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

IV. SPECIES FROM SRI LANKA

By K. TSUNEKI

M I S H I M A

AUGUST 20, 1979

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S y n o p s i s

Nineteen species are recorded from Sri Lanka, of which 6 are new to science (capillatum, basiflavum, krombeini, benten, kandyianum and srilankum) and, besides these, 9 are new to Sri Lanka. Noteworthy is that the male of pileatum Smith is discovered for the first time.

The material that forms the basis of the present Part is the collection made during the field work of the Smithsonian Institution's "Biosystematic Study of the Insects of Ceylon", Dr. Karl V. Krombein, principal investigator. The collection consists of 150 fresh specimens and includes comparatively a large number of species. This shows that the fauna of the Island is well investigated under the project of the Smithsonian Institution. The fact is proved by the fact that the number of the species of Trypoxylon is raised from hitherto known 4 (mandibulatum, schmiedeknechti, errans and bicolor ceylonicum) to 19 and that 6 new species are discovered among them. However, whether the new species described are endemic to the Island or not is uncertain, since the wasp fauna of adjacent South India has been investigated only very insufficiently.

The most remarkable fact regarding the Ceylonese Trypoxylon is that the specimens of bicolor Smith s. str. have the external appearance very close to petiolatum Smith of other areas and form a distinct local race (Part III, p. 157).

The discovery of the male of pileatum Smith is very valuable for elucidating the secret characters of this long questioned species.

As to the specimens, unless otherwise stated, they are collected by Dr. K. V. Krombein and some of his assistants and are deposited in USNM.

I express my cordial thanks to Dr. Karl V. Krombein, chief entomologist of Smithsonian Institution, who kindly entrusted his study to me.

ABBREVIATIONS

- Al, 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 gastrer (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, namely IODv/IODc.
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.
RI ... Apical produced part of RI 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.

KEY TO THE SPECIES

O F S R I L A N K A

- 1 Frons with shield-shaped enclosure (inner branch carinae lacking)..... 2*
- Frons without shield-shaped enclosure 6
- 2 Frontal shield with upper lateral carinae widely interrupted, or disturbed with punctures, long curved bristles on IAA markedly abundant (lower carinae of the shield straight, L:W of enclosure \neq 2:1), 13-16 mm
interruptum Tsuneki, 1978
- Frontal shield with upper lateral carinae distinct, bristles on IAA not so abundant, length 8-12 mm 3
- 3 Frontal shield with upper area subequal in length to lower area (when somewhat longer upper lateral carinae roundly convergent upwards and lower carinae near lateral angles upcurved and markedly sinuate as a whole, or medio-apical angle acutely pointed, in δ $Al3 = A9-$ or 10 - 12)
schmiedeknechti Kohl, 1906
- Frontal shield with upper area distinctly longer than lower area (upper lateral carinae subparallel, or medio-apical angle broadly rounded) 4
- 4 Medio-apical angle of frontal shield broadly rounded (upper lateral carinae roundly convergent upwards, lower carinae rounded out wholly or below middle, surface of the shield broadly roundly excavated, in δ $Al3$ as in schmiedeknechti)
melanurum Cameron, 1901
- Medio-apical angle of frontal shield pointed 5
- 5 Lower carinae of frontal shield straight or gently down-curved, (length of upper area : lower area = 2:1 or nearly, surface considerably deeply excavated, with shining median bottom line, $Al3 \neq Al1+12$)
thaiantum Tsuneki, 1961
- Lower carinae gently upcurved as a whole (upper area : lower area \neq 3:2, surface except around fore ocellus in δ flat, in δ very gently excavated, without medial bottom line, $Al3 \neq Al0+11+12$), δ 10, δ 8 mm
pileatum Smith, 1856
- 6 Gastral petiole clavate, gradually widening apically, as long as, or shorter than $G2+3$ 7
- Gastral petiole flask-shaped, apical widening more sudden, with cylindrical slender part in front, usually longer than $G2+3$ 15
- 7 $G1,2$ and 3 each with a minute fovea at apex in middle 8
- $G1-3$ without fovea 10
- 8 Frons and mesoscutum without microsculpture, shining and strongly coarsely punctured (in δ antenna and legs modified and partly white maculated), 10-12 mm
buddha Cameron, 1889
- Frons and mesoscutum microcoriaceous, half mat and superimposed with fine punctures 9
- 9 Fore and mid legs nearly wholly and hind leg largely yellow, gaster broadly ferruginous (propodeal sternite long and distinct, $IODs=3:1$, $R1$ longer than $CV2$, reaching wing apex, $A3=AW \times 3$, clypeus broadly ferruginous apically, apical margin minutely bidentate in middle, propodeum with lateral carinae, area dorsalis without lateral furrows), about 8 mm
flavipes Tsuneki, 1979, δ
- Fore and mid femora and mid tibia and tarsus broadly black, hind leg except tibial base and tarsal articulations black (propodeum distinctly produced posteriorly beyond base of hind coxae, but sternite short and indistinct, $IODs=10:4-4.5$, $R1$ shorter than $CV2$, not reaching wing apex, $A3 \neq AW \times 2.5$, $A3,4,5 \neq 10,7,6$, clypeus narrowly ferruginous apically, minutely bidentate in middle, gaster black, base of $G3$ narrowly yellowish), 8 mm
indianum Tsuneki, 1979, δ
- 10 Mesoscutum fairly shining, microsculpture very weak, finely and rather sparsely punctured (otherwise as in krombeini sp. nov., δ)
krombeini sp. nov., δ , var.
- Mesoscutum distinctly microcoriaceous and punctured, half mat, or very finely and densely punctured and half mat 11
- 11 Head seen from above transverse, with $W:L \neq 2:1$, gaster medianly reddish, about 10 mm (bases of tibiae, fore and mid $T1$ at least yellowish white, cly-

* See also Part I of the present paper.

- peus flat, apical margin almost not produced anteriorly, weakly rounded out in middle, SAT triangularly extended on to IAA and densely covered with silvery hair, propodeum with lateral carinae, area dorsalis with lateral furrows shallow, (Gl=AWx3)
- Head from above thick, at least with W:L=5:3, gaster wholly or largely black, without reddish area (propodeum with lateral carinae) 12
 - 12 Mandible thick, with a tooth on inner margin near apex (head from above subquadrate, SAT low tuberiform, antenna of ♂ 12-jointed) 13
 - Mandible slender, without tooth on inner margin (head from above wider than long, W:L=5:3 - 3:2, antenna of ♂ 13-jointed) 14
 - 13 Fore and mid tibiae at base more or less broadly black, punctures on mesoscutum comparatively finer, area dorsalis microcoriaceous, apparently granulate (apical margin of clypeus narrowly brown and always medianly bluntly bidentate; ♀ IODs=10:7, Al2 with apex bluntly pointed, clypeus nearly as wide at base as long in middle; ♂ IODs=10:6, Al2 with apex acutely pointed, clypeus with W:L=10:12), 4-5 mm pygmaeum Cameron, 1900
 - Fore and mid tibiae completely yellow, punctures on mesoscutum comparatively larger, area dorsalis minutely rugoso-striate or -punctate, always coarser than in pygmaeum (apical margin of clypeus black and medianly produced, with apex truncate or rounded, very rarely somewhat similar in colour and form to pygmaeum; ♀ IODs=10:8, Al2 with apex narrowly rounded, clypeus with W:L=10:8; ♂ IODs=10:6, Al2 apically acutely pointed, clypeus with W:L=10:7, medio-apical protuberance always narrowly rounded), 5-7 mm mandibulatum Richards, 1933
 - 14 Antenna and legs broadly yellow maculated, gaster with base of ♂ narrowly yellow (SAT tuberiform, without median carina, apex obliquely inclined to IAA, pronotum without medial tubercle; ♀ A3=AWx3.5, IODs=5:4, clypeus medianly triangularly produced; ♂ A3=AWx3, IODs=4:3, Al3: Fig. 25, clypeus with apical margin medianly very weakly recurved), ♀ 7, ♂ 6 mm basiflavum sp. nov.
 - Antenna and legs black, at most partly brownish, gaster black (SAT low, flattened, but on apical area provided with a tectiform elevation in middle that falls at apex perpendicularly to IAA, pronotum with a minute tubercle in middle, IODs=2:1 in both sexes; ♀ A3=AWx2.7, SAT not mat, clypeus medianly produced and minutely incised in middle; ♂ A3=AWx1.7, Al3: Fig. 36, SAT mat, clypeus with apical margin weakly recurved in middle area), ♀ 6-8, ♂ 6 mm krombeini sp. nov.
 - 15 Mesoscutum microcoriaceous and superimposed with distinct punctures (SAT moderately high broad nasiform, with distinct median carina, apical margin transversely roundly edged, ASR highly bicarinate on top, PAF deep, flat-bottomed, clypeus: Fig. 46, A3=AWx4.3, area dorsalis enclosed with broad shallow furrow, propodeum except sides transversely closely striate, G2 and 3 red, with black maculae, fore tibia and tarsus and mid T1-4 ferruginous to brown, hair silvery), 12 mm henten sp. nov., ♀
 - Mesoscutum without microsculpture, simply punctured 16
 - 16 Propodeum without lateral carinae (gaster medianly red, area dorsalis with lateral furrows shallow and weak, sometimes rather indistinct, SAT moderately high tuberiform, PAF deep, flat-bottomed and on both ends shortly inclined, RC B-type, IODs=10:8; ♀ clypeus strongly produced, with apical margin medianly truncate, hairs at its base strongly convergent towards medial line, A3=AWx4.5-5, mid T1 wholly yellowish white, 12-16 mm; ♂ clypeus weakly roundly produced and medianly weakly recurved, hairs on disc parallel, A3=AWx2, Al3=Al0-12, in some condition appears slightly longer, mid T1 on basal half yellowish white, 10-12 mm bicolor ceylonicum Tsuneki, 1979
 - Propodeum with lateral carinae 17
 - 17 Gaster ferruginous, but Gl dorsally except apex and the rest posteriorly more or less dark brown (SAT on apical area transversely roundly flattened, apical margin acutely carinated, covering ASRs and IAA: Figs. 48-52, clypeus: Fig. 53, A3=AWx5, area dorsalis with distinct lateral furrows, Al and 2, and fore and mid legs broadly yellowish, RC C-type, CV1≠CV2x7), 11.5 mm kandyianum sp. nov., ♀
 - Gaster black, or only medianly red 18
 - 18 SAT anteriorly with highly raised=shaped carinae (Figs. 55-58) (clypeus with apical margin almost simply rounded, IODs=5:4, antenna and legs black; ♀ with clypeus: Fig. 64, A3=AWx3.5, gaster medianly red; ♂ clypeus: Fig. 59, A3=AWx2, gaster black, Al3=A9-12), 9-13 mm srilankum sp. nov.
 - SAT without=shaped carinae anteriorly 19
 - 19 ASR with a hollow on postero-lateral area (SAT with apical margin acutely

edged, hanging over PAF, PAF deep, flat-bottomed, clypeus with a small prominence at apex in middle, gaster medianly reddish, in ♂ often wholly black, legs black, tibial spurs white, tarsi partly brownish; $A3=AW \times 3.5$ (♀), or 2 (♂), $Al3=A9-12$, 10-12 mm

- ASR without hollow on postero-lateral area (SAT moderately high nasiform apical margin triangular in vertical view, obliquely inclined to PAFs and IAA, sometimes weakly edged at verge to PAF, clypeus with apical margin brown to ferruginous, medianly broadly recurved, frequently weakly incised in middle, gaster medianly red, sometimes brown or nearly black in ♂, all trochanters, fore tibia except folded side, fore tarsus wholly, mid tarsus largely yellowish white; ♀ with IODs=5:3, $A3=AW \times 4$, ♂ with IODs=7:4, $A3=AW \times 2.5$, $Al3=A8-12$), ♀ 10-12, ♂ 8-10 mm

nigripes Tsuneki, 1979
errans Saussure, 1867

DESCRIPTIONS AND RECORDS OF THE SPECIES

1. TRYPOXYLON SCHMIEDEKNECHTI Kohl, 1906

Trypoxylon schmiedeknechti: Tsuneki, SPJHA, 7: 21 (with references, synonyms, redescription, geographical races, figures)

Specimens examined: 12 ♀ 3 ♂. North Central Province. Anuradhapura District: 3 ♀, Padaviya, 180 ft, Irrigation Bungalow, 18. V. 1976, Malaise trap. Central Province. Kandy District: 2 ♀, Kandy, 5-15. VII. 1976; 1 ♀, Hasalaka, 140-170 m, 15-17. IX. 1977. Eastern Province. Amparai District: 1 ♀ 2 ♂, Lahugara Sanctuary, 13-15. VI. 1976; 1 ♀, Ecgal Aru, Sanctuary, Jungle, 140 m, 11-15. IX. 1977. Trincomalee District: 1 ♂, Trincomalee, China Bay, 0-30 m, near Widge Bungalow, 8-11. X. 1977; 1 ♀, the same place, 27-31. I. 1977. Sabaragamuwa Province. Ratnapura District: 3 ♀, Gilimale, 19-22. VI. 1976.

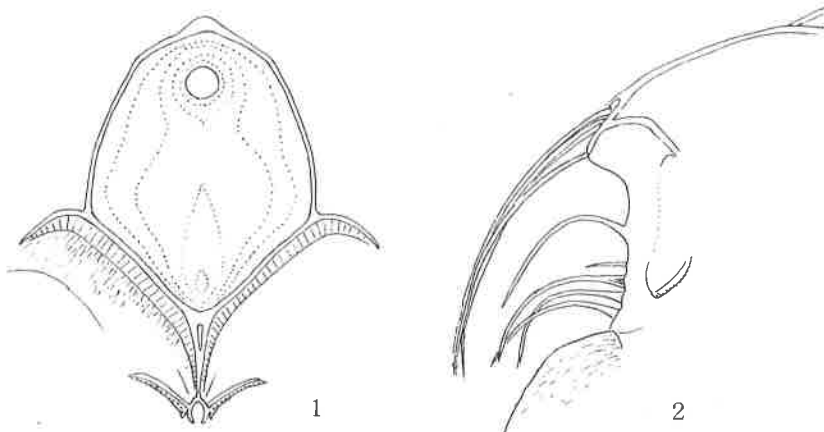
Remarks. The specimens belong to the typical form. In ♂ $Al3$ is longer than 3, but shorter than 4 preceding joints united.

2. TRYPOXYLON MELANURUM Cameron, 1901

Trypoxylon melanurum: Tsuneki, SPJHA, 7: 41 (redescription of the holotype, description of ♀, distribution, figures)

Specimens examined: Southern Province. Hambantota District: 1 ♀, Palatupana, 3-6. II. 1975.

Observation. 12.0 mm. Comparatively large specimen. Collar and mesothorax mat,



Figs. 1-2.
Trypoxylon
melanurum
Cameron

mesoscutum weakly microcoriaceous, punctures somewhat large, fairly close, PIS mostly PDx1-2, frontal enclosure microcoriaceous, except median smooth line, and fairly closely superimposed with fine punctures; sides of propodeum, except narrow anterior part along metapleural suture, obliquely closely striate and sparsely mixed with punctures, tibial spurs white, articulations of legs brownish. Frontal shield vertically seen: Fig. 1, state of bristles in IAA: Fig. 2 (seen from left side).

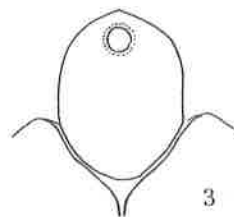
HW, IODv, A3, P=100, 26, 16, 136; IODs=4:3; A3=AWx3.2; OOD, Od, POD=2, 5, 6; P, Ma, Mi, 2 (Ma), 3(Ma)=100, 18, 7, 44(20), 46(32). RC B-type, TCV slightly longer than CV2, CV1=CV2x 2.2, RL very short.

3. TRYPOXYLON THAIANUM Tsuneki, 1961

Trypoxylon thaianum: Tsuneki, SPJHA, 7: 49, 1978 (ref. syn. redescr. geogr.-rac. figs.)

Specimens examined: 16 ♀ 10 ♂. North Central Province. Amuradhapura District: 6 ♀, Padaviya, 180 ft, Irrigation Bungalow, 18. V. 1976, Malaise trap. Central Province. Kandy District: 2 ♀, Kandy, 16-31. VIII., 20-27. IX. 1976; 1 ♂, 5 miles NW of Muhiyangana, Hasaraka Irrigation Bungalow, 30. III. - 9. IV. 1971, P. & P. Spangler, Malaise trap. Western Province. Colombo District: 1 ♂, Gampaha Botanical Garden, 8. XI. 1977. Eastern Province. Amparai District: 8 ♂, Lahugala Sanctuary, 13-15. VI. 1976; 4 ♀, Ekgal Aru, 90 m, Circuit Bungalow, 12. IX. 1977 or Reservoir Jungle, 9-11. VI. 1976, 19-22. II. 1977; Batticaloa District: 1 ♂, Maha Oya Tank, 15. IX. 1977. Sabaragamuwa Province. Ratnapura District: 1 ♀, Gilimale, 19-22. VI. 1976; 1 ♀, Sinharaja Forest, Weddagala, 18-21. VI. 1976. Southern Province. Galle District: 1 ♀, Kottawa Forest, 23. X. 1973, M. & B. Robinson.

Remarks. In males the frontal shield is considerably variable in form and in the state of surface excavation. In one of the specimens the lower carinae are downcurved, with the lower angle broadly rounded, and the shield becomes remarkably rounded (Fig. 3) somewhat similar to that of melanurum Cameron. But in this specimen the upper area is appr. twice as long as lower area and the ultimate antennal joint about as long as 2 preceding joints united, keeping the distinctions of the species. In the females also the frontal shield is more or less variable in form. Generally the ratio of the lengths of the upper area to lower area is much greater than in the male, hence appearing much longer. Variable factors are (1) grades of constriction (inward curvature) just above the lateral angles, and (2) grades of upward convergency of the upper lateral carinae. However, all variations fall within the range of specific distinctions of thaianum.



4. TRYPOXYLON INTERRUPTUM Tsuneki, 1978

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

Specimens examined: Western Province. Colombo District: 1 ♀, Labugama, Reservoir, 110 m, 29. X. 1977, in hand net. Southern Province. Galle District: 2 ♀, Udugama, Kanneliya Jungle, 400 ft, 6-12. X. 1973, light trap.

Remarks. In the specimens the mesoscutum is without microsculpture, closely punctured (PIS=PD), punctures comparatively large and strong. Sides of propodeum finely but distinctly and fairly closely punctured, punctures on medio-dorsal area very sparse, on narrow ventral area obliquely and on extreme posterior area transversely and arcuately, striate. RC B-type, TCV:CV2=10:9, CV1=CV2x3, vestigial cubital cell 2 is observed.

5. TRYPOXYLON PILEATUM Smith, 1856

Trypoxylon pileatum: Tsuneki, SPJHA, 7: 8, 1978 (3 ♀, Madras and Bombay, redescr. figs.).

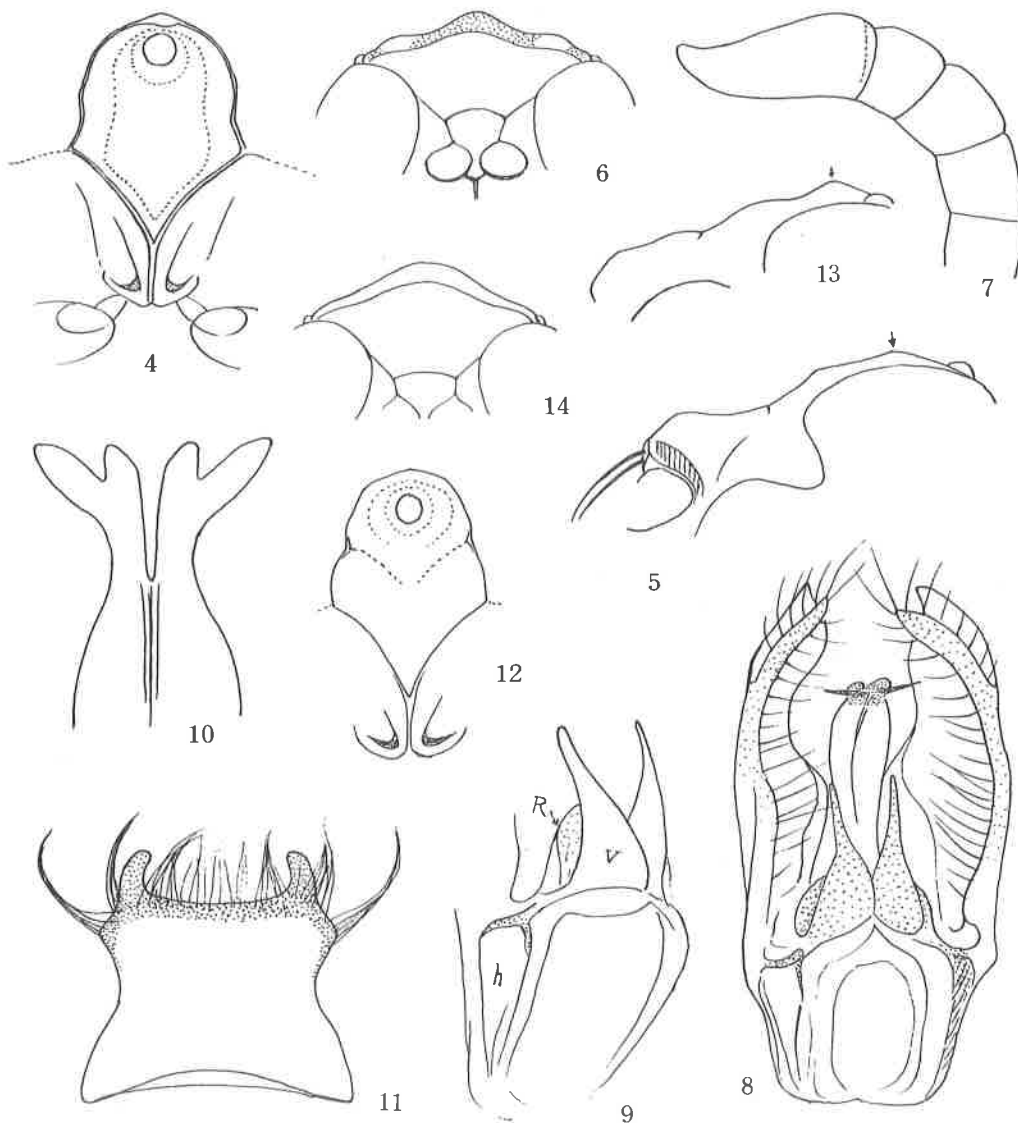
Specimens examined: Northern Province. Mannar District: 1 ♂, 5 miles NE of

Kokmotte Wilpattu National Park, 50-100 ft, 22-23. I. 1977. Eastern Province, Amparai District: 1 ♀, Ekgal Aru, Reservoir Jungle, 11-12. VI. 1975, Malaise trap.

Description of ♂ (hitherto unknown).

8 mm. Black; mandible ferruginous, at base black, palpi pale brownish white, both at base black, pronotum with tubercle black, posterior part of collar discoloured and lustreless yellow, tegula pale brown, tibial spurs whitish, knees and articulations of tibiae and tarsi, fore T2-4 pale brownish. Hair silvery.

Head in frontal view much shorter than in ♀, W:L=100:85 (in ♀ 100:90), with sides roundly convergent below, vertex not depressed, HW, HL, IODv, A3, Al3, P=100, 48, 34, 17, 22, 112; OOD, Od, POD=2, 3, 4; IODs=10:7, frontal shield vertically seen: Fig. 4, somewhat similar in form to some of the variations of T. thaianum, but the lower carinae distinctly upcurved as in ♀, surface gently roundly excavated without medial furrow, but not nearly flattened as in ♀ (but much shallower as compared with thaianum), and more distinctly impressed than in ♀ around fore ocellus, sides of medio-apical



Figs. 4-14. T. pileatum Smith, 4-11: ♂, 12-14: ♀.(explanation in text).

carina, just behind supraantennal transverse carina distinctly impressed (in Fig. 4), upper lateral and lower carinae of the shield seen in profile: Fig. 5 (arrow shows the upper margin), clypeus: Fig. 6, with a semitransparent spot on each side of apical margin, disc gently roundly raised, not tectate; $A3=AW \times 2$, $Al3=BW \times 2.2$, distinctly bent at apex (Fig. 7) and = $Al0-12$; occipital carina deeply roundly depressed behind buccal cavity where it appears almost lacking for a short distance; collar with both parts similar in length in middle, anterior blunt margin gently incurved and anterior part widened laterally; mesopleuron normal, propodeum with strong lateral carinae, area dorsalis with distinct lateral furrows, GSR roundly raised, with top bluntly bicarinate, not discoloured, only slightly brownish at apex. $P, Ma, Mi, 2(Ma), 3(Ma) = 100, 20, 9, 50(22), 48(33)$, Mi located just behind basal condyle, spiracles at about $1/3$ from base; in fore wing RC B-type, Rl short, $CV1 \neq CV2 \times 2$, $TCV:CV2 = 2:3$, TCV straight, CV2 at apical 3rd curved out, angle about 90° .

Genitalia seen somewhat obliquely from beneath: Fig. 8, in general structure similar to allied species. Paramere deeply bifid at apex, dorsal layer broad lamellate almost transparent, without fringe of hair, ventral one narrower, yellowish in colour and fringed with stout hair, at base on outer side of main body longitudinally deeply hollowed (Fig. 9, h), volsella bearing general form of the group and provided with a distinct reflection at baso-dorsal area (Fig. 9, R, seen obliquely from beneath), penis in dorsal view: Fig. 10; sternite 8: Fig. 11, somewhat similar to that of thaiannum, but latero-apical horn-like processes more markedly curved inwards.

Frontal shield distinctly microcoriaceous, but medianly weakly so, superimposed punctures fine, fairly close, surface medianly more or less shining and laterally opaque; mesoscutum also microcoriaceous and more distinctly superimposed with fine punctures, punctures closer and partly subrugosely confluent, propodeum with lateral series of striae strong and coarse, on posterior inclination the striae long extended inwards to median furrow and interspaces of striae finely irregularly reticulate and sparsely mixed with fine hair-bearing punctures, area dorsalis from base to disc obliquely coarsely striate, interspaces finely irregularly weakly reticulate, median furrow transversely sparsely striate, the striae connected laterally with the oblique ones on disc; sides of the segment at basal area obliquely weakly, at apical half transversely and more strongly, finely closely striate, striae stronger on dorsal side than on ventral side.

On the female examined. About 10 mm; similar in colour to δ , frontal shield vertically seen: Fig. 12, surface on lower half flattened, level with the marginal carinae (rather lateral edges than carinae), on upper half moderately inclined toward fore ocellus, medial furrow on upper half weakly defined, but on lower half almost completely disappeared (in Fig. 12 the area below oblique dotted lines flattened and above these inclined toward fore ocellus), marginal carinae and medio-apical carina seen from left side: Fig. 13 (arrow shows the upper margin), undulation weaker than in δ (cf. Fig. 5); clypeus (Fig. 14), with apical margin more strongly rounded out than in δ and medianly widely and weakly recurved. Punctures on mesoscutum distinct, but much sparser than in δ , PIS 1-1.5 times PD. Area dorsalis at base obliquely, on main part transversely arcuately and coarsely striate, GSR highly and roundly raised, apical area simple and discoloured. $HW, HL, IODv, A3, P = 100, 50, 28, 19, 118$; $OOD, Od, POD \neq 1, 4, 3$; $IODs = 7:6$; $A3 = AW \times 3.2$; $P, Ma, Mi, 2(Ma), 3(Ma) = 100, 20, 7, 50(23), 48(32)$. Wing venation as in δ , except that CV2 is only very slightly longer than TCV and that angle formed by them is less than 90° , but these may be within the variation range of the species.

6. TRYPOXYLON BUDDHA Cameron, 1889

Trypoxylon buddha: Tsuneki, SPJHA, 8: 1 (syn.), 33 (redescr., figs.), 1978.
Trypoxylon buddha: Tsuneki, SPJHA, 9: 19, 1979.

Specimens examined: Eastern Province. Trincomalee District: 1 ♀, Trincomalee, China Bay, Ridge Bungalow, 0-100 ft, 13-17. V. 1976; 1 ♀, the same place, 8-11. X. 1977. Uva Province. Nonoragala District: 1 ♀, Nau Ara, 100 m, 10 miles E of Udawalawa, 24-26. IX. 1977, Malaise trap.

Distribution. India, Burma, Malaya, Thailand, Laos, Philippines (Is. Tawi Tawi) and Ceylon (new to the fauna).

7. TRYPOXYLON FLAVIPES Tsuneki, 1979

Trypoxylon flavipes Tsuneki, SPJHA, 9: 24, 1979 (♀, Laos)

Specimen examined: Southern Province. Galle District: 1 ♀, Kanneliya Jungle, 4 miles E of Udugama, 7. X. 1973, Malaise trap.

Remarks. Measurements: HW, HL, IODv, A3, P=100, 67, 34, 18, 170; IODs=5:1; OOD, Od, POD=1, 6, 4; $A3=AW \times 2.6$; P, Ma, Mi, 2(Ma), 3(Ma)=100, 19, 9, 52(24), 50(26); RC=B-type, RI markedly long, almost reaching wing apex, CV2 relatively long, CV1=CV2 \times 3.2 (in holotype CV2 \times 4). In colour Al not yellow, but ferruginous, gaster and hind leg more broadly ferruginous or yellowish than in the types from Laos, venation generally similar, but CV2 relatively long, CV1=CV2 \times 3 (in holotype \times 4), RI markedly long as in types.

8. TRYPOXYLON INDIANUM Tsuneki, 1979

Trypoxylon indianum Tsuneki, SPJHA, 9: 29, 1979 (♀, S. India).

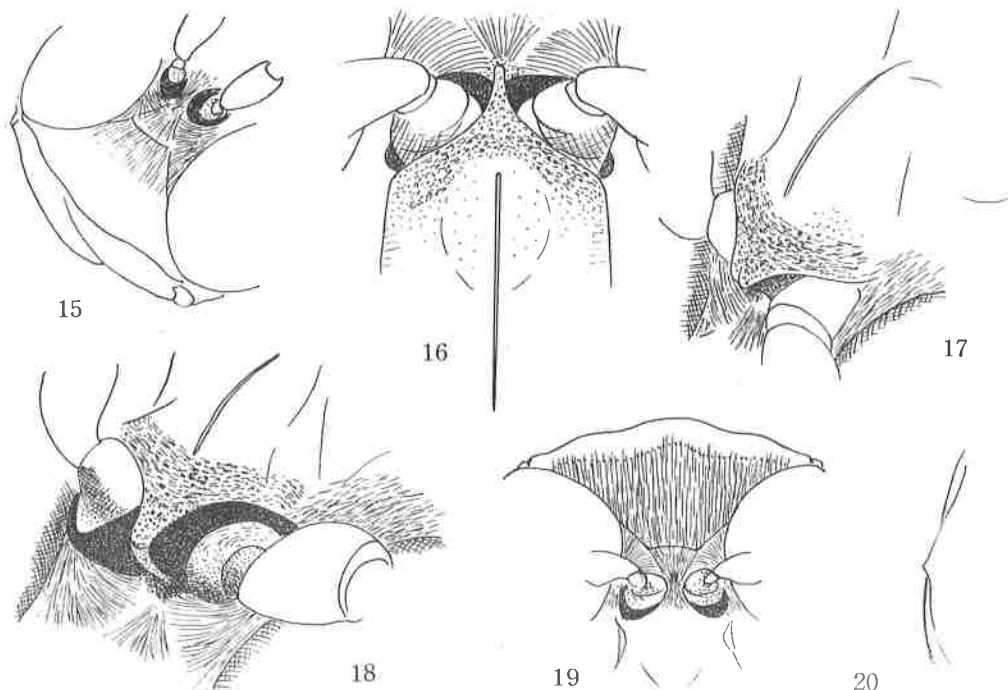
Specimens examined: North Western Province. Kurunegala District: 1 ♀, Badagamwa Jungle, 24-27. I. 1975. Southern Province. Galle District: 1 ♀, Kanneliya Jungle, 11-16. I. 1975.

Remarks. The Ceylonese specimens differ from the type mainly in that G4 is yellowish at base and G2 and 3 not ferruginous at base, mid T2-4 much more broadly black. Venation similar.

9. TRYPOXYLON CAPILLATUM sp. nov.

Characteristic in that hairs on SAT produced in tuft beyond interantennal area and those on oculo-antennal areas also in dense tuft, apically truncate and curved inwards over supra-clypeal area (Figs. 15-19, hairs on SAT are removed).

♀. 10 mm or so. Black; ferruginous to ochre yellow: Al and 2 at each apex and beneath, apical narrow marginal area of clypeus, mandible (apically broadly castaneous), palpi, discoloured posterior part of cellar, tegula and basal plates of wing, apices of coxae, underside of fore trochanter and of femur, both ends of the latter,



following tibia and tarsus except black arolium, precoxal extension of mesosternum, mid femur on both ends, -tibia except elongate brownish mark on outer side, -tarsus except large mark on T2-5 above, both ends of hind tibia, apices of T1 and 2 and whole of 5 of hind leg; palpi, tibiae, spurs and tarsi rather whitish in colour; G2 and 3 except apical black mark on each reddish yellow. Hair silvery, short and appressed, on elyptus parallel.

Head in frontal view somewhat quadrate, weakly roundly convergent below, vertex not depressed, eye emarginations nearly parallel-sided, sinus broadly rounded. HW, HL, IODv, A3, P=100, 52, 28, 18, 100; OOD, Od, POD=1, 3, 3; IODs=10:7; A3=AW×2.6. Frontal elevation moderately high and higher below, median furrow broad and shallow, SAT (to see the structure hairs must be removed) tectiform, acutely carinated on top, anteriorly flattened, covering ASRs and then curved down laterally, in middle it is extended slenderly forwards high over IAA and perpendicularly inclined below middle of IAA (Fig. 16, vertical view, 17 obliquely from above and left side, 18 obliquely from beneath). Clypeus: Fig. 19, disc and triangular supraclypeal area flattened, but apical margin gently reflected; Al strongly incrassate apically, as long as A3, occipital carina complete, but weak behind buccal cavity; collar seen in front with dorsal margin roundly raised, without median tubercle, lamina on side: Fig. 20, very indistinct; mesopleuron normal; propodeum with distinct lateral carinae, almost thorough, area dorsalis enclosed with weak but distinct furrow, area apicalis indistinct, GSR moderately roundly raised, honey yellow. Petiole clavate, P, Ma, Mi, 2(Ma), 3(Ma)=100, 38, 16, 56(50), 60(60); BC B-type, but close to C-type, CV1=CV2×3.5, CV2 somewhat shorter than TCV, shortly produced beyond angle, TCV strongly sinuate, angle roughly about 130°.

Frons microceriaceous and closely subrugosely superimposed with fine punctures, on tectate part of SAT punctures slightly weaker and microsculpture lacking, but apical flattened area again microceriaceous and somewhat more coarsely irregularly rugose-punctate; mesoscutum finely closely punctured, PIS=PD and microceriaceous; propodeum at base of area dorsalis weakly crenate, on other areas closely covered with fine hair-bearing punctures, the hair on area dorsalis very fine and indistinct, series of short striae along lateral carinae weak and rather indistinct, partly due to the obliquely arranged covering hairs, sides smooth and polished, only on posterior portion finely sparsely punctured and on dorso-anterior portion along metapleural suture shortly longitudinally striate.

♂, unknown.

Holotype: ♀, Eastern Province, Trincomalee District, Trincomalee, China Bay, 0-30 m, 8-11. X. 1977, Malaise trap.

Paratypes: 1 ♀, North Central Province, Anuradhapura District, Willpattu National Park, Panikka Wila Bungalow, 1. XI. 1977; 1 ♀, Eastern Province, Asparai District, Inginiyagala, 250ft, Samdra Gardens, 22-23. XI. 1976, Malaise trap.

Remarks. In my key to the Indian species the present species runs to T. maai, but differs markedly from it in body length, structure of SAT, length of R1 and colour of legs.

10. TRYPOXYLON PYGMAEUM Cameron, 1900

Trypoxylon pygmaeum: Tsuneki, SPJHA, 8: 41, 1978 (redescr. types, figs.).

Trypoxylon pygmaeum: Tsuneki, SPJHA, 9: 52 (♀ ♂ from Viet-Nam and Laos).

Specimens examined: Central Province. Matale District: 1 ♀, Kibissa, 0.5 mile west of Sigiriya, Jungle, 28. VI. - 4. VII. 1978, Malaise trap; Western Province. Colombo District: 4 ♀, Colombo Museum Garden, 50 ft, on Ehara, 18. II. 1977.

Remarks. The Ceylonese specimens are closer in colouration to the Indian ones than to those of the S.E-Asiatic areas, namely, the antenna is not wholly black, but ferruginous beneath and fore and mid tibiae are not at apical area only ferruginous, but broadly so except basal area. Pronotal lamina is not developed.

11. TRYPOXYLON MANDIBULATUM Richards, 1933

Trypoxylon mandibulatum: Tsuneki, SPJHA, 8: 73, 1978 (redescr. types, figs. incl.

genit., stern.-8).

Trypoxylon mandibulatum: Tsuneki, SPJHA, 9: 53, 1979 (Ceylon, Bengal, India incl. Deesa).

Specimens examined: North Central Province. Anuradhapura District: 1 ♀, Padavia, Irrigation Bungalow, 180 ft, 27. II. - 9. III. 1970, Davis & Rowe; 1 ♂, the same place, Archaeological Site, 21. V. 1976, Malaise trap. Polonnaruwa District: 1 ♀, Polonnaruwa, 3. III. 1972. Western Province. Colombo District: 1 ♀, Colombo, Museum Garden, 28-31. I. 1975. Eastern Province. Amparai District: 1 ♀, Lahugala, 15. VI. 1976.

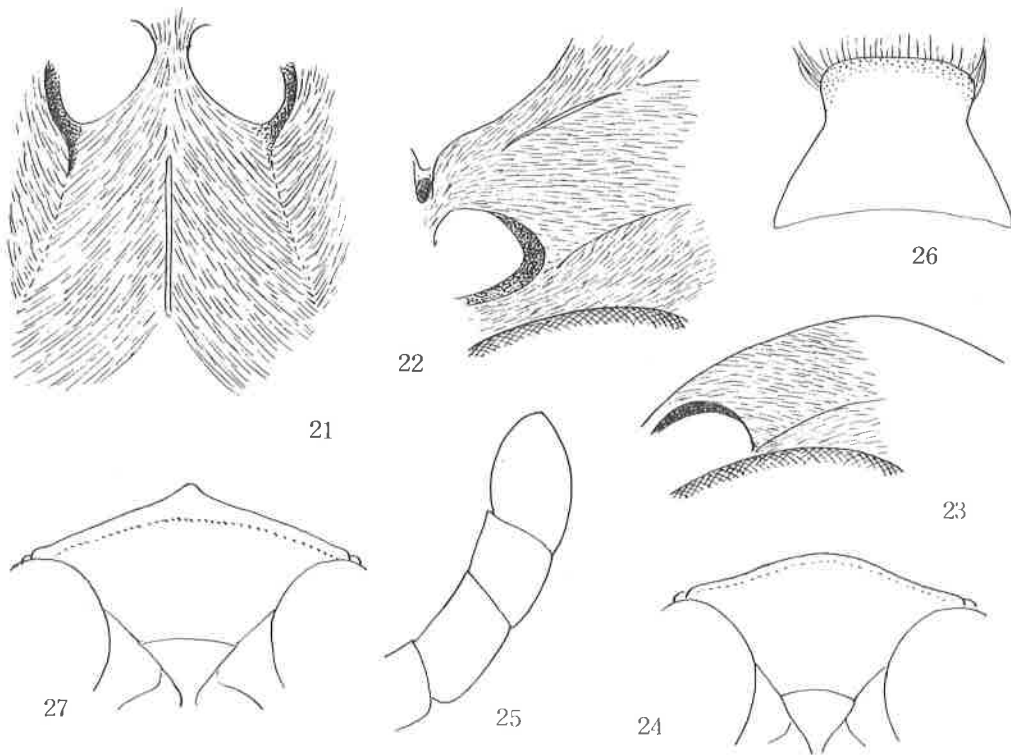
Remarks. As to the structure of the male genital organs and 8th sternite see Part II of the present paper.

12. TRYPOXYLON BASIFLAVUM sp. nov.

The present species is in the structure of SAT somewhat similar to members of pygmaeum-group, but head is not so thick, mandible simple, antenna in the male 13-jointed, area dorsalis transversely striate and G2 is yellow at base.

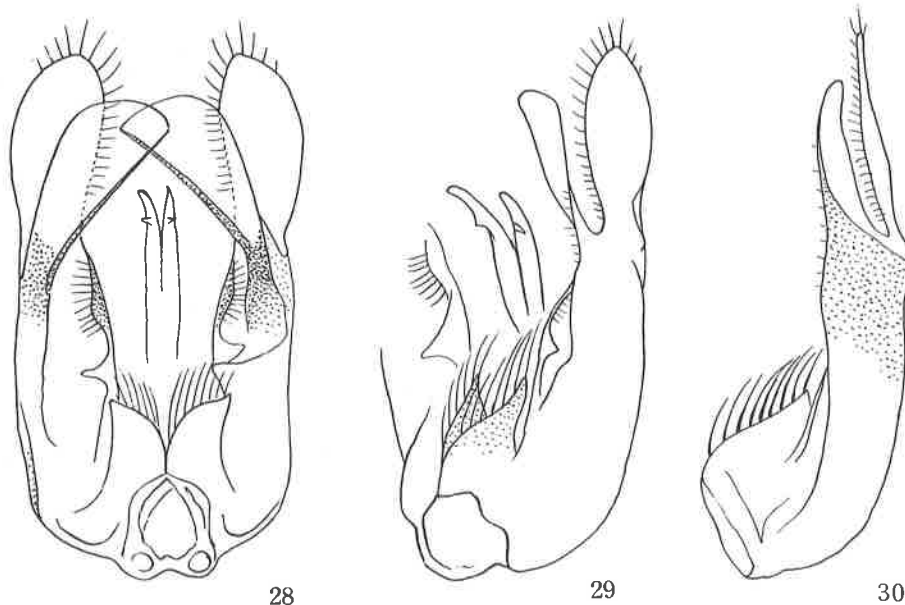
♂, 5.5 mm. Black; antenna ferruginous, dark brown above and basally somewhat paler, mandible only on apical area glossy ferruginous; palpi ochre yellow, pronotal tubercle and base of G2 yellow, posterior part of collar and tegula transparent yellow; fore and mid legs except coxal bases nearly wholly (mid trochanter and femur brown above) and hind leg partly (coxal apex, tibial base, T1 except apical area and all articulations) ferruginous. Hairs silvery, on clypeus parallel, on SAT all directing obliquely inwards, while on inner orbital area obliquely outwards, the contrast is very striking (Fig. 21).

Head in frontal view somewhat quadrate, weakly roundly convergent below. HW, HL, IODv, A3, Al3, P=100, 62, 30, 17, 14, 90; OOD.Od, POD=1, 4.5, 4; IODs=10:8; Al≠A3, A3=AW×3.2,



Figs. 21-27. Trypoxylon basiflavum sp. nov., 21-26 ♂, 27 ♀.

A3,4,5=10,7,7; Al3=Bw×1.7. Frons gently raised, medial furrow broad and shallow, SAT broadly roundly tectate (differing in this regard from *pygmaeum*-group), with a somewhat elongate shining spot on top, thence further extended anteriorly in triangle on IAA and roundly curved down to lower part of the area (somewhat similar to the case of *capillatum*, but the apex not perpendicularly inclined), oblique parts of the triangle covering ASRs, SAT as a whole densely covered with appressed silvery hair, but the hair not produced anteriorly in a tuft, seen vertically: Fig. 21, obliquely from left side: Fig. 22, in profile: Fig. 23. Clypeus: Fig. 24, disc flattened, apical area not reflected; antennal flagellum without incision beneath, Al3 distinctly less than as long as 2 preceding joints united (Fig. 25); occipital carina disappeared behind buccal cavity. Pronotum in frontal view with dorsal margin gently roundly raised, seen from above anterior inclination of collar broadly roundly excavated, hence the part as much incrassate laterally, lamina on side not developed; mesopleuron normal, propodeum with strong lateral carinae, almost thorough from spiracle to apex, area dorsalis with distinct lateral furrows, GSR roundly elevated, apical area brown-



Figs. 21-27. *Trypoxylon basiflavum* sp. nov., male genitalia

ish. P, Ma, Mi, 2(Ma), 3(Ma)=100, 26, 16, 78(32), 64(42), petiole distinctly clavate, sternite 6 with 4 short erect hairs on apical margin, 7 with 2 longer thicker ones, 8: Fig. 26. In fore wing BC B-type, R1 short, CV1=Cv2×3.5, CV2 slightly shorter than TCV, TCV incurved, CV2 outcurved as usual, angle roughly about 90°.

Paramere of genitalia deeply bifurcate at apex into broad lamellate layers, both nearly transparent, but the ventral one well chitinized on inner margin and blackish (Fig. 28, ventral view; 29 oblique lateral, 30 lateral), dorsal lobe fringed with hair on inner margin, inner margin at basal area with two extensions, the basal in acute triangle and the apical much obtused and carrying hairs (Fig. 28); velsella triangular, slenderly extended apically, dorsal margin fringed with long bristles; penis valve without shoulder, but with a pair of sickle-shaped appendages.

Microsculpture on frons posteriorly weaker, with PIS well shining, but anteriorly strong, surface mat, superimposed punctures comparatively large and close; mesoscutum distinctly but not strongly microcoriaceous, somewhat more sparsely superimposed with finer punctures than on frons; series of striae along lateral carinae of propodeum strong and distinct, area dorsalis transversely strongly fairly closely striate, posterior inclination closely covered with fine hair-bearing punctures, sides obliquely striate along dorsal carina, remaining area smooth and shining.

♀. Slightly larger, about 7 mm. Colouration similar except that apical mar-

gin of clypeus brown or ferruginous, mandible yellow and apically brown and basal plate of wing marked with a brown patch.

Head in frontal view somewhat more rounded, slightly convergent below. Measurements: HW, HL, IODv, A3, P=100, 60, 28, 19, 90; OOD, Od, POD=1, 4, 4; IODs=10:9; (100, 59, 28, 19, 94) (1, 5, 5) (10:9)
A3=AW×3.5; A3, 4, 5=10, 8, 8; P, Ma, Mi, 2(Ma), 3(Ma)=100, 26, 18, 68(34), 62(56). RC almost (3, 5) (10, 8, 7.5) (100, 26, 17, 66(30), 64(46))
C-type (ditto), RI short (ditto), CV1=CV2×4 (4.2), TCV incurved (ditto), CV2 outcurved (ditto), TCV slightly longer than CV2 (ditto), angle about 120°(110°). Measurements are made in one of the paratypes and within parentheses are in the other.

Supraantennal structure generally similar to that of ♂, but medial carina weak and short, posteriorly replaced with fine impressed line which is connected with medial furrow of frons, in one of the specimens an impressed line is further present in front of the carina. Clypeus: Fig. 27.

Holotype: ♂, Eastern Province, Trincomalee District: Trincomalee, China Bay, Ridge Bungalow, 30. V. 1976, K. V. Krombein et al. (USNM).

Paratypes: 1 ♀, the same place, 0-100 ft, 12-15. V. 1976, K. V. Krombein; 1♀, the same place, 13-17. V. 1976, K. V. Krombein et al. (USNM).

13. TRYPOXYLON KROMBEINI sp. nov.

Characteristic in the structure of SAT, especially in its perpendicularly inclined apical area.

♂. 5.5-6 mm. Black; mandible orange yellow, apically brownish, palpi nearly white, tegula and basal plates of wing dark brown, tarsi slightly brownish apically. Hairs silvery, on clypeus parallel.

Head in frontal view quadrate, rounded at corners, HW, HL, IODv, A3, Al3, P=100, 64, 27, 12, 22, 100; OOD, Od, POD=2, 5, 3.5; IODs=5:3, A3=AW×2.2, A3, 4, 5=10, 8, 7.5, Al3=BW×2 and =Al0-12, in some condition appears slightly longer than the 3 united. Frons gently raised, medial furrow broad and weak on basal area and disappearing on apical half, SAT broadly roundly elevated and medianly at apical area triangularly reelevated (Fig. 31, vertically seen), reelevated area carrying an acute median carina and apex perpendicularly inclined to IAA; the inclined area medianly shortly carinate and deeply excavated on each side of the carina (Fig. 34, seen obliquely from beneath, also in Fig. 31). ASR with inner part separated from SAT by the above mentioned excavation (ditto). The structure with basal parts of antennae seen obliquely from left side; Fig. 32, in profile; Fig. 33. Clypeus: Fig. 35, medio-apical prominence sometimes simply rounded at apex, disc flattened, on upper portion together with supraclypeal area markedly depressed below level of inner orbits; antenna apically incrassate, Al3 as in Fig. 36. Occipital carina disappeared behind buccal cavity. Pronotal collar seen in front: Fig. 37, anterior inclination broadly roundly excavated, posterior part discoloured, lamina on side not developed. Subalar area of mesopleuron without pterofurrow structure, but the excavation below the area broad and deep, very conspicuous. Propodeum with distinct lateral carinae, area dorsalis distinctly enclosed with deep furrow, GSR comparatively broad and thick, but not elevated, gastral petiole clavate, P, Ma, Mi, 2(Ma), 3(Ma)=100, 20, 13, 50(36), 48(40). RC B-type, but close to C-type, RI moderately long, CV1=CV2×5, TCV:CV2=2:1. TCV sinuate, CV2 not produced beyond apical angle, angle roughly about 120°.

Apical part of sternite 8: Fig. 38, pointed latero-apical corners characteristic. Genitalia obliquely from beneath: Fig. 39, paramere simple at apex, but not pointed, outer margin somewhat more strongly chitinized on apical half, sparsely covered with hair, inner margin fringed with hair on apical area and expanded, rolled on basal area, with dense tuft of bristles near middle (Fig. 39), volsella triangular, slenderly extended apically, carrying a few short pubescence at apex, penis valve simple, turned ventrally near apex, without shoulder and sickle-shaped appendages.

Frons on upper half smooth and shining, finely sparsely punctured, on lower half microceriaceous and densely superimposed with somewhat large punctures, surface mat, but the triangular elevated area in middle shining, only with sparse fine punctures, the contrast between the areas very conspicuous. Mesoscutum microceriaceous and closely superimposed with distinct punctures, in some specimens, however, microsculpture very weak, punctures fine and sparse and surface fairly well shining. Propodeum with distinct series of striae along lateral carinae, area dorsalis at base obliquely striate, disc and 3 furrows transversely strongly, somewhat sparsely stri-

ate, posterior inclination anteriorly covered with hair-bearing punctures, posteriorly transversely coarsely striate, sides smooth and polished and only partly obliquely striate, striae variable in location, area and strength individually.

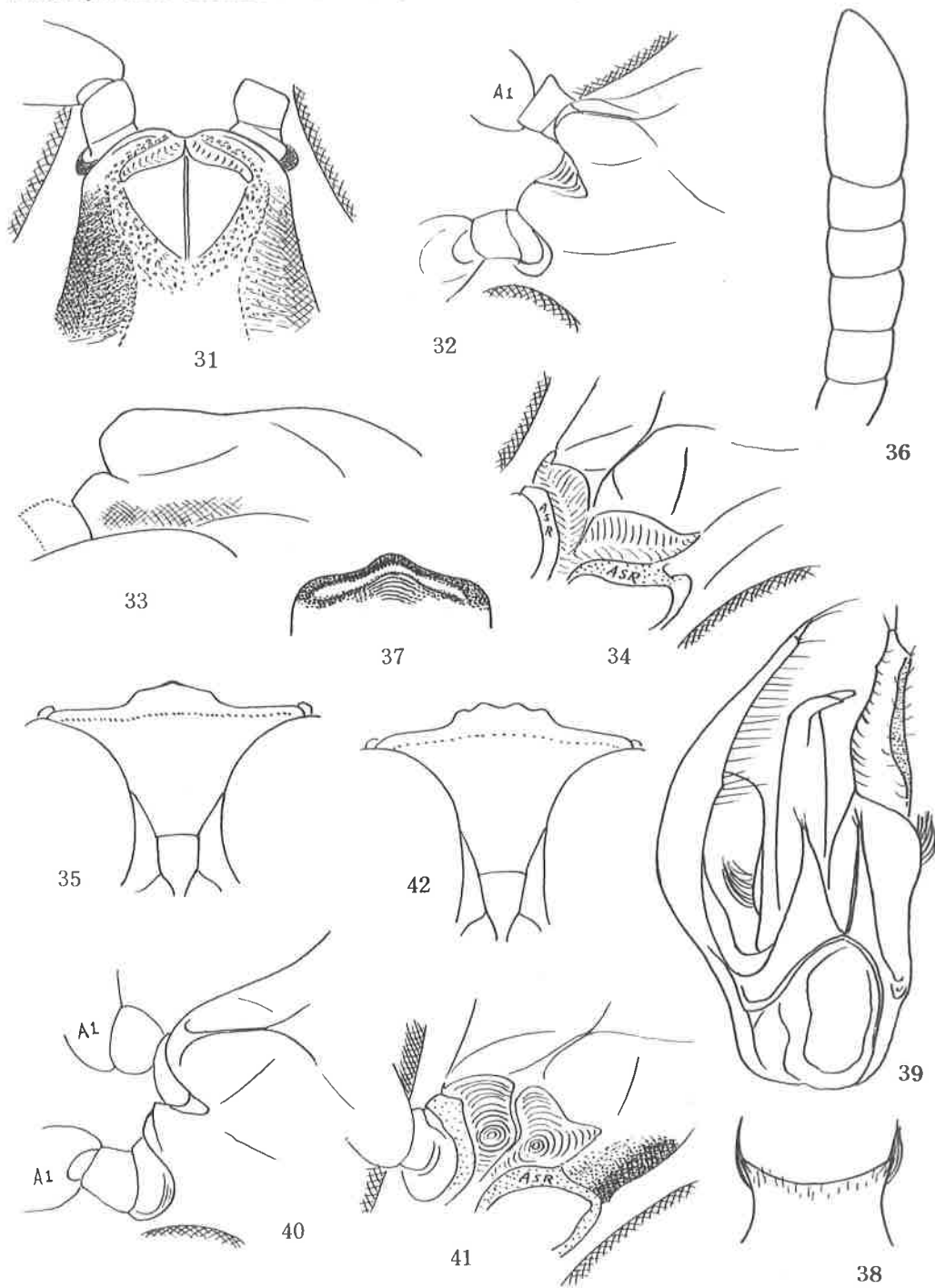


Fig. 31-42. Trypoxylon krombeini sp. nov., 31-39 ♂, 40-42 ♀.

♀. 6-7 mm. Generally similar to ♂. In colour tibial spurs and fore tarsus pale brown. SAT-ASR same in pattern of structure, but medial elevation somewhat wider, antero-lateral excavation much deeper, seen obliquely from side: Fig. 40, obliquely from beneath: Fig. 41. Frons on lower part also shining, only weakly microcoriaceous and more closely than on upper area punctured; clypeus: Fig. 42. Measurements: HW, HL, IODv, A3, P=100, 66, 25, 16, 104; OOD, Od, POD=3, 8, 7; IODs=10:5; A3=AW×2.5, A3, 4, 5=10, 8, 8; P, Ma, Mi, 2(Ma), 3(Ma)=100, 24, 10, 46(27), 47(38). RC rather C-type, relations between CV1, CV2, TCV similar to that of ♂.

Holotype: ♂, Savragamwa Province, Ratnapura District, Sinharaja Forest, Weddagala, 18-21. VI. 1976, K. V. Krombein et al. (USNM).

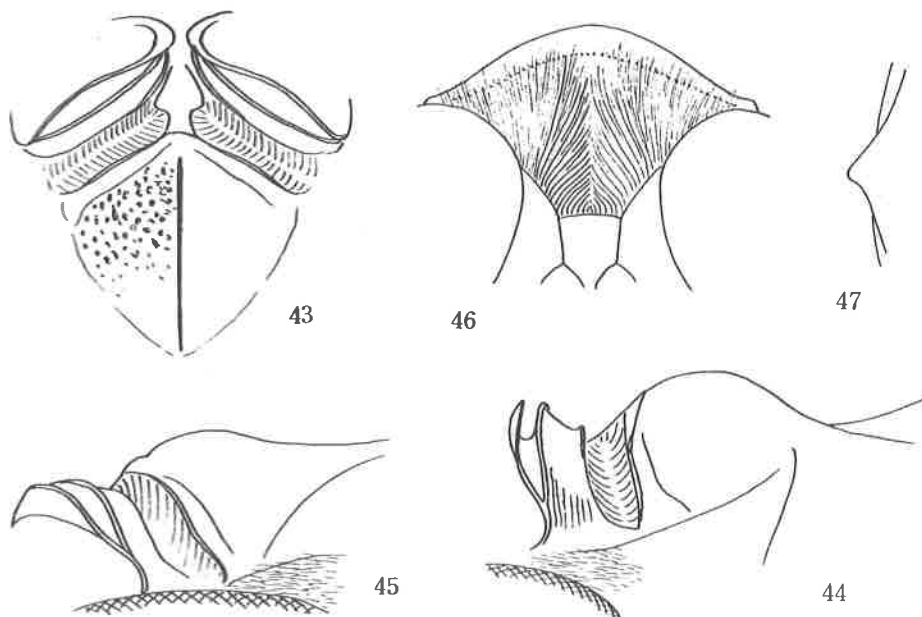
Paratypes: 2 ♀ 3 ♂, the same data as holotype; Southern Province, Galle District, Kanneliya Jungle: 2 ♀ 1 ♂, Hiniduma, 500 ft, 11-12. III. 1972; 3 ♀, 11-16. I. 1975, Malaise trap; 4 ♀, 13-16. VIII. 1972; 1 ♀, Hiniduma, Kottawa Forest Reserve, 11. III. 1972; 1 ♀, Udugama, 400 ft, 6-12. X. 1971. (USNM).

Other specimens: Sabaragamwa Province; Ratnapura District: 1 ♀ 1 ♂, 2 miles South of Weddagala, Sinharaja Jungle, 10-12. I. 1977; 1 ♀ 4 ♂, ditto, 8-12. II. 1977; 1 ♀ 1 ♂, Kegalla District: Kitulgala Jungle, 180-200 m, 25-26. X. 1977. (USNM). The specimens were later sent.

14. TRYPOXYLON BENTEN sp. nov.

In my key to the Indo-Malayan representatives the present species runs to T. spangleri, differing from this, however, in the body size, in the colour of gaster, in the sculpture of propodeum and in the structure of SAT-ASR.

♀. About 12 mm. Black; mandible ferruginous, at extreme base black and at extreme apex brown, palpi ochre yellow, tegula semitransparent brown, G2 and 3 reddish yellow, each with a blackish mark above (G1 on side of apical swelling somewhat reddish); knees, fore tibia largely, fore tarsus wholly except areolium, mid (narrow)



Figs. 43-47. Trypoxylon benten sp. nov., ♀

and hind (broad) tibiae at base, tibial spurs, mid T1-4 and articulations of hind tarsus ferruginous. Hair silvery, on clypeus at base strongly convergent towards medial

line.

Head in frontal view with sides rounded, very slightly convergent below, vertex not depressed, $W:L=100:88$. $HW,HL,IODv,A3,P=100,48,25,24,154$; $OOD,Od,POD=1,3,3$; $IODs=10:8$; $A3=AW \times 4,3$, $A3,4,5=10,7,6.5$. Frons gently raised, medial furrow broad and shallow, anterior part nearly flat, SAT moderately high broad nasiform, distinctly carinated in middle, ASR highly raised, tricarinate, PAF deep, flat-bottomed, SAT-ASR seen vertically: Fig. 43, medio-apical inclination of SAT comparatively high, the structure seen obliquely from left side to see through PAF: Fig. 44, PAF higher inwards, seen in profile SAT-ASR: Fig. 45. Clypeus: Fig. 46, at base raised and medianly weakly tectate, apical margin reflected; occipital carina complete, not depressed behind buccal cavity. Collar of pronotum in frontal view with dorsal line obtused triangular, top rounded and slightly swollen, in dorsal view anterior margin roundly emarginate, posterior part incompletely discoloured, posterior margin only brownish, lamina on side: Fig. 47; subalar area of mesopleuron normal. Propodeum with distinct lateral carinae, area dorsalis indistinctly enclosed with broad shallow furrow, area apicalis only on sides carinated, but well defined by the smooth and polished surface, GSR roundly raised. Gastral petiole distinctly flask-shaped, $P, Ma, Mi, 2(Ma), 3(Ma)=100, 20, 6, 34(22), 44(29)$. RC intermediate between B- and C-types, RI short, $CV1=CV2 \times 5.5$, TCV sinuate, $TCV:CV2=3:2$, angle about 120° .

Frons strongly microcoriaceous and rather sparsely superimposed with fine rounded punctures, surface mat except median line, SAT more strongly subrugosely punctured; mesoscutum on lateral areas fairly closely, on median area more sparsely punctured, punctures comparatively large and distinct, PIS distinctly microcoriaceous, prepectus with punctures somewhat larger and stronger than on scutum, fairly close, rest of mesopleuron very sparsely, weakly punctured; propodeum with strong distinct series of striae along lateral carinae, the striae extended inwards and completely covering whole the surface, area dorsalis at base obliquely, thence posteriorly transversely closely striate, the striae connected with those of lateral series; sides smooth and polished and except broad anterior area fairly closely covered with comparatively large punctures.

δ , unknown.

Holotype: ♀, Southern Province, Galle District, Kanneliya Jungle, 13-16. VIII. 1972, K. V. Krombein and P. B. Karunaratne. (USNM).

15. TRYPOXYLON BICOLOR CEYLONICUM Tsuneki, 1979

Trypoxylon bicolor ceylonicum Tsuneki, SPJHA, 9: 158, 1979 (♀ ♂, Ceylon).

Specimens examined: Northern Province. Jaffna District: 1 ♀, Klinechchi, 80 ft, 24-27. I. 1977; 1 ♀, Elephant Pass, Sea level, 25. I. 1977. North Central Province. Anuradhapura District: 2 ♀, Padaviya, 180 ft, Irrigation Bungalow, 18. V. 1976, Malaise trap. Central Province. Kandy District: 1 ♀, Kandy, Udawattakele Sanctuary, 2100 ft, 16-31. VIII. 1976; 2 ♀, Kandy, Udawattakele, 510-580 m, 8-10. IX. 1977; 1 ♀ 1 ♂, Hasalaka, 107 m, 16-19. II. 1977; 1 ♀, ditto, 140-170 m, 15-17. IX. 1977. Western Province. Colombo District: 2 ♂, Gampaha Botanical Garden, 8. XI. 1977; 1 ♂, ditto, 14. I. 1977; 1 ♂, Godagama, 25. X. 1973, M. & B. Robinson; 1 ♀, Labugama Reservoir, 13-14. X. 1973, Jungle; 1 ♀, ditto, 2-3. X. 1976, 400 ft elevation. Eastern Province. Trincomalee District: 1 ♀ 1 ♂, Trincomalee, China Bay, 0-30 m, 8-11. X. 1977; Amparai District: 1 ♀, Ekgal Aru, 100 m, Reservoir Jungle, 19-22. II. 1977; 1 ♀, Inginiyagala, 10. VI. 1976. Sabaragamwa Province. Ratnapura District: 1 ♀, Ratnapura, 12. X. 1975; 1 ♀, Gilimale Jungle, 17. VI. 1976; 2 ♂, Uggalkaltota, 350 ft, 20. VI. 1976. Southern Province. Galle District: 2 ♀, Kanneliya Jungle, Hiniduma, 500 ft, 11-12. III. 1972; 1 ♀, ditto, Jungle, 13-16. VIII. 1972.

Remarks. The bicolor specimens from Ceylon are very similar in external characters to petiolatum, especially in ♀. Detailed explanation was already given in Part III of the present paper.

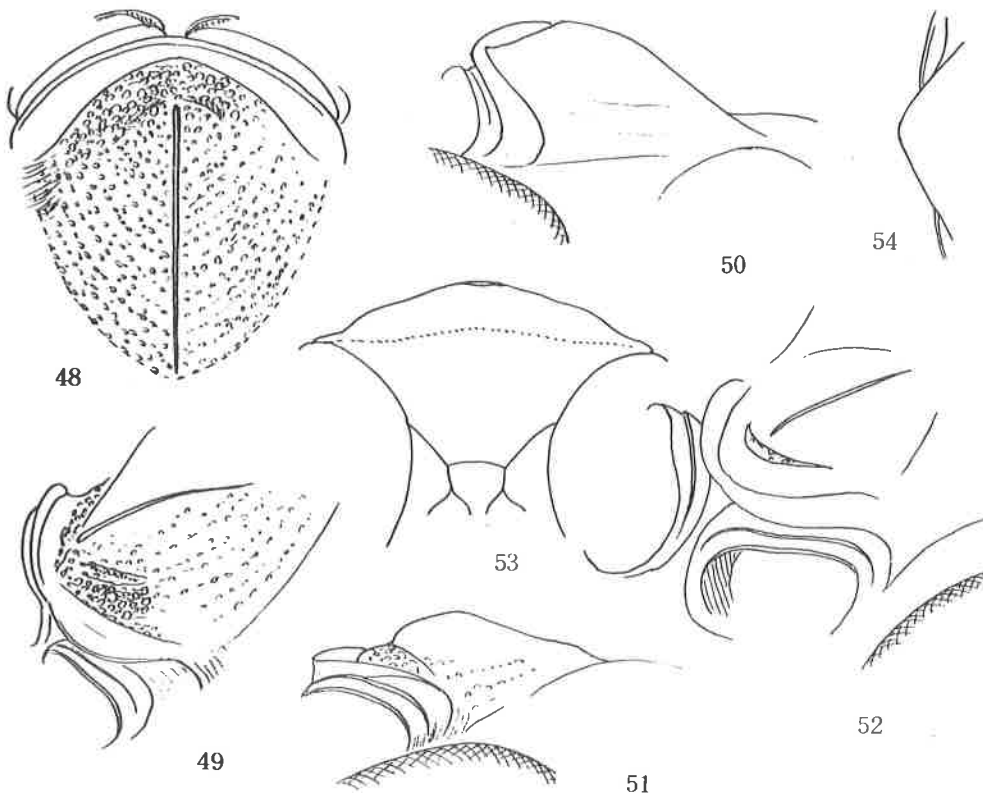
Additional specimens: Central Province. Matale District: 1 ♀, Kibissa, 0.5 mile West of Sigiriya, Jungle, 28. VI - 4. VII. 1978. Eastern Province. Trincomalee District: 1 ♀, Trincomalee, China Bay, 0-100 ft, 27-31. I. 1977. Sabaragamwa Province. Ratnapura District: 1 ♀, Gilimale Induruwa Jungle, 5-7. II. 1977, Malaise trap.

16. TRYPOXYLON KANDYIANUM sp. nov.

In my key to the Indian and S.E.-Asiatic species the present specimen runs to penangense, but it does not agree with the species. It is characteristic in the structure of SAT and colour of gaster.

♀. 11.5 mm. Black; with strong plumbeous shine on thorax. Ferruginous are Al-2 except above, mandible (apex brown), pronotal tubercle (rather yellowish), tegula (semitransparent), gaster (petiole above dark brown, but basally paler, G^{4,5} widely blackish, possibly postmortem change), apices of coxae, trochanters except brownish marks above, fore and mid femora except blackish dorsal side, fore and mid tibiae, base of hind tibia, tibial spurs, fore tarsus except arolium and greater part of mid T⁴⁻⁵; apical margin of clypeus castaneous brown, lamina of pronotum reddish brown, palpi ochre yellow, rest of legs strongly brownish, posterior part of pronotal collar incompletely discoloured, with posterior margin only dark yellowish. Hair silvery, on clypeus nearly parallel (at base somewhat convergent towards medial line).

Head in frontal view with W:L=100:80, vertex somewhat depressed, lateral margins roundly weakly convergent below. HW,HL,IODv,A3,P=100,46,24,23,126; OOD,Od,POD≠ 1,3,2 (strictly 2,6,5,4,5); IODs=10:8; A5=AW×4, A3,4,5≠10,7,6; All longer than wide. Frons gently raised, medial furrow broad and shallow, SAT low broad nasiform, long carinated in middle, apical margin transversely broadly rounded and acutely carinated, marginal area flattened, lamellate, shining and reflected, completely covering PAF and hanging over IAA, PAF practically lacking, ASR closely bicarinate on top, with posterior margin covered with lamellate expansion of apical margin of SAT. SAT-ASR seen vertically: Fig. 48, obliquely from above and left side; Fig. 49, from somewhat more below; Fig. 50, in profile; Fig. 51, obliquely from beneath; Fig. 52. Clypeus: Fig. 53, at base gently raised and apically weakly reflected, occipital carina com-



Figs. 48-54. Trypoxylon kandyianum sp. nov., ♀

plete, not depressed behind buccal cavity. Collar gently roundly raised towards middle, weakly tuberculate there, lamina on side: Fig. 54; subalar area of mesopleuron normal, episternal suture nearly straight. Propodeum with distinct lateral carinae, but the carina disappeared at base and at apex, area dorsalis with shallow broad but distinct lateral furrows, area apicalis margined on both sides with high carinae, at medio-dorsal area marked with a short transverse carina, interrupting extension of medial furrow of posterior inclination of the segment, GSR roundly highly elevated, with apical area amber yellow. Petiole flask-shaped, P, Ma, Mi, 2(Ma), 3(Ma)=100, 22, 7, 38(29), 38(36); RC intermediate between C- and M-types, RI short, but reaching close to wing apex, CV1=CV2x7, TCV:CV2=2:1, TCV weakly sinuate.

Frons distinctly microcoriaceous and somewhat sparsely superimposed with round punctures, PIS=1-3 times PD, SAT posteriorly closely covered with punctures similar to those of frons, but anteriorly much more strongly and closely, irregularly coarsely rugoso-punctate. Mesoscutum closely covered with fine (finer than on frons) punctures; propodeum with longitudinal series of short striae along lateral carinae, the striae not extending inwards, area dorsalis on medial furrow transversely closely striate, at base obliquely and on lateral furrows irregularly crenate, disc finely closely punctured, sides smooth and shining, median obliquely area sparsely covered with fine punctules.

♂, unknown.

Holotype: ♀, Central Province, Kandy District: Kandy, Udawattakete Sanctuary, 2100 ft, 2-13. VIII. 1976, S. Karunaratne (USNM).

17. TRYPOXYLON NIGRIPES Tsuneki, 1979

Trypoxylon nigripes Tsuneki, SPJHA, 9: 132, 1979 (♀ ♂, S. India).

Specimens examined: Central Province. Kandy District: 1 ♀, Kandy, Udawattakete Sanctuary, 2100 ft, 2-13. VIII. 1976, S. Karunaratne; 1 ♂, 5 miles N.W. of Mahiyangana, 30.III. - 9.IV. 1971, P. & P. Spangler; Western Province. Colombo District: 1 ♀, Labugama, Reservoir Jungle, 2-4. II. 1977.

Remarks. In the Ceylonese male examined the gaster is completely black, differing from the paratype of the species from South India which is coloured as in ♀.

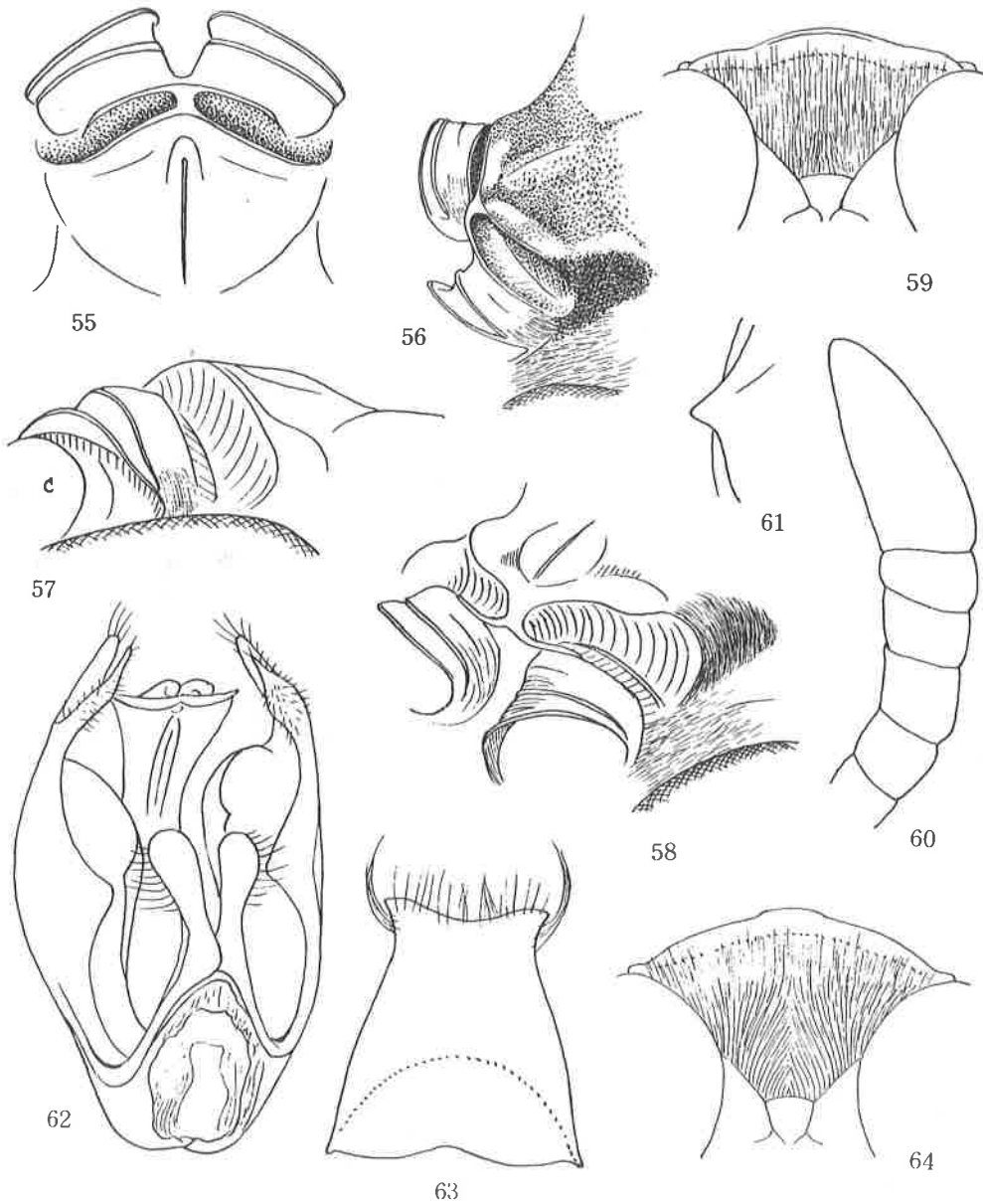
18. TRYPOXYLON SRILANKUM sp. nov.

In the key to the Indian and S.E. Asiatic species the present specimens run to couplet 121 and run out. They are very characteristic in the structure of supraantennal elevation, having a π -shaped carina anteriorly and can easily be separated from all other allied species.

♂. 9-10 mm. Black; antenna completely black, mandible yellowish glossy brown, at base black and at apex dark brown; palpi ochre yellow, posterior part of pronotal collar incompletely discoloured, with only posterior marginal area narrowly dirty yellowish (densely covered with hair), tegula transparent pale brown, fore tibia in front ferruginous, fore tarsus except black arolium ochre yellow or pale brown (T1 always slightly dark), mid tarsus apically somewhat pale. Hair silvery, on clypeus almost parallel.

Head in frontal view much wider than long (W:L=100:76), with sides rounded, not convergent below, vertex almost not depressed. HW, HL, IODv, A3, Al3, P=100, 52, 27, 13, 26, 130; OOD, Od, POD=2, 5, 4; IODs=10:8; A3=AWx2.2; Al3=HWx3 and =A9-12. Frontal elevations gently rounded, medial furrow broad and moderately deep, but on anterior part shallower, with surface nearly flat, SAT raised towards apex, surface very gently tectate, nearly flat, with a shining thick carina in middle, apical margin in vertical view subtriangular (Fig. 55) and acutely carinated, the margin except medio-anterior area somewhat incrassate and distinctly reflected, ASR obliquely extended antero-laterally, with top tricarinate, the anteriormost one lamellately expanded towards IAA, the posteriormost ones of both sides extended inwards and connected with each other, this carina is again connected by a short bridge with the apical marginal carina of SAT at the middle, thus forming π -shaped carina-complex (Fig. 55), interspace of the carinae (=PAF) deeply excavated (Fig. 56, obliquely from left side; 58, obliquely from beneath), seen in profile (Fig. 57) roundly excavated anterior wall of

SAT well visible. Clypeus: Fig. 59, disc gently roundly tectate, with apical reflection very slight; antenna comparatively long, AB-13; Fig. 60 (dorsal view), occipital carina complete, but somewhat weak behind buccal cavity; prenotal collar in frontal view straightly raised towards middle and weakly tuberculate there, in dorsal view with apical margin gently roundly emarginate, lamina on side produced in triangle (Fig. 61); mesopleuron normal, propodeum with distinct lateral carinae, area dorsalis distinctly enclosed with deep furrow, area apicalis triangular, margined with carina (to see the structure hair should be removed) which is interrupted at the top by the medial furrow of posterior inclination, GSR highly raised in triangle, with top rounded and discoloured, Gastral petiole slender, flask-shaped, P, Ma, Mi, 2 (Ma), 3 (Ma)=100, 19, 7, 32(26), 34(40). RC C-type, RI short, TCV varied in situation, some-



Figs. 55-64. *Trypoxylon srilankum* sp. nov., 55-63, ♂; 64, ♀.

times nearly straight, $TCV:CV2=3:2$, $CV1=CV2 \times 5$, angle roughly about 110° .

Genitalia seen obliquely from beneath: Fig. 62, paramere bifurcate at apex into two slender layers, both fairly well chitinized, both sides of main body lamellately expanded, rolled ventrally and inwards, forming a cylindrical pouch, volsella wide spatulate, apical margin fringed with yellowish hair; penis valve with well developed shoulder and sickle-shaped appendages; sternite 8: Fig. 63.

Frons distinctly microceriaceous, nearly mat and closely superimposed with comparatively large punctures, SAT with punctures finer, anteriorly (before apex of medial carina) smooth and shining, ASR also smooth; mesoscutum without microsculpture, smooth and polished and finely sparsely, not strongly punctured. Propodeum with series of striae along lateral carinae, the carinae posteriorly extended inwards, forming transverse carinae in front of area spicalis, area dorsalis with medial furrow transversely striate, with lateral furrows strongly crenate.

♀. 10-13 mm. Generally similar to ♂, but gaster broadly (mostly from apex of G1 to base of G4) reddish in middle, fore tibia in front partly brown, dark brown, often nearly wholly black, fore and mid tibial spurs and fore tarsus apically pale brown.

Head in frontal view relatively longer (100:83), with sides gently roundly convergent below, HW, HL, IODv, A3, P=100, 50, 26, 22, 154; OOD, Od, POD=2, 5, 4; IODs=10:8, A3=AW×3.5. Frontal and supraantennal structure similar; clypeus: Fig. 64, at base more distinctly elevated, with hair convergent towards medial line; occipital carina complete; collar including lamina similar, propodeum similar, except that area apicalis is not interrupted dorsally by the longitudinal furrow of posterior inclination of the segment. P, Ma, Mi, 2(Ma), 3(Ma)=100, 18, 6.5, 30(23), 34(31), venation similar. Mesoscutum with strong plumbeous shine, otherwise punctuation similar.

Holotype: ♂, Eastern Province, Asparai District: Ekgal Aru, Reservoir Jungle, 9-11. VI. 1976, K. V. Krombein and P. B. & S. Karunaratne (USNM).

Paratypes: Central Province, Kandy District, Kandy: 2 ♀, 5-15. VII. 1976, S. Karunaratne; 4 ♀, 20-30. VII. 1976 and 1 ♀, 16-31. VIII. 1976, S. Karunaratne; Kandy, Udawattakele, 26-30. III. 1973, S. & P. B. Karunaratne, 1 ♀, ditto, 510-580 m, 8-10. IX. 1977; Hasalaka Circuit Bungalow, 30-31. V. 1975; Matale District: 1 ♀, Kibissa, 0.5 mile W of Sigiriya, Jungle, 28.VI - 4.VII. 1978, Malaise trap. Eastern Province, Asparai District: Ekgal Aru, Reservoir Jungle, 9-11. VI. 1976. Sabaragamuwa Province, Ratnapura District: 1 ♀, Gilimale, 19-22. VI. 1976. Southern Province, Galle District: 1 ♀, Udugama Kanneliya Jungle, 400 ft, 6-12. X. 1973 (USNM). 1 ♀, Teideniya, 13. I. 1954, F. Keiser (NHMB).

19. TRYPOXYLON ERRANS Saussure, 1867

Trypoxylon errans: Tsuneki, SPJHA, 8: 1 (syn.), 28 (redescr.: intrudens Sm.), 1978.
Trypoxylon errans: Tsuneki, SPJHA, 9: 114, 1979.

Synonyms: T. intrudens Smith, 1870; canaliculatum Cameron, 1889; philippinense Ashmead, 1904; gardineri Cameron, 1907; indicum Menke, 1967 (= ernatipes Cameron, 1913, nec Fox, 1891); tanoi Tsuneki, 1976.

Distribution: Mauritius Is., Rodrigues Is., Seychelles Is., Ceylon, India, Nepal, Burma, Thailand, Cambodia, Malaya (incl. Penang), Java, Philippines, Formosa.

Specimens examined: Central Province, Kandy District: 1 ♀, Kandy, Udawattakele Sancturay, 2100 ft, 26-30. III. 1975, S. & P. B. Karunaratne; 2 ♀, the same place 20-30. VII. 1976, S. Karunaratne; Sabaragamuwa Province, Ratnapura District: 1 ♀, Rajawaka, 20. VI. 1976, P. B. Karunaratne; 1 ♀, Gilimale Jungle, 17. VI. 1976.

Remarks. The gaster of the male of this species is usually red on G2 and 3, but sometimes wholly black and only somewhat brownish on the segments mentioned beneath. Petiole is markedly variable in relative length, sometimes it becomes as long as two following segments united and 3-4 times as long as its maximum width. This aberration is especially marked in the male specimens from the Seychelles.

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