. 1940, J. van der Vecht (RMNH).

Paratypes: 32 ♀ 3 ♂, West Java: 9 ♀, Mt. Gedeh, 3-7000 ft, VIII, IX. 1937, M. E. Walsh (RMNH); 3 ♀, Mt. Gedeh, Perliawatte, 4-5000 ft, X, X. 1937, I. 1938, M. E. Walsh (RMNH); 2 ♀, Mt. Gedeh, tjibodas, 450 m, 25. XI. 1938, 9. IV. 1950, J. van der Vecht (RMNH); 3 ♀, Mt. Gedeh, Tapos, 800 m, 4-5. III. 1933, 700 m, VIII. 1933, 1000 m, 20-26. I. 1933, J. van der Vecht (RMNH); 1 ♂, Mt. Bentang, III. 1938, J. van der Vecht (RMNH); 2 ♀, Salatry, I. 1938, M. E. Walsh (RMNH); 1 ♀, South Bantam Bajah, 300 ft, I. 1938, M. E. Walsh (RMNH); 3 ♀, Mt. Malang, 3-4000 ft, III. 1937, I. 1938, M. E. Walsh (RMNH); 1 ♀, Djampang Mts., Tjekarang, III. 1937, M. E. Walsh (RMNH); 1 ♂, Djampang Mts., Tjigaeha, II. 1938, M. E. Walsh (RMNH); 1 ♀, Middle Djampang, date ?, M. E. Walsh (RMNH); 1 ♀, Middle Djampang, Bibidjilan, VII. 1937, M. E. Walsh (RMNH); 1 ♀, Middle Djampang, Mt. Tjigeng, XII. 1937, M. E. Walsh (RMNH); 1 ♀, East Djampang, Mt. Melang, 3-7000 ft, M. E. Walsh (RMNH); 1 ♀, East Djampang, II. 1936, J. van der Vecht (RMNH); 1 ♀, Djampang Soekanegara, 900 m, 22. IX. 1939, J. van der Vecht (RMNH); 1 ♀, Mt. Salak, Kloot, 900 m, X. 1936, F. Dupont (RMNH); 1 ♀, W. Preanger, South Soekaboemi, IV. 1933, J. van der Vecht (RMNH); 1 ♀, Mt. Pantjar, buitenzorg (now Bogor), X. 1936, F. Dupont (RMNH); 1 ♀, ? Buitenzorg, 700 m, 9. II. 1936, F. Dupont (RMNH). 2 ♀, East Java: 1 ♀, Tengger Highlands, Nongkodjarjar, 1100 m, V. 1938, M. E. Walsh (RMNH); 1 ♀, Blawan, 20. VIII. 1941, H. Luft (RMNH).

Other specimens. 1 ♀, Java, V. 1936, M. E. Walsh & J. Elalimann ? (RMNH) (gaster lacking); 1 ♀, Java, -, Muller (RMNH) (head lacking); 1 ♀, Djasinga Toge, 20. VIII. 1939, J. van der Vecht (RMNH) (gaster lacking).

Remarks. In two paratype males (1) gaster completely, (2) from G2 apically lacking.

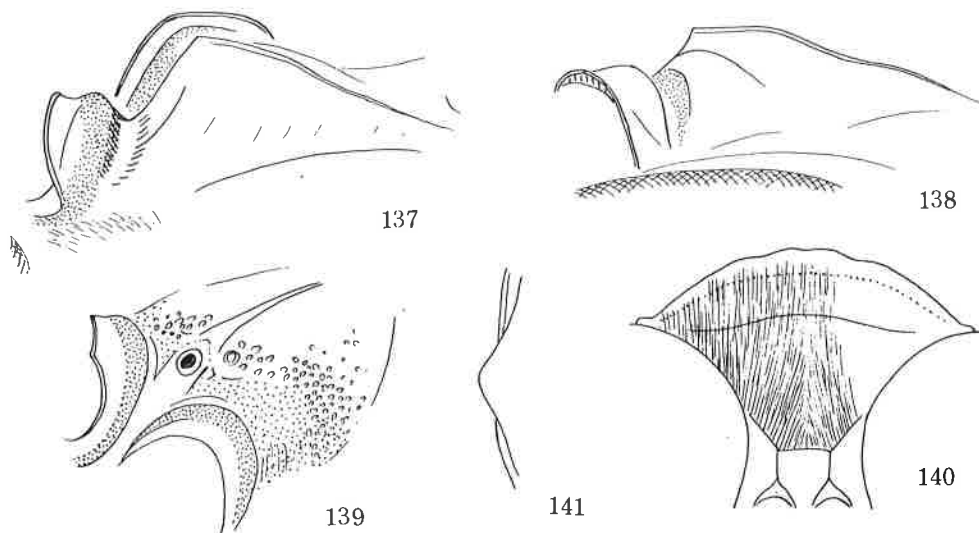
28. TRYPOXYLON BUEHLERI sp. nov.

The present species (♀) is characteristic among the golden haired relatives in having the antenna, collar, gaster and legs completely ferruginous; PAF moderately deep and up-curved, clypeus almost simply rounded out, IODs=3:2, propodeum with lateral carinae and G1 flask-shaped.

About 12 mm. Black; ferruginous are antenna wholly, apical area of clypeus broadly, mandible, palpi (ochre yellowish), collar completely, tubercle, anterior margin of nape region, lamina, tegula, basal plates of wings, gaster and legs; tubercle and tegula rather yellow, extreme base of coxae and arolia black, mid and hind tarsi apically slightly brownish. Hair golden, on clypeus at base somewhat convergent towards medial line, but as a whole nearly parallel (Fig. 140).

Head in frontal view markedly wider than long (100:86), with sides rounded and slightly convergent below, vertex moderately depressed, eye incisions narrow, deep, with upper margins of both sides in a line, but at apical third inclined below. HW, HL, IODv, A3, P=100, 48, 24, 26, 164; OOD, Od, POD=2, 6, 3, 5; IODs=10:7; A3=AWx5, occipital carina complete. Frontal elevations gentle, oval in outline, medial furrow broad and

deep, on anterior area broadly enlarged to round shallow excavation (with shining bottom-line in middle); SAT low nasiform, near to tuberiform, distinctly and long carinated in middle, carina enlarged at apical end to obliquely inclined round flat area, carrying a large fovea on it, the area flatly extended below till lower end of IAA, thus there is no impressed IAF (Fig. 139), ASR transversely constricted across middle, anterior part ambur yellow and carinated at apical margin, posterior part brown and roundly raised (Fig. 137, dorso-lateral view to see through PAF), dorsal surface smooth



PAF moderately deep, with bottom line up-curved, wide V-shaped in cross section, with sinus rounded and at inner end absorbed by medio-apical flat area of SAT (Fig. 139, seen obliquely from beneath), the structure seen in profile: Fig. 138. Clypeus: Fig. 140, disc broadly roundly tectate, apical area broadly, fairly strongly reflected. Pronotal collar gently roundly raised in frontal view, without tubercle in middle, in dorsal view weakly roundly enlarged laterally, lamina on side: Fig. 141, posterior part discoloured and ferruginous; subalar area of mesopleuron acutely edged at outer margin and somewhat produced laterally, but not widely expanded to pent-roof structure. Propodeum with lateral carinae, area dorsalis enclosed with broad shallow furrow, medial furrow fairly deep, posteriorly enlarged to elongated oviform excavation, area apicalis comparatively long, triangular, with lateral carinae gently rounded, at the top the carina broadly interrupted by the apex of medial furrow of posterior inclination, GSR highly raised, ambur yellow in colour, Gastral petiole distinctly flask-shaped, semitransparent ferruginous, P, Ma, Mi, 2(Ma), 3(Ma)=100, 17, 6, 28(20), 28(30), RC M-type, R1 short, CV1≠CV2×5, TCV gently sinuate, CV2 down-curved, ratio ≅5:3, angle at base about 100°, CV2 shortly produced beyond angle.

Frons distinctly microcoriaceous and fairly closely, somewhat irregularly superimposed with feeble punctures, punctures posteriorly weaker and anteriorly somewhat stronger and partly subrugosely confluent. Mesoscutum finely, rather sparsely punctured with PIS 2-3 times PD and under high magnification very delicately microcoriaceos; propodeum almost without series of striae along lateral carinae (apparently present, due to transversely appressed hair, but when hairs are removed only a few weak striae can be seen, but the state may vary), area dorsalis smooth, with only a few faint striae on medial furrow.

♂, unknown.

Holotype: ♀, Is. Sumba, Central District, Lindiwatju, 10. X. 1949, A. Bühler and E. Sutter. (NHMB)

Remarks. The present species is apparently similar to *rufigaster* m., but differs from this in the foveate SAT, oviform PAF and in the colour of legs.

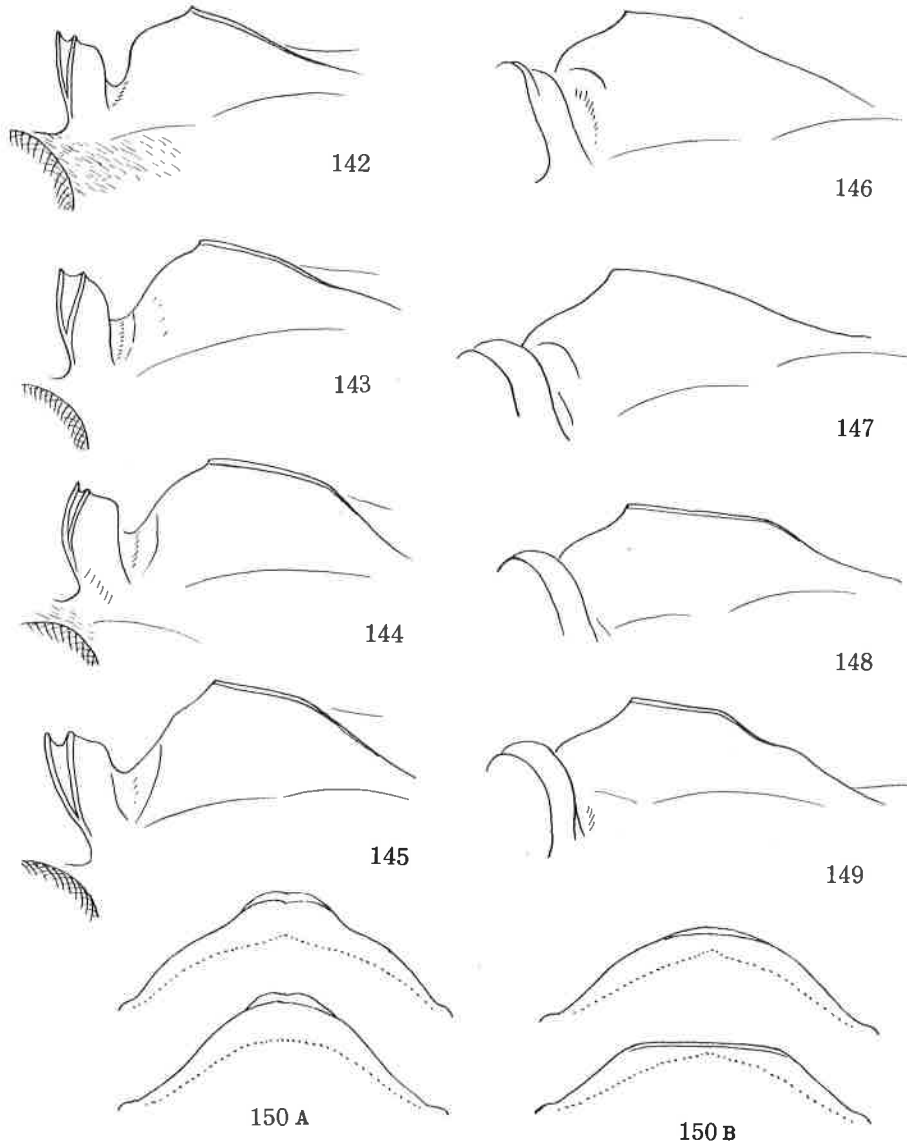
29. TRYPOXYLON KALIMANTAN Menke, 1976

Trypoxylon annulipes Cameron, J. Str. Br. R. Asiat. Soc., 39: 164, 1903 (nec Taschenberg, 1875) (♀, Borneo: Sarawak, Mt. Matang).

Trypoxylon kalimantan Menke, in Bohart & Menke, World Sphecid., p. 346, 1976 (nom. nov.)

Trypoxylon annulipes (= kalimantan Menke): Tsuneki, SPJHA, 8: 48, 1979 (redescr. type, figs.)

Specimens examined: 1 ♀, West Java, Djampang Mts., Tjigaaha, II. 1938, M. E. Walsh (BMNH); 1 ♀, West Java, Buitenzorg (now Bogor), 1901, ? (BMNH); 2 ♀, West Java, Radjamandala, IX. 1907, E. Jacobson, III. 1938, J. van der Vecht (BMNH); 1 ♀, West Java, Mt. Gedeh, Sitoegoeng, 1000 m, 21. II. 1937, J. van der Vecht (BMNH); 1 ♀, Java, Mt. ? , M. E. Walsh (BMNH).



Figs. 142-150. Trypoxylon kalimantan Menke, ♀

Remarks on the Javanese specimens.

Apical margin of clypeus in the young specimens black and incrassate in middle, showing a form as in the holotype (Figs. 150 A), while in the semile specimens the colour turns into brown (never ferruginous) and apical margin are rubbed down to simply rounded or even truncate (Figs. 150 B); disc at base roundly raised and reflected at apex, basal hair markedly sinuately curved towards medial line.

Gaster from apex of G1 (on sides considerably extended forwards) to G3 ferruginous red, with a large dark brown or black mark on each tergite.

Antenna black, A1 and 2 at each apex narrowly brown.

SAT low broad nasiform, long carinated in middle, the form seen in profile more or less varied (Figs. 146-149, corresponding respectively to Figs. 142-145), medio-apical area with a small round flat area in front of the apex of carina and then obliquely inclined to IAF.

PAF deep (slightly varied in degrees) with bottom line either flat or gently up-curved, V- or narrow V-shaped in cross section (Figs. 142-145, corresponding respectively to Figs. 146-149). ASR always transversely bicarinate.

Lateral carinae of propodeum are intermediate between absence and presence, lateral ends of impressed lines forming a series of striae appear like a weak longitudinal line and the area just outside the line also appears like an elevated line, namely a carina. The Javanese specimens examined can be classified rather to be "present".

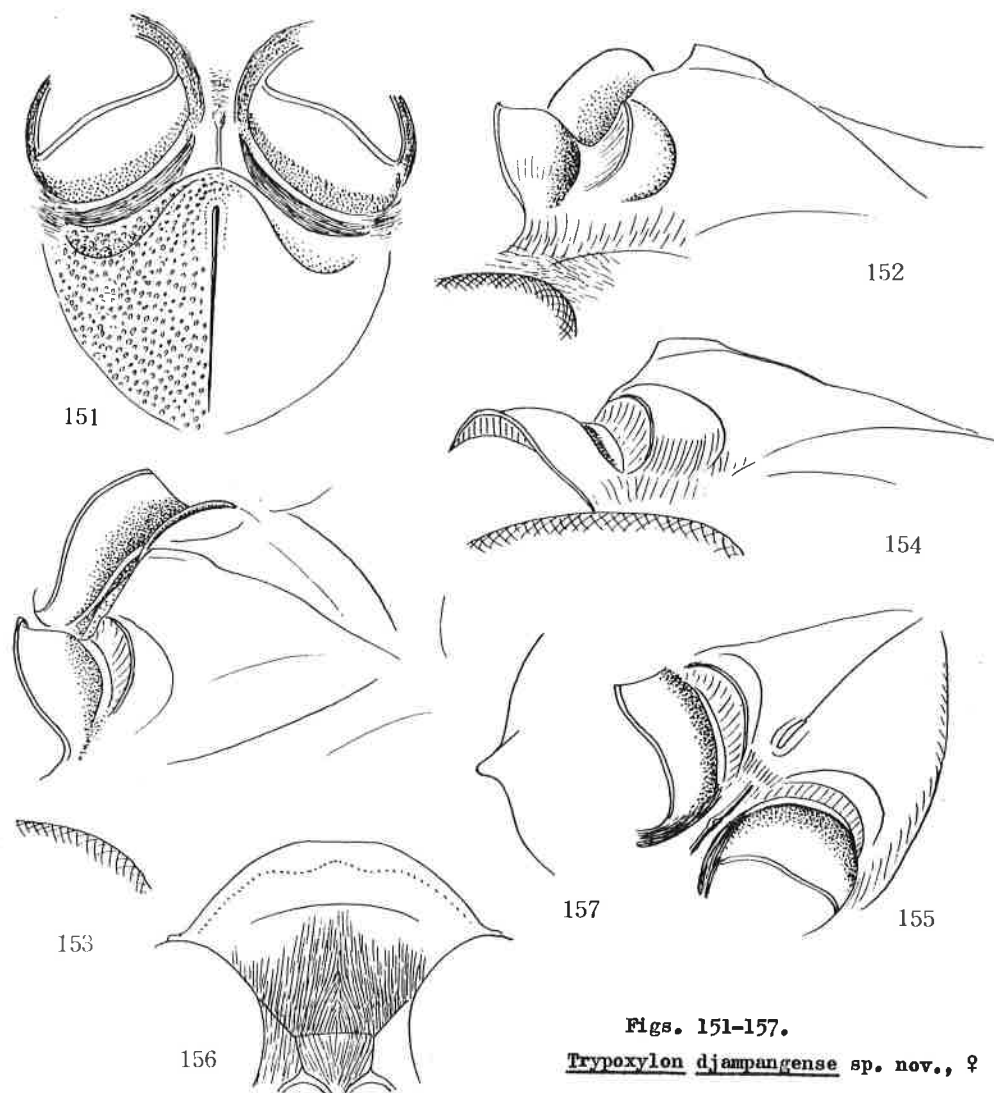
RC is also intermediate between B- and C- types, CV1:CV2=7-8, TCW:CV2=3:2 - 5:3, angle roughly about 100°.

30. TRYPOXYLON DJAMPANGENSE sp. nov.

In the key to the Indo-Malayan representatives the present species runs to speciosus-ornatigaster couplet, but differs from both of them in the structure of SAT-ASR and in some other characters (clypeus, vertex, mesoscutum and colour of legs) from either of them.

♀. About 16 mm. Black; yellowish ferruginous are A1 and 2, apical 2/5 of clypeus, mandible (apically brown), palpi (ochre yellowish), discoloured posterior part of collar (dusky yellow), tubercle, tegula, apical margin and apical sides of G1, whole of G2, parts of G3 (base broadly and apex narrowly of tergite), apical margins of G4 and 5, fore leg except base of coxa and arolium, mid femur at base and apex, -tibia wholly, base of T1 (apex of coxa and whole of trochanter pale brown) and broad basal area of hind tibia (articulations of hind leg pale brown). Hair golden, on clypeus dense and at base convergent medially, on thorax and propodeum not dense, at baso-lateral area of dorsal aspect of propodeum sparsely curled.

Head in frontal view rounded (W:L=100:86), with sides slightly roundly convergent below, vertex very narrow and markedly depressed, upper eye margin roundly elevated, eye incision comparatively narrow, nearly parallel-sided, with sinus comparatively broadly rounded, upper margins of both incisions in a line, or rather slightly raised outwards. HW, HL, IODv, A3, P=100, 47, 19, 26, 156; OOD, Od, POD=2, 6, 3; IODs=10:11; A3≠AW×5; Frontal elevation weak (as usual in this group), medial furrow broad and deep, elevations on both sides of the furrow gently rounded, SAT short broad nasiform, wider than long, medially long carinated (Fig. 151, vertical view), medio-apical area obliquely roundly, not smoothly inclined to IAF, verge to PAF incrassate and raised, with margin acutely carinated, ASR obliquely raised towards apex, apical area broadly amber yellow in colour, PAF moderately deep, with bottom line smooth, shining and flat, at inner end roundly inclined and joined to IAF, at outer end strongly inclined outwards, roughly V-shaped in cross section, with sinus narrowly rounded, in dorso-lateral view to see through PAF: Fig. 152, seen slightly higher: Fig. 153, in lateral view: Fig. 154 and in ventro-lateral view: Fig. 155. Clypeus: Fig. 156, disc at base gently roundly elevated, apical margin broadly reflected (in the specimen apical margin seems to be abraded, it may have median prominence in fresh condition as in allied species); occipital carina complete, broadly shallowly emarginate behind buccal cavity, collar of pronotum gently roundly raised medially in frontal view and weakly tuberculate in middle, lamina on side: Fig. 157; subalar area with half-developed pent-roof structure, lateral margin of the area acutely edged and slightly produced, but not expanded into lamellate pent-roof; propodeum with distinct lateral carinae, area dorsalis practically without lateral furrow, area apicalis in a rounded triangle, top area interrupted by the extension of the medial furrow of posterior inclination, GSR roundly highly raised, broadly discoloured. P distinctly flask-shaped, P, Ma, Mi, 2(Ma), 3(Ma)=100, 18, 6, 32(22),



Figs. 151-157.

Trypoxylon djampangense sp. nov., ♀

34(32). RC M-type, Rl short, $CV1=CV2 \times 5$, $TCV:CV2 \approx 4:3$, TCV sinuate, angle roughly about 110° .

Frons distinctly microcoriaceous and somewhat sparsely superimposed with comparatively large, flat-bottomed distinct punctures, surface half mat, SAT closely covered with similar punctures, PIS smooth and shining, mesoscutum with strong aeneous shine, mat, with sparse fine, very indistinct punctures. Propodeum along lateral carinae with a longitudinal zone of close hair-bearing punctures, mixed posteriorly with sparse striae, area dorsalis on median furrow transversely striate, on disc sparsely covered with fine hair points, sides somewhat sparsely covered with hair-bearing punctures, PIS smooth and shining.

♂, unknown.

Holotype: ♀, West Java, Middle Djampang, 1934, M. E. Walsh (RMNH).

31. TRYPOXYLON ORNATIGASTER Tsuneki, 1979

Trypoxylon ornatigaster Tsuneki, SPJHA, 9: 105, 1979 (♀, Malaya).

Specimen examined: 1 ♀, Sumatra, Paganbaru, V-VI. 1963, O. Milton (RMNH).

Remarks. Well agrees with the holotype from Malaya not only in structure, but also in colouration. Especially the constancy of the black maculation on the yellow legs is impressive, because it is very characteristic: Coxae except apex, fore and mid trochanters largely, fore and mid femora above, hind femur wholly, median third of hind tibia except inner side, hind Tl-3 and all arolia. Hind T4-5 brown, 5 especially pale. A3,4,5=10,6.5,6. Eye incision narrow, convergency towards bottom weak, bottom rounded, upper margins of both sides almost in a line in frontal view. SAT in lateral view: Fig. 158.

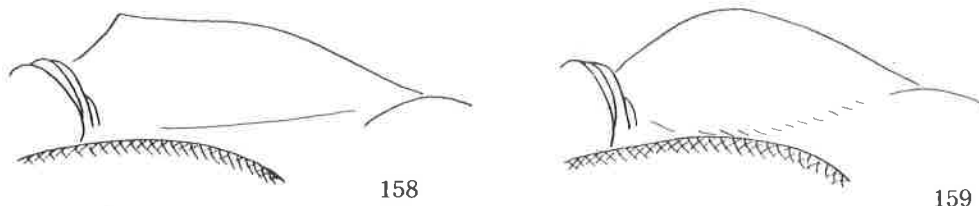


Fig. 158. Trypoxylon ornatigaster Tsuneki. Fig. 159. Trypoxylon sumbanicola sp. nov.

32. TRYPOXYLON SUMBANICOLA sp. nov.

♀. Fundamentally having the same structure and colouration as the preceding species and may be in the subspecific relationships with this. The fact should finally be determined, however, when the males of the two species (especially the genitalia) are comparatively studied and the variation ranges of characters of the two are made clear. Here, basing upon the following differences they are separated at the species rank:

1. SAT tuberiform, roundly raised, median carina long curved (Fig. 159, lateral view, cf. Fig. 158 in ornatigaster).
2. Subalar area of mesopleuron with edged lateral margin more distinctly produced sideways, though not lamellately expanded into pent-roof structure.
3. A4-11 slightly constricted at each base and apex (in ornatigaster not constricted).
4. IODs=10:8.5 (10:10-11).
5. Gastral petiole semitransparent ferruginous, only on apical swollen area black (completely black, only extreme apex and sides of apical swelling ferruginous).
6. A1-3 yellow (A1-2 only yellow).
7. Hair deep golden (brassy)
8. Bright coloured areas of gaster and legs reddish yellow, only partly lemon yellow (wholly lemon yellow).

Lemon yellow parts of legs: Apices of femora, whole of tibiae of fore and mid legs, fore Tl-5, mid Tl-2 and broad base and apex of hind tibia. Tibial spurs of fore and mid legs ferruginous, those of hind leg reddish brown; coxae except apices, hind femur and Tl-3 black, elongate marks on fore and mid femora (shorter than in ornatigaster), middle mark on hind tibia and rest of tarsi brown or dark brown. Gaster with G1 and 2 (1 with a small blackish mark, 2 with a large one beneath) and apical margins of G4 and 5 yellowish. Hair dense on thorax and propodeum also (posterior part of collar, sides of mesoscutum, scutellum, whole of postscutellum, mesopleuron - somewhat sparse -, dorsal aspect of propodeum, apical areas of its sides), at base of clypeus distinctly convergent towards medial line and on baso-lateral areas of propodeum curled.

Head in frontal view as in ornatigaster (with lateral margins roundly convergent below, vertex not noticeably depressed, eye incision narrow, convergency towards bottom weak, bottom broadly rounded, upper margins of both sides in a line), W:L=100:86,

HW, HL, IODv, A3, P=100, 44, 26, 24, 136; OOD, Od, POD=2, 3, 2; IODs=10:8.5; A3, 4, 5=10, 6, 6; PAF shallow, wide, V-shaped in cross section, but bottom flat and strongly curved down at outer end (in *ornatigaster* up-curved, but this may vary in both species), ASR tricarinate on top. P, Ma, Mi, 2(Ma), 3(Ma)=100, 21, 8, 40(30), 44(42); RC M-type, CV1=CV2×5.5, TCV: CV2÷4:3, angle at base about 90°, GSR highly raised, honey yellow in colour.

Mesoscutum with plumbeous shine, finely, somewhat sparsely punctured, PIS shining. Length 13 mm.

♂, unknown.

Holotype: ♀, Central Sumba, Lindiwatju, 10. X. 1949, Drs. A. Bihler and E. Sutter leg. (NIMB).

33 a. TRYPOXYLON PENANGENSE Tsuneki, 1979

Trypoxylon penangense Tsuneki, SPJHA, 9: 99, 1979 (♀ ♂, Is. Penang, Malaya, Singapore and Laos).

Specimen examined: 1 ♀, West Java, Buitenzorg (now Bogor), VI. 1920, -? (RMNH).

Remarks. The specimen examined differs from the typical form from Malaya (including Penang) and Singapore in that all the legs are till near apex of femora black and hind tibia except base and hind tarsus largely are brown or dark brown. In the Laotian specimens (♀♂) the legs are fairly darkened like the present specimen, but less in degree than in this.

From the specimen the gaster is lacking, but on one of the labels attached "Trypoxylon gracilescens Sm." is written with pencil by some entomologist. Judging from this the specimen must have had the gaster at least broadly ferruginous. Measurements:

HW, HL, IODv, A3, P=100, 48, 23, 24, -; OOD, Od, POD=2, 7, 6; IODs=10:8; A3=AW×4.5; Head in frontal view wider than long (W:L=100:86), with sides roundly, fairly strongly convergent below, vertex moderately depressed, eye incisions comparatively deep, nearly parallel-sided, sinus narrowly rounded, upper margins nearly in a transverse line.

Supplements to the description of ♂.

The male of the present species was described with 6 specimens from Laos. Except for the characters common with ♀, stress was placed on the structure of clypeus, antenna, genital organs and sternite 8, and the variations in IODv and IODs and characters of G1, 2, 3 were neglected. These are supplemented as below:

- (1) IODv to HW as 100 (from Nos. 1 to No. 6)
26 26 26 26 28 26
- (2) IODs (relative IODc to IODv as 10) (from No. 1 to No. 6)
7.5 8.0 8.0 7.5 7.7 8.0
- (3) P (relative length of petiole to HW as 100) (from No. 1 to No. 6)
122 116 106 116 100 110
- (4) G1, G2, G3.

No.	Ma	Mi	2 (Ma)	3 (Ma)	(to P as 100)
1	19	7	40 (26)	42 (38)	
2	20	8	36 (30)	40 (44)	
3	23	10	40 (34)	42 (48)	
4	22	8	34 (36)	36 (44)	
5	28	11	42 (46)	42 (61)	
6	30	12	32 (34)	38 (54)	

Of the above the relative length and width of gastral segments 1, 2, 3 are markedly variable, for instance, P, it is usually about 5 times as long as wide at maximum, but sometimes only 3 times so. This is due to that the petiole is extended after final ecdysis and when suppressed by the environmental condition it can not be extended to full length of hereditary character.

Gastral colour of the species.

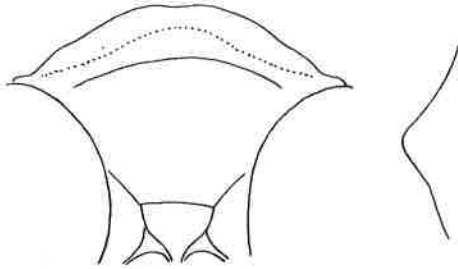
In the typical specimens gaster wholly ferruginous, with a small brown patch in front of apical swelling of petiole, but frequently G4-5 or G4-6 more or less black stained, this is due to postmortem change. In the male frequently the petiole is completely ferruginous, without brownish patch.

This species is easily separable from allied congeners by the structure of SAT.

33 b. TRYPOXYLON PENANGENSE SUTTERI sp. nov.

♀. About 11 mm. A single female specimen collected in Sumba differs from the typical ones as follows:

1. Gaster completely ferruginous red, without dark mark on or before the apical swelling of petiole and not darkened apically.
2. Legs, except coxae, a line above each trochanter and arolia, completely reddish ferruginous.
3. Punctures on mesoscutum much larger and closer.
4. Area dorsalis more distinctly enclosed with crenate furrow (in form nearly circular).



160

161

Head in frontal view with sides roundly, slightly convergent towards clypeus, $W:L=100:88$, vertex not markedly depressed, eye incisions similar to typical race. $HW, HL, IODv, A3, P=100, 48, 23, 24, 120$; $OOD, Od, POD=2, 7, 4$; $IODs=10:9$; $A3=AW \times 5$; $P, Ma, Mi, 2(Ma), 3(Ma)=100, 26, 8$ (at extreme base), $37(38), 36(48)$. RC M-type, RI short, thick, $CV1=CV2 \times 7$, $TCV:CV2=2:1$, TCV nearly straight.

SAT-ASR similar (cf. Figs. 376-378 of Pt. III.). Clypeus: Fig. 160, with hair at base weakly convergent towards median line; lamina on side of pronotum (Fig. 161) similar to that of typical race.

♂, unknown.

Holotype: ♀, Central Sumba, Lindiwatju, 10.X.1949, A. Mihler and E. Sutter leg. (NHMB).

34. TRYPOXYLON SIBOLANGITUM sp. nov.

♀. Closely resembles in appearance T. errans Saussure, but is different from this in the main in the following characters:

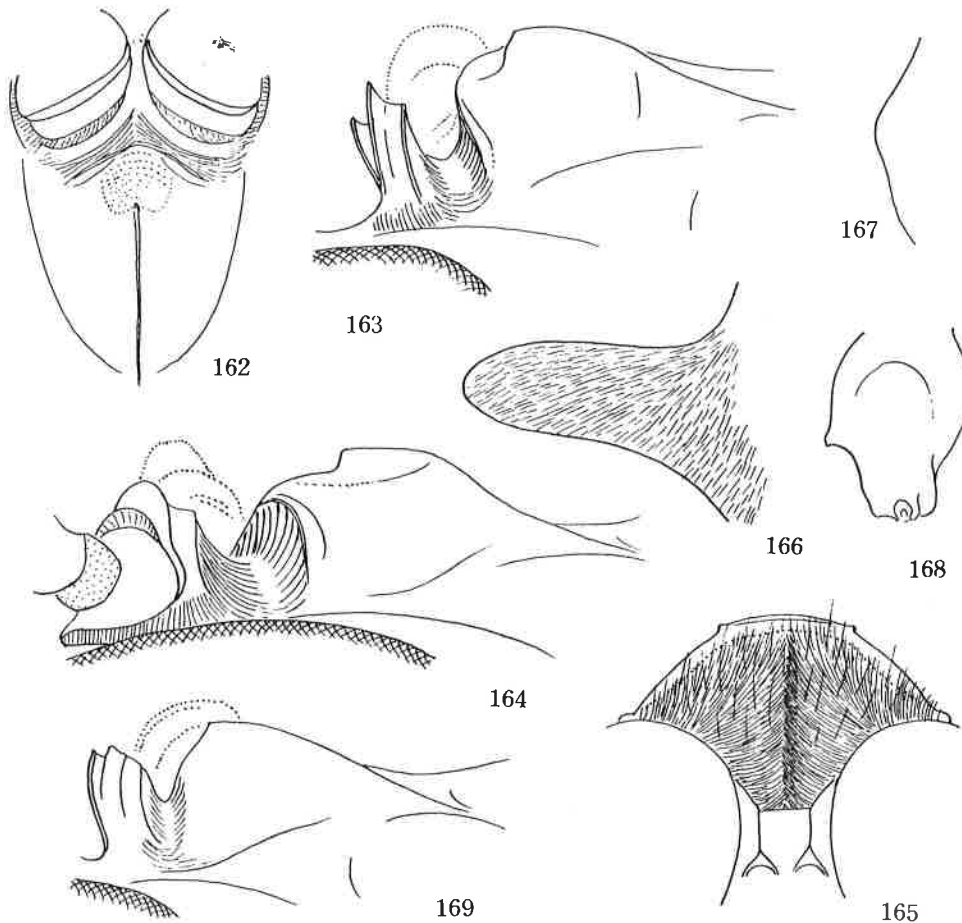
1. Much larger, about 14 mm.
2. Frons more distinctly bituberculate, with median furrow deeper, surface more sparsely superimposed with punctures and appears smoother.
3. SAT higher nasiform, more sparsely covered with hair, with a subtriangular and nearly flat step in front of apex of median carina, then acutely inclined to IAF, at verge to PAF edged and somewhat incrassate, ASR more acutely and more highly elevated (Figs. 162, 163, cf. Fig. 169 in errans).
4. Clypeus distinctly tectate, medianly carinated, with hair strongly convergent medially, forming a hair ridge in middle, apical margin trapeziform, median area gently curved, with its lateral corners distinctly angulate and slightly produced (Fig. 165).
5. A1 and 2 and underside of 3 yellow.
6. Mesoscutum more finely and more sparsely punctured, with surface more shining.
7. Sides of propodeum smooth and polished, only apical area transversely striate, with scattered punctures between striae (in errans closely covered with comparatively large punctures).

♀. About 14 mm. Black; ferruginous yellow are A1 and 2 wholly, 3 beneath, mandible at base (rest slightly brownish), palpi, tubercle wholly, tegula (transparent) and basal plates of wings, fore and hind coxae at apex, greater part of mid coxa, fore trochanter except brown streak above, mid trochanter wholly, inner side of hind trochanter, bases and apices of fore and mid femora, fore and mid tibiae except inside, hind tibia at base, fore and mid tarsi except arolia and all tibial spurs. Gaster from apex of G1 (on sides somewhat extended forwards) to G3, G4-5 broadly beneath and whole of G6 reddish yellow, G2 and 3 with a brown mark above.* A3 brown above, clypeus dark brown at

* It seems probable that gaster is, except G1, sometimes wholly ferruginous red.

apical area, mid tarsus slightly brownish apically, rest of hind trochanter brown, hind tarsus with articulations and parts of T4 and 5 ferruginous. Hair silvery.

Head in frontal view with sides roundly narrowed below, W:L=100:94, vertex not markedly depressed, eye incisions comparatively narrow and deep, nearly parallel-sided and apically roundly convergent (Fig. 166), upper margins except apical area in a transverse line. HW, HL, IODv, A3, P=100, 56, 25, 23, 196; OOD, Od, POD=2, 4, 3; IODs=10:5; A3=AWx4.5; A3, 4, 5=10, 6, 5, 5, 5. Frontal elevations suboval in outline, roundly raised above level of eye in lateral view, SAT-ASR in vertical view: Fig. 162, in dorso-lateral view to see through PAF: Fig. 163, in lateral view: Fig. 164, PAF deep, U-shaped in



Figs. 162-168. Trypoxylon sibolangitum sp. nov., ♀

Fig. 169 Trypoxylon errans Saussure, ♀

cross section, flat-bottomed, but at outer end curved down. Occipital carina complete, not incised nor depressed behind buccal cavity. Collar comparatively thick, in frontal view subtriangular above, rounded in middle, not tuberculate, in dorsal view somewhat incrassate laterally, lamina on side: Fig. 167; subalar area of mesopleuron with half developed pent-roof structure, lateral margin acutely edged and slightly produced, but not lamellately expanded. Propodeum with lateral carinae, not strong, area dorsalis enclosed with smooth distinct furrow, area apicalis completely enclosed with carina, GSR roundly highly raised, transparent yellow. P distinctly flask-shaped, very slender and long. P, Ma, Mi, 2(Ma), 3(Ma)=100, 12, 4, 28(18), 30(23). RC M-type, R1 very short, CVL $\frac{1}{2}$

CV2×4.5, TCV slightly sinuate, TCV:CV2=3:2, angle roughly about 110°. Hind coxal tubercle well developed (Fig. 168, right coxa from inside).

On propodeum lateral series of striae distinct, striae close, but area dorsalis completely smooth.

♂, unknown.

Holotype: ♀, North Sumatra, Sibolangit, 500 m, 4. I. 1955, J. van der Vecht (RMNH).

35. TRYPOXYLON NGUM Tsuneki, 1979

Trypoxylon ngum Tsuneki, SPJHA, 9: 111, 1979 (♀♂, figs. Laos, Thailand, Malaya - Penang).

Specimen examined: 1 ♀, North Sumatra, Sibolangit, 600 m, 4. I. 1955, J. van der Vecht (RMNH).

Remarks. In the present specimen the red colour on median area of gaster turned to brown and confined to underside only, as in some of the specimens used in the description. Mound-like elevation around the medial carina of SAT is marked, apical margin of clypeus: Fig. 170. Measurements: HW, HL, IODv, A3, P=100, 50, 20, 24, 200; OOD, Od, POD=1, 6, 3, OOD very narrow, IODs=10:10, A3=AW×4.5, A 3, 4, 5=10, 7, 6, head in frontal view wider than long, W:L=100:86, with sides rounded, almost not narrowed below, vertex moderately depressed, eye incisions narrow, deep, slightly convergent outwards, sinus rounded, upper margins somewhat raised sideways above transverse line.



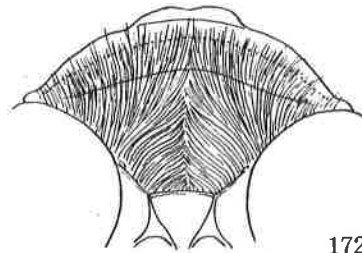
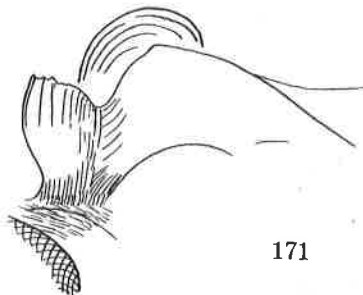
P, Ma, M1, 2(Ma), 3(Ma)=100, 11, 4, 27(14), 31(22), apical swelling of P rather gradual, but stalk part very long, as a whole markedly slender.

36. TRYPOXYLON STRIOLATUM Tsuneki, 1979

Trypoxylon striolatum Tsuneki, SPJHA, 9: 113, 1979 (♀, figs, Singapore, Laos).

Specimens examined: 1 ♀, Sumatra, Sibolga, VIII. 1913, E. Jacobson (RMNH); 1 ♀, West Java, Mt. Halimoen, 4-5000 ft, XI. 1937, M. E. Walsh (RMNH).

Remarks. In two specimens above listed mesoscutum with plumbeous shine, in the Javanese one mat, in the Sumatran not mat, in both punctures finer and sparser than in



the typical one and PIS without microsculpture (in the Javanese very faintly observed under 50x magnification). Sides of propodeum in the Javanese specimen fairly closely covered with distinct punctures on posterior half, while in the Sumatran almost without puncture. Clypeus similar in form to that of the type, worthy of mention is that the hair on basal half strongly curved towards medial line.

Length 11 (Sumatran), 12.5 mm (Javanese). Measurements (within parentheses; Javanese): HW, HL, IODv, A3, P=100, 50, 24, 24, 160 (100, 50, 24, 25, 170). OOD, Od, POD=1, 2, 2 (1, 3, 2). IODs=10:8 (10:8). A3=AW×4.5 (×4.5). P, Ma, M1, 2(Ma), 3(Ma)=100, 15, 5, 28(18), 32(28) (100, 16, 5, 30(18), 36(24)). RC C-type (do.), CV1=CV2×5.3 (×6). angle about 110° (110°).

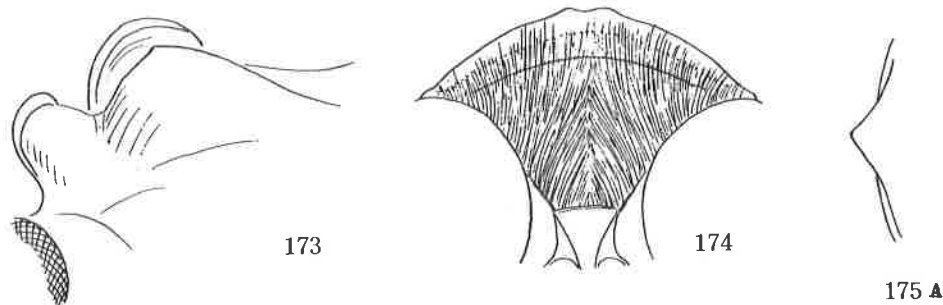
Head in frontal view with sides roundly, slightly convergent below, W:L=100:90(92),

vertex not depressed, eye incision narrow, deep, distinctly convergent towards bottom, sinus narrowly rounded, upper margins of both sides almost on a straight line. SAT-ASR in dorso-lateral view to see through PAF: Fig. 171, clypeus: Fig. 172.

37. TRYPOXYLON TJIANGSANUM sp. nov.

♀, 12 mm. Very similar in colouration and in general structure to T. striolatum m., especially to the Sumatran specimen (mesoscutum shining) above mentioned, but differs from the species in the structure of the clypeus (Fig. 174, cf. Fig. 172 - drawn correctly based on numerous measurements - , notice that the curvature of hair is different, this depends upon the difference in the state of elevation of the disc, medio-apical area is not thickened as done in striolatum, further, in the present species the hair is much finer and sparser; these differences are not secondary results, because the specimen is not senile and the mechanical change through working can not be considered). Moreover, in the present specimen mid tarsus till apex whitish (in striolatum T3-5 brown or dark brown) and transverse striae on area dorsalis sparser and weaker.

Black; apical reflected area of clypeus pale brown (in striolatum black), G1 at apical area narrowly (on sides more broadly extended forwards), G2 (with a large brown mark above), G3 (with a smaller brown mark above) and G4 on sides largely and beneath wholly reddish yellow; mandible ferruginous, apically reddish brown, tegula transparent brown. Pale ferruginous white are palpi (maxillary palpi with a brown patch on joints 2 and 4), fore knee, tibia and tarsus except arolium, mid tibia at base and apex, mid T1-2 (3-5 slightly brownish in part) and base of hind tibia; of hind tibial spurs the shorter one yellowish white as in fore and mid ones, but longer one brownish.



Figs. 173-175A. Trypoxylon tjiangsanum sp. nov., ♀

Head in frontal view wider than long ($W:L=100:88$), with lateral margins roundly convergent below, vertex not strongly depressed, eye incision similar to striolatum, SAT-ASR in dorso-lateral view to see through PAF: Fig. 173, very similar to that of the compared species (cf. Fig. 171), only slightly differs in the form of ASR. Occipital carina very weak and indistinct beneath head, rather disappeared behind buccal cavity (in striolatum thorough and distinct). Structure of pronotum (posterior part incompletely discoloured) including lamina and of subalar area also similar. Propodeum with lateral carinae and area dorsalis with lateral furrows as in striolatum, but GSR not highly raised. Measurements: HW, HL, IOV, A3, P=100, 54, 24, 23, 182; OOD, Od, POD=1, 6, 3; IODs=10:7.5; A3=AW×3.7; A3, 4, 5=10, 6.5, 6; P, Ma, Mi, 2(Ma), 3(Ma)=100, 15, 5, 24(18), 30(27); RC C-type, R1 short, CV1=CV2×4.4, TCV:CV2=1:1, TCV weakly sinuate, CV2 at apex curved, angle about 90°.

Series of striae along lateral carinae of propodeum distinct and close, sides of propodeum finely sparsely punctured, with anterior hind-femoral sinus polished.

♂, unknown.

Holotype: ♀, West Java, Middle Djampang, Tjiangšana, XI. 1938, J. van der Vecht (RMNH).

Remarks. The present species appears to be an aberrant of T. striolatum, but the difference in the structure of clypeus is certainly beyond the range of variation of a species.

38. TRYPOXYLON VARDYI Tsuneki, 1979

Trypoxylon vardyi Tsuneki, SPJHA, 9: 145, 1979 (♂ ♀, North and South India, Malaya, figs.)

Specimens examined: 1 ♀, Sumatra, Padang, IX. 1913, E. Jacobson (RMNH); 1 ♀, S. Sumatra, Mt. Tanggamaes, Prov. Lampung, 650 m, 22.VII. - 5.VIII. 1935, M. E. Walsh (RMNH); 1 ♀, Sumatra, Westkust, -?, J. W. van Lansberge (RMNH); 1 ♀, Djawa (Java), Karimon, 22-30. XI. 1930, M. A. Lieftinck (RMNH).

Remarks. In the specimen from Padang, G1 except apical swelling broadly semi-transparent brown and G2 and G3 also pale brown, each with a large dusky mark above. In this specimen the legs also strongly brownish. This may be due to long exposure to cyanide vapour. All others have the gaster medianly (apex of G1, whole of G2 and 3) ferruginous red, with large dusky marks above.

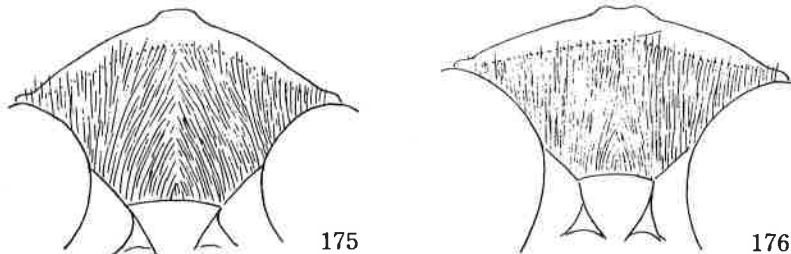


Fig. 175. T. vardyi Tsuneki, ♀ Fig. 176. T. membranaceum Tsuneki, ♀

39. TRYPOXYLON MEMBRANACEUM Tsuneki, 1979

Trypoxylon membranaceum Tsuneki, SPJHA, 9: 121, 1979 (♀ ♂, figs. Singapore, Laos, S. India).

Specimens examined: 1 ♀, North Sumatra, Pematang Siantar (Naga Horta Estate, 1750 ft), 11. II. 1932, R. I. Nel. (BMNH); 1 ♀, South Sumatra, Prov. Benkoelen, Tandjong Sakti, about 600 m, 21-30. VI. 1935, M. E. Walsh (RMNH); 4 ♀, East Java, Malang, III, IV, IX. 1933, V. 1934, J. G. Betrem (RMNH); 1 ♀, East Java, Nongkodjadar, 1202 m, VIII. 1934, J. G. Betrem (RMNH); 1 ♀, West Java, East Djampang, Tjigoeha, I. 1938, J. van der Vecht (RMNH).

Remarks. The single male specimen from Malang has the gaster completely black, measured values: HW, HL, IODv, A3, Al3, P=100, 54, 27, 12, 22, 154; OOD, Od, POD=2.5.3; IODs=10:8.3; A3=AWx2; Al3=BWx2 and ≠ Al0-12; P, Ma, Mi, 2(Ma), 3(Ma)=100, 16, 6, 27(21), 30(34).

From the male the genitalia and 8th sternite were taken out and examined. Both well agree with those of the specimen from Singapore. Fringe of hair at apical margin of sternite 8 is soft, tufts of hair at latero-apical corners are also soft and only slightly longer than the hair between the corners, not so long produced as given in Fig. 476 of Pt. III.

40. TRYPOXYLON ORIENTALE Cameron, 1904

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

Trypoxylon orientale: Tsuneki, SPJHA, 8: 56, 1978 (redescr., figs.).

Trypoxylon orientale: Tsuneki, SPJHA, 9: 128 (♀ ♂, figs., Nepal, Assam, Malaya, South India).

Specimens examined: ♀♀: (1) West Java, Middle Djampang, Bibidjilan, XII. 1937, M. E. Walsh (BMNH); (2) West Java, Mt. Gedeh, Sitoegoenoeng, 16-20. IX. 1940, J. van der Vecht (holotype of ssp. gedeh nov. RMNH); (3) East Java, Mt. Ardjuno, Soemoer Brantas, 6000 ft, I. 1936, M. E. Walsh (holotype of ssp. ardjuno nov. RMNH); (4)(5)

East Java, Nongkodjardjar, I. 1911, E. Jacobson (RMNH); (6), (7), (8), the same place VIII. 1934, J. G. Betrem (RMNH); Is. Bali, Bedugul, 24. III. 1965, J. Winkler (BMNH); 33. (10) East Java, Malang, 22. XII. 1931, J. G. Betrem (RMNH); (11), (12), (13) East Java, Nongkodjardjar, Tengger Highland, 1100 m, V. 1938, M. E. Walsh (BMNH); (14) East Java, Nongkodjardjar, X. 1930, J. G. Betrem (RMNH); (15), (16) East Java, Nongkodjardjar, 1202 m, VIII. 1934, J. G. Betrem (RMNH); (17), (18), (19), (20) the same place, 1202 m, VIII. 1934, J. G. Betrem (RMNH).
* (escaped from Pt. III), North India, W. Almora, Kumaon, 8. II. 1919, H. G. C. (BMNH).

For comparison of the Javanese specimens with the Indo-Malayan representatives measurements were made on the same characters as done previously with the latter (cf. Table 6 of Pt. III). The results are given in Table 4 (Nos. of the specimens are the same as those in the list of the specimens examined).

Table 4. Variation of characters in the Javanese specimens of *T. orientale* Cam.

No.	Loco	Sex	IODv	A3	P	OOD	Od	POD	IODs	A3	Ma	Mi	M.S.P	M.S.L	A.D.F
1	W	♀	26	22	148	2	6	5	8.0	4.0	19	6	f s	mat	dis.
2	W	♀	26	24	160	2	6	5	8.5	4.4	18	6	f s	mat	dis
3	E	♀	30	27	176	2	3	3	9.8	4.5	13	5	m c	shine	indis
4	E	♀	30	24	188	2	3	3	9.5	4.3	13	5	m c	shine	indis
5	E	♀	30	26	174	2	3	3	9.5	4.3	14	5	m c	shine	indis
6	E	♀	30	26	172	4	7	6	9.7	4.1	13	5	m c	shine	none
7	E	♀	30	26	176	3	3	4	9.5	4.2	14	5	m c	shine	indis
8	E	♀	29	26	190	2	2	3	10.0	4.3	13	4	m c	shine	none
9	Bali	♀	31	26	166	2	2	3	9.7	4.5	13	5	m c	shine	weak
* N.Ind		♀	28	26	160	2	3	2	9.0	4.7	15	6	m s	h.mat	weak
10	E	♂	33	18	168	3	3	4	9.5	2.4	12	5	m c	shine	weak
11	E	♂	32	19	172	3	3	4	9.0	2.7	12	5	m s	shine	weak
12	E	♂	34	19	172	3	3	4	9.5	2.5	11	5	m c	shine	weak
13	E	♂	32	18	176	3	3	3	9.0	2.7	12	5	m c	shine	weak
14	E	♂	32	18	150	5	5	6	9.7	2.4	14	6	m c	shine	indis
15	E	♂	32	19	174	3	3	4	9.5	2.8	13	5	m c	shine	weak
16	E	♂	33	18	164	3	3	3	9.5	2.5	13	5	m c	shine	weak
17	E	♂	34	19	166	3	3	3	9.3	2.6	13	5	m c	shine	weak
18	E	♂	34	20	172	5	4	6	9.0	2.6	--	--	m c	shine	weak
19	E	♂	33	19	163	3	3	3	9.2	2.7	13	5	m c	shine	weak
20	E	♂	32	18	162	3	3	3	9.5	2.8	14	5	m c	shine	indis

Remarks. IODv, A3 and P under HW as 100. IODs= Relative IODc to IODv as 10. Ma and Mi under P as 100. W= West Java. E= East Java. M.S.P= Mesoscutum puncture (at antero-lateral area in front of parapsidal suture, medianly sparser); f= fine, m= medium-sized, s= sparse, c= close. M.S.L= Mesoscutum lustre: mat and shining. A.D.F= Area Dorsalis, enclosing Furrow: dis= distinct (= deep), indis= indistinct (= very shallow), none= practically without furrow, weak (= shallow).

No. corresponds to the No. of the specimens examined.

At a glance we can easily perceive that Nos. 1 and 2 from West Java are markedly different from the others from East Java, namely, in the first two IODv is relatively narrower, P is somewhat shorter and thicker, OOD is remarkably narrow and, beside, in them G2 and 3 largely red (in others wholly black), clypeus at medio-apical area more strongly produced anteriorly, mesoscutum completely mat (shining), with punctures fine and sparse even at antero-lateral quarter in front of parapsidal suture (larger and close) and lateral furrows of area dorsalis fairly deep and distinct (very weak and indistinct). However, both the groups are unanimous in the structure of frons, SAT-ASR (Fig. 179), basic plan of clypeus, propodeum, gaster, wing venation and in the colour of antenna and legs, and there is no problem as to that they remain within

the category of *T. orientale*. They must represent, therefore, a different geographical race respectively.

For further comparison of the two forms with the Indo-Malayan specimens including *ssp. keralae* observations on some items were made and the results were given in Table 5. In the table Northern shows specimens from North India, Nepal and Assam and South India is the holotype of *ssp. keralae*.

Table 5. Local variation in *Trypoxylon orientale* Cameron

Item	Northern	Malaya	West Java	East Java	South India
G.M.C.	red-brown	black	red	black	?
M.S.P.	f m-s	f m-s	f s	m c	f s
M.S.L.	shining	shining	mat	shining	mat
Pl.S.	present	absent	weak	absent	weak
A.D.F.	weak	distinct	distinct	indistinct	distinct
A3	long	long	med.-short	medium	short
IODv	medium	medium	medium	broad	medium
OOD	broad	broad	narrow	broad	broad
C.M.P.	medium	medium	medium	strong	strong
ASR,E.	none	none	none	none	present
PAF	U-shaped	U-shaped	narrow U-s.	wide U-s.	deep V-shaped
SAT	broad	broad	broad	broad	narrow

Remarks. G.M.C. = Gaster median area colour. M.S.P. = Mesoscutum puncture.
M.S.L. = Mesoscutum lustre. Pl.S. = Plumbeous shine on mesoscutum.
A.D.F. = Area dorsalis lateral furrow.
C.M.P. = Clypeus median prominence.
ASR,E = Elevation at postero-lateral corner of ASR.
f = fine. m = moderate. s = sparse. c = close.

The Table shows clearly that the two Javanese forms differ not only from each other, but also from other forms of the continent.

Upon the bases above mentioned the two Javanese forms are named respectively as a different subspecies of *T. orientale*:

West Javanese: *TRYPOXYLON ORIENTALE GEDEH* ssp. nov.

Holotype: No. 2 above listed.

Paratype: No. 1 above listed.

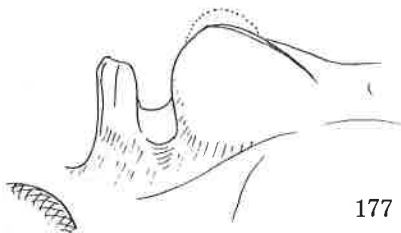
East Javanese including that of Bali:

TRYPOXYLON ORIENTALE ARDJUNO ssp. nov.

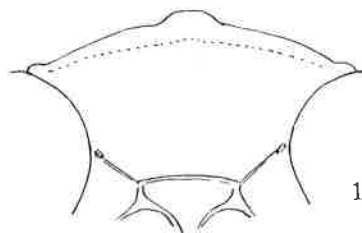
Holotype: No. 3 above listed.

Paratypes: Nos. 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 19, 20 above listed.

Other specimens: No. 17 and 18 above listed (gaster from G2 apically lost).



177



178

Figs. 177-178. *T. orientale ardjuno* ssp. nov., ♂

In T. orientale ardjuno SAT-ASR seen obliquely from above and side to see through PA : Fig. 177 and clypeus: Fig. 178.

Remarks. As to Table 5, the Malayan specimens are rather intermediate in having the gaster completely black, but in them other characters are consistent with those of Assam and Nepal. Hence they are dealt with as mere variation of orientalis s. str.

For comparison the male genital organs and the 8th sternite were taken out of the East Javanese specimens and examined. The genitalia well agree in structure with those of the typical form, except that the dorsal one of the apical two lobes of paramere is slightly narrower, but the eight sternite differs markedly in the form of api-

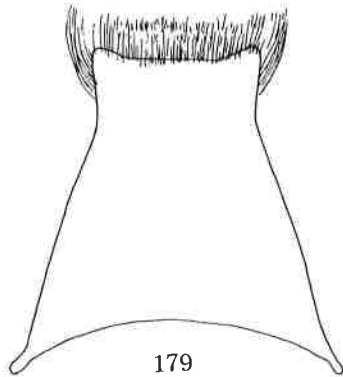


Fig. 179. T. o. ardjuno, ♂

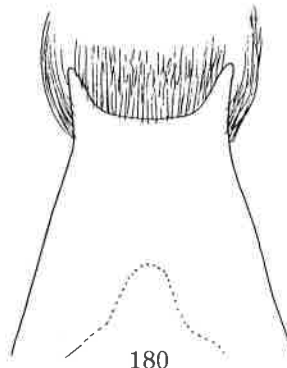


Fig. 180. T. o. orientale, ♂

cal margin. In the East Javanese ardjuno the lateral prominences are comparatively short and thick (Fig. 179), while in the other form they are longer and slender (Fig. 180). In both the hair at apical margin is not thick, not bristle-like, but soft and dense and somewhat longer in the typical race than ardjuno.

41. TRYPOXYLON ATRICORNE nom. nov.

Trypoxylon melanocorne Tsuneki (nec Strand, 1922), SPJHA, 9: 121, 1979 (♀ ♂, Singapore, Laos, figs.).

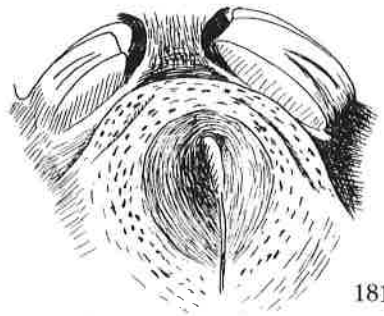
Specimens examined: (1) ♀, West Java, Buitenzorg (now Bogor), III. 1903, Bryant & Palmer (antenna lacking, gaster mounted on data label)(USNM); (2) ♀, East Java, Malang, 9. XII. 1931, J. G. Betrem (gaster from G2 apically lacking)(RMNH); (3) ♂, East Java, Tengger Highland, 1100 m, V. 1938, M. E. Walsh (BMNH); (4) ♂, West Java, Middle Djampang, VIII. 1935, M. E. Walsh (RMNH). (5), (6), (7), from Sumba below listed.

In the specimens from Sumba SAT with anterior area more broadly extended laterally than in those from other areas and the extended area nearly flat (Fig. 181, somewhat oblique vertical), the contrast of this flat area against medial mound-like elevation of SAT is conspicuous. Based on this character the specimens of this Island were treated as a geographical race (♂, unknown):

TRYPOXYLON ATRICORNE PLANUM ssp. nov.

Holotype: ♀ (5), West Sumba, Pogobina, 13. IX. 1949, A. Bühler and E. Sutter (NHMB).

Paratypes: (6) ♀, same loco, 15. IX.



181

1949 (NHMB); (7) ♀, Central Sumba, Locojengo, 23. IX. 1949, same collectors (NHMB).

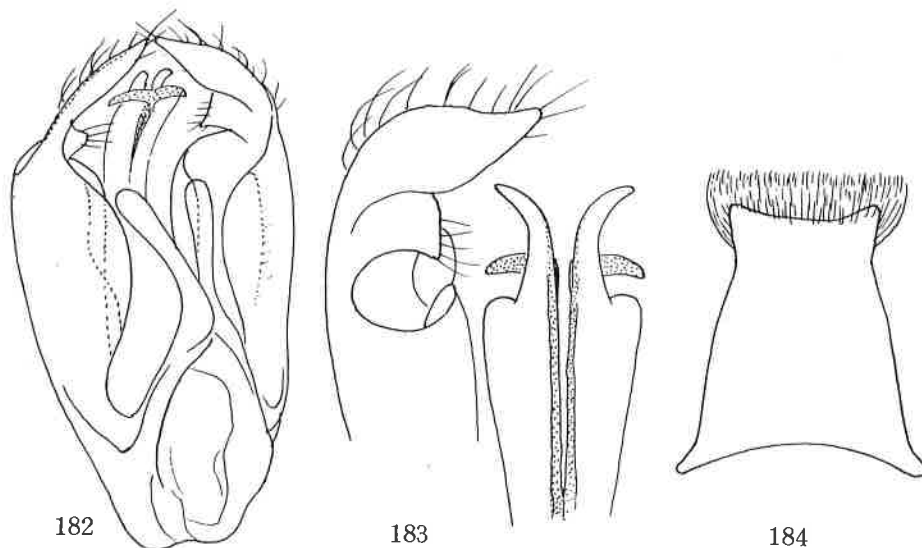
Table 6. Measurements of Trypoxylon atricorne from Java and Sumba

No.	Loco	Sex	IODv	A3	P	OOD	Od	POD	IODs	Ma	Mi
1	W. Java	♀	24	--	188	1	3	2	9.0	14	4
2	E. Java	♀	25	25	185	1	3	2	9.0	--	-
3	E. Java	♂	28	18	182	2	3	4	8.0	12	5
4	W. Java	♂	28	18	170	4	7	8	8.2	12	5
5	W. Sumba	♀	26	24	200	2	4	3	8.0	13	4
6	W. Sumba	♀	26	25	200	1	3	2	8.5	14	4
7	C. Sumba	♀	25	25	206	1	5	2	8.5	13	4

Remarks. IODv, A3 and P = under HW as 100.
Ma and Mi = under P as 100.

Remarks. In the Javanese male specimens the structure of ASR is as in Figs. 487 and 489 of Pt. III of the present paper and the apical margin of the clypeus resembles Fig. 493 of the Part.

From No. 4 specimen genital organs and sternite 8 were taken out and examined: Fig. 182 (obliquely from beneath), 183 (apical part from dorsal side, left paramere omitted) and Fig. 184. The genital organs well agree with those of the Laotian specimen (Fig. 496 of Pt. III), but the form of sternite 8 is considerably different (cf. Fig. 495 of Pt. III), namely, in the Javanese specimen it is much longer, though the form of apical area and the character of the fringe of pubescence is fundamentally similar.



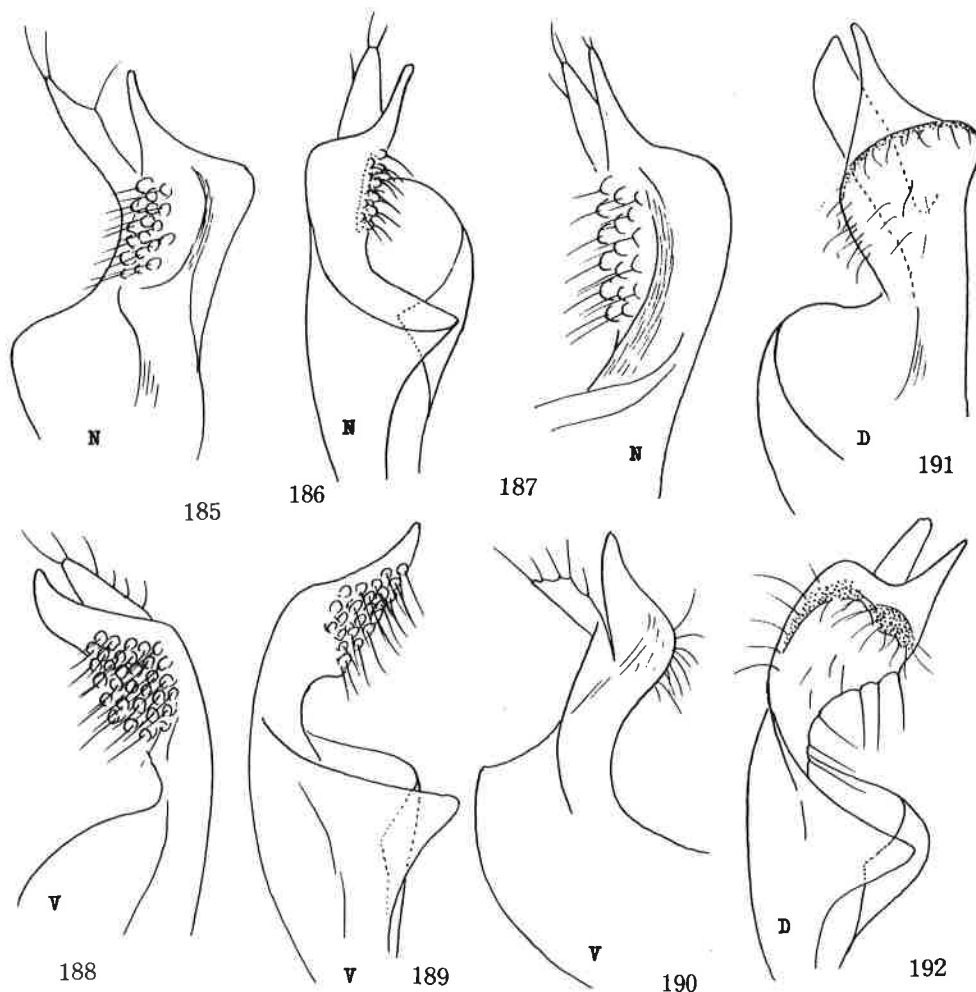
Figs. 182-184. Genitalia and sternite 8 of Javanese T. atricorne, ♂

42. TRYPOXYLON NESIANUM sp. nov.

Except that the gaster is completely black the present species is very close to T. vardyi and T. daicocum and seems to be a black-gastered form of either of the

species. Comparative examinations of the male genital organs reveal, however, that, although the organs are also similar to each other in the basic pattern of structure, the present species is much closer to vardyi than to daioocum in the details of the apical part of paramere. Comparative explanation will be tried with the figures of this part. Figs. 185, 186 and 187 are the present species, Figs. 188, 189 and 190 are T. vardyi, while Figs. 191 and 192 are T. daioocum. Figs. 185, 188 and 191: apical part of right paramere seen from beneath. Figs. 186, 189 and 192 left paramere seen from beneath. Fig. 187 right, seen from outer side. Fig. 190 left, dorso-lateral.

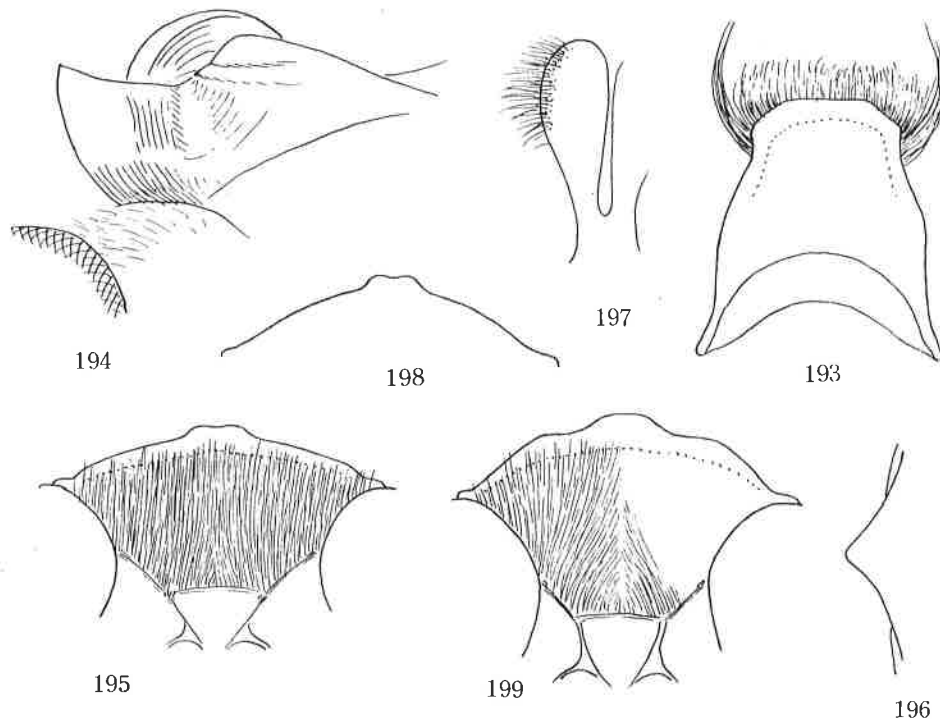
In the present species and vardyi the ventral surface of the wider ventral lobe is covered with haired tubercles, while in daioocum not. Hereupon daioocum can be separated from the others. Between the first two, however, there are two delicate differences, namely, in the present species the haired tubercles cover only inner half of total width of the lobe, while in vardyi full width, and the apical slender part of the lobe is in the present species is much slenderer than in vardyi (Fig. 185, cf. Fig. 188; Fig. 186, cf. Fig. 189). The similar tendency is also observed in the characters of sternite 8 (Fig. 193, cf. Fig. 627 of Pt. III, notice the difference in the apical form between them). The differences are very delicate and slight, but are parallel to that of the gastral colouration, and together with the fact that both species are syntatic in Sumatra and Java without accompanying any intermediate form between them, seem to support the separation of them at the species rank.



Figs. 185-192. Apical part of paramere in nesianum (N), vardyi (V) and daioocum (D).

♂, 10-12 mm. Black, mandible on basal third black, rest reddish brown, palpi dark brown, tegula semitransparent brown. Hair silvery, on clypeus parallel, only at base very weakly curved inwards.

Head in frontal view wider than long (W:L=100:75), with sides roundly, slightly convergent towards clypeus, vertex not depressed, eye incision broad and rather shallow, markedly narrowed towards bottom, upper margins of both side almost in a line. HW, HL, IODv, A3, Al3, P=100, 57, 27, 15, 21, 160; OOD, Od, POD=2, 4, 3; IODs=10:10; A3≠AW×2.8; A3, 4, 5≠10, 8, 8; Al3=BW×2.3; Al3≠Al0+11+12. Frons gently raised, medial furrow moderately deep and shallower and broader apically, SAT low broad nasiform, long carinated in middle, very frequently with a small nasiform mound again in middle, including the apical part of median carina, at the periphery of this elevation a narrow flat area forming a round step and at verge to PAF and IAF more or less distinctly edged, but sometimes the step is not distinct and the edge is blunt and obscure, especially at medio-anterior area. General structure of SAT-ASR similar to that of *daicocum* or or *vardyi*. SAT-ASR in vertical view as in *vardyi* (Fig. 620 of Pt. III), PAF: Fig. 194



Figs. 193-199. *Trypoxylon nesianum* sp. nov., 193-197 ♂, 198-199 ♀.

(dorso-lateral view to see through PAF). Clypeus: Fig. 195, with medio-apical protuberance subtruncate or weakly emarginate at apex, Al3 feebly bent as a whole in dorsal view. Collar in frontal view with dorsal side slightly raised towards middle and not strongly swollen there, seen from above somewhat strongly roundly incrassate sideways, posterior part incompletely discoloured, lamina on side: Fig. 196, subalar area of mesopleuron with lateral margin bluntly edged, but not expanded. Propodeum with distinct lateral carinae, area dorsalis with narrow, deep and sparsely crenate lateral furrows, area apicalis margined with the last one of transverse arcuate striae covering posterior part of posterior inclination, GSR highly raised, apical area discoloured. P distinctly flask-shaped, P, Ma, Mi, 2(Ma), 3(Ma)=100, 14, 5, 25(18), 28(30). In fore wing RC C-type, but somewhat close to M-type, R1 short, CV1≠CV2×5, TCV; CV2≠5:3, TCV strongly sinuate, angle at base roughly about 90°. Paramere of genitalia: Figs. 185-187, with outer margin strongly produced inwards at about middle of its length (Fig. 186), volsella comparatively short and broad spatulate (Fig. 197), apical side fringed

with long hair, penis valve with shoulder and sickle-shaped appendages as in compared species.

Frons distinctly microcoriaceous and fairly closely superimposed with comparatively large punctures, punctures anteriorly closer and partly obliquely contiguous to each other. SAT closely, obliquely rugoso-punctate, on narrow round step finely irregularly punctured. Mesoscutum with plumbeous lustre, but well shining, punctures fine and sparse. Propodeum with strong series of striae along lateral carinae, striae on posterior part of posterior inclination extending inwards and turn into transverse arcuate striae, area dorsalis at base obliquely, on median furrow transversely striate. Sides except anterior part closely covered with comparatively large punctures, punctures on posterior portion transversely subrugosely confluent.

♀. 10-13 mm. Except sexual characters similar to ♂, but SAT usually without particular step around central elevation, without edged verge to PAF, medio-apical area only occasionally with blunt transverse carina, but the inclination at the place variable, sometimes obliquely smoothly inclined, but sometimes after gently inclined acutely falling to IAF, in this case punctures coarse and irregular. Clypeus more strongly produced anteriorly (Fig. 198), in specimens from Sumba and Timor apical margin more strongly sinuate (Fig. 199). Measurements on one of the Javanese specimens (within parentheses on one of the Sumbanese specimens):

HW:HL in frontal view =100:82(84), HW,HL,IODv,A3,P=100,46,25,23,176 (46,26,23,175), OOD,Od,POD=2,3,3 (2,5,4), IODs=10:10 (9), A3=AWx4 (4), P,Ma,Ml,2(Ma),3(Ma)=100,15,5,25(17),28(28) (100,15,6,26(18),28(28)). RC C-type, but close to M-type, Rl short (do.), TCV:CV2±5:3 (do.), CVL=CV2x5 (6), angle at base about 90° (do.).

Holotype: ♂, West Java, Tjibarabang Djasinga, 15. XI. 1935, J. van der Vecht (RMNH).

Paratypes: 1 ♀, South Sumatra, Prov. Benkoelen, Tandjong Sakti, 1600m, 11-20. VI. 1935, M. E. Walsh (RMNH); 1 ♀, South Sumatra, Kedaton, 150 m, 24. III. 1937, J. van der Vecht (RMNH); 1 ♀ 2 ♂, same loco, Wai Rilau, 25. III. 1937, J. van der Vecht (RMNH);

1 ♀, West Java, Mt. Gedeh, Gekbrong, 6. II. 1935, J. van der Vecht (RMNH); 1 ♀, West Java, Tang: Alang, Udjurg-Kulon, 9. VII. 1955, M. R. Wegner (RMNH); 1 ♀, West Java, Mt. Halimoen, 4-5000 ft, XI. 1937, M. E. Walsh (RMNH); 1 ♀, West Java, Mt. Djampang, Tjigaeha, I. 1938, M. E. Walsh (RMNH); 1 ♀, West Java, Bogor, 10. I. 1954, A. H. G. Alston (RMNH); 2 ♀, West Java, Buitenzorg (now Bogor), Tjiboensial, 24. II. 1929, J. van der Vecht (RMNH); 1 ♀, West Java, Mt. Malang, Soekaboemi, I. 1940, Oeke (RMNH); 2 ♀, East Java, Malang, Karong Plato, IV. 1933, J. G. Betrem (RMNH); 3 ♀ 1 ♂, Java W. Preanger, South Soekaboemi, III, IV. 1933, J. van der Vecht (RMNH); 1 ♀, Java, Sindanglaja, X. 1935, J. van der Vecht (RMNH); 1 ♀, Tjitere Pengalengan, 23. VII. 1932, J. van der Vecht (RMNH); 1 ♀, Central Java, Semarang, 2 ♀ (II. 1902 ?), E. Jacobson (RMNH); 2 ♀, East Java, Idjen Mts., 17. I. 1940, Blawan & Mrs. A. Lucht (RMNH); 1 ♀, Java, E. Kangean Is., Petapan, II. 1936, Mrs. M. E. Walsh (RMNH); 1 ♂, Central Java, Ambarawa, - ?, E. W. A. Ludeking (after van der Vecht probably 1870) (RMNH);

1 ♀, West Sumba, Pogobina, 15. IX. 1949; 2 ♀, Central Sumba, Lindiwatju, 10. X. 1949; 2 ♀, East Sumba, Melolo, Laiwui, 17, 18. VI. 1949, all A. Bühler et E. Sutter (all NHMB);

1 ♀, Timor, Balguia, VIII. 1935, C. Bühler und Meyer (NHMB).

Other specimen: 1 ♀, East Java, Malang, III. 1933, J. G. Betrem (gaster from G2 apically lost) (RMNH).

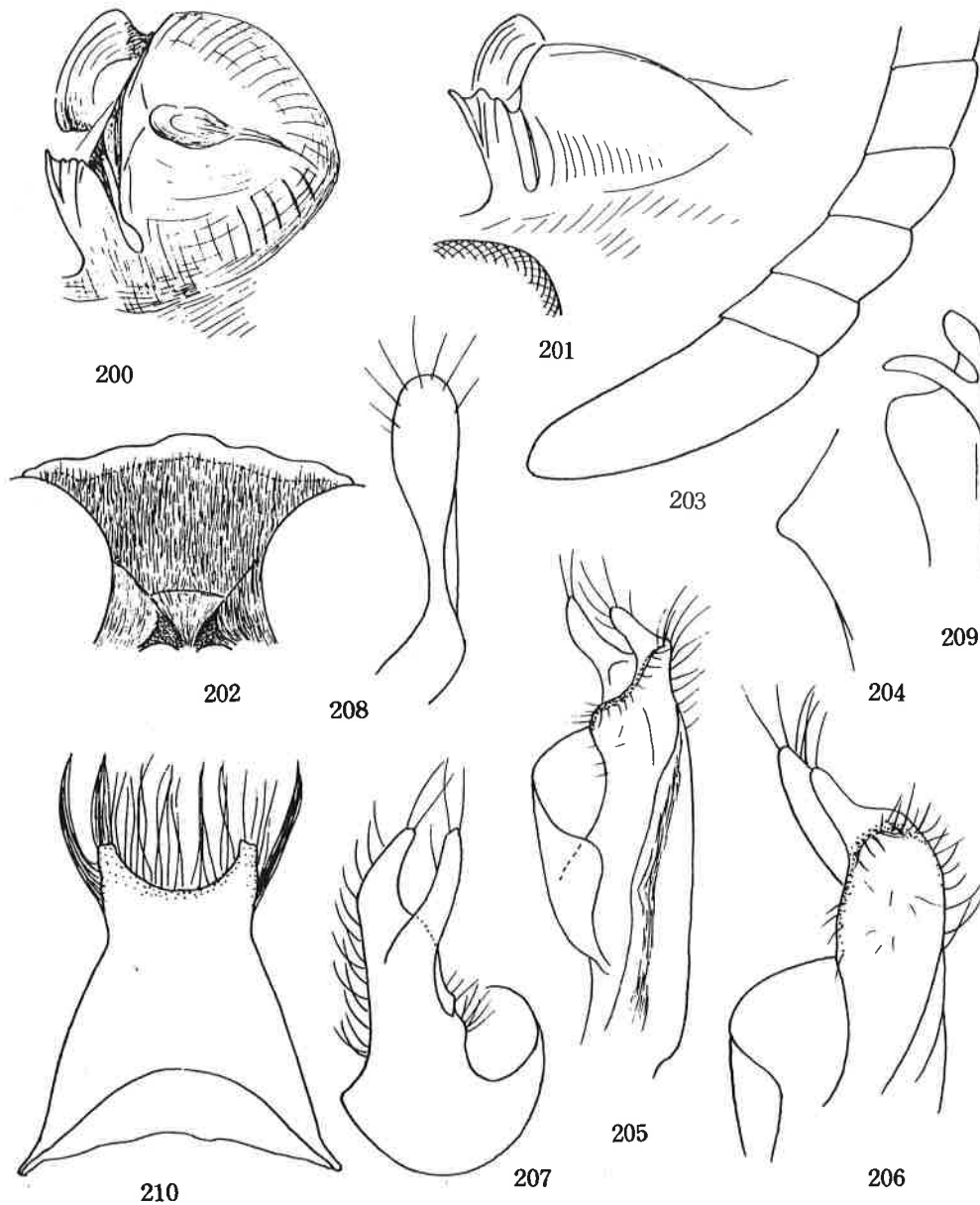
Remarks. The present species can be distinguished from closely allied membranaeum by the following characters:

Gaster is wholly black, area dorsalis enclosed with much deeper stronger furrow, medio-apical margin of clypeus much more stoutly produced anteriorly and the margin completely black.

43. TRYPOXYLON BETREMI sp. nov.

In my key to the Indo-Malayan representatives the present species (♂) runs to couplet 169, but runs out there. The species is characteristic in the large round swelling of SAT and narrow deep PAF (Figs. 200 and 201). In the genitalial structure it is somewhat close to daicoocum m. known from Laos having quite a different SAT.

♂, 9.5 mm. Black, antenna and legs somewhat brownish, mandible ferruginous, api-



Figs. 200-210. *Trypoxylon betremi* sp. nov., ♂

ally reddish brown, mouth parts pale ferruginous, tegula and basal plates of wing castaneous, tibial spurs and fore tarsus pale brown. Hairs silvery, on clypeus parallel.

Head in frontal view wider than long ($W:L=100:74$), with sides slightly roundly convergent below, vertex not depressed. $HW, HL, IODv, A3, Al3, P=100, 50, 27, 14, 23, 144$. $OOD, Od, POD=1, 2, 2$, $IODs=10:8$, $A3=AW \times 2.3$, $Al3=BW \times 2.7$ and longer than 3 but shorter than 4 preceding joints united. Frons moderately raised, median furrow at base considerably deep, but shallower and broader anteriorly, on anterior area widely shallowly excavated, SAT moderately high rounded swelling, apical margin in vertical view in a gentle curve; medio-apical area obliquely inclined to IAF, the inclined area wide

rhombic in outline and with a weak transverse carina across middle, median carina of SAT broad, shining and apically broader, reaching upper margin of the rhombic area (Fig. 200, in oblique vertical view), ASR comparatively short, nearly as high as SAT and tricarinate on top, apical carina higher and strongly expanded inwards, PAF deep, narrow, flat-bottomed and partly hung over by verge of SAT which is carinated and somewhat incrassate, SAT-ASR in dorso-lateral view to see through PAF: Fig. 201. Clypeus: Fig. 202, disc gently roundly tectate, Al3: Fig. 203. Occipital carina complete, not depressed behind buccal cavity. Collar in frontal view with dorsal surface rounded triangular, not swollen in middle, seen from above anterior part narrowly ridged and weakly widened laterally, posterior part discoloured, dusky yellowish, lamina on side: Fig. 204. Subalar area of mesopleuron normal. Propodeum with strong lateral carinae, originating a little behind spiracle, curved up in lateral view, but not reaching apex, ending at densely haired area, area dorsalis with wide shallow lateral furrows, not reaching base, area apicalis widely open on dorsal area, GSR subtriangularly raised, fairly high, with apical area widely discoloured. Gastral petiole flask-shaped, $P, Ma, Mi, 2(Ma), 3(Ma) = 100, 19, 6, 30(27), 34(38)$. In fore wing RC C-type, Rl short, $CV1 = CV2 \times 5$, TCV nearly straight, $TCV: CV2 = 5:4$, angle about 120° .

Sternite 8: Fig. 210; right paramere of genitalia in ventral view: Fig. 205, apical part turned ventrally, the turned part seen vertically: Fig. 206, considerably similar to that of *T. daicocoum* (Figs. 191-192), apical part in dorso-lateral view: Fig. 207, left volsella: Fig. 208, left half of penis valve: Fig. 209 (ventral, somewhat from inside).

Frons strongly microcoriaceous and fairly closely superimposed with comparatively large punctures, PIS 1-1.5 times PD, SAT closely covered with hair-bearing punctures, punctures circularly, concentrically disposed, mesoscutum half mat, with feeble plumbous lustre, finely rather sparsely punctured; propodeum with strong series of striae along lateral carinae, the striae posteriorly extended inwards to transverse arcuate ones covering in front of area apicalis, area dorsalis at base obliquely, medial furrow transversely coarsely striate, the striae partly extending on to disc, lateral furrows finely, closely punctured and mixed with obscure striae.

♀, unknown.

Holotype: ♂, East Java, Malang, IV. 1933, J. G. Betrem (RMNH).

44. TRYPOXYLON VIRIDARICOLA sp. nov.

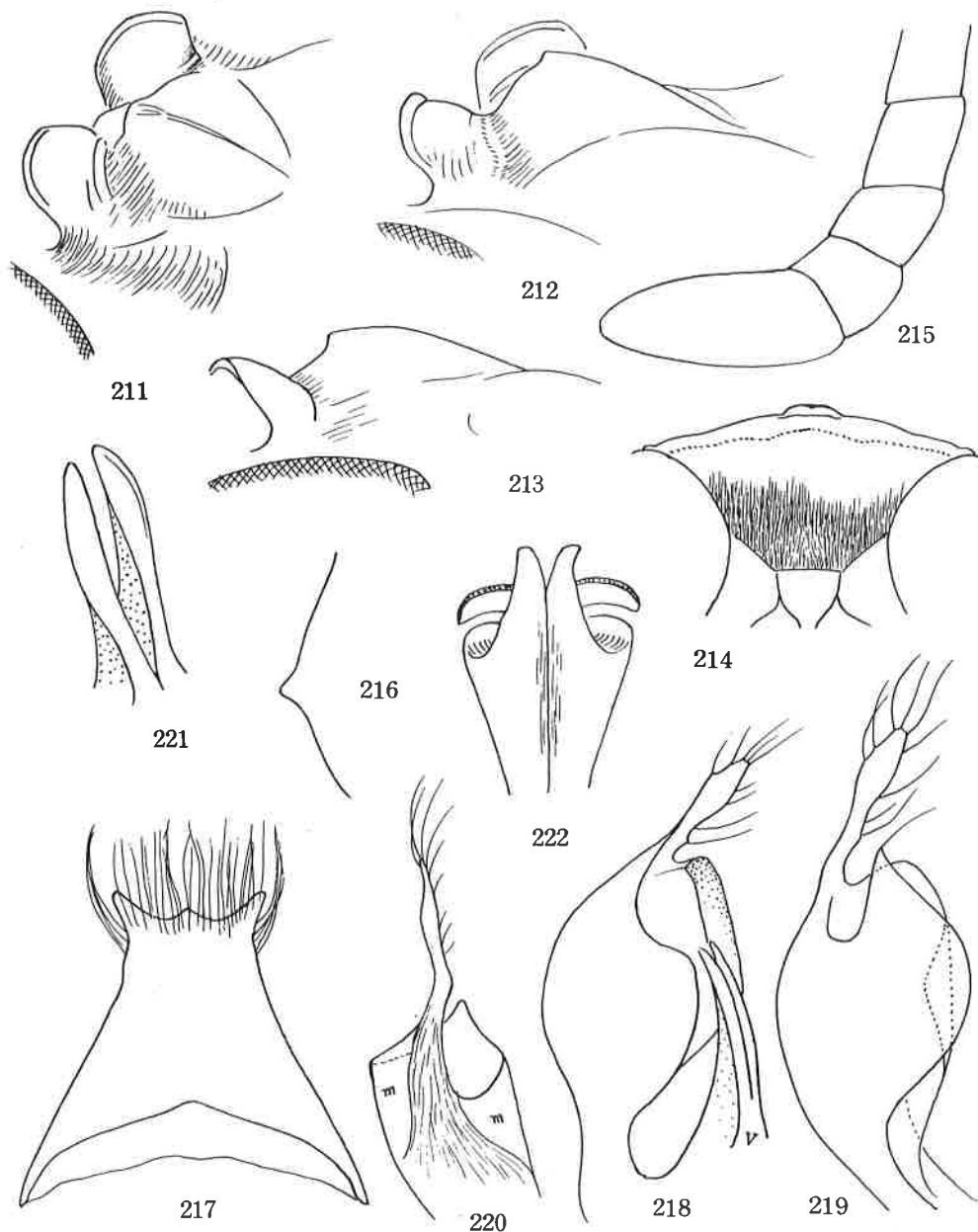
Closely allied to *T. sayabouryense* known from Laos, differs from it, however, in the colour of mandible and fore leg, and in the form of sternite 8 and the apical part of genitalial paramere (volsella similar in its peculiar form).

♂. 9.0 mm. Black; ferruginous are mandible, palpi, tegula, fore tibia and tarsus and all tibial spurs; mid tarsus apically brownish. Hair silvery, on clypeus nearly parallel.

Head in frontal view wider than long, $W:L = 100:80$, with sides roundly, slightly convergent below, vertex not depressed, eye incision moderate in width, narrowed towards bottom, upper margin slightly inclined outwards. $HW, HL, IODv, A3, Al3, P = 100, 48, 26, 14, 22, 160$; $OOD, Od, POD = 2, 4, 3$; $IODs = 10:9$; $A3 = AW \times 2.7$; $Al3 = BW \times 2.3$ and $\approx AlO-12$. Frons moderately raised, medial furrow broad and deep, hence frontal elevations appear roundly raised, SAT moderately high nasiform, long carinated in middle, with a round narrow flat area in front of its apex, thence apically inclined to IAF and PAFs. SAT-ASR in oblique vertical view: Fig. 211, in dorso-lateral view to see through PAF: Fig. 212, in profile: Fig. 213 clypeus: Fig. 214, disc gently roundly tectate, A9-13: Fig. 215; occipital carina complete, slightly depressed behind buccal cavity. Pronotal collar roundly, subtriangularly raised in frontal view, without particular swelling in middle, seen from above weakly widened laterally, posterior part discoloured, lamina on side: Fig. 216; subalar area normal. Propodeum with distinct lateral carinae, area dorsalis enclosed with distinct furrow, area apicalis indistinct, GSR nearly simple. Gastral petiole flask-shaped, $P, Ma, Mi, 2(Ma), 3(Ma) = 100, 14, 5, 24(18), 28(28)$. In fore wing RC C-type, Rl short, $CV1 = CV2 \times 4$, TCV nearly straight, angle at base about 100° . Sternite 8 tridentate at apex (Fig. 217), very curious and exceptional (in *sayabouryense* broadly subtriangularly incised: Fig. 786 of Pt. III). Genitalia with paramere simple at apex (in *sayabouryense* bifurcate), with outer and inner margins broadly expanded and lamellate, rolled ventrally (Fig. 218, right paramere seen from inside, V... volsella; Fig. 219, left one seen from outside; apical part in

dorso-lateral view: Fig. 220 (m ... membranous), volsella in latero-ventral view: Fig. 221, apical part of penis valve in dorsal view: Fig. 222 (apex of penis curved ventrally, not straightly stretched).

Frons distinctly microcoriaceous and fairly closely superimposed with comparatively large punctures, SAT closely covered with somewhat large punctures (but smaller than on frons), punctures partly subrugosely confluent; mesoscutum finely sparsely punctured, PIS shining. Propodeum with distinct series of striae along lateral carinae, area dorsalis at base smooth, on medial and lateral furrows transversely finely close-



Figs. 211-222. *Trypoxylon viridaricola* sp. nov., ♂

ly striate, posterior inclination posteriorly transversely, somewhat arcuately striate, sides smooth and polished, and sparsely covered with distinct punctures.

♀, unknown.

Holotype: ♂, West Java, Buitenzorg (now Bogor), Dramaga, 22. IX. 1929, J. van der Vecht (RMNH).

Remarks. Apical part of the gaster was dissected and the dissected parts were mounted on the card point and attached to the specimen.

R E F E R E N C E S

- Tsuneki, K. 1978. Studies on the genus Trypoxylon Latreille of the Oriental and Australian Region (Hymenoptera, Sphecidae). I. Group of Trypoxylon scutatatum Chevrier, with some species from Madagascar and the adjacent Islands. SPJHA (Spec. Publ. Jap. Hymen. Ass.), 7, 87 pp. (346 figs.)
- Tsuneki, K. 1978. Idem. II. Revision of the type series of the species described by F. Smith, P. Cameron, C. G. Nurse, W. H. Ashmead, R. E. Turner and O. W. Richards. Ibid., 8, 84 pp. (289 figs.).
- Tsuneki, K. 1979. Idem. III. Species from the Indian Subcontinent, including Southeast Asia. Ibid., 9, 178 pp. (786 figs.).
- Tsuneki, K. 1979b. Idem. IV. Species from Sri Lanka. Ibid., 10, 20 pp. (64 figs.).
- (As for other papers see Part II of the present paper).

P O S T S C R I P T U M.

It should be added to the foreward that the Javanese as well as the Sumatran specimens of the species that are common to the Indo-Malayan Region show distinctly the tendency towards the melanism. The bright coloured parts of the antenna, gaster and legs are either more narrowed in extension or more darkened in brightness, turning from white, yellow or ferruginous to brown, dark brown or black. This is most remarkable in T. petiolatum, especially the male (black legged form). But the same tendency is also observed more or less in penangense, fletcheri, khasiae, bicolor, ngum, membranaceum and orientale, sometimes over the whole area, sometimes in one of the Islands and sometimes in some restricted area or areas. The fact is certainly one of the characters of the species occurring in Java and Sumatra.

I N D E X

<u>antennatum</u> Tsuneki	28	<u>petiolatum</u> Smith	39
<u>atricorne</u> nom. nov.	59	<u>prominens</u> Tsuneki	38
<u>atricorne planum</u> ssp. nov.	59	<u>schmiedeknechti</u> Kohl	11
<u>bakerianum fortius</u> ssp. nov.	33	<u>sibolangitum</u> sp. nov.	52
<u>betremi</u> sp. nov.	63	<u>striolatum</u> Tsuneki	54
<u>bicolor</u> Smith s. str.	38	<u>sumatraense</u> sp. nov.	30
<u>buehleri</u> sp. nov.	45	<u>sumbanicola</u> sp. nov.	50
<u>cheesmanae</u> sp. nov.	11	<u>sumbanum</u> sp. nov.	20
<u>clypeatum</u> sp. nov.	32	<u>thaiantum</u> Tsuneki	11
<u>djampangense</u> sp. nov.	48	<u>tjiangkoedang</u> sp. nov.	26
<u>errans</u> Saussure	28	<u>tjiangsanum</u> sp. nov.	55
<u>fletcheri</u> Turner	21	<u>urbanii</u> sp. nov.	35
<u>fulvocollare</u> Cameron	42	<u>vardyi</u> Tsuneki	56
<u>fumi</u> Tsuneki	40	<u>vechti</u> sp. nov.	22
<u>interruptum</u> Tsuneki	11	<u>vicinum</u> sp. nov.	15
<u>jacobsoni</u> sp. nov.	12	<u>viridaricola</u> sp. nov.	65
<u>javanense</u> sp. nov.	24	<u>walshae</u> sp. nov.	18
<u>javanicum</u> sp. nov.	42		
<u>kahsiae</u> Cameron	36		
<u>kalimantan</u> Menke	47		
<u>maculiventre</u> Tsuneki	29		
<u>melanocorne</u> Tsuneki	59		
<u>membranaceum</u> Tsuneki	56		
<u>naviforme</u> sp. nov.	14		
<u>nesianum</u> sp. nov.	60		
<u>ngum</u> Tsuneki	54		
<u>orientale</u> Cameron	56		
<u>orientale gedeh</u> ssp. nov.	58		
<u>orientale ardjuno</u> ssp. nov.	58		
<u>ornatigaster</u> Tsuneki	50		
<u>penangense</u> Tsuneki	51		
<u>penangense sutteri</u> ssp. nov.	52		

39
38
11
52
54
30
50
20
11
26
55
35
56
22
15
65
18

SPECIAL PUBLICATIONS OF
THE JAPAN HYMENOPTERISTS ASSOCIATION
NO. 10

Published on September 20, 1979

Price U.S. \$ 7.00; Y. 1500. Order should be made
through one of the book dealers in Japan

All the communications relating to the Publications
should be addressed to

Dr. K. Tsuneki
Asahigaoka 4-15,
Mishima, Japan 411.