

SPECIAL PUBLICATIONS
OF THE
JAPAN
HYMENOPTERISTS ASSOCIATION

NO. 16

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

XI. ADDITIONAL SPECIMENS FROM VARIOUS PARTS
OF THE REGIONS, WITH AN APPENDIX ON SOME
SPECIES FROM OTHER REGIONS

By K. TSUNEKI

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April 30, 1981 d

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ABBREVIATIONS

- A1, A2 and so on ... Antennal joint 1, Antennal joint 2 ...
A10-12 ... A10+A11+A12.
ASR ... Antennal socket rim (raised upper part of antennal socket) (see p. 89).
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 ... (see p. 89).
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 eyes.
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) ... Ocellocular 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. (see p. 89)
PIS ... Puncture interspace.
POD ... Postocellar distance, distance between inner margins of hind ocelli.
RC ... Radial cell of fore wing (see p. 89).
Rl ... Apical produced part of R1 beyond the meeting point with Rs, often very long.
SAT ... Supraantennal tubercle, nasiform or tuberiform, characteristic to species.
TCV ... Transverse cubital vein (see p. 89).
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, A13, P= ... measured under the standard of HW as 100.
P, Ma, Mi, 2(Ma), 3(Ma)= ... measured under the standard of P as 100.
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 A13 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.

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The present part comprises the records and descriptions of the specimens that have been sent after the first study of the related area was finished and those which were left aside at the first study because of the insufficient material to form a Part. In the specimens treated here are included a considerable number derived from the areas that are considered to belong to the Palaearctic Region. However, in connection with the fact that the Himalayan areas are included under the present heading, some South Chinese Provinces adjacent to the Himalayas are also placed within the scope of the present study, merely for convenience' sake.

Besides the above, some specimens that are involved in the material sent, although they are derived distinctly from other Zoogeographical Regions, are also recorded in the present paper as an appendix on this occasion, because most of them have some bearing upon the species that have been dealt with in the present study.

Of the species investigated those from the northeastern Provinces of Burma that were collected by Dr. R. Malaise in 1934 and sent from Swedish Museum of Natural History, Stockholm, and those from Szechuan, South China that were collected by D. C. Graham in 1924 and sent from United States National Museum of Natural History, Washington, D. C. are particularly of interest, because both areas remain quite unexplored in regard to the wasps of the present genus.

1. SPECIMENS FROM SRI LANKA

All the specimens were sent successively by Dr. K. V. Krombein, the principal investigator of the field work of Smithsonian Institution's "Biosystematic Study of the Island of Ceylon"

The new material consists of 16 species, including four new ones (T. triangulum, T. gampahae, T. kitulgalaense and T. fruticicola) and one new sex (T. capillatum Tsuneki, ♂).

In order to receive the new forms an enlarged key to the Ceylonese species was made.

1. TRYPOXYLON SCHMIEDEKNECHTI KOHL, 1906

Trypoxylon schmiedeknechti: Tsuneki, SPJHA, 7: 21, 40, 1978 (ref., redescr., ssp, figs.)

Trypoxylon schmiedeknechti: Tsuneki, Ibid., 10: 5, 1979 (Ceylon, 12 ♀ 3 ♂).

Specimens newly examined: 4 ♀ 1 ♂.

3 ♀, Mon. Dist., Angunakolapelessa, 17-19. VI. 1978, 21-23. I. 1979 (100 m, Malaise trap); 1 ♀, Rat. Dist., Gilimale, Induruwa Jungle, 7-8. III. 1979, Malaise trap; 1 ♂, Man. Dist., 0.5 mile NE of Kokmotte, Wilpattu National Park, 15-16. II. 1979, Malaise trap.

Remarks. In the specimens (♀ ♂) RC=B, Rl very short, attenuate apically, sometimes rather indistinct, CV1=CV2×2. TCV:CV2=6:5, angle about 70°.

2. TRYPOXYLON THAIANUM TSUNEKI, 1961

Trypoxylon thaianum: Tsuneki, SPJHA, 7: 49, 1978 (ref., syn., redescr., ssp, figs.).
Trypoxylon thaianum: Tsuneki, Ibid., 10: 6, 1979 (Ceylon, 16 ♀ 10 ♂).

Specimens newly examined: 7 ♀.

1 ♀, Rat. Dist., Gilimale, Induruwa Jungle, 13-15. III. 1979, Malaise trap; 6 ♀ Amp. Dist., Ekgal Aru, Sanctuary Jungle, 9-11. III. 1979.

Remarks. In the specimens (♀), RC=B, Rl short, attenuate apically, CV1=CV2×2, TCV:CV2=5:6, angle slightly greater than in schmiedeknechti, about 80°.

3. TRYPOXYLON PILEATUM SMITH, 1856

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

Trypoxylon pileatum: Tsuneki, Ibid., 10: 6, 1979 (Ceylon, 1 ♀ 1 ♂, descr. ♂).

Specimens newly examined:

2 ♀, Ham. Dist., Palatupana Tank, 15-50 ft, 18-20. I. 1979, Malaise trap.

Head in frontal view with lateral margins rounded, slightly narrowed towards clypeus, W:L=100:88-89, vertex slightly depressed, tops of hind ocelli almost level with tops of eyes, eye incision comparatively broad and shallow, gently narrowed towards bottom. Measurements on two females:

HW, HL, IODv, A3, p=100, 48, 28, 9, 112. 100, 50, 29, 10, 112. IODs=10:9. 10:9. OOD, Od, POD=2, 6, 6. 2, 5, 5. A3=AW×2.8 AW×2.8. A3, 4, 5=10, 7, 6. 10, 8, 7. P, Ma, Mi, 2(Ma), 3(Ma)=100, 24, 8, 52(28), 40(44). 100, 24, 8, 52(30), 42(40).

Frontal shield on apical area very shallow, almost level with marginal carinae, surface nearly flat; clypeus at base gently raised, but with hair parallel, apical margin gently recurved; punctures on mesoscutum distinct, close, slightly larger than in schmiedeknechti, PIS PD, PIS microcoriaceous (not with impressed lines connecting punctures). Veins of wing dark brown, nearly black, RC=B, Rl short, CV1=CV2×2, TCV:

CV2=5:6, angle about 80°. In the second specimen similar. In fore wing reduced cubital cell 2 is obscurely observed.

4. TRYPOXYLON TRIANGULUM SP. NOV.

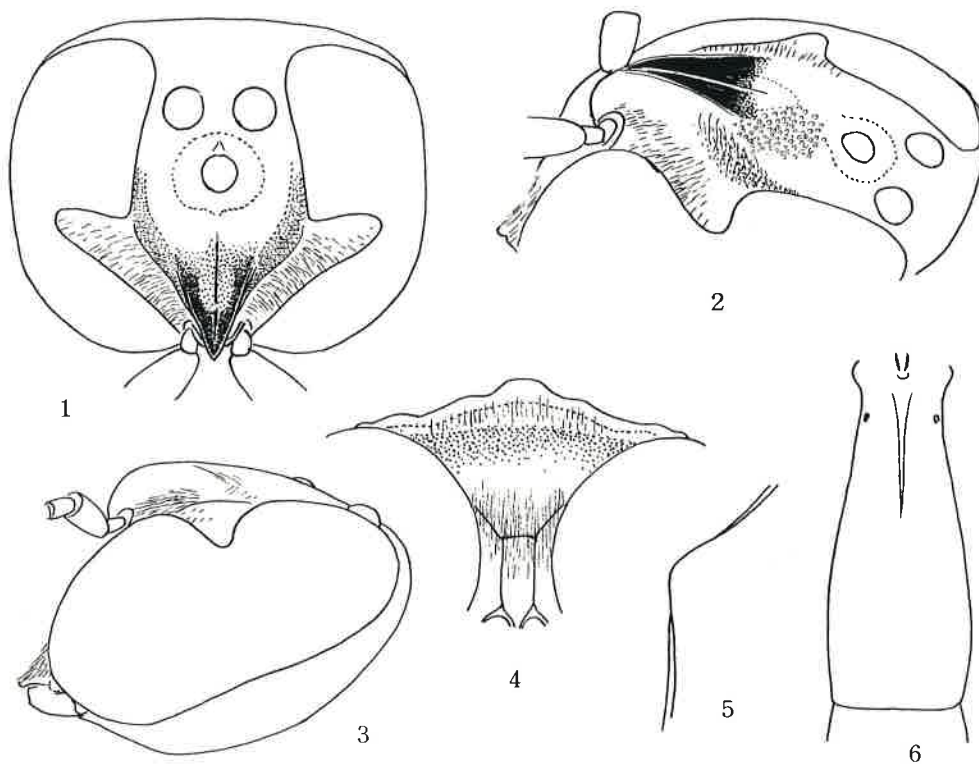
The present species very closely resembles T. lucidipes known from Borneo (see remarks), but differs from this in some detailed characters:

- (1) Ship-shaped hollow on frons much shallower.
- (2) A3 somewhat relatively longer.
- (3) Mid leg with black areas.
- (4) Inner orbits above eye incisions more distinctly divergent anteriorly.
- (5) Eye incision broader and less strongly narrowed towards sinus.
- (6) R1 in fore wing much longer.

The species is considerably similar in appearance to T. naviforme recorded from Java, but can be distinguished from this in the structure of the ship-shaped hollow on the frons.

Diagnosis. ♀, 7 mm. Supraantennal area with a large ship-shaped hollow, widely open upwards (Figs. 1 and 2), G1 clavate (Fig. 6), mesoscutum microcoriaceous and punctured, propodeum with lateral carinae, area dorsalis enclosed with furrow, fore leg nearly wholly, mid leg largely and hind leg partly yellow, hair silvery, R1 considerably long.

Black; yellow are A1 completely, A2 except above, A3 at base and apex narrowly, apical margin of clypeus comparatively broadly (Fig. 4, but glabrous area castaneous brown), mandible (apically brown), mouth parts, pronotal tubercle except basal area, posterior part of collar (discoloured and greyish yellow), tegula (basal plate of



Figs. 1-6. Trypoxylon triangulum sp. nov. ♀

wing brown), coxae at apex, trochanters wholly, thence apically of fore and mid legs except black arolia, brownish median part above of mid femur, a small brownish patch near apex of mid tibia and obscure marks on mid T₂, 3, 5, and the following parts of hind leg: both ends narrowly of femur, base broadly and apex narrowly of tibia and articulations of tarsus (hind tibial spurs dark brown). Gaster on sides and beneath of intersegmental areas of G₂-3 and 3-4 reddish, stigma of wing black and veins dark brown. Hair on clypeus silvery, parallel.

Head thick, seen in front nearly quadrate, W:L=100:99, vertex not depressed, eye incision comparatively broad and gently narrowed towards bottom, bottom widely rounded, dorsal margin horizontal, length of inner orbit above eye incision greater than IODv (5:4), frons gently raised and apically above antennae longitudinally triangularly excavated, the hollow margined on both sides with carinae (Fig. 1 vertical view), similar in form to that of lucidipes, in dorso-lateral view: Fig. 2, seen in profile: Fig. 3, ASR not well developed, very fine ring-shaped and attached to the lateral wall of the praantennal structure (Figs. 2 and 3). Clypeus: Fig. 4, surface not raised at base and not markedly reflected at apex, supraclypeal area narrow and long.

HW, HL, IODv, A₃, P=100, 70, 32, 21, 90. IODs=10:3.7. OOD, Od, POD=1, 6, 4. A₃=AW×3.5. A₃, 4, 5=10, 7, 6.5. P, Ma, M₁, 2(Ma), 3(Ma)=100, 42, 22, 62(51), 64(55).

Occipital carina disappeared behind buccal cavity. Collar of pronotum transverse, anterior part narrow ridge-like, much narrower in middle than posterior part, gently incrassate laterally, in frontal view dorsal margin gently roundly raised, but without medial tubercle, posterior part discoloured, lamina on side: Fig. 5, parapsidal suture on mesoscutum less than 1/3 the length of the scutum, glittering fine impressed line, subalar area of mesopleuron normal, propodeum with distinctly lateral carinae, but not reaching apex of the segment, lateral carinae of area apicalis distinct, but not curved inwards, between apex of the carina and end of lateral carina of propodeum there is an empty space and, moreover, the latter not straightly directing towards the former. Area dorsalis almost completely enclosed with fine but distinct furrow, medial furrow broad, the area at base obliquely inclined from fine furrow just behind postscutellum and sculpture of the area begins from about middle of this inclination, GSR slightly roundly raised at posterior margin, but not discoloured, Gl: Fig. 6. In fore wing RC=B, Rl moderately long, appr. as long as A₄, CV1=CV2×3, TCV:CV2=9:8, TCV nearly straight, CV2 down-curved near apex, angle about 130°.

Frons distinctly microcoriaceous and closely superimposed with comparatively large punctures, PIS PD, punctures not entering the triangular hollow, within the hollow posteriorly microreticulate and anteriorly smooth and shining, mesoscutum distinctly microcoriaceous and very closely and finely (more finely than on frons) punctured, surface half mat, propodeum with lateral series of striae, the striae fine and close, covered with hair, not distinct, area dorsalis obliquely strongly coarsely striate, median furrow transversely, more finely and closely striate, striae of both areas connected with each other, outsides of the area and posterior inclination surface closely covered with fine piliferous punctures, sides except antero-ventral femoral sinus obliquely microreticulate and microstriate.

♂, unknown.

Holotype: ♀, Keg. Dist., Kitulgala, Bandarakele, 17-18. III. 1979, K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, L. Jajawickrema and T. Gunawardana (USNM).

Remarks. In Pt. VI of the present paper, dealing with the Bornean species I allocated T. lucidipes within the category of T. naviforme and treated it as a local race of this species. But the discovery of a closely resembling and yet different form, namely triangulum, in Ceylon changed my view: n. lucidipes should be separated from naviforme at the species rank, namely

TRYPOXYLON LUCIDIPES TSUNEKI, 1980 (STAT. NOV.),

because the difference between them in the structure of the half-enclosure on frons is as great as, or even greater than the difference between schmiedeknechti and thai-anum in the structure of frontal enclosure.

Rather, there may exist such a subspecific relationships between lucidipes and triangulum, but here, basing upon the differences above listed between them both are treated as a distinct species respectively.

T. townesorum n. known from the Philippines is also similar in the structure of the frons, but in this species the hollow is much smaller and can easily be separated from other relatives.

5. TRYPOXYLON INDIANUM TSUNEKI, 1979

Trypoxylon indianum Tsuneki, SPJHA, 9: 29, 1979 (♀ ♂, india, with figs. of clypeus & pronotal lamina).

Trypoxylon indianum: Tsuneki, Ibid., 10: 9, 1979 (2 ♀, Ceylon).

Specimens newly examined:

1 ♀, Mon. Dist. Angunakolapelessa, 100 m, 21-23. I. 1979; 1 ♀, Gal. Dist., Sinharaja Jungle, Kanneliya Section, 13-16. VII. 1978, Malaise trap. (USNM).

Remarks.

(1) In the key to the species of Ceylon this species is erroneously indicated to have the yellow mark at base of G3. In reality yellow is base of G4 as is explained in text.

(2) The specimen from Gal. Dist. is considerably aberrant in colour: Gaster besides G4 at base, G2 and G3 both at base ferruginous, narrowly above and broadly beneath, especially marked on G3 where it is broadly yellowish on both sides also. In fore femur ground colour ferruginous and marked with dark brown above (the mark comparatively large, covering about median half) and beneath (smaller, covering about median third), mid femur brown and with a broad ferruginous streak in front and mid tibia almost without dusky mark, mid T2-3 brown (not black) and T4-5 pale brown, hind tarsus black, apically strongly brownish. In this specimen G2 with base considerably exposed and shows a deep distinct fovea at base beneath also, but no fovea is present at base beneath of G3 and 4.

(3) Head in frontal view subquadrate, W:L=100:96, vertex not depressed, tops of hind ocelli distinctly above level of tops of eyes, eye incision comparatively broad and distinctly narrowed towards bottom, dorsal margin horizontal.

(4) HW, HL, IODv, A3, P=100, 67, 31, 18, 156. IODs=10:4. A3=AW×2.7. A3, 4, 5=10, 7, 6. OOD, Od, POD=1, 10, 9. P, Ma, Mi, 2(Ma), 3(Ma)=100, 22, 12, 52(25), 44(32). RC=C, Rl moderately long, appr. as long as TCV, CV1=CV2×3. TCV=CV2, TCV gently incurved, angle about 110°.

6. TRYPOXYLON PYGMAEUM CAMERON, 1900

Trypoxylon pygmaeum: Tsuneki, SPJHA, 8: 41, 1978 (redescr. holotype ♂, nec ♀).

Trypoxylon pygmaeum: Tsuneki, Ibid., 9: 52, 1979 (♀ ♂, Viet-Nam, Laos).

Trypoxylon pygmaeum: Tsuneki, Ibid., 10: 10, 1979 (5 ♀, Ceylon).

Specimens newly examined.

1 ♀, Col. Dist., Colombo, Museum Garden, 50 ft, 25. II. 1977, K. V. Krombein (SNM).

On some characters.

Head in frontal view subquadrate, W:L=100:104, vertex not depressed, gently roundly raised, eye incision broad and shallow, located much more anteriorly than usual, weakly narrowed towards sinus which is broadly rounded, dorsal margin distinctly inclined outwards.

HW, HL, IODv, A3, P=100, 80, 34, 13, 84. IODs=10:8. A3=AW×1.8. A3, 4, 5=10, 8, 8. OOD, Od, POD=1, 4, 4. RC=C, Rl short, CV1=CV2×1.4. TCV:CV2=3:5, TCV gently sinuate, angle about 110°.

Colouration. A1 and 2 at apices and beneath yellowish, rest ferruginous beneath. Legs black with following yellow: fore trochanter beneath, base and apex of fore femur, fore tibia except a fine line beneath and broader one above (both brown), fore tarsus except arolium, mid femur at base and apex, mid tibia at base and apex and inner side, mid tarsus except apically above, hind tibia at base and all spurs; articulations of hind tarsus pale brown.

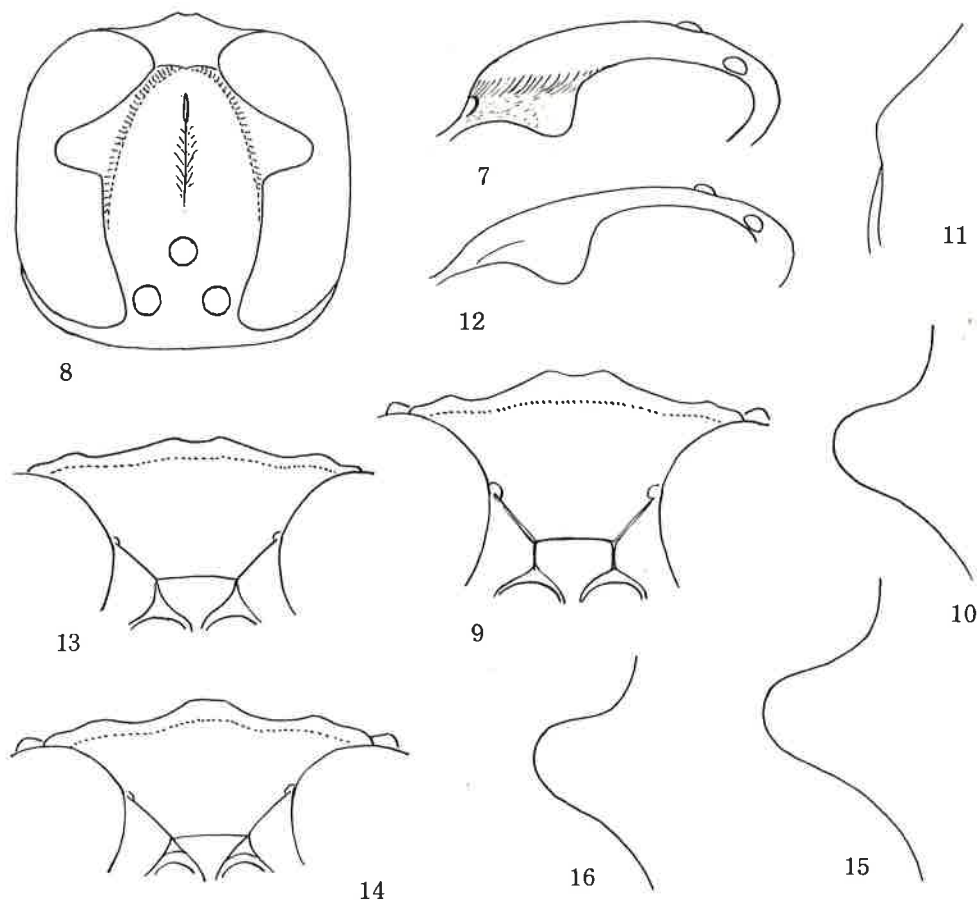
7. TRYPOXYLON GAMPAHAE SP. NOV.

Very closely resembles T. pygmaeum Cameron, but differs from this in that the length is smaller, frons more highly raised and at apex more acutely (roundly) inclined.

ed to IAA, area dorsalis obliquely rugoso-striate in the main, IODs smaller and antenna and legs more broadly black.

♀. 3.5 mm. Black; antenna dark brown, each joint largely brownish beneath; ferruginous or yellow are apical margin of clypeus (pale castaneous), mandible till apex (yellow), palpi (bright yellow), pronotal tubercle posteriorly (greyish yellow), discoloured posterior part of collar (do.), parts of fore leg (apex of trochanter, narrow base and apex of femur, slightly more broadly so of tibia, spurs and tarsus except arolium), of mid leg (generally similar to fore leg, but from middle of T1 apically black) and of hind leg (base of tibia and spurs only). Hair silvery, on clypeus parallel.

Head in frontal view similar to that of *pygmaeum*, but slightly shorter, W:L=100:96 (in *pygmaeum* 100:104, the difference more conspicuous under eye measurement), eye incision also similar (Fig. 10), but slightly different from *mandibulatum* (Figs. 15: ♀, 16: ♂), head in lateral view more highly raised than in *pygmaeum* and at anterior end more acutely inclined to IAA (Fig. 7, cf. Fig. 12 in *pygmaeum*); frons well deve-



Figs. 7-16. 7-11: *Trypoxylon gampahae* sp. nov., ♀. Figs. 10, 12, 13: *T. pygmaeum* Cameron, ♀. Figs. 14-16: *T. mandibulatum* Richards, ♀ (14-15) and ♂ (16).

loped, much wider and longer than usual, in vertical view: Fig. 8, with median furrow very weak, only anteriorly at the area of SAT shortly but distinctly impressed. Clypeus: Fig. 9, more closely resembles that of *pygmaeum* ♀ (Fig. 13) than that of *mandibulatum* (Fig. 14), but forward prominence is somewhat stronger than in *pygmaeum*

♀ (Fig. 9, cf. Fig. 13), ratio of width at base to length in middle 7:8 (in pygmaeum 6:5 and in mandibulatum 5:4), disc broadly, gently roundly swollen at the centre as in two compared species, supraclypeal area flat, apparently somewhat depressed, pentagonal in form (in the two species compared distinctly triangular, cf. Fig. 13 in pygmaeum and Fig. 14 in mandibulatum).

HW, HL, IODv, A3, Al2, P=100, 70, 36, 11, 19, 80. IODs=10:5.7. OOD, Od, POD=2, 6, 7. A3=AWx2. A3, 4, 5=10, 7, 7. P, Ma, Mi, 2(Ma), 3(Ma)=100, 38, 24, 60(48), 64(62). RC=C. Rl short, but comparatively longer than in the compared two, appr. half the length of TCV, not attenuate, CV1=CV2×2.3. TCV:CV2=6:7, TCV straight, CV2 downcurved as usual, angle roughly about 110°.

IODc relatively much smaller than in compared two species, ♀. Antenna markedly incrassate apically, Al2 appr. twice as thick as A3. Pronotum as in pygmaeum, lamina on side obtused triangular, with apex broadly rounded, almost not produced; parapsidal suture on mesoscutum not distinct, scutellum nearly quadrate, on both sides very broadly and very deeply excavated, the excavation is separated from deep post-tegular hollow by a pale brownish lamellate septum which appears from above as a triangular membrane, postscutellum also markedly excavated on both sides, but the excavation smaller and shallower than those of scutellum, subalar area of mesopleuron without pent-roof structure. Propodeum with distinct lateral carinae, but the carina at base and at apex considerably broadly obsolete, area dorsalis without lateral furrows, median furrow broad and distinct, gradually enlarged towards apex, median furrow of posterior inclination deep but short, ending at about mid point of posterior inclination, apical area heavily disturbed by coarse sculpture and closely covered with hair. GSR comparatively long, brown in colour, feebly transversely striate, up-curved as a whole, but not lamellately elevated at posterior margin, Gl with spiracles at about one fifth from base.

Frons microcoriaceous and finely and very closely punctured, microsculpture appears to be fine connecting impressed lines between punctures, not microreticulation between them; mesoscutum similarly microsculptured and punctured. Propodeum without lateral series of striae, area dorsalis obliquely, finely and closely rugoso-striate and on medio-basal area minutely, irregularly reticulate and median furrow transversely finely closely striate, outsides of the area and posterior inclination coarsely, but fairly closely punctured, sides obliquely, closely striate except baso-ventral femoral sinus.

♂, unknown.

Holotype: ♀, Colombo District, Gampaha Botanical Garden, 4. III. 1979, K. V. Krombein, T. Wijesinhe, S. Siriwardane, L. Jajawickrema and T. Gunawardane.

8. TRYPOXYLON MANDIBULATUM RICHARDS, 1933

Trypoxylon mandibulatum: Tsuneki, SPJHA, 8: 73, 1978 (redescr. types ♀ ♂, figs. incl. genitalia etc.).

Trypoxylon mandibulatum: Tsuneki, Ibid., 9: 53, 1979 (Ceylon, Bengal, India including Deesa).

Trypoxylon mandibulatum: Tsuneki, Ibid., 10: 10, 1979 (Ceylon, 4 ♀ 1 ♂).

Specimens newly examined: 2 ♀ 1 ♂.

1 ♂, Anu. Dist., Padaviya, Antiquities Site, 20-25. VII. 1978, K. V. Krombein et al.; 1 ♀, Ham. Dist., Palatupana Tank, 15-50 ft, 18-20. I. 1979, Malaise trap; 1 ♀, Mon. Dist., Angunakolapelessa, 100 m, 21-23. I. 1979, Malaise trap.

On some characters.

(1) Eye incision (Figs. 15, ♀; 16, ♂). Very similar to that of pygmaeum (Fig. 10), but dorsal margin appears somewhat more strongly inclined outwards and round curvature of the bottom is also slightly different, namely more regularly rounded.

(2) Measurements. See Table 1. Measurements regarding eyes and ocelli are very difficult and exact measurement is frequently impossible, and if possible it is of no practical use. The eye has a rim, but frequently it is obscure and unobservable under luge; ocellus is quite indistinct at the margin, it has sometimes the so-called pupil, but its appearance is uncertain and, moreover, it does not show the margin of the round elevation. When the ocellus is pure black it is difficult to determine its margin. Furthermore, ocellar diameter (= Od) is sometimes individually variable. For the practical use, therefore, as to OOD and POD more than rough values can not be ex-

pected and the rough values are good and practical. This is also the case with IODs.

Table 1. Measurements on Trypoxylon mandibulatum Richards

Loco	Sex	BL	HW	fHL	HL	IODv	A3(L/W)	Aul(L/W)	P	IODs	OOD	Od	POD
Anu.	♂	6	100	96	67	34	10(1.7)	16(1.5)	80	6.5	1	5	5
Ham.	♀	6	100	96	66	36	10(1.7)	18(1.8)	80	8.0	1	4	6
Mon.	♀	6	100	96	68	36	11(1.7)	18(1.8)	78	7.5	1	6	6

A3	A4	A5	P	Ma	M1	2(Ma)	3(Ma)	RC	RI	CV1	T:C	Angle
10	8	8	100	52	20	70(36)	68(52)	B	s	2.4	7:9	100
10	8	7	100	32	20	68(36)	64(52)	B	s	2.8	6:8	100
10	8	8	100	28	20	60(32)	58(46)	B	s	2.4	6:9	100

Remarks. BL ... Body length. fHL ... Head length in frontal view.
 Aul ... Ultimate antennal joint (in ♂ A13, in ♀ A12).
 L/W ... Length to width; width in ♂ at base, in ♀ at apex.
 CV1 ... CV1/CV2. T:C ... TCV:CV2. Angle ... at apex.

(3) Colour of antenna. In ♂ thoroughly orange yellow beneath, A1 and 2 at apices and A3, 4 and 5 except brown mark above yellowish. In ♀ similar to ♂, but blackish mark at base above of A3, 4 and 5 larger and the segments appear more blackish.

(4) Colour of legs (♀ ♂). Fore leg: Apex of trochanter, base and apex narrowly of femur, tibia with spurs and tarsus except arolium yellow, rest black. Mid leg: Similar to fore leg, but T2, 3 and 5 brown (♂) or blackish (♀) above, sometimes apex of trochanter and base of femur almost completely black. Hind leg: Apex of femur, base broadly and apex narrowly of tibia, spur, basal half of T1 and articulations of tarsus yellow. In ♀ from Ham. Dist. T1 and 4 both completely yellow.

9. TRYPOXYLON CAPILLATUM TSUNEKI, 1979

Trypoxylon capillatum Tsuneki, SPJHA, 10: 9, 1979 (3 ♀, Ceylon).

Specimens newly examined: 2 ♀ 2 ♂.

1 ♀ 1 ♂, Mon. Dist., Angunakolapelessa, 100 m, 21-23. I. 1979, Malaise trap; 1 ♂, Mon. Dist., 0.5 mile NE of Kokmotte Wilpattu National Park, 15-16. II. 1979, Malaise trap; 1 ♀, Mon. Dist., Cashew Corp., Ma Villu, 17-21. II. 1979, Malaise trap.

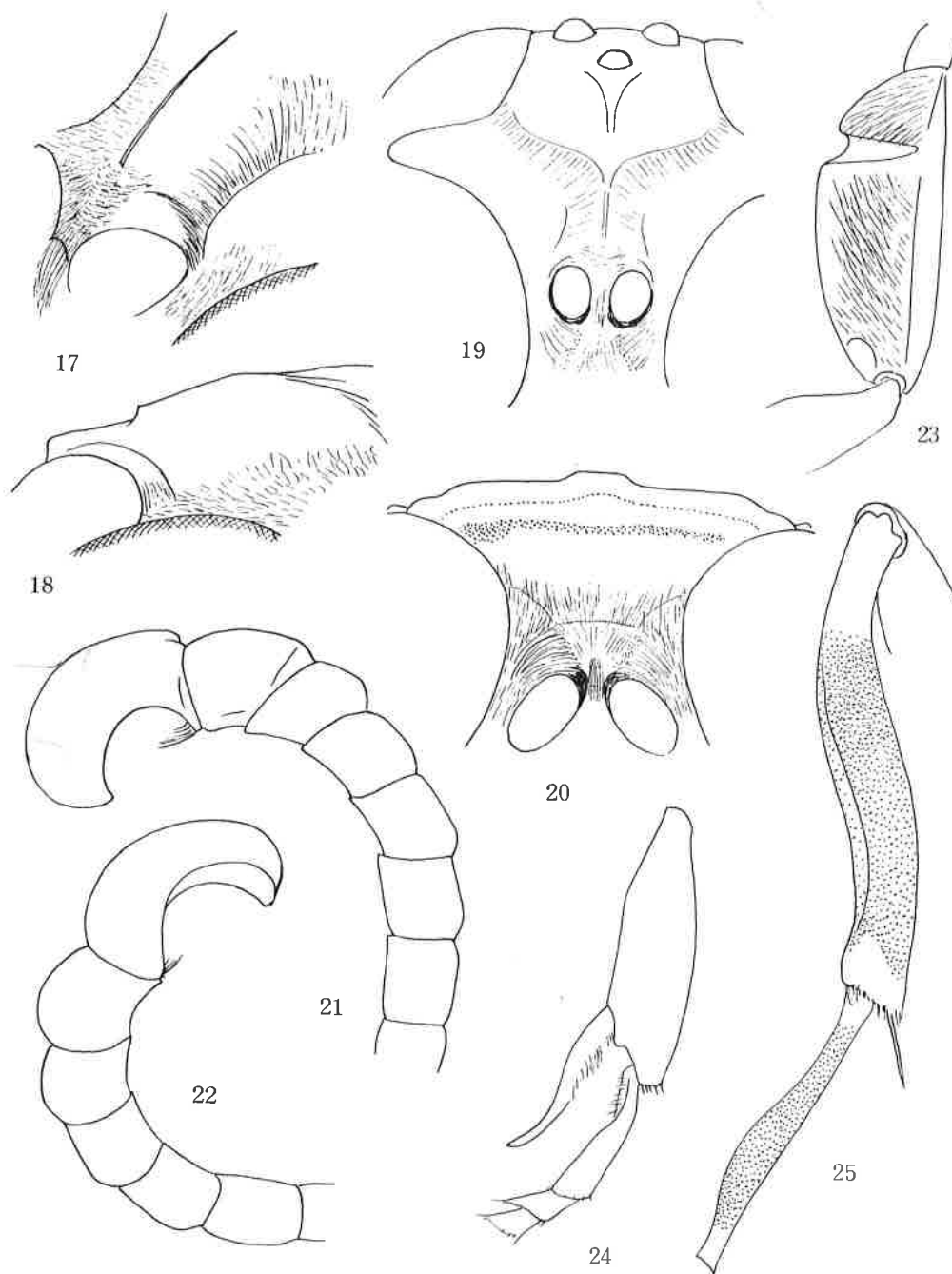
Description of ♂.

In the characteristic structure of antenna and fore leg the present species is very closely allied to T. truncatum m. known from Laos (cf. Pt. III, p. 43), but here gaster is red and only on G1 and 2 beneath blackish (in truncatum nearly wholly ferruginous), hind leg more broadly darkened and, further, with tibia distinctly modified, hairs on medio-apical narrowed part of SAT produced in bundle over IAA, those on oculo-antennal area below curved inwards and spread in wide triangle as in ♀ (in truncatum at medio-apical area of SAT hairs not so strongly produced in bundle and at oculo-antennal area simply longitudinally parallel). Still further, in the present male frontal elevation lower, frontal furrow shallower, SAT at anterior part flattened and expanded laterally (in truncatum not flattened and not expanded laterally) and smoothly connected with ASR, almost without PAF, and sternite 8 much broader.

Length 8.5-9.0 mm. Except sexual characters apparently as in ♀, but full description is given below:

Black; antenna dark brown, A1 and 2 at apex and beneath, from A9 apically beneath and partly above ferruginous, clypeus at apex narrowly castaneous brown, mandible yellow, apically broadly brown, palpi bright yellow, pronotal tubercle posterior

ly, posterior part of collar (discoloured) yellowish; G2 and 3 at base reddish yellow and brown beneath, especially marked on G3; yellow on legs; apices of coxae, fore trochanter beneath, fore and mid femora except broad brown streaks above and beneath, fore tibia and tarsus, mid tibia except brownish outer side, mid tarsus except T3 and 5



Figs. 17-25. *Trypoxylon capillatum* Tsuneki, ♂.

partly above, hind knee, tibia at base and apex and articulations of tarsus (at T1-2 broad), Arolia black. Hairs on inner orbits and clypeus silvery, on SAT dense, forming a curved bundle at apex, producing over IAA (Figs. 17, 19 and 20), on outer sides of supraclypeal area curved inwards, forming a triangular hair plate and producing over part of supraclypeal area where hairs triangularly diverging forwards (Figs. 19 and 20), on clypeus parallel.

Head in frontal view with sides rounded, but somewhat quadrate as a whole, W:L=100:80, vertex not depressed, eye incision moderate in width, but strongly narrowed towards bottom (in ♀ subparallel-sided), dorsal margin distinctly inclined outwards (in ♀ horizontal), frontal furrow broad and shallow, elevations on both sides only gentle, but frons rather abruptly narrowed apically to form nasiform SAT (Fig. 19) which is comparatively thick, medianly acutely carinate, but the carina ending far behind apex, sides of SAT acutely inclined to scapal sinus, apical part of SAT in front of medial carina flattened, expanded to triangular area, with surface arcuately rugoso-punctate and nearly smoothly (flatly) connected with ASR; the structure seen vertically from clypeal side: Fig. 19, in oblique dorso-lateral view (somewhat from beneath): Fig. 17, in profile: Fig. 18; clypeus: Fig. 20, disc flattened, only weakly depressed along inner orbits; occipital carina indistinct behind buccal cavity.

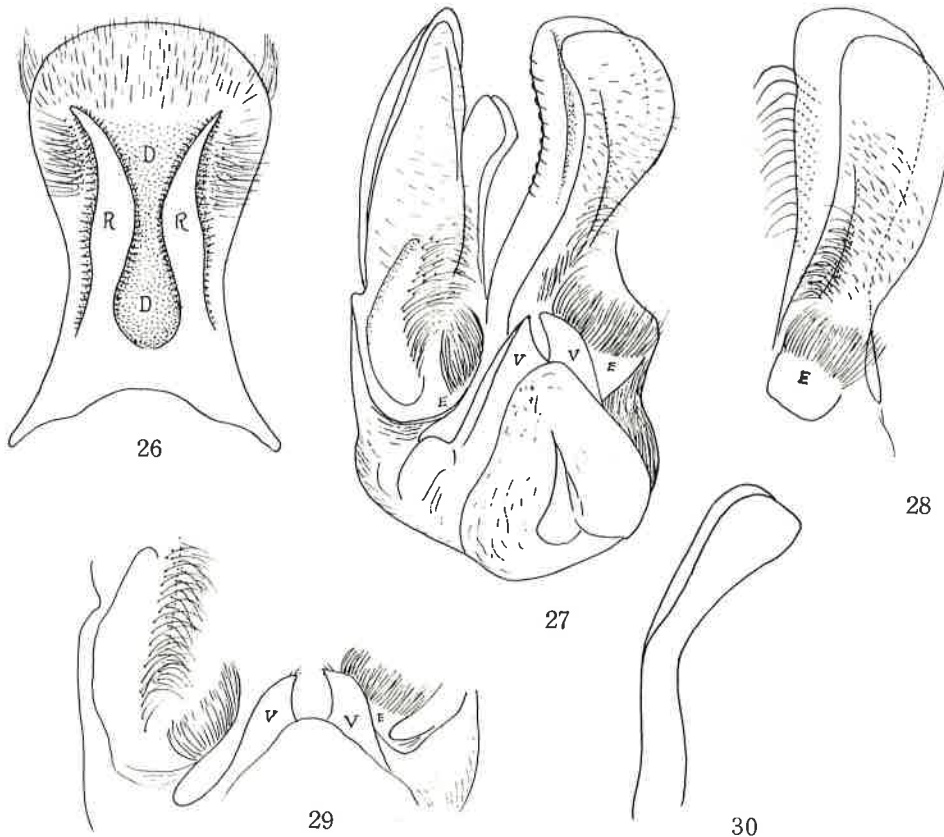
HW, HL, IODv, A3, Al3, P=100, 55, 51, 15, 26, 100. IODs=10:6, 5. OOD, Od, POD=1, 2, 2. A3=AWx2. A3, 4, 5=10, 8.5, 8. Al3 strongly curved. P, Ma, Mi, 2(Ma), 3(Ma)=100, 32, 15, 50(52), 48(64). A9-13: Figs. 21 (dorsal) and 22 (ventral), Al3 parallel-sided in vertical view, strongly curved, slightly twisted and deeply excavated beneath from base till apex, bearing a row of 5-6 silvery hairs at base beneath, directing towards apex, surface of the excavated ventral side smooth and polished.

Collar transverse, both parts similar in length in middle, anterior part not narrow carina-like, at anterior verge roundly inclined towards nape region, and gradually incrassate towards sides where it is broadly rounded, lamina on side generally similar to that of ♀; mesoscutum without impressed lines at base, parapsidal sutures not impressed, but slightly raised, weak and short, less than one third of the scutal length, lateral excavations of scutellum and of postscutellum normal, not particularly large nor deep; subalar area of mesopleuron normal. Propodeum at base with a somewhat raised transverse area, its surface transversely rugulose, from just behind this area usual area dorsalis begins which is enclosed with a fine shallow furrow, the furrow weaker and indistinct anteriorly, median furrow broad and deep, lateral carina of propodeum distinct, long, originating near spiracle and reaching apex, just at outside of lateral carina of area apicalis which is curved inwards at anterior end but not completely enclosing the area, GSR roundly raised, discoloured to amber-yellowish.

In fore wing RC=B, Rl comparatively short, less than half the length of TCV, CV1=CV2 x 3.5, TCV:CV2=4:3, TCV gently sinuate, angle markedly broad, about 130°, no vestigial cubital cell 2. Fore femur near base beneath transversely incised (Fig. 23, seen from beneath), the basal and apical areas separated by the incision closely covered with white hair, the hair on the former dense and directing apically, while that on the latter somewhat sparse, but long and directing obliquely towards base, spur of the following tibia markedly long and Tl flattened and slightly modified (Fig. 24, seen from beneath). Mid and hind femora strongly thickened, but without modification, hind tibia distinctly modified, in posterior view: Fig. 25, and Tl also slightly modified (ditto). Gastral petiole distinctly clavate, 8th sternite very strange in form and characteristic, seen from inside, namely from above: Fig. 26, in the figure area R raised and area D depressed or excavated, state of the hair is also very curious.

Genitalia pale brownish yellow in colour, seen obliquely from beneath and left side: Fig. 27; paramere deeply split into two broad lobes, the dorsal lobe at inner margin fringed with long hair (Fig. 28, right paramere at apical area, ventral view), ventral lobe with ventral surface somewhat sparsely covered with short erect hair, near its inner margin a weak ridge runs longitudinally which becomes weaker apically and not reaching apex, at its basal half, from its outer slope long curved hair densely arising (Figs. 27, 28 and 29); at the base of ventral side of paramere where it is elevated perpendicularly against the volsella another row of long brownish hair present, forming a conspicuous tuft (Figs. 27, 28 and 29, E); volsella (V in Figs. 27 and 29) seen vertically from apical side of genitalia: Fig. 29, with a few short hairs at apex; penis valve consists of a pair of spatulate lamellae, without shoulder and the sickle-shaped appendages, in lateral view: Fig. 30 (from left side).

According to the structure of genitalia in the male of the present species, it is presumed that the male genitalia in *truncatum* are generally similar in structure, judging from the imperfectly observed parts of the organs of this species. (cf. Figs. 119-120 of Pt. III.). But the 8th sternite is markedly different in form, although



Figs. 26-30. Trypoxylon capillatum Tsuneki, ♂

the characters at apical part is fundamentally similar.

Frons microcoriaceous and closely superimposed with fine punctures, punctures anteriorly contiguous to the adjacent ones, SAT densely covered with piliferous punctures, especially closely so on medio-apical area, mesoscutum microcoriaceous and rather closely and more finely punctured than on frons, surface half mat, lateral series of striae of propodeum very weak, covered with hair and not well defined, area dorsalis smooth and polished, outsides of the area and posterior inclination closely covered with fine hair-bearing points, sides polished, with a few weak striae and scattered punctures.

10. TRYPOXYLON KROMBEINI TSUNEKI, 1979

Trypoxylon krombeini Tsuneki, SPJHA, 10: 13, 1979 (♂ ♀, Ceylon, 14 figs.).

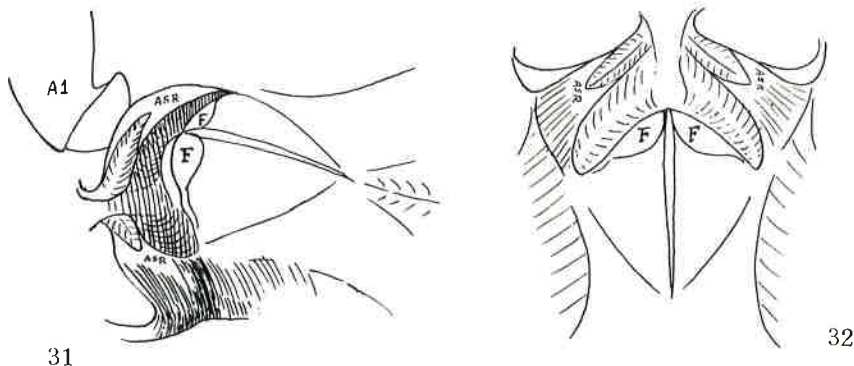
Specimens newly examined: 8 ♀.

4 ♀, Gal. Dist., Sinharaja Jungle, Kanneliya Section, 13-16. VII. 1978, Malaise trap, K. V. Krombein et al.; 4 ♀, Keg. Dist., Kitulgala, Sandarakele Jungle, 17-18. III. 1979.

Remarks. The present species is characteristic in the structure of SAT-ASR, but the place is deep black in colour, strongly shining and the excavations of anterior aspect of SAT are complicate and very deep. On this account it is very difficult to observe the detailed structure of SAT-ASR. In the following some additional explana-

tion will be tried again:

SAT gentle tectiform and medianly thickly ridged or carinate, anterior aspect deeply hollowed out and apical margin of SAT comes to be strongly produced over the hollow; the hollow extended laterally, occupying whole the anterior aspect of SAT. Thus, it comes to reach near the postero-lateral part of ASR (Fig. 31, seen obliquely from above and left side) and Fig. 31, vertical view from back side). In another view this lateral part of anterior hollow of SAT can be considered to be the broad PAF that is inclined towards IAA. Apical margin of SAT on both sides of the end of median carina is obliquely flattened, with surface gently concave, forming a special area (F in Figs. 31 and 32) and makes the structure as much complicated (by reflecting the light irregularly); median carina of SAT running down in middle of posterior wall of anterior excavation (shown with dotted line in Fig. 31), but it is very difficult to observe (in Figs. 34 and 41 of the original description the carina is shown as if very conspicuous!). ASR becomes short, due to the lateral extension of the excavation. Besides the above hollow, ASR carries one more transverse excavation on inner half along anterior margin which is gradually shallower towards top (in Figs. 31 and 32).



Figs. 31-32. Trypoxylon krombeini Tsuneki

Gastral petiole in this species is rather intermediate in form between clavate and flask-shaped. Apical swelling is rather gradual, but with a short subparallel-sided part in front of it. The length ratio of P and G2+3 is almost subequal. In the female specimens examined: 100 : 90, 100, 95, 97, 90, 90, 93 and 100.

11. TRYPOXYLON KITULGALAENSE SP. NOV.

Diagnosis. ♀, 11.5 mm. G1 flask-shaped, but shorter than G2+3, mesoscutum without microsculpture, finely and very closely punctured, propodeum with lateral carinae, area dorsalis distinctly enclosed with furrow, IODs=2:1, SAT simply narrowed extension of frons, not particularly raised, PAF weakly down-curved in cross section, gaster from apex of G1 till near end ferruginous, fore leg nearly wholly, mid leg largely and hind leg fairly broadly pale yellow, RC=C.

Amongst the known species of Sri Lanka T. kandyannum is closest in appearance to the present species, but in the new species SAT is not transversely carinated at apex, wing venation markedly different and gastral petiole except apex completely black. Among the known species T. kedah recorded from Malaya and Laos is the closest relative of the present species, having almost similarly structured SAT-ASR, but the present species differs from kedah in many detailed characters as follows:

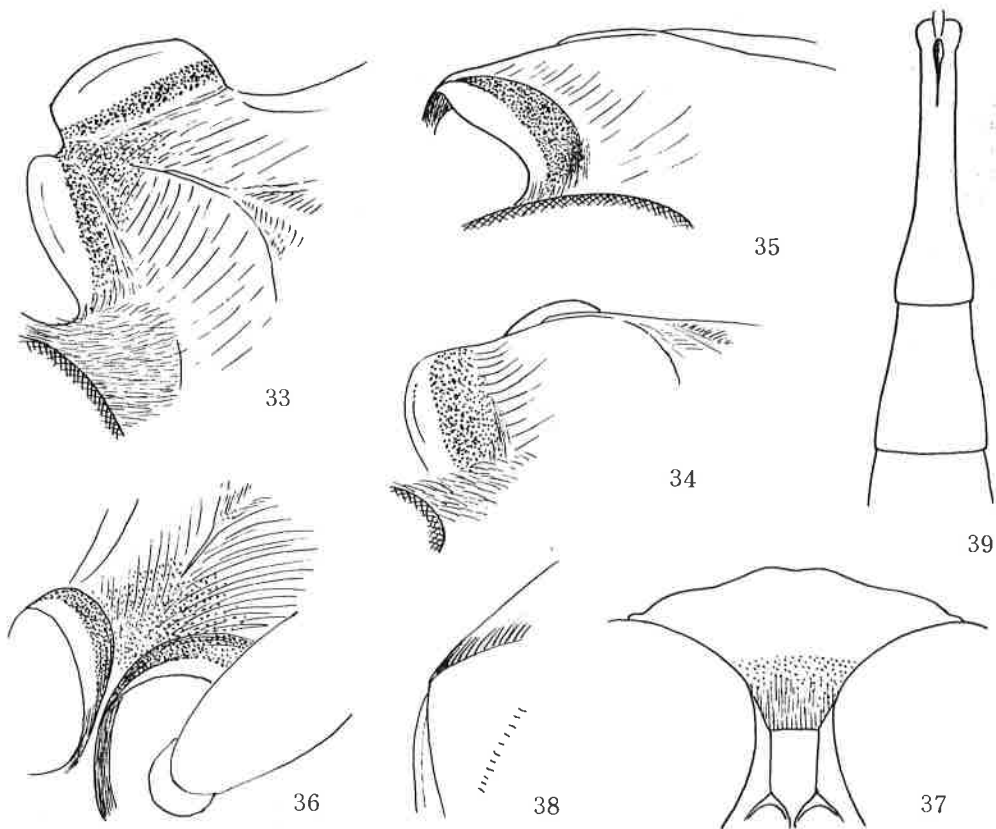
(1) Mesoscutum without microsculpture, with punctures much finer, though similarly close.

(2) A3 relatively much longer, =AW×4.5 (in kedah =AW×3).

(3) IODs=2:1 (in kedah =5:3).

- (4) $A3:IODc=5:3$ (in kedah =1:1).
 (5) Gl except apex black (wholly ferruginous).
 (6) Mid and hind legs more broadly black (mid leg wholly yellow except extreme base of coxa and arolium and hind leg except tarsus above also yellow).
 (7) Area dorsalis smooth (transversely closely striate).
 (8) Frontal furrow deeper, with lateral elevations higher (though similar in pattern).
 (9) Apical margin of clypeus medianly broadly, but not strongly emarginate (in kedah weakly recurved, though in both not strongly produced as a whole).
 (10) Eye incision comparatively narrower, subparallel-sided, with dorsal margin horizontal (in kedah broader and distinctly narrowed apically, with dorsal margin slightly inclined outwards).
 (11) Median carina of SAT comparatively shorter.
 (12) Veins of wing black, R1 short, apically attenuate, ending far before reaching wing apex (in kedah veins pale brown, R1 moderately long, apex subtruncate and reaching close to wing apex).

Supplement. Black, A1 and 2 yellow beneath, 3-12 greyish yellow beneath, clypeus apically more than half of its length yellowish ferruginous, extreme margin brownish, mandible yellow apically brown - dark brown, palpi and greater part of mouth parts yellow, legs yellow with following blackish areas: Extreme bases of fore and mid coxae, basal half of hind coxa, all arolia, mid femur above slightly brownish, mid T2-5 except apices brown (on T2-3 dark brown), hind femur above, -tibia except base above and -tarsus except articulations above blackish. Gaster posteriorly with dusky area. Hair silvery, on clypeus parallel, SAT under natural condition densely covered with silvery hair, the hair at medio-apical part produced anteriorly in bundle over IAA.



Figs. 33-39. *Trypoxylon kitulgalaense* sp. nov., ♀

Head in frontal view with lateral margins rounded, somewhat convergent towards clypeus, vertex almost not depressed, $W:L=100:84$, eye incision as given above, ocellar area flat, frontal furrow fairly deep, elevations on both sides considerably high, extending upwards to near hind ocelli and roundly inclined to median furrow, anteriorly narrowed to turn to SAT, at its base a small Y-shaped carina present, arms of Y rather blunt, given rise to by the apex of median furrow and verge to antero-lateral incision of frons, median carina of SAT acute, but short, not reaching forward middle of median length of SAT (in kedah median carina long, reaching near apex of SAT), SAT with lateral inclination not acute and flatly sloped to scapal hollow, ASR gently and roundly elevated, surface smooth and amber-yellow in colour (in kedah much shorter, with surface except apical margin closely punctured), SAT-ASR seen obliquely from left side: Fig. 33 (under natural condition densely covered with hair, the hair from apical middle produced in bundle over IAA), in dorso-lateral view to see through PAF: Fig. 34, in lateral view: Fig. 35, in ventro-lateral view: Fig. 36. Clypeus: Fig. 37, at base almost not elevated, at apex roundly reflected.

HW, HL, IODv, A3, P=100, 57, 28, 24, 114. IODs=10:5. OOD, Od, POD=4, 9, 8. A3=AW \times 4.5. A3, 4, 5=10, 7.5, 7. P, Ma, Mi, 2(Ma), 3(Ma)=100, 26, 13, 53(36), 54(46). RC=C, Rl short, ending far before reaching wing apex, CV1=CV2 \times 4.3, TCV:CV2=6:5, TCV weakly sinuate, angle about 120°.

Occipital carina complete. Collar in frontal view with dorsal margin gently roundly elevated and medianly weakly tuberculate, in dorsal view anterior margin widely roundly emarginate, posterior part slightly longer in middle than anterior part and distinctly discoloured, lamina on side: Fig. 38, subalar area of mesopleuron normal, propodeum with lateral carinae long, originating near spiracle and reaching apex of the segment, area dorsalis enclosed with distinct furrow till base, median furrow comparatively broad, fairly deep, area apicalis depressed, but not margined with carina, GSR gently roundly elevated, amber-yellow, Gl: Fig. 39.

Frons very faintly microcoriaceous and very closely superimposed with comparatively large punctures, nearly reticulate, punctures on top areas of elevations not sparse. SAT more shallowly, but similarly closely punctured, ASR smooth and polished, mesoscutum closely punctured, punctures smaller than on frons, PIS without microreticulation, lateral series of striae on propodeum defined only on posterior portion, lateral furrows of area dorsalis weakly crenate on posterior part, disc finely sparsely punctured, punctures slightly larger and deeper towards lateral furrows, sides polished, but on oblique medial area sparsely punctured and posteriormost area irregularly rugulose.

♂, unknown.

Holotype: ♀, Sabaragamuwa Prov., Kegalla District, Kitulgala, Bandarakele Jungle, 17-18. III. 1979, K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, L. Jajawickrema, T. Gunawardane (USNM).

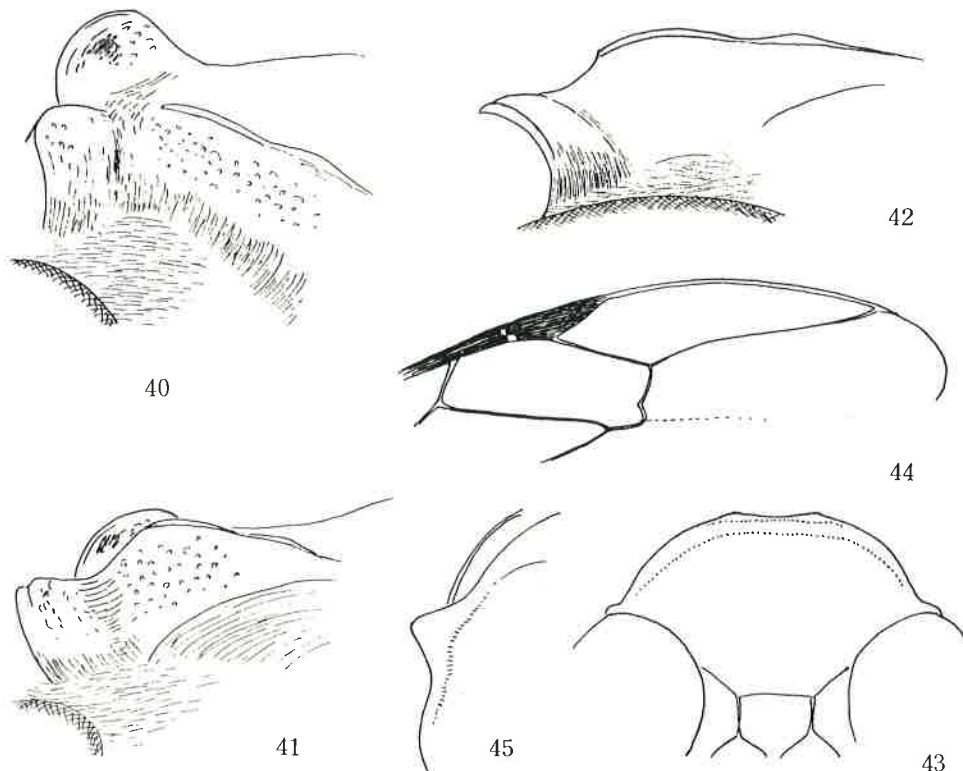
12. TRYPOXYLON FHUTICICOLA SP. NOV.

In the key to the species of Indo-Malayan region the present species (♀) runs smoothly to T. spangleri m. known from Thailand (♂), and certainly considerably close to it, but apart from the sexual characters, the new species differs from this in the detailed structure of SAT-ASR, in the characters of area dorsalis and considerably so in the colouration, and there is no doubt that it is not the other sex of spangleri.

Diagnosis. ♀, about 12 mm. Gl flask-shaped, mesoscutum microcoriaceous, propodeum with lateral carinae, hair silvery, IODs=4:3, gaster medianly red, fore and mid tarsi pale ferruginous, SAT low broad tuberiform, medianly strongly carinated, PAF shallow, wide-V-shaped (bottom rounded) or deep down-curved in cross section, area dorsalis enclosed with furrow, transversely coarsely striate, clypeus: Fig. 43.

Black; antenna black not brownish beneath, clypeus also till apex black, mandible ferruginous, apically brown, palpi except blackish joint 1 of maxillary pulpus also bright ferruginous, posterior part of collar not discoloured, tegula pale brown, basal plates of wing dark brown, veins black, brown or ferruginous on legs: Knees, fore tibia except folded side and outer median area, fore tarsus except arolium, mid and hind tibiae at base, all spurs, mid Tl-2 (3-4 and claws brown). Hair on head silvery, on clypeus almost parallel, on supra-clypeal area divergent downwards and on its outside areas somewhat curved inwards as in kapillatum, but not so conspicuous.

Head in frontal view with sides rounded, somewhat narrowed towards clypeus, $W:L=$



Figs. 40-45. *Trypoxylon fruticicola* sp. nov., ♀

100:84, vertex not depressed, eye incision moderately broad, gently narrowed towards sinus and near sinus strongly narrowed, dorsal margin nearly horizontal, frons gently elevated, median furrow broad and moderately deep, SAT-ASR in oblique lateral view (from left side): Fig. 40, in dorso-lateral view to see through PAF: Fig. 41, seen in profile: Fig. 42; clypeus: Fig. 43, disc only gently raised, apical reflection feeble; occipital carina high and complete, minutely roundly emarginate behind buccal cavity.

HW, HL, IODv, A3, P=100, 50, 28, 24, 154. IODs=10:7.5. OOD, Od, POD=2, 3, 3. A3=AW×4. A3, 4, 5=10, 7, 6, 5. P, Ma, Mi, 2(Ma), 3(Ma)=100, 18, 6, 30(21), 34(30). RC=C, Rl short, CV1=CV2×5, TCV:CV2≈3:2, TCV strongly bent (Fig. 44), angle at base about 90° and at apex about 100°.

Collar transverse, anterior part ridge-like, almost not thickened laterally, in frontal view dorsal margin broad triangularly raised and minutely tuberculate in middle, posterior part more than twice as long as anterior part in middle, transverse furrow separating the two parts markedly deep, lamina on side triangular, distinctly produced, somewhat toothed (Fig. 45), parapsidal sutures on mesoscutum normally impressed, subalar area of mesopleuron normal, propodeum with long lateral carinae, reaching posteriorly near apex of the segment, ending at the outside of lateral carina of area apicalis, the latter curved inwards at anterior end, but not completely enclosing the area, GSR roundly, highly raised, but not discoloured, Gl distinctly flask-shaped.

Frons fairly strongly microcoriaceous and superimposed with comparatively large, well outlined punctures, punctures on upper part sparse, on lower part close, PIS < PD, SAT more finely and closely punctured, punctures indistinct in outline, on medio-apical area in front of medial carina minutely granulate, ASR shining, with some irregular striae and irregular punctures; mesoscutum microcoriaceous and fairly closely punctured, punctures similar in size and depth to those of frons, PIS 1-2 times PD. Propodeum except medial furrow of posterior inclination transversely strongly, fairly

closely striate, striae at base of area dorsalis oblique and outsides of the area mixed with piliferous punctures, sides on oblique anterior half including femoral sinus smooth and polished, on the rest strongly, closely punctured, mixed with fine, close and oblique striae.

♂, unknown.

Holotype: ♀, Rat. Dist., Gilimale, Induruwa Jungle, 7-8. III. 1979, K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, S. Siriwardane, L. Jayawickrema (USNM).

Remarks. From the type specimen the right antenna from A6 apically is lacking.

13. TRYPOXYLON BICOLOR CEYLONICUM TSUNEKI, 1979

Trypoxylon bicolor ceylonicum Tsuneki, SPJHA, 9: 158, 1979 (13 ♀ 11 ♂, holotype: ♂, figs.).

Trypoxylon bicolor ceylonicum: Tsuneki, Ibid., 10: 16, 1979 (19 ♀ 7 ♂, Ceylon).

Specimens newly examined: 13 ♀ 10 ♂, all collected by K. V. Krombein, P. B. Karunaratne, N. Karunaratne, T. Wijesinhe, V. Kulasekare, L. Jayawickrema, S. Siriwardane and T. Gunawardane:

1 ♀ 4 ♂, Mon. Dist., Angunakolapelessa, Malaise trap, 17-19. VI. 1978; 2 ♂, Rat. Dist., Uggalkaltota, Malaise trap, 23-26. VI. 1978; 1 ♀, Col. Dist., Labugama Reservoir, 11. VII. 1978; 1 ♀ 3 ♂, Gal. Dist., Sinhalaja Jungle, Kanneliya Section, 13-16. VII. 1978; 1 ♀, Kan. Dist., Kandy, Udawattakele Sanctuary, 26-30. VII. 1978; 1 ♀, Mate Dist., Sigiriya Jungle, 28. VII. 1978; 1 ♀ 1 ♂, Mon. Dist., Angunakolapelessa, 100 m, 21-23. I. 1979, Malaise trap; 2 ♀, Rat. Dist., Gilimale, Induruwa Jungle, 3. II. 1979; 2 ♀, Mate. Dist., Kibissa Jungle, 0.5 mile west of Sigiriya, 1-3. III. 1979; 1 ♀, Col. Dist., Gampaha Botanical Garden, 4. III. 1979; 1 ♀, Rat. Dist., Girimale, Induruwa Jungle, 7-8. III. 1979 (all USNM).

Remarks. As to the variation on the colour of the legs detailed explanation was already given in Pt. III of the present paper. Among the specimens newly examined the three males collected at Sinhalaya Jungle, on 23-26. VI. 1978 have the legs except dark brown fore tarsus and spurs, completely black. In these specimens the gaster is also more broadly black than usual. The reddish colour is confined to the base beneath of G2 and 3 only (genitalia were examined). In one male specimen from Angunakolapelessa captured with Malaise trap on 21-23. I. 1979, the colour of the legs is similar to the above three, but in this specimen G2 and 3 completely red, without dusky mark above.

In the Ceylonese specimens (♀ ♂) SAT has a flattened area in front of and around apex of median carina and apical margin of the area distinctly edged and thence inclined to PAFs and IAA (just as in petiolatum of other regions), but, here PAF is deep and flat-bottomed even in ♀ (different from petiolatum), as already mentioned in Pt. III of the present paper.

In genitalia of the male the shoulder of the penis valve is in vertical view (= seen from apex of the organs) roundly and highly raised, just as in the typical specimens of bicolor Smith s. str.

14. TRYPOXYLON NIGRIPES TSUNEKI, 1979

Trypoxylon nigripes Tsuneki, SPJHA, 9: 132, 1979 (holotype ♀, paratypes 1 ♀ 3 ♂, figs.).

Trypoxylon nigripes: Tsuneki, Ibid., 10: 18, 1979 (2 ♀ 1 ♂, Ceylon).

Specimens newly examined: 1 ♀ 1 ♂,

1 ♀ 1 ♂, Mon. Dist., Angunakolapelessa, 17-19. I. 1978, K. V. Krombein et al. (USNM).

Remarks. In the male specimen the gaster is completely black as in the one that was captured near Mahiyangana, Kandy District and was recorded in Pt. IV of the present paper.

15. TRYPOXYLON SRILANKUM TSUNEKI, 1979

Trypoxylon srilankum Tsuneki, SPJHA, 10: 18, 1979 (1 ♂ 1 ♀, Ceylon).

Specimens newly examined: 7 ♀ 2 ♂:

1 ♀, Anu. Dist., Padaviya, Antiquities site, 20-23. VII. 1978; 1 ♀, Mate. Dist., Kibissa, 0.5 mile west of Sigiriya, Jungle, 28. VI. - 4. VII. 1978; 1 ♀, Col. Dist., Mirigama Scout Camp, primary jungle, 8-9. VII. 1978; 1 ♀, Tri. Dist., China Bay ridge Bangalow, 0-50 ft, 24-25. VII. 1978; 1 ♂, Tri. Dist., Trincomalee, China Bay ridge Bangalow, 25-50 ft, 26. II. 1979, Malaise trap; 1 ♀, Rat. Dist., Girimale, Induruwa Jungle, 2. II. 1978; 2 ♀, Rat. Dist., same loc., 13-15. III. 1979; 1 ♂, Amp. Dist., Ekgal Aru Sanctuary Jungle, 9-11. III. 1979, Malaise trap, collectors same (USNM).

Remarks. In all the female specimens fore T1-4 are nearly completely black, only T5 whitish ferruginous and mid and hind legs wholly black, only occasionally articulations of tarsus brownish, spurs also dark brown. Mandible pale castaneous brown from base till apex. In ♀ ♂ RC=M, Rl short, yet reaching close to wing apex.

16. TRYPOXYLON ERRANS SAUSSURE, 1867

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

Trypoxylon errans: Tsuneki, SPJHA, 8: 1, 28, 1978 (syn., redescrip. holotype of intrudens Smith)

Trypoxylon errans: Tsuneki, Ibid., 9: 114, 1979 (Mauritius Is., Rodrigues Is., Seychelles - Mahe Is. - , Ceylon, India, Nepal, Burma, Thailand, Cambodia, Malaya; variations).

Trypoxylon errans: Tsuneki, Ibid., 10: 18 (Ceylon, 5 ♀).

Trypoxylon errans: Tsuneki, Ibid., 11: 28 (Java, 32 ♀ 8 ♂; Sumatra, 5 ♀ 2 ♂; Sunda Is. 2 ♀; variations).

Trypoxylon errans: Tsuneki, Ibid., 12: 87, 1980 (Celebes 2 ♀; none in Borneo).

Trypoxylon errans: Tsuneki, Ibid., 13: 115, 1980 (Philippines, 32 ♀ 20 ♂).

Trypoxylon errans: Tsuneki, Ibid., 14: 45, 1981 (1 ♀, Guam Is.; 6 ♀ 2 ♂, Hawaii).

Trypoxylon errans: Tsuneki, Ibid., 15: 42, 1981 (Formosa,

Specimens newly examined: 4 ♀ 1 ♂:

1 ♀, Mon. Dist., Man Aru, 12 miles east of Uda Walawe, 17-19. VI. 1978; 1 ♀, Mate. Dist., Sigiriya Jungle, 28. VI. - 3. VII. 1978; 1 ♀, Kan. Dist., Udawattakele Sanctuary, 8-11. II. 1979; 1 ♀, Rat. Dist., Belihuruya Rest-House, 10-11. IV. 1978, M. D. Hubbard & T. Wijesinhe; 1 ♂, ditto.

Remarks. In all the female specimens observed all trochanters are dark brown above and brown or pale brown beneath, while in the male all trochanters are black except brownish or whitish base and apex. This is worthy of notice, since the colour of trochanters has been considered rather constantly whitish or ferruginous, at least on the underside (sometimes dark brown partly above and rarely wholly so above). In the present male mid leg is also more broadly black than usual: tibia except base and apex (narrowly brown) completely black and tarsus with only basal half whitish (from apex of T1 to T5 black, but T4 castaneous brown).

To be added to the characters of A13. A13 is about as long as 5 preceding joints united, but its form is markedly different according to the direction in which it is observed: In dorsal view it is tapered and pointed at apex, but in lateral view it is not tapered, but subparallel-sided, with apex broadly rounded.

In fore wing RC=C, Rl short, CV1=CV2×4.5-5. TCV:CV2≈5:3, angle about 105-110°.

REVISED AND ENLARGED KEY TO THE SPECIES OF SRI LANKA

- 1 Frons with shield-shaped enclosure, dorsal part of enclosure distinctly closed (without inner branch carinae) 2
- Frons without shield-shaped enclosure 6
2 Frontal shield with upper lateral carinae widely interrupted, or disturbed with punctures, long curved bristles at lower enclosed space markedly abundant (lower carinae of the shield straight, L:W of the shield about 2:1)

- interruptum Tsuneki, 1973
- Frontal shield with upper lateral carinae distinct (bristles on lower enclosed space not so abundant), 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, medio-apical angle acutely pointed, in ♂ $Al3=A9-12$ or $=A10-12$), 10-11 mm
- 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 ♂ $Al3$ 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 (ratio of length of upper area : lower area = 2 : 1 or nearly, surface considerably deeply excavated, with shining median bottom line, $Al3 = Al1+12$), 8-12 mm
- Lower carinae gently upcurved as a whole (upper are thaiannum Tsuneki, 1961
- Lower carinae gently upcurved as a whole (upper area : lower area = 3:2, surface of the shield except around fore ocellus in ♀ flat, in ♂ gently excavated, without medial bottom line, $Al3 = A10-12$), ♀ 10 mm, ♂ 8 mm
- pileatum Smith, 1856
- 6 Gastral petiole clavate, gradually widening apically, as long as or shorter than G 2+3 7
- Gastral petiole flask-shaped, apical widening rather sudden, with cylindrical slender part in front, usually longer than G 2+3 18
- 7 Supraantennal area with a ship-shaped hollow, margined with carinae, the hollow widely open upwards (Figs. 1 and 2) (clypeus: Fig. 4, mesoscutum microcoriaceous and finely closely punctured, propodeum with lateral carinae, gaster medianly red and marked with black above, legs broadly yellow), 7 mm
- triangulum sp. nov.
- Supraantennal area without such a structure 8
- 8 G 1, 2 and 3 each with a minute fovea at apex in middle 9
- G 1-3 without foveae 11
- 9 Frons and mesoscutum without microsculpture, shining, but strongly, coarsely punctured (in ♂ antenna and legs modified and partly maculated with white), 10-12 mm
- buddha Cameron, 1889
- Frons and mesoscutum microcoriaceous, half mat and superimposed with fine punctures 10
- 10 Fore and mid legs nearly wholly and hind leg largely yellow, gaster broadly ferruginous (propodeum sternite long and distinct, $IODs=3:1$, $R1$ longer than $CV2$, reaching wing apex, $A3=AW 3$, clypeus broadly ferruginous at apical margin, and minutely bidentate in middle, propodeum with lateral carinae, area dorsalis without lateral furrows), about 8 mm
- flavipes Tsuneki, 1979, ♀
- 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, $A3=AW 2.5$, $A3,4,5=10,7,6$, clypeus narrowly ferruginous apically, minutely bidentate in middle, gaster black, base of G4 narrowly yellowish), 8 mm
- indianum Tsuneki, 1979, ♀
- 11 Mesoscutum fairly shining, microsculpture very weak and finely, rather sparsely punctured (otherwise as in krombeini Tsuneki, ♂)
- krombeini Tsuneki, ♂, var.
- Mesoscutum distinctly microcoriaceous and punctured, half mat, or very finely and densely punctulate, half mat 12
- 12 Head seen from above transverse, $W:L=2:1$ (gaster with red area, propodeum with lateral carinae) 13
- Head seen from above thick, $W:L$ at least $=5:3$ (gaster largely black, without red area, propodeum with lateral carinae) 14
- 13 Gaster from apex of G 1 apically red, hairs on sides of supraclypeal area normally parallel (G1 subflask-shaped, with fairly long subparallel-sided area before apical swelling, but shorter than G 2+3 -Fig. 39-, mesoscutum finely, densely punctured, but without microsculpture on PIS, femora of legs wholly or largely yellow), 11 mm
- kitulgalaense sp. nov., ♀

- Gaster only medianly red, marked with black above, hairs on sides of supraclypeal area curved inwards (Figs. 19-20) (Gl similar, mesoscutum microcoriaceous and closely punctured, femora of legs largely black, SAT-ASR: Figs. 17-18, in ♂ fore leg somewhat modified: Figs. 23-25, Al3 long, curved, parallel-sided and strongly excavated beneath: Figs. 21-22), 9-10 mm capillatum Tsuneki, 1979
- 14 Mandible thick, with a tooth on inner margin near apex (head from above subquadrate, frons till base of antenna roundly swollen, SAT low tuberiform, antenna of ♂ 12-jointed) 15
- Mandible slender, without tooth on inner margin (head from above wider than long, W:L=5:3-3:2, frontal elevation and SAT different, antenna of ♂ 13-jointed) 17
- 15 Fore and mid tibiae completely yellow (punctures on mesoscutum comparatively larger, area dorsalis minutely rugoso-striate or -punctate, always coarser than in the following species, apical margin of clypeus usually black and medianly produced, in ♀ IODs=10:8, Al2 with apex narrowly rounded, clypeus with W:L=10:8, in ♂ IODs=10:6, Al2 apically acutely pointed, clypeus with W:L=10:7; medio-apical prominence of clypeus always narrowly rounded), 5-7 mm mandibulatum Richards, 1933
- Fore and mid tibiae broadly black (punctures on mesoscutum comparatively finer, apical margin of clypeus narrowly ferruginous, always medianly bluntly bidentate) 16
- 16 Area dorsalis microcoriaceous, apparently granulate (in ♀ IODs=10:7, Al2 with apex bluntly pointed, clypeus nearly as wide as base as long in middle; in ♂ IODs=10:6, Al2 with apex acutely pointed, clypeus with W:L=10:12), 4-5 mm pygmaeum Cameron, 1900
- Area dorsalis obliquely rugoso-striate, on median furrow transversely striate (IODs=10:6, clypeus with W:L=7:8, frons more strongly raised, with inclination at IAA acuter and antenna and legs more broadly black than in pygmaeum) smaller, 3.5 mm gampahae sp. nov., ♀
- 17 Antenna and legs broadly yellow maculated, gaster with base of G3 narrowly yellow (SAT tuberiform, without median carina, apex obliquely inclined to IAA, pronotum without medial tubercle, in ♀ A3=AW×3.5, IODs=10:8, clypeus medianly triangularly produced; in ♂ A3=AW×3, IODs=10:7.5, Al3<Al1+12, clypeus with apical margin medianly very weakly recurved), ♀ 7 mm, ♂ 6 mm testaceicorne Cameron, 1907
- Antenna and legs black, at most partly brownish, gaster black (SAT low, flattened, but on apical area provided with a tectiform elevation in middle, apical area acutely inclined to IAA and transversely deeply hollowed out (Figs. 31-32), pronotum with a minute tubercle in middle, in ♀ IODs=10:5, in ♀ A3=AW×2.7, clypeus medianly produced and minutely incised in middle, in ♂ A3=AW×1.7, Al3≠Al0-12, clypeus with apical margin weakly recurved in middle), ♀ 6-8, ♂ 6 mm krombeini Tsuneki, 1979
- 18 Gaster except Gl ferruginous, sometimes posteriorly brownish (mesoscutum without microsculpture, finely closely punctured, propodeum with lateral carinae, area dorsalis enclosed with furrow) 19
- Gaster black, or on median area only more or less reddish 20
- 19 Gl distinctly longer than G2+3, SAT low broad nasiform, on apical area transversely roundly flattened, with apical margin acutely carinated and produced over IAA and PAF (clypeus rounded out, apical margin weakly wavy, A3=AW×5, Al and 2 and fore and mid legs broadly yellowish, CV1=CV2×7), 11.5 mm kandyianum Tsuneki, 1979
- Gl with apical swelling somewhat gradual, slightly shorter than G2+3, SAT-ASR: Figs. 33-36, SAT not transversely acutely edged at apical margin and not produced over IAA and PAF, PAF weakly down-curved in cross section (clypeus: Fig. 37, A3=AW×4.5, antenna brown beneath, on Al and 2 yellow, CV1=CV2×4), 11.5 mm kitulgalaense sp. nov., ♀
- 20 Propodeum without lateral carinae (gaster medianly red, area dorsalis with shallow and weak lateral furrows, sometimes rather indistinct, SAT moderately high tuberiform, PAF deep, flat-bottomed and on both ends shortly inclined, RC B-type, IODs=10:8; in ♀ clypeus strongly produced, with apical margin medianly truncate, hairs at its base strongly convergent towards medial line, A3=AW×4.5-5, mid T1 wholly yellowish white, 12-16 mm; in ♂ clypeus weakly roundly produced and medianly weakly recurved, hairs on disc parallel, A3=AW×2, Al3≠Al0-12, in some condition appears slightly longer, mid T1 on basal half only yellowish white, 10-12 mm), bicolor ceylonicum Tsuneki, 1979

- Propodeum with lateral carinae 21
- 21 Mesoscutum distinctly microcoriaceous and superimposed with fine punctures (area dorsalis transversely striate, G2-3 red and black marked above, fore and mid legs broadly ferruginous) 22
- Mesoscutum without microsculpture, simply punctured (sometimes under high magnification weak microsculpture can be observed partly) 23
- 22 SAT moderately high broad nasiform, apical margin transversely roundly edged, ASR highly bicarinate, PAF deep, flat-bottomed (RC=B, lamina of pronotum shortly toothed), 12 mm benten Tsuneki, 1979, ♀
- SAT low broad tuberiform, not edged at apical margin, ASR without distinct carina on top, PAF down-curved in cross section (RC=C, lamina on side of pronotum in a large triangle, distinctly produced - Figs. 40-42), 12 mm fruticicola sp. nov., ♀
- 23 SAT anteriorly with highly raised π -shaped carinae (in original description, Figs. 55-58) (clypeus with apical margin almost simply rounded, IODs=5:4, antenna and legs black; in ♀ clypeus rounded out and medianly shortly produced, A3=AW×3.5, gaster medianly red; in ♂ clypeus weakly rounded out and medianly recurved, A3=AW×2, gaster black, A13≠A9-12), 9-13 mm srilankum Tsuneki, 1979
- SAT without such a carinae at medio-apical area 24
- 24 ASR with a hollow on posterior wall (SAT with apical margin transversely acutely edged and 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×3.5 in ♀, AW×2 in ♂, A13≠A9-12), 10-12 mm nigripes Tsuneki, 1979
- ASR without hollow on posterior wall 25
- 25 SAT low tectiform, apex perpendicularly inclined and transversely, deeply hollowed out, the hollow extended laterally to posterior part of ASR (Figs. 31-32) (see also couplet 17) krombeini Tsuneki, 1979
- 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 or ferruginous, medianly broadly recurved, frequently feebly incised or depressed in middle, gaster medianly red, sometimes brown or nearly black in ♂, all trochanters at least largely, fore tibia except folded side, fore tarsus, mid tarsus largely yellowish white; in ♀ IODs=5:3 and A3=AW×4, in ♂ IODs=7:4 and A3=AW×2.5, A13≠A8-12), ♀ 10-12 mm, ♂ 8-12 mm errans Saussure, 1867

2. SPECIMENS FROM INDO-MALAYAN AND
JAVANESE REGIONS

Most of the specimens dealt with in this section are those that were recently collected in India (southern provinces in the main) and belong to British Museum (Natural History) and some old ones from various regions are those which were casually omitted from the first investigation of the related region and are recorded on this occasion. As a whole the material includes twenty one species, of which three (dentatum, singator and gentingense) are new to science. Regionally they are divided as follows: 18 species are from India, two species from Sri Lanka, one species from Thailand, three species from Singapore and two species from Java. Of these the Ceylonese one (membranaceum) is not included in the list of the species of the Island treated in the preceding Section and worthy of notice.

Besides the above, one species (crassifrons m.) that was recorded from Thailand in 1963 and that was left out in Part III of the present paper is particularly added to the present Section. As a result total number of the species dealt with here becomes 22.

Records and Descriptions of the Species

1. TRYPOXYLON SCHMIEDEKNECHTI KOHL, 1906

Trypoxylon schmiedeknechti: Tsuneki, ref. p. 2 of this paper.

Specimens examined.

1 ♀, India, Karnataka, Bangalore, 19-23. IX. 1979, J. S. Noyes (BMNH); 1 ♀, India, Karnataka, Mudigere, 26. X. - 4. XI. 1979, J. S. Noyes (BMNH); 1 ♀, India, Kerala, Periyar A. Sanctuary, 5-15. X. 1979, J. S. Noyes (BMNH); 3 ♂, Malaysia, Selangor, Serdang, Orchard Farm, VIII. 1979, I. Gauld (BMNH).

2. TRYPOXYLON MELANURUM CAMERON, 1901

Trypoxylon melanurum: Tsuneki, SPJIA, 7: 41, 1978 (Maldives and Laccadives Is. India).
Trypoxylon melanurum: Tsuneki, Ibid., 10: 5, 1979 (Ceylon).

Specimens newly examined.

1 ♀, India, Hyderabad, Patancheru, ICRISAT., 20. IX. 1979, E. Bernays (BMNH);
1 ♀ 1 ♂, India, Karnataka, Bangalore, VIII. 1979 and 19-23. IX. 1979, J. S. Noyes (BMNH);
1 ♀, India, Kerala, Walayar Forest, 26. IX. - 1. X. 1979, J. S. Noyes (BMNH).

Remarks. In the present species the frontal shield is deeply roundly concave and easily separable from closely allied schmiedeknechti.

3. TRYPOXYLON CUCURBITINUM TSUNEKI, 1978

Trypoxylon cucurbitinum Tsuneki, SPJHA, 7: 20, 1978 (♀, India: Deesa).

Specimen newly examined.

1 ♀, India, Hyderabad, Patancheru, ICRISAT, 14. IX. 1979, E. Bernays (BMNH).

Remarks. This is the first specimen other than the holotype of the present species, so the measurements are given:

Length about 9 mm. HW, HL, IODv, A3, P=100, 50, 28, 20, 126. IODs=10:8. OOD, Od, POD=2,

6,5. $A_3=AW \times 3$. $A_3, 4, 5=10, 9, 7$. $P, Ma, Mi, 2(Ma), 3(Ma)=100, 20, 8, 46(28), 46(38)$.

The values are somewhat different from those of the holotype, but within tolerable range of variation or of inevitable error of measurement.

Noteworthy is the fact that in this specimen the dorsal margin of frontal enclosure is completely carinated. The upper lateral carinae at the constriction thickened and seen in profile the place is at the top of the gradual elevation of the carina. The form of the frontal enclosure is just as in the holotype (cf. Fig. 283 of Pt. II). The long curved bristle at the lower enclosed space is but a single, also just as in the holotype.

4. TRYPOXYLON BUDDHA CAMERON, 1889

Trypoxylon buddha: Tsuneki, SPJHA, 13: 21, 1980 (list of reff.).

Distribution: India, Thailand, Ceylon, the Philippines.

Specimens newly examined:

2 ♀ 1 ♂, India, Karnataka Bangalore, VIII. 1979, J. S. Noyes (BMNH); 1 ♀, S. India, T. Nadu, Coimbatore, 25. IX.-1. X. 1979, J. S. Noyes (BMNH); 1 ♀, Ceylon, Habantota, T. V. F. Coil, 14. III. 1908 (BMNH).

5. TRYPOXYLON INDIANUM TSUNEKI, 1979

Trypoxylon indianum: Tsuneki, ref. p. 5 of this paper.

Specimens newly examined:

1 ♀, India, Hyderabad, Mt. Parancheru, ICRIST, 20. IX. 1979, E. Bernays (BMNH).
1 ♀, India, Karnataka, Bangalore, VIII. 1979, J. S. Noyes (BMNH).

6. TRYPOXYLON TESTACEICORNE CAMERON, 1907

Trypoxylon testaceicorne Cameron, J. Bombay Nat. Hist. Soc., 17: 1009, 1907 (♀, India, Deesa).

Trypoxylon testaceicorne: Tsuneki, SPJHA, 8: 57, 1978 (redescr. holotype, figs.).

Trypoxylon testaceicorne: Tsuneki, Ibid., 9: 43, 1979 (suppl.).

Trypoxylon basiflavum Tsuneki, Ibid., 10: 11, 1979 (♂ ♀, Ceylon)

Trypoxylon testaceicorne: Tsuneki, Ibid., 12: 2, 1980 (basiflavum synonymized).

Trypoxylon testaceicorne: Tsuneki, ref. p. 19 of this paper.

Specimens newly examined:

1 ♀ 1 ♂, India, Karnataka Bangalore, VIII. 1979, J. S. Noyes (BMNH); 1 ♀, T. Nadu, Coimbatore, 25. IX. - 1. X. 1979, J. S. Noyes (BMNH).

7. TRYPOXYLON NILGIRIENSE TSUNEKI, 1979

Trypoxylon nilgiriense Tsuneki, SPJHA, 9: 38, 1979 (♀ ♂, S. India).

Specimens newly examined:

1 ♀, India, T. Nadu, Valparai (Cinchora), 20-22. X. 1979, J. S. Noyes; 1 ♀, India, Kerala Periyar A. Sanctuary, 5-15. X. 1979, J. S. Noyes; 1 ♀, India, Karnataka, Mudigere, 26. X. - 4. XI. 1979, J. S. Noyes (all BMNH).

8. TRYPOXYLON DENTATUM SP. NOV.

The present species (♀) closely resembles T. rubrocaudatum m., but is distinguished therefrom by the apical form of the clypeus, relative length of antennal joint 3

and by the colour of the trochanters of the legs in the main.

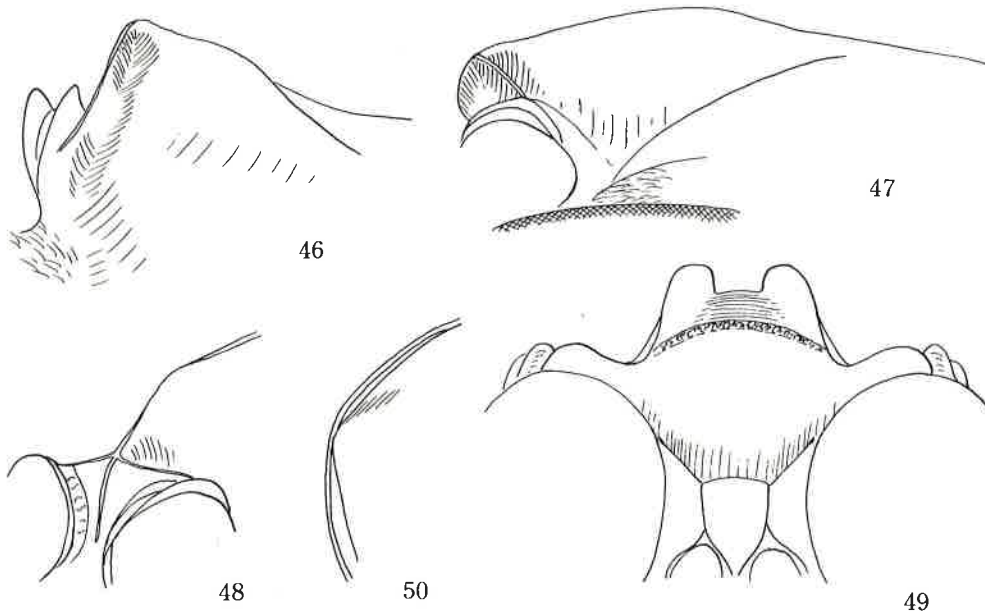
Diagnosis. ♀, 9-12 mm. G1 clavate, but subflask-shaped, mesoscutum distinctly microcoriaceous, propodeum with lateral carinae, area dorsalis enclosed with furrow, gaster black, but G5 at dorso-apical area and G7 completely yellowish red, IODs=5:3, A3=AW 2.7, frons flat, SAT high narrow nasiform, keeled as a whole, PAF shallow, up-curved, clypeus exceptionally robustly bidentate at apex, legs black, RC=B, hair silvery.

Black, mandible on apical 2/3 dark red, with margins black, palpi dark brown, apically paler, tegula dark brown, with outer area translucent pale brown, red of G5 covers posterior half of dorsal side, hair on clypeus long, thick, but not dense and parallel.

Head in frontal view wider than long, W:L=100:92 (due to long produced clypeal teeth), vertex not depressed, tops of hind ocelli slightly above level of tops of eyes, eye incision broad and shallow, gently narrowed towards bottom, bottom broadly rounded, dorsal margin slightly inclined outwards. Measurements of two females:

HW,HL,IODv,A3,P=100,58,31,22,120. 100,56,31,22,114. IODs=10:6. 10:6. OOD,Od,POD=4,8,7. 4,7,7. A3=AW×2.7. AW×2.7. A3,4,5=10,6.5,6. 10,7,6. P,Ma,Mi,2(Ma),3(Ma)=100,29,13,44(43),44(50). 100,27,12,46(46),44(58). RC=B, =B, in both somewhat close to C, Rl moderately long in both, =A6, CV1=CV2×5.5. CV2×5. TCV:CV2≅5:3 in both, angle about 130° in both, TCV nearly straight.

Frons flat, anteriorly very slightly concave, SAT in profile with dorsal margin in a line with frons, narrow nasiform, acutely inclined laterally, dorsal carina of SAT medianly longitudinally, finely furrowed, the furrow finer towards apex, SAT at apex almost truncate, giving rise to a triangular area, from the top of the area on the lateral ridge a transverse highly raised carina runs obliquely backwards to postero-lateral part of ASR, interrupting PAF, from the top also a longitudinal carina running down in middle of the area to IAA, ASR much below top level of SAT, highly bicarinate on top, PAF shallow, V-shaped in cross section and up-curved, but intersected by the transverse carina above mentioned. SAT-ASR in dorso-lateral view: Fig. 46, in lateral view: Fig. 47, in ventro-lateral view: Fig. 48. Clypeus: Fig. 49, medio-apical structure is separated from the disc by a curved, foveolate and distinctly impressed line, disc at base not elevated, but at the centre gently roundly elevated, apical teeth deeply hollowed beneath. Antenna strongly incrassate towards penultimate joint, A3,4,5 in dorsal view each rather abruptly roundly enlarged at apex,



Figs. 46-50. Trypoxylon dentatum sp. nov., ♀

the form is quite exceptional; occipital carina disappeared behind buccal cavity where it is narrowly depressed. Pronotal collar in frontal view gently roundly elevated, in dorsal view anterior part narrow ridge-like, alightly incrassate laterally, lamina on side: Fig. 50 (in paratype similar), parapsidal suture in a distinctly impressed line, subalar area of mesopleuron normal. Basal elevation of area dorsalis not bank-like, at extreme base elevated and sloped down to basal transverse furrow of area dorsalis, lateral furrows of the area broad and shallow, but distinct, medial furrow very broad and moderately deep, parallel-sided, with apex broadly rounded, lateral carinae of propodeum only on median part distinct, on posterior area broadly absent, area apicalis only with lateral carinae, incomplete, GSR not highly raised at apical margin, intercoxal carina gently upcurved, hind coxal tubercle rather weak.

Frons strongly, minutely microcoriaceous, half mat and somewhat sparsely superimposed with rather fine, rounded and flat-bottomed punctures, PIS mostly 1.5-2 times PD, on mesoscutum microreticulation somewhat larger and surface more shining than on frons, punctures superimposed also slightly larger, but much closer, PIS = or smaller than PD, on posterior area punctures gradually sparser. Mesopleuron except prepectus almost without microsculpture and sparsely punctured, epimeral area without puncture and polished. Area dorsalis on basal furrow obliquely, coarsely and on medial furrow transversely and finely striate, disc sparsely covered with comparatively large pili-ferous punctures, punctures on lateral areas including lateral furrows much closer, lateral series of striae of propodeum lacking, the corresponding places are strongly punctured, area apicalis and GSR smooth and shining, sides polished and very sparsely scattered with very fine punctures, only on posterior area more closely and more strongly punctured.

♂, unknown.

Holotype: ♀, India, T. Nadu Shembaganur, X. 1979, J. S. Noyes (BMNH).

Paratype: 1 ♀, same data (BMNH).

Remarks. The present species can be inserted in my key to the Indo-Malayan species in Part III of the present paper as follows:

23	♀ (IODs=5:3, SAT at apex transversely carinated)	23A
—	♂ (IODs=5:4 etc.)	<u>rubrocaudatum</u> Tsuneki
23A	Clypeus medianly stoutly produced, with apical margin emarginate (Fig. 73) A3=AW 3.5, trochanters brown to whitish, 10 mm, S. India	<u>rubrocaudatum</u> Tsuneki
—	Clypeus medianly stoutly bidentate (Fig. —), AS=AW 2.7, trochanters black, 8-12 mm, S. India	<u>dentatum</u> Tsuneki
71	SAT high narrow nasiform, G5-6 red, G1 with Ma:Mi=2:1	71A
—	SAT low broad tuberiform, gaster wholly black, G1 with Ma:Mi=4:1 etc.	<u>spangleri</u> Tsuneki
71A	Same as in 23A	<u>rubrocaudatum</u> Tsuneki
—	Same as in 23A —	<u>dentatum</u> Tsuneki

9. TRYPOXYLON PYGMAEUM CAMERON, 1900

Trypoxylon pygmaeum: Tsuneki, see p. 5 of this paper.

Specimen newly examined:

1 ♀, India, Kerala, Periyar A. Sanctuary, 5-15. X. 1979, J. S. Noyes (BMNH).

10. TRYPOXYLON MANDIBULATUM RICHARDS, 1933

Trypoxylon mandibulatum: Tsuneki, see p. 7 of this paper.

Specimens newly examined:

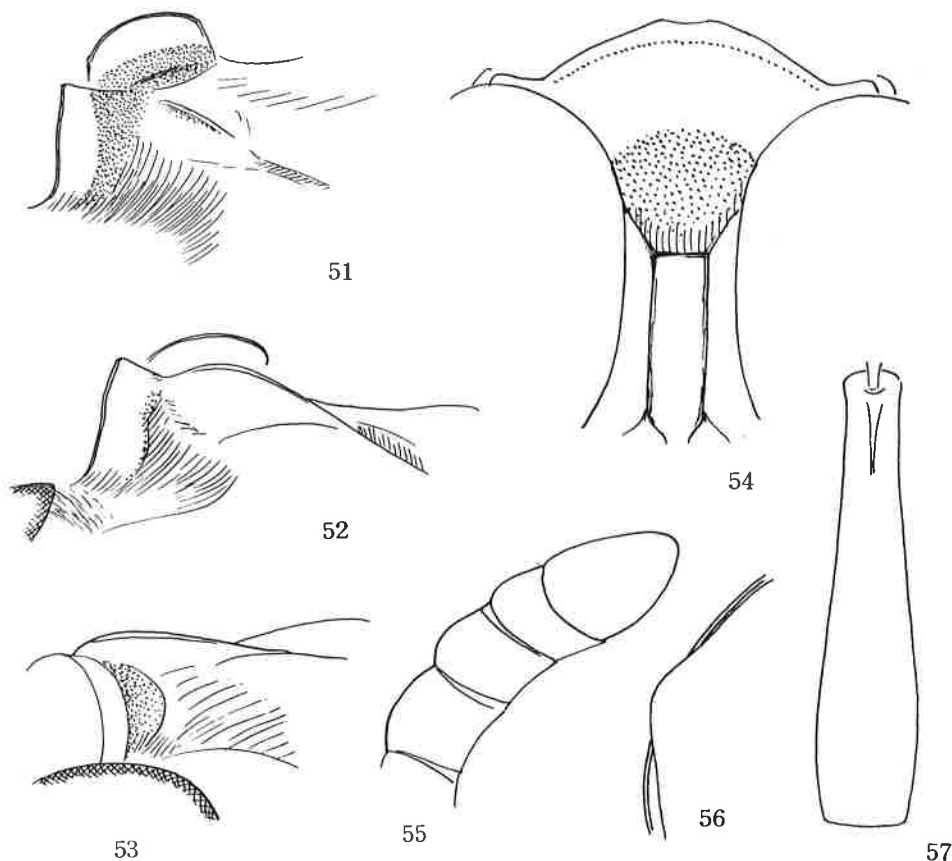
1 ♀ 1 ♂, S. India, Karnataka, Bangalore, VIII. 1979; 1 ♀ 1 ♂, same loco, 19-23. IX. 1979, all leg. by J. S. Noyes (BMNH).

11. TRYPOXYLON SINGATOR SP. NOV.

In the key to the Indo-Malayan species the present specimen runs straight to T. crassiventre, but markedly different from this in many characters, e. g. antenna, clypeus and gastral petiole.

Diagnosis. ♂, possibly 6 mm or so (from G2 apically lacking). G1 short, clavate, mesoscutum without microsculpture, finely and closely punctured, propodeum with lateral carinae, area dorsalis distinctly enclosed with furrow, subalar area with pent-roof structure, IODs=3:1, A3=AWx4, SAT nearly flat, medianly carinate, PAF down-curved, clypeus: Fig. 54, antenna broadly, fore and mid legs nearly wholly and hind leg partly (including trochanter) yellow, pronotal collar ferruginous on top.

Black; lemon yellow are antenna (from A4 apically slightly brownish and A8-12 gradually turning to dark brown), apical area of clypeus broadly, mandible, palpi, pronotal tubercle, tegula, pent-roof structure of mesopleuron (with a black patch posteriorly), meso- and metapleural flanges, fore leg except black arolium, mid leg except brown T2-5 and hind leg on apex of coxa, trochanter wholly, bases and apices of femur and tibia, all tibial spurs and all claws; fore and mid femora rather orange yellow, mid T2-5 at each base and apex yellowish, rest of hind leg brown and at articulations of tarsus paler. Pronotum with anterior part of collar pale brown, on top rather ferruginous, posterior part discoloured, yellowish, sides also brown, basal plates of wing pale brown. Hair silvery, on clypeus parallel, dense and conspicuous on clypeus, supraclypeal area, eye incision, lower inner orbits, temples, posterior part of collar, lateral marginal areas of mesoscutum thoroughly, whole of postscutellum, mesopleuron and propodeum except area dorsalis and sides.



Figs. 51-57. Trypoxylon singator sp. nov., ♂

Head in frontal view wider than long, $W:L=100:86$, with sides rounded, almost not narrowed below, vertex slightly depressed, tops of hind ocelli level with tops of eyes, eye incision narrow and deep, subparallel-sided, dorsal margin horizontal, or rather slightly raised outwards, $HW, HL, IODv, A3, Al3, P=100, 50, 29, 23, 14, 92$. $IODs=10:3.5$. $OOD, Od, POD=4, 9, 6$. $A3=AW \times 4$, $A3, 4, 5=10, 7, 6.5$. $Al3=BW \times 1.5$, only slightly longer than $Al1+12$ (Fig. 55). $P, Ma, Mi, 2(Ma), 3(Ma)=100, 22, 14, -(-), -(-)$. $RC=B$, Rl long, $\neq TCV$, $CV1=CV2 \times 4$, $TCV:CV2 \neq 5:4$, TCV evenly incurved, angle about 110° . Ocelli comparatively large, amber yellow in colour, anterior one slightly smaller, each in a shallow hollow, ocellar area just behind fore ocellus gently swollen, frons weakly raised, but apical inclination comparatively high, medial furrow broad and fairly deep, reaching SAT, elevations on both sides not typically rounded, not strong, SAT-ASR in stampy Y-form, area of SAT gently raised, median carina distinct, area of ASR amber-yellow, markedly contrasted to pitchy black SAT, PAF very shallow, only a weak depression, SAT-ASR in oblique dorso-lateral view: Fig. 51, seen from more below: Fig. 52, in profile: Fig. 53. Clypeus: Fig. 54, antenna characteristic in the long $A3$ and short $Al3$ (Fig. 55). Occipital carina weak in general and much weaker beneath, almost disappeared behind buccal cavity; anterior part of collar short, gently widened laterally, dorsal margin in frontal view gently rounded, almost without tubercle in middle, lamina on side: Fig. 56, pent-roof structure at subalar area is characteristic in its yellow colouration and in the thin broad lamellate and almost transparent expansion at outer margin, meso- and metapleural flanges also yellow in colour and more broadly expanded than usual, meso- is vertically and meta- is horizontally so, from inside the cavity covered with the pent-roof a minute yellow lamella produced and the wall structure of the cavity invisible. Lateral carinae of propodeum not strong, but distinct and long, area dorsalis distinctly roundly enclosed, basal elevation not marked, medial furrow broad and deep, lateral furrows fine and deep, area apicalis only with lateral carinae, GSR broad, obliquely raised posteriorly as a whole, not at apical margin only, gastral petiole: Fig. 57.

Frons weakly microcoriaceous and closely superimposed with fine punctures, surface fairly shining, mesoscutum with weak plumbeous shine, finely and closely punctured, surface covered with short greyish pubescence and not strongly shining; area dorsalis at base obliquely shortly, on median furrow transversely and strongly striate, the striae extended weakly on to whole of the disc, lateral series of striae weak, rest of dorsal and posterior aspects closely covered with fine piliferous punctures, sides smooth and polished, posteriorly with scattered feeble punctures, posteriormost depressed area coarsely rugose.

♀, unknown.

Holotype: ♂, Singapore, date?, Baker leg. (USNM).

12. TRYPOXYLON PAHANGENSE TSUNEKI, 1979

Trypoxylon pahangense Tsuneki, SPJHA, 9: 51, 1979 (♀, Malaya).

Specimen newly examined:

1 ♀, Malaisia: Pahang, Cameron Highland, Tana Rata, Mardi Exped., 1500, XI. 1979, I. Gauld (BMNH).

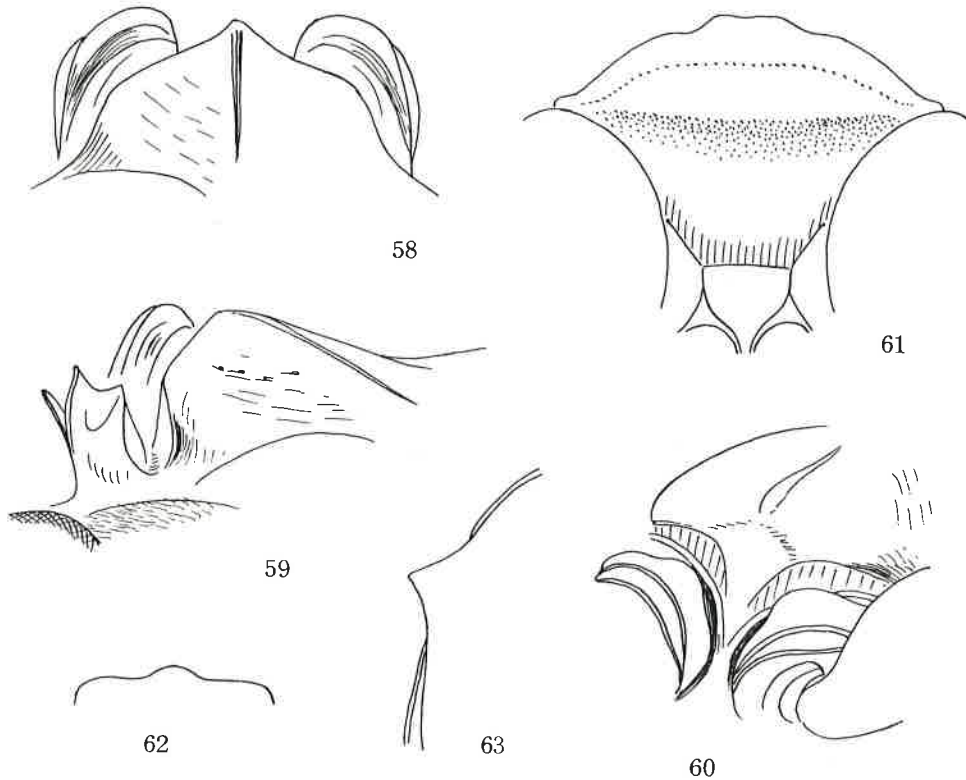
Observation. Well agrees with the holotype which is also collected at Cameron Highland. Frontal furrow broad and deep, bottom line distinct, reaching top end of SAT. In the holotype the colour of the legs is faded away and the difference between castaneous and ferruginous, and ferruginous and yellow is not clear. In the present specimen: Bright whitish yellow are apices of coxae, all trochanters, bases of fore and mid femora, bases and front and rear sides of fore and mid tibiae, base of hind tibia, fore tarsus wholly except arolium and mid T1 and bases of T2, 3 and 5. Dorsal-apical area of fore and mid femora, baso-frontal area of hind femur, hind tibia except outer side and apex, mid T4 and base of hind T1 ferruginous; rest of coxae and hind tarsus black; rest of femora and tibiae glossy dark brown, but on fore and mid tibiae pale brown; fore tibial spur ferruginous, mid one and longer hind one pale castaneous, while shorter hind one dark brown. $Al, 2, 3$, yellow, but Al at apex above brown and $A2$ and 3 dark brown above. Apex of tongee and whole of palpi yellowish white, pronotal tubercle on apical margin ferruginous, gaster completely ferruginous.

13. TRYPOXYLON GENTINGENSE SP. NOV.

Belonging to selangor - maculiventre - compluvium - kaching group, having well developed pent-roof structure at subalar area of mesopleuron, but differs from selangor and compluvium markedly in the colour of antenna, gaster and legs, from maculiventre in the structure of ASR and PAF and from kaching in the surface condition of mesoscutum, in the colour of gaster and hair etc. The present species is much slenderer in body form than any of them and has the antennal joints relatively distinctly shorter.

Diagnosis. ♀, 13 mm. Flask-G 1, strongly microcoriaceous mesoscutum, golden hair, subalar area with well developed pent-roof structure, propodeum with lateral carinae, area dorsalis with feeble lateral furrows, IODs=10:9, SAT broad nasiform, PAF deep, flat-bottomed, clypeus with apical margin bluntly trilobate, G1=AW×9, A3=AW×5; A1-2, G1 on sides and at base beneath, G2 and 3 on sides and at each base, fore leg nearly wholly, mid leg broadly and hind leg partly yellow, RC=M.

Black; ferruginous to yellow: A1 and 2, apical marginal area of clypeus broadly, mandible, palpi (ochre yellow), discoloured posterior part of collar, tubercle largely, tegula (translucent) and basal plate of wing, meso- and metapleural flanges, G1 on sides and basal part beneath (dorsal side turning brown towards base), G2 and 3 both except large brown mark above and beneath, attenuating and reaching base, apices of all coxae narrowly, fore leg except arolium, mid trochanter largely, -femur at base (narrow) and apex (broad), -tibia with spur and -T1, hind trochanter at base and apex (rest brown), base of tibia and spurs; mid T1 apically and whole of mid T5 pale brown. Hair on clypeus golden and parallel, on thorax-complex rather brassy, but on dorsal aspect of propodeum not curled.



Figs. 58-63. Trypoxylon gentingense sp. nov., ♀

In frontal view HW:HL=100:86, sides rounded, slightly convergent towards clypeus, vertex slightly depressed, tops of hind ocelli almost level with tops of eyes, eye incision narrow, parallel-sided and rounded at the sinus, dorsal margin horizontal.

HW, HL, IODv, A3, P=100, 50, 22, 29, 202. IODs=10:9. OOD, Od, POD=1, 6, 3. A3=AWx5. A3, 4, 5=10, 6, 6. P, Ma, Mi, 2(Ma), 3(Ma)=100, 11, 4.5, 30(14), 32(21). RC=M, RI moderately long, nearly as long as half TCV and reaching close to wing apex, CV1=CV2 x 6.5. TCV:CV2=5:3. angle about 120°.

Frontal elevations low, rounded, median furrow shallow and broad, enlarged into wide depression on anterior area behind SAT, SAT moderately high broad nasiform, with lateral inclinations posteriorly oblique and flat, anteriorly somewhat rounded, apical margin without transverse carina, but edged and laterally carinated at verge to PAF, medio-apical area broadly flattened and acutely inclined to IAA, ASR tricarinate on top, hind carina somewhat reflected, PAF deep, flat-bottomed, U-shaped (somewhat oval) in cross section. The structure in dorsal view: Fig. 58, in dorso-lateral view to see through PAF: Fig. 59, seen obliquely from beneath: Fig. 60. Clypeus: Fig. 61, disc almost not raised, broadly, gently, roundly tectate, apical margin almost not reflected; occipital carina complete, not incised nor depressed behind buccal cavity. Anterior part of collar narrow ridge-like, slightly widened towards sides, in frontal view dorsal margin: Fig. 62, very weakly and minutely tuberculate in middle, lamina on side triangular, apex pointed (Fig. 63). Pent-roof structure at subalar area of mesopleuron well developed, apical area broadly lamellate, smooth and polished, amber-yellow in colour, vertical wall of subalar pit flattened and provided with 3 transverse and strongly rugosed carinae, metapleural flange first horizontal and posteriorly raised and vertical; basal elevation of area dorsalis fairly marked, about a third the length of postscutellum, but much below level of this, with surface flattened and finely striate, lateral furrows of area dorsalis very feeble, rather indistinct, medial furrow moderately deep, enlarged posteriorly, lateral carinae of the segment not strong, but distinct, up-curved in lateral view, with both ends broadly obsolete, area apicalis with only lateral carinae, GSR roundly raised, amber yellow, but not reflected.

Frons distinctly microcoriaceous and finely, sparsely and very indistinctly punctured, mesoscutum strongly microreticulate and superimposed with fine punctures, punctures not weak, but indistinct due to strong microsculpture, PIS slightly larger than PD, but punctures posteriorly finer and sparser, mesopleuron more weakly microcoriaceous and similarly finely punctured, on epimeral area punctures much finer and sparser; area dorsalis at base smooth, in this specimen with 2 short carinae in middle, medial furrow transversely striate, striae closer and finer posteriorly, disc closely covered with large, weak and shallow punctures, lateral series of striae distinct till near posterior end, but anteriorly weaker and sparser, sides except smooth femoral sinus transversely (somewhat obliquely), finely and closely striate, mixed sparsely with medium-sized punctures, on posteriormost depressed area strongly closely rugoso-punctate.

♂, unknown.

Holotype: ♀, Malaisia, Genting Highland, XI. 1979, Fox (BMNH).

Remarks. The present species can be inserted in the key to the Indo-Malayan species as follows:

73	Antenna wholly ferruginous	<u>selangor</u> Tsuneki	
—	Antenna black, A1-2 or -3 yellow		73A
73A	SAT-ASR: Fig. 255 (of Pt. III)	<u>maculiventre</u> Tsuneki	
—	SAT-ASR: Figs. 58-60 (of the present paper)	<u>gentingense</u> Tsuneki	

14. TRYPOXYLON RUFIVENTRE TSUNEKI, 1976

Trypoxylon rufiventre Tsuneki, Steenstrupia, (Copenhagen), 4: 81, 1976 (♀ ♂, Philippines).

Trypoxylon penangense Tsuneki, SPJHA, 9: 99, 1979 (partim, specimens from Malaya, Is. Penang and Singapore, nec those from Laos).

Trypoxylon penangense: Tsuneki, Ibid., 11: 51, 1979 (1 ♀, from W. Java, nec 6 ♂ from Laos)

Trypoxylon rufiventre: Tsuneki, Ibid., 12: 49, 1980 (♀, Borneo).

Specimen newly examined:

1 ♀, W. Java, Ambarawa, date ?, E.W.A. Ludeking (BMNH).

15. TRYPOXYLON FULVOCOLLARE CAMERON, 1904

Trypoxylon fulvocollare: Tsuneki, SPJHA, 13: 70, 1980 (♀ ♂, Philippines, with all references).

Distribution: India (Assam), Laos, Malaya, Sumatra, Borneo and the Philippines.

Specimen newly examined:

1 ♀, S. India, T. Nadu Valparai (Cinchora), 20-22. X. 1979, J. S. Noyes (BMNH).

Observation. About 16 mm. Yellow in this specimen is more narrowly restricted on legs than in those of the Malayan specimens described in Pt. III of the present paper. A1-3, G1 except apical swelling above, G2, 3, 4 each except apical lunate black mark above and apical margin of clypeus broadly ferruginous; apical margin of all tergites broadly discoloured and amber yellow; yellow on legs: Apices of all coxae, both ends narrowly of trochanters, all femora except baso-dorsal brown mark (mid and hind ones further with a black mark apically beneath), all tibiae and tarsi (mid and hind T2-5 brown). RC=M, R1 short, CV1=CV2×8.4. TCV:CV2≐3:2, TCV strongly bent inwards, angle at base about 90° and at apex about 120°.

16. TRYPOXYLON PETIOLATUM SMITH, 1857

Trypoxylon petiolatum: Tsuneki, SPJHA, 13: 82, 1980 (list of ref.)

Trypoxylon petiolatum: Tsuneki, Ibid., 14: 75, 1981 (ditto).

Trypoxylon petiolatum: Tsuneki, Ibid., 15: 30, 1981 (Formosa and Ryukyus).

Specimens newly examined:

1 ♀, India, Karnataka, Madingere, 26. X. - 4. XI. 1979, J. S. Noyes (BMNH).

1 ♀, Malaysia, Selangor, Serdang, Orchid Farm, VIII. 1979, I. Gauld (BMNH).

1 ♂, Singapore, — ? , Baker (USNM).

1 ♂, Java, Buitenzorg (now Bogor), III. 1909, Biryant & Palmer (USNM).

Remarks. In the first and second female specimens,

HW,HL,IODv,A3,P=100,51,28,27,180 and =100,52,27,26,170.

In both G2 and 3 are completely bright red and without blackish mark above.

In the first male specimen legs dark brown, fore tibia in front obscurely and fore tarsus at articulations comparatively broadly pale, mid knee and apex of tibia and hind tibia at base also pale brown, tibial spurs pale brown or brownish yellow.

In the second male specimen lateral series of striae on propodeum stronger than usual and accompanied at just outer side with a feeble longitudinal carina that consists of minute swellings at apices of the striae, just as in the case of the type of T. cognatum Cameron (=petiolatum, ♂). Measurements on this specimen:

HW,HL,IODv,A3,A13,P=100,52,30,16,27,163. IODs=10:8. OOD,Od,POD=2,4,3. A3=AW×2.5. A3,4,5=10,8,8. A13=BW×3.7 and ≐A9-12. P,Ma,Mi,2(Ma),3(Ma)=100,16,5,25(23),26(32).

17. TRYPOXYLON ERRANS SAUSSURE, 1867

Trypoxylon errans: Tsuneki, see p. 17 of this paper.

Specimens newly examined:

1 ♀, S. India, T. Nadu, Coimbatore, 25. IX. - 1. X. 1979, J. S. Noyes (BMNH);

1 ♀, Singapore, — ? , Baker (USNM); 1 ♀, Nakon, Sritamarat, Thailand, 7. VI. 1928,

— ? (USNM).

18. TRYPOXYLON ALBISPINOSUM TSUNEKI, 1979

Trypoxylon albispinosum Tsuneki, SPJHA, 9: 173, 1979 (♀ ♂, W. and S. India).

Specimen newly examined:

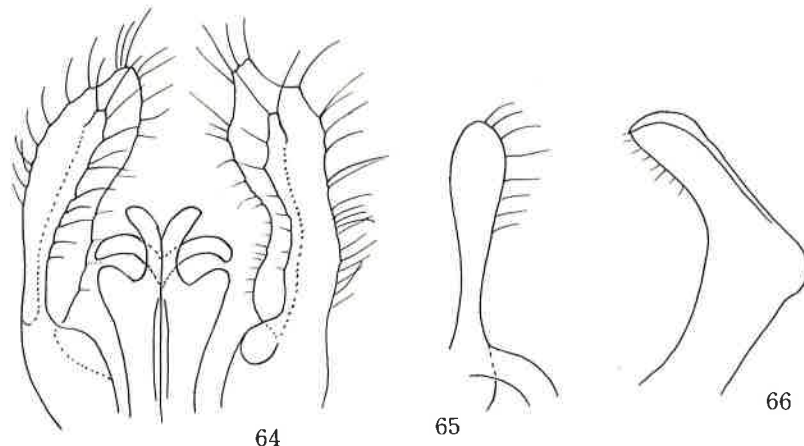
1 ♂, S. India, T. Nadu, 3 km east of Manjaler Dam, 15-18. X. 1973, J. S. Noyes (BMNH).

Remarks. This is one of the difficult species to identify and the specimen was identified with the present species on the basis of the structure of the genitalia, especially that of the apical lobes of the paramere.

Paramere as in typical, on dorsal side of apical lobe provided with a long slender frag-shaped lamella along median line, the free margin of which is fringed with sparse long hair (Fig. 64, apical part of genitalia seen from dorsal side, dotted line is the attaching margin of the lamella), volsella in ventral view: Fig. 65, seen from inside; Fig. 66, the widest aspect of which is obliquely located. 8th sternite is as in the typical specimen (Pt. III, Fig. 546), apical curved fringe of pubescence is characteristic.

In this specimen gaster nearly completely black, dark reddish only on Glat apical sides and on G2 and 3 at each base beneath. The local differences between this and the Laotian specimen are observed in relation to relative length of A3 and the state of lateral furrows of area dorsalis and can be inserted in the key of Pt. III as follows:

171	A13=A9-12	171A
—	A13=A10-12	172
171A	Lateral furrows of area dorsalis distinct, A3=AW × 1.5-1.7 (TCV:CV2=1:1)	S. Indian form
—	Lateral furrows of area dorsalis very feeble, rather indistinct, A3=AW × 2 (TCV:CV2=3:2)	Laotian form



Figs. 64-66. Trypoxylon albispinosum Tsuneki, ♂

19. TRYPXYLON NISHIDAI TSUNEKI, 1979

Trypoxylon nishidai Tsuneki, SPJHA, 9: 134, 1979 (♂ ♀, Laos).

Specimen newly observed:

1 ♀, India, Kerala Periyar A. Sanctuary, 5-15. X. 1979, J. S. Noyes (BMNH).

Remarks. Measurements of HW:IODv and the surface condition of the frons well agree with those of the holotype of nishidai, but ASR bears only a single large fovea at postero-lateral area. G2 and 3 reddish yellow and G2 with a broad brown band in front of apical margin and G3 a broad black band on posterior half, both paler towards underside.

20. TRYPXYLON MEMBRANACEUM TSUNEKI, 1979

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

Trypoxylon membranaceum: Tsuneki, SPJIA, 11: 56, 1979 (Sumatra and Java, ♀ ♂).
Trypoxylon membranaceum: Tsuneki, Ibid., 12: 55, 1980 (Borneo, ♀ ♂).

Specimen observed:

1 ♀, Sri Lanka, Kandy District, Udawattekele Sanctuary, 23. II. 1974, A. E. Stubbs & P. J. Chandler (BMNH). NEW TO CEYLON.

Observation. This Ceylonese specimen differs slightly from the original description of the species mainly in colour. This may partly be due to the freshness of the specimen. Antenna completely black, clypeus also till apical margin black, fore tibia pale brown in front largely, mid and hind tibiae almost without pale basal ring, fore T1-3 castaneous brown, 4-5 ferruginous, mid T4-5 somewhat brownish, tibial spurs of fore and mid legs ferruginous, of hind leg dark brown. Measurements:

HW, HL, IODv, A3, P=100, 54, 25, 18, 160. IODs=10:9. OOD, Od, POD=1, 2, 2. A3=AW × 3.7. A3, 4, 5=10, 8, 8. P, Ma, Mi, 2(Ma), 3(Ma)=100, 19, 6, 26(27), 26(32).

Except the ocellar location, the values agree tolerably well with those of the Singapore specimen (holotype) previously recorded.

In the present specimen ASR is nearly completely translucent amber yellow. Apparent basal dusky area is in reality the ground colour below the broadly expanded epidermal lamella.

21. TRYPOXYLON SP.
(? T. striolatum Tsuneki)

Specimen:

1 ♀, Bombay, Matheran, P. Cameron Coll. 1914-110. With name label 'Trypoxylon bicolor' by R. E. Turner and that 'Trypoxylon sp. nov.' by V. Gussakovskij.

Observation. The specimen lacks the head and can not be identified. The colour of the legs and gaster, the state of the lateral carinae of the propodeum, the punctuation of the mesoscutum, the extended state of radial cell of fore wing and the presumed body length are very similar to those of T. errans Saussure, but in the specimen the legs are till apices of all femora completely black and the area dorsalis is practically without lateral furrows; moreover, the surface of the area is on basal part obliquely and posterior part transversely, finely, closely and not strongly striate, except medio-posterior part of the area, including medial furrow and parts of disc.

According to the characters above mentioned the specimen is best consistent with Trypoxylon striolatum Tsuneki, 1979 and if so the characters of the wing venation and other minor distinctions are tolerably accepted. Possibly, therefore, the specimen belongs to this species, and if correctly so, it comes to represent the westernmost distribution of the species. References:

Trypoxylon striolatum Tsuneki, SPJHA, 9: 113, 1979 (♀, Laos, Singapore).
Trypoxylon striolatum: Tsuneki, Ibid., 11: 54, 1979 (♀, Sumatra, Java).
Trypoxylon striolatum: Tsuneki, Ibid., 12: 74, 1980 (♀ ♂, Borneo).
Trypoxylon striolatum: Tsuneki, Ibid., 13: 76, 1980 (♀, Philippines).

22. TRYPOXYLON CRASSIFRONS TSUNEKI, 1963

Trypoxylon crassifrons Tsuneki, Etizenia (Fukui), 4: 14, 1963 (1 ♀, Thailand).

The holotype of this species is at present kept in Thailand and can not be reexamined. According to the description and figures (head in frontal, lateral and dorsal views, with pro- and mesonotums in dorsal view) given it is very close in characters with T. maculipes Tsuneki (Pt. III, p. 25, 1979) known from Laos and Viet-Nam and if the specimen is reexamined it may fall within the category of this species. As far as the description goes, however, it differs from maculipes in that SAT is at anterior margin transversely edged and seen from above roundly raised on both sides of mid point as if to be bilobate. On this basis crassifrons is kept as distinct and maculipes is also kept as it is without being identified with the former.

Main characters of crassifrons:

♀, length 8.5 mm. Gl clavate, but comparatively long and subflask-shaped, but

shorter than G2+3, G1, 2 and 3 each with a fovea at apex in middle, mesoscutum microcoriaceous and mat, propodeum with lateral carinae, area dorsalis without lateral furrows, anterior third obliquely, rest transversely, finely and closely striate. Head in frontal view subquadrate, W:L=100:92, in dorsal view thick, HW, HL, IODv=100, 65, 31. IODs=3:1, IODc=A8, OOD very narrow, almost none, POD slightly smaller than Od. Al-5=10, 6, 9, 8, 8. Clypeus triangularly produced and minutely incised and bidentate in middle, frons in lateral view gently rounded till apex of SAT where acutely inclined to IAA, seen from above frontal median furrow broad and shallow, reaching near apex of SAT; pronotal collar thick, apical (anterior) margin roundly emarginate, posterior part shorter in middle than anterior part, discoloured and closely covered with pubescence, scutellum nearly quadrate, W:L=7.5:7. Area dorsalis defined by rounded elevation and difference in sculpture from outer areas, G1 with relative length to width at maximum and in middle (not minimum): about 100:22:13, G2 and 3 relatively 56(26), 54(32).

Frons microcoriaceous and closely superimposed with fine punctures, mesoscutum also superimposed with fine punctures, mesopleuron more weakly microcoriaceous and finely and closely punctured, propodeum with outsides of area dorsalis and posterior inclination transversely, finely and closely striate, sides polished and partly obliquely finely striate.

Black; whitish yellow; mandible (apically brown), palpi, humeral tubercle, fore leg from apex of femur to T5, mid leg from apex of femur to T1 (hind legs from femora apically lacking). Spurs, Al, 2, and 3 at each apex, wing tegula and mid tibia in front vaguely ferruginous, articulations of all legs more or less brownish, mid tarsus deep brown.

Specimen: 1 ♀ (holotype), Bangkok, 6. IV. 1961, K. Yoshikawa leg.

3. SPECIMENS FROM NORTHEASTERN PROVINCES OF BURMA

The specimens here treated were all collected by Dr. R. Malaise in 1934 and preserved at present at Swedish Museum of Natural History, Stockholm, and kindly sent by Dr. S. Erlandsson for my present study, together with the Philippine material.

According to his personal communication these specimens were formerly investigated by Dr. V. Gussakovskij, and, certainly, many of them are attached with the name labels written with pencil by the hand of this entomologist. By some unknown reason, however, he did not publish the result of his study.

The material includes 21 species, of which 8 are undescribed ones and 2 are new local races. A considerable number of them are, naturally, common with the fauna of Assam or other Himalayan areas and some of them are even common with the Palaearctic fauna, e. g. fronticorne Gussakovskij and malaisiei Gussakovskij.

The key to the species treated here is given at the end of this section.

1. TRYPOXYLON SCHMIEDEKNECHTI KOHL, 1906

Trypoxylon schmiedeknechti: Tsuneki, ref. p. 2 and 21 of this paper.

Specimen examined.

1 ♂, North Burma, Myitkyina, 175 m, 1-14. III. 1934, R. Malaise (RMS).

Remarks. The specimen is very small, measuring only 7 mm. Antenna nearly completely and legs largely are lost from the specimen.

2. TRYPOXYLON BIFOVEATUM TSUNEKI, 1979

Trypoxylon bifoveatum Tsuneki, SPJHA, 9: 20, 1979 (♀ ♂, Malaya and Laos).

Specimen examined:

1 ♀, Sikkim, 200 m, Valley at Tista Bridge, 8-15. XII. 1934, R. Malaise (RMS).

Remarks. In the present specimen fore leg broadly ferruginous: femur at base and apex, tibia except folded side (outer side brownish), tarsus except T5 (T1-4 slightly brownish), rest of the legs dark brown, but fore and mid tibial spurs pale yellow.

RC=B, but somewhat close to C, R1 fairly long, longer than A3 and reaching close to wing apex. CV1=CV2×3.5, TCV:CV2=1:1, angle about 130°.

3. TRYPOXYLON TROCHANTERATUM CAMERON, 1902

Trypoxylon trochanteratum Cameron, Entom., 35: 313, 1902 (♀, Khasi Hills)

Trypoxylon trochanteratum: Tsuneki, SPJHA, 8: 47, 1978 (lectotype desig., redescri., figs.)

Trypoxylon trochanteratum: Tsuneki, Ibid., 9: 40, 1979 (♀, Assam).

Specimens examined:

9 ♀, N. E. Burma, Kambaiti, 2000 m, 12,17,25,26, V, 4,4,4,8,11. VI. 1934, R. Malaise (RMS).

Remarks. The present species is very closely related to T. nasale Tsuneki (= T. nasutum m, 1979, nec 1974), but averaged body length larger, IODv greater (though IODs similar, hence OOD distinctly broader), eye incision somewhat wider, antenna and clypeus completely black, gaster marked with black above, legs more broadly dusky (some of trochanters brown or dark brown above) and surface condition of frons and propodeum somewhat different.

In the specimens observed blackish marks on gaster are as follows:

G1 (usually wholly black) brown to dark brown above, not always uniformly so, of-

ten on apical part only, and sometimes medianly pale, G1, 2 and 3 black maculated on each posterior part above, on G1 smaller and on G3 larger.

Ferruginous on legs: apices of coxae, all trochanters (sometimes black or brown marked above), both ends narrowly of femora, fore tibia and tarsus (sometimes brownish above), mid and hind tibiae on inner side (sometimes on apical area only), bases of mid and hind T1 (often becomes indistinct) and mid T5. Fore tibial spurs ferruginous, rest brown to dark brown, especially the shorter one of hind spurs darker.

Frons distinctly microcoriaceous and fairly closely superimposed with medium-sized punctures, punctures rather shallow and somewhat sparser posteriorly and closer anteriorly and there punctures closer in oblique direction, thus forming oblique puncture lines, mesoscutum similarly sculptured, but punctures uniformly and more closely disposed, surface much less glossy, on mesopleuron microsculpture weaker, punctures on prepectus close, on episternum sparse and on epimeral area lacking, with surface smooth and shining; area dorsalis at base obliquely striate, on disc irregularly (mainly transversely) rugulose and mixed with fine punctures, on median furrow transversely striate or rugoso-striate, striae posteriorly weaker, outsides of the area very finely and closely punctulate, punctures on posterior inclination finer and weaker, sides together with metapleuron smooth and polished, but sometimes partly weakly striate or sparsely punctured. Measurements on one of the specimens:

HW, HL, IODv, A3, P=100, 56, 31, 25, 120. HW:HL in frontal view =100:90. IODs=3:2. OOD, Od, POD=2, 5, 4. A5=AWx4. A3, 4, 5=10, 7, 6.5. P, Ma, Mi, 2(Ma), 3(Ma)=100, 26, 13, 52(38), 48(50). Gussakovskij correctly identified the specimens and put the name label to each (det. 1941).

4. TRYPOXYLON FERRUGINEUM TSUNEKI, 1979

Trypoxylon ferrugineum Tsuneki, SPJHA, 9: 50, 1979 (♀ ♂, Thailand, Laos).

Specimen examined:

1 ♀, S. Shan, States Burma, 1500 m, Taunggyi, l. VIII. - 22. IX. 1934, R. Malaise (RMS).

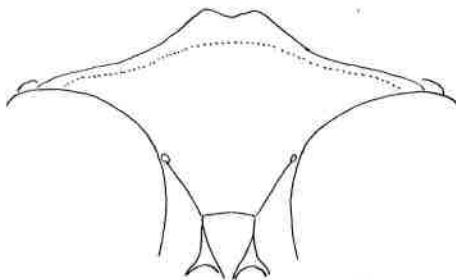
Remarks. Well agrees in characters with the typical female; gaster on G3-5 beneath obscurely brown, hind femur ferruginous and dark brown above and beneath, hind tarsus from apical third of T1 apically dark brown to black. IODs=2:1.

5. TRYPOXYLON NILGIRIENSE SHAN SSP. NOV.

Trypoxylon nilgiriense Tsuneki, SPJHA, 9:38, 1979 (♀ ♂, high altitude of S. India).

♀, 11 mm. Differs from the typical form mainly in the following respects:

Gaster completely ferruginous, hind tibia different in the pattern of maculation and apical margin of clypeus similar to that of the paratype (different considerably from that of holotype).



67



68

Figs. 67-68. Trypoxylon nilgiriense shan ssp. nov., ♀

Hind tibia wholly ferruginous and on outer side from 1/5 to 3/5 from base castaneous brown, the mark indistinct in outline and paler apically (in the holotype tibia black and at base till 1/5 from base yellowish white). Al with its basal condyle and A2 ferruginous, 1 with a brown mark above and 2 wholly dark brown above. Clypeus: Fig. 67 and pronotal lamina: Fig. 68 (left side). Measurements:

HW, HL, IODv, A3, P=100, 54, 32, 21, 116. IODs=10:5. OOD, Od, POD=1, 4, 3. A3=AW×3.8. A3, 4, 5=10, 8, 7. P, Ma, Mi, 2(Ma), 3(Ma)=100, 28, 14, 52(36), 50(46). RC=B, somewhat close to C, Rl short, slightly less than half TCV, CV1=CV2×3.3. TCV≠CV2, TCV gently incurved and CV2 outcurved at apical area, angle at base about 120° and at apex about 130°. ♂, unknown.

Holotype: ♀, N. E. Burma, Kambaiti, 24. V. 1934, R. Malaise (RMS).

Remarks. The specimen is heavily broken and parts of thorax are glued together, but mesosternum is lost, gaster is dropped off and mounted on a small card point; the right antenna completely and the left from A10 apically lacking, left fore leg completely, left mid leg from femur apically and right mid T5 also lost. Further the right compound eye is partly broken.

6. TRYPOXYLON FLETCHERI TURNER, 1918

Trypoxylon fletcheri Turner, Ann. Mag. Nat. Hist., (9), 1: 369, 1918 (♀, India: Assam).

Trypoxylon fletcheri: Tsuneki, SPJHA, 8: 67, 1978 (redescr. Holotype, figs.).

Trypoxylon fletcheri: Tsuneki, Ibid., 9: 31, 1979 (♀, Malaya).

Trypoxylon fletcheri: Tsuneki, Ibid., 11: 21, 1979 (♀, Java).

Trypoxylon fletcheri: Tsuneki, Ibid., 13: 43, 1980 (♀ ♂, Luzon, ssp. baguionis)

Specimens examined:

2 ♀, N. E. Burma, Kambaiti, 2000 m, 15, 24. V. 1934, R. Malaise (RMS).

Remarks. Gussakovskij correctly identified the specimens with fletcheri. But the specimens are more broadly blackish on antenna and legs than in typical form: Antenna black, Al and 2 both at apex only ferruginous, legs black, with following ferruginous: Apices of coxae (on fore and mid legs very narrowly), hind trochanter except a mark above, fore and mid femora at apices, -tibiae at apices and on inner side vaguely (fore tibia brown on outer side), hind femur on basal half and at apex, -tibia on basal and apical obscure marks, all tibial spurs, fore tarsus except arolium, mid tarsus beneath and at apex of each joint (dorsal side brown) and hind T1 beneath and at apex. G1 without blackish mark and G3, 4 and 5 partly brown or dark brown above. IODs=10:9.

In one of the specimens captured on April 25 IODs is slightly smaller, namely 10:8, but otherwise except slight difference in colour of legs well agrees with the first specimen. Ferruginous on legs: apices of coxae, trochanters and of femora of fore and mid legs, fore tibia and tarsus, mid tibia except vague streak on outer side and mid tarsus, hind coxa at apex, trochanter wholly, basal third of femur, tibia except vague mark at apex, spurs and articulations of tarsus. Gaster ferruginous from apical area of G3 to G5 brown.

In the female specimens formerly recorded from Malaya (Kdah Peak) in Pt. III of the present paper IODs are also somewhat narrower than the typical ones, namely, 10:7.5, but otherwise very similar and were identified with fletcheri.

7. TRYPOXYLON KAMBAITIUM SP. NOV.

The female of the present species resembles very closely T. pahangense which is known from Cameron's Highland, Malaya, (Pt. III, p. 51), but in the present species IODs=3:2 (not 2:1) and OOD:POD=4:5 (not 1:2) and antenna and legs are more broadly blackish; otherwise, especially in the form of apical margin of clypeus and in the structure of SAT-ASR very similar. It may be a northern race of pahangense, but as the male characters of pahangense remains unknown it seems too hasty to identify the present specimens (♀ and ♂) with pahangense at the species rank, so here it is dealt with as a separate species rather provisionally until the comparative study of the male characters between them will be done in future.

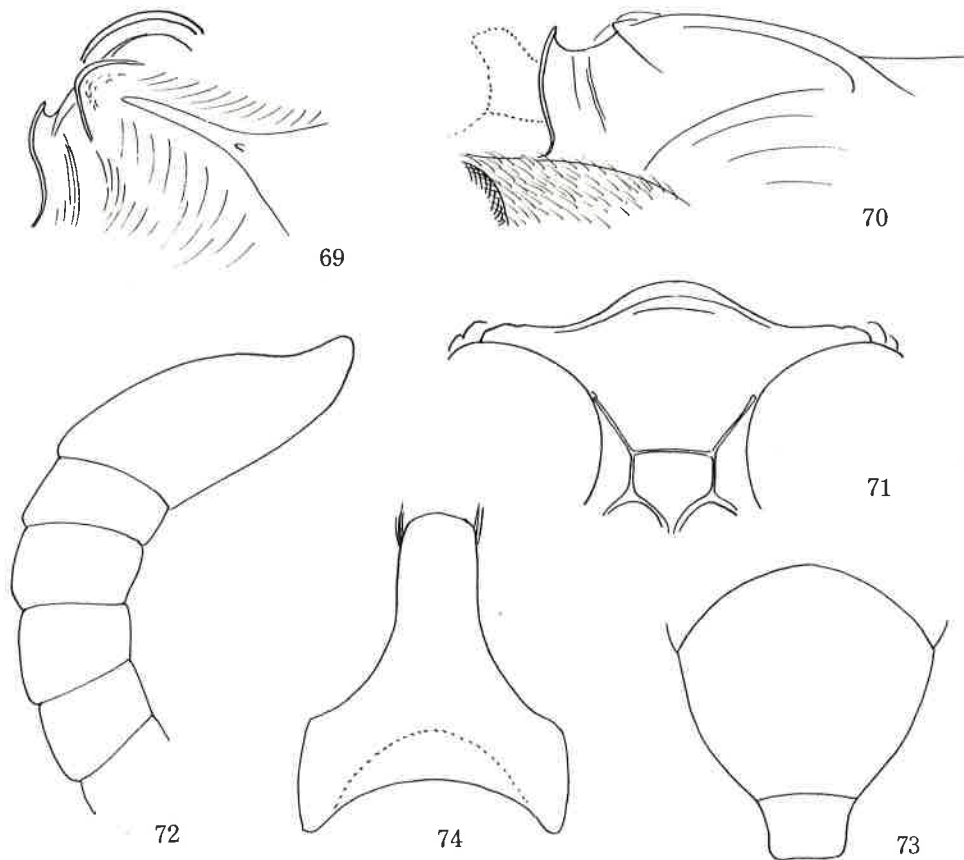
On the other hand, in the character of IODs and in the other general characters

the specimens before me are also considerably similar to *T. pagdeni* m., also known from Malaya, but are different from it distinctly in the apical form of the clypeus.

♂, 9.5 mm. Black; ferruginous are a transverse narrow line behind apical margin of clypeus, mandible, mouth parts, discoloured posterior part of collar, greater part of humeral tubercle, tegula (transparent), gaster except a few small marks scattered on G3-6 and broad areas of legs; apical margin of clypeus dark brown; A1 and 2 beneath and at apices brown, extreme base of gastral petiole, a vaguely outlined small marks on posterior part of G3 above and beneath, a band around posterior part of G4 (broader beneath) and a mark on each side of G5 and G6 beneath dark brown; all coxae except apex, fore and mid femora except base, apex and above, hind femur except base and apex, hind tibia on outer side except base and apex and hind tarsus from apex of T1 apically dark brown; fore and mid tibiae apically and mid T4-5 brown. Hair on lower face and clypeus silvery, comparatively long and appressed, on temples and posterior margin of pronotal tubercle also silvery, on vertex and dorsum of thorax greyish white, short, on sides and underside of thorax short, white and in some light appears silvery.

Head in frontal view wider than long, W:L=100:80, with sides rounded, somewhat convergent towards clypeus, eye incision broad and rather shallow, broadly rounded at the sinus, vertex not depressed.

HW, HL, IODv, A3, A13, P=100, 56, 33, 18, 28, 108. IODs=10:9. OOD, Od, POD=3, 5, 3. A3=AW×2.5. A3, 4, 5=10, 6, 5.5. A13=BW×2.4. A13≠A9-12, markedly bent at apex. P, Na, Mi, 2(Na) 3(Na)=100, 32, 14, 44(44), 46(60). BC=B, R1 moderately long, about 2/3 the length of

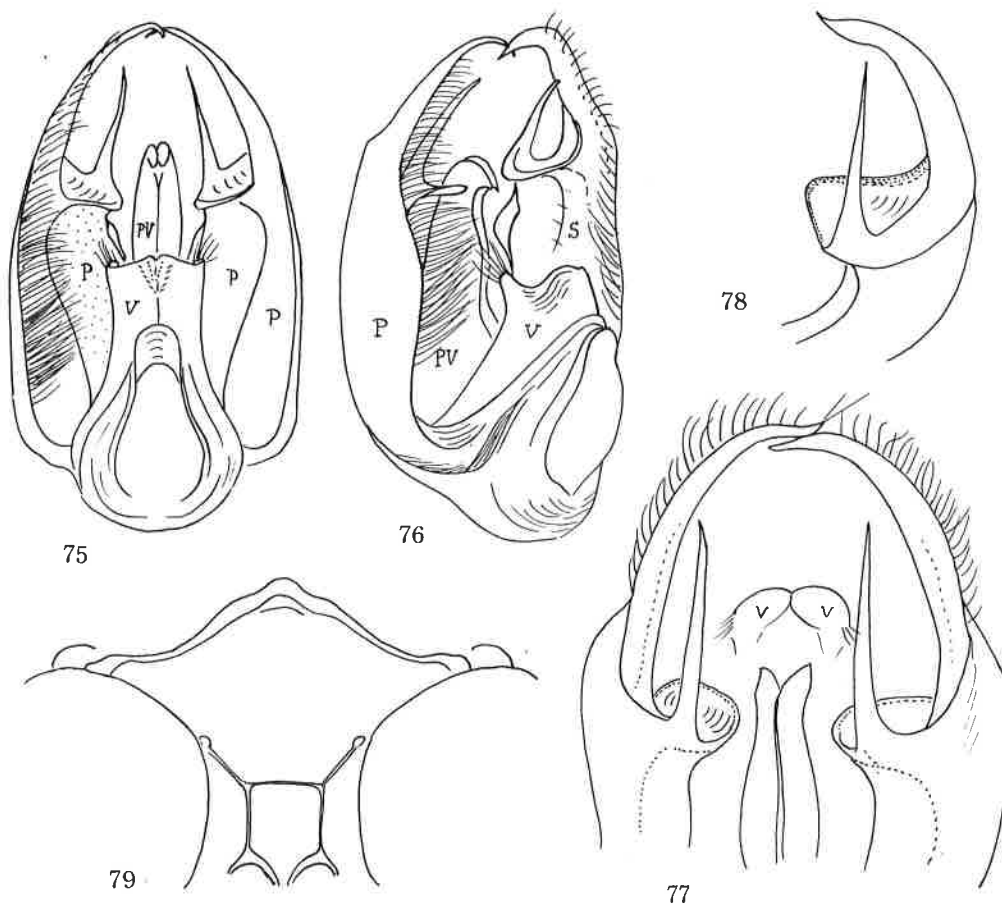


Figs. 67-74. *Trypoxylon kambaitium* sp. nov., ♂

TCV, CV1=CV2 × 3.5, TCV:CV2=8:7, angle about 130°.

Frons gently raised, at apex triangularly convergent and connected at middle narrowly with SAT, medial furrow broad and shallow, SAT moderately high nasiform, top angle formed with lateral inclinations about 120°, at posterior end (= at apex of medial furrow of frons) minutely impressed and thence forwards medianly bluntly carinated, carina not reaching apex, apex minutely roundly produced and carinated at the margin, from middle of apical carina other carina runs to postero-inner part of ASR, crossing and interrupting PAF (Fig. 69, nearly vertical view, somewhat from left side), ASR short, acutely and highly carinated at apex, SAT-ASR in dorso-lateral view to see through PAF: Fig. 70, ventral surface of SAT flattened, medianly carinate and smooth and shining. Clypeus: Fig. 71, disc medianly broadly and gently tectate, A3 not particularly long, A6 not excavated at base beneath, A15: Fig. 72 (right one seen from above). Anterior part of collar short, transverse, ridge-like, slightly widened toward sides and rounded at the ends, seen in front blunt triangularly raised and broadly rounded on top, posterior part broad, discoloured, lamina on side triangularly produced, apical angle about 130-140°, apex minutely rounded; propodeum with distinct lateral carinae, posteriorly curved down in front of apico-lateral carina of posterior inclination, area dorsalis enclosed with fine but distinct furrow, median furrow broad and fairly deep, on abdomen tergite 6 subconstricted at apex and tergite 7 narrowly produced, with apical margin truncate, the structure very curious (Fig. 73). Sternite 8: Fig. 74, very characteristic in form and in state of apical hair.

Genitalia in ventral view: Fig. 75, ventro-lateral view: Fig. 76, dorso-apical



Figs. 75-79. Trypoxylon kambaitium sp. nov., 75-78 ♂, 79 ♀.

view: Fig. 77, P... paramere, V... volsella, PV... penis valve, BR... basal ring. Penis valve simple at apex, without shoulder and sickle-appendages, curved ventrally like a bill; paramere strange in structure, at apex bifurcate into asymmetric slender lobes, the longer and inwardly curved outer one and the shorter and obliquely ventrally protruding inner one, the sinus between them not triangularly pointed, but broadly rounded (Fig. 77; main body of paramere roundly hollowed and provided with a median longitudinal septum (S in Fig. 76) which is connected with outer apical lobe at its base of inner margin and from the junction it expanded inwards to form a horizontal (somewhat concave) membranous shelf between bases of the two apical lobes, the margin of the shelf thickened and well chitinized (Fig. 78, left paramere in dorso-apical view and somewhat from inside, also in Figs. 75-77), volsella in lateral view at dorso-apical area produced and fringed with a tuft of hair (Fig. 76), outer margin of paramere also adorned with dense fringe of long hair; whole the structure ferruginous in colour.

Frons weakly microcoriaceous and closely superimposed with medium-sized puncture, punctures partly contiguous to each other, mesoscutum somewhat more closely punctured with similar punctures, PIS somewhat more strongly microstriate and surface less shining than on frons, on mesopleuron microreticulation indistinct and on epimeral area completely lacking, well shining, punctures also finer, weaker and sparser on prepectus and episternum; area dorsalis at base obliquely shortly rugoso-striate, on median furrow transversely and closely striate, on disc finely, weakly and sparsely punctured, posterior inclination smooth, sides without puncture, strongly polished.

♀, 9.5 mm. Similar to ♂ in general, but antennal joints longer, with ultimate joint not modified, clypeus more strongly produced anteriorly, with apical margin somewhat different in form (Fig. 79) and mid and hind tarsus from T1 apically brown, fore tarsus also slightly brownish and dusky marks on gaster confined to basal half of sides of G1 and to apical area of G4.

HW, HL in frontal view 100, 88. HW, HL, IODv, A3, P=100, 58, 34, 19, 111. IODs=10:6.5. OOD, Od, POD=4, 7, 5. A3=AWx3. A3, 4, 5=10, 6, 5, 6. P, Ma, Mi, 2(Ma), 3(Ma)=100, 31, 14, 47(44), 50(54). RC=B. RL short, less than half the length of TCV, CV1=CV2 x 3.5, TCV:CV2=4:5, angle about 130°.

Pronotal lamina less produced, with apex bluntly rounded.

Holotype: ♂, N. E. Burma, Kambaiti, 2000 m, 29. V. 1934, R. Malaise (RMS).

Paratype: 1 ♀, same locality, 26. IV. 1934, R. Malaise (RMS).

Remarks. In the key to the Indo-Malayan species of the genus (Pt. III) the present species can be inserted as follows:

- ♂ runs to couplet 44.
- | | | | |
|-----|---|----------------------------|-----|
| 44 | Antenna: Figs. 114, 115 (of that paper) etc. | <u>curvicorne</u> Tsuneki | |
| — | Antenna different etc. | | 44A |
| 44A | Antenna: Figs. 151, 152 (of that paper), A3=AWx4, A6 excavated at base beneath and produced at apex, A13 not curved, IODs=10:7 (etc.) | <u>ferrugineum</u> Tsuneki | |
| — | Antenna: Fig. 72 (of this paper), A3=AWx2.5, A6 not excavated beneath, A13 distinctly curved, IODs=10:9 (gaster ferruginous, with obscure brown marks posteriorly, legs broadly ferruginous), about 10 mm | <u>kambaitium</u> sp. nov. | |
| | ♀ runs to couplet 41. | | |
| 41 | Clypeus stoutly produced anteriorly as in Fig. 153 (of that paper and Fig. 79 of this paper) | | 41A |
| — | Clypeus different | | 42 |
| 41A | A3=AWx3.5, IODs=10:5, OOD:POD=1:2, 8 mm, Malaya | <u>pahangense</u> Tsuneki | |
| — | A3=AWx3, IODs=10:6.7, OOD:POD=4:5, 9.5 mm | <u>kambaitium</u> sp. nov. | |

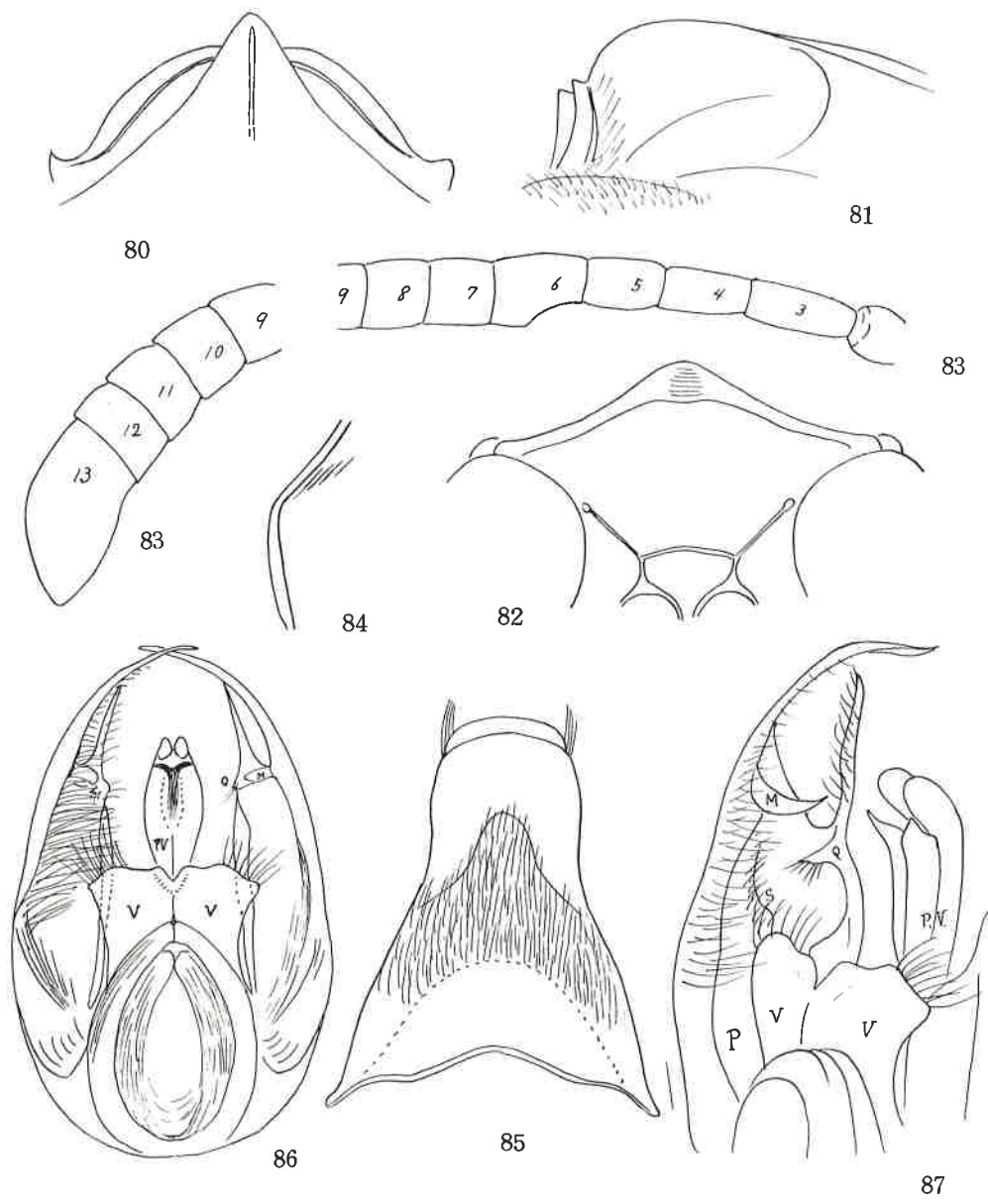
8. TRYPOXYLON BURMAENSE SP. NOV.

The present species (♂) closely resembles T. ferrugineum and runs to this species in the key of Pt. III (with slight inconsistency), but can be distinguished therefrom by the following differences:

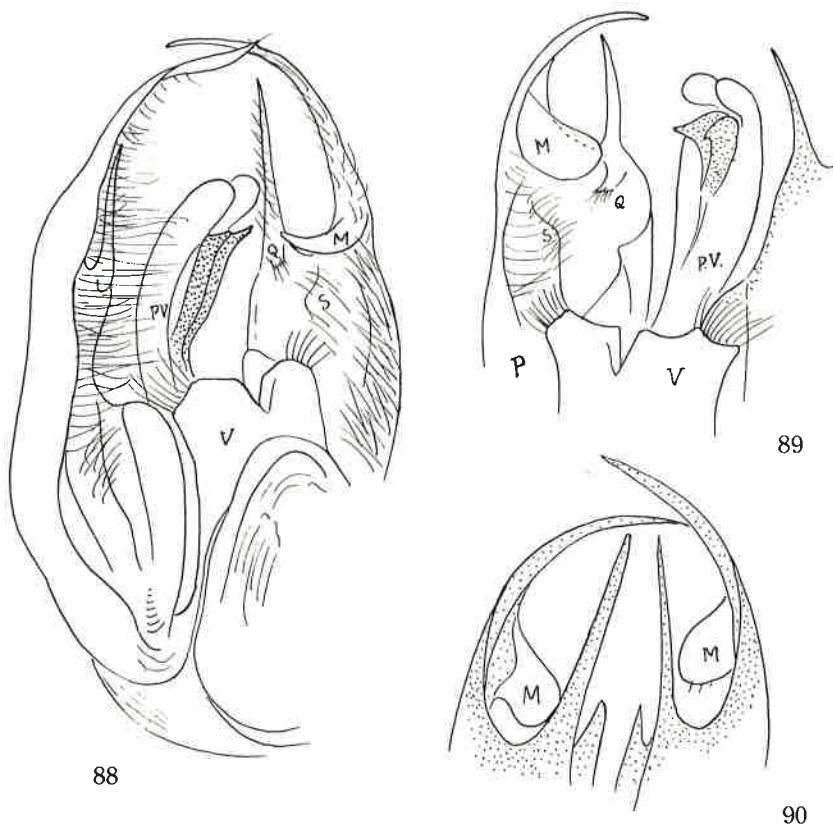
- (1) Antennal joints (e.g. A3, A13) relatively distinctly shorter,
- (2) apical margin of clypeus medianly more strongly produced anteriorly,
- (3) SAT without anterior transverse carina and up-curved PAP present,
- (4) IODs=10:9 (in ferrugineum 10:6.7),
- (5) legs more broadly ferruginous, and (6) body much smaller.

Diagnosis. ♂, 5.5 mm. G1 clavate, mesoscutum microcoriaceous and punctured, propodeum with lateral carinae, area dorsalis enclosed with furrow, IODs=10:9, A3=AWX2.3, A6 excavate at base beneath, Al3≠Al0-12, clypeus with apical margin recurved in middle, gaster nearly wholly, Al-3 largely and legs also largely ferruginous, Hair silvery, RC=B, Rl moderately long.

Ferruginous to pale brown are Al-3 except dorsal marks, mandible, palpi, discoloured posterior part of collar, tubercle posteriorly, tegula and basal plate of wing, gaster (G4-5 dark brown beneath) and legs except the following: bases of coxae, fore femur on inner and outer side (broadly brown), mid femur beneath (brown), mid and hind tarsi apically (brown) and all areolia (black). Hair on clypeus silvery, comparatively



Figs. 80-87. *Trypoxylon burmaense* sp. nov., ♂



Figs. 88-90. *Trypoxylon burmaense* sp. nov., ♂

long and thick, not dense, mixed with a few longer hairs.

Head in frontal view wider than long, $W:L=100:78$, with sides roundly convergent below, vertex not depressed, eye incision broad and shallow.

$HW, HL, IODv, A3, Al3, P=100, 54, 32, 20, 21, 84$. $IODs=10:9$. $OOD, Od, POD=2, 3, 3$, $A3=AW \times 2.3$. $A3, 4, 5=10, 8, 7$. $Al3=BW \times 2$ and $\neq Al0-12$. $P, Ma, Mi, 2(Ma), 3(Ma)=100, 44, 22, 50(65), 50(79)$. $RC=B$. $RI=TCV \times 0.5$. $CV1=CV2 \times 2.8$. $TCV:CV2=4:5$. TCV nearly straight, $CV2$ at apex curved up, angle about 100° .

Frons gently raised, medial furrow indistinct, surface broadly and shallowly concave in middle, seen in profile surface almost smoothly connected with that of SAT as gently curved line, SAT medianly ridged and laterally obliquely inclined, namely teetate (Fig. 80, dorsal view), in dorsal view apex not transverse, but triangularly produced on IAA, median ridge anteriorly carinate and the carina curved down between antennal sockets; ASR short, bicarinate on top, PAF narrow and shallow, strongly up-curved, SAT-ASR in dorso-lateral view to see through PAF; Fig. 81. Clypeus: Fig. 82, antenna: Fig. 83 ($A2-9 \dots$ lateral view, notice $A6, A9-13 \dots$ dorsal view). Anterior part of collar roundly raised in frontal view, without median tubercle, in dorsal view narrow ridge-like, only slightly widened laterally, lamina on side: Fig. 84 (left), scutellum subquadrate, only slightly wider than long, subalar area of mesopleuron normal. Propodeum with distinct lateral carinae, arising just behind spiracle and ending a short distance in front of anterior end of lateral carina of area apicalis, area dorsalis gently roundly raised and enclosed with comparatively broad and rather shallow groove, median furrow broad and moderately deep, area apicalis only with lateral carinae, GSR not roundly raised at apical margin, as a whole like a ring, on both sides of it, just inside lateral carina the surface deeply roundly impressed, apical part of gaster normally roundly convergent; sternite 8; Fig. 85 (ven-

tral view).

Genitalia in ventral view: Fig. 86, penis valve without shoulder, but strongly elliptic in form and provided with a pair of sickle appendages that are not well developed, triangular in form, not produced sideways, but obliquely ventrally, but well chitinized, black in colour (other parts pale ferruginous); genitalia in ventro-lateral view: Figs. 87 (from right side) and 88 (from left side); paramere deeply but asymmetrically bifurcate at apex into long, slender and curved outer lobe and short, slender and straight inner lobe, with the sinus of the bifurcation broadly rounded (Figs. 87 and 90). The structure of its inner side is complicated and to confirm the details is difficult, because of the presence of long glittering dense hair and of the almost transparent membranous areas, but according to the observations from various directions, outer lobe bears an almost transparent membranous expansion near its base which is nearly round in form and vertical to the length axis of paramere (M in the figures), in ventro-apical view (somewhat from right side) more clear (Fig. 89) in dorso-apical view: Fig. 90 (penis omitted). Inner lobe also has a thin flat protuberance near its base which is short, subtrapeziform and fringed with hair at apical margin (Q in Figs. 86-89), inner margin of main body of paramere broadly expanded, lamellate, reaching just behind volsella, appearing as if to be an independent lobe standing, because of the presence of a blackish longitudinal line near middle of its expansion. Main body of paramere (P in the figures) appears to have, further, a longitudinal septum (S in the figures) near middle of its ventral side, carrying dense hair on its inner area. Volsella (V in the figures) is a pair of lamellate processes at the top of basal ring, with each apex sinuate and fringed with long hair at the outer (posterior) half.

Frons strongly microcoriaceous and superimposed with medium-sized punctures, PIS longitudinally =PD, but transversely PD, therefore, punctures appear transversely arranged, forming irregular and sinuate puncture lines; mesoscutum also strongly microcoriaceous and punctured, punctures somewhat smaller than those on frons, but much closer, scutellum almost without microsculpture, closely punctured, mesopleuron weakly microcoriaceous and more finely and more sparsely punctured, but on epimeral area punctures very sparse and fine, with surface well shining. Area dorsalis smooth and polished and from base obliquely distinctly striate, striae posteriorly weaker, median furrow from middle posteriorly transversely rugoso-striate (on anterior portion longitudinally striate as the series of basal striae), rugae posteriorly very weak, outer sides of the area closely rugoso-punctate, series of striae along lateral carinae indistinct, posterior inclination transversely finely and closely striate, but on lateral areas irregularly, closely punctured, sides of the segment shining, with feeble oblique close striae on dorsal area.

♀, unknown.

Holotype: ♂, N. E. Burma, Kambaiti, 2000 m, 15. V. 1934, R. Malaise (RMS).

Remarks. In the key to the species of the Indo-Malayan regions (Pt. III) the present species rung to couplet 43. It can be inserted into it as follows:

43	Antenna: Figs. 114, 115 (of that paper, etc.)	<u>truncatum</u> Tsuneki	
—	Antenna different		43A
43A	A13=A9-12		44
—	A13=A10-12 (Fig. 83) (clypeus: Fig. 82, A3=AW 2.3, A6 excavated at base beneath, PAF narrow and shallow, but not interrupted by the anterior transverse carina of SAT, gaster ferruginous), 5.5 mm, N. E. Burma	<u>burmaense</u> sp. nov.	

9. TRYPOXYLON FRONTICORNE BURMANICUM SSP. NOV.

Trypoxylon fronticorne Gussakovskij, Trav. Zool. Acad. Sci. USSR, 3: 659, 1936 (♀ ♂, S. Europe, Transcaucasus, Siberia till Pacific Ocean).

Trypoxylon fronticorne: Beaumont, Ins. Helvet. Fauna, 3. Hym. Sphec., p. 85, 1964.

Trypoxylon fronticorne: Tsuneki, SPJHA, 9: 56, 1979 (incl. ssp. assamense, brevicorne, japonense).

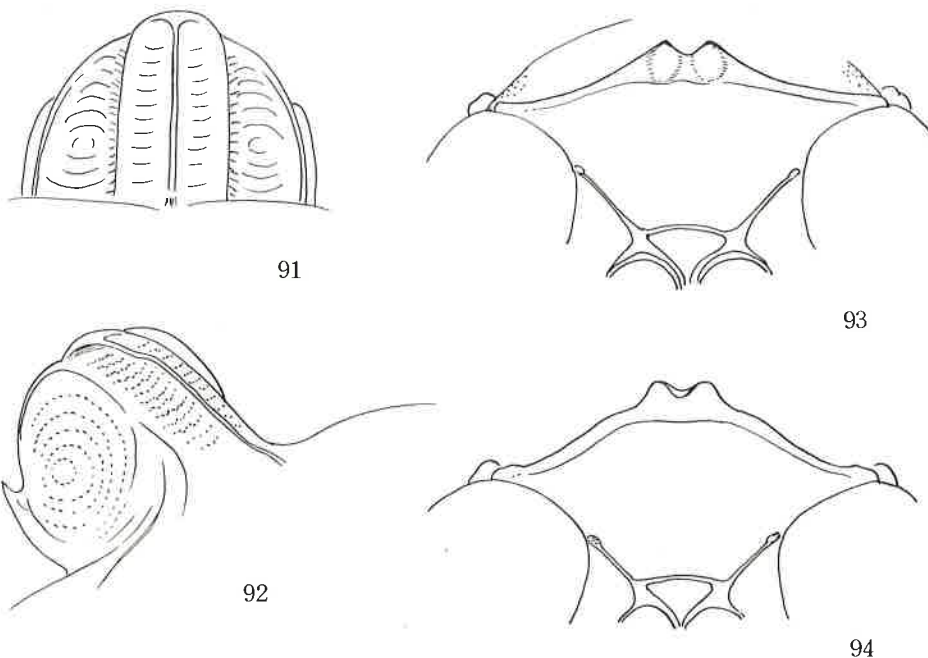
Trypoxylon fronticorne: Tsuneki, Ibid., 15: 13, 1981 (incl. ssp. shirozui, obliquum).

The present subspecies differs from other subspecies in that SAT is markedly thick till top and the medio-apical prominence of clypeus is distinctly bidentate. From other Asiatic subspecies it also differs in that the dorsum of SAT is not transversely striated with carinae (in this respect similar to the typical form).

♂, 6.5 mm. Black; mandible apically ferruginous, palpi brown, tegula dark brown, posteriorly translucent pale brown, fore tibial spur whitish, mid and hind ones dark brown, the former apically whitish. Hair on clypeus silvery, markedly long and not so closely appressed as usual, on sides and underside of thorax and on basal half of legs also long and silvery, on vertex and dorsum of thorax long but fine and greyish white, rather sparse and erected.

HW:ML in frontal view 100:80, lateral margins strongly rounded and very slightly convergent towards clypeus, frontal elevations gentle, medial furrow broad and shallow, SAT thick and high, in dorsal view: Fig. 91, in dorso-lateral view: Fig. 92, without fovea or longitudinal impression at dorsal end in middle, medianly finely carinated till near apex, apical margin transversely carinated in vertical view, in ventral view lower area of SAT subtriangular, flattened, nearly perpendicular to IAA and margined by the carina above mentioned and further medially carinated; dorsal surface of SAT irregularly rugulose and punctulate, not shining, but lower area smooth and polished, sides of SAT deeply roundly hollowed out, with surface smooth and shining, as a result antero-lateral carina of SAT becomes thin transverse and vertically raised plane and connected with ASR with intervention of up-curved PAF (Fig. 92, dorso-lateral view to see through PAF). Clypeus: Fig. 93, disc gently roundly elevated, supraclypeal area wide triangular in form.

HW, HL, IODv, A3, Al3, P=100, 51, 59, 14, 28, 93. IODs=10:7.5. OOD, Od, POD=9, 8, 8. A3=AW×1.5. A3, 4, 5=10, 10, 12. Al3=BW×2.4 and ≈Al0-12. P, Ma, M1, 2(Ma), 3(Ma)=100, 29, 16, 53(38), 50(52). Al3 distinctly curved at apical area, with apex minutely rounded. Anterior part of collar of pronotum blunt triangularly raised in frontal view and minutely rounded at the top, in dorsal view ridge narrowly carinated, with top area posteriorly reflected and produced and closely attached to posterior part (in *ssp. assamense* similar, but with reflection somewhat weaker, in *japonense* not reflected).



Figs. 91-94. *Trypoxylon fronticerne burmanicum* ssp. nov., ♂

Propodeum with lateral carinae, but area dorsalis without lateral furrows, median furrow broad and shallow, medial furrow of posterior inclination broad and deep and connected with area apicalis which is deeply roundly hollowed, with surface smooth and shining, with lateral and posterior carinae highly raised and in the latter (=GSR) top ridge roundly elevated and slightly reflected. In fore wing $BC=B$, RI short, $CV1=CV2 \times 3.6$, $TCV:CV2 \approx 1:1$, TCV distinctly bent behind middle, angle at base about 100° , at apex

about 115. Genitalia not examined.

Frons microcoriaceous, mat and sparsely punctured, punctures fine, shallow, flat-bottomed and shining, mesoscutum more distinctly microreticulate and more sparsely superimposed with punctures than frons, punctures slightly larger than those on frons and irregular in distribution, partly closer, but as a whole sparser than on frons; propodeum at base obliquely, on median furrow transversely striate, striae at base almost straight, but posteriorly distinctly rugulose, posterior inclination within median furrow obliquely closely striate, on the rest transversely rugulose, sides obliquely, closely striate, intervals of striae microreticulate.

♀, 8-10 mm. Head in frontal view slightly longer than in ♂, W:L mostly =100:85 or so, with sides more distinctly and more straightly narrowed towards clypeus, clypeus: Fig. 94, relatively longer, with medio-apical area more distinctly bidentate than in ♂, antenna normal, mid tibial spurs till apex dark brown, otherwise similar to ♂.

Measurements with allotype female: HW, HL, IODv, A3, P=100, 50, 40, 18, 94. IODs=10:7. OOD, Od, POD=5, 4, 5. A3=AW×3. A3, 4, 5=10, 9, 8. A3:IODc=10:16. P, Ma, M1, 2(Ma), 3(Ma)=100, 32, 17, 60(45), 52(64). RC=B, Rl short, CV1=CV2×4.4, TCV=CV2, TCV gently bent inwards, angle about 90°.

In sculpture and punctuation on frons and mesoscutum similar to ♂, on propodeum also similar in basal plan, but actually sometimes completely obliquely rugose-striate, sometimes on narrow basal area only distinctly striate. The structure and striation of posterior inclination similar to ♂, but usually medial furrow broader and deeper than in ♂ and appears deeply furrowed till apex, with inclinations of the furrows obliquely and closely striate.

Holotype: ♂, N. E. Burma, Kambaiti, 2000 m, 23. IV. 1934, R. Malaise (RMS).

Paratypes: 8 ♀, same locality, 20. III, 6, 6, 6, 10. IV, 15, 15. V, 11. VI. 1934, R. Malaise (RMS).

Other specimens: 5 ♀ (antennae incomplete), same locality (7000 ft - 2000 m.), 10, 10, 12. IV, 17, 29. V. 1934, R. Malaise (RMS). 1 ♀, same locality, (but broken to pieces and glued on to slit of card paper), 17. V. 1934, R. Malaise (RMS).

10. TRYPOXYLON MALAISEIELLUM SP. NOV.

The present species is very closely allied to T. darjeeling Tsuneki, but can be distinguished from this in the following differences:

(1) Body slightly larger and appears much robuster. (2) IODc is relatively somewhat wider. (3) A3 relatively slightly longer. (4) Apical margin of clypeus different in form (Fig. 98, cf. Fig. 100 in darjeeling). (5) Mid leg almost completely black and ferruginous colour of fore leg is also comparatively darker.

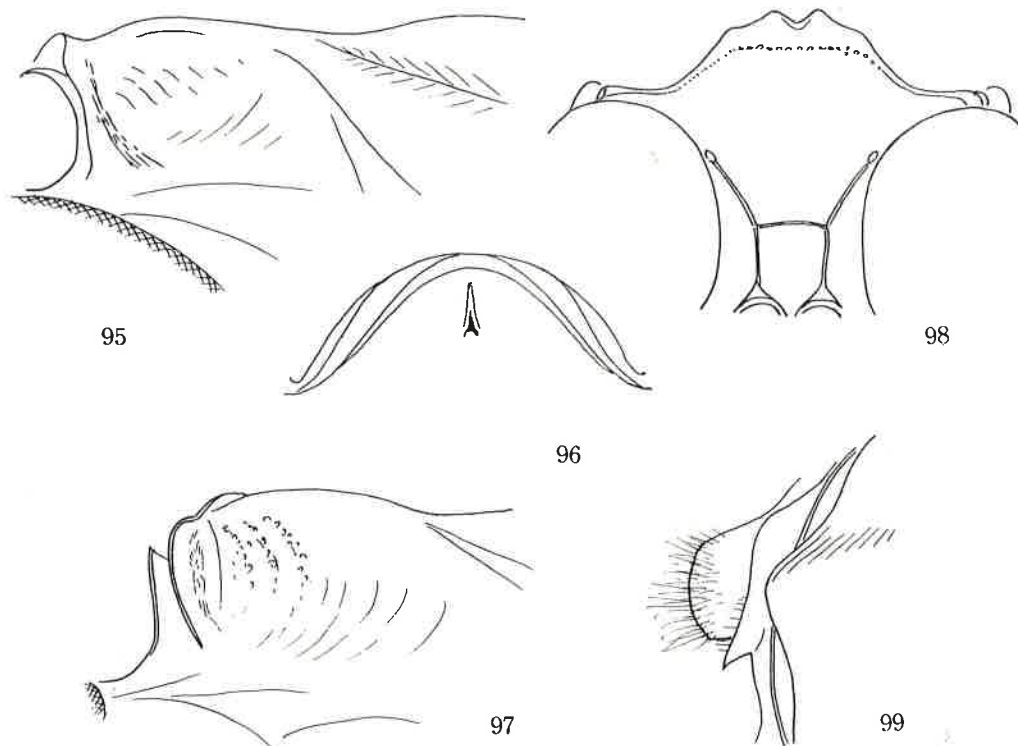
Diagnosis. ♀, about 10 mm; black, fore tibia and tarsus pale brown, mid tibia and tarsus black, Gl clavate, but comparatively long, subflask-shaped, mesoscutum microcoriaceous, propodeum with lateral carinae, area dorsalis enclosed with furrow, at base obliquely, on the rest transversely striate, SAT broadly tectate, medianly longitudinally and anteriorly transversely and arcuately striate, the latter carina half covering ASR, clypeus triangularly produced and incised in middle, IODs=5:3, A3=AW×3, RC=C, CV1=CV2×4, hair silvery.

9.5-10 mm, mandible and palpi ferruginous, posterior part of collar discoloured, yellowish, tegula translucent castaneous, tibial spurs brown to dark brown, mid femur appears in some light to have brownish streak.

Head in frontal view slightly wider than long, W:L=100:85, with sides roundly and weakly convergent towards clypeus, vertex not depressed, tops of hind ocelli above level of tops of eyes, eye incision comparatively broad and narrowed towards bottom, bottom rounded, dorsal margin almost horizontal.

HW, HL, IODv, A3, P=100, 54, 31, 18, 125. IODs=10:6, OOD, Od, POD=4, 9, 6 (in paratype 3, 6, 5). A3=AW×3. A3, 4, 5=10, 7, 7. P, Ma, M1, 2(Ma), 3(Ma)=100, 26, 11, 45(34), 44(46). Rl short, half the length of TCV, TCV=CV2, angle about 130°.

Frons gently raised and gently inclined towards medial line, anterior margin of elevation in vertical view triangularly convergent, with angle about 70°, dorsal sal margin of frons and SAT seen obliquely from left side: Fig. 95, SAT in dorsal view as in Fig. 96, SAT-ASB in dorso-lateral view: Fig. 97, false PAF obliquely running down. Clypeus: Fig. 98, disc broadly tectate, apical reflection only slight; anterior part of collar in frontal view gently rounded, dorsal margin not smooth, but more or less minutely sinuate, but without medial tubercle, in dorsal view very short, trans-



Figs. 95-99. *Trypoxylon malaiseiellum* sp. nov., ♀

versely linearly carinated, carina slightly widened towards sides and the part median-broadly reflected posteriorly and closely attached to posterior part, posterior part markedly broad, in middle about 7-8 times as long as anterior part, lamina on side: Fig. 99, parapsidal suture an impressed shining line, subalar area of mesopleuron normal, only postere-lateral part edged; basal transverse elevation of propodeum not high-raised, lateral carinae of the segment long, originating just behind spiracle, but not reaching lateral carinae of area apicalis, lateral furrows of area dorsalis broad and fairly deep, with impressed bottom line, medial furrow very broad, elongated oviform, fairly deep, medial furrow of posterior inclination with impressed bottom line which reaches area apicalis, lateral carinae of this area anteriorly shortly curved inwards, but with dorsal margin widely open, lateral parts of the area deeply roundly impressed at the inside of the lateral carinae.

Frons microcoriaceous and closely superimposed with medium-sized punctures, $PIS \leq PD$, microsculpture on mesonotum somewhat stronger than on frons, with punctures similar in size, but closer, surface less glossy, on mesopleuron more weakly microcoriaceous and more sparsely punctured, on prepectum somewhat closer, on epimeral area finer and sparser and weaker, surface almost smooth and shining; striae at base of area dorsalis strong and coarse, on the rest of the area fairly strong and fairly close, outsides of the area finely and very closely punctured, series of striae along lateral carinae coarse and strong; sides smooth and polished, but on dorsal side obliquely and finely closely striate.

♂, unknown.

Holotype: ♀, N. E. Burma, Kambaiti, 2000 m, 4. IV. 1934, R. Malaise (RMS) (right antenna from A4 apically, T5 of both mid legs and right hind leg and left hind tarsus completely lacking).

Paratype: 1 ♀, same data, but 23. V. 1934 (left antenna dropped off and glued on to left eye, left hind T5 lost and gaster and wings stained with gummy substance).

Remarks. In the present species, as also the case in darjeeling, the gastral petiole is intermediate between claviformed and flask-shaped; a considerably long parallel-sided stalk area present, but posterior swelling is distinctly gradual as compared with the typical flask-shaped ones.

11. TRYPOXYLON DARJEELING TSUNEKI, 1980

Trypoxylon brevicarinatum Tsuneki, SPJHA, 9: 65, 1979 (nec Cameron, 1912) (N. India, N. Burma, ♀).

Trypoxylon darjeeling Tsuneki, Ibid., 12: 2, 1980 (nom. nov.).

Specimens examined:

1 ♀, N. E. Burma, Kambaiti, 7000 ft, 30. IV. 1934, R. Malaise (RMS); 3 ♀, same loco, 2000 m, 12, 29. V, 11. VI. 1934, R. Malaise (RMS).

Remarks. The data label of the first listed specimen is the same one as that of the paratype of the species.

The specimens are 6.5, 6.8, 8.5 and 8.5 mm in length, clypeus: Fig. 100, in the smallest specimen the measurements are:

HW, HL, IODv, A3, P=100, 28, 33, 16, 120. IODs=10:5. OOD, Od, POD=4, 10, 7. A3=AW×2.6. A3, 4, 5=10, 7, 6.5. P, Ma, Mi, 2(Ma), 3(Ma)=100, 26, 13, 48(40), 44(46). RC=C, R1 short, CV1=CV2×2.8. TCV:CV2=4:5, angle about 130°.

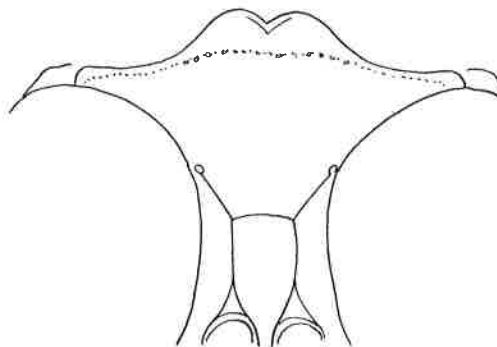


Fig. 100.

Trypoxylon darjeeling

Tsuneki, ♀.

Clypeus and supraclypeal area.

100

12. TRYPOXYLON PETIOLATUM SMITH, 1857

Trypoxylon petiolatum Smith, J. Proc. Linn. Soc. London, Zool., 2: 105, 1857 (♀, Borneo).

Trypoxylon bicolor: Tsuneki, SPJHA, 8: 1, 1978 (partim).

Trypoxylon petiolatum: Tsuneki, Ibid., 8: 6, 1978 (lectotype desig., redescrip.)

Trypoxylon petiolatum: Tsuneki, Ibid., 9: 160, 1979 (♀ ♂, syn., Singapore, Malaya, India, Thailand, Tenasserim, Nepal, Laos, Viet-Nam, S. China, Maldives Is.).

Trypoxylon petiolatum: Tsuneki, Ibid., 11: 39, 1979 (Sumatra, Java, Sumba, Flores).

Trypoxylon petiolatum: Tsuneki, Ibid., 12: 110, 1980 (Ambon, Binongko, Celebes, Borneo).

Trypoxylon petiolatum: Tsuneki, Ibid., 13: 82, 1980 (Luzon, Basbas, Busanga, Palawan, Mindanao, Basilan, Tawitawi).

Trypoxylon petiolatum: Tsuneki, Ibid., 14: 75, 1981 (Ogasawara and Hawaii).

Trypoxylon petiolatum: Tsuneki, Ibid., 15: 30, 1981 (Formosa, Ryukyus)

Trypoxylon petiolatum: Tsuneki, p. 29 of this paper.

1 ♀, Burma, about 200 m, Washaung, 20 km east of Myitkyina, 14. VII. 1934, R. Malaise (RMS) (other specimen: 1 ♀, Korea, Seoul, 30. VII. 1938, N. Zhenzhuzist (RMS)).

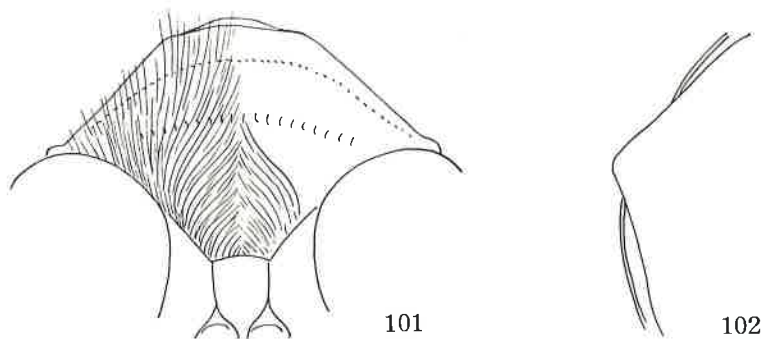
Observation on the Burmese female specimen:

Black; antenna dark brown, from A4 apically ferruginous beneath, apical margin castaneous brown, mandible ferruginous, at extreme base black, palpi ochre yellow, posterior part of collar discoloured, yellowish, tegula ferruginous, gaster from apex of G1 (on sides extended forwards) to base of G4 reddish yellow, without blackish mark above; fore and mid tibiae at base and in front largely, hind tibia at base and apex and all spurs ferruginous; basal ring of hind tibia rather pale yellow, fore and mid tarsi whitish yellow, the former on T4 and 5 slightly brownish and the latter on T3-5 largely brown to dark brown, hind tarsus on articulations and claws brownish, areolia black.

Structural characters generally as usual, but clypeus with medio-apical subtruncate area narrower than usual and anteriorly shortly roundly bevelled; Fig. 101, lamina on side: Fig. 102; punctures on mesoscutum fine, shallow and sparse, lateral furrows of area dorsalis broad and weak, practically lacking, lateral series of striae distinct, area apicalis widely open upwards, GSR not elevated.

Measurements (within parentheses: the Korean specimen for comparison):

HW, HL, IODv, A3, P=100, 48, 26, 27, 160 (100, 48, 29, 24, 132). IODs=10:7 (10:7). A3=AW×5 (AW×4.3). A3, 4, 5=10, 6, 5, 6 (10, 7, 6). P, Ma, Mi, 2(Ma), 3(Ma)=100, 18, 6, 34(20), 34(26) (100, 21, 7, 30(25), 34(34)).



Figs. 101-102. Trypoxylon petielatum Smith (♀, Burmese specimen)

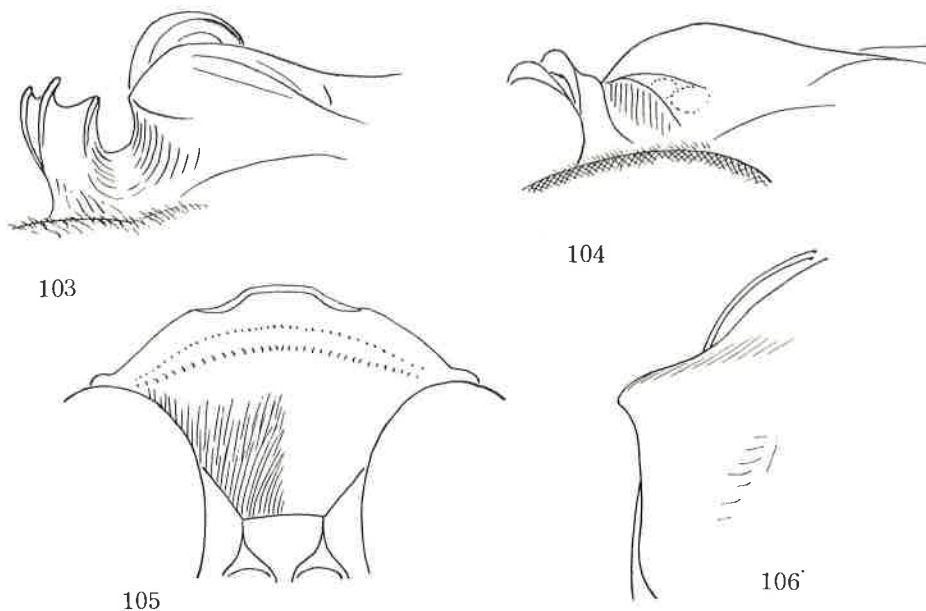
13. TRYPOXYLON KACHIN SP. NOV.

The present species belongs to the group of selangor, maculiventre, compluvium etc., bearing a well-developed pent-roof structure at the subalar area of mesopleuron, but is different from all of them in the colour of clypeus and from any of them in the colour of either antenna or gaster.

Diagnosis. ♀, 13 mm, G1 flask-shaped, mesoscutum rather weakly microcoriaceous, propodeum with lateral carinae, area dorsalis with feeble lateral furrows, mesopleuron with pent-roof structure at subalar area, IODs=1:1, A3=AW×7, clypeus medianly produced, RC=C, hair on clypeus silvery, A1-2, G1 largely, G2-3, fore leg broadly, mid leg moderately and hind leg partly ferruginous.

Black; ferruginous are A1 with its basal condyle, A2, apical margin of clypeus, mandible, palpi, discoloured posterior part of collar, tubercle largely, tegula, basal plates, veins and stigma of wing, G1 except apical swelling above (dark brown), G2, 3 and base of 4, fore femur, tibia, tarsus, mid tibia and T1, hind tibia at base and all tibial spurs; rest of tarsi brown to dark brown, areolia dark brown. Hair on head silvery, on posterior part of collar slightly brassy, but on the rest of thorax silvery.

Head in frontal view wider than long, W:L=100:86, with sides roundly, distinctly convergent towards clypeus, vertex depressed, tops of hind ocelli slightly below tops



Figs. 103-106. *Trypoxylon kachin* sp. nov., ♀

of eyes, each ocellus not in a hollow, eye incision narrow and deep, subparallel-sided, with dorsal margin rather slightly raised outwards, frontal furrow at base fairly deep, but broader and shallower anteriorly to turn into broad and shallow depression, elevations on both sides gently rounded; SAT moderately high rounded nasiform, shortly, rather thickly carinated in middle, anterior part with top area nearly flattened and edged at vertex to PAF and IAA, thence acutely falling down, ASE acutely tricarinate, hind carina reflected posteriorly, PAF deep, flat-bottomed, oval in cross section; the structure very similar to that of *compluvium*, in dorsolateral view; Fig. 103, in lateral view: Fig. 104; clypeus: Fig. 105, also similar to *compluvium*, disc only gently raised at base, with hair weakly convergent towards medial line.

HW, HL, IODv, A3, P=100, 48, 22, 30, 183. IODs=10:9.5. OOD, Od, POD=2, 9, 6. A3=AW×6.7. A3, 4, 5=10, 6, 6. P, Ma, Mi, 2(Ma), 3(Ma)=100, 14, 5, 26(16), 31(23). (The values are very close to those of *compluvium* and *selangor*). RC=C, RI moderately long, about half length of TCV, reaching close to wing apex, TCV:CV2=5:3, CV1=CV2×6, 6, TCV bent at 1/3 from lower end and angle at base about 95° and at apex about 120°. Occipital carina complete, not incised nor depressed behind buccal cavity.

Anterior part of collar subtriangularly bluntly raised in frontal view, with top weakly tuberculate, lamina on side; Fig. 106. Pent-roof structure at aubalar area of mesopleuron well developed, vertical wall of the cave that is covered with the pent-roof is flattened and coarsely rugoso-carinate, meso and metapleural flanges amber-yellow, the latter first horizontal and posteriorly oblique; lateral carinae of propodeum not strong but distinct, seen in profile locating considerably below dorsal surface, only slightly above middle of the side, and upcurved, not reaching anteriorly the spiracle and posteriorly the lateral carina of area apicalis, which is incomplete, widely open upwards, lateral furrows of area dorsalis broad and very feeble, GSR roundly, moderately elevated, amber-yellow in colour, not reflected; hind coxal tubercle not well developed.

Frons minutely microcoriaceous and sparsely superimposed with medium-sized punctures, punctures on anterior depressed area close, SAT closely covered with strong piliferous punctures, mesoscutum closely punctured, punctures as large as those on frons, PIS≠PD, PIS under 40× magnification bearing feeble microstriae that connect punctures with each other, surface not shining, punctures posteriorly smaller and

weaker, with PIS inversely larger, basal furrow of area dorsalis crenate, medial furrow transversely striate, striae on posterior portion extended laterally on to disc and posterior part of lateral furrows, disc closely covered with weak indistinctly outlined, comparatively large punctures, surface not shining, lateral series of striae of the segment fairly strong and close, reaching posteriorly anterior end of lateral carina of area apicalis, posterior inclination transversely closely striate on medial furrow and on posterior area, rest of the aspect closely covered with small, shallow, piliferous punctures, sides on antero-ventral femoral sinus smooth and polished, on the rest finely, sparsely punctured, with intervals obliquely, finely and closely striate, posteriormost area somewhat strongly striate.

♂, unknown.

Holotype: ♀, N. Burma, Myitkyina, 175 m, 1-14. III. 1934, R. Malaise (RMS).

14. TRYPOXYLON NIGRIFEMUR TSUNEKI, 1979

Trypoxylon nigrifemur Tsuneki, SPJHA, 9: 87, 1979 (♀, Laos).

Specimen examined:

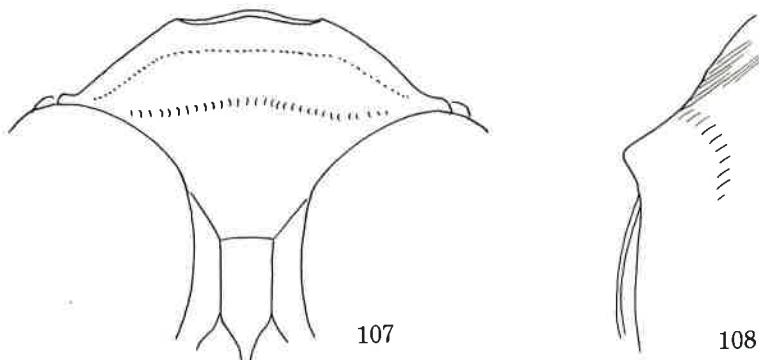
1 ♀, South Shan, States Road, 40 km east of Taunggyi, 29.IX. - 13. X. 1934, R. Malaise (RMS).

Remarks. Well agrees in general with the holotype specimen from Laos, slight differences:

(1) Apical margin of clypeus generally similar in form (broadly truncate and in the holotype bluntly quadrisinuate), but in this specimen median emargination absent and the margin turned to trisinuate (Fig. 107), apical reflection broad and fairly marked and extreme margin raised to carina, in colour apical area more narrowly ferruginous.

(2) Fore trochanter, except apex and beneath, almost completely dark brown.

(3) Hind tarsus wholly dark brown, with articulations pale.



Figs. 107-108. Trypoxylon nigrifemur Tsuneki, ♀

On some characters. IODs slightly smaller than 2:1, frontal median furrow broad and deep, lowered to nearly same level of inner orbital area and elevations on both sides of the furrow very distinct. SAT in lateral view with top line rounded, median carina anteriorly enlarged, flattened to triangular area, carrying a minute fovea in it, ASB bicarinate, hind carina highly raised and markedly reflected, PAF deep, flat-bottomed, oval in cross section, lamina on side of pronotum triangularly produced, posterior margin weakly incurved behind apex (Fig. 108), area dorsalis enclosed with distinct, crenate furrow, area apicalis almost complete, GSR highly, roundly elevated and lateral series of striae along lateral carinae distinct.

Antenna dark brown, Al-3 ferruginous beneath and Al and 2 each at apex and A3 at broad basal area also ferruginous, gaster from apical swelling of G1 posteriorly

ferrugineous, but G₄ posteriorly and G₅ basally with a brownish dirty area (not well outlined) above.

15. TRYPOXYLON ERRANS SAUSSURE, 1867

Trypoxylon errans Saussure, Voyage de Novara, Hym., p. 84, 1867 (♀, Mauritius Is.).
Trypoxylon intrudens Smith, Trans. Zool. Soc. London, 7 (3): 188, 1978 (♀, India).
Trypoxylon errans: Tsuneki, SPJHA, 8: 28, 1978 (with syn.); 9: 114, 1979; 10: 20, 1979; 11: 28, 1979; 12: 87, 1980; 13: 115, 1980; 14: 45, 1981; 15: 42, 1981; 16 (the present paper): 16, 29, 1981.

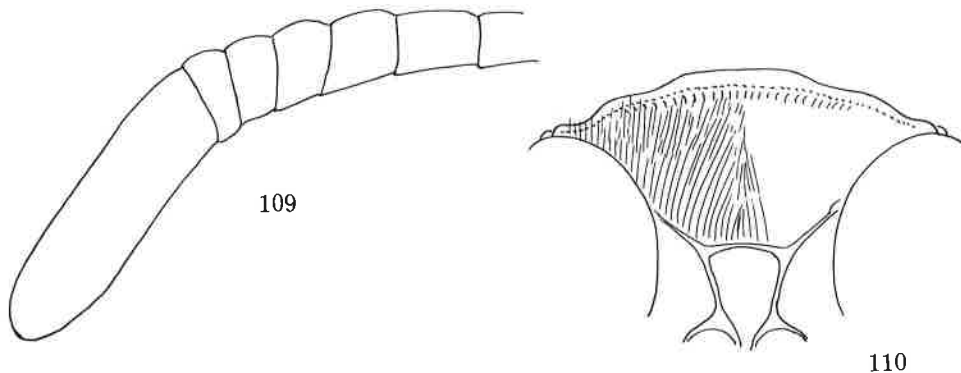
Specimens examined:

1 ♀, N. E. Burma, Sadon, 1200 m, 28. VI. - 5. VII. 1934, R. Malaise (RMS); 1 ♂, North Burma, Myitkyina, 175 m, 1-14. III. 1934, R. Malaise (RMS).

Remarks. Both normal in characters, medio-apical recurved area of clypeus medi-ally weakly incised. RC=C. Measurements (within parentheses ♂):

HW, HL, IODv, A3, Al3, P=100, 52, 26, 22, —, 152 (100, 53, 30, 15, 34, 130). IODs=10:5 (10: 6.7). OOD, Od, POD=2, 5, 4 (3, 5, 4). A3=AW×4.7 (AW 2.7). (Al3=BW×3.5 and ≠A8-12). A3, 4, 5=10, 6, 5.5 (10, 7, 6). P, Ma, Mi, 2(Ma), 3(Ma)=100, 17, 6, 24(20), 29(26) (100, 20, 6, 30(26), 34(46)). (in the female G₂ and 3 mechanically laterally compressed, with width smaller than normal).

In ♂ Al3: Fig. 109 (in dorsal view of right antenna), clypeus: Fig. 110 (somewhat unusual in the curvature near sides).



Figs. 109-110. Trypoxylon errans Saussure, ♂

♂. Gaster black, only slightly pale brownish at apical sides of G₁ and base narrowly of G₅ and 3; all trochanters dark brown, only on both ends narrowly ferruginous. RC=C, but close to M, Rl short, about half the length of TCV (in ♀ similar), yet reaching close to wing apex. CV1=CV2×6.5. TCV:CV2≅3:2, TCV nearly straight, angle about 120°.

16. TRYPOXYLON MYITKYINAE SP. NOV.

In the key to the Indo-Malayan species the present specimen (♂) runs to triplet 133 and runs out, because in the specimen fore tibia largely dark brown, fore tarsus pale brown and mid tarsus dark brown. If followed the second route it completely runs out at couplet 138, and if followed the third route it also comes to deal lock at 145, but close to one of them, namely petiolatum Smith. Certainly the present species is similar in general characters to a certain form of T. petiolatum ♂ (for instance, form of cognatum Cameron), but differs from petiolatum in that Al3 is distinctly longer.

The specimen is close to the type of *T. cognatum* Cameron (= a form of *T. petiolatum* Smith, ♂) in many characters, as far as confirmed at present (see Pt. III, p. 40 of the present paper) and we are tempted to identify it with this species and to recover the original status of *cognatum* as a separate species. Strictly, however, in the present specimen A3 is distinctly longer (=AW 2.1, in *cognatum* AW 1.8), apical margin of clypeus bluntly bilobed in middle (in *cognatum* trilobed), vertex without distinct furrow just behind hind ocelli and the angle formed by TCV and CV2 of fore wing about 90 (in *cognatum* about 110). Speaking to some other characters that are more variable in nature, body length smaller (8 mm as against 11 mm), OOD:POD=2:2 (in *cognatum* 2:3), dorsal margin of SAT rounded in profile (Fig. 113) and raised above level of frons (in *cognatum* triangular and main part is level of frons - compare with Fig. 149 of Pt. II), parapsidal suture on mesoscutum not a raised line here, but impressed and longer hind tibial spur not brown.

Based mainly upon the three characters first mentioned the present specimen is treated here as a distinct species.

Diagnosis. ♂, 8 mm, G1 flask-shaped, mesoscutum without microsculpture, propodeum with feeble lateral carinae, IODs=10:8, A3=AW×2, A13≠A8-12, area dorsalis enclosed with feeble furrow, G2-3 yellowish red, fore tibia at base in front and fore tarsus pale brown, spurs all pale yellowish.

Supplement. Black; mandible ferruginous, at base black, palpi pale brown, G1 at extreme apex and on sides of apical area and G4 at base narrowly ferruginous red. Hair on clypeus silvery, nearly wholly parallel.

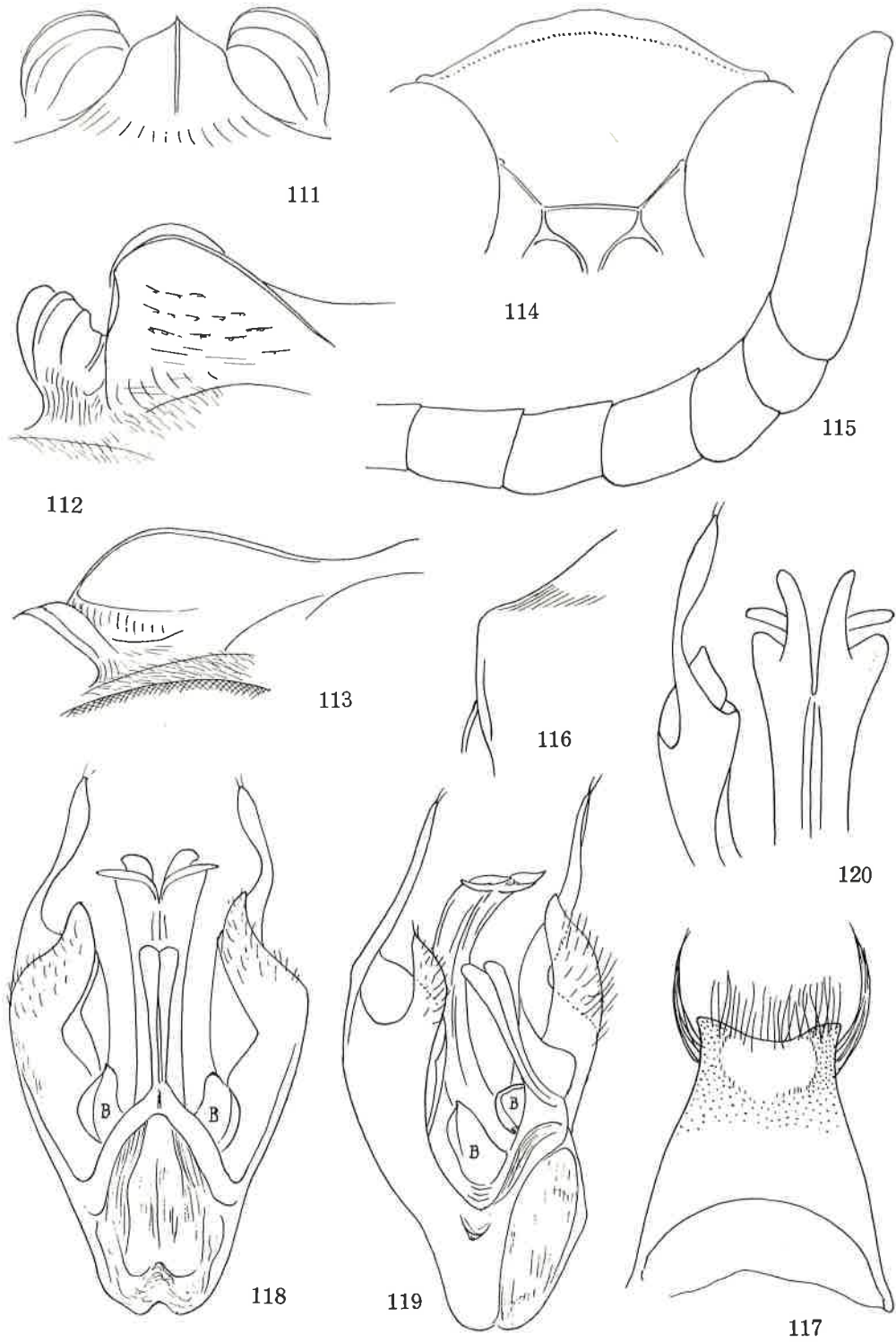
Head in frontal view markedly wider than long, W:L=100:80, with lateral margins roundly, fairly strongly convergent towards clypeus, vertex almost not depressed, tops of hind ocelli slightly above level of tops of eyes, eye incision broad, first subparallel-sided and then markedly narrowed towards sinus, dorsal margin horizontal, vertex flat, hind ocellus not in a hollow, but surface gently obliquely raised posteriorly and bluntly edged at the line connecting posterior margins of eyes, fore ocellus in a weak hollow and the hollow extended forwards as a broad and fairly deep frontal furrow, elevations on both sides of the furrow moderately high, rounded in outline as well as in profile, but comparatively small, reaching upwards level of anterior margin of fore ocellus. SAT-ASR in dorsal view: Fig. 111, in dorso-lateral view (from left side): Fig. 112, seen in profile: Fig. 113, SAT moderately high nasiform, with sides roundly inclined, but at verge to PAF edged and steeply inclined to PAF, medio-anterior area roundly inclined and in vertical view triangularly produced on IAA and medianly acutely carinated, the carina extended posteriorly, connected with median carina of SAT, reaching upper end, ASR acutely tricarinate, the carinae gradually lowering backward (Fig. 112), PAF deep, flat-bottomed; clypeus: Fig. 114, disc gently roundly raised and weakly reflected at apical area; A13: Fig. 115; occipital carina becomes very weak behind buccal cavity.

HW, HL, IODv, A3, A13, P=100, 50, 31, 16, 30, 116. (IODs relatively 24), IODs=10:8. OOD, Od, POD=2, 3, 2. A3=AW×2.1. A3, 4, 5=10, 8, 7. A13=BW×3.6 and >A9-12, but <A8-12 (only slightly so). P, Ma, Mi, 2(Ma), 3(Ma)=100, 21, 9, 37(28), 38(37). RC=C, R1 short, CV1=CV2×4.5, TCV:CV2=6:5, TCV nearly straight, angle about 90°.

Anterior part of pronotal collar narrow ridge-like, slightly widened laterally, medianly somewhat reflected and appressed to posterior part which is incompletely (only at apical marginal area narrowly) discoloured, lamina on side: Fig. 116; subalar area of mesopleuron normal; lateral carinae of propodeum weak, but distinct, in lateral view up-curved, lateral furrows of area dorsalis very feeble, area apicalis incomplete, widely open upwards, GSR not raised.

Eight sternite: Fig. 117, very similar to that of *petiolatum*. Genitalia (Fig. 118, seen from beneath) also closely resembles those of this species, especially in the form of apical two lobes of paramere. But in the present species paramere has a strange basin near base of ventral side which is lamellate, suboval in outline (apex pointed) and roundly hollowed (Figs. 118, 119, B, the latter in latero-ventral view); volsella long, spatulate; penis valve with well developed shoulder and sickle-shaped appendages, its apical part in dorso-vertical view: Fig. 120 (left paramere omitted).

Frons distinctly microcoriaceous and closely superimposed with medium-sized punctures, punctures shallow and partly subrugosely contiguous to adjacent ones, forming puncture lines; mesoscutum fairly closely covered with comparatively large punctures, PIS≠PD, but on median area punctures somewhat sparser (general appearance close to that of *errans*), punctures on mesopleuron sparser, weaker, especially on epimeral area, but on prepectus less so; propodeum at base of area dorsalis without crenae or striae, but in middle finely longitudinally rugoso-striate, striae extended on medial



Figs. 111-120. *Trypoxylon myitkyinae* sp. nov., ♂

furrow, disc feebly and very sparsely punctured, apical part of medial furrow with a few feeble transverse striae, outsides of the area and posterior inclination closely covered with comparatively large piliferous punctures, sides sparsely punctured with large, shallow punctures that are partly longitudinally arranged to form puncture lines.

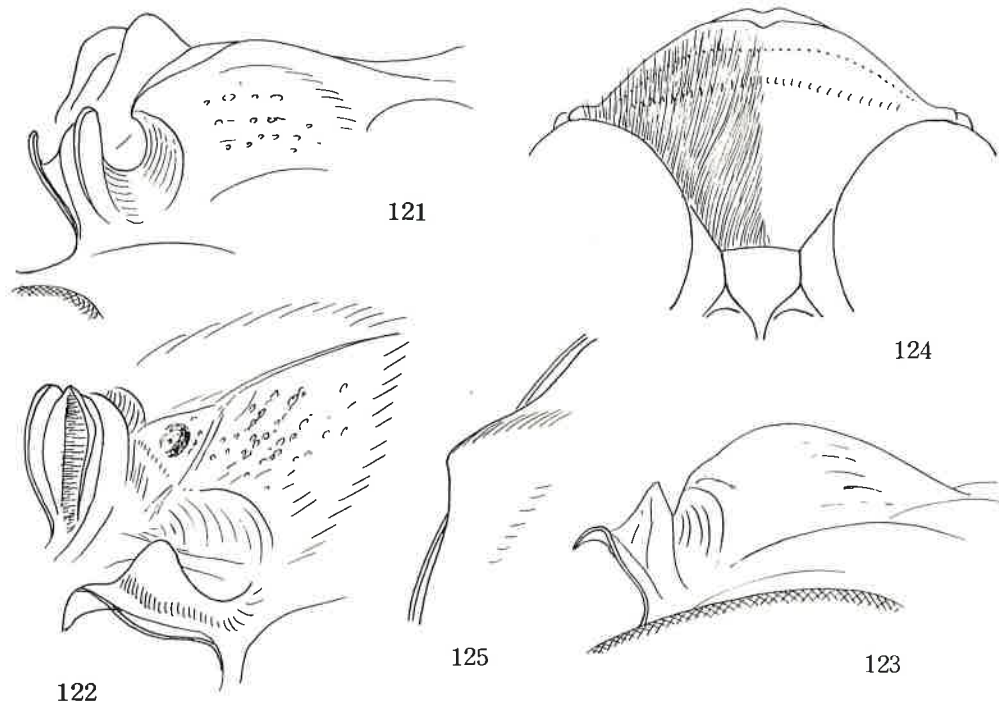
♀, unknown.

Holotype: ♂, North Burma, Myitkyina, 175 m, 1-14. III. 1934, R. Malaise (RMS).

17. TRYPOXYLON SHANSHAN SP. NOV.

Apparently similar to *T. petiolatum* Smith, but in the present species propodeum is provided with lateral carinae and the structure of SAT-ASR and clypeus is different. In the key to Indo-Malayan species it runs to couplet 118 and runs out, in that of Java-Sumatran species it goes to couplet 52 and stops; in the key to the Bornean species it runs to *djun* and certainly somewhat close to this, but in the structure of vertex, frens and clypeus it is completely different from this species and, further, measured values are also considerably different. In the key to the Philippine species it runs to couplet 81 (*tawitawiense*), but disagrees with this in many distinctions.

♀, about 14 mm, shining black, without aeneous lustre. Apices of A1 and 2 pale yellow, clypeus narrowly brown at apex, mandible basally yellow and apically glossy brown, palpi ochre yellow, posterior part of cellar almost not discoloured, with marginal area in some light appears brownish, tegula translucent dark brown, G1 at apex and G2-3 wholly yellowish red (G3 appears dark brownish posteriorly due to dirt); legs with following parts pale yellowish to ferrugineous; Fore tibia except folded side and a large obscure mark on outer side before apex, fore tarsus wholly except arolium, mid tibia at base and apex, hind tibia at base, all tibial spurs and mid T1-3. Mid T3 brownish and 4-5 brown to dark brown, hind tarsus brownish black, but somewhat pale at base of T1, 2 and 3. Hair on clypeus silvery, at base in middle distinctly convergent towards medial line (Fig. 124).



Figs. 121-125. Trypoxylon shanshan sp. nov., ♀

Head in frontal view with sides roundly, fairly strongly convergent towards clypeus, $W:L=100:88$, vertex depressed, tops of hind ocelli slightly below level of tops of eyes, eye incision comparatively narrow, gradually narrowed towards apex, apex minutely rounded, dorsal margin slightly raised outwards, frontal elevations comparatively small, roundly and moderately highly raised, medial furrow broad and deep, SAT moderately high nasiform, with lateral inclinations oblique and nearly flat, medial carina at anterior inclination widened to flat subtriangular area, carrying a fovea on it, SAT at verge to IAA and PAF edged and thence steeply inclined below, ASR acutely bicarinate, posterior carina somewhat thick at base, but thin at apex and distinctly reflected posteriorly, PAF deep, flat-bottomed, oval in cross section. The structure in dorso-lateral view: Fig. 121, latero-ventral view: Fig. 122, lateral view: Fig. 123; clypeus: Fig. 124, basal elevation of disc comparatively small, moderately high, but apical reflection broad and considerable (occipital carina unobservable beneath head).

HW,HL,IODv,A3,P=100,48,27,26,164. IODs=10:6.5. OOD,Od,POD=2,5,3. A3=AW×5. A3,4,5=10,7,6. P,Ma,M1,2(Ma),3(Ma)=100,17,6,26(24),27(32). RC=B. Rl short. CV1=CV2×7. TCV:CV2=2:1. TCV gently sinuate. Angle at base nearly 90°, but at apex about 100°.

Anterior part of collar short, gently widened laterally, dorsal margin in frontal view roundly raised and weakly tuberculate in middle, lamina on side: Fig. 125; subalar area with postero-lateral area acutely edged and slightly produced laterally, connected with mesopleural flange, somewhat hanging over subalar pit, but not widely expanded to form pent-roof structure; basal elevation of propodeum narrow ridge-like, lateral carinae of the segment at base narrowly and at apex broadly disappeared, seen in profile located fairly below dorsal margin of the segment and up-curved, area dorsalis enclosed with broad and shallow, rather indistinct furrow, median furrow broad and apically widely open, lateral carina of area apicalis high, comparatively long and roundly curved inwards at anterior end, but not completely closing the area, GSR highly roundly elevated, amber yellow in colour, but not reflected.

Frons almost without microsculpture (under 50× magnification faint microstriae can be seen near bottom line of median furrow), surface smooth and shining and closely covered with medium-sized punctures, punctures partly contiguous linearly to adjacent ones. SAT sparsely punctured, punctures comparatively large, but weak, indistinct in outline, surface without microsculpture, shining; mesoscutum also well shining, punctures fine and sparse, but on lateral areas large, shallow and obscure impressions sparsely present and frequently including piliferous puncture within; punctures on mesopleuron slightly large, sparse, more distinct and hair-bearing, but on epimeral area fine and sparser; area dorsalis at base sparsely crenate, median furrow on basal area with bottom line crenate, disc shining, with sparse fine hair point scattered, posteriorly with a few obscure striae, lateral series of striae along lateral carinae distinct, posteriorly closer, stronger and longer, in front of area apicalis covering completely the surface of posterior inclination, sides shining, on femoral sinus smooth, the rest anteriorly closely, posteriorly sparsely punctured, posterior-most area covered with strong transverse striae.

♂, unknown.

Holotype: ♀, South Shan State, Road 40 km east of Taunggyi, 13. X. 1934, R. Malaise (RMS).

Remarks. The specimen is attached with a name label, *Trypoxylon bicolor* Smith, identified by V. Gussakovskij.

18. TRYPOXYLON MALAISEI GUSSAKOVSKIJ, 1933

Trypoxylon malaisei Gussakovskij, Ark. Zool., 24 A, 10: 10, 1933 (♀, Ussuri).

Trypoxylon malaisei: Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci., 6 (1): 14, 1956 (♀ ♂, Japan and Korea).

Specimen examined:

1 ♀, N. E. Burma, Kambaiti, 2000 m, 17. V. 1934, R. Malaise (RMS).

Specimens used for comparison:

1 ♀, Vladivostok, Suchan, 8. VII. 1950, R. Malaise (det. by Gussakovskij, with name label of this species, possibly a paratype); many ♀♀ from Korea and Japan.

Remarks. The Burmese specimen is strongly punctured on the mesoscutum just as

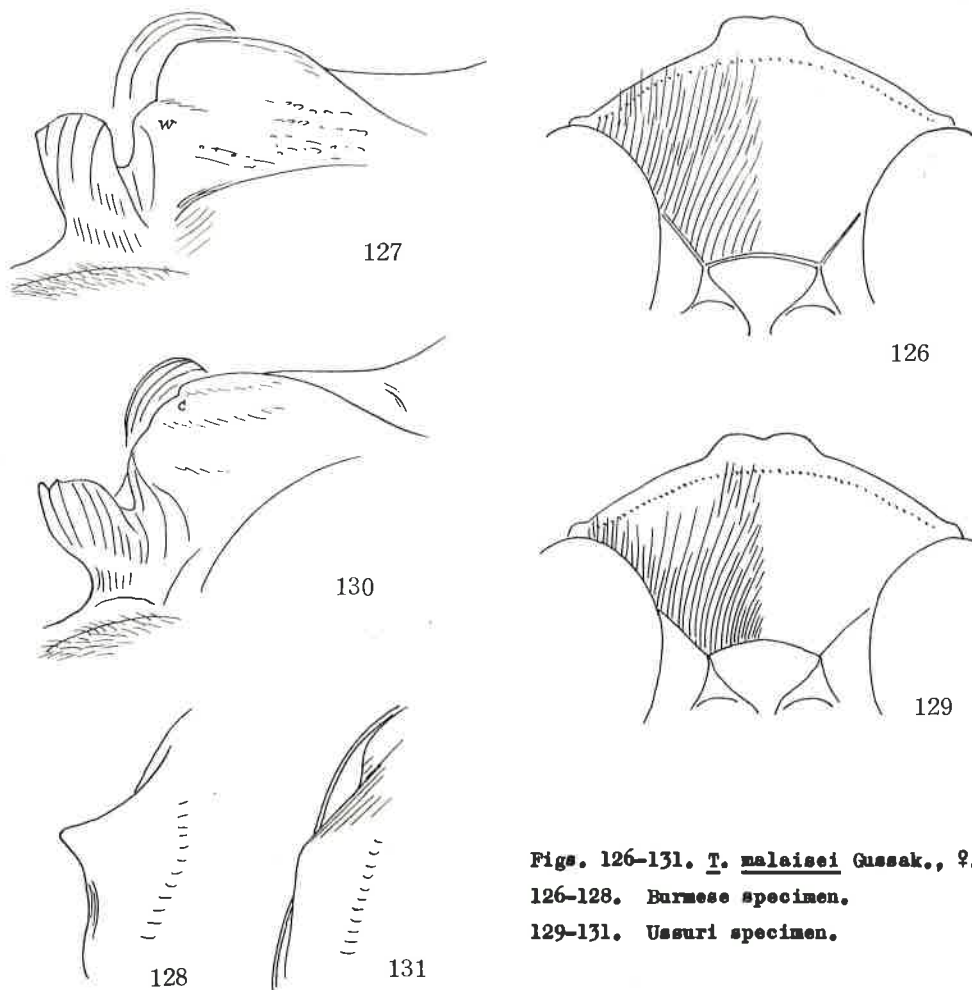
in the Ussuri (Vladivostock) specimen (typical), while in the Japanese representatives punctures on the scutum finer and weaker, and in the Korean specimens quite intermediate in this respect. The surface of the scutum is without plumbeous shine in the Burmese, while in the Japanese it shows strong plumbeous shine and in the specimens from Korea and the Ussuri region the shine is intermediate.

The gaster of the Burmese specimen is from apical swelling of G1 to G4, except posterior black mark of tergite 4, reddish yellow, in the Ussuri specimen from apical swelling of G1 to G3 red, but G3 is broadly black beneath and carrying a large black mark posteriorly above. In the Japanese ones considerably variable in the extension of red on G2-4.

Clypeus in the Burmese specimen; Fig. 126, in the Ussuri specimen; Fig. 129. In the former medio-apical prominence is narrower than in the latter, as well as in those of Japan and Korea and the apical reflection is much weaker in the Burmese one than in the others.

SAT in the Burmese specimen at medio-apical inclined area much more strongly carinated in middle than in the others compared in which the carina is lacking or very weak if present. SAT-ASR in dorso-lateral view to see through PAF; Fig. 127 in Burmese specimen, Fig. 130 in Ussuri specimen. In Vladivo specimen SAT at medio-apical top area with narrow collidor (Fig. 130, C), while in Burmese without such, but with side elevations like wings of nose (Fig. 127, W). Curvature in dorsum of ASR is also different between them (Figs. 127, 130).

Pronotal lamina is markedly different in form between them, in the Burmese: Fig.



Figs. 126-131. *T. malaisei* Gussak., ♀.

126-128. Burmese specimen.

129-131. Ussuri specimen.

128, strongly toothed, in the Ussuri; Fig. 131, not toothed.

RC=M in the Burmese specimen also, but somewhat retreated to C as compared with the Ussuri specimen, RI short in both, but in the latter reaching very close to wing apex, while in the Burmese not so close; further, length ratio of CV1:CV2 is considerably different between them (see measurements).

Measurements (within parenthesis Ussuri specimen):

HW, HL, IODv, A3, P=100, 47, 31, 24, 130 (100, 50, 30, 24, 128). IODs=10:9 (10:8.5). OOD, Od, POD=1, 1, 1 (6, 7, 6). A3=AW×4 (AW×4). A3, 4, 5=10, 7, 6.5 (10, 6.5, 6). P, Ma, Mi, 2(Ma), 3(Ma)=100, 22, 8, 34(26), 44(38) (100, 22, 8, 38(30), 46(40)). RC and RI as above mentioned. CV1=CV2×4.8 (CV2×6.2). TCV:CV2=9:7 (8:5). TCV nearly straight, angle about 110° (120°).

According to the comparison above given the differences between the Ussuri and the Japanese or Korean specimens are only slight, but those between the typical and the Burmese specimens are considerable and seem to be worthy of separation of them at the subspecies rank:

Trypoxylon malaisei arakanum ssp. nov.

Holotype: ♀, the Burmese specimen above given.

On the other hand, the present species closely resembles also T. orientale Cameron in the structure of SAT-ASR, in the form of apical margin of clypeus and in IODs, but in orientale punctures on mesoscutum are finer and much sparser, lateral furrows of area dorsalis very weak and red colour of gaster much narrower in extension and often completely disappeared.

19. TRYPHOXYLON SALWEEN SP. NOV.

♀. In my key to the Indo-Malayan species the present species runs to triplet 116 and runs out, since in this species fore tibia ferruginous only on basal 2/3 of inner side. If dare follow the second route it goes to langkawiense, but inconsistent with this in many distinctions and if follow the third route it goes to couplet 129 including orientale Cameron and goes out.

Certainly, the present species is close to orientale, but differs from this in that IODs=10:8, punctures on mesoscutum much stronger and closer, gaster medianly more distinctly reddish yellow and fore tibia and T5 both partly ferruginous.

The present species is also very similar to malaisei, but can easily distinguished from this species by the colour of the fore tibia. Further, in the present species mesoscutum with strong plumbeous shine, and pronotum more finely and more feebly punctured. The male is also closely resembles that of malaisei, but differs from this, besides the colour of fore leg, in the relative length of ultimate antennal joint.

Diagnosis. ♀ 13-14 mm, ♂ 10-11mm. Black, fore tibia on inner side largely ferruginous, G1 flask-shaped, in ♀ G2-3 at least largely red, mesoscutum without micro-sculpture, propodeum with lateral carinae, area dorsalis with weak lateral furrows, often the furrow indistinct, IODs=10:8 (♀), 10:7.5 (♂), A3=AW×4 (♀), ×1.8 (♂), A13 slightly less than A9-12, SAT low broad nasiform (or moderately high tuberiform), medianly carinate, verge to PAF edged, PAF deep, flat-bottomed, clypeus with medio-apical prominence, its margin gently emarginate or truncate (♂), RC=C-M.

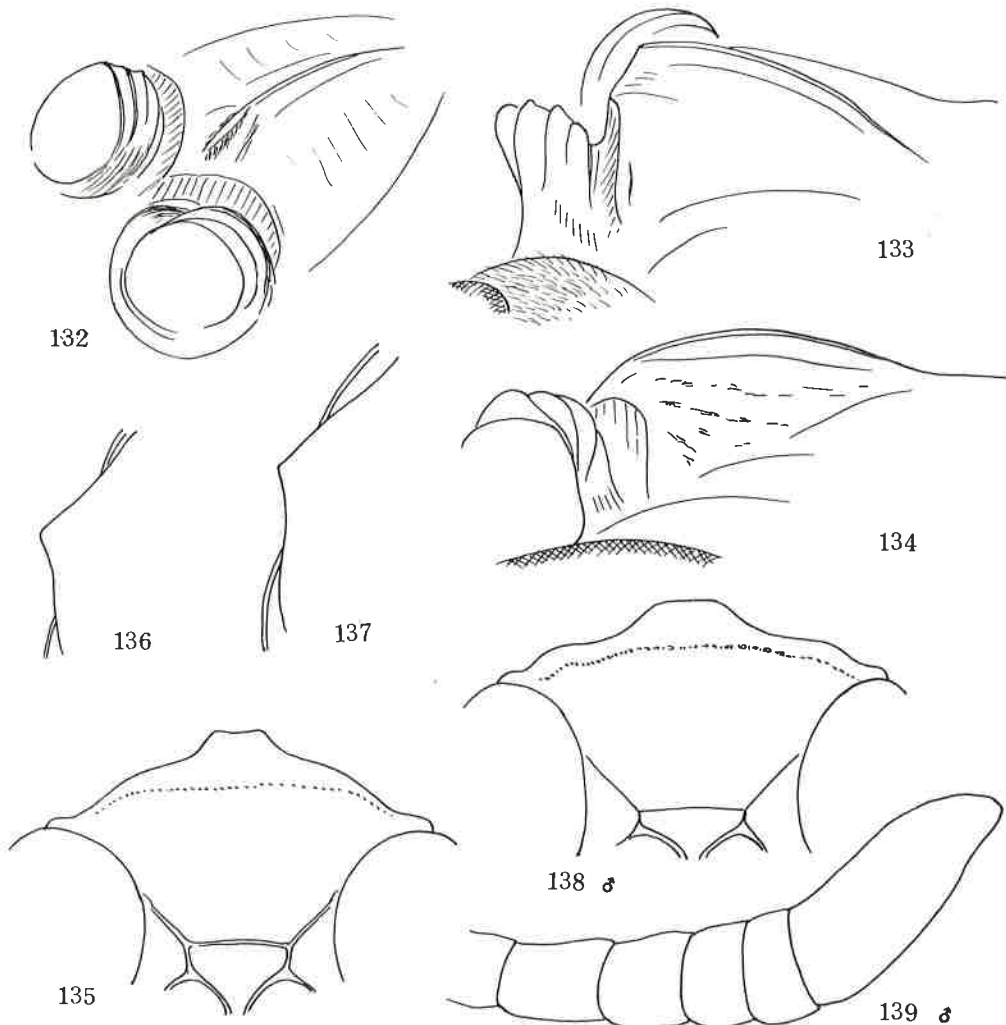
♀, 13-14 mm. Black; mandible ferruginous, at base black, palpi pale brown, apically paler and basally darker, tegula translucent brown, basal plates of wing dark brown, costa, subcosta and stigma of wing black, other veins dark brown. Gaster from apical swelling of G1 to base of G4 reddish yellow, sometimes with black marks above; fore tibia at base and on inner side except apical third, fore T5 largely and all tibial spurs ferruginous, T5 of all other legs also pale brown. Hair on clypeus silvery, comparatively long, appressed and sparsely mixed with longer half erect hairs, at base in middle convergent towards medial line; hair on other part of body as in malaisei, comparatively long, but not dense.

Head in frontal view wider than long, W:L=100:83, with lateral margins roundly, strongly convergent towards clypeus, vertex slightly depressed, tops of hind ocelli level with tops of eyes, eye incision comparatively broad, gently narrowed towards round sinus.

HW, HL, IODv, A3, P=100, 48, 32, 23, 155. IODs=10:8. OOD, Od, POD=4, 5, 4. A3=AW×4. A3, 4, 5=10, 7, 6.5. P, Ma, Mi, 2(Ma), 3(Ma)=100, 19, 7, 32(28), 32(37). RC=C, but close to M, RI not long, slightly less than half TCV, not reaching close to wing apex, CV1≠CV2×5.

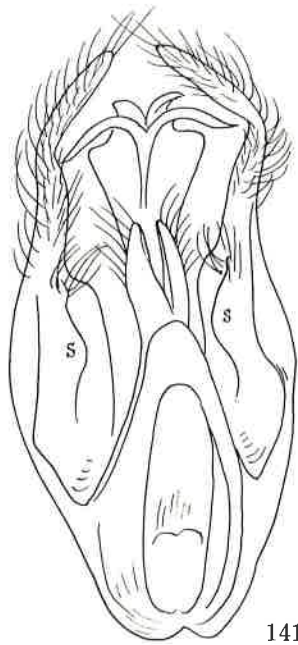
TCV:CV2#5:4, angle about 120°.

Frons moderately roundly elevated on both sides of medial furrow, the furrow wide and fairly deep, SAT moderately high, with outline roughly round and medianly long and distinctly carinated, lateral inclinations oblique and flat, medio-apical area subtriangularly, nearly flattened and inclined to IAA, usually carrying a medial carina the carina variable in strength, at verge to IAA and PAF distinctly edged (often verge to PAF weakly carinated), thence steeply inclined to IAA and PAF (Fig. 132, in oblique ventro-lateral view), ASR raised high, but not reaching top level of SAT, in all the specimens tricarinate on top, PAF deep, flat-bottomed, in dorso-lateral view to see through it: Fig. 133, the structure in lateral view: Fig. 134; clypeus: Fig. 135, disc at base gently roundly elevated and apically weakly reflected, not tectate; occipital carina complete, but low and feeble behind buccal cavity. Pronotum gently and roundly, sometimes subtriangularly raised, medial tubercle sometimes weakly defined, sometimes completely absent, in dorsal view anterior part narrow-ridge-like, weakly widened laterally, posterior part discoloured, brown (not yellowish), about twice the length of anterior part, lamina on side triangularly produced, with apex acutely angled (Figs. 136, 137). Subalar area of mesopleuron with outer margin thoroughly edged, the edge acuter posteriorly, but not expanded laterally to form pent-roof. Propodeum with a basal elevation, a transverse round ridge, in middle about a third the length of postscutellum, lateral carinae of dorsal aspect distinct, originating at

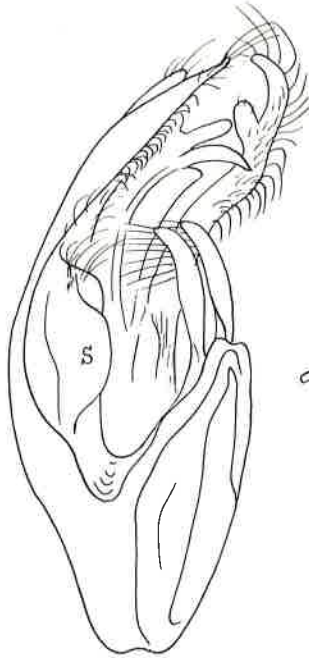


postero-ventral corner of spiracle, gently curved in lateral view and ending at transverse arcuate carina that margins the posterior depressed area of the side of the segment, lateral furrows of area dorsalis weak and, moreover, disturbed with punctures and rugae and sometimes indistinct, area apicalis distinctly margined with carinae, GSR highly and roundly raised, in lateral view apical area reflected.

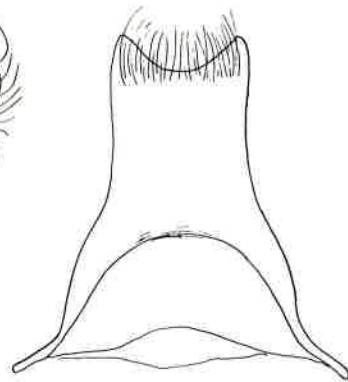
Frons strongly microcoriaceous and sparsely superimposed with comparatively large punctures, punctures partly transversely contiguous to the adjacent ones, forming puncture lines; mesoscutum without microsculpture, punctures slightly smaller than those on frons, but strong, on antero-lateral area in front of parapsidal suture PIS≠PD, on median area and posteriorly punctures slightly smaller, with PIS wider. Area dorsalis at baso-lateral areas obliquely, on median furrow and postero-laterally transversely,



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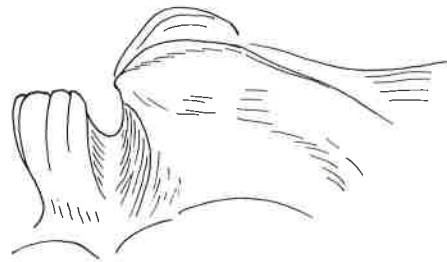
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Figs. 140-143.

T. salveen sp. nov., ♂



143



144

Fig. 144. *T. orientale* Cameren, ♀

strongly and somewhat rugosely striate, at base in middle coarsely crenate, on the rest of the disc strongly, irregularly punctured, in some specimens disc is largely covered with arcuate rugae and mixed with punctures; lateral series of suriae strong and distinct, posteriorly closer, extending inwards on to disc of posterior inclination in front of area apicalis, within this area surface smooth and polished, sides smooth and shining, only on posterior area that is margined anteriorly with transverse carina strongly and closely rugose-striate.

♂. Generally similar to ♀, but gaster completely black; in frontal view HW:HL=100:82, with sides more rounded and less strongly convergent below than in ♀, eye incision wider and apparently shallower; head in dorsal view with temples flat and more strongly convergent posteriorly than in ♀.

HW,HL,IODv,A3,Al3,P=100,48,36,16,27,140. IODs=10:7 - 10:7.5. OOD,Od,POD=10,9,9. A3=AW×1.8. A3,4,5=10,8,7.5. Al3=BW×2.4 and slightly less than A9-12. P,Ma,Mi,2(Ma),3(Ma)=100,21,7,30(34),30(42). Venation generally similar.

Clypeus: Fig. 138, Al3: Fig. 139. In the structure of occipital carina, pronotum, its lamina, subalar area and propodeum (including structure and punctuation of area dorsalis and area apicalis).

Sternite 8: Fig. 140. Genitalia seen from beneath (somewhat from left side): Fig. 141, obliquely from left side; Fig. 142, apical half seen vertically from dorsal side: 143. Paramere pale ferruginous in colour, outer margin of main body dark brown, it is slenderer than usual and slenderly extended towards apex, apex deeply bifid, but bifurcate structure can not be seen in ventral view (Fig. 141), but well visible in dorso-vertical view (Fig. 142 - apical half curved ventrally and sparsely covered with long ferruginous hair), main body of paramere hollowed as usual, but here provided with a longitudinal, thin and roundly expanded septum (S in Figs. 141, 142), carrying a few long hairs at apical end; volsella not spatulate in form, thick, dark brown in colour and apical part fringed with long hair. Penis valve bearing half developed shoulder (in vertical view - Fig. 143 - not roundly elevated, but obliquely inclined sideway) and very long, well developed sickle-shaped appendages (Fig. 143), the combination is very characteristic.

In punctuation and sculpture generally as in ♀.

Holotype: ♀, N. E. Burma, Kambaiti, 2000 m, 28. V. 1934, R. Malaise (handwritten) (RMS).

Paratypes: 4 ♂, same locality, 10*, 15,17,28. V. 1934, R. Malaise; 1 ♀, same loco. 4. VI. 1934, R. Malaise (data labels are all pressed) (RMS).

Other specimens: 1 ♂, same loco, 24. V. 1934 (left antenna from A5 apically and right from A4 apically lacking); 1 ♀, do., 10. IV. 1934 (both antennae completely lost); 1 ♀, same loco, 24. V. 1934 (left antenna completely and gaster completely lacking), all leg. by R. Malaise (RMS).

* In this specimen G6-7 are separated, dissected and mounted on a card point with genitalia and sternite 8.

Remarks. Each of the specimens above listed, except one male, is attached with a name label "Trypoxylon rejector Smith" identified by V. Gussakovskij in 1940. However, T. rejector Smith is a phantasmic species. The type is lost and the description is incomplete. Even when strictly followed (in colour and size) several different species can be included within the category of the description. If slight variations in body size and in colour of mandible are taken into consideration over 10 species known from India can be identified with this species. Moreover, the sex determination of Smith is frequently incorrect and the sex (♀) of rejector is quite doubtful.

Taking into account the facts above mentioned I provisionally determined in Pt. II of the present paper that T. rejector is a male of a certain form of T. petiolatum Smith (at that times called bicolor), because this is a common and an easily collectable species. In order to retain the name "rejector" there is no other way than to designate a neotype with one of the corresponding species, but such seems to be unnecessary, since this name is not so important.

The present specimens that were identified by Gussakovskij with T. rejector are different from the description of this species at least in the colour of the mandible and fore tibia and in the length of the body.

20. TRYPXYLON ORIENTALE CAMERON, 1904

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

sia Hills).

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

Trypoxylon orientale: Tsuneki, Ibid., 9: 128, 1979 (♀, descr. ♂, figs.).

Trypoxylon orientale: Tsuneki, Ibid., 11: 56, 1979 (♀ ♂, Java, 2 spp.).

Specimens examined:

1 ♀, N. E. Burma, Kambaiti, 2000 m, 10. V. 1934, R. Malaise (RMS); 1 ♀, N. E. Burma, Sadon, 1200 m, 28. VI. - 5. VII. 1934, R. Malaise (RMS); 1 ♀, Sikkim, 200 m, Valley at Tista Bridge, 8-15. XII. 1934, R. Malaise (RMS).

Remarks. In all the specimens the gastral red is confined to bases of G2 and 3, as most usually the case in this species (in one of them gaster has been dropped off, but easily be judged to be of this species). The form of clypeus is very similar to that of malaisei from Vladivostok, but IODc is relatively somewhat smaller (when utmost width of clypeus - between lateral angles - is 70 IODc is 34, in malaisei 37-38), the form of medio-apical prominence more or less variable, usually with a median minute emargination, but sometimes without emargination. SAT-ASR is generally similar to that of the compared species, but SAT is at medio-apical inclination triangularly flattened (but not smooth and without hollow), in dorso-lateral view; Fig. 144.

Gussakovskij considered the specimens to belong to an undescribed species.

This species can be distinguished from the closely allied other species by the very fine and sparse punctures on mesoscutum and the wholly black fore-tibia.

21. TRYPOXYLON BUM SP. NOV.

In the present species the head and the thorax-complex are very characteristic and there is no doubt that it belongs to an undescribed species.

Similar to orientale Cameron, but can be separated easily from it by the differences in the form of clypeus, in the punctuation of frons in the structure of SAT-ASR and of area dorsalis.

Diagnosis. ♀, 12 mm or so. Black; fore tibia at base in front narrowly ferruginous, gaster medianly red, G1 flask-shaped, mesoscutum shining without microsculpture, weakly and sparsely punctured, frons without microsculpture, closely punctured, propodeum with distinct lateral carinae, area dorsalis enclosed with distinct furrow, IODs=10:9, A3=AW 5, clypeus: Fig. 150, SAT-ASR: Figs. 145-149.

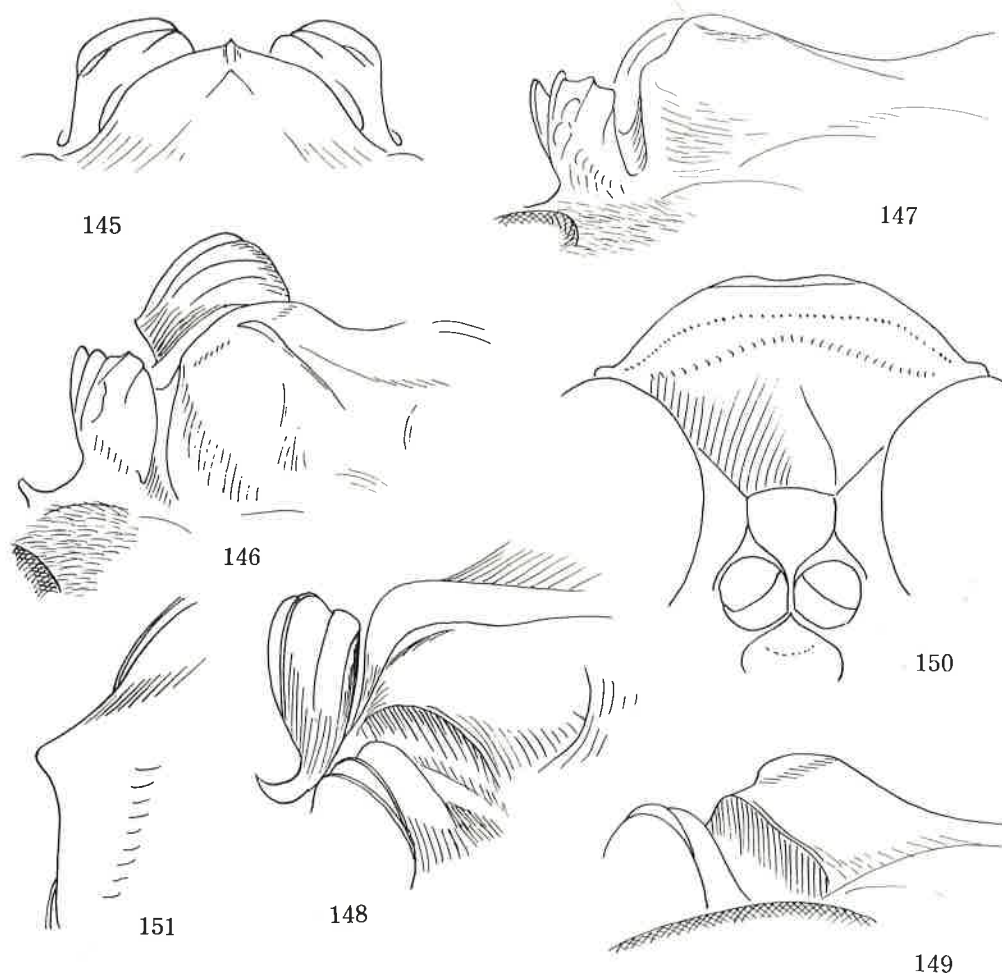
Black and shining, mandible ferruginous, at extreme base black and at apical area shining brown, palpi ochre yellow, gaster from middle of apical swelling of G1 to G3 red, G3 on posterior half black above, tibial spurs pale brown, in some light appearing ferruginous, rest of fore tibia and tarsus strongly brownish; hair on clypeus silvery, on sides of thorax sparse and long, also silvery.

In frontal view HW:HL=100:85, sides strongly rounded, almost not narrowed below, vertex slightly depressed, tops of hind ocelli slightly below level of tops of eyes, eye incision moderate in width and narrowed towards bottom, dorsal margin horizontal.

HW, HL, IODv, A3, P=100, 50, 23, 26, 154. IODs=10:9. OOD, Od, POD=2, 7, 4. A3=AW×4.7. A3:IODc=10:7.5. A3, 4, 5=10, 7, 6. P, Ma, M1, 2(Ma), 3(Ma)=100, 22, 7, 34(28), 35(38). RC=M. Rl short, about a third the length of TCV, CV1=CV2×5.5. TCV:CV2=5:3, angle about 110°.

Frontal furrow fairly deep, from just below fore ocellus markedly enlarged, with sides oblique and flat, roughly quadrate in outline, with lateral angles at tops of lateral elevations, with lower angle at base of SAT, SAT low broad short nasiform, almost tuberiform, dorsal aspect medianly thickly and shortly carinate, surface anteriorly broadly flattened, with apical margin transversely rounded and at verge to PAF acutely edged, thence perpendicularly falling to PAF, ASR highly raised, with dorsum quadricarinate, apical two of the carinae especially high, PAF deep, U-shaped in cross section. The structure in dorsal view: Fig. 145, in obliquely dorso-lateral: Fig. 146, in dorso-lateral: Fig. 147, in oblique lateral: Fig. 148, in lateral: Fig. 149. IAA medianly finely and highly carinate from medio-apical part of SAT to top of supraclypeal area. Clypeus: Fig. 150, disc at base moderately and roundly elevated, apically fairly strongly reflected, reflected area glabrous and shining. Occipital carina complete, not depressed nor incised behind buccal cavity. Anterior part of pronotal collar comparatively thick, almost as long in middle as posterior part and widened toward sides, sides roundly swollen, lamina on side: Fig. 151. Subalar area of mesopleuron normal, only postero-lateral margin edged, slightly thinly produced and connects with mesopleural flange; propodeum with basal transverse elevation narrow ridge-like, not conspicuous, lateral carinae strong, in lateral view up-curved, originating some-

what behind spiracle, but ending far before lateral carina of area apicalis which is long, curved inwards, but at dorsal middle of the area interrupted by the apex of median furrow of posterior inclination, GSR roundly, highly elevated, but not curved posteriorly in lateral view, sides at posteriormost area deeply excavated.



Figs. 145-151. *Trypoxylon bum* sp. nov., ♀

Frons without microsculpture, without plumbeous shine, surface well shining (but under 50 magnification microsculpture faintly observed), punctures comparatively large and fairly close, PIS≠PD; mesoscutum smooth, but with plumbeous shine, finely, sparsely punctured, on lateral areas punctures slightly larger and stronger, but sparse, mesopleuron finely and sparsely punctured, on epimeral area almost without puncture; area dorsalis at base smooth, on median and lateral furrows transversely strongly and closely striate, disc very finely, sparsely punctured, series of striae along lateral carinae strong and coarse, posterior inclination posteriorly in front of area apicalis transversely, arcuately striate, median furrow also striate, sides smooth and polished, on dorsal half finely and sparsely punctured and in front of posterior rounded hollow transversely coarsely striate, inside of the hollow polished.

♂, unknown.

Holotype: ♀, N. E. Burma, Kambaiti, 2000 m, 17. VI. 1934, R. Malaise (RMS).

KEY TO THE BURMESE SPECIES

(treated in this section)

- | | | |
|----|---|--------|
| 1 | Frons with shield-shaped enclosure (enclosure complete, upper area above lateral angles nearly semicircular, lower area below lateral angles triangular, both subequal in length to each other, lower carinae upcurved near lateral angles), 7-13 mm | |
| - | Frons without shield-shaped enclosure | 2 |
| 2 | G1 clavate, gradually widening apically, less than, at most as long as, G2+3 (sometimes G1 subflask-shaped, bearing subparallel-sided area before apical swelling, but swelling itself is gradual) | 3 |
| - | G1 flask-shaped, longer than, at least as long as, G2+3 | 15 |
| 3 | Mesoscutum without microsculpture | (none) |
| - | Mesoscutum microcoriaceous and superimposed with punctures (hair silvery) | 4 |
| 4 | Propodeum without lateral carinae | (none) |
| - | Propodeum with lateral carinae | 5 |
| 5 | G2 and 3 each with a fovea at apex in middle (gaster slender, G1≠AW×6, head thick, subcubic, pronotum well developed, IODs=3:1, SAT flat, roundly produced between antennal bases, apical margin of clypeus bluntly quadridentate, median two more advanced; legs except fore tibia and tarsus black), about 10 mm | |
| - | G2 and 3 without fovea | 6 |
| 6 | Gaster at least largely ferruginous (area dorsalis enclosed with furrow) | 7 |
| - | Gaster black | 13 |
| 7 | ♀ | 8 |
| - | ♂ | 12 |
| 8 | G1 more or less dusky above, G2, 3 and 4 also with a dusky patch (trochanters largely ferruginous, fore and mid legs broadly pale brown, IODs≠3:2, clypeus with apical margin medianly recurved and weakly incised in middle, SAT high nasiform, anteriorly transversely carinated, A3≠AW×4), 12-14 mm | |
| - | G1 completely ferruginous, if partly dusky G2, 3 and 4 without blackish patches | 9 |
| 9 | IODs=2:1 | 10 |
| - | IODs=5:4 - 3:2 | 11 |
| 10 | Frons with shallow median furrow, clypeus triangular, medianly minutely produced and incised in middle (A1-3 and fore and mid legs, except coxae) ferruginous, SAT low broad nasiform, anteriorly transversely carinate, not deeply excavated at antero-lateral area behind transverse carina), 9 mm | |
| - | Frons flat, apical margin of clypeus more broadly bidentate - Fig. 67 - (A1-2 above and 3 largely black; fore and mid femora broadly pale castaneous, SAT high narrow nasiform, anteriorly transversely carinated and deeply excavated at antero-lateral area behind the transverse carina), 12 mm | |
| 11 | Fore and mid trochanters and femora black, A3=AW 2, clypeus triangularly produced and incised in middle (IODs≠5:4, SAT low tuberiform, shortly carinated in middle), about 10 mm | |
| - | Fore and mid trochanters and femora largely pale brown, A3≠AW×3, clypeus medianly produced and recurved in middle (IODs≠3:2, SAT low nasiform, long carinated in middle, apical margin also transversely carinate) | |
| 12 | A13=A9-12, A6 not excavated at base beneath (SAT as in ♀, area dorsalis transversely striate on median furrow), about 10 mm | |
| - | A13 distinctly shorter than A10-12, A6 markedly excavated at base beneath, (SAT nasiform, long carinated in middle, apical margin without transverse carina, PAF shallow, up-curved, area dorsalis longitudinally, somewhat obliquely striate), 8 mm | |
| 13 | SAT high narrow nasiform, anteriorly transversely highly carinated and sides of SAT just behind the carina deeply excavated, IODs≠5:4 (mesoscutum sparsely, but very distinctly superimposed with large punctures, clypeus triangularly produced and bidentate in middle, in ♂ A13≠A10-12, strongly curved, legs com- | |

- pletely black), ♀ 9-10 mm, ♂ 8 mm fronticorne burmanicum ssp. nov.
- SAT rather low broad nasiform, lateral inclination oblique, apically with a weak transverse carina, sides not hollowed behind the carina, IODs=2:1 (mesoscutum more finely and more closely punctured, punctures not conspicuous, clypeus produced and medianly incised, fore leg partly pale brown, Gl subflask-shaped) 14
- 14 Apical margin of clypeus: Fig. 98, $A_3=AW \times 3$, IODs=5:3 (fore tibia in front narrowly ferruginous, fore tarsus largely dark brown), 9-10 mm
malaisellum sp. nov., ♀
- Apical margin of clypeus: Fig. 100, $A_3 \approx AW \times 2.5$, IODs=2:1 (fore tibia and tarsus largely pale brown), 7-9 mm
darjeeling Tsuneki, 1980, ♀
(= brevicarinatum Tsuneki, 1979, nec Cameron, 1912)
- 15 Propodeum without lateral carinae (all tibiae at base - in fore tibia also in front - and fore and mid tarsi largely ferruginous to yellowish white, gaster medianly red, IODs=3:2, PAF moderately deep, up-curved, pronotal lamina triangular, not toothed, lateral furrows of area dorsalis indistinct, mesoscutum sparsely, weakly punctured, antennal flagellum ferruginous beneath), 12-15 mm
petiolatum Smith, 1856, ♀
- Propodeum with lateral carinae 16
- 16 Gaster with more or less reddish area 17
- Gaster completely black (at most medianly with brownish area beneath) 26
- 17 Subalar area with well developed pent-roof structure, Gl largely ferruginous, mesoscutum under 30 magnification microcoriaceous and superimposed with comparatively large close punctures (IODs=1:1, Al-2, G2-3, fore leg largely, mid leg medianly and hind tibia at base ferruginous, PAF deep, flat-bottomed), 13 mm
kachin sp. nov., ♀
- Subalar area without well-developed pent-roof structure, Gl largely or completely black, mesoscutum without microsculpture 18
- 18 Gaster from G2 apically completely ferruginous or brown, apical margin of clypeus truncate and waved (IODs=2:1, Al-3 and fore and mid legs broadly, hind trochanter wholly ferruginous, SAT high nasiform, PAF deep, flat-bottomed, oval in cross section, area dorsalis enclosed with distinct furrow, mesoscutum very finely and very sparsely punctured), 12 mm
nifrifemur Tsuneki, 1979 ♀
- Gaster only medianly red, sometimes black maculated above, apical margin of clypeus different 19
- 19 ♂ ($A_3=AB-12$) 20
- ♀ 21
- 20 Mid tarsus largely ferruginous or pale brown, $A_3=AW \times 2.7$, IODs=10:7 (median furrow of area dorsalis transversely striate, mid and hind tibiae at base ferruginous, G2 and 3 often largely black, and brown beneath), 8-10 mm
errans Saussure, 1867
- Mid tarsus dark brown, $A_3=AW \times 2$, IODs=10:8 (area dorsalis without distinct striae, mid and hind tibiae black or dark brown, G2-3 red, black marked above) about 9 mm
myitkyinae sp. nov.
- 21 Legs broadly ferruginous or whitish 22
- Legs black, at most apically brownish 23
- 22 Trochanters largely ferruginous, IODs=2:1, mesoscutum distinctly punctured (furrows of area dorsalis transversely striate, SAT without fovea at medio-apical area, ASR not reflected), 10-11 mm
errans Saussure, 1867
- Trochanters black, IODs=3:2, mesoscutum weakly indistinctly punctured (area dorsalis without strong striae, SAT with a fovea on medio-apical flat area, ASR with hind carina strongly reflected), 13-14 mm
shanshan sp. nov.
- 23 HW:IODc=3:1, punctures on mesoscutum distinct and close, $A_3 \approx AW \times 4$, IODs=5:4, clypeus medianly produced, area apicalis complete 24
- HW:IODc=4:1 or less, punctures on mesoscutum weak and sparse, $A_3 \approx AW \times 5$, IODs=1:1 25
- 24 Fore tibia and tarsus black, frons anteriorly nearly flat, area dorsalis enclosed with furrow (area apicalis without median longitudinal carina, IODs=10:8.5 or 10:9, sides of propodeum except femoral sinus strongly, fairly closely punctured, RC=M), 13-16 mm
malaise arakanum ssp. nov.
- Fore tibia in front broadly ferruginous, fore tarsus often partly pale brown, frontal median furrow fairly deep and distinct, lateral furrows of area dorsalis shallow and weak, disturbed with punctures and striae, rather

- indistinct (area apicalis with distinct medial carina or septum, dividing the area into two deep hollows, IODs=10:8, sides of propodeum almost completely smooth and polished, RC=C), ♀ 13-14 mm salween sp. nov.
- 25 Frons nearly flat, distinctly microcoriaceous and mat, apical margin of clypeus medianly produced, lateral furrows of area dorsalis shallow and indistinct (fore tibia black, SAT moderate high, thick nasiform, medio-apical inclined area triangularly flattened, IODs=10:10, G1 markedly slender and long, =AW 6-7, G2, 3, 4 often only partly brown or reddish beneath), 13-16 mm orientale Cameron, 1904
- Frontal furrow deep, anteriorly widely enlarged into shallow hollow, surface without microsculpture, shining, apical margin of clypeus rounded and emarginate in middle, lateral furrows of area dorsalis deep and distinct (fore tibia at base narrowly ferruginous, SAT low broad tuberiform, shortly carinated in middle, apical margin rounded and acutely edged, IODs=10:9), 15 mm bun sp. nov.
- 26 ♀ (not known)
- ♂ (malaisellum, darjeeling and bun may be included within this category, but not as yet be known) 27
- 27 Fore tibia in front partly ferruginous (IODs=10:7.5, A3=AW 1.7, A13=A10-12, area apicalis with median carina, apical margin of clypeus medianly produced, frontal furrow present, shallower and wider anteriorly, mesoscutum distinctly, somewhat sparsely punctured, area dorsalis enclosed with furrow, SAT low broad nasiform, nearly tuberiform, PAF deep, flat-bottomed, U-shaped in cross section, tibial spurs somewhat greyish), about 10 mm salween sp. nov.
- Fore tibia black (area apicalis without median carina) 28
- 28 A3=AW 2.5, IODs=10:9-9.5 (A13=A10-12, clypeus, area dorsalis, mesoscutum, SAT-ASR similar to those of salween), 10-12 mm orientale Cameron, 1904*
- A3=AW 1.8, IODs=10:8 (A13, clypeus, area dorsalis, mesoscutum, SAT-ASR etc. similar to the above) malaisei Gussakovskij, 1932**

* With Nepalese specimen.
 ** With Japanese specimen.

4. SPECIMENS FROM BORNEO AND CELEBES

The specimens dealt with in this section are mostly the recently collected ones and the possession mainly of British Museum (Natural History). They belong to the following eight species, of which the male of T. ornatigaster is the first record of the sex: Trypoxylon schmiedeknechti Kohl, T. maculiventre Tsuneki, T. singaporense Tsuneki, T. coloratum Smith, T. sandakanum Tsuneki, T. ornatigaster Tsuneki, T. striolatum Tsuneki and T. petiolatum Smith.

1. TRYPOXYLON SCHMIEDEKNECHTI KOHL, 1906

Trypoxylon schmiedeknechti: Tsuneki, the present paper, pp. 2, 21 and 33.

Specimens examined:

2 ♀, Brunei, Seria, Coastal scrub, VIII - IX. 1979, I. Gauld (BMNH); 1 ♂, Brunei, Seri Begawan, Mangrove, 10 m, IX. 1979, I. Gauld (BMNH).

2. TRYPOXYLON MACULIVENTRE TSUNEKI, 1979

Trypoxylon maculiventre Tsuneki, SPJHA, 9: 73 (♀ ♂, Malaya, Singapore, Laos - ssp.)
Trypoxylon maculiventre: Tsuneki, Ibid., 12: 44 (♀, Sarawak).

Specimen examined:

1 ♀, Sarawak, 4th Div., Gn. Mulu, BGS Exp., 17. IX. -23. X. 1977, D. Hollis (BMNH).

3. TRYPOXYLON SINGAPORENSE TSUNEKI, 1979

Trypoxylon singaporense Tsuneki, SPJHA, 9: 29, 1979 (♂, Singapore).
Trypoxylon singaporense: Tsuneki, Ibid., 12: 19, 1980 (♂ ♀, Borneo).

Specimen examined:

1 ♂, Sarawak, 4th Div., Niah, 3°49'N, 113°46'E, 9-17. X. 1976, P. S. Cranston (BMNH).

Remarks. In this specimen mesoscutum finely and somewhat sparsely punctured, with interspaces fairly distinctly microcoriaceous. Sternite 6, besides the basal pair of oblique tuft of long, curved and yellowish hair, densely fringed with also long yellowish hair which is, seen from apex, appearing a dense tuft at each side of apical margin of the segment.

4. TRYPOXYLON COLORATUM SMITH, 1957

Trypoxylon coloratum: Tsuneki, SPJHA, 12: 61, 1980 (list of ref., ♀ ♂, Borneo).

Specimen examined:

1 ♂, Brunei, Bk. Retak, 1600 m, IX. 1979, I. Gauld (BMNH).

Remarks. This species is endemic to Borneo. All the specimens recorded under this species name from other localities are different species. As to the characters of this species see Pt. 3, p. 8 and figs. 22-28 of the present paper.

5. TRYPOXYLON SANDAKANUM TSUNEKI, 1980

Trypoxylon sandakanum Tsuneki, SPJHA, 12: 35, 1980 (♀, Borneo).

Specimen examined:

1 ♀, Brunei, Labi, Mixed dipterocarp forest, 200 m, VIII. - IX. 1979, I. Gauld (BMNH).

6. TRYPOXYLON ORNATIGASTER TSUNEKI, 1979

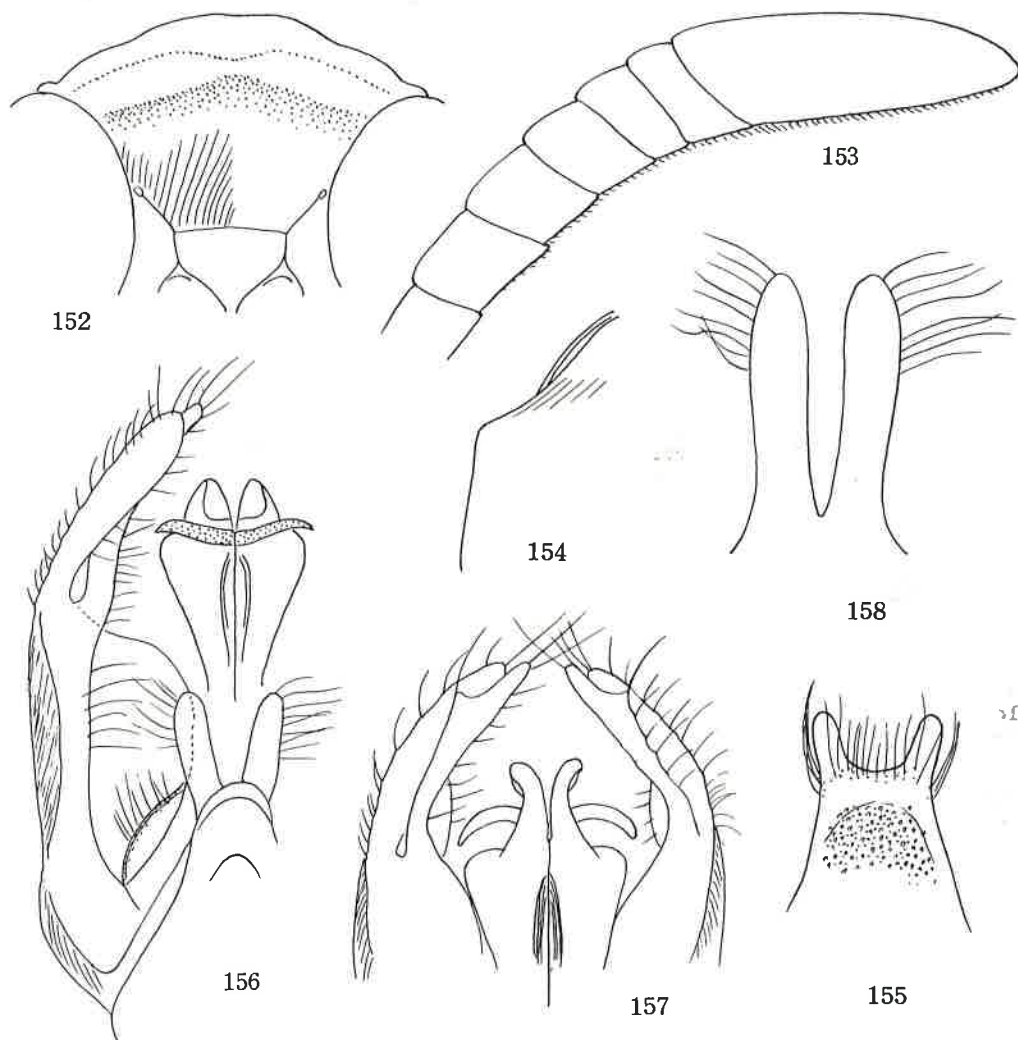
Trypoxylon ornatigaster Tsuneki, SPJHA, 9: 105, 1979 (♀, Malaya).

Trypoxylon ornatigaster: Tsuneki, Ibid., 11: 50, 1979 (♀, Sumatra).

Trypoxylon ornatigaster: Tsuneki, Ibid., 12: 56, 1980 (♀, Borneo).

Specimen examined:

1 ♂, Brunei, Labi, mixed dipterocarp forest, 200 m, VIII.-IX. 1979, I. Gauld (BMNH).



Figs. 152-158. Trypoxylon ornatigaster Tsuneki, ♂

This is the first record of the male of the present species.

♂, about 11mm. Black; opaque whitish yellow are A1-2 except blackish marks above, (A3 brown beneath), apical marginal area of clypeus (extreme margin brownish), mandible except dark brown apical area, palpi, posterior part of collar (rather amber yellow), greater part of tubercle, tegula (semitransparent), basal plates of wing largely, apical sides of G1, G2 and 3, both at base and apex and on sides narrowly, discoloured apical margin of tergites and sternites 4-6 (translucent), apices of all coxae, fore and mid trochanters except blackish mark above, hind trochanter at base and apex, fore and mid femora except a large black mark on each above, hind femur on both ends, fore and mid tibiae and tarsus completely except arolia, hind tibia except a wide dusky ring in middle and all tibial spurs; mid T3 and 4 brown and hind T5 slightly brownish. Hair brassy, on clypeus almost parallel (at base-medial area slightly convergent towards medial line) and on base-lateral areas of propodeum curled.

Head in frontal view wider than long, W:L=100:82, vertex not depressed, eye insertion moderate in width, not deep, but subparallel-sided, dorsal margin only slightly inclined outwards.

HW,HL,IODv,A3,Al3,P=100,45,27,16,31,132. IODs=10:8.5. OOD,Od,POD=3,5,4. A3=AW×2.5. A3,4,5=10,6,6.5. Al3=BW×3 and >A9-12 but <A8-12. P,Ma,Mi,2(Ma),3(Ma)=100,21,8,37(28),42(42). RC=C. Rl short. CV1=CV2×5. TCV:CV2=4:3. TCV gently sinuate, angle roughly about 110°.

Frontal elevation very slight, median furrow shallow but not broad, with shining bottom line which is well defined except anterior area; as a whole, however, frons nearly flat. SAT low long nasiform, long carinated in middle, carina reaching backward about mid point of the distance from antennal base to fore ocellus, ASR moderately expanded anteriorly, tricarinate on dorsum, PAF shallow, bottom line up-curved, general structure of SAT-ASR as in ♀, apical margin weakly recurved and in middle slightly depressed (Fig. 152), disc at base gently, broadly and roundly elevated and thence anteriorly gently roundly tectate, apical reflection very weak; Al3: Fig. 153; occipital carina complete, but low and weak behind buccal cavity. Anterior part of collar in frontal view subtriangularly roundly raised, somewhat swollen in middle, in dorsal view with depressed nape area and posterior part of collar densely covered with brassy hair, lamina on side: Fig. 154; marginal areas of mesoscutum, postscutellum and dorsal and posterior aspect of propodeum densely covered with brassy hair, the hair at area dorsalis curled; subalar area of mesopleuron normal, also fringed with hair on outer margin; lateral carinae of propodeum distinct, lateral furrows of area dorsalis feeble.

Sternite 8: Fig. 155, characteristic is the long apical horns and the sparse fringe of hair. Genitalia in ventral view: Fig. 156 (right paramere omitted), in dorsal (vertically seen) view: Fig. 157, paramere deeply bifid at apex into asymmetric lobes, partly overlapped, inner margin of main body broadly expanded, lamellate, half rolled, with ventro-lower corner fringed with hair, volsella thin, also lamellate and apical outer margin fringed with sparse long hair (Fig. 156, obliquely seen; Fig. 158, vertically seen). Penis valve with well developed shoulder and well developed sickle-shaped appendages (in Figs. 156 and 157).

Frons very minutely microcoriaceous, mat and sparsely superimposed with fine, shallow and flat-bottomed punctures, mesoscutum without microsculpture, shining and moderately closely covered with fine pin-pricked piliferous punctures, punctures on median area and posteriorly sparser; area dorsalis without striae, sparsely covered with hair-bearing punctures, lateral series of striae of the segment indistinct, the corresponding areas posteriorly strongly and closely punctured, sides with a sinuate longitudinal shallow groove, surface above the groove distinctly, fairly closely punctured, below this smooth and polished.

Remarks. The structure of genitalia is considerably similar to those of *fulvo-collare* Cameron (ref. Pt. III, Figs. 392-393), differs in the detailed forms of apical lobes of paramere and especially in the state of the pubescence on the paramere and volsella. Sternite 8 is markedly different in the form at its apex.

7. *TRYPOXYLON STRIOLATUM* TSUNEKI, 1979

Trypoxylon striolatum: Tsuneki, SPJHA, 13: 76, 1980 (list of ref.).

Distribution: Laos, Singapore, Sumatra, Java, Borneo and the Philippines.

Specimens examined: 2 ♀, Brunei, Bk. Retak, 1600 m, IX. 1979, I. Gauld (BMNH);

1 ♀, Brunei, Sega Begawan, Mangrove, 10 m, IX. 1979, I. Gauld (BMNH).

Remarks. In the first listed two female specimens G2 and 3 on sides and beneath only reddish, while in the third specimen from apical 2/3 of apical swelling of G1 to end of G3 completely red and further, G4-6 on sides and beneath also red; clypeus with apical marginal area broadly castaneous brown, A1 and 2 at apices yellowish, fore and mid legs more broadly yellow than usual; fore tibia except a fine streak on posterior side, mid tibia except folded side broadly and both tarsus except arolia yellow, hind tibia on basal half and outer margin yellow, T1, 2, 3 and 5 at each base broadly and T4 wholly ferruginous, basal plates and veins of wings on basal area and stigma strongly yellowish. Besides the colouration, IODc is relatively wider than usual, namely, IODs=10:9 (usually 10:7) and the hair on thorax-complex somewhat brassy. Certainly this specimen is an aberratio, possibly a mutant, of the species.

8. TRYPOXYLON PETIOLATUM SMITH, 1857

Trypoxylon petiolatum: Teuneki, ref. pp. 29 and 45 of the present paper.

Specimens examined:

1 ♀, Brunei, Seria, coastal scrub, VIII. - IX. 1979, I. Gauld (BMNH).

1 ♂, Celebes, Makassar, F. Muir (BMNH).

Remarks. measurements on Brunei female:

Length about 14 mm. HW, HL, IODv, A3, P=100, 50, 26, 25, 165. IODs=10:7.5. OOD, Od, POD=2, 4, 3. A3=AW×5.3. A3, 4, 5=10, 7, 6.5. P, Ma, Mi, 2(Ma), 3(Ma)=100, 18, 5, 27(20), 31(30).

Measurements on Celebes male:

Length about 12 mm. HW, HL, IODv, A3, A13, P=100, 50, 30, 15, 28, 128. IODs=10:8.5. OOD, Od, POD=2, 4, 3. A3=AW×1.8. A3, 4, 5=10, 8, 8. A13=BW×3 and A9-12. P, Ma, Mi, 2(Ma), 3(Ma)=100, 22, 8, 38(29), 42(43).

In this specimen G1 is slightly robuster than usual and the colour of legs is not of black type.

5. A SPECIMEN FROM AUSTRALIA

1. TRYPOXYLON MINDANAONIS TSUNEKI, 1976

Trypoxylon mindanaonis: Tsuneki, SPJHA, 14: 21, 104, 1981 (list of ref., New Guinea and Australia).

Specimen observed:

1 ♀, Queensland, Brisbane, Long Pocket, 1977, I. D. Galloway (BMNH).

On some characters.

G2 at base (above and beneath) brown; apical sides of G1, sides of G2 and 3 and discoloured comparatively broad marginal areas of the tergites yellowish brown; Legs black, but spurs greyish white except longer hind one which is brown; bases of all claws of T5 pale brown, as frequently the case in black-legged species.

HW, HL, IODv, A3, P=100, 50, 29, 22, 168. IODs=10:9.3. OOD, Od, POD=1, 2, 2. A3=AW×3.3. A3, 4, 5=10, 8, 7. P, Ma, Mi, 2(Ma), 3(Ma)=100, 19, 6, 28(22), 30(28). RC=B, somewhat close to C. R1 short, CV1=CV2×3.8. TCV:CV2=10:9. TCV incurved, angle at base about 90°, at apex about 110°. Eye incision comparatively broad and strongly narrowed towards sinus, but dorsal margin horizontal; apical margin of clypeus typical in form, apical angle of SAT in vertical view comparatively broad, broader than 90°.

Microsculpture on mesoscutum distinct, punctures sparse, on anterior area PIS 1-3 times PD, on posterior area 3-5 times PD, but punctures everywhere similar in size.

Remarks. The present species has been known from the Philippines (Mindanao, Basilan - ssp. mindanaonis; Luzon and Busuanga - ssp. fortius), Singapore (ssp. bakerianum), Java (ssp. fortius), Borneo (ssp. Mulu), New Guinea (close to ssp. mulu) and Australia (all from Brisbane).

In my previous paper the Australian specimens were considered to belong to the typical race, having comparatively long antennal joints and black gaster. According to the measurements and observation of the present specimen it is generally similar to the New Guinean specimens and in the comparatively shorter A3 it is certainly close to ssp. mulu known from Borneo. However, in the colour of gaster and in the ocellar disposition (OOD is relatively wider) it is different from other subspecies. But it is also different from other specimens from Brisbane in the relative length of A3 and in the colour of the gaster. In order to determine the subspecific status of the Australian specimens further study on the variation of the characters seems to be necessary.

6. SPECIMENS FROM THE PHILIPPINES

Five species, including no new one, were examined: schmiedeknechti, thaiantum, rehveriellum, mindanaonis and trituberculatum.

1. TRYPOXYLON SCHMIEDEKNECHTI KOHL, 1906

Trypoxylon schmiedeknechti: Tsuneki, SPJHA, 13: 13, 1980 (Philippines).

Trypoxylon schmiedeknechti: Tsuneki, ref. p. 2, 21, 33 and 64 of this Part.

Specimens examined:

5 ♀, Luzon, Laguna Liliw, VI - VII. 1980, M. Wilson (Rice) (BMNH).

2. TRYPOXYLON THAIANUM PHILIPPINICUM TSUNEKI, 1978

Trypoxylon thaianum philippinicum Tsuneki, SPJHA, 7: 62, 1978 (♀ ♂, Philippines).
Trypoxylon thaianum philippinicum; Tsuneki, Ibid., 13: 13, 1980 (Philippines).

Specimens examined:

7 ♀, Luzon, Laguna Liliw, VI - VII. 1980, M. Wilson (Rice) (BMNH).

Remarks. The frontal enclosure is considerably variable in form as was explained in the above listed literature.

3. TRYPOXYLON RHOWERIELLUM TSUNEKI, 1980

Trypoxylon rohweriellum Tsuneki, SPJHA, 13: 77, 1980 (♀, Luzon).

Specimens examined:

2 ♀. Luzon, Laguna Liliw, VI - VII. 1980, M. Wilson (Rice) (BMNH).

On some characters. Typical in colour of gaster and hind leg, as given on p. 77 of Pt. VII. Other brownish ferruginous parts of legs: fore tibia except folded side, mid and hind tibiae at base (broad) and at apex (narrow), spurs of fore and mid tibiae, fore and mid tarsi except pale brown T5 and blackish arolia; hind tibial spurs with shorter one pale brown toward apex and longer one from base distinctly brown.

Measurements of the two specimens:

HW, HL, IODv, A3, P=100, 51, 27, 23, 140. =100, 53, 24, 24, 150. IODs=10:7. =10:7.5.
OOD, Od, POD=2, 5, 5. =2, 5, 4. A3=AW×4. =AW×4. A3, 4, 5=10, 6.7, 6.5. =10, 6.5, 6.5. P, Ma, Mi, 2(Ma), 3(Ma)=100, 17, 6, 30(19), 38(32). =100, 19, 6, 29(25), 36(33). P is slightly widened at spiracles and narrowed basally and apically, at base just behind basal condyle narrowest, strictly relatively 5.5, and in front of apical swelling, at about 2/3 from base, here relatively 6.0 (the place depressed dorsally and gently concave). RC=B, somewhat close to C, R1 short, CV1=CV2×5 (in the other 5.6), TCV:CV2≠ 3:2 (do.), TCV gently sinuate, angle about 110° (about 105°).

In both specimens G2 longitudinally, distinctly, rather acutely ridged above, G3 also on basal half similarly ridged above. It is uncertain, however, whether the segments are naturally so, or changed so through the desiccation process.

Remarks. In the specimens the lateral carinae of the propodeum are very feeble, in certain light only can be observed with difficulty. It should be included also in the group of "without carinae" in the key to the species.

4. TRYPOXYLON MINDANAONIS TSUNEKI, 1976

Trypoxylon mindanaonis Tsuneki, Steenstrupia (Copenhagen), 4: 84, 1976 (♀, Mindanao).

Trypoxylon mindanaonis; Tsuneki, SPJHA, 13: 105, 1980 (Mindanao, Basilan, Basuanga and Luzon). See also the preceding page.

Specimen examined: 1 ♂, Mindanao, Misamis occ., Mt. Malindang, 19. X. 1959, C. M. Yoshimoto (BPM).

5. TRYPOXYLON TRITUBERCULATUM TSUNEKI, 1980

Trypoxylon trituberculatum Tsuneki, SPJHA, 13: 111, 1980 (♂ ♀, Luzon, common).

Specimens examined:

5 ♀, Luzon, Laguna, Liliw, VI - VII. 1980, M. Wilson (Rice) (BMNH).

7. SPECIMENS FROM SOUTH CHINA

Six species are recorded, mostly from Szechwan, of which three species (mowchowense, kunzui and szechuen) and one subspecies (clavicerum suifuense) are new to science. Others are petiolatum Smith and orientale Cameren.

1. TRYPOXYLON CLAVICERUM SUIFUENSE SSP. NOV.

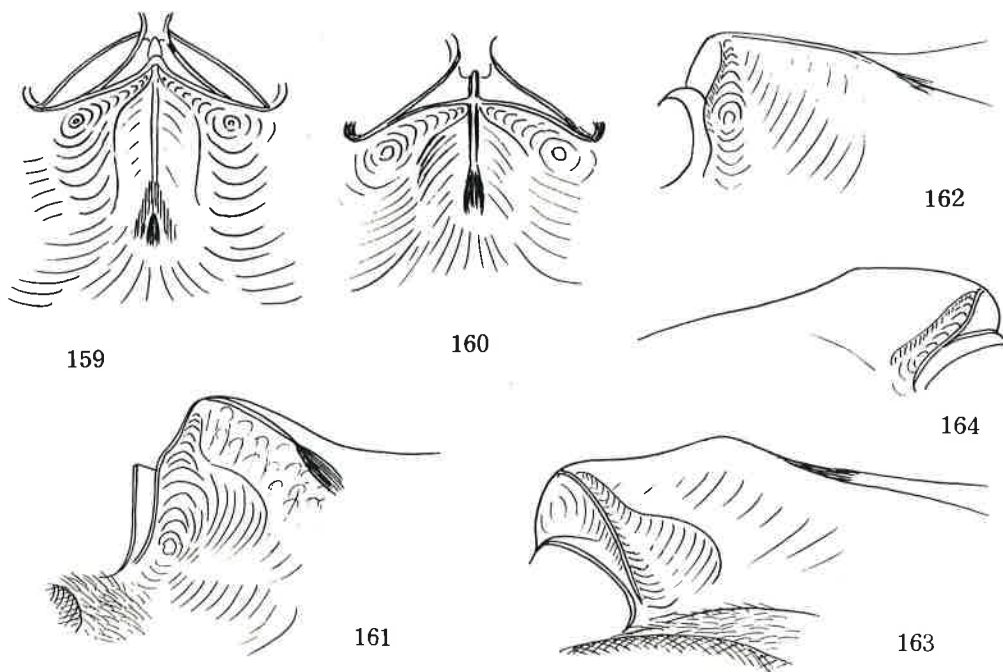
Differs from the typical race in the following characters:

(1) SAT is not so broadly flattened above, with main lateral inclinations oblique, with excavation at latero-anterior part just behind anterior transverse carina more distinctly and more closely approaching medio-apical centre of SAT and seen in profile SAT distinctly raised above level of frons (in the typical race top of SAT is level with frons); SAT-ASR in vertical view: Figs. 159 (holotype ♀), 160 (paratype ♂), in dorso-lateral view: Fig. 161 (holotype ♀), more lateral view: Fig. 162 (paratype ♂), in lateral view: Figs. 163 (holo, ♀), 164 (para, ♂ from right side). In the typical race occurring in Europe: Figs. 165 (♀, vertical), 166 (♀, oblique dorso-lateral), 167 (♀, dorso-lateral), 168 (♂, vertical), 169 (♂, dorso-lateral) and 170 (♂, oblique lateral).

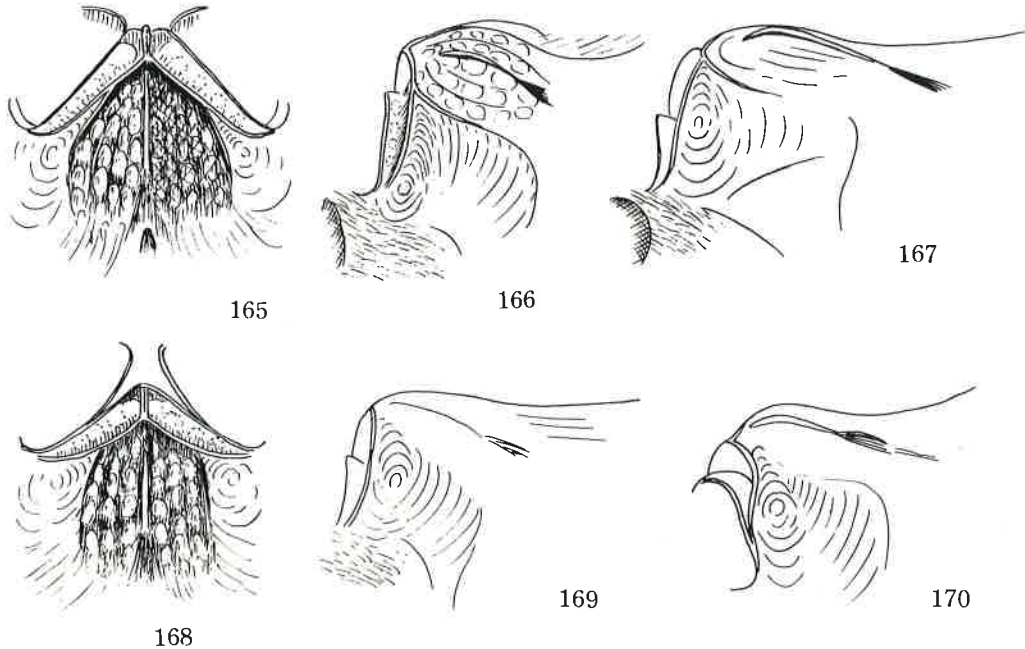
(2) IODs in ♀ =2:1 (in typical race =5:3).

(3) On an average slightly smaller in body size.

The present subspecies is more closely related to the Northeastern Asiatic race, T. clavicerum exiguum Tsuneki, but in exiguum (1) SAT much narrower and higher on the average, with lateral inclinations steeper and seen in profile much more highly raised above level of frons, (2) IODs in ♀ smaller, namely, 10:4.5, (3) oblique and transverse striae on prepedum less rugose, much stronger and more distinct (in this respect suifuense is similar to the typical race).



Figs. 159-164. T. clavicerum suifuense ssp. nov. Odd numbers ♀, even numbers ♂.



Figs. 165-170. *T. c. clavicerum* Lepelletier. 165-167 ♀, 168-170 ♂.

The male of the present subspecies is similar in the characters of antenna and the genital organs to the typical race. In regard to the structure of clypeus, frons, vertex, pronotum, propodeum, wing venation and the colour of the legs both sexes are generally similar to the European specimens of *clavicerum* Lepelletier.

Measurements of holotype ♀ (within parentheses one of paratypes, ♂):

HW, HL, IODv, A3, Al3, P=100, 60, 35, 17, —, 78. (100, 57, 36, 12, 26, 64). IODs=10:5.5 (10:7, in other 10:7.5). OOD, Od, POD=2, 4, 5. (4, 5, 6). A3=AW×2.5. (AW×1.7). A3, 4, 5≠ 10, 8, 7. (10, 6, 5). (Al3=BW×2 and >A9-12 but <A8-12). P, Ma, Mi, 2(Ma), 3(Ma)=100, 44, 22, 68(52), 70(70). (100, 56, 36, 72(70), 68(86)). RC=B, but somewhat close to C, (do.). Rl considerably long, nearly as long as CV2, (do.). CV1=CV2×3.5, (CV2×4). TCV:CV2=5:3, (do.). Angle about 120°; (do.).

Holotype: ♀, S. China, Szechuen, Suifu, date?, D. C. Graham (USNM).

Paratypes: 1 ♀ 5 ♂, same loco, 1000-2000 ft, D. C. Graham (USNM).

Remarks. In most of the paratype specimens the head and or thorax are crushed and sometimes the gaster is also crushed, as if they were caught by killing mechanically.

2. *TRYPOXYLON MOWCHOWENSE* SP. NOV.

The present species (♀) is considerably similar in characters to *T. trochanteratum* Cameron, but differs from it in that IODc is relatively smaller, gaster is completely black, with its petiole much shorter and robuster and SAT is different in its apical structure. It is also closely allied to *T. pacificum* of Eastern Asia, but can be distinguished from this by the colour of gaster and by the apical structure of SAT. In the key to Indo-Malayan species the present species runs to couplet 52 and runs out.

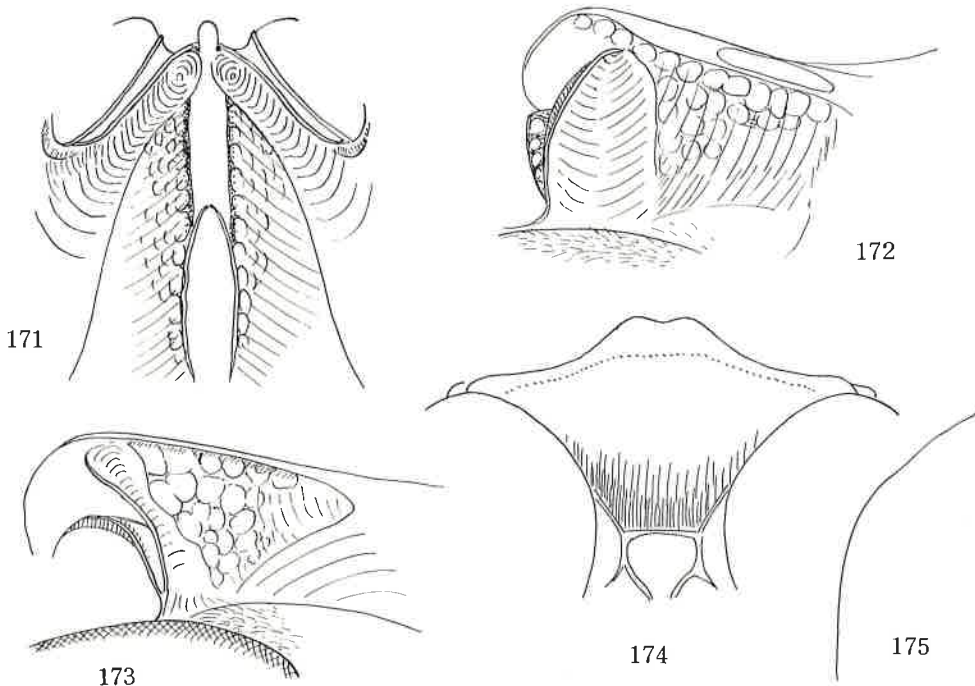
Diagnosis. ♀, about 10 mm. Except mandible, palpi and part of fore leg black; Gl clavate, robust, propodeum with lateral carinae, mesoscutum distinctly microcoriaceous and fairly closely punctured, IODs=2:1, A3=AW×2.7, SAT high acute nasiform, anteriorly transversely carinate and medianly produced and roundly curved down; clypeus: Fig. 140, RC=C, CV1=CV2×3, area dorsalis without distinct laeeral furrows, hair

on clypeus silvery.

Black; clypeus on apical glabrous area castaneous brown, mandible ferruginous and reddish brown at apex, palpi ferruginous, basally kite brown, posterior part of collar discoloured, tegula translucent yellow, basal plates of wing brown, apices of fore and mid femora, fore tibia except brown outer side, mid tibia narrowly at base, all tibial spurs and fore T5 ferruginous; rest of fore tarsus and apical part of mid tarsus brown, hind spurs appear in some light brownish. Hair on clypeus parallel.

HW:HL in frontal view: 100:84, vertex not depressed, eye incision broad and shallow, strongly narrowed towards bottom, bottom broadly rounded, dorsal margin slightly inclined outwards. HW,HL,IODv,A3,P=100,54,35,18,82. IODs=10:5. OOD,Od,POD=2,5,5.5. A3=AW×2.7. A3,4,5=10,6.5,6.5. P,Ma,Mi,2(Ma),3(Ma)=100,42,25,63(52),70(64).

Fore ocellus in a hollow, but the hollow not extended narrowly as frontal furrow, frontal elevation considerably high, with surface flat, without medial furrow or impressed line, SAT acute nasiform, but dorsal line somewhat flattened, smooth and shining, on its posterior half longitudinally deeply furrowed, in lateral view dorsal margin of frons and SAT in a line (Fig. 173), in vertical view (Fig. 171) apical margin of SAT transversely carinate, carina obliquely running down laterally to connect with outer side of low short ASR, the part enclosed with the carina and anterior part of side of SAT deeply roundly excavated into an oblique furrow, surface of the furrow smooth and shining, SAT in medio-anterior part extended anteriorly beyond the carina and roundly curved down to IAA. The structure in vertical view: Fig. 171, in dorso-lateral view: Fig. 172, in lateral view: Fig. 173; clypeus: Fig. 174, very similar to that of *trochanteratum*, disc at base gently raised and medianly gently and broadly tectate, apical reflection feeble, antenna comparatively thick, incrassation towards apex mediocre, All not reaching twice Ma of A3. (Occipital carina unobservable beneath head). Anterior part of collar short, a narrow ridge-like, but rounded at the sides, lamina broadly rounded, not produced, nearly lacking (Fig. 175), parapsidal suture is a strongly impressed line, fairly long, subalar area normal. Basal elevation of area dorsalis inconspicuous, surface obliquely inclined posteriorly, lateral carinae of propodeum distinct, in lateral view at apex curved down remotely in front of lateral carina of area apicalis which is fairly long, but not curved inwards at anterior end, GSR with elevation indistinct. Fore wing more broadly rounded at apex than usual, R1 short, TCV=CV2, TCV gently sinuate, angle about 130°. Gl, 2 and 3 in lateral view



Figs. 171-175. *Trypoxylon mowchowense* sp. nov., ♀

roundly swollen at apex and G2 and 3 considerably constricted at base, G1 medianly at base deeply excavated,

Frons strongly microcoriaceous and closely superimposed with medium-sized punctures, PIS = or PD, mesoscutum distinctly microcoriaceous and more finely and more closely punctured than on frons, not turning finer and weaker towards apex, propodeum at base obliquely, on median furrow transversely, strongly striate, disc near median furrow obliquely rugoso-striate, rest of the area and between striae microcoriaceous, lateral series of striae distinct, sides except anterior femoral sinus obliquely rugoso-striate and punctured on upper area, and more finely and weakly so on lower area, posteriormost depressed area more coarsely but irregularly punctured or striate.

♂, unknown.

Holotype: ♀, S. China, Szechuen, Mowchow, 1400-4500 ft., VII. 1924, D. C. Graham (USNM).

3. TRYPOXYLON PETIOLATUM SMITH, 1857

Trypoxylon petiolatum: Tsuneki, ref. p. 29, 45 and 67 of this paper.

Specimens and characters:

1 ♀, South China, Yang Chun, Amoy region, Fukien, V. 1913, Dr. J. P. Maxwell (USNM). In this specimen HW:IODv=100:28, intermediate between petiolatum s. str. and ssp. obsonator Smith.

1 ♀, Canton, 31. V. 1918, C. W. Howard (USNM). In this specimen HW:IODv=100:28.

1 ♀, Szechuen, Kuanchien, 3000 ft., 1-4. VIII. 1934, D. C. Graham (USNM). In this specimen HW:IODv=100:26, very close to ssp. obsonator.

1 ♀, Szechuen, South of Suifu, IV. - VI. 1929, D. C. Graham (USNM). HW:IODv=100:26, this is also very close to ssp. obsonator.

1 ♀, Szechuen, Kuanshien, 1600-2000 ft., 27-29. VII. 1934, D. C. Graham (USNM). In this specimen the head is lacking.

It seems note-worthy that the Szechuen specimens are, in regard to the relative width of interocular distance at vertex, very close to ssp. obsonator Smith, occurring in Northeastern part of Asia.

4. TRYPOXYLON KUNZUI SP. NOV.

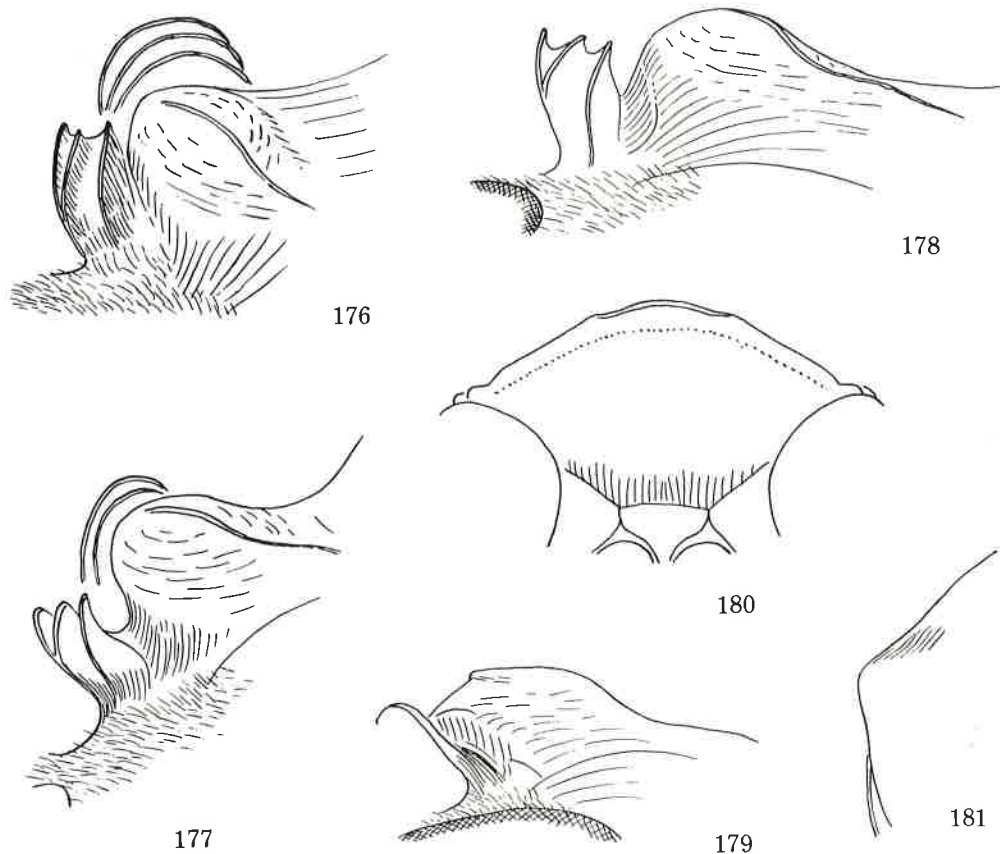
The present species (♀) is apparently very similar to T. petiolatum Smith, can be distinguished from it, however, by the differences in the relative length of the antennal joints and in the form of the head seen in front and of the clypeus.

Diagnosis. ♀, 14.5 mm. G1 flask-shaped, mesoscutum without microsculpture, propodeum without lateral carinae, gaster medianly red, fore and mid legs apically broadly, hind leg partly pale yellow, hair silvery, IODs=10:8.3, A3=AW×2.4, SAT tuberiform, PAF deep, clypeus weakly rounded out, RC=B.

Black, mesothorax with strong plumbeous shine, antenna dark brown, slightly paler beneath (not ferruginous as in petiolatum), clypeus till apex black, mandible ferruginous, at extreme base black and at apex reddish brown, palpi yellow, with basal joints partly brown, posterior part of collar incompletely discoloured, appearing brownish, tegula translucent ferruginous, basal plates, veins and stigma of wing brown to pale brown; gaster from apical half of apical swelling of G1 (on sides more broadly extended anteriorly) to apex of G3 reddish yellow, without dusky mark, all trochanters at apices, all knees, fore tibia at base, apex and in front, mid tibia at base and apex, hind tibia at base, all spurs, fore tarsus, mid T1-3 and all claws yellowish ferruginous, rest of fore tibia and of mid tarsus castaneous brown, hind tarsus at articulations and beneath pale brown, arolia black. Hair on head and sides of thorax-complex silvery, on clypeus parallel, on thorax long as in petiolatum.

Head in frontal view markedly wider than long, W:L=100:80, with sides roundly convergent towards clypeus, vertex not depressed, elevation of hind ocelli weak, eye incision broad (much broader and shallower than in petiolatum), not parallel, sinus broadly rounded, dorsal margin slightly inclined outwards, especially at apical half curved down.

HW, HL, IODv, A3, P=100, 50, 29, 17, 170. IODs=10:8.3. OOD, Od, POD=7, 8, 8. A3=AW×2.4



Figs. 176-181. *Trypoxylon kunzui* sp. nov., ♀

(widest view as usual, in narrowest view 3). $A_3, 4, 5, 6, 7, 8, 9, 10, 11=10, 7, 7, 5, 7, 7, 6, 5, 5, 5$. $A_4=AW \times 1.6$. $A_5=AW \times 1.8$. $A_6=AW \times 1.7$. $P, Ma, Mi, 2(Ma), 3(Ma)=100, 18, 5, 28(22), 31(28)$. $RC=B$. Rl short. $CV_1=CV_2 \times 6$. $TCV:CV_2 \approx 5:3$. TCV gently incurved as a whole, CV_2 downcurved as usual, angle about 90° (venation generally similar to that of *petiolatum*).

Configuration of vertex and frons generally very similar to that of *petiolatum*, but elevation of frons slightly stronger, especially at anterior area where more distinctly inclined below, median furrow fairly deep and widened at anterior area (in accordance with the round outlines of frontal elevations), SAT rather tuberiform, apical half broadly flattened and long carinated in middle, carina extended posteriorly beyond SAT (constant?), at apical verge bluntly edged and steeply falling down to PAFs and IAA; ASR acutely tricarinate on dorsum, PAF fairly deep, U-shaped in cross section, bottom line gently up-curved (nearly flat-bottomed). SAT-ASR in oblique dorso-lateral view: Fig. 176, similar but from more below: Fig. 177, more below to see through PAF; Fig. 178, in lateral view: Fig. 179; clypeus: Fig. 180, comparatively shorter than in *petiolatum*, with apical margin delicately undulate, at base gently elevated and at apex weakly reflected, supraclypeal area also much shorter than in *petiolatum*. Occipital carina very weak behind buccal cavity. Collar of pronotum as in *petiolatum*, anterior part not very short, laterally widened, lamina on side also considerably similar (Fig. 181), parapsidal suture is a deep black impressed line in plumbeous lustre of surroundings and very conspicuous, subalar area normal, meso- and meta-pleural flanges vertically raised, basal elevation of area dorsalis with two impressed lines across middle, lateral furrows of area dorsalis very shallow, practically

lacking, in stead a series of short striae present there, medial furrow fairly deep, deeper than the usual case in petiolatum and fairly broad, area apicalis with strong lateral carinae, but dorsally margined with weak arcuate striae, GSR narrow band-like, with posterior margin slightly roundly elevated, but not conspicuous.

Frons very minutely microreticulate and closely superimposed with medium-sized shallow punctures, punctures on top areas of elevations somewhat sparse and anteriorly closer; mesoscutum finely, weakly and sparsely punctured, PIS mostly 2-3 times PD and punctures posteriorly weaker and finer, area dorsalis at basal furrow smooth, median furrow also almost smooth, disc finely, sparsely punctured, lateral series of striae of the segment distinct, sides polished and, except anterior femoral sinus, finely and rather sparsely punctured, without coarse striae on posterior area.

♂, unknown.

Holotype: ♀, South China, Loh Fan Shaan, 1-19. IX. 1921, G. W. Howard (USNM).

Remarks. From the specimen the right antenna from A9 apically and the left at A12 and hind tarsus from base are lacking.

5. TRYPOXYLON SZECHUEN SP. NOV.

The present species (♀) very closely resembles T. paeninsulicola, known from Malaya, but can be distinguished therefrom by the slight differences in the colour of legs, in the structure of SAT-ASR, in the type of RC in fore wing and somewhat also in the form of apical margin of clypeus.

Diagnosis. ♀, 22 mm, G1 flask-shaped, mesoscutum without microsculpture, propodeum with lateral carinae, gaster except G1 ferruginous, fore tibia in front and all tibial spurs pale brown, fore tarsus brown, IODs=10:9. A3=AW×5, clypeus: Fig. 185, SAT-ASR: Figs. 120-122, RC=M.

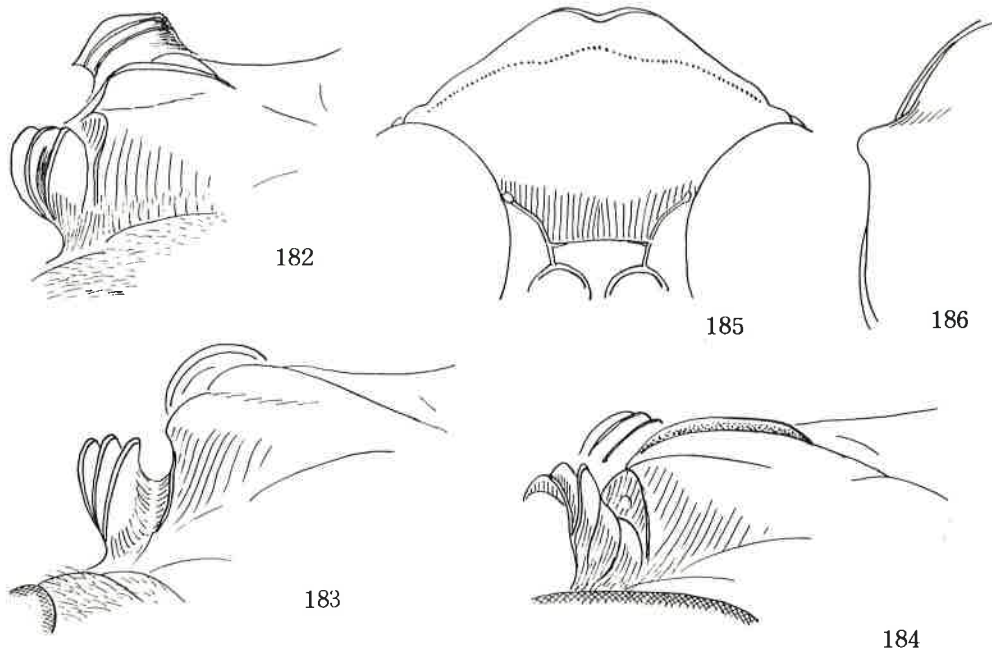
Black; mandible reddish ferruginous, at extreme base black, palpi ochre yellow, at base reddish brown, posterior part of pronotal collar slightly brownish, tegula translucent bright ferruginous, gaster from apical swelling of G1 to apex reddish yellow; legs at articulations brownish, fore tibia in front ferruginous, fore tarsus brown, apically paler, other tarsi also apically brownish, tibial spurs all light brown, wings slightly yellowish, stigma ferruginous, veins brown. Hair silvery, on clypeus at base slightly turned towards medial line.

Head in frontal view with sides roundly and weakly convergent towards clypeus, W:L=100:85, vertex depressed, tops of hind ocelli about level with tops of eyes, eye incision comparatively narrow, but not parallel-sided, narrowed towards bottom, dorsal margin horizontal (in paeninsulicola narrow and parallel-sided).

HW, HL, IODv, A3, P=100, 48, 26, 28, 200 (in paeninsulicola IODv relatively 22). IODs=10:9. OOD, Od, POD=4, 4, 3. A3=AW×5.2. A3, 4, 5=10, 6.5, 6. P, Ma, Mi, 2(Ma), 3(Ma)=100, 13, 5, 25(14), 31(20). RC=C (in paeninsulicola =M). R1 short, CV1=CV2×5, TCV:CV2=5:4, TCV strongly bent inwards in middle, angle at base about 90°, at apex about 120°.

Hind ocelli in a transverse depression, fore ocellus in a round depression (in paeninsulicola not), frontal elevation only gentle, median furrow shallow and on anterior broad area turning to fine groove, with surface of frons almost flat (in paeninsulicola median furrow broad but fairly deep, with elevations on both sides roundly swollen), SAT rather moderately high tuberiform, with comparatively broad dorsal dorsal surface which is curved longitudinally and medianly acutely but rather shortly carinate (Fig. 184, in lateral view) (in paeninsulicola SAT nasiform, with lateral surface obliquely inclined from the medial carina, namely, distinctly tectate), ASR highly raised, tricarinate on top, PAF fairly deep, but not very deep, almost flat-bottomed, but bottom line fairly above scapal hollow, U-shaped in cross section (in paeninsulicola bottom line up-curved and V-shaped in cross section), SAT-ASR in oblique dorso-lateral view: Fig. 182, in dorso-lateral view to see through PAF: Fig. 183, in lateral view: Fig. 184 (cf. Pt. III, Figs. 366-368). Clypeus: Fig. 185, disc longitudinally roundly raised as a whole (not roundly tectate, not roundly raised at the centre, therefore the hairs are not convergent towards medial line), apical marginal, glabrous and shining area, castaneous in colour, strongly reflected (shown with dotted line in Fig. 185), median subtruncate and emarginate area much narrower than in paeninsulicola, with emargination deeper (cf. Pt. III, Fig. 369). Occipital carina complete, but minutely incised behind buccal cavity. Anterior part of collar comparatively thick, almost as long as posterior part in middle and medianly minutely tuber-

culate, lamina on side; Fig. 186, considerably different in form from that of paeninsulicola (cf. Pt. III, Fig. 370). Propodeum with distinct lateral carinae, basal elevation of area dorsalis not conspicuous, lateral furrows of the area broad but distinct, narrowed posteriorly, medial furrow elongate oviform, fairly deep, area apicalis complete as in compared species, GSR roundly elevated, apical area weakly discoloured to brown, not curved posteriorly (in paeninsulicola amber-yellow in colour and distinctly reflected).



Figs. 182-186. Trypoxylon szechuen sp. nov., ♀

Frons distinctly microcoriaceous, punctures medium-sized, clearly roundly outlined, fairly close, mostly PIS = or < PD, but partly 1.5 times PD; mesoscutum with punctures on antero-lateral areas as large as on frons and PIS 1-2 times PD, but punctures on medial area somewhat finer and posteriorly much finer and sparser; lateral series of striae on propodeum strong and close, on posterior inclination extended inwards in front of area apicalis, area dorsalis at base obliquely and coarsely striate, medial furrow transversely and closely and lateral furrows more weakly and sparsely striate, disc closely and fairly strongly punctured; sides polished and except femoral sinus finely and sparsely punctured, but on posterior hollowed area transversely rugose-striate.

♂, unknown.

Holotype: ♀, S. China, Szechuen, Ningyuenfu, 6000-6200 ft, 2-4. VIII. 1928, D. C. Graham (USNM).

6. TRYPOXYLON ORIENTALE CAMERON, 1904

Trypoxylon orientale: Tsuneki, ref. p. 58 of this paper.

Specimen examined:

1 ♀, S. China, Szechuen, Shin Kaisi, Mt. Omei, 4400 ft, 20-26. VIII. 1934, D. C. Graham (USNM).

Remarks. In the present specimen the gaster is from ♂ apically lacking. But as

G1 is red at its apical area it is clear that the gaster is from G2 apically at least partly red. Judging by the colour of the legs it is presumed that the rest of the gaster is not wholly red, but possibly G2-3 or G2-4, at least partly, red. In the following comparison with other species is done under this presumption.

In my key to the Indo-Malayan species it runs to couplet 122 and runs out, since in the present specimen PAF is fairly deep and yet with bottom line upcurved. But if we follow the second route it goes to orientale Cameron, and comparison with the complete specimen of this species makes it clear that the differences are only slight and tolerable as variations, so that the specimen is synonymized with this species.

Other differences found in this case are mainly as follows:

(1) Frons with medial furrow distinct, it is a narrow impressed line and gently sloped up laterally to gentle rounded frontal elevations, but anteriorly the surface broadly depressed as shallowly concaved area (yet medial impressed line distinct), not anteriorly broadly flattened as usual (surface distinctly microcoriaceous and somewhat sparsely superimposed with medium-sized strong punctures).

(2) G1 apically broadly red (in orientale s. str. narrowly so and G2-3 broadly black (ref. p. 59)).

Measurements:

HW:HL in frontal view 100:78. HW, HL, IODv, A3, P=100, 47, 27, 24, 174. IODs=10:9. OOD, Od, POD=2, 3, 2. A3=AW × 4.2. A3, 4, 5=10, 6.5, 6. P, Ma, Mi, 2(Ma), 3(Ma)=100, 15, 5.5, —(—), —(—). RC=M, RI short, CV1=CV2×7, TCV:CV2=2:1, TCV moderately sinuate, angle about 100°(at base and at apex).

8. SPECIMENS FROM HONGKONG

The species included in the material are only seven. Small as they are in numbers, yet they are very interesting in the fact that they consist of species of Indo-China, Philippines, Formosa and the Ryukyus. Especially interesting is that they include common species with the Philippines and also with Formosa, because between the Philippines and Formosa, except the widely spread species such as petiolatum, errans and schmiedeknechti, no common species has been known up to the present.

The species dealt with here are: T. petiolatum Smith (widely spread), errans Saussure (widely spread), lobatifrons Tsuneki (Laos and Philippines), albispinosum Tsuneki (Laos and S. India), mindanaonis Tsuneki (Philippines, Borneo, Java, Singapore, New Guinea and Australia), takasago Tsuneki (Formosa and Ryukyus), formosicola inornatum Matsumura et Uchida (Ryukyus), of which takasago Tsuneki is a new subspecies.

Besides the seven above listed, from Hongkong T. schmiedeknechti Kohl has richly been collected.

1. TRYPOXYLON PETIOLATUM SMITH, 1857

Trypoxylon petiolatum: Tsuneki, ref. pp. 29, 45, 67, 73 of the present paper.

Specimens examined:

6 ♀ 1 ♂, N. T. Taipokaw (Kowloon or in hills behind For. Sta., 11, 19, 27, 29. VI. 1964, 65, Malaise trap, W. J. Voss & Wau Ming Hui (BPEM); 1 ♂, Saikung, Kowloon, 22. IV. 1965, N. Wilson (BPEM).

Remarks. In the specimens IODv as against HW as 100 is as follows:

♀: 26, 27, 27.5, 28, 27, 28. ♂: 32, 30.

In ♀ the values are strictly intermediate between Southern form (once called tropicale Ts.: 25) and Northern form (ssp. obsonator Smith: about 30). In the lectotype female from Borneo it is 26.5; therefore, the Hongkong specimens belong to the typical form.

In both males A13 is >A10-12, but <A9-12.

2. TRYPOXYLON ERRANS SAUSSURE, 1867

Trypoxylon errans: Tsuneki, ref. pp. 17, 29, 49 of the present paper.

Specimen:

1 ♀, Hong Kong, —, Terry (BMNH).

3. TRYPOXYLON LABATIFRONS TSUNEKI, 1979

Trypoxylon labatifrons Tsuneki, SPJHA, 9: 131, 1979 (♀, Laos, figs.)

Trypoxylon labatifrons: Tsuneki, *Ibid.*, 13: 103, 1980 (♀, Luzon and Mindanao).

Specimens examined:

1 ♀, Trappist Monastery to Silver Mine Bay (over hills), 22. VII. 1964, W. J. Voss (BPBM); 1 ♀, Taipokau, Kowloon, 15. V. 1965, Malaise trap, Lee Kit Ming & Hui Wai Ming (BPBM); 1 ♀, Taipokau, 20. VII. 1965, Lee Kit Ming & Hui Wai Ming (BPBM)

Remarks. The Hongkong specimens belong to the typical form.

4. TRYPOXYLON ALBISPINOSUM TSUNEKI, 1979

Trypoxylon albispinosum Tsuneki, SPJHA, 9: 173, 1979 (♂, Laos).

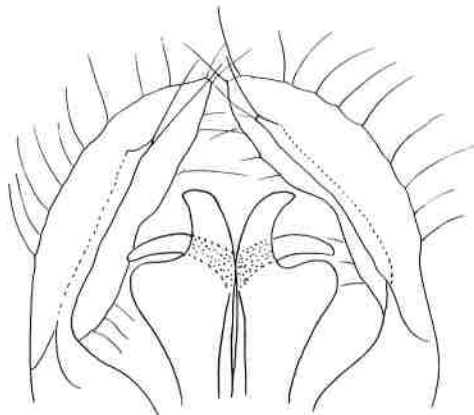
Trypoxylon albispinosum: Tsuneki, Present paper, p. 29 (♂, South India).

Specimens examined:

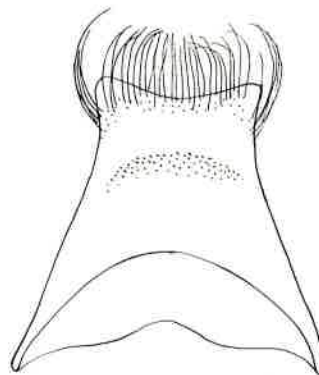
1 ♀, N. T. Taipokau, 24. VI. 1965, Malaise trap, Lee Kit Ming & Hui Wai Ming (BPBM); 1 ♀, same loco, 6. IX. 1965, same collectors (BPBM); 1 ♂, same loco, 8. VI. 1965, same collectors (BPBM).

The present species is apparently very similar to T. mindanaonis m. and difficult to distinguish from it, but can be separated therefrom by the different structure of SAT-ASR and of the paramere of the male genital organs (Fig. 187, apical half in dorsal view, cf. Pt. V, p. 34, Figs. 104-106 and Pt. VII, p. 107, Figs. 441-443). In the form of sternite 8 the present specimen is similar in pattern to the Laotian holotype, but comparatively slightly wider (Fig. 188, cf. Pt. III, p. 174, Fig. 769). As to male sternite 8 of T. mindanaonis considerable differences are observed among subspecies and the present specimen is closest to typical mindanaonis in the form of the sternite.

♂. In the specimen lateral furrows of area dorsalis shallow and broad, but dis-

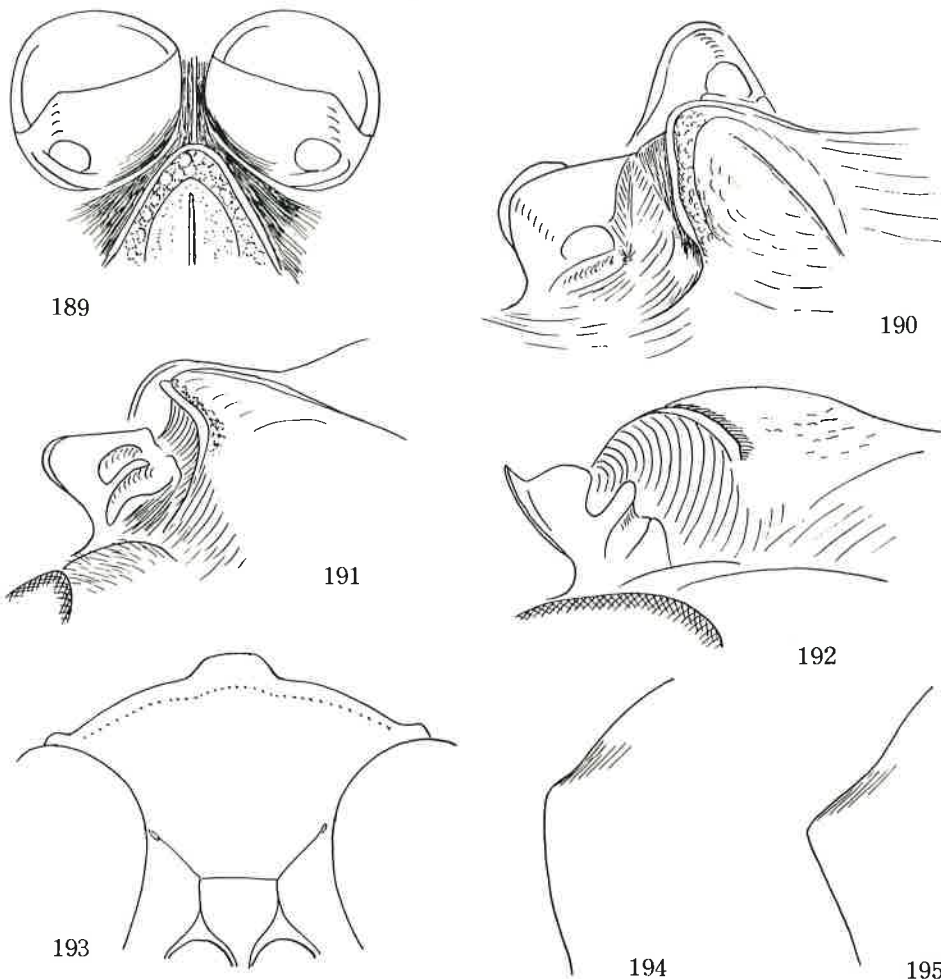


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Figs. 187-188. Trypoxylon albispinosum Tsuneki, ♂.



Figs. 189-194. *Trypoxylon albispinosum* Tsuneki, ♀.
 Fig. 195. *Trypoxylon mindanaonis* Tsuneki, ♀.

tinct and $A3 \approx AW \times 2$ and belongs clearly to the Laetian form; SAT-ASR as in the type of this species (Pt. III, p. 174, Figs. 762-765). Measurements:

HW, HL, IODv, A3, Al3, P=100, 50, 30, 14, 24, 164. IODs=10:8.5. OOD, Od, POD=2, 4, 3. $A3=AW \times 2$ (strictly 1.8). A3, 4, 5=10, 7, 7. $Al3=BW \times 2.6$ and $\approx A9-12$, not curved at apex. P, Ma, Mi, 2(Ma), 3(Ma)=100, 16, 5, 26(23), 28(30). RC=C-B, RI short, $CV1=CV2 \times 4$, $TCV:CV2=7:5$, TCV gently incurved, angle at base about 90° , at apex about 105° .

Fore tibia and tarsus brown, all tibial spurs white, gaster black, but on apical sides of G1 and G2-3 beneath brown; mesoscutum weakly microcoriaceous, nearly mat and somewhat sparsely superimposed with comparatively large punctures, PIS 1-1.5 times PD, but on median area punctures sparser and posteriorly much finer and sparser. Propodeum at base obliquely and strongly, on median furrow and posterior part of disc transversely finely, weakly striate, disc sparsely covered with indistinctly outlined comparatively large and shallow punctures.

♀ (hitherto unknown). Length 10-10.5 mm. Black; gaster from apical sides of G1 to G3 red, with a large blackish mark above and a small brownish mark beneath on G2 and G3, usually the basal areas of dorsal side of the segments not covered with the mark; mandible ferruginous red, at base broadly black, palpi at base brown, apically pale brown, posterior part of collar almost not discoloured, in some light slightly brownish, tegula translucent ferruginous, basal plate and veins of wing castaneous.

Legs black, but fore and mid tibiae and tarsi dark brown, tarsi somewhat paler, especially on T5, tibial spurs whitish, but longer hind one appears in some light somewhat brownish. Hair silvery, on clypeus parallel.

Head in frontal view slightly wider than long, W:L=100:90, with sides rounded, slightly narrowed towards clypeus, vertex not depressed, eye incision comparatively broad and convergent towards bottom, dorsal margin horizontal.

HW,HL,IODv,A3,P=100,52,26,22,178. IODs=10:9. OOD,Od,POD=2,9,6. A3=AWx4. A3,4,5=10,7,7. P,Ma,Mi,2(Ma),3(Ma)=100,18,6,26(20),32(28). Venation generally similar to that of ♂.

Frontal elevation gentle, medial furrow at base distinct, but soon becomes broad and shallow and on anterior area turning to shallow concave depression; SAT produced anteriorly, semioval in outline, surface flat and medianly with a longitudinal small mound carrying carina on top and at the margin finely carinated (Fig. 189, vertical), ASR highly and subtriangularly raised (in frontal view), surface smooth and shining, apical margin thinly carinate, obliquely inclined inner aspect flat, outer aspect more acutely so, on postero-lateral corner at upper area there is a small round hollow, just below it runs a transverse furrow (not the hollow as in *nishidai*), PAF deep, flat-bottomed, curved in vertical view, IAA longitudinally, very finely carinate in middle and on both sides of it deeply furrowed (Fig. 189). SAT-ASR in vertical view: Fig. 189, in dorso-lateral view: Fig. 190 (seen from higher direction), ditto but in lower direction to see through PAF: Fig. 191, in lateral view: Fig. 192; clypeus: Fig. 193; occipital carina complete. Anterior part of collar in dorsal view comparatively thick, widely and roundly swollen at the sides, in frontal view dorsal margin in wide rounded triangular and minutely, weakly tuberculate in middle, lamina on side: Fig. 194. Subalar area normal. Propodeum with distinct lateral carinae, area dorsalis with weak but distinct lateral furrows, area apicalis almost lacking, with lateral carinae very short, GSR highly elevated, in lateral view distinctly curved posteriorly.

Frons distinctly microcoriaceous and closely superimposed with comparatively fine punctures, punctures shallow, flat-bottomed and rather indistinct strong, granulate microreticulation. SAT on the feeble furrow along apical marginal carina irregularly, coarsely punctured, while the medial mound covered with feeble punctures and fairly well shining; mesoscutum finely (as finely as on frons), somewhat sparsely punctured, PIS 1-3 times (mostly 2-3 times) PD, punctures posteriorly finer, sparser and weaker, PIS nearly mat, with plumbeous shine and under high magnification very delicate microreticulation can be seen; series of striae along lateral carinae of propodeum distinct, area dorsalis at base obliquely and coarsely, on medial furrow transversely, finely and weakly striate, lateral furrows partly feebly crenate, disc indistinctly covered with shallow fine punctures, sides smooth and polished and, except femoral sinus, finely and sparsely punctured.

5. TRYPOXYLON MINDANAONIS TSUNEKI, 1976

Trypoxylon mindanaonis Tsuneki, 1976, ref. pp. 68 and 69 of this paper.

Specimen examined:

1 ♀, N. T. Sai Kung Station, 12. V. 1965, W. J. Voss & Hui Wai Ming (BPBM).

Remarks. The present species is very closely allied to the preceding one, T. albispinosum. In the female it can be separated from this by the following delicate differences:

(1) SAT in vertical view with medio-apical angle wider and more weakly carinated there, with surface more flattened and much smoother.

(2) The hollow at posterior aspect of ASR at dorso-central area present and more elongate in form, extending posteriorly and running down on the posterior aspect of ASR (cf. Pt. VII, Figs. 434-438 and compare with Figs. 189-191 of the present Part).

(3) Prenetal lamina more acute at apex (Fig. 195, cf. Fig. 194).

The present specimen is somewhat smaller in body size, 9 mm, and has the gaster more broadly black; reddish yellow are on G1 at apical side and on G2 at base only (narrow above and broad on sides and beneath), G3 almost completely black. But the gastral colouration is considerably variable and slight difference is not important.

HW,HL,IODv,A3,P=100,54,31,23,176. IODs=10:9. OOD,Od,POD=1,4,3. A3=AWx4. A3,4,5=10,7,7. P,Ma,Mi,2(Ma),3(Ma)=100,18,6,24(22),32(29). RC=B, RL short, CV1=CV2x5, TCV:CV2=8:7. TCV nearly straight, angle about 95°.

Medio-apical prominence of clypeus is somewhat narrower than in albispinosum, an-

terior part of collar medianly shorter (but similarly widened laterally), microreticulation of mesoscutum more distinct (though not strong and not distinct in the usual sense).

Remarks. The present specimen is fairly close to *ssp. bakerianum* in that the gaster is medianly more or reddish, but differs from it in the wider form of SAT and in the comparatively distinct microsculpture on the mesoscutum. Possibly it forms a separate local race.

6. TRYPOXYLON FORMOSICOLA INORNATUM MATSUMURA ET UCHIDA, 1926

Trypoxylon inornatum Matsumura et Uchida, *Ins. Mats.*, 1: (1): 42, 1926 (♀, Okinawa).

Trypoxylon formosicola: Yasumatsu, *Trans. Nat. Hist. Sec. Formosa*, 28 (183): 447, 1938 (♀, Okinawa).

Trypoxylon inornatum: Tsuneki, *Etizenia*, 6:3, 1964 (compared with formosicola through descriptions).

Trypoxylon inornatum: Tsuneki, *Ibid.*, 13:7, 1966 (♀ ♂, redescr., figs.).

Trypoxylon formosicola inornatum: Tsuneki, *Ibid.*, 22: 5, 1967 (♀ ♂, comp.).

Trypoxylon formosicola inornatum: Tsuneki, *SPJHA*, 15: 34, 1981 (♀, ♂, Okinawa).

Specimens examined:

1 ♀, N. T. Taipokau, 15. VI. 1964, W. J. Voss & Wai Ming Hui, Malaise trap (BPBM)
1 ♀, Kowloon, 30. VI. 1965, Malaise trap, Lee Kit Ming & Hui Wai Ming (BPBM).

Remarks. In one of the specimens anterior transverse carina of SAT is completely lacking, while in the other very feeble trace of the carina only is observable. For comparison with the Ryukyu representatives measurements of the two specimens are given below:

HW, HL, IODv, A3, P=100, 48, 28, 22, 168; =100, 47, 27, 23, 168. IODs=10:8.5; 10:8.5. OOD, Od, POD=2, 4, 3; 2, 4, 3. A3=AW×3.8; AW×4. A3, 4, 5=10, 7, 6; 10, 7, 6.5. P, Ma, Mi, 2(Ma), 3(Ma)=100, 14, 6, 28(20), 30(27); 100, 15, 5, 26(18), 30(25).

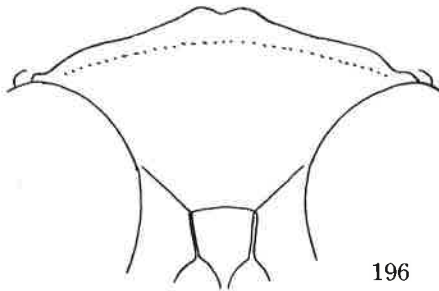
7. TRYPOXYLON TAKASAGO HONGKONGENSE SSP. NOV.

Trypoxylon takasago: Tsuneki, *SPJHA*, 15: 35, 1981 (♀ ♂, list of ref.).

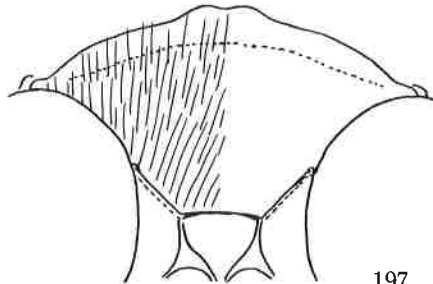
The present subspecies (♀) differs from the typical race in that the gaster is from apex of G1 to G3 red, IODs considerably larger, A3 relatively somewhat shorter, medio-apical prominence of clypeus less marked and more distinctly emarginate at apex.

♀, 10.5 mm. HW, HL, IODv, A3, P=100, 55, 24, 19, 146. IODs=10:9. OOD, Od, POD=1, 5, 2. A3=AW×3. A3, 4, 5=10, 7, 6.5. P, Ma, Mi, 2(Ma), 3(Ma)=100, 20, 7, 32(29), 30(37).

Clypeus: Fig. 196 (cf. Fig. 197 in typical race), with apical reflection stronger than in typical form, lamina on side of pronotum generally similar in form (cf. Fig. 198), but with apex somewhat more obtuse (probable variation).



196



197

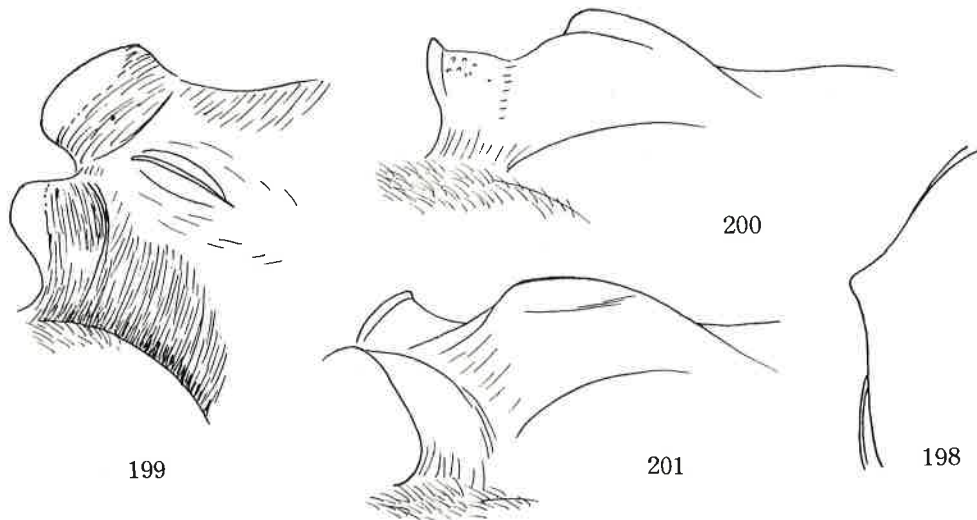
Fig. 196. T. takasago hongkongense ssp. nov., ♀, clypeus.

Fig. 197. T. takasago takasago Tsuneki, ♀, clypeus.

SAT-ASR similar to that of the typical race (cf. Figs. 199, latero-vertical view; 200, dorso-lateral view to see through PAF; 201, lateral view).

Legs similar in colour to the typical, but fore and mid tibial spurs somewhat brighter.

Frons distinctly microreticulate and very closely superimposed with medium-sized punctures; mesoscutum with strong plumbeous shine and finely and sparsely punctured.



Figs. 198-201. Trypoxylon takasago takasago Tsuneki, ♀

Propodeum with distinct lateral carinae, accompanied just inside with a fine, deep and strongly erenate furrow (the furrow stronger than in typical race), area dorsalis similarly structured and sculptured, but area apicalis incomplete, broadly open dorsally, without a zone of arcuate transverse striae in front of it, GSR roundly and highly raised, discoloured, sides of propodeum polished and, except femoral sinus, distinctly, but rather sparsely punctured, on posterior area punctures much sparser and finally replaced with fine oblique striae, posterior impressed area obliquely and very coarsely rugose-striate.

♂, unknown.

Holotype: ♀, Hongkong, N. T. Sai Kung Station, 31. III. 1965, W. J. Voss & Hui Wai Ming, Malaise trap (BPEM).

Remarks. One other local race, ssp. kumaso, of the present species is known to occur in Okinawa, the Ryukyus. As to the preceding species, T. formosicola Strand, also the same subspecies as that of Hongkong is known from Okinawa. The phylogenetic relationships of these two species and their local races seem to be an interesting problem.

At least as to formosicola the representative of Formosa is considered to be the final product, because it has a specially developed SAT. But what relation is present between the subspecies of formosicola and of takasago of Hongkong and of Okinawa? In order to solve the problem at least the exploration of the eastern coastal regions of China is necessary.

A P P E N D I X

(SOME SPECIMENS FROM OTHER ZOOLOGICAL REGIONS)

1. ON SOME SPECIMENS FROM MADAGASCAR

1. Trypoxylon catalactae madecassum Arnold, 1945

Arnold in his description of this species paid special attention to its strange structure of the male genital organs gave explanation with three figures, first with ventral view and second with dorsal and lateral views. His figures are certainly accurate, but in order to give inermations about the comparative morphology of the organs they are not sufficiently detailed. Fortunately the specimen sent from British Museum (Natural History) is a male, so that the observation, with my new method, on this interesting species, especially on the curious structure of the genitalia will supplementarily be given in the following.

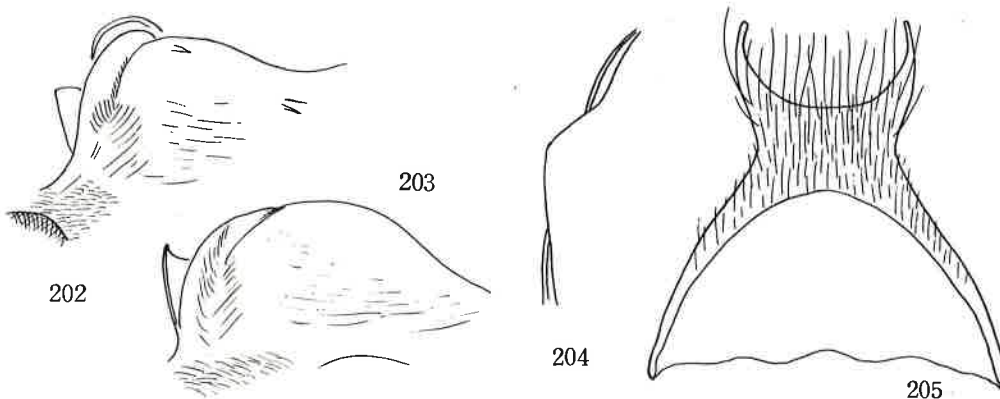
Main characters. ♂, about 13 mm. G1 flask-shaped, propodeum without lateral carinae, mesoscutum simply punctured, clypeus medianly shortly produced, with apex truncate, SAT tuberiform, anteriorly transversely carinate, area dorsalis incompletely enclosed with very broad furrows, gaster medianly dark red, legs black.

A2 and 3 roundly swollen out beneath, A3-5 strongly incrassate towards apex, A6 deeply excavated at base beneath and produced at apex, A7 also somewhat incrassate apically, 8-10 rounded beneath, 12-13 ferruginous with apex dark brown, 13 not modified, simply attenuate apically.

HW,HL,IODv,A3,Al3,P=100,55,27,18,15,148. IODs=10:8.5. OOD,Od,POD=2,8,5. A3 $\frac{1}{2}$ AWx3. A3,4,5=10,8,8. Al3=BWx2 and >Al2 but <Al1+12. P,Ma,Mi,2(Ma),3(Ma)=100,20,7,29(25),36(33).

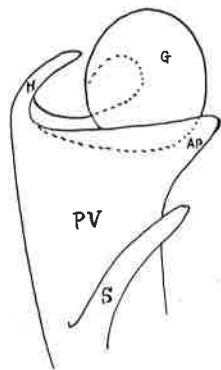
SAT broad and round tuberiform, apical margin provided with a roundly upcurved transverse high carina, between the carina and main body of SAT a comparatively broad shallow furrow present, roundly running down laterally which is from about mid point of its length fairly deeply and widely excavated, the carina at its lateral lower end attached to ASR; the structure in dorso-lateral view: Fig. 202, ditto but seen from more below: Fig. 203, medial carina of SAT very short. Apical margin of clypeus medianly with a large subquadrate prominence; pronotum thick, trituberculate on dorsum, lamina on side: Fig. 204; subalar area normal.

Propodeum without lateral carinae, area dorsalis with very wide lateral furrows, the furrow elliptic in form and deeply excavated, not reaching apex of the area (thus the area is not completely enclosed with the furrow), median furrow posteriorly widened, moderate in depth (slightly shallower than the lateral furrows), the three furrows

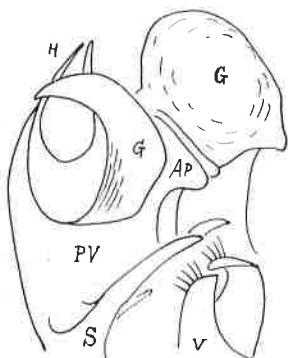


Figs. 202-205. Trypoxylon catalactae madecassum Arnold, ♂

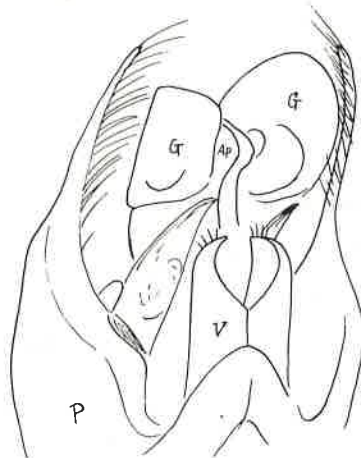
similar in width at each maximum, hence the raised disc between them very narrow, the surface including lateral furrows longitudinally, somewhat obliquely, coarsely striate, median furrow transversely, arcuately, very feebly and sparsely striate, outsides of the area and posterior inclination transversely, strongly and closely striate; gaster medianly dark red. Sternite 8: Fig. 205.



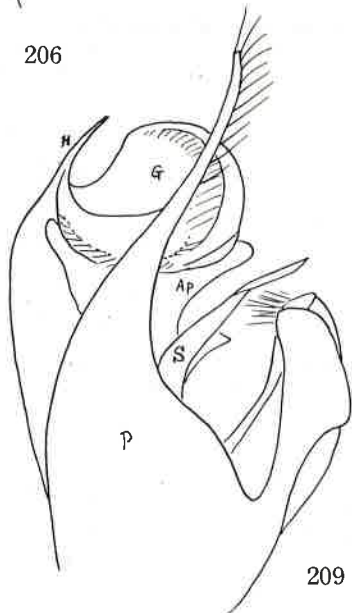
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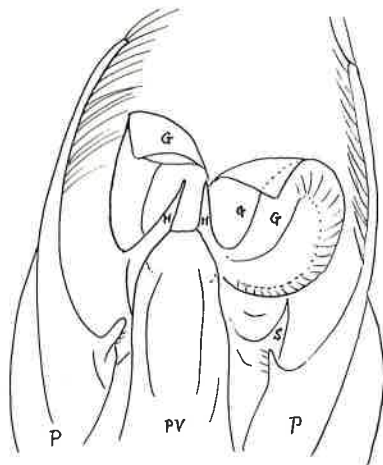
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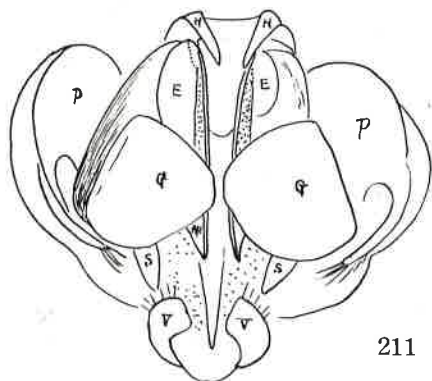
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209



210



211

Figs. 206-211.

Trypoxylon catalactae madecassum

Arnold, 1945, ♂,

genitalia.

According to the figures given by Arnold (1924 and 1945) the genitalia of this species seem to be very characteristic and exceptional, having a pair of large globular appendages near apex of penis valve. But his figures are only to show the general appearance of genitalia as one of the specific characters and no analytical explanation is given.

According to my observations it was made clear that the strange hemispherical auricular structure producing laterally from near the apex of penis valve is nothing else than the exceptionally developed sickle-shaped appendages and not the deformation of the shoulder of penis valve. Shoulder is certainly not developed.

The complicated structure of penis valve is schematically shown with Fig. 206 (right half seen from left side). Actual structure seen obliquely (from left side) from beneath: Fig. 207. PV is the main body of penis valve, Ap is its apex, H is the posterior horn, G is the globular appendage (modified sickle-shaped appendage), S is the side appendage, a very strange structure which I have never met with among the members of the genus so far examined. Genitalia as a whole in ventro-lateral view (but from more ventral side than in Fig. 207): Fig. 208, in lateral view: Fig. 209, in dorso-lateral view: Fig. 210, seen vertically from apex (with dorsal side upwards): Fig. 211.

The globular appendage consists of a broad lamella roundly rolled (Figs. 207 and 210), its inner side is completely closed, with surface rounded, but provided with a round carina (possibly the suture line). Apical process of main body of penis valve is similar in form to that of most other species, main body itself is much wider than usual, posterior horn is quite strange and exceptional, side appendage is also very curious as above mentioned. Paramere (P in the figures) with apex simple and very slenderly extended and provided with an elliptic process on inner margin before middle (against side appendage of penis valve, see Figs. 208 and 210), apically slenderly extended and fringed on inner margin with stiff hair. Volsella (V in the figures) lamellate, elongate rectangular, apical area curved inwards and on dorsal margin with a fringe of sparse long hair. Sternite 8 (Fig. 104) is also characteristic in form.

References:

Trypoxylon catalactae Arnold, Ann. Transv. Mus., 11: 13, 1924 (♂ ♀, S. Rhodesia).
Trypoxylon catalactae madecassum Arnold, Trust. Natn. Mus. S. Rhed., p. 9, 1945 (♂ ♀, Madagascar, figs.).

Specimen examined:

1 ♂, Tulcar Pr. Bevilany, 300 m, 12. IV. 1968, K. M. G. & P. D. (BMNH).

2. Trypoxylon hova Saussure, 1892

Trypoxylon hova Saussure, Hist. Madag., 20: 525, 1892 (♀, figs.).
Trypoxylon hova: Arnold, Trust. Natn. Mus. S. Rhed., p. 9, 1945 (♀ ♂, figs.).

Specimens examined:

2 ♀, Madagascar, Isalo Km. P. 713, 1000 m, 19. III. 1968, K. M. G. & P. D. (BMNH); 1 ♂, Madagascar, Majunga s. l., 25. II. - 3. III. 1968, K. M. Gaichard (BMNH).

2. TRYPXYLON ERRANS FROM EAST AFRICA

Trypoxylon errans: Arnold, Trust. Natn. Mus. S. Rhed., p. 7, 1945 (♀, Madagascar, keyed).

Specimen examined:

1 ♀, East Africa, Zanzibar, Nazi Moja, X. - XII. 1924, H. J. Snell (BMNH).

It is an interesting thing to us to know the characters of the African specimen of T. errans Saussure.

Colouration. G1 at apex and G2, 3, 4 each at base reddish yellow, each trochanter ferruginous and black above, fore tibia except folded side, fore tarsus except areolium, mid tibia at base and apex, hind tibia at base and mid tarsus at least on T1-4 (5 lacking) yellowish white; hind T1-3 black (T4-5 lacking), fore and mid tibial spurs whitish, hind ones brownish.

Measurements. HW, HL, IODv, A3, P=100, 53, 28, 22, 154. IODs=10:5.7. OOD, Od, POD=2, 6, 5. A3=AW 3.6. A3, 4, 5=10, 6.5, —. P, Ma, Mi, 2(Ma), 3(Ma)=100, 16, 6, 24(17), 27(24).

Remarks. In this specimens antennae and legs are largely lacking and remained part of hind leg is heavily stained.

3. ON SOME SPECIMENS FROM SIBERIA

1. Trypoxylon attenuatum Smith, 1851

Trypoxylon attenuatum: Gussakovskij, Trav. Ins. Zool. Acad. Sci. URSS, 3: 658, 1936 (S. & M. Europe, Caucasus, Asia Minor, N. Iran, S.W. Siberia).

Specimen examined:

1 ♂, USSR, Daghestan, 25. VII. 1962, —? (USNM).

2. Trypoxylon pacificum Gussakovskij, 1933

Trypoxylon pacificum Gussakovskij, Ark. Zool., 24 A, 10: 12, 1933 (♂ ♀, Ussuri).
Trypoxylon pacificum: Gussakovskij, Trav. Inst. Zool. Acad. Sci. USSR, 3: 665, 1936.
Trypoxylon pacificum: Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ. Ser. II, Nat. Sci., 6 (1): 33, 1956 (♀ ♂, Japan and Korea).

Specimen examined:

1 ♂, Okeanskaya, Siberia, 1923, Cockerell (USNM).

Remarks. This species is considered to be a local race of T. trochanteratum Cameron. Detailed treatment will be done in connection with the Revision of the Japanese species.

3. Trypoxylon okeanskayanum sp. nov.

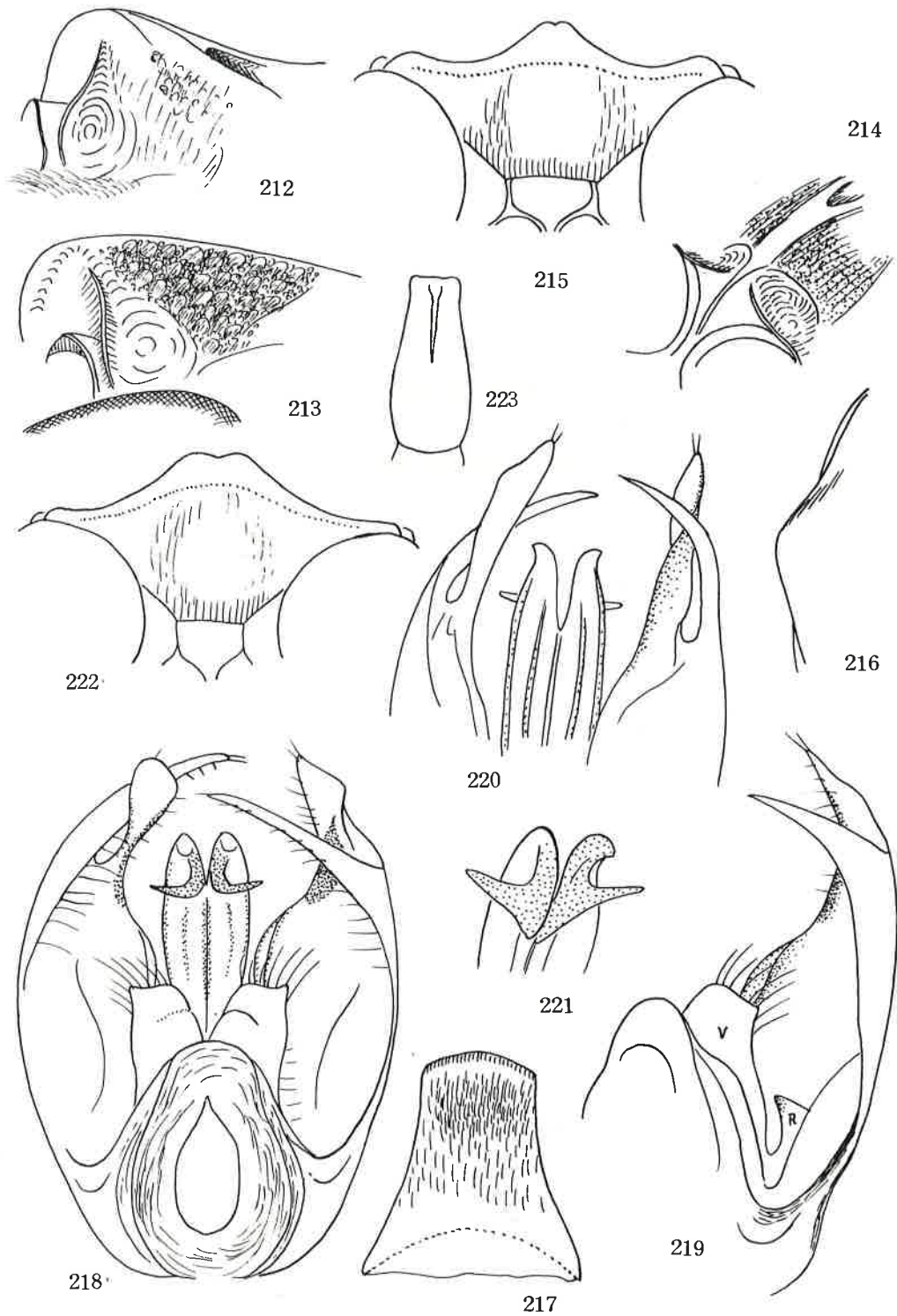
The present species runs, in the Gussakovskij's key to the Palaearctic species of Trypoxylon (1936), to T. varipes Pérez in both sexes, but differs from this markedly in the relative length of A3 and G1 (♀), in the form of antenna (degrees of incrassation towards apex) (♂) and in the form of clypeus and in the characters of the legs (♀ ♂) and can easily be separated from this species.

The present species is considerably similar in characters to T. clavicerum gussakovskiji n. (= pygmaeum Guss., nec Cameron), but differs from this in the much higher SAT, more indistinct lateral furrows of area dorsalis and in the form of apical margin of the clypeus.

In these respects it also considerably resembles T. clavicerum exiguum n., but is different from this in the form of apical margin of the clypeus and in the marginal furrow and surface sculpture of the area dorsalis.

♂. Length 6-7 mm. Black; ferruginous are apical margin of clypeus narrowly (extreme apex castaneous), mandible (apex reddish brown), articulations of legs, bases of all bitiae, fore tibia in front further, mid tibia at apex, all tibial spurs, fore tarsus and bases of mid T1. Hair silvery, on clypeus parallel.

HW:HL in frontal view 100:84, sides roundly convergent below, vertex not depressed, hind ocellus in a shallow hollow, fore ocellus in a deeper hollow, frons consi-



Figs. 212-223. *Trypoxylon okeanskayanum* sp. nov., 212-221 ♂, 222-223 ♀.

derably raised, but without median furrow, surface flattened, SAT high narrow nasiform and steeply inclined laterally (or stoutly carinated as a whole), dorsal ridge flattened, shining, at upper end longitudinally deeply excavated and at lower end narrowly produced and roundly and steeply inclined to IAA, at a short distance from the medial produced end of SAT and slightly below top ridge, a transverse carina arises and runs to postero-lateral part of ASR which is short, much below top level of SAT and rather inconspicuous, the transverse carina is also much lower than usual in the allied species and inconspicuous, but anterior sides of SAT, just behind the carina very deeply excavated. SAT-ASR in dorso-lateral view: Fig. 212, in lateral view: Fig. 213, in ventro-lateral view: Fig. 214, the structure is very similar to that of *T. clavicerum exiguum* m. Clypeus: Fig. 215, disc at base raised and medianly broadly roundly tectate (different from *clavicerum* spp. in this regard). Antenna very similar to that of *clavicerum* (but in this specimen A13 is lacking), occipital carina obsolete behind buccal cavity.

HW, HL, IODv, A3, A13, P=100, 60, 36, 14, —, 80. IODs=10:7. OOD, Od, POD=3, 4, 5. A3=AW×2 (of course widest view). A3, 4, 5=10, 7, 7. P, Ma, M1, 2(Ma), 3(Ma)=100, 43, 22, 64(54), 66(66). RC=B, Rl short, CV1=CV2×3.5, TCV≅CV2, angle about 120°.

Anterior part of pronotal collar very short, narrow ridge-like, slightly widened laterally, in frontal view dorsal margin gently roundly raised, with a small and feeble median tubercle, posterior part discoloured, appearing yellowish, lamina on side: Fig. 216. Subalar area normal. Propodeum with distinct lateral carinae, basal elevation of area dorsalis as long as postscutellum, obliquely inclined posteriorly, not conspicuous, lateral furrows very shallow and feeble, in oblique light only obscurely defined, practically absent, medial furrow moderately broad and fairly deep, area apicalis incomplete, lateral carinae only distinct, but medianly longitudinally carinated, GSR wide band-like, posteriorly inclined, not highly elevated.

Sternite 8: Fig. 217, without apical fringe of hair, only marginal area greyish. Genitalia seen from beneath: Fig. 218, right paramere and volsella in latero-ventral view: Fig. 219, apical parts of whole the organs vertically seen from dorsal side: Fig. 220, apical part of penis valve in ventro-lateral view: Fig. 221. Paramere asymmetrically, deeply bifid at apex, inner lobe flattened and lamellate, outer lobe slender (Figs. 218, 220), main body of paramere on inner side expanded and half rolled as usual, volsella not long stretched, fringed with long stiff hair at apex, accompanied at base behind, separated with a notch, with a short protuberance (Fig. 219, R), penis valve without shoulder, but with a pair of half-developed sickle-shaped appendages (Figs. 218 and 221).

Frons microcoriaceous and closely superimposed with fine punctures, mesoscutum similar, but punctures posteriorly finer (but not sparser), both not completely mat, area dorsalis at base obliquely and coarsely, on median furrow transversely and arcuately, finely and closely striate, disc obliquely, finely and fairly closely striate and on outer area finely reticulate, intervals of striae feebly punctured, such sculpture of the disc very feeble, under high magnification (60-80×) only defined, under low magnification appears obscurely microsculptured and half mat. Sides shining, on dorsal part obliquely finely closely striate and on posterior part finely punctured, punctures sparse below.

♀, alightly larger, presumably 9-10 mm (gaster from G2 apically lacking). Similar to ♂ in general, except sexual characters. Clypeus: Fig. 222, similarly raised at base and roundly tectate on disc, apical reflection somewhat stronger. SAT-ASR similar, pronotal lamina also similar, G1: Fig. 223. Head in frontal view somewhat longer, W:L=100:90. Measurements:

HW, HL, IODv, A3, P=100, 56, 36, 18, 80. IODs=10:5. OOD, Od, POD=3, 6, 7. A3=AW×2.5. A3, 4, 5=10, 7, 6. P, Ma, M1, 2(Ma), 3(Ma)=100, 41, 27, —, —. RC=B, Rl short, CV1=CV2×3.5. TCV≅CV2, angle about 120°.

Punctuation and sculpture generally similar.

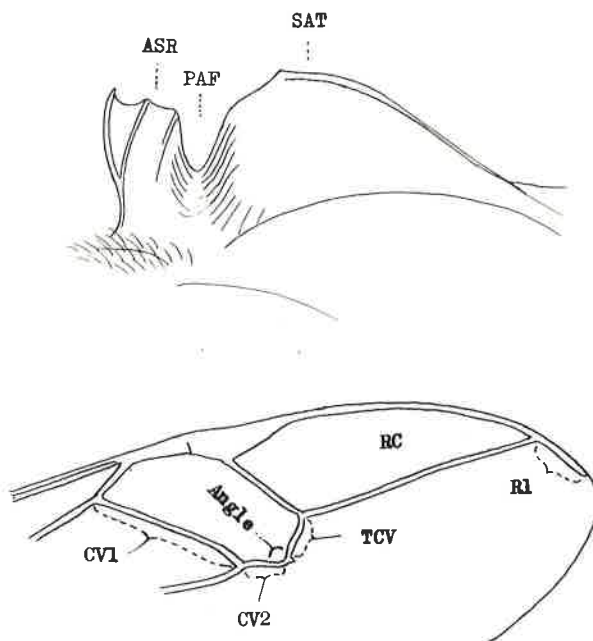
Holotype: ♂, Siberia, Okeanskaya, VIII. 1923, Cockerell (USNM).

Paratypes: 1 ♀ 1 ♂, Siberia, Kongaus, VIII. 1923, Cockerell (USNM).

Remarks. All the specimens are incomplete. In holotype left A5-13, right A12-13, left fore femur-apex, left mid T2-5 (left mid leg dropped and glued on to card), right mid T5, left hind T4-5, right hind femur - apex are lost, and parts of right wing are apex of gaster are eaten by insect. In ♀ left A4-12, right A6-12, G2-6, right fore femur - apex, left hind femur - apex, apical part of mid and hind tarsi are lacking; in paratype ♂ greater part of antennae and legs and parts of wings are eaten by insect.

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