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

II. REVISION OF THE TYPE SERIES OF THE SPECIES DESCRIBED
BY F. SMITH, P. CAMERON, C. G. NURSE, W. H. ASHMEAD,
R. E. TURNER AND O. W. RICHARDS

By K. TSUNEKI

M I S H I M A

OCTOBER 25, 1978 *b*

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S y n o p s i s

The following synonyms are confirmed (* SYN. NOV.):

1. Trypoxylon bicolor Smith, 1856
Synonyms: (1) petiolatum Smith, 1857*, (2) rejector Smith, 1870* (possibly ♂), (3) obsonator obsonator Smith, 1873*, (4) accumulator Smith, 1875, (5) javanum Taschenberg, 1875*, (6) tinctipenne Cameron 1889, (7) cognatum Cameron, 1897*, (8) erythrozonatum Cameron, 1902* (9) responsum Nurse, 1905*, (10) obsonator tropicale Tsuneki, 1961*.
Of these (4), (9) and (10) are complete synonyms; (2), (5), (6) and (7) are black-legged form that appears occasionally in the male only; (1) and (8) are possibly the females of black-legged form, having the legs slightly whitish, and (3) is a subspecies.
2. Trypoxylon errans Saussure, 1867
Synonyms: (1) intrudens Smith, 1870*, (2) canaliculatum Cameron, 1889*, (3) philippinense Ashmead, 1904*, (4) gardineri Cameron, 1907 (5) indicum Menke, 1976* (= ornatipes Cameron, 1913, nec Fox, 1891), (6) tanoi Tsuneki, 1967*.
3. Trypoxylon buddha Cameron, 1889 (♀)
Synonyms: (1) monstruosum Tsuneki, 1974 (♂)*, (2) buddha tarawanum Tsuneki, 1976*.
4. Trypoxylon orientale Cameron, 1904 (♀)
Synonym: (1) montanum Schulz, 1906* (= placidum Cameron, 1904, ♂ nec Smith, 1864).

The following new combinations are resulted:

- A. Trypoxylon bicolor obsonator Smith, 1873
The subspecies that have been combined with T. responsum Nurse are changed as follows:
- B. Trypoxylon regium regium Gussakovskij, 1932 (Ussuri); T. r. hatogayuum Tsuneki, 1956 (Japan); T. r. ryukyuense Tsuneki, 1966 (Okinawa) T. r. taiwanum Tsuneki, 1967 (Formosa).

In the syntypes of the species described by F. Smith and P. Cameron confusion of the sex and identification of the specimens is sometimes discovered.

I N T R O D U C T I O N

The species of the genus Trypoxylon described by F. Smith, P. Cameron, C. G. Nurse and W. H. Ashmead from the Oriental Region during the periods 1856-1913 attain a considerable number. They form the basis of the subsequent investigation of the genus. Unfortunately the descriptions made by these authors are so simple and superficial that frequently the difference between some of the species is quite obscure and frequently more than one species can fall within the category of one of their species.

On the other hand, C. T. Bingham in his Hymenoptera, Vol. I of the Fauna of British India synonymized some of their species and gave a key to the species known from the Indian Subcontinent up to his days. But the characters used by him in his key are sometimes variable or indistinct ones and the decided separation between some of the species still remains difficult or impossible.

Such being the case, the species later published that were described in comparison with their species have also become uncertain in regard to the true characters. Frequently it seems quite questionable whether the species later listed by some authors under a certain of their species names belongs really to one and the same species or not. Some prudent authors, therefore, gave question marks to their species and attempted independently the descriptions of their related specimens as new. This is certainly a more clever way to avoid the invisible confusion than to make an uncertain identification. As a result it is easily presumed that a considerable number of synonyms and misidentifications do exist among the prevailing names of the species known from the Oriental and the related Regions. Thus a revision and redescription of their species with as many illustrations as possible have been desired. However, the work is not an easy matter, especially to those who are not easily accessible to the types of their species, and, moreover, the work is a rather charmless one, especially to the young investigators, because it is a rewardless, remedial or supplementary work for the other entomologists and without originality. At any rate, no one has touched the work. But the work is necessary to make the foundation to the subsequent investigation solid and to avoid further confusion in taxonomy of the genus.

By the kind aid of Dr. A. S. Menke, Systematic Entomology Laboratory, U. S. Department of Agriculture, Washington, D. C. and the Directors of British Museum (Natural History) and Hope Department of Entomology, University Museum of Oxford, I was given a chance to revise the type material of the Oriental species described by the previous authors without visiting the Museums at which they are preserved.

During the present work I am much indebted to Mr. C. B. Vardy of British Museum (Natural History) and to Mr. M. O'Toole of University Museum of Oxford, regarding the annotations to and the loan of the type material, to whom I express my cordial thanks. I am also indebted to Dr. A. S. Menke, U.S.A., Dr. W. J. Pulawski, Poland, Prof. M. Yamada and Dr. S. Takagi, both Hokkaido University and Dr. Y. Murakami, Kyushu University, for their kind aid in regard to the literature.

Abbreviations. The abbreviations used in the present Part are mostly the same as those of Part I, but some new additions are made:

- SAT ... Supraantennal tubercle, a nasiformed or tuberculate elevation at above antennal base.
- ASR ... Antennal socket rim, raised inner-dorsal part of rim of antennal socket.
- PAF ... Postantennal furrow, the furrow between ASR and SAT.
- GSR ... Gastral socket rim, in reality dorsal rim of socket of lifting muscle of gaster.
- TCV ... Transverse cubital vein of fore wing.
- CV1 and CV2 ... Abscissa 1 and Abscissa 2 of cubital vein of fore wing.
- PIS ... Puncture interspace.
- PD ... Puncture diameter.

On some characters. (1) OOD:Od:POD. The method of measurement adopted in Part I was proved to be unpractical. So from Part II on they are measured on the bases of exact eye margin and margins of the so-called pupil. (2) As a result of measurements it was confirmed that relative IOD at the bottoms of eye incisions and relative location of spiracles of gastral petiole are very constant and similar not only within a species, but also between them, so that the values are omitted from the measurement table. (3) Relative width and form of eye incision are sometimes characteristic of the species and in such a case they are treated in the description. (4) In the venation of fore wing relative site of apex of radial cell as against wing apex is very constant to and characteristic of the species. They can roughly be classified into 3 types, namely B-type (e.g. bicolor), C-type (e.g. coloratum) and M-type (e.g. malais-ei), as given in Fig. 1. Similarly relative length of CV1 and CV2 is fairly constant and can be used to separate species or species-groups. Curvature of TCV and relative

length of CV2 to TCV is fairly stable within a certain narrow extent and the angle formed by them is sometimes of use to characterize the species.

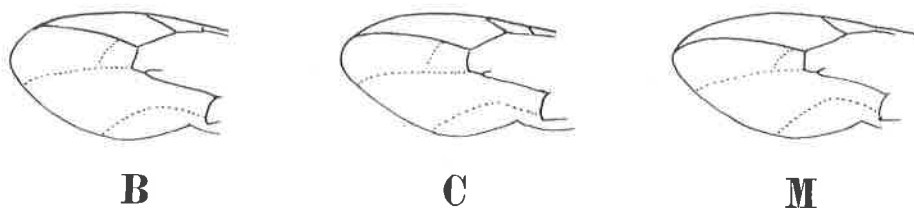


Fig. 1. Types of radial cell. B...B-type, C... C-type and M...M-type.

I. SPECIES DESCRIBED BY F. SMITH

1. TRYPOXYLON BICOLOR SMITH, 1856

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

The present states of syntype specimens.

There are two syntypes of T. bicolor in the collection of British Museum.

(1) A male specimen of about 14 mm, pinned at posterior margin of mesoscutum with a 18 mm fine pin of about No. 1 in thickness and mounted on a slender piece of white polyethylene compound. In the specimen both antennae are lacking, but otherwise complete. Labels accompanied are from top: A 7 mm round red-circled type label, with "Type" pressed at the centre; a 8 mm round label of white card paper, with "55 9" in 2 lines on the surface and "Sing" on the back, both handwritten with black ink (? Sept. 1855, Singapore); a name label, 14x7 mm, with "bicolor Sm. Type" handwritten in 2 lines (but not by Smith); a Museum reference label with "B. M. TYPE" pressed in 2 lines and "21. 455" handwritten in below.

(2) A similarly, but more nicely prepared specimen with much thicker pin and mounted on a slit of card paper. It is also a male, nearly complete, only apical 1 or 2 joints of mid and hind tarsi are lacking, but the gaster and right hind leg are glued in place with gelatine paste. I dissected apical 2 segments and they are, together with genitalia, mounted on the card paper point and attached to the pin. Labels: A 8 mm round label, with "SING" handwritten on the surface (but without numerals on the back); A reference label, "Smith coll. pres. by Mrs. Farren White, 99 - 303" pressed in 4 lines; a bluish purple name label (usually used by Smith), with "bicolor Sm." in a line.

In the original description Smith describes the specimens as "female". The Javanese syntype(s) is not found among the specimens, it may be a female, but judging from the description of this species the specimen used by Smith is possibly a male, because he says "abdomen ... the first segment ... the apex swollen and ferruginous, as well as the three following segments, the three apical segments black", showing that the abdomen is 7-segmented. Taking into consideration the fact above mentioned the two specimens well agree in characters with the original description of T. bicolor. Based on the more complete condition and the name label by Smith the second specimen is designated as the lectotype.

Redescription.

Diagnosis. ♂, 14-14.5 mm, black, gaster from apex of petiole to segment 4 ferruginous red; all tibiae at base, rest of tibia and tarsus of fore leg largely, those of mid leg partly yellowish ferruginous, antenna black, with ultimate joint longer than 3, but shorter than 4 preceding joints united, hairs silvery, SAT low broad nasiform, IODs nearly 6:5, OOD:POD=1:1, mesoscutum smooth, finely, sparsely punctured, propodeum without lateral carinae, area dorsalis with shallow and weak lateral furrows, gastral petiole long, flask-shaped, in fore wing radial cell not closely reaching apical margin of wing, CV1 about 4.5 times as long as CV2.

Supplement. Mesothorax with plumbeous shine, antennal flagellum very slightly brownish beneath, mandible ferruginous, apically brownish, collar of pronotum with posterior part somewhat brownish, but not completely discoloured, tegula of wing semitransparent ferruginous, knees narrowly, fore tibia in front except apical fourth (extreme apex again ferruginous), all tibial spurs, fore tarsus (apically slightly brownish), basal portions of joints 1 and 2 of mid tarsus, base of hind metatarsus and all claws yellowish pale ferruginous; apices of coxae, trochanters and of each tarsal joint somewhat brownish, wings hyaline, stigma and veins dark brown. Silvery hair comparatively dense, on SAT also dense, silky white, leaving glittering medial carina only, gaster covered with short somewhat ferruginous pubescence.

Head from above twice as wide as long at inner orbit, ocelli in an equilateral triangle, the fore very slightly smaller, vertex slightly depressed and raised into transverse ridge on the line connecting posterior margins of eyes, without interocular elevation, fore ocellus in a depression whence moderately deep frontal furrow runs down, on both sides of it frons gently roundly raised, eye incision comparatively narrow. Head in frontal view: Fig. 2, SAT on lower portion roundly inclined laterally, but nearly flatly so on upper portion, with stout carina in middle, running up till about $\frac{3}{7}$ of the distance to fore ocellus, SAT in lateral view: Fig. 3, ASR highly raised, with surface tricarinate, PAF deep, nearly flat-bottomed (Fig. 4), but in paralectotype not so deep, somewhat up-curved (Fig. 5, seen through the furrow), clypeus: Fig. 6, with disc gently roundly raised at base, but not tectate, with hair not convergent towards medial line, occipital carina complete, but weak beneath head, not emarginate behind buccal cavity, maxillary pulpus with joints 4 and 5 equal in length, 6 much longer; antennal joints 3, 4, 5 with relative length 10, 7.5 and 7, joint 3 in widest view appr. 2.8 times as long as its maximum width, ultimate joint: Fig. 7. Pronotum: Fig. 8, with laminae on sides acutely pointed at apex, mesoscutum with admedian line and notauli weakly impressed, not reaching middle of scutum, parapsidal suture in a fine impressed line, about $\frac{1}{3}$ the length of scutum, conspicuous by its pure black, mesopleuron without pent-roof structure, propodeum with area dorsalis enclosed with shallow but distinct grooves and medianly shallowly canaliculate, canal widely enlarged posteriorly (Fig. 9), posterior inclination with deep median furrow, wedge-shaped in dorsal view, area apicalis not distinctly margined anteriorly, covered with arcuate striae, GSR weakly roundly produced; gastral segments 1-3: Fig. 10, in lateral view: Fig. 11, sternite 8: Fig. 15; genitalia from beneath: Fig. 12, seen obliquely from side: Fig. 13, paramere split into 2 lobes apically, one is long, slender, weakly bent at mid point, the other short, subtriangular, lamellate and embraced from inner dorsal side by the lamellate expansion of basiparamere, volsella spatulate, penis valve strongly curved apically, seen vertically from dorsal side: Fig. 14.

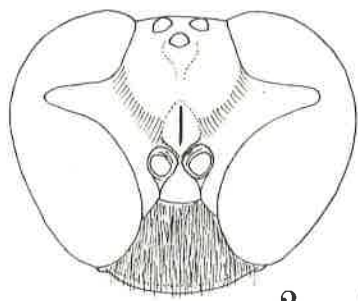
Vertex finely closely punctured, averaged PIS somewhat smaller than PD and very delicately microcoriaceous, frontal elevations more distinctly microcoriaceous, with superimposed punctures larger and sparser, median furrow also weakly sculptured and punctured, not shining; mesoscutum and scutellum minutely, not deeply and very sparsely punctured, averaged PIS 2-4 times as large as PD, with surface smooth but not strongly shining (due to plumbeous shine), hair-bearing punctures on mesopleuron much finer and sparser; dorsal aspect of propodeum with a longitudinal series of short transverse striae on each side, area dorsalis at base obliquely striate, medial furrow anteriorly and lateral grooves posteriorly transversely striate, outside the area surface smooth and sparsely covered with punctures, sides of propodeum finely sparsely punctured. Ventral side of gastral petiole also covered sparsely with fine points.

Remarks. The lectotype male is somewhat abnormal to the species. It has antennal joint 3 slightly longer and gaster more broadly reddish than usual, triangular lobe of paramere of genitalia also somewhat broader and the state of lateral furrows of area dorsalis represents only one of variations in the species. This species is rather plastic in some characters, details including variations will be treated in the subsequent Part, but the descriptions of other synonymic species dealt with lat-

Explanation to Figs. 2-13.

Figs. 2-13. *Trypoxylon bicolor* Smith, ♂.

2: Head. 3: SAT and ASR (from left side). 4: Ditto seen through left PAF (lectotype). 5: Ditto (paralectotype). 6: Clypeus and supraclypeal area. 7: Apical part of antenna. 8: Pronotum from above. 9: Area dorsalis. 10: Gastral segments 1-3. 11: Ditto (lateral). 12: Genitalia from beneath. 13: Ditto, somewhat obliquely from side.



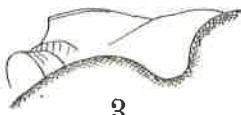
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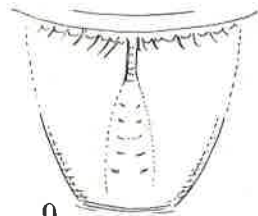
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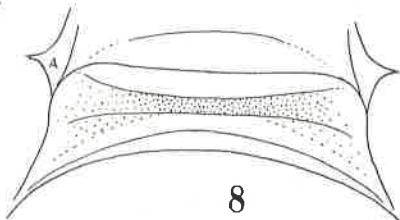
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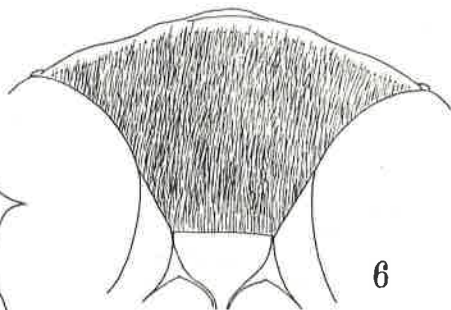
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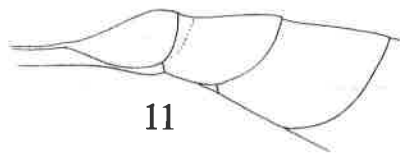
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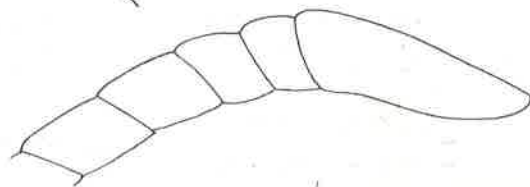
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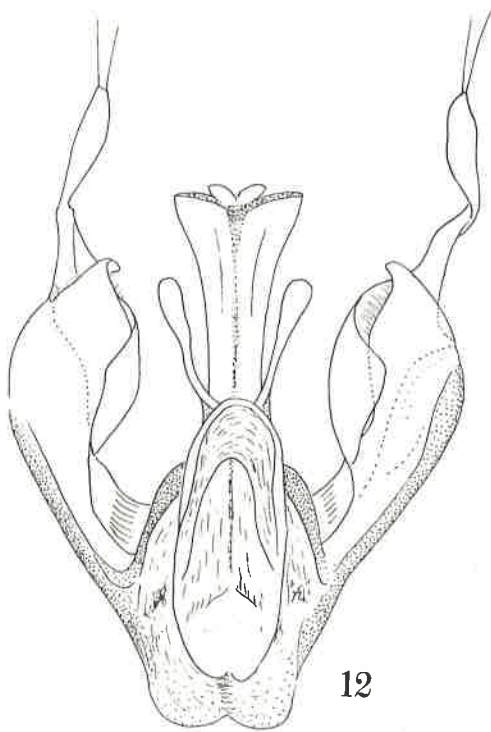
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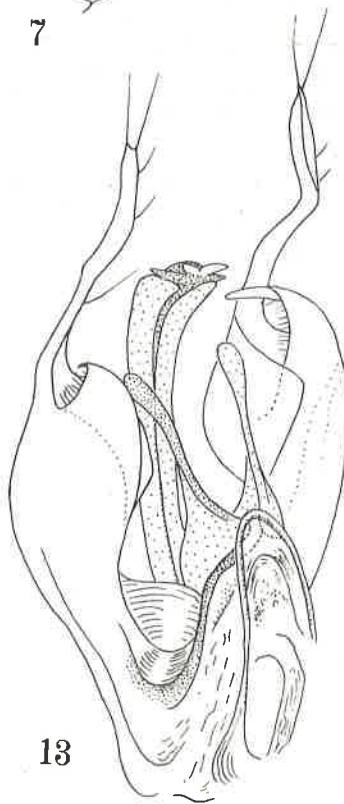
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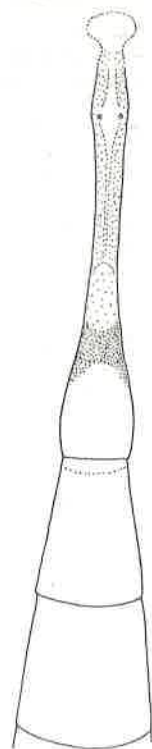
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10

er in the present Part will furnish some knowledge about the matter.

The female of the present species is generally slightly larger than the male (the lectotype male is rather somewhat larger than usual), with head seen in front much less roundly convergent below (Fig. 16, in the specimen from Malaya), with clypeus longer, and roundly pectate on basal raised area, hairs covering there distinctly convergent towards medial line, antenna ferruginous beneath, with joints longer (joint 3 about 5 times as long as wide at apex), ultimate joint not deformed, otherwise except sexual characters as in the male. (As to variation see Appendix.)

2. TRYPOXYLON PETIOLATUM SMITH, 1857
(= T. bicolor Smith)

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

State of the lectotype (present designation). A single specimen preserved at Hope Department of Entomology, University Museum of Oxford is a female, pinned at mesoscutum with a 30 mm nickel plated insect pin of No. 3 in thickness. Left antenna from joint 4 apically and gastral segments 2 and 3 are lacking, segments 4 - 6 are glued on to the top one of the labels. It is not particularly prepared, with mandibles closed, but with wings opened. Three labels, from top: a 7 mm round label, with "SAR" (Sarawak) written by the hand of Wallace or his assistant; name label, 26 × 10 mm, pale purple paper, with "Trypoxylon petiolatum Smith" written in 3 lines by the hand of Smith with black ink; Museum label, "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines, with "petiolatum Sm." handwritten in on top.

There is no doubt that the specimen is a female of T. bicolor. But as it is different in sex and somewhat in colour of legs from the types of bicolor and, moreover, different also in locality a detailed description is tried on this occasion.

Redescription.

Diagnosis. Already given in the remarks to T. bicolor; to be added is that fore and mid tibiae except base in front dark brown and fore and mid tarsal joints 3-5 (5 except apex and claws) also strongly brownish.

Supplement. Length from head to apex of petiole 9.3 mm, 3 apical segments about 3 mm (Smith gives as 7 lines, about 14.7 mm). Black, from thorax posteriorly, especially propodeum, strongly shining (due to loss of hair), but head is not (Smith says very smooth and shining). Mandible dark lustreless brown, collar of pronotum with posterior part discoloured, bright brown, tegula semitransparent brown; gaster from apex of petiole to base of segment 4 reddish ferruginous (partly followed Smith), base in front of fore and mid tibiae narrowly brownish white, the colour at base of hind tibia brighter and slightly wider, tibial spurs yellowish white, fore and mid tarsal joints 1 and 2 pale yellowish white (mid ones pale brownish at apex), apex of ultimate tarsal joints and claws of all legs ferruginous, fore tarsal joints 3 and 4 and all arolia brownish, hind tarsus completely black. Wings hyaline, veins and stigma dark brown. Dense appressed hair on head silvery, long hair on thorax silky white.

Hind ocelli not in hollows, a weak fine interocellar carina present, post-ocellar area transversely bluntly ridged and flatly inclined towards occipital carina, fore ocellus slightly smaller and in a hollow whence frontal furrow runs to SAT, elevations on frons moderately high, higher than in types of bicolor, SAT rounded, low tuberculate, but on posterior half lateral inclinations flattened, top carina incised behind middle (possibly a variation), supraantennal area seen obliquely from side: Fig. 17, ASR with expanded surface transversely weakly striate, PAF moderately deep, upcurved (Fig. 17), SAT seen in profile: Fig. 18 (Ur... ASR seen from beneath), clypeus and antennal area: Fig. 19, apical margin of clypeus broadly subtruncate in mid area and broadly reflected anteriorly, disc at base gently roundly elevated and medianly tectate, medial ridge not strong. Measurements in Table 1. IODs appr. 4 : 3, A3 5 times as long as wide at apex, lamina on left side of pronotum: Fig. 20, area dorsalis distinctly enclosed with furrow, but the furrow fine, shallow and anteriorly much weaker, wedge-shaped deep furrow on posterior inclination reaching anterior margin of area apicalis which is completely enclosed with carina, the carina anteriorly low, but postero-laterally highly raised, GSR simple parallel-sided carina, not roundly expanded posteriorly. Gaster petiole flask-shaped, very long (Table 1). Hind coxal organ distinctly produced (Fig. 21). In fore wing CV2 about 1/6 the length of CV1 and 2/3 of TCV.

Vertex and frons microcoriaceous and superimposed with fine punctures, microscu-

Table 1. Measurements of bodily parts and antenna of the type material of the species described by the previous authors.

Species	S	T	Locality	BD	IODv	IODc	(OD Od POD)	A3	(L/W)	Aul	(l/w)	Pet	(Ma Mi 2 3)
bicolor	♂	L	Singapore	14.5	25.0	22.0	(1 1.3 1.0)	17.0	(2.7)	26.0	(6.5)	148	(17.0 6.0 34 36)
"	♂	P	"	14.0	26.0	22.0	(1 1.5 1.1)	-	-	-	-	150	(16.0 5.4 36 36)
"petiolatum	♀	L	Sarawak	14.7	26.5	19.0	(1 2.0 1.7)	25.0	(5.0)	16.0	(3.0)	180	(16.0 5.0 - -)
coloratum	♀	L	Sarawak	16.5	22.0	17.0	(1 2.4 1.2)	29.0	(4.9)	17.0	(2.8)	180	(17.0 5.2 28 32)
"	♀	P	"	16.0	21.4	15.0	(1 2.7 1.3)	28.0	(4.7)	16.0	(2.7)	174	(17.5 5.0 32 36)
eximium	♀	L	Aru	17.5	23.0	20.0	(1 3.3 2.3)	27.0	(5.4)	17.0	(3.1)	164	(20.0 5.5 34 34)
"	♀	P	Key	(17.5)	22.0	20.0	(1 3.3 2.0)	27.5	(5.1)	17.0	(3.1)	162	(22.0 6.0 - -)
" (bicolor)	♀	L	Makassar	17.7	26.0	18.0	(1 2.0 1.5)	24.0	(4.4)	17.0	(3.1)	164	(18.0 5.5 32 34)
" B.M.No.1	♀	P	Key	19.0	22.0	20.0	(1 2.7 2.0)	28.0	(5.0)	17.4	(3.1)	174	(19.4 5.5 34 36)
" B.M.No.2	♀	P	Key	19.0	22.0	19.0	(1 2.4 1.5)	28.0	(5.0)	17.4	(2.9)	160	(22.0 5.8 34 40)
elegantulum	♀	L	Celebes	15.0	25.0	18.0	(1 2.7 1.3)	26.0	(4.3)	16.0	(2.4)	152	(23.0 6.0 34 42)
ferox	♀	L	Celebes	12.0	28.0	12.0	(1 2.7 1.5)	24.0	(4.0)	18.0	(2.6)	164	(22.0 8.0 28 32)
"	♂	P	"	9.5	24.0	20.0	(1 2.7 1.7)	18.0	(3.2)	26.0	(2.8)	154	(18.0 5.6 40 44)
gracilescens	♀	L	Celebes	13.5	24.0	16.0	(1 2.6 1.6)	26.0	(4.6)	16.5	(2.7)	154	(18.0 6.0 32 36)
providum	♀	L	Bachian	22.0	24.0	17.0	(1 1.5 1.0)	30.0	(5.8)	16.5	(3.3)	184	(20.0 5.5 30 36)
"	♀	P	Gilolo	20.0	24.0	18.0	(1 1.7 1.0)	27.5	(5.1)	-	-	178	(18.0 5.5 30 32)
" (eximium)	♀	L	Bac.o Gil.	(20)	22.0	18.0	(1 3.5 2.0)	28.0	(5.0)	17.0	(2.8)	172	(18.5 5.5 - -)
" (eximium)	♀	L	New Guinea	20.0	21.0	20.0	(1 4.0 2.5)	28.0	(5.2)	18.0	(3.0)	178	(20.0 6.0 28 32)
placidum	♀	L	(Mysol)	8.0	26.0	13.0	(1 2.5 2.0)	22.0	(3.7)	16.0	(2.2)	-	-
gracillimum	♂	L	Mysol	15.0	24.0	20.0	(1 2.0 1.5)	16.0	(2.7)	30.0	(3.8)	160	(14.0 5.5 30 32)
intrudens	♀	L	India	8.5	30.0	15.3	(1 2.0 2.3)	22.0	(4.2)	16.5	(2.2)	136	(22.0 7.0 28 34)
obsonator	♀	L	Japan	(14.5)	26.0	20.0	(1 2.0 1.8)	22.0	(4.4)	15.0	(2.7)	156	(18.0 6.0 28 32)
accumulator	♀	L	India	14.0	26.0	18.5	(1 2.0 1.5)	27.0	(5.0)	16.5	(3.0)	176	(16.0 5.5 28 32)
"	♀	P	"	15.0	-	-	-	-	-	-	-	?	(19.0 5.5 32 35)
buddha	♀	L	India	8.5	30.0	18.0	(1 4.5 6.0)	18.0	(3.0)	15.0	(1.7)	126	(20.0 9.5 62 60)
canaliculatum	♀	L	India	10.0	28.0	15.0	(1 2.2 2.3)	23.0	(4.3)	16.0	(2.1)	140	(20.0 7.0 30 32)
tinctipenne	♂	L	India	12.0	31.0	24.0	(1 1.2 1.3)	-	-	-	-	146	(16.5 6.5 34 36)
coematum	♂	H	Himalaya	(11)	31.0	24.5	(1 1.0 1.5)	15.5	(1.8)	-	-	-	-
pygmaeum	♂	H	India	4.5	34.0	21.0	(1 3.0 3.5)	10.0	(1.5)	17.0	(1.4)	84	(34. 24.0 68 56)
mandibulatum	♂	A	Bengal	5.3	37.0	24.0	(1 3.0 4.0)	11.0	(1.4)	17.0	(1.5)	76	(36. 24.0 76 56)
varipilosum	♀	H	Singapore	15.5	21.0	18.0	(1 6.0 2.5)	30.0	(6.0)	-	-	180	(15.0 4.5 26 32)
geniculatum	♀	L	Khasia	11.5	28.0	14.5	(1 2.7 2.0)	25.0	(4.1)	18.0	(2.2)	154	(14.0 6.0 30 32)
" BMNH	♀	S	"	11.0	26.0	14.0	(1 2.7 2.0)	24.0	(4.5)	18.0	(3.1)	150	(16.0 6.0 30 32)
" UHO No. 1	♀	P	"	?	28.0	14.0	(1 2.1 2.0)	24.0	(4.7)	18.0	(2.3)	-	-
" UHO No. 2	♀	S	"	?	28.0	14.0	(1 2.4 2.0)	24.0	(4.3)	18.0	(2.4)	152	(16.0 5.8 - 32)
trochanterat.	♀	L	Khasia	12.5	29.0	18.5	(1 3.0 2.5)	25.5	(4.0)	19.0	(2.4)	118	(26. 14.0 60 42)
" BMNH	♀	P	"	11.5	29.0	20.0	(1 2.7 2.5)	24.5	(4.0)	20.0	(2.5)	114	(28. 14.0 54 46)
" UHO No. 1	♀	P	"	11.5	30.0	20.0	(1 2.7 2.5)	24.0	(4.0)	21.0	(2.6)	116	(26. 15.0 52 46)
" UHO No. 2	♀	P	(? "	?	30.0	18.5	(1 3.0 2.5)	24.5	(4.0)	-	-	-	-
" UHO No. 3	♀	P	(? "	?	30.0	18.0	(1 2.5 2.3)	24.5	(4.1)	-	-	-	-
annulipes	♀	H	Sarawak	16.5	22.0	19.0	(1 2.7 1.5)	28.0	(5.0)	17.5	(2.8)	182	(17.5 5.5 30 32)
placidum C.	♂	L	Assam	12.0	28.0	26.0	(1 1.0 0.9)	17.0	(2.7)	23.0	(2.0)	142	(16.0 6.4 30 30)
"	♂	P	Assam	13.0	30.0	26.5	(1 1.0 1.0)	18.0	(2.8)	-	-	160	(12.0 5.2 28 30)
"	♂	-	Malaya	12.0	30.0	27.0	(1 1.2 1.0)	18.0	(2.7)	22.0	(2.8)	164	(13.0 4.0 26 28)
fulvocollare	♀	H	Assam	15.0	21.0	21.0	(1 2.5 1.0)	26.0	(4.3)	19.0	(3.2)	130	(24.0 8.5 34 48)
khasiae	♀	H	Assam	20.0	21.0	18.0	(1 3.2 1.5)	31.0	(6.0)	-	-	-	-
orientale	♀	L	Assam	15.0	25.0	24.0	(1 2.0 1.5)	-	-	-	-	175	(14.0 5.0 28 30)
testaceicornes	♀	H	India	6.0	28.0	22.0	(1 6.0 5.5)	19.0	(3.5)	14.0	(2.0)	86	(28. 18.0 70 56)
gardineri	♀	L	Seychelles	10.0	28.0	16.0	(1 3.0 2.2)	22.0	(4.5)	16.0	(2.1)	160	(18.0 6.0 28 32)
"	♀	P	"	9.0	28.0	15.5	(1 3.0 2.3)	21.5	(4.5)	15.5	(2.0)	159	(16.0 5.5 28 28)
ornatipes	♀	H	India	?	30.0	16.0	(1 2.0 2.0)	21.0	(4.0)	-	-	-	-
(simulaense)	♀	S	India	9.0	27.0	19.0	(1 3.3 2.5)	14.0	(2.2)	19.0	(2.0)	112	(28. 13.5 48 46)
"	♀	S	"	9.5	29.0	20.0	(1 3.3 3.0)	14.0	(2.0)	22.0	(1.8)	100	(34. 16.0 50 37)
mediator	♀	L	Quetta	10.0	32.0	16.5	(1 2.2 2.4)	19.0	(3.1)	14.0	(1.8)	134	(17.0 7.2 40 40)
"	♂	P	"	8.7	34.0	16.0	(1 2.3 2.5)	18.0	(2.3)	16.5	(2.1)	124	(16.0 7.4 40 40)
nodosicorne	♂	H	India	8.0	28.0	22.0	(1 2.5 2.3)	3.3	(0.7)	11.0	(1.8)	100	(34. 16.0 50 36)
fletcheri	♀	H	India	8.0	25.0	20.0	(1 6.0 4.5)	14.0	(2.2)	21.0	(2.1)	104	(34. 16.0 50 52)

Abbreviation. Head line: S = Sex. T = Type. BD = Body length (mm). IODv = Interocular distance on vertex (relative value to head width 100). IODc = IOD at base of clypeus (do.). OD Od POD = OOD:Od:POD, Od = Ocellar diameter. A3 = Antennal joint 3. Aul = Ultimate antennal joint (both ratio to head width 100) Pet = Petiole (do.) L/W = relative length to width at apex (A3), or at base (Aul). Ma = Maximum width of petiole (relative value to its length 100). Mi = Minimum width of petiole (do.). 2 = segment 2 (do.). 3 = segment 3. Those regarding Type: H = Holotype. A = Allotype. L = Lectotype. P = Paralectotype. S = Syntype.

apture on vertex, inner orbital area and median furrow much weaker, with surface fairly shining, on frontal elevations stronger, more distinct and surface mat, punctures on shining areas finer, shallower and closer ($PIS < PD$), on elevations larger, slightly deeper, somewhat sparse ($PIS \geq PD$); SAT without microsculpture, finely closely punctured, surface fairly shining, mesoscutum without microsculpture, finely sparsely ($PIS > PD$) punctured, shining, punctures on scutellum slightly larger but sparse, on mesopleuron weaker and sparser, but larger and closer downwards. Propodeum smooth and polished, area dorsalis finely very sparsely punctured, anterior narrow part of medial furrow weakly crenate, posterior enlarged part polished, outsides of area dorsalis and posterior inclination very minutely sparsely punctured, practically impunctate, sides very finely sparsely punctured, area apicalis minutely rugulose, gaster closely covered with fine pubescence points, not shining.

Remarks. Judging by the colouration of fore and mid legs the specimen is considered to represent the female of the black-legged form of T. bicolor Smith known under the names, tinctipenne, cognatum and javanum.

3. TRYPOXYLON COLORATUM SMITH, 1857

Trypoxylon coloratum Smith, J. Proc. Linn. Soc. London, Zool., 2: 106, 1857 (δ , Borneo: Sarawak).

States of syntypes. There are two syntypes of this species, one in each of BMNH and UMO, both collected by A. R. Wallace in Borneo.

The specimen of BMNH is pinned at mesoscutum and on a slit of card paper and the pin is shortly cut above the insect and below the paper; with 3 labels, from top: a 7 mm round card paper label, with "SAR" handwritten with black ink; a Museum reference label, 14 x 5 mm, carrying "F. Sm. Coll. 79.22" pressed in 2 lines; a name label, 20 x 8 mm, pale bluish purple paper, with "Trypoxylon coloratum Smith" written in 3 lines by the hand of Smith with black ink. The specimen is complete, with right wing laterally expanded and the left obliquely raised. In the original description Smith treated the male. But the specimen is a female.

The specimen of UMO is also a female and pinned with 30 mm No. 3 insect pin, possibly as it originally was, but its gaster is broken into 2 pieces and the petiole and the remainder are separately glued on to the label. The round label with "SAR" and the coloured name label are the same as those of BMNH and added with a Museum reference label with "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines and "Coloratum SM." handwritten in with black ink on top. From the specimen left antenna from joint 5 apically, left hind leg wholly, right mid tarsus and both hind tarsi are lacking.

Both specimens are females and disagree with the Smith's description in this regard. But they agree well in colour of pubescence and of body and appendages, as well as in the length of body (nothing is given as to the structure and punctuation). Possibly these are the syntypes used by him in the description. It is frequently the case that he confuses the sexes of the specimens. Because of the more complete condition the BMNH specimen is designated as the lectotype.

Redescription.

Diagnosis. ♀, 16-16.5 mm. Black, pale amber yellow: antennal joints 1 and 2, clypeus anteriorly broadly, mandible largely, palpi, posterior part of collar, tubercle largely, tegula, gastral petiole except dorsal side from spiracles posteriorly, segments 2-6 except a large mark on each tergite and legs except a large mark on hind femur beneath, a greater part of hind tarsus and all arolia. Hairs golden. Head and petiole bicolor-style, IODs appr. 3:2, A3 apical width x 5, apical margin of clypeus with a gentle emargination on each side of medial area, mesoscutum weakly microcoriaceous and very finely, rather sparsely punctulate, propodeum without lateral carinae lateral furrows of area dorsalis indistinct, in fore wing radial cell reaching fairly close to wing apex, CV1 about CV2 x 5.

Supplement. Included in basal yellow of antenna: basal condyle, a part of rim of socket and joint 3 beneath on basal half; mandible on inner margin and apical area brownish. Antero-ventral part of pronotal neck region, prosternum (somewhat brownish) basal plates of wings (brownish at the centre), surrounding area narrowly of each coxal articulation, extreme apex of propodeum also yellowish. Gastral marks: Fig. 27. Black on legs: underside of hind femur except extreme base (extending upwards as fading brown), mid tarsal joints 2 and 3 above (4, 5 above somewhat brownish), hind tarsal joints above (apically brownish) and all arolia. Wings hyaline, veins dark brown apically paler, stigma pale ferruginous. Golden hairs dense on collar, lateral and posterior portions of mesoscutum, sides of scutellum, postscutellum wholly and pro-

podeum except central area of its side; on its baso-lateral areas of dorsal aspect remarkably curled.

Head from above with ratio of width to length at inner orbit 50:22, with ocelli slightly higher than wide, seen in front with vertex fairly strongly depressed below level of dorsal margins of eyes, intercellular area not raised, frons on both sides of medial furrow gently roundly raised, SAT low nasiform (Fig. 23, lateral view), obliquely truncate on anterior end, forming smooth surface which is broadly shallowly excavated (Fig. 22), ASR (Fig. 23, Ur) carinated on anterior margin, but surface smooth and shining, PAF deep, U-shaped in cross section and flat-bottomed. Clypeus and supra-clypeal area: Fig. 24; antennal joints 3, 4, 5 with relative length 10, 6.5 and 6. Lamina on side of pronotum broad rounded triangular only slightly produced (Fig. 25), mesoscutum and mesopleuron normal, median furrow of area dorsalis shallow and posteriorly enlarged, that on posterior inclination deep, ending at upper part of incompletely enclosed area apicalis (Fig. 26), GSR not expanded (the area densely covered with golden hair, not well visible). Gaster: Fig. 27, right hind coxa seen from inside: Fig. 28; venation of fore wing: Fig. 1, C. Measurements in Table 1.

Vertex very minutely microcoriaceous and closely superimposed with fine puncture PIS < PD, surface somewhat shining; frontal elevations extremely minutely but comparatively strongly microreticulate, mat, superimposed punctures fine and weak, quite indistinct, but on median furrow and inner orbital areas microsculpture weaker and punctures distinct. On mesoscutum microsculpture as on vertex and rather sparsely superimposed with fine punctures, PIS distinctly larger than PD, with surface fairly shining, mesopleuron smooth and polished, with sparse hair-bearing punctures, punctures somewhat stronger downwards and on ventral side fairly distinct and rather close. Propodeum with a longitudinal series of transverse striae on each side, the striae shorter, weaker anteriorly and longer and more distinct posteriorly, on other areas except posterior part of medial furrow surface covered with very fine sparse hair-bearing point, practically smooth and polished, area apicalis minutely rugoso-punctate, not polished; sides smooth, with very fine sparse punctules.

4. TRYPOXYLON EXIMIUM SMITHI, 1859

Trypoxylon eximium Smith, J. Proc. Linn. Soc. London, 3 (11-12): 161, 1859 (♀, Aru and Key Is.)

Trypoxylon eximium: Smith, Ibid., 5 (Suppl.): 84, 1860 (Makassar and Key Is.).

Two apparent syntypes (Key I.) are at BMNH and two others (Aru I. and Key I.) at UMO. Two other specimens named as eximium, both from Makassar are also one at each Museum, but they are not considered syntypes. All are females.

States of syntypes. (1) BMNH specimen. Pinned at posterior margin of mesothorax and mounted on a slit of card paper; well prepared, with wings and legs extended laterally, but gastral segments 5 and 6, right antenna from joint 6 apically, tarsal joints 4 and 5 of right fore, 2-5 of right hind and 5 of left hind leg are missing. With 2 labels: a 7 mm round label, with "Ke" handwritten and a Museum reference label, with "B.M.1977, Under (pressed) eximium (handwritten)".

(2) BMNH. This is apparently a complete specimen, having the clypeus not worn out. But left fore wing is glued at its base; the glued wing is possibly not one of the specimen, though the venation is the same as in the right wing, because a slender remnant of its own wing bearing anal vein is present duplicately there. The specimen is similarly rearranged on a slit of card paper and accompanied with the same labels as in 1.

(3) BMNH. Pinned at mesoscutum with a 38 mm formal nickel-plated insect pin of No. 1 in thickness (possibly recent product). It lacks the left antenna completely and the gaster from segment 3 apically. With 3 labels: a 8 mm round label, with "Mak" handwritten with blue-black ink (now faded); name label, 20 x 8 mm, pale purple paper, with "T. eximium Smith" by the hand of Smith; Museum reference label, "Smith coll. pres. by Mrs. Farren White 99-303" pressed in 4 lines (placed up-side-down).

(4) UMO. Pinned at posterior margin of mesoscutum with a 23 mm business pin of about No. 1 in thickness. The specimen is nearly complete, lacking only the left antenna from joint 4 apically, but the gaster is glued between segments 1 and 2. With 3 labels, from top: a pale purplish name label, with "Trypoxylon eximia Smith" written in 3 lines by the hand of Smith with black ink (this label is folded in three); a 7 mm round label, with "Aru" handwritten with blue black (?) ink, possibly by Wallace or his assistant; a Museum reference label with "HOPE DEPT. UNIV. MUSEUM OXFORD", pressed in 3 lines and topped with handwritten "eximium Sm."

(5) UMO. Pinned as in (4), but slightly apart from posterior margin, labeled also as above, but the letters on 7 mm round label are "Key I." This specimen lacks gaster except petiole and head is glued to the thorax, but the antennae and legs are complete, though the latter is folded beneath thorax.

(6) UMO. Pinned as in (4), with 7 mm round label carrying "Mak" and a Museum reference label as in (4), but without the name label. In this specimen antennae and legs are complete, but the gaster is from segment 2 apically dropped off and glued on to the round label.

Of these, (3) is in reality a specimen of T. providum Smith which is later dealt with in the present paper and (6) is a specimen of T. bicolor Smith, while one female with the name label, "T. providum Sm." written by the hand of Smith (locality is unknown, since the letters on the round label are faded completely) is really a female of T. eximium. This specimen lacks the left antenna completely and the gaster from segment 2 apically. Possibly when they were pinned the labels were erroneously exchanged.

The 5 specimens above mentioned, excluding 2 mistaken ones from Makassar, well agree in character with the original description of T. eximium. Taking into consideration the presence of the Smith's name label and the present state of the specimen, (4) is designated as the lectotype. As to this species see also p. 22, Nos. (3), (4).

Redescription.

Diagnosis. ♀, 18 mm, black, central part of gaster reddish yellow, legs variegated with ferruginous tint, antenna apically beneath brownish, hairs silvery, head, petiole and radial cell bicolor-style, IODs 5:4-6:5, eye incision narrow, SAT low nasiform, but with median carina highly raised, PAF shallow, upcurved, apical margin of clypeus broadly truncate, with a small protuberance in middle, antennal joint 3 5 times as long as wide at apex, mesoscutum without microsculpture, fairly closely punctured, punctures medium-sized, propodeum without lateral carinae, but with lateral series of striae, area dorsalis with shallow lateral furrows, in fore wing CV1 5-6 times as long as CV2.

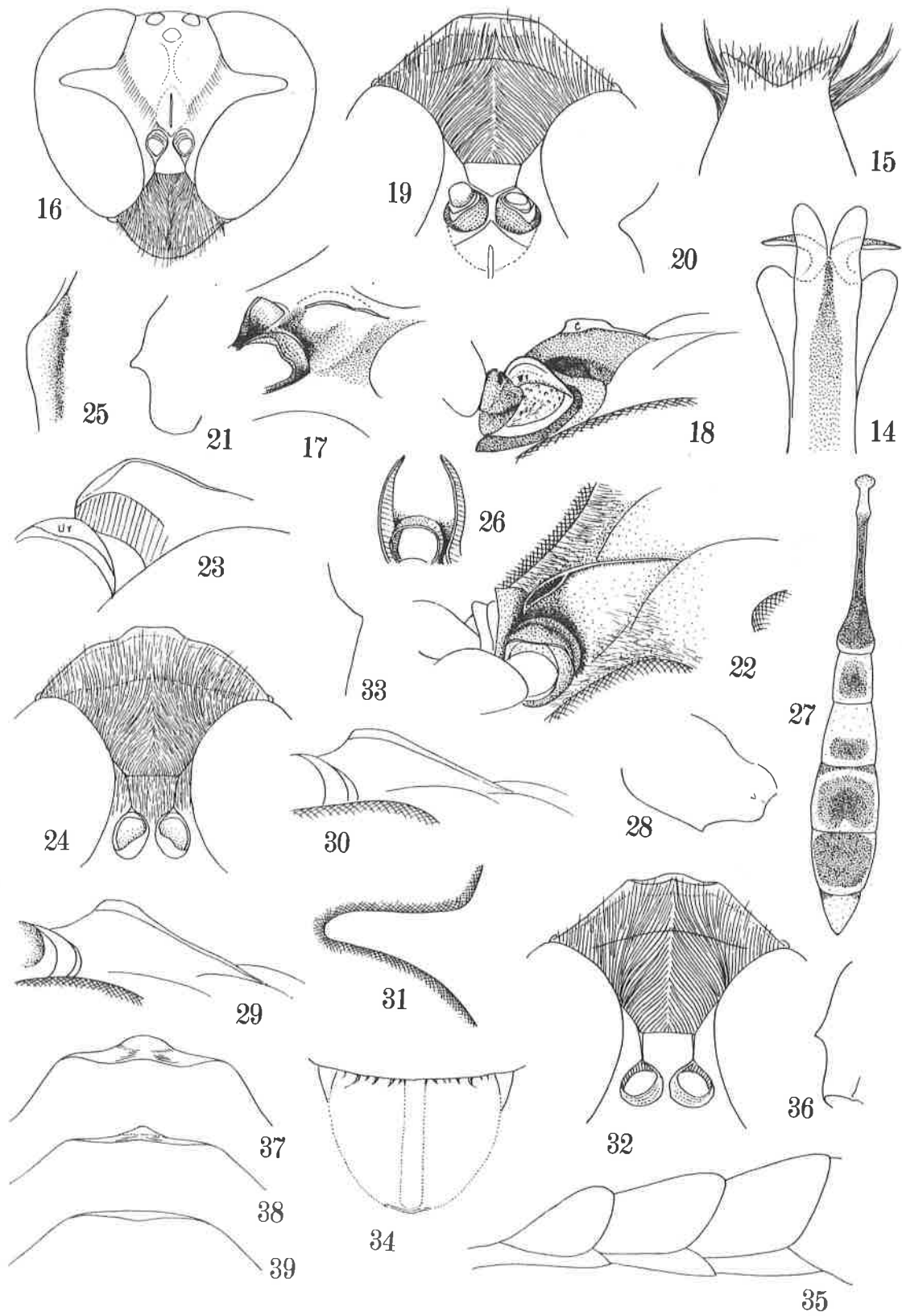
Supplement. Length 17.5-19 mm (in original description 8.5 line). Black almost without plumbeous shine on thorax, apex and apical sides of gastral petiole, segment 2 and 3 wholly (sometimes each with a large blackish mark above) and 4 except a large mark on posterior part of tergite ferruginous red, margins of tergites 5 and 6 also reddish; mandible ferruginous, apically slightly darker, apex black; collar of pronotum with posterior part not completely discoloured, slightly brownish in certain light only, tegula of wing semitransparent brown, antennal joints 1-4 each with a vague brownish apical ring, flagellum on apical portion beneath slightly brownish, palpi largely ferruginous, knees of fore and mid legs, fore tibia except inner side, mid tibia at base and apex (medial area pale castaneous, on posterior side darker), hind tibia broadly at base, all tibial spurs (those of hind leg slightly brownish), fore and mid tarsi except black arolia and brownish end joints above and hind tarsal joints 2-4 light ferruginous; base and apex of metatarsus and end joint of hind leg dark brown, joints 2-4 also somewhat darker brown than in other legs, arolium black, claws ferruginous, apex brown. Hair on head and thorax-complex silvery, on basal elevation of clypeus convergent towards medial line.

Measurements in Table 1. Head from above with ratio of width to length at inner orbit appr. 2:1, ocelli in an equilateral triangle, each in a weak depression, with intervals and posterior margin bluntly raised, frontal furrow broad and shallow, elevations on both side gentle, SAT in lateral view: Figs. 29 (lectotype), 30 (other Key specimen), PAF wide V-shape in cross section, ASR broadly expanded, smooth, eye incision: Fig. 31; clypeus and supraclypeal area: Fig. 32, the former on basal half gently raised and on apical third markedly reflected, medio-apical margin subtrun-

Explanation to Figs. 14-39.

- Figs. 14-21. Trypoxylon bicolor Smith, 14-15... ♂, 16-21... ♀.
22-28. Trypoxylon coloratum Smith, ♀.
29-39. Trypoxylon eximium Smith, ♀.

14: Apical part of penis valve (vertically from dorsal side). 15: Sternite 8.
16: Head (ex. from Kangra Valley). 17, 22: Supraantennal area seen obliquely from side. 18, 23, 29, 30: Ditto seen in profile. 19, 24, 32: Clypeus and antennal area. 20, 25 (left side), 33 (right side): Lamina on side of pronotum. 21, 28, 36: Hind coxal tubercle (right, from inside). 26: Area apicalis, with raised rim of lifting muscle of gaster. 27: Maculae of gaster. 31: Eye incision. 34: Area dorsalis. 35: Gastral segments 1-3 (lateral view, 1 apical part only). 37, 38, 39: Variation in form of anterior margin of clypeus (37, 38 in ex. from Key Is., 39 in ex. from Makassar — really of providum)



cate, forming bevel, with extreme margin medianly broadly roundly produced (Fig. 32) (anterior margin rounded and much produced, with a slight curving upwards at its margin ... Smith), variation in form: Figs. 37 (BMNH, No. 1, Key), 38 (BMNH, No. 2, Key) (39 is misidentified providum). Antennal joints 3, 4, 5 with relative length 10, 6.5, 6; lamina on side of pronotum broad triangular, slightly produced, with apex distinctly angulated (Fig. 33), mesoscutum and mesopleuron normal, propodeum in lectotype: Fig. 34, median furrow of posterior inclination deep, wedge-shaped, reaching anterior margin of area apicalis, GSK ring-shaped, not expanded posteriorly; dorsal curvature of gastral segments 1,2,3: Fig. 35, hind coxa: Fig. 36, in fore wing CV2 2/3 - 3/5 the length of TCV, both meeting in about right angle.

Vertex weakly, frons more strongly microcoriaceous, both superimposed with fine sparse punctures, mesoscutum under 50X magnification very feeble microsculpture can be seen, but practically smooth, with punctures somewhat larger than those on frons, on antero-lateral area rather close (PIS \div PD), on central area punctures finer and sparser, punctures on mesopleuron finer, sparser upwards and larger, stronger and closer downwards; area dorsalis at base obliquely striate, on median furrow transversely weakly striate, disc on posterior portion very finely, somewhat sparsely, on anterior portion more sparsely punctured, outsides of the area and posterior inclination closely covered with very minute pores of pubescence, lateral series of striae arising from about 1/3 from base and reaching apex, on apical portion arcuately extended inwards, covering the area before area apicalis, this area anteriorly arcuately rugoso-striate, but greater part smooth and polished.

5. TRYOXYLON ELEGANTULUM SMITH, 1860

Tryoxylon elegantulum Smith, J. Proc. Linn. Soc. London, Zool., 4 (Suppl.): 84, 1860 (♀, Makassar).

State of the lectotype (present designation). A single specimen preserved at UMO is a female, pinned at postero-lateral area of mesoscutum with a 22 mm business pin of about No. 1 in thickness and placed at a mid point of the pin. It is a complete specimen, with fore legs folded beneath prosternum, wings latero-posteriorly extended and gaster from segment 4 apically curved downwards. Three labels, from top: a 8 mm round label, with handwritten "Mak"; a name label, pale purplish paper, three folded, with "Tryoxylon elegantulum Smith" written in 3 lines by the hand of Smith with black ink; Museum label, with "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines and "elegantulum" handwritten in at the top with black ink. Well agrees in characters with the original description.

Redescription.

Diagnosis. ♀, about 15 mm, hairs on head rather silvery, on thorax brassy or golden. Black; clypeus anteriorly, gaster wholly and all appendages ferruginous, head and petiole bicolor-style, clypeus: Fig. 44, IOBs = 4:3, A3 4.5 times as long as wide at apex, mesoscutum without microsculpture, finely sparsely punctured, propodeum without lateral carinae, area dorsalis without lateral furrows, SAT low broad nasiform, anteriorly broadly obliquely flattened and shining, ASR forming high double ridges, posterior higher, acute triangular and black, anterior blunt triangular and ferruginous, PAF very deep, U-shaped in cross section and flat-bottomed, radial cell not reaching close to wing apex, CV1 nearly 5 times as long as CV2.

Supplement. Length 14.5 mm at the state of curved gaster, if stretched possibly reaches 16 mm. Head and thorax black, apical 2/5 of clypeus, anterior margin narrowly of neck region of pronotum, posterior part (discoloured) and tubercle of collar, tegula and basal plate of wing ferruginous, rim of antennal socket largely pale brown gaster and all appendages pale reddish ferruginous, mandible on apical half brownish and dark brown at apex, gaster posteriorly somewhat brownish; extreme base of coxae and apical portion broadly of all arolia black. Wings hyaline, veins light brown, costa and subcosta slightly dark. Hair on head silvery, but in some light appearing brassy, on thorax and propodeum more distinctly brassy - golden

Head from above twice as wide as long at inner orbit, measurements in Table 1. Ocelli each in a shallow hollow, interocellar area gently raised, frontal elevations comparatively small and low (smaller and lower than in bicolor), median furrow rather broad and shallow, widely divergent above and below, forming a shallow depression above SAT; SAT and ASR with basal condyles of antennae seen vertically from above: Fig. 40, SAT anteriorly obliquely flattened and broadly hollowed (round dotted area in Fig. 40), antero-laterally perpendicularly steeply inclined (rather somewhat ex-

cavated - Fig. 41, E), ASR raised, anteriorly expanded, with surface transversely bicarinate, each carina highly raised into triangular lobiform appendage, the anterior somewhat thick, broadly rounded on top and ferruginous in colour, while the posterior much higher, acutely pointed at apex, slightly different in rising direction (more inwards) and black in colour, PAF deep, broad, flat-bottomed, smooth, shining and suboval in cross section. The structure of the area in dorsal view: Fig. 40 (PAF in a thick up-turned V-shape), in lateral view: Fig. 42, seen through PAF: Fig. 43 and seen obliquely from above and side: Fig. 41. Head in frontal view with outline of both sides somewhat more roundly convergent below than in bicolor, but the degree of depression at vertex similar; clypeus: Fig. 44, basal elevation weak, tectate, apical reflection also weak, antennal joint 1 (scape) on inner and dorsal aspects flattened, with a fairly acute ridge between them (Fig. 41), joints 3, 4, 5 with relative length appr. 10, 7, 6. Pronotal collar with anterior part triangularly raised toward middle and weakly tuberculate there, lamina on side broadly rounded, only slightly produced (Fig. 45, dotted area), mesoscutum on admedian area somewhat depressed, notauli indistinct, parapsidal sutures in fine impressed lines, mesopleuron without pent-roof structure upwards; medial furrow of area dorsalis on basal third fine, deep parallel-sided, weakly crenate, then enlarged into subelliptic shallow hollow, truncate at apex and flatly inclined to median furrow of posterior inclination, the furrow wedge-shaped, deep, reaching anterior margin of area apicalis which is distinctly marked off, GSR weakly rounded out posteriorly; gastral petiole flask-shaped, curvature of dorsal line of segments 1, 2, 3: Fig. 46, hind coxal organ shortly but distinctly toothed (Fig. 47). CV2 appr. $2/3$ the length of TCV, forming nearly right angle between them.

Vertex feebly microcoriaceous and superimposed with sparse fine punctures, surface fairly shining, punctures on interocellar and postocellar areas much closer, surface not shining, frontal elevations more strongly microcoriaceous and closely superimposed with somewhat larger punctures, raised lobes of ASR smooth and polished, mesoscutum very finely and sparsely punctured, without microsculpture, scutellum and prepectus of mesopleuron somewhat more strongly punctured, rest of mesopleuron punctured as on scutum, propodeum also punctured as on mesoscutum, without longitudinal series of transverse striae on lateral margins, posterior margin of area dorsalis distinctly striate, area apicalis weakly arcuately rugoso-punctate and striate.

6. TRYPOXYLON FEROX SMITH, 1860

Trypoxylon ferox Smith, J. Proc. Linn. Soc. London, 4 (Suppl.): 84, 1860 (♀, Makassar)

Two specimens of T. ferox from Makassar accompanied with the locality label by the hand of A. R. Wallace or his assistant and preserved at UMO are one female and one male. Because of the fact that Smith described only the female (although his sexing is quite doubtful) and that the female alone is accompanied with the name label by the hand of Smith, the female syntype is designated as the lectotype.

Present state of syntypes. The lectotype is pinned (possibly after desiccation judging from the broken pore at the pin) at posterior part of mesoscutum with a 22 mm nickel plated business pin of about No. 0 in thickness and placed at mid height of it. The specimen is nearly complete, only the right leg from femur apically lacking. The gaster had been glued to propodeum, but again dropped off during the present mailing and is mounted on the card point and put below the specimen. In the specimen both the antennae and wings are stretched postero-laterally, fore legs are folded beneath the body, but other legs stretched sideways. With 3 labels, from top: a 8 mm round label with "Mak" handwritten with black ink; name label (2-folded), with "Trypoxylon ferox Smith" handwritten in 2 lines, "ferox Smith" is underlined; Museum reference label, "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines, with "ferox Sm" handwritten in on top. The male specimen is pinned as in the female and with the same labels as in this except the name one. The specimen is also pinned after desiccation, the pin pore is wide and broken, the thorax is split between pro- and mesothorax and glued beneath body, the split is also seen between left meso- and metapleurae. From the specimen right antenna from joint 6 apically and left hind leg from tarsal joint 2 apically lacking, gaster with sternite 1 alone attached to the propodeum and tergite 1 and the following tergites and sternites are glued as a whole to the margin of the round label; a Museum label alone is attached to the pin.

Redescription.

Diagnosis ♀, 12 mm. Black; gaster except black apical 2 segments, and all appendages except black coxae and arolia, ferruginous; hairs silvery; in form of head

and gastral petiole bicolor-style; frontal elevations fairly strongly convex, SAT nasiform, with anterior end gently excavated, ASR highly raised and broadly expanded anteriorly, with surface granulate, PAF deep, flat-bottomed, clypeus with basal elevation very weak, apical margin gently recurved, A3 four times as long as broad at apex, IODs appr. 2:1; mesoscutum without microsculpture, propodeum with lateral carinae, area dorsalis enclosed with fine furrows, CV1 about 5 times as long as CV2.

♂. 9.5 mm. Similar to ♀, A3 thrice as long as wide at apex, Al3 appr. as long as 3 preceding joints united, IODs = 6:5, mesoscutum microcoriaceous and punctured, mesopleuron with pent-roof structure, apical 3 segments of gaster black.

Supplement. ♀. Head and thorax-complex 4.5 mm, gaster 7.5 mm (original description 6 lines). Ferruginous are clypeus on anterior 2/5, antenna, mandible (inner and outer margins castaneous, apex dark brown), mouth parts with palpi, posterior part and tubercle of pronotum, tegula (semitransparent) and basal plates of wings, gastral segments 1-4 and legs except greater part of coxae (apex and beneath ferruginous) and arolia; extreme anterior margin of neck, apical part of pronotal lamina and hind tibia and tarsus on outside distinctly brownish. Wings hyaline, apically somewhat clouded, veins dark brown, stigma largely ferruginous. Hair on head silvery, normal in distribution, but on disc of clypeus not convergent towards medial line, on thorax-complex silky white, also normal in distribution.

Head from above slightly thick, W:L at inner orbit nearly equal to 10:6, measurements in Table 1; ocelli in an equilateral triangle, similar in size, each in a weak hollow, with interocellar areas very gently raised, frontal elevations large (from sides of anterior ocellus to upper margin of SAT, occupying full width at dorso-interior corners of eye incisions) and fairly strongly, somewhat more highly than in bicolor, raised, with median furrow deeper than in this, SAT nasiform, considerably high, but not acutely raised, rather broad (Fig. 50, dorsal view), with glittering carina on top, anterior end seen from above rounded (Ditto), but seen from side roundly excavated (Fig. 51), ASR stoutly raised and expanded, with surface finely, closely punctured, granulate, PAF deep, U-shaped in cross section (Fig. 52, seen through the furrow) and flat-bottomed. Head in frontal view: Fig. 48, eyes wider and more strongly swollen out than in bicolor, with ommatidia markedly larger than in this; clypeus and antennal area: Fig. 49, supraclypeal area depressed, clypeus with disc very slightly raised at base, nearly flat, with hairs almost all directing forwards, but apical ferruginous area distinctly reflected and slightly depressed in middle of subtruncate part of apical margin. Antennal joints 3, 4, 5 with relative length 10, 6.3, 6, the joints relatively much shorter than in bicolor. Collar of pronotum in frontal view curved (somewhat subtriangularly) upwards, with top weakly tuberculate, posterior part discoloured, lamina on side with propleural tubercle: Fig. 53, mesopleural flange acutely margined and slightly expanded laterally, but not so marked as to be called pent-roof structure; lateral carinae of propodeum arising slightly behind spiracles, reaching near the lateral carinae of area apicalis (covered with pubescence and not clearly observed), sides of the segment flat and smooth, area dorsalis not raised above the level of surrounding areas, but rather slightly depressed, with the border distinctly margined with a fine crenate impressed line which is only slightly curved, medial furrow as in Fig. 54, medial furrow of posterior inclination very deep, wedge-shaped, but broadly truncate at apex by the anterior marginal carina of area apicalis which is low, but by degrees higher posterioro-laterally, GSR slightly roundly expanded posteriorly where the rim turned ferruginous; intercoxal carina weakly unisinate (in elegantulum simply upcurved); gastral segments 1, 2, 3 in lateral view: Fig. 56, hind coxal tooth slightly shorter, weaker than in elegantulum.

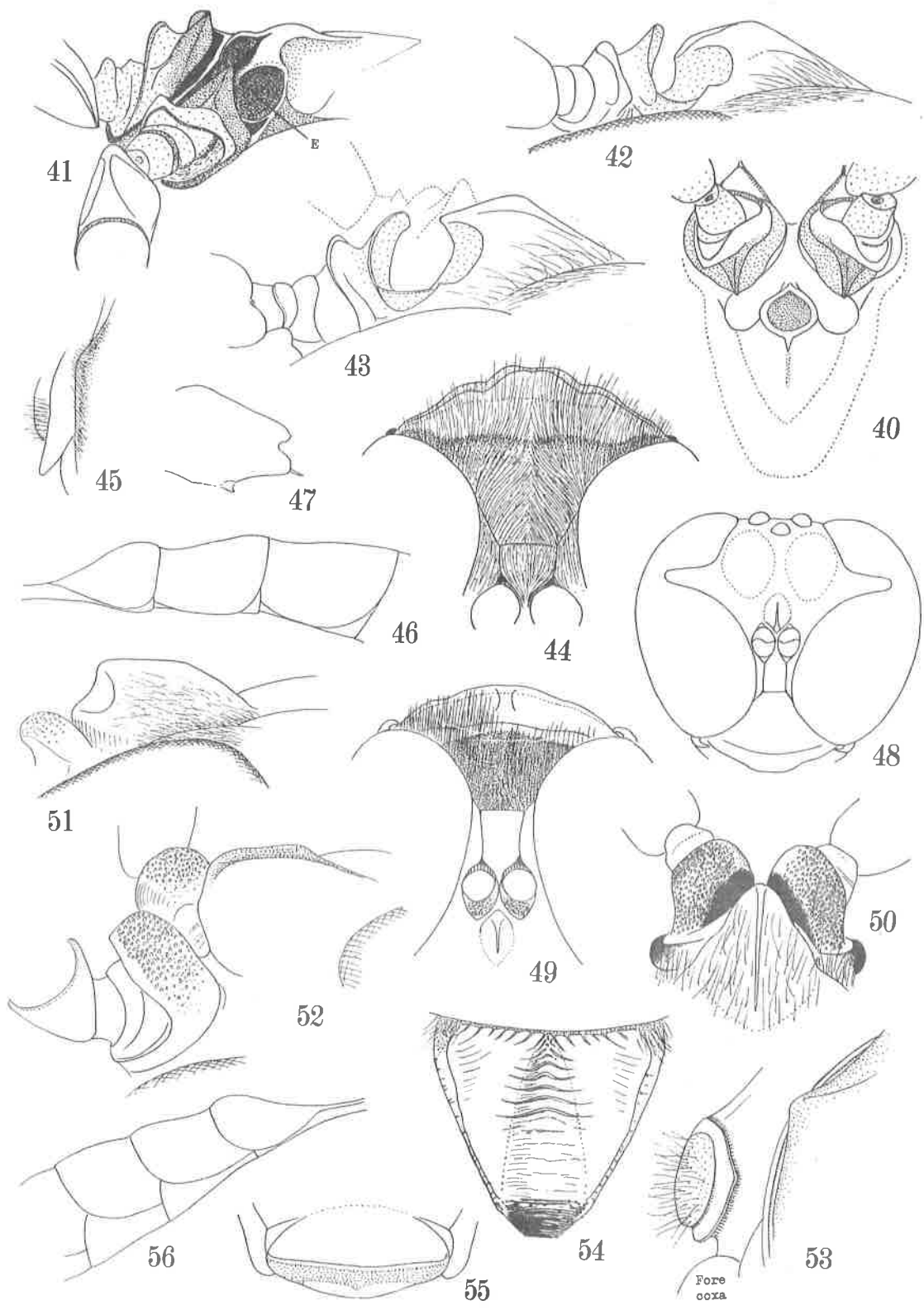
Vertex till upper part of frontal elevations very weakly microcoriaceous and

Explanation to Figs. 40-56.

Figs. 40-47. Trypoxylon elegantulum Smith, ♀.

48-56. Trypoxylon ferox Smith, 48-55... ♀, 56... ♂ (to be continued).

40, 50: Supraantennal structure, seen vertically from back side. 41: Ditto, seen obliquely from side, E... excavation. 42, 51: Ditto in lateral view. 43, 52: Ditto seen through left PAF. 44, 49: Clypeus and antennal area. 45, 53: Pronotal lamina (dotted area) and ante-coxal tubercle of propleuron. 46, 56: Gastral segments 1-3 (1... posterior part only). 47: Hind coxa. 48: Head. 54: Area dorsalis. 55: GSR (gastral socket rim) and area apicalis seen from above.



sparsely superimposed with fine punctures, on posterior half of interocellar area and post-ocellar area punctures stronger and closer, not shining, on frontal elevations microsculpture distinct, with superimposed punctures larger and deep, surface not shining, SAT except medial carina covered with hair-punctures, not polished, mesothorax without microsculpture, finely sparsely punctured, with a weak aeneous shine punctures on scutellum and prepectus somewhat large. Area dorsalis at base obliquely, on medial furrow transversely striate, the striae somewhat extended on to the disc and posteriorly weaker, disc finely sparsely punctured, outsides of the area till lateral carinae finely sparsely punctured, the carinae accompanied inside with the series of short transverse striae, the striae on posterior portion broadly extended inwards and mixed with punctures, area apicalis weakly irregularly rugulose, not smooth, sides of propodeum anteriorly broadly smooth and polished, posteriorly finely sparsely punctured, punctures on postero-ventral area stronger and closer.

♂ (hitherto undescribed). Length 9.5 mm (from head till apex of petiole 5.5 and rest of gaster 4.0 mm). Similar to ♀ in colour and general structure, but head from above less thick, W:L at inner orbit 10:4.5, in frontal view relatively wider and shorter (Fig. 57), with clypeus less produced anteriorly (Fig. 58) and gently roundly tectate, not reflected on apical margin, inner orbits less strongly convergent towards clypeus (Fig. 57, cf. Fig. 48), frontal elevations much less raised than in ♀, with medial furrow much shallower, SAT and PAF generally as in ♀ (Fig. 60, seen through the furrow), but ASR markedly different in pattern and surface sculpture, it is bilobed, with anterior lobe higher (Fig. 60) and pale brownish, having round marginal area broadly semitransparent and more broadly expanded inwards (Fig. 59) than posterior lobe which is lower, black in colour (Fig. 60) and whole the structure smooth and polished. Clypeus distinctly pectate, with medial ridge narrowly rounded, almost without apical reflection and without medio-apical depression, supraclypeal area shorter (Fig. 58, cf. Fig. 49). Antennal joints shorter, ultimate joint: Fig. 61, strictly slightly longer than 3-, but shorter than 4 preceding joints united; pronotal lamina

more produced and distinctly pointed at apex (Fig. 62) mesoscutum microcoriaceous and fairly closely (PIS 0.5-2 times as large as PD) superimposed with fine but distinct punctures, parapsidal suture in a short raised line (in ♀ in an impressed line), mesopleuron more weakly microcoriaceous and more finely and sparsely punctured than on scutum, mesopleural flange markedly expanded outwards, turning into brownish membranous pent-roof structure (Fig. 71). Area dorsalis gently raised above the level of surroundings and margined, furrowed, striated and punctured as in ♀, but punctures larger and striae stronger and more broadly extended on to the disc, area apicalis with dorsal carina completely lacking (lateral carinae posteriorly high and anteriorly lowering), medial furrow of posterior

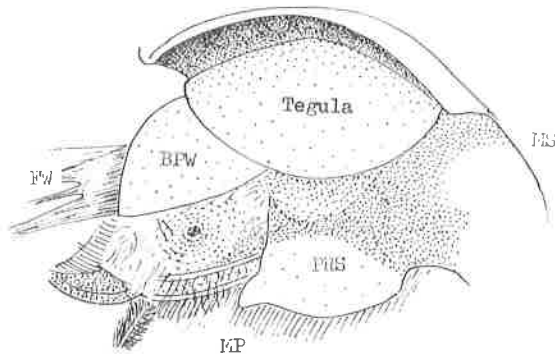


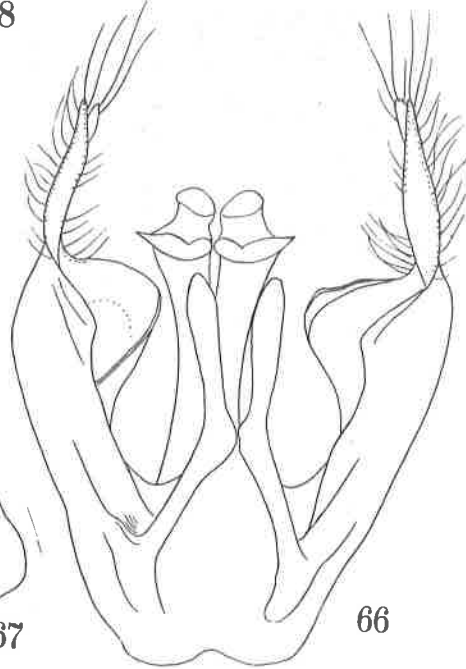
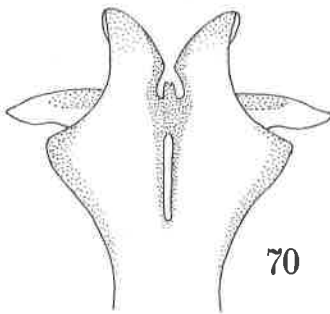
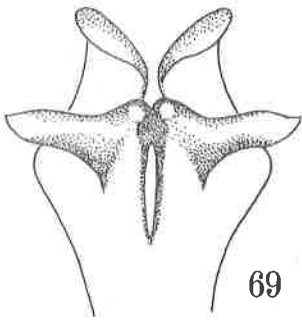
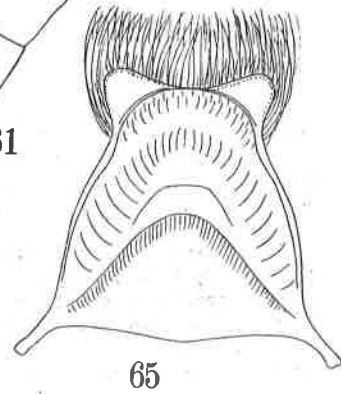
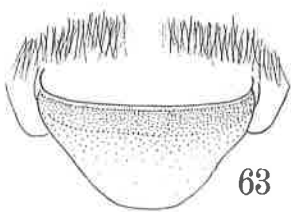
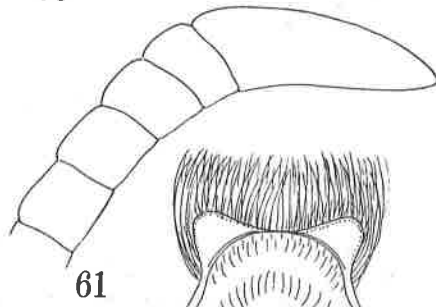
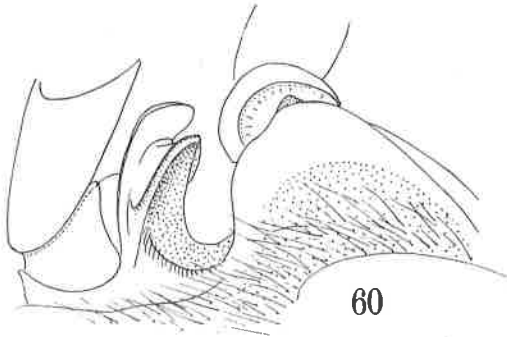
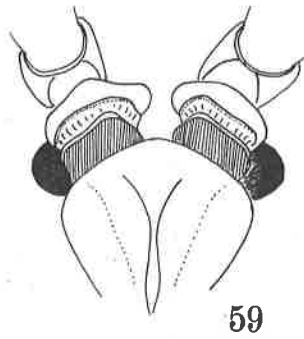
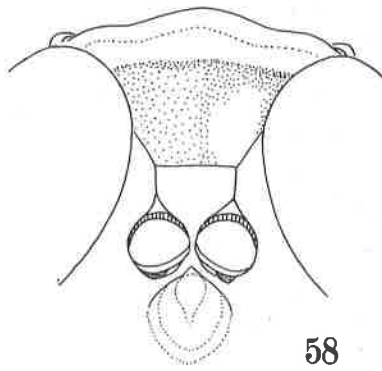
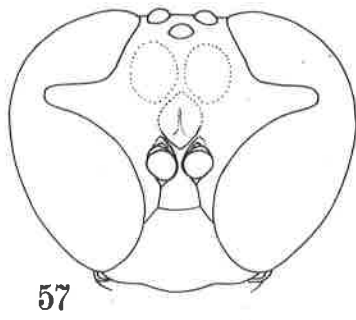
Fig. 71. Pent-roof structure on mesopleuron in *T. ferox* Smith, ♂, from right side.

inclination in the same width and form till apex, reaching directly to GSR, the rim much more markedly roundly expanded posteriorly than in ♀ (Fig. 63, cf. Fig. 55),

Explanation to Figs. 57-70.

Figs. 57-70. *Trypoxylon ferox* Smith, ♂.

57: Head (cf. Fig. 48). 58: Clypeus and antennal area. 59: Antennal area seen vertically from back side. 60: Ditto seen through left PAF. 61: Apical part of right antenna. 62: Pronotal lamina (left). 63: GSR seen vertically. 64: Ditto seen from right side. 65: Sternite 8. 66: Genitalia seen from beneath. 67: Ditto seen from left side. 68: Right paramere seen from apex. 69: Apical part of penis valve, from beneath. 70: Ditto, from above.



bottom line of medial furrow and narrow area in front of GSR smooth and polished, surrounding areas finely, more or less sparsely punctured; lateral areas of dorsal and posterior aspects of propodeum transversely finely closely, and more broadly than in ♀, striated; lateral carinae as in ♀; sides of propodeum from top area in front of spiracle through anterior part along metapleural suture and lower part till apex of segment broadly smooth and polished, remaining area comparatively grossly, partly subrugosely punctured and mixed with transverse feeble striae. Measurements in Table 1. Sternite 8: Fig. 65; genitalia in ventral view: Fig. 66 (basal ring removed), in lateral view: Fig. 67, right paramere seen from apex: Fig. 68, characteristic are the shallow splitting at apex of paramere (Fig. 67) and form of apical sickle-shaped appendages of penis valve (Fig. 69, ventral view; 70, dorsal view), volsella halberd-shaped (Fig. 66).

Remarks. Shallow splitting at apex of paramere of genitalia is considered to show the primitive state in evolutionary process from single lobe to the bifurcated ones. The fact that the cylindrical roll of basiparamere is also incomplete, inner and outer margins being only slightly expanded inwards, leaving a wide aperture on the inside (Figs. 66 and 68) seems to me to support this consideration. While the form of the apical sickle-shaped appendages of penis valve is quite strange and I have never met with such an instance in other species of the genus.

7. TRYPOXYLON GRACILESCENS SMITH, 1860

Trypoxylon gracilescens Smith, J. Proc. Linn. Soc. London, Zool., 4 (Suppl.): 85, 1860 (♀, Makassar).

State of syntype. A single syntype preserved at UMO is a female as given in the original description. It is pinned at medio-posterior part of mesoscutum (sclerite of the part irregularly broken) with a 22 mm nickel plated business pin of about No. 0 in thickness and put slightly below mid point of its height. The gaster from segment 2 apically dropped off and segments 2 and 3 are glued on to the round label as was the case in ferox ♂, but the posterior part from segment 3 apically is lost. The right antenna from joint 5 apically missing, other part including left antenna, wings and legs are complete. Three labels, from top: a 8 mm round label carrying handwritten "Mak"; a 3-folded name label, 22×10 mm slit of pale purplish paper, with "Trypoxylon gracilescens Smith" written in 3 lines by the hand of Smith; Museum reference label, 17×4 mm, with "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines on lower part and "gracilescens SM" handwritten in at the top. This is the sole syntype left, so it is designated as the lectotype.

Redescription.

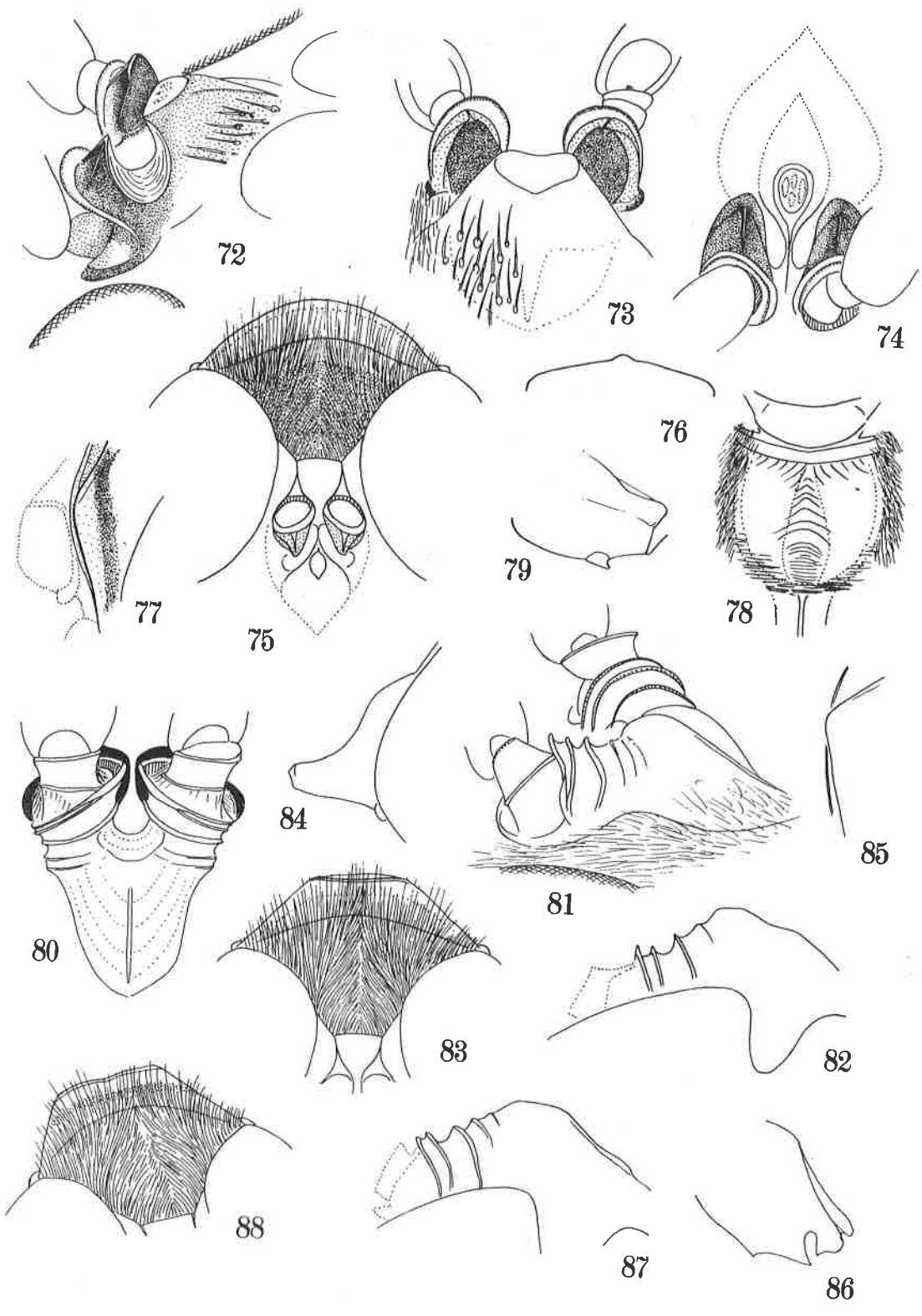
Diagnosis. ♀. 13.5 mm. Black, antenna, gaster except petiole and legs ferruginous, hairs on head silvery, on thorax pale brassy, head and petiole in form bicolor style, IODs = 3:2, A3 4.5 times as long as wide at apex, frontal elevations low, SAT tuberciform, anteriorly obliquely flattened, ASR forming high two layers, PAF deep, broad, straight-bottomed, clypeus simply rounded out, mesoscutum without microsculpture, finely sparsely punctured, propodeum without lateral carinae, area dorsalis enclosed with broad weak furrow, area apicalis dorsally indistinct, GSR simple, radial cell type-C, CV1 5.5 times as long as CV2.

Supplement. Length till apex of petiole 8.5 mm and total of gastral segments 2 and 3 appr. 2.5 mm, we can accept the length (6.5 lines) in the original description. Antenna apically dark brownish, generally paler beneath, clypeus on anterior margin broadly yellow, with extreme margin brown, mandible at base yellow, apically brownish, mouth parts ferruginous, basally broadly dark brown to black, pronotum with an-

Explanation to Figs. 72-88.

Figs. 72-79. Trypoxylon gracilescens Smith, ♀.
80-88. Trypoxylon providum Smith, ♀ (to be continued).

72, 81: Supraantennal area seen through left PAF. 73, 80: Ditto, vertically from back side. 74: Ditto seen in front. 75, 83: Clypeus and antennal area. 76: Dorsal marginal line of pronotal collar seen in front. 77, 85: Lamina on left side of pronotum. 78: Area dorsalis. 79, 86: Hind coxa. 82, 87: SAT in profile (82 in lectotype from Bachian, 87 in other from Gilolo). 84: Clypeus in profile. 88: Ditto obliquely from above.



tero-lateral margin on its side (including a part of lamina) narrowly ferruginous, with posterior part of collar discoloured, ferruginous, tubercle yellowish, tegula (semitransparent) and basal plates of wing pale castaneous, gaster from apical swelling except basal narrow area till apex (following Smith) ferruginous, legs at base of coxae black, arelia dark brown, claws at apex brown to dark brown. Wings hyaline veins dark brown, stigma rather ferruginous. Hairs on thorax pale brassy, on side of collar, tubercle and antero-lateral areas of mesoscutum nearly golden, but on mesopleuron in some light appear silvery.

Head from above with ratio of W:L at inner orbit 2:1, measurements in Table 1, fore ocellus slightly smaller, each in a slight hollow, interocellar area longitudinally gently raised, gentle frontal elevations separated from each other by the wedge-shaped comparatively broad median furrow and nearly pointed at upper end on each side of fore ocellus (the elevation is subpointed oviform in outline), SAT low wide nasiform, with lower end obliquely truncate (Figs. 73, vertically from above, 72, seen through PAF), median carina and anterior half smooth and polished, anterior truncated area circular in outline and sculptured with some longitudinally elongate gross punctures (Fig. 74, in frontal view), PAF broad and deep, somewhat scraped on each side (Fig. 72), ASR highly raised into 2-layered structure, somewhat similar to that of *ferox*, ♂ (Fig. 72 cf. Fig. 60), but here posterior lobe (subtriangular in form) much higher than the anterior (Figs. 72, 73), with anterior surface more gently inclined and medianly raised into a keel (Figs. 72, 74). Head in frontal view similar in outline to that of *ferox* ♀ (Fig. 48), more roundly convergent below than in *bicolor* ♀, but less so than in *varipilosum* Cam. ♀. Clypeus and supraclypeal area: Fig. 73, disc of clypeus roundly raised on basal portion and weakly tectate, anterior reflection broad, about 1/4 of total length (the border is shown with a curved line in the figure). Collar of pronotum in frontal view: Fig. 76, lamina on side: Fig. 77, thick line), mesoscutum with admedian area represented by a smooth shining, somewhat broad elongated area, distinctly margined on each side with an impressed line, notaulus in a short impressed line, shorter than admedian area, parapsidal suture in impressed line, conspicuous by its pitchy black in the plumbeous surrounding; mesopleuron with subalar flange acutely edged on lower margin, forming a slight overhang above subalar pit, but not so much as to be called pent-roof structure. Area dorsalis: Fig. 78, lateral furrows broad and shallow, indistinct in outline, posteriorly more so by being disturbed by transverse close fine striae, medial furrow fairly deep, that of posterior inclination wedge-shaped, with glittering bottom line in middle which enters slightly the range of area apicalis, the anterior margin of which is not carinated, GSR broad ring-formed, very slightly rounded out posteriorly, interoccal carina gently upcurved; legs slender and long as in *ferox*, ♀, hind coxal organ well developed (Fig. 79); radial cell of fore wing C-type, CV2 1/5.5 of CV1 and 5/7 of TCV, TCV sinuate and curved inwards on posterior 2/3, forming regular angle with CV2.

Vertex feebly microcoriaceous, with sparse fine punctures, fairly shining, punctures on median raised area close; frons more strongly microcoriaceous, with sparse fine punctures, nearly mat, punctures on anterior portion behind SAT somewhat close, partly arcuately confluent, SAT except anterior smooth area rather coarsely sculptured with hair-bearing punctures, ASR smooth and polished; mesoscutum without microsculpture, sparsely scattered with very fine punctures (PIS mostly 3-5 times as large as PD), but scutellum weakly but distinctly microcoriaceous and scattered with somewhat large punctures, mesopleuron with punctures as on scutum, on prepectus rather as on scutellum; area dorsalis striated as given in Fig. 78, disc punctured as on scutellum rest of dorsal and posterior aspects transversely finely closely striate, including lateral walls of wedge-shaped medial furrow; area apicalis anteriorly transversely striate, posteriorly closely weakly irregularly punctured; sides somewhat closely and somewhat largely punctured, on upper and posterior areas mixed with oblique striae, anterior (usually smooth) area also scattered sparsely with punctures.

8. TRYPOXYLON PROVIDUM SMITH, 1860

Trypoxylon providum Smith, J. Proc. Linn. Soc. London, Zool., 5 (Suppl.): 125, 1860
(♀, Bachian).

There are four apparent syntype specimens before me, each of which is accompanied with the round locality label by the hand of A. R. Wallace or his assistant and the name label written by F. Smith. One is the possession of BMNH and all others of

UMO. Localities are Gil, Bac, N, respectively in the UMO specimens and almost disappeared and unreadable in the BMNH specimen. Judging from the title of the Smith's 1860b paper Gil, Bac, N, are presumed to be Gilolo, Bachian and New Guinea (Dory) respectively. In the original description is given as the locality Bachian alone. At the moment of his description it is considered, therefore, Smith used the specimen from Bachian alone. Certainly it well agrees with the description, especially in the body length. It is uncertain whether the BMNH specimen having the unreadable locality label is derived from Bachian or not. The UMO specimen having the Bachian label is, therefore, designated here as the lectotype.

State of lectotype. It is pinned at the medio-posterior part of mesoscutum with 25 mm nickle-plated business pin of about No. 2 in thickness and put slightly above middle of its height. It is possibly pinned after desiccation and the sclerite from pinned area to the right side of propodeum is broken and the gaster is glued between segments 1 and 2; otherwise it is a complete specimen. It has the wings laterally extended, the antennae stretched downwards, right mandible half opened, fore legs folded beneath the thorax and other legs, though irregularly, stretched. Three labels, from top: a 8 mm round locality label, with "Bac" handwritten with blue black ink; 2-folded white (instead of purplish) paper name label, 20 x 10 mm, with "Trypoxylon providum Smith" written in 3 lines by the hand of Smith with black ink; Museum reference label, "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines and "providum" handwritten in at top with black ink.

Redescription.

Diagnosis. ♀. Length 22 mm; black, mandible, mouth parts, fore tibia in front, fore tarsus and mid metatarsus more or less ferruginous; in form of head and petiole bicolor-style, frontal elevations low, SAT moderately high, in a thick stampy Y-form (seen from dorsal side), without PAF, but with a large deep hollow in front to which it is obliquely inclined; mesoscutum without microsculpture, mesopleuron without pent roof structure, propodeum without lateral carinae, area dorsalis enclosed with weak furrows; IODs nearly 4:3 and A3 about 5 times as long as wide at apex, CV1 longer than CV2 x 5, radial cell C-type.

Supplement. Black with fairly strong plumbeous shine on thorax, mandible at base narrowly black, turning to yellow - ferruginous - dark brown apically, mouth parts mainly dark brown, but palpi ochre yellow, antenna except brownish apical ring of some basal joints completely black, pronotum with posterior part not discoloured, tubercle, lamina also black, tegula semitransparent brown, inner part and basal plates of wing dark brown; fore tibia in front on basal 2/3, -tarsus except a brown patch above on apical joint and dark brown arolium ferruginous (tarsus rather yellowish white), mid and hind tibiae at base on inside, all tibial spurs and mid basitarsus except black apex also ferruginous, wings apically slightly darkened, veins and stigma black. Hair on head silvery, normal in distribution, on thorax and propodeum comparatively abundant and long, silky white, on gaster normal.

Head from above with W:L appr. 2:1 (50:23), seen in front with outline as in bicolor ♀, measurement in Table 1. Vertex with transverse interocellar ridge behind fore ocellus stronger and more acutely raised than the longitudinal one between hind ocelli, depression around fore ocellus comparatively broad and deep, smoothly continued to frontal furrow, forming together a comparatively broad elongated triangle, frontal elevations on both its sides rather weak (appr. as in bicolor), SAT fairly high tuberiform, anteriorly bifurcate to connect with each of the highly raised ASR (Fig. 80, seen from dorsal side), without being interrupted by PAF (Fig. 81, seen obliquely from side and above; Fig. 82, in profile), thus forming a thick stampy Y-shaped elevation (Fig. 80), each branch of the Y transversely coarsely striate or rather carinate, upper part of interantennal area that is enclosed by the branches of the Y is deeply hollowed, only opening below as a narrow deep furrow running down to supraocellar area (Fig. 80); clypeus: Fig. 83, disc at base convex, not tectate, anteriorly broadly reflected (Fig. 84, in profile, in Fig. 83 the border is shown with curved solid line). Antennal joint 3 long (Table 1), pronotal lamina narrowly rounded at the apex, but only slightly produced (Fig. 85), mesopleural flange acutely edged, but not expanded into pent-roof structure, area dorsalis nearly equilateral triangle, lateral furrows only slightly curved, apex narrowly truncate, median furrow comparatively deep, on posterior half enlarged, median furrow of posterior inclination wedge-shaped, deep, area apicalis with dorsal carina indistinct, confused with similar arcuate striae on the area, GSR nearly ring-formed (very slightly rounded out), gastral petiole and segments 2 and 3 in Table 1; hind coxal tubercle rather weak (Fig. 86); in fore wing CV1 appr. 5.5 times as long as CV2 and TCV 1.5 times so and nearly straight.

Vertex practically without microsculpture and finely, very sparsely punctured,

fairly shining, punctures on median gentle ridge very close, surface not shining, frontal elevations distinctly microcoriaceous and superimposed with punctures, punctures somewhat larger than on vertex and somewhat irregular in size and distribution (PIS 1-3 times PD), mesoscutum practically without microsculpture, but under 50x enlargement very feeble microreticulation can be seen, punctures finer and weaker than on frons and fairly close at mid lateral area in front of parapsidal suture, but sparser on median area; on prepectus of mesopleuron punctures as on scutum, on episternum finer and sparser; area dorsalis at base obliquely strongly, on lateral and median furrows transversely finely weakly striate, on the narrow basal part of median furrow striae somewhat strong, on posterior part of lateral furrows long, extended on to the disc and on posterior margin the striae of the 3 furrows connected with each other and much stronger, disc finely sparsely punctured, outside the area surface smooth and polished except very fine sparse hair points, lateral area from a short distance from spiracles apically covered with a longitudinal series of transverse close striae, the striae on posterior inclination extended inwards and on its posterior half arcuately covering whole the surface, area apicalis anteriorly similarly striate, posteriorly surface minutely uneven, but shining; sides finely closely punctured, punctures posteriorly slightly larger and sparser, only narrow area along metapleural suture smooth; gastral tergites covered with close fine pubescence points, sternites nearly glabrous and bristled as usual.

On other specimens.

(1) Gilolo specimen (UMO). Present state. It is pinned and labeled as the lectotype, but the sclerite is not broken, with wings and legs well extended laterally. However, right antenna from joint 4 apically, left from 5 apically lacking, apical 2 joints of both fore legs and of left hind leg also missing. Gaster has been dropped off and is mounted on the card point and attached to the pin. The specimen is now mounted on a small oblong block. Three labels, the same as those of lectotype, except that the letters on the round label are "Gil" instead of "Bac" and the colour of the name label is pale purple instead of white and 3-folded.

Variation in characters. This specimen is very similar in colouration, structure and punctuation to the lectotype (black apex of mid metatarsus and structure of antennal area - Fig. 80 - also similar), except that antennal joint 3 slightly shorter (Table 1), clypeus in some direction appears medianly weakly emarginate (Fig. 88, lectotype also shows the same tendency), microsculpture can not be observed on mesoscutum even under 50x magnification and punctures and striae on propodeum somewhat stronger and more distinct.

(2) New Guinea specimen (UMO). Pinned and labeled as in the Gilolo specimen. But the letters on the round label is "N", the pin is slightly thicker (about No. 3) and pierces the insect at the base of propodeum. It is also well prepared, with the wings and legs laterally extended and nearly complete, only the left antenna from joint 4 apically lacking.

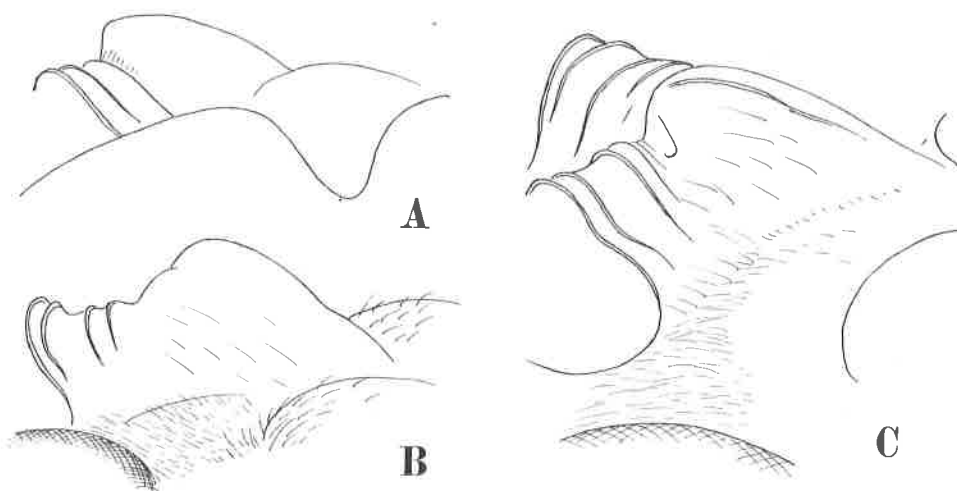
This specimen is really a female of T. eximium. Possibly by the similar appearance Smith would have made the misidentification. It is 20 mm in length, having the gaster wholly black seen from above, only the underside from apex of petiole to segment 3 brownish; mid tibia black and hind tibia only obscurely brownish at base (fore and mid tarsi yellowish white). Remarkable is the smooth and shining head and thorax-complex, especially striking on mesoscutum and propodeum. This is due to (1) punctures and sculpture very fine, sparse and weak and (2) almost hairless surface. SAT, ASR as in Figs. 89 and 90; PAF seen through it; Fig. 91; clypeus without medial protuberance on apical margin, in this respect rather similar to providum. Possibly this specimen represents a local race. Measurements in Table 1, in the group of providum.

(3) BMNH specimen. Pinned and labeled as in the lectotype. But the pin is much thicker (about No. 4), the name label is pale purplish in colour and on the Museum label is pressed "Smith coll. pres. by Mrs. Farren White, 99 - 303" in 4 lines. The letters showing the locality of the specimen on the round label are completely faded out and unreadable, left antenna completely and gaster except petiole are lacking.

This specimen is also a female of T. eximium, not providum (the gaster had already been lost when Smith examined it?). Except the unobservable colour of the gaster the specimen is nearly typical in characters: SAT and ASR; Figs. 92 and 93; PAF; Fig. 94 (seen through the furrow). Clypeus; Fig. 95, in colour of legs generally similar to the lectotype of eximium. Measurements in Table 1, in the group of providum.

(4) Besides the above, a female specimen from Makassar is present (BMNH). It is distinctly a providum-specimen, but it is erroneously labeled as "T. eximium Sm." by Smith. As to this specimen mention was already made in connection with T. eximium (p. 9 and 10, No. 3).

In this specimen there is a weak PAF, accordingly seen in profile (Fig. A) lower end of SAT slightly produced, seen through the furrow: Fig. B, the area seen from more above: Fig. C. Colour of legs typical, but mid tarsus with joints 1 and 2 only yellowish white. Frontal elevations somewhat more highly raised than in lectotype.



9. TRYPOXYLON PLACIDUM SMITH, 1864

Trypoxylon placidum Smith, J. Proc. Linn. Soc. London, Zool., 7: 35, 1864 (♀, Mysol).

State of syntype. A single specimen preserved at UMO is pinned between mesoscutum and scutellum with 25 mm nickel plated pin of about No. 0 in thickness. The gaster is completely lacking; ultimate joint of left antenna, joints 3-5 of left fore tarsus and apical joint of left hind tarsus are also lacking; wings laterally extended, but partly folded longitudinally and partly broken. Three labels, from top: a 8 mm. round label, with "M" written by the hand of A. R. Wallace or his assistant with black ink; 3-folded name label, 20 × 8 mm, pale purplish paper, with "Trypoxylon placidum Smith" written in 3 lines by the hand of Smith; Museum label, 15 × 15 mm, with "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines and "placidum Sm." handwritten in at the top.

The specimen is doubtlessly a female, with combined length of head and thorax-complex appr. 4 mm (length given by Smith $3 \frac{3}{4}$ lines \pm 8 mm). Judging by the relative length of head+thorax-complex and gaster the petiole is presumed to be of the clavate type. The specimen well agrees in characters with the description of placidum, as far as it goes, so that it is designated as the lectotype of the species.

Redescription.

Diagnosis. ♀. About 8 mm, basal 3 segments of gaster and tibiae and tarsi of legs largely ferruginous, hairs silvery, head slightly thick, frontal elevations considerably high, fairly shining, IODs = 2:1, A3 appr. 4 times as long as wide at apex, SAT nasiform, PAF shallow, up-curved, clypeus nearly rounded out, mesoscutum without microsculpture, shining, lateral carinae of propodeum weakly defined, area dorsalis marked off with broad shallow furrows, gastral petiole clavate, in fore wing CV1 5 times as long as CV2, radial cell C-type.

Supplement. Black, ferruginous: mandible (apically brown), palpi, tegula (semitransparent) and basal plates of wing, all coxae on apical half beneath, all trochanters beneath, base and apex of fore and mid femora, tibiae with apical spurs and tarsi (except black arolia) of fore and mid legs, hind tibia (apically brownish) and joint 4 of following tarsus. Posterior part of pronotum half discoloured, dark brown, in some light posterior margin appears ferruginous, clypeus with anterior margin brownish; femora of legs (hind femur paler beneath) and rest of hind tarsus brown, joints of the latter on both ends paler. Gaster (after Smith): the three basal seg-

ments ferruginous, the third dusky above; beneath ferruginous, with the two apical segments slightly dusky (the fourth? possibly it is included within "two apical segments"; petiole has to be included within "three basal segments", since in diagnosis he says "abdominis basi ... ferrugineis").

Head from above: Fig. 96, $W:L = 5:3$, each ocellus in a weak depression, inter-ocellar area gently raised. Head in frontal view: Fig. 97, frontal elevation fairly strongly convex (Fig. 98, in lateral view), SAT rather broad nasiform, considerably high, with lateral inclinations flattened, with top acutely edged longitudinally, top angle in cross section about 90° (or slightly larger), in lateral view: Fig. 99, the area seen through PAF: Fig. 100, anterior inclination transversely rounded and medianly with a longitudinal carina which is the extension of the dorsal edge; apical margin of clypeus: Fig. 101, in some direction appears subtruncate, since medio-anterior part is bevelled, disc at base only gently raised and at apex considerably reflected, the reflection laterally stronger, since the surface distinctly tectate as a whole, in lateral view the surface line almost straight; antenna comparatively thick and robust (Table 1), rather markedly thickened apically (maximum widths at joints 3 and 12 appr. $3:4$, joint 7 about 1.5 times as long as wide). Head in profile (Fig. 98) with eye markedly thick, appr. thrice the width of temple; collar of pronotum comparatively thick, in frontal view sideward inclination fairly strong (Fig. 102), lamina on side (Fig. 103, dotted lines showing antecoxal tubercle) considerably produced, mesoscutum with parapsidal sutures in impressed lines, mesopleuron without pent-roof structure, with episternal sulcus broader and deeper than usual; on propodeum lateral carinae only weakly defined, not distinctly carinated, appearing slightly and gently raised by the aid of shallow groove at the inside of it; area dorsalis enclosed with shallow broad furrow, the furrow more distinct forwards (usually posteriorly more distinct), medial furrow gradually widened posteriorly, medial furrow of posterior inclination broad and deep, posteriorly narrowed, but not simple wedge-shaped, but with sides curved out; area apicalis enclosed with carina which is on anterior margin very weak, in form crescent-like, posterior carina (= GSR) somewhat rounded out, expanded portion pale brownish in colour, intercoxal carina weakly upcurved. Legs similar in length relation between segments to *T. bicolor*, but fore tibial spur much shorter, only reaching mid point of metatarsus, hind coxal tubercle weak, with a short hair on top (Fig. 104).

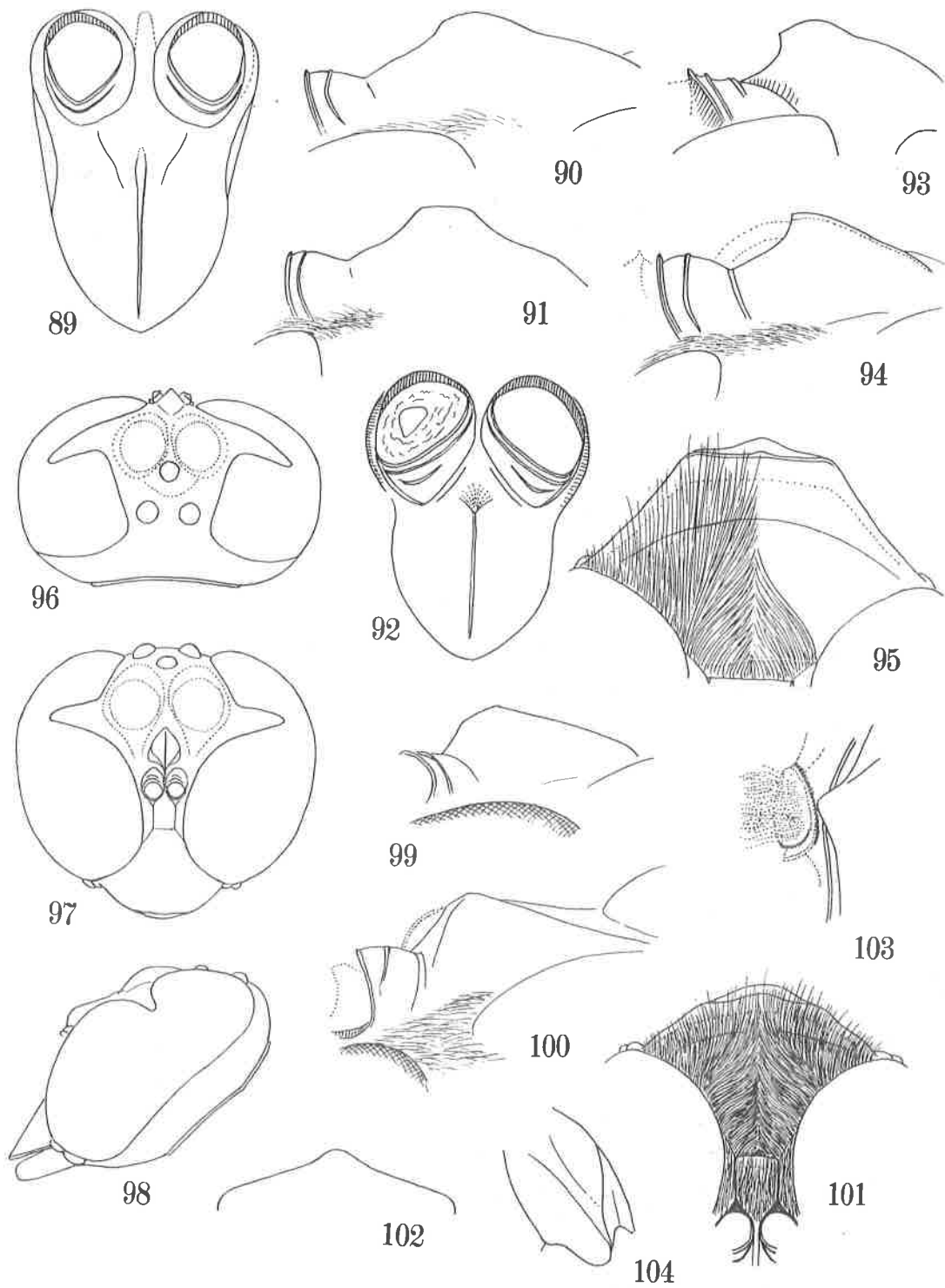
Vertex very faintly, frons more distinctly (but weaker than usual) microcoriaceus, superimposed punctures on vertex fine, sparse, but along eyes fairly close, on frontal elevations slightly larger, much sparser and the surface fairly shining, mesoscutum smooth and shining, on mid-lateral area in front of parapsidal suture punctures as large as on vertex, fairly close ($PIS \approx PD$), but on median area finer and sparser, mesopleuron finely sparsely punctured, punctures gradually larger downwards; propodeum smooth and polished, at base minutely crenate, along lateral carina transversely closely striate, 3 furrows of area dorsalis anteriorly distinctly, posteriorly obsolete striate, posterior margin of the area with 1-2 strong striae, disc very sparsely scattered with fine hair-bearing punctures, posterior inclination punctured as on disc, only posteriorly arcuately finely weakly striate, but the striae can not cross the medial furrow, area apicalis smooth and polished and medianly longitudinally weakly elevated, sides except anterior part fairly closely covered with comparatively large, not well outlined shallow punctures. See POSTSCRIPTUM.

10. TRYPOXYLON GRACILLIMUM SMITH, 1864

Explanation to Figs. 89-104.

Figs. 89-95. Trypoxylon eximium Smith, ♀ (misidentified by Smith as T. providum)
96-104. Trypoxylon placidum Smith, ♀.

89, 92: Supraantennal area seen vertically from back side (89 in ex. from New Guinea, 92 in ex. from some place of E. Lesser Sunda Is.). 90, 93, 99: SAT in profile (90 = 89, 93 = 92). 91, 94, 100: SAT and ASR seen through PAF (91 = 89, 94 = 92). 95, 101: Clypeus. 96, 97, 98: Head. 102: Pronotal collar in frontal view. 103: Pronotal lamina and antecoxal tubercle of propleuron (left side). 104: Hind coxa.



Trypoxylon gracillimum Smith, J. Proc. Linn. Soc. London, Zool., 7: 35, 1864 (♂, Mysol)

Two syntypes preserved at UMO are accompanied with the 3 same labels, from the top: a 8 mm round locality label, with handwritten "M"; a name label, 25×9 mm, pale purplish in colour, with "Trypoxylon gracillimum Smith" written in 3 lines by the hand of Smith with black ink, a transverse line is drawn between the 2nd and 3rd lines, notice "gracillimum" and not gracillimum"; a Museum label, with "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines and handwritten in at the top in 2 lines "gracillimum SM."

One of the syntypes is a male and well agrees in characters with the original description, while the other is a female and different in characters from the description. Possibly it was roughly identified by Smith after the description, neglecting the differences in punctuation on the thorax-complex and in colour of hind tarsi. Furthermore, it differs markedly in structural characters from the first specimen and there is no doubt that it belongs to quite a different species. Hereupon, the first specimen is designated as the lectotype.

State of the lectotype. It is pinned at mesoscutum with a 25 mm nickel-plated pin of about No. 4 in thickness. The wings and legs laterally extended and well arranged. As the pin is thick the thorax is somewhat split between scutum and scutellum and the fissure extended till mesopleuron. From the specimen right antenna completely and apical joints of both fore legs and of left hind leg are missing. In the present investigation apical part of gaster is dissected and the dissected parts are mounted on the card point.

Redescription.

Diagnosis. ♂, 15.0 mm; black, mandible and legs partly ferruginous, in form of head and petiole bicolor-style, IODs = 6:5, OOD:POD = 2:3, frontal elevations low and mat, SAT low nasiform, PAF shallow, upcurved, ASR simply roundly raised and expanded anteriorly, clypeal margin rounded out and medianly weakly produced, ultimate antennal joint as long as 4 preceding joints united, A3 = Apical width×2.7, mesoscutum without microsculpture, fairly closely punctured, propodeum with weak lateral carinae, area dorsalis enclosed with furrow, disc distinctly sparsely punctured.

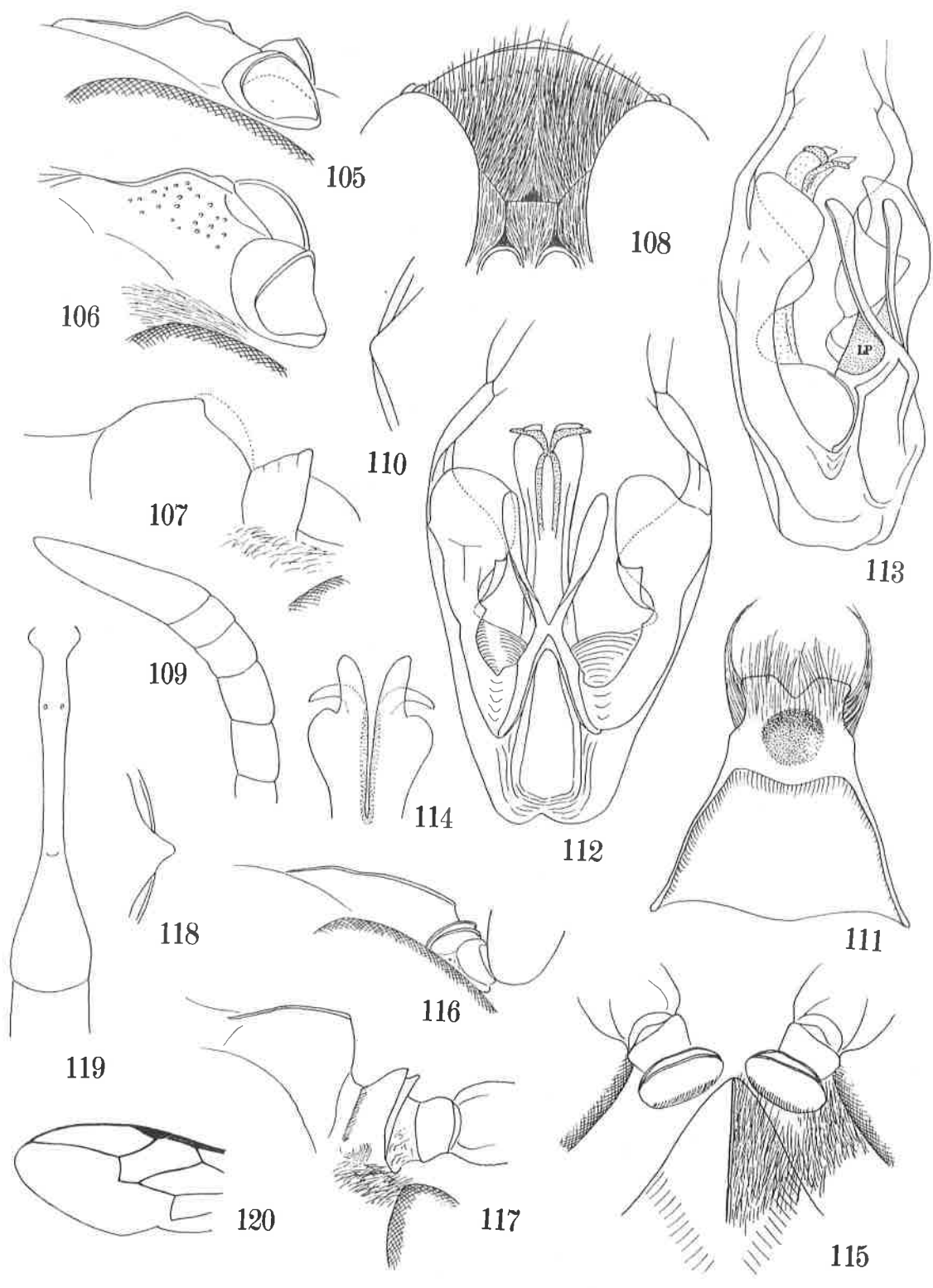
Supplement. Mesothorax with plumbeous shine; ferruginous are mandible (apically dark brown), mouth parts except basal portion, all tibiae at base obscurely, tibial spurs, fore tarsus (at least joints 1-4), mid and hind tarsal joints 2 - 5 (2 and 5 brownish above, 2 especially at apex); tegula of wing semitransparent brown, gastral sternites 2 and 3 and apical portion of 1 somewhat brownish, rest of fore and mid tibiae and mid and hind metatarsi dark brown, fore tibia in front somewhat paler. Wings hyaline, apical third distinctly clouded, stigma and veins dark brown, Hair on head silvery, on thorax-complex silky white, both normal in distribution, on the latter comparatively long, fairly abundant.

Head from above with ratio of width to length at inner orbit appr. 2:1 (50:22), seen in front roundly convergent below, outer margins slightly more rounded than in bicolor ♀. Measurements in Table 1, length ratio of petiole to rest of gaster 50:58. Vertex behind each hind ocellus distinctly impressed, intercellular area gently raised, fore ocellus in a deeper impression, it extended anteriorly as broad shallow frontal furrow, frontal elevations only gentle and from near the lateral margin gently flatly inclined towards medial furrow, hence the elevation along the furrow very inconspicuous, SAT low nasiform, with lateral inclinations nearly flat, only anteriorly somewhat rounded, carina on top acute, not extended to anterior inclination, SAT seen from right side: Fig. 105, somewhat from above: Fig. 106, SAT and ASR seen

Explanation to Figs. 105-120.

Figs. 105-114. Trypoxylon gracillimum Smith, ♂.
115-120. Trypoxylon intrudens Smith (= errans Saussure), ♀ (to be continued).

105, 116: SAT and ASR in profile (from right side). 106: Ditto, from a little more upper side. 107, 117: Ditto seen through PAF. 108: Clypeus and supra-clypeal area. 109: Apical part of left antenna. 110, 118: Lamina on side of pronotum (110, left; 118, right). 111: Sternite 8. 112: Genitalia from beneath. 113: Ditto, obliquely from left side. 114: Apical part of penis valve (vertically from above). 115: Antennal area, vertically from back side. 119: Gastral petiole. 120: Venation of fore wing.



through PAF (right side); Fig. 107 (dotted line is ASR of left side); clypeus and supra-clypeal area: Fig. 108, disc medianly from base to apex broadly raised, and gently inclined laterally, apical reflection weakly observable on lateral areas alone, hairs not strongly convergent towards median line (ditto); head seen in profile with eye 2.3 times as thick as temple; ultimate antennal joint: Fig. 109; collar of pronotum in frontal view as in placidum (Fig. 102), lamina on side: Fig. 110, with apex somewhat reflected, mesopleuron without pent-roof structure. Propodeum with lateral carinae very indistinctly defined, outer end of longitudinal series of transverse striae slightly impressed and outer margin of this impressed line forms a very weak obtuse ridge, the ridge is in some direction defined, but in other direction rather indistinct, area dorsalis with lateral furrow shallow and broad, but well defined, in form subsemicircular, median furrow posteriorly broader, with apex rounded, area apicalis lunate in form, anteriorly weakly carinate, GSR slightly rounded out. In fore wing radial cell B-type, CV1 6 times as long as CV2, CV2 about 3/5 of TCV. Sternite 8 seen from inside: Fig. 111, genitalia seen from beneath: Fig. 112, seen obliquely from side: Fig. 113, apical part of penis valve seen vertically from dorsal side: Fig. 114, apical lobes nearly transparent and sickle-shaped protuberances comparatively narrow, paramere bifurcate at apex, lower lobe broad triangular, lamellate, semitransparent and reflected apically, while upper lobe slender and long, basiparamere twice expanded on inner margin, apical expansion rolled ventrally, half embracing lower triangular lobe (Figs. 112, 113), basal expansion connected with the dorsal ridge of volsella (Fig. 112, hatched area, Fig. 113, LP).

Vertex somewhat weakly microcoriaceous, slightly shining, with superimposed punctures fine and close, frons strongly microcoriaceous, completely mat, with superimposed punctures larger than those on vertex, SAT sparsely covered with somewhat strong punctures, mesoscutum closely covered with medium-sized punctures, PIS \neq PD, somewhat sparse on median area, scutellum similarly but somewhat sparsely punctured, mesopleuron similarly, but somewhat sparsely punctured, propodeum on area dorsalis finely, sparsely punctured (punctures finer than on scutum), outside the area more closely covered with finer punctures, lateral furrows of the area also punctured and mixed with weak striae, medial furrow transversely very weakly striate, punctures on posterior inclination finer and sparser, series of transverse striae along lateral margins posteriorly extended inwards, forming arcuate striae covering fairly broad area in front of area apicalis which is coarsely crenate, sides closely covered with punctures except anterior smooth area, punctures as large as those on area dorsalis.

Remarks. T. gracillimum is closely allied to T. bicolor. This is shown by the resemblance in the structure of the male genitalia. The difference in this regard is only slight. The slender lobe at the apex of paramere is relatively somewhat shorter and the triangular lobe is more broadly rounded at apex, otherwise very similar. The structural differences in the external characters are observed in PAF, pronotal lamina and lateral carinae of propodeum. Difference in the form of sternite 8 is also conspicuous.

The second specimen that is labeled by Smith as Trypoxylon gracillimum Smith (not gracillimum) is, as mentioned earlier, a female of a different species. It is pinned and labeled as in the lectotype of T. gracillimum (but the pin is finer, about No. 0 in thickness). From the specimen gaster is dropped off and is mounted on a triangle card point. The right antenna is from joint 5 apically lacking, otherwise complete. It is a slightly varied specimen of T. bituberculatum unknown from New Guinea. It differs markedly in that the frontal elevations are strongly convex, much stronger than in T. placidum Smith. Details on this specimen will be given in other Part of the present paper. (As to bituberculatum ref. Spec. Publ. Jap. Hym. Ass., 7: 17, 1977)

11. TRYPOXYLON INTRUDENS SMITH, 1870
(= T. errans Saussure, 1864)

Trypoxylon errans Saussure, Voyage de Nevara, Hym., p. 84, 1864 (♀, Mauritius Is.).
Trypoxylon errans: Saussure, Hist. Madagascar, 20, Hist. Nat. Hym., p. 527, 1892.
Trypoxylon intrudens Smith (in Horne), Trans. Zool. Soc. London, 7 (3): 188, 1870 (♀, Mainpuri, N.W. Prov. India).

Trypoxylon intrudens Smith is one of the junior synonyms of T. errans Saussure, as was given in the synopsis of the present paper. But here the redescription of the

syntype of *T. intrudens* is attempted, since it has been one of the obscure and questionable species.

There is a single syntype specimen of *T. intrudens* in BMNH. Possibly some specimens were used at the moment of his description, because Smith gives "Length 4 - 4.5 lines".

State of the syntype. It is pinned at the right side of posterior part of mesoscutum with a fine pin of about No. 000 in thickness. At present it is mounted on a slender white artificial gum piece and the pin is cut just above the insect. Four labels, from the top: a 7 mm round label, encircled with red band, with "Type" pressed at the centre; a 7 mm round label of white card paper, carrying "69 86" handwritten in 2 lines (69 may mean 1869, but as to 86 whether it is the specimen No. or it means August 6 is uncertain); a name label, about 20 × 10 mm, white card paper, with "Trypoxylon intrudens Smith (Type)" written in 3 lines by the hand of Smith; a Museum reference label, with "B. M. TYPE · HYM." pressed in 2 lines and 21.451 handwritten in below. According to the original description the locality is "Mainpuri, North-west Provinces of India" (lying about 150 km SE of Delhi). The specimen is well prepared, with the wings laterally opened and most of the legs extended. From it the left antenna from joint 5 apically and left fore leg from tarsal joint 2 apically missing. Mesosternum is partly broken by the tried pin hole. The specimen is considerably faded in colour, the black parts of gaster, antennae and legs turned into light castaneous.

Redescription.

Diagnosis. ♀. 8.5 mm, hairs silvery, bicolor-style in form of head and gastral petiole. Central part of gaster red, legs broadly pale ferruginous, IOs = 2:1, OOD:POD = 1:2, A3 appr. 4 times as long as wide at apex, frontal elevations mediocre, SAT low nasiform, PAF curved up, ASR raised and bicarinate on dorsal surface, clypeus rounded out, broadly recurved in middle, disc tectate, pronotal lamina toothed at apex, mesoscutum almost without microsculpture, with distinct close punctures, propodeum with lateral carinae, the surface broadly transversely striate, area dorsalis enclosed with furrows, in fore wing CV1 = CV2 × 3, radial cell B-type.

Supplement. Antenna brown, apically darker, not paler beneath, ferruginous area of anterior margin of clypeus comparatively broad, somewhat semitransparent, with extreme margin brownish; mandible, palpi, tegula, basal plate, stigma, veins of wing, all trochanters, fore tibia in front, mid and hind tibia at base, spurs, fore and mid tarsi and hind tarsal joint 4 ferruginous or pale ferruginous; tarsal joint 5 of mid leg brown above, bases of joints 1-3 of hind leg also ferruginous, gastral segment 1 on sides of apical swollen part, 2, 3 wholly, 4 at base beneath ferruginous red, 2 and 3 each with a brownish mark above.

Measurements in Table 1, ocelli in an slightly low equilateral triangle, fore ocellus slightly smaller, vertex flattened, without impressions around hind ocelli, while fore ocellus in a marked hollow whence runs down frontal furrow, the furrow becomes soon shallow and broad, frons broadly roundly raised between eyes excepting eye incisions till sides of SAT, elevation is considerably high, but as median furrow is shallow, not very marked, SAT low nasiform, with lateral inclinations nearly flat, densely covered with silvery hair, only the carina on top appeared above the hair, the carina long, about 2/3 the rest of frons to fore ocellus; SAT and ASR in dorsal view from the back side: Fig. 115, seen from right side: Fig. 116, seen through right PAF: Fig. 117, PAF fairly deep, comparatively broad, flat-bottomed, but raised towards interantennal area, ASR not broadly expanded anteriorly, strongly bicarinate on dorsal surface, clypeus markedly recurved on apical margin (Fig. 121), disc raised from base but not roundly elevated, but strongly tectate, hence in lateral view the surface line straight. Length relation between palpal joints of maxilla generally similar to that of bicolor, but each joint relatively shorter and thicker (joints 2, 3 about twice, 4, 5 about thrice, 6 about 6 times as long as broad at the maximum, in bicolor 3 about 3 ×, 4 about 4.5 ×, 5 about 5.5 ×, 6 about 6.5 × maximum width and 4 = 5 in length); antenna (Table 1) fairly strongly incrassate apically, relative widths at base of joints 3 and 12 appr. 1:2, joint 7 about 1.5 times, 8 about 1.3 times as long as broad, penultimate joint slightly shorter than wide. Collar of pronotum much depressed below level of mesoscutum, with transverse furrow comparatively shallow and broad, anterior and posterior parts subequal in length at middle, posterior part discoloured, in frontal view broad triangular, with top tuberculate, lamina on side tooth-shaped, with apex pointed (Fig. 118, right side), mesoscutum markedly roundly raised at base, mesopleuron normal; propodeum with strong lateral carinae, accompanied inside with a longitudinal series of striae, the striae on posterior inclination extended inwards, covering whole the surface as transverse striae; area dorsalis with a comparatively deep broad median furrow, broader posteriorly and coarsely striated,

lateral furrows curved, area apicalis lunate in form, GSR broadly rounded out; gastral petiole: Fig. 119, minimum width located just before posterior swelling and not at base, just behind basal condyle. CV1, CV2, TCV and radial cell: Fig. 120.

Vertex weakly microcoriaceous and finely and closely punctured, punctures on interspace of fore and hind ocelli sparse, frons more distinctly microcoriaceous, with superimposed punctures slightly larger and close, partly subrugosely confluent, surface nearly mat; mesoscutum under 50x magnification very feeble microsculpture observable, but practically without the sculpture, fairly shining, punctures as large as those on frons, on mid lateral area in front of parapsidal suture with PIS 1-1.5 times as large as PD, on broad central area much sparser, but posteriorly finer and closer, scutellum finely sparsely punctured as on central area of scutum, mesopleuron finely sparsely punctured, punctures larger downwards; dorsal side of propodeum mostly transversely striate, narrow area left on disc of area dorsalis and outside of the area punctured, punctures on the former rather large and sparse, on the latter fine and close, both considerably mixed with striae, area apicalis not smooth, sides of propodeum broadly smooth and shining, on antero-dorsal area weakly rugose and mixed with a few shallow punctures, extreme posterior area strongly coarsely transversely striate. Gastral sternite 1 smooth and polished, but with a few fine short hairs scattered.

Remarks. According to the observation of other female specimens the form of anterior margin of clypeus is considerably varied as given in Figs. 122-124, frequently medio-apical area more or less impressed. In the male clypeus much less produced anteriorly, with recurving weak, basal elevation also weak, with covering hair not markedly convergent towards median line (Fig. 125); flagellar joints of antenna short but ultimate joint long and deformed as given in Fig. 126.

12. TRYPOXYLON REJECTOR SMITH, 1870

(= bicolor F. S. 44)

Trypoxylon rejector Smith, Trans. Zool. Soc. London, 7 (3): 189, 1870 (India: Mainpuri).

The syntype specimen(s) of this species is not present in the collections of either BMNH or UMO. Possibly the specimen(s) had been lost before 1897 when Bingham's The Fauna of British India, Hymenoptera Vol. I appeared. Because in this book he does not give redescription of this species, only citing the original description, despite that he gives redescription of T. intrudens that were published in the same paper. According to the description of Smith and the figure of general appearance of the wasp given by C. Horne in connection with its habits the characters of this species can be summarized as follows:

♀ (?). Length about 11mm; black, with gastral segments 2 and 3 reddish, their apical margins more or less fuscous, mandible ferruginous at apex, legs wholly black, hair silvery; the form of head from above and gastral petiole bicolor-style, frontal furrow present, SAT in an elevated carina, mesoscutum smooth and shining, area dorsalis enclosed with furrow and medianly with a channel, disc smooth, wings subhyaline, with apical margin clouded.

This species is, as was compared by Cameron, very similar to T. cognatum Cameron and I think that they must be conspecific, because the difference pointed out by this author (the state of frontal furrow) is very slight or a question of expression of the character. Moreover, the sex judgement of Smith is quite incredible and I think that the specimen dealt with by him may be a male. As the syntype of this species is lost, in order to confirm its characters there is no other way than to study the species that is considered a synonym of this species. It will be attempted in connection with T. cognatum Cameron.

Remarks. C. Horne describes the nesting habits of this species to construct mud cells like some Pompilids, such as Deuteraenia (= Amplopus) spp.

If such a nest was really constructed by the Trypoxylon observed by Horne and the rejector specimen named by Smith as such really emerged from such a nest the species must be distinct from bicolor s. l. To me it seems, however, that the observed habits of the Trypoxylon may be correct, but the specimen sent to Smith may be confused with some other, because rejector is presumed to be very close to (and in the present paper treated as a form of) T. bicolor, on the basis of the study of the types of T. tinctipenne and T. cognatum, both of which are considered synonyms of T. rejector. Smith considered that the nest was made by Pterochilus pulchellus. This is probably incorrect. It is known that some Trypoxylon ~~make~~ ^{nest} nests as observed by Horne.

13. TRYPOXYLON OBSONATOR SMITH, 1873

(= T. bicolor obsonator Smith)

Trypoxylon obsonator Smith, Trans. Ent. Soc. London, 1873, p. 194, 1873 (♀ ♂, Japan: Hiogo)

The detailed knowledge of T. bicolor obtained through the type series and other correctly identified specimens of this species at once let me perceive that T. obsonator occurring in Japan is in a subspecific relationships with T. bicolor, while T. obsonator tropicale m. is a complete synonym of this species.

In describing ssp. tropicale I pointed out the difference in the relative width of IODv between the specimens of southern areas and of Japan. The fact is reconfirmed by the comparative measurements with abundant specimens. It should further be added that in obsonator clypeus with anterior margin more roundly curved in both sexes, ultimate antennal joint in ♂, on an average, slightly more strongly curved, area dorsalis with lateral furrows generally shallower and more indistinct and genital organs with apical triangular lobe of paramere somewhat narrower (but this is due to speciality of the lectotype, see remarks given to bicolor - p. 4). Otherwise, including general colouration, punctuation, microsculpture, structure of antennal area and of genitalia and sternite 8, both are quite similar to each other. Details of comparison of both the races, with many figures, will be dealt with in another Part of the present paper.

According to the Vardy's list kindly prepared for me, there are two syntypes of obsonator in BMNH and they are certainly among the loaned material. Smith describes female and male specimens from Hiogo, but the syntype specimens examined are both females, one is certainly the species that we have identified with obsonator ♀, but the other is T. malaisei Gussakovskij ♀ which has wholly black antennae and less broadly reddish-maculated abdomen and in so far as the characters are concerned well agrees with the Smith's description of the male of obsonator. But it is about 7 lines (about 15 mm) in length, differing from 5 lines (about 10.5 mm) of the described male. The specimen may be certainly one of the syntypes, but it is uncertain whether the measurement by Smith is erroneous or he used other specimen. To me it seems that the former is true.

States of the syntypes. The obsonator-specimen. It is pinned with about No. 2 insect pin of 30 mm long from which the pin head is dropped off. From the specimen right antenna from joint 4 apically, apical 2 joints of both hind tarsi and gastral segment from 4 apically missing. Right mandible opened and wings well extended laterally. Five labels, from top: a Type label, 7 mm circular card paper, broadly margined with red, carrying printed "Type"; a data label, 7 × 6 mm white paper, with handwritten "Hiogo" and pressed "Japan" in 2 lines; a reference label, 20 × 5 mm, with "F. Sm. Coll. 79. 22" pressed in 2 lines and "type" handwritten in at the left side; a name label, 21 × 11 mm, with "Trypoxylon obsonator Smith" written in 3 lines by the hand of Smith with black ink (white card paper); the other type label, 10 × 10 mm, with "B. M. TYPE HYM. 21. 453" pressed in 3 lines.

The malaisei-specimen. It is pinned at mesoscutum, mounted on a slit of card paper, with 4 labels, from top: a data label, 6 × 7 mm, with "Japan" pressed and "Hiogo" handwritten in below, possibly by G. Lewis; a Museum reference label, 12 × 7 mm, with "Smith coll. Mrs. Farren White, 99-302" pressed in 3 lines; a name label, 18 × 7 mm, white card paper, with "Trypoxylon obsonator Sm." handwritten in 3 lines, the letter resemble those of Smith; a Museum label put by Mr. Vardy: "B. M. 1977. under obsonator" (the last 7 and obsonator are handwritten).

The obsonator specimen has the fore and mid legs brightly maculated as is the case in most of the specimens of this species found in Japan: fore tibia except inner side (apical half except extreme apex brownish), fore tarsus except arolium, mid tibia broadly at base and apex (broader on outer side than on inner side), mid tarsus except brownish apical 2 joints and black arolium, hind tibia broadly at base (about 2/5) and narrowly at apex, bases of tarsal joints and all tibial spurs bright yellowish ferruginous. SAT low, rounded, with a glittering keel on top, not so different as given by Bingham from that of bicolor; lateral furrows of area dorsalis very indistinct, with feeble transverse carinules on posterior portion.

Remarks. There are three female specimens labeled as T. obsonator in BMNH, of which one is derived from Japan (Kyushu, Amakusa, 18. VI. 1931, leg. T. Esaki and H. Hori), having a Museum reference label, "O. W. Richards, B. M. 1967-510" pressed

in 2 lines, and Mr. Vardy's label "B. M. 1977. Under obsenator". This specimen is doubtlessly obsenator (both antennae from joint 4 apically lacking), having well developed frontal elevations and rather dark legs (fore tibia in front narrowly, mid and hind tibiae at base rather obscurely, basal half of fore and mid tarsi and tibial spurs distinctly ferruginous).

Two others are from Tenasserim, Burma, collected and identified by Bingham (Thaungyin val. III. 1894 and Martaban, II. 1894). The two specimens are nicely prepared, as is always the case in his specimens, with the wings laterally extended and legs are symmetrically opened. In these specimens lateral furrows of area dorsalis are very weak and obscure, but such is often met with in the specimens of bicolor also. They are certainly somewhat large specimens, but they can not be separated from other specimens of bicolor by any essential character. SAT, ASR, PAF are quite similar in structure to this species. Measurements distinctly indicate that they do not belong to ssp. obsenator.

14. TRYPOXYLON ACCUMULATOR SMITHI, 1875

(= T. bicolor Smith, 1856)

Trypoxylon accumulator Smith, Trans. Ent. Soc. London, 1875 (1): 33, 1875 (♀, India).

States of syntypes. Two syntype specimens of this species are in UMO.

(1) Pinned at posterior part of mesoscutum with a 26 mm nickel-plated pin of about No. 1 in thickness, accompanied with 2 labels, from top: a name label, 20 × 9 mm, white paper, with "Trypoxylon accumulator Smith" written in 3 lines by the hand of Smith with black ink; a Museum label, 16 × 10 mm, with "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines and "accumulator Sm." handwritten in at the top. The specimen is heavily damaged, head is lost, gaster dropped off and glued on to the posterior part of the name label, the petiole and the rest of gaster are separated; tarsal joints 4 and 5 from right fore leg and from both middle and hind legs and apical joint from right hind leg are lacking; only left fore leg is complete.

(2) Similarly pinned with a similar pin, with one label: a name label, 20 × 7 mm white paper, with "accumulator Sm." handwritten with pencil. It is a complete specimen.

Possibly the first specimen was used mainly in the description by Smith. But it is so incomplete at present and the second well agrees in characters with the first as far as the remained parts of the first are concerned, so the second is designated as the lectotype of T. accumulator Smith.

In order to leave record of the characters of the specimens that were named "accumulator" by Smith, redescription of the syntypes are attempted below:

Redescription.

Diagnosis. ♀. About 15 mm; central part of gaster red, antenna beneath, all tibiae at base, spurs, fore tibia in front, fore and mid tarsi ferruginous, posterior margin of pronotal tubercle and tegula pale brown, posterior part of collar dark brown. Hairs silvery. Head and petiole in form bicolor-style, OOD:POD = 2:3, IODs = 4:3, frontal elevations moderate, SAT tuberciform, PAF up-curved, ASR tricarinate, clypeus rounded out, medio-apical part subtruncate, A3 appr. 5 times as long as wide at apex, mesoscutum finely sparsely punctured, propodeum without lateral carinae, area dorsalis with lateral furrows, very weak, rather indistinct, radial cell C-type, CV1 5 times as long as CV2.

Supplement. Smith describes as 6.5 lines, this is possibly the length with the gaster curved downwards. Antenna with joints 1-3 black, only apices of 1 and 2 pale, rest of flagellum apically gradually brownish above and from apex of 3 apically ferruginous beneath; clypeus with apical margin dark brown, mandible yellowish ferruginous, apex reddish brown, palpi largely ferruginous, fore tibia in front with apical third brown, extreme apex again ferruginous, mid tarsal joints with each apex slightly brownish and joints 4 and 5 brown, hind tarsal joint pale at each apex, all arolia black; posterior part of collar only slightly discoloured; gaster from apex of petiole to base of segment 4 ferruginous red; wings somewhat clouded throughout, somewhat darker apically. SAT fairly closely covered with silvery hair, on gastral sternites hair scarce, but even sternite 1 not completely hairless.

Measurements in Table 1. Clypeus at base roundly raised and medianly tectate as a whole, with hairs convergent towards median line (Fig. 128), seen in profile with surface line only gently sinuate (Fig. 129), SAT and ASR in profile: Fig. 127, lamina

on sides of propodeum less produced than in lectotype male of bicolor (Fig. 130), especially in the headless specimen; mesopleuron with subalar flange acutely carinated and slightly produced, but not expanded into pent-roof structure; propodeum with a longitudinal series of short transverse striae along each lateral margin, beginning from slightly behind spiracle and reaching till apex, the striae fine and close, not strong and posteriorly longer, extending inwards; area apicalis semicircular, anteriorly with 2-3 weak arcuate striae, surface smooth, GSR only very slightly roundly produced (nearly parallel).

Mesoscutum without microsculpture, very finely and rather sparsely punctured, on mid-lateral area in front of parapsidal suture PIS slightly larger than PD, but much sparser on median area; punctuation on mesopleuron as on mid-lateral part of scutum, but punctures slightly stronger, and much stronger and somewhat larger below, area dorsalis without striae at base, lateral indistinct furrow very weakly striate, medial furrow on basal part more distinctly striate, disc punctured as on scutum, posterior margin of the area marked with a few strong transverse striae, sides finely, rather sparsely punctured except anterior smooth area.

Remarks. Propodeum in the head lacking specimen much more distinctly striate, longitudinal series of striae rather coarse and strong, lateral furrows of area dorsalis (though broad and indistinct) distinctly transversely, somewhat sparsely striate, the striae long, covering fairly broadly the lateral parts of the disc, medial furrow (similar in form and depth) also more strongly striate, a few striae at base somewhat obliquely connected with those of the lateral furrows; medial furrow of posterior inclination with its lateral inclination also covered with transverse striae.

As was already synonymized by C. T. Bingham in 1897 this species is nothing else than T. bicolor Smith, 1856, ♀.

II. SPECIES DESCRIBED BY P. CAMERON

Since 1889 to early part of the present century P. Cameron describes very many species of aculeate and parasitic Hymenoptera from the Oriental Region, among them are included 18 species of the genus Trypoxylon and these, together with those described by F. Smith, form the basis of the succeeding investigation of the genus. However, his descriptions, though somewhat more detailed than those of Smith, very frequently can not afford us necessary and sufficient clues to identify the species.

The following facts could be revealed through the present revisional study of the syntype specimens of his species:

1. His sex judgement is occasionally incorrect.
2. He repeatedly describes one and same species under different names, especially when the locality of the specimen is different.
3. He often made quite a misleading description.
4. Some characters can not be understood from his explanation.
5. His description is often different from the true character of the specimen, partly due possibly to the difference in the magnifying instrument.

15. TRYPHOXYLON BUDDAH CAMERON, 1889

Trypoxylon buddah Cameron, Mem. Manch. Lit. Phil. Soc., 4 (2): 119, 1889 (♀, India, Barrackpore).

Present state of the holotype.

A single specimen preserved at UMO is a female measuring about 8.5 mm (presumed length when the curved gaster is extended - in the original description "9 - 5 mm")

It is pinned at the left side of mesoscutum with a 26 mm nickel-plated pin of about No. 1 in thickness. As the insect is markedly slender and the pin is comparatively thick the mesothorax is considerably broken. From the specimen ultimate tarsal joint of right fore leg and right hind leg, and right mid leg from tibia apically missing. It is accompanied with a single label: a Museum reference label, 15x9 mm, with "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines and "buddha Cam." handwritten in at the top with black ink.

Redescription.

Diagnosis. ♀, 8.5 mm. Black; mandible largely, fore tarsus partly and base of hind tibia somewhat dusky ferruginous, spurs whitish; hair silvery. Head thick, subquadrate (Figs. 131-133), clypeus triangular, apex narrowly truncate, IOBs = 5:3, OOB very small, A3 = apical width x 3, frons and SAT forming a mass, highly raised, medianly furrowed, without microsculpture, very coarsely punctured, sinus of eye incision hairless, smooth and polished, mesoscutum smooth, coarsely punctured, without pent-roof structure on mesopleuron, propodeum coarsely striate, with distinct lateral carinae, area dorsalis with deep lateral furrows, gaster slender, petiole shorter than 2 following segments united, basal 3 segment each with a distinct fovea at apex; in fore wing main venation: Fig. 141.

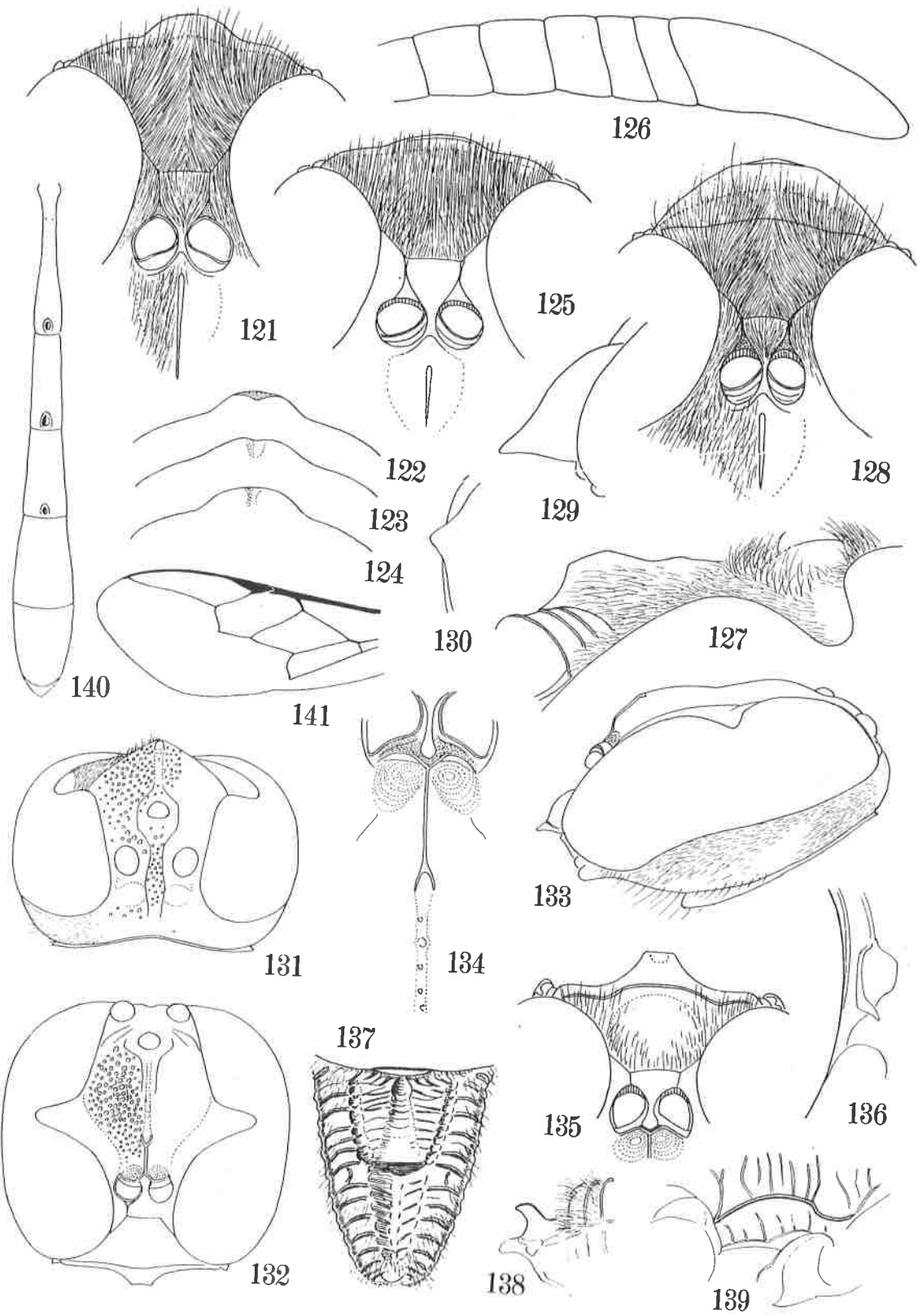
Supplement. Mandible at base black, fore tibia on inner side brown, tarsus brownish, apices of joints 1, 2 and whole of 4 paler, wings hyaline, veins and stigma dark brown.

Measurements in Table 1; occipital carina complete, markedly higher below and triangularly incised beneath head at a short distance behind buccal cavity, in lateral view lower end apparently toothed (Fig. 133). Frontal elevation begins from before hind ocellus, leaving low a small lunate impression in front of each ocellus and a broad interocellar furrow, the furrow continued to depression around fore ocellus (Fig. 131), thence runs down as a narrow distinct groove till SAT (Fig. 132); frontal elevations broad and high, leaving only eye incisions and inner orbits low till outside of antennal base, with median furrow far shallower as compared with the level at inner orbits, SAT forming the lower end of frontal elevation, triangularly attenuated, with lateral inclinations high and flattened, carrying a carina on top, the carina at upper end shortly bifurcate, embracing (and forming the margin of) low end of frontal furrow, the carina at lower end, after inclining anteriorly, broadly bifurcate to connect with the raised upper rim of antennal sockets of both sides, thus forming the angulated interantennal transverse carina (Fig. 132), lateral inclinations of SAT just behind the transverse carina broadly roundly and fairly deeply hollowed out (Fig. 134), usual PAF lacking which is replaced by the rounded hollow above mentioned, ASR shortly expanded anteriorly, with surface weakly bicarinate, antennal joints 3 + 4 = 10Dv (not 2 + 3 as given by Cameron), clypeus (Fig. 135) with disc roundly raised as a whole, this area distinctly bordered by a transverse furrow from the triangularly produced and strongly reflected anterior marginal area, this area just behind medio-apical truncated part with a small impression and the part in some direction appears bidentate; maxillary palpus with 3 apical joints equal in length (in most species of bicolor-style ultimate joint longer than penultimate), 4 and 5 appr. 5 times, 6 appr. 6 times, as long as wide at each maximum width. Antennal joints 3, 4, 5 with relative length appr. 8, 7, 5, joint 7 nearly as long as wide, joint 11 about 1.5 times wider than long. Collar of pronotum not depressed below level of mesoscutum, thick, median area roundly inclined anteriorly, at the dorsal surface anterior part before transverse furrow medianly weakly tuberculate, not markedly thicker than the posterior part, but strongly incrassate laterally, posterior

Explanation to Figs. 121-141.

- Figs. 121-126. Trypoxylon intrudens Smith (= errans Saussure), 121-124, ♀; 125-126, ♂.
127-130. Trypoxylon accumulator Smith (= bicolor Smith), ♀.
131-141. Trypoxylon buddha Cameron, ♀.

121, 125, 128: Clypeus and antennal area. 122, 123, 124: Variation in form of apical margin of clypeus. 126: Apical part of right antenna. 127: SAT and ASR in profile (from left side). 129: Clypeus in profile. 130, 136: Pronotal lamina (130, left; 136, right, thick line, with antecoxal tubercle). 131, 132, 133: Head. 134: Antennal and supraantennal area. 135: Clypeus and antennal area. 137: Propodeum. 138: GSR from right side. 139: Intercoxal carina (thick line, right side). 140: Gaster. 141: Venation of fore wing.



part not discoloured, lamina on sides distinctly produced, but with the margin broadly rounded, without angulated apex (Fig. 136, thick line), mesoscutum on broad median area, together with scutellum, nearly flattened, with parapsidal suture in a very fine impressed line, indistinct among the coarse punctures, mesopleuron with episternal sulcus (prepectal furrow or anterior oblique suture) not straight, but curved (as in Fig. 159); propodeum along lateral carinae longitudinally depressed, median furrow of area dorsalis posteriorly markedly broader and shallower, structure of the segment: Fig. 137, area apicalis lunate in form, medianly longitudinally elevated, surface smooth and polished, GSR markedly roundly produced, in lateral view; Fig. 138, intercoxal carina; Fig. 137; gaster: Fig. 140, tarsi, especially hind tarsus comparatively short, length ratio to each tibia (as 10): in fore leg 11 (arolium excluded), in mid leg 14 and in hind leg 10 (in bicolor ♀ 12.5, 15, 12.5 respectively). Noteworthy is that in fore wing CV1 only twice as long as CV2.

Vertex smooth and polished except finely punctured interocellar furrow, posterior inclination to occipital carina also smooth and shining, with scattered fine punctures, frontal elevations very strongly, rather grossly punctured (Fig. 132), punctures anteriorly closer, sinus of eye incisions glabrous, highly polished, mesoscutum smooth and shining and grossly punctured as on frons, PIS much smaller than PD, but on medio-posterior portion partly PIS larger than PD, on latero-posterior portions weakly subrugosely confluent, punctures on pronotum slightly finer and very close, on dorsal aspect of collar very sparse, sides excavated, smooth and polished, with a crenate longitudinal furrow in middle, mesopleuron smooth, episternal furrow coarsely crenate, postspiracular furrow also coarsely crenate, crenae longer than usual, extending over the verge of the furrow, prepectus grossly and sparsely punctured, but rest of episternum more finely and sparsely punctured, sculpture on propodeum: Fig. 137, intervals of striae shining, but weakly minutely rugulose and not smooth, sides with about 12 transverse striae, most of which come from dorsal side crossing the lateral carina, on posterior portion the striae reach below intercoxal carina, but anteriorly weaker below and vanished on the way, interspaces of striae weakly, minutely subcoriaceously rugulose, extreme anterior part along metapleural suture smooth and shining; gaster closely covered with pubescence-bearing points, but sternite of petiole nearly smooth and polished.

Remarks. (1) The specimen well agrees in characters with the original description of T. buddha Cameron, 1889, except the clypeus. Cameron says "Clypeus with a raised margin, sharply rounded at the apex"; this is certainly misleading, in reality it is as given in Fig. 135. (2) T. buddha tarawakanum Tsuneki was separated from the nominate race by the form of clypeus and the character of the eye incision on the basis of the Cameron's description. By the present reexamination of the holotype it has been clarified that it has just the same characters as those of tarawakanum, hence the latter has become a complete synonym of buddha s. str. (3) As to the male of this species I already gave detailed description with figures (including those of genitalia) under the name, T. monstruosum (ref. Pol. Pism. Ent., 44: 633, 1974).

16. TRYPOXYLON TINCTIPENNE CAMERON, 1889
(= T. bicolor Smith, a form)

Trypoxylon tinctipennis Cameron, Mem. Manch. Lit. Phil. Sec., (4), 11: 121, 1889 (♀, India: Barrackpore).

States of the syntypes. There are two syntypes of Trypoxylon tinctipennis Cameron in the collection of UMO. One is certainly a female, but it is that of T. errans Saussure (= intrudens Smith), measuring only 10 mm in the body length (Cameron says 12 mm), while the other is a male of T. bicolor Smith, 12 mm in length, though it has exceptionally broadly black legs. (Synonymy of this species with bicolor was already made by Bingham, 1897, but the basis of synonymy is uncertain and it is ignored by Bohart and Menke, 1976).

(1) T. errans (♀) specimen. Pinned at mesoscutum with a 25 mm nickel-plated pin of about No. 1 in thickness. It lacks completely the antennae and tibia and tarsus of left mid leg. With 3 labels, from the top: a small subquadrate paper label, with "5" handwritten with red ink; a white card paper, 20 × 10 mm, with "canaliculatum Cam." handwritten by unknown person in 3 lines with black ink (it is placed upside-down); a Museum reference label with "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines and "tinctipennis Cam." handwritten in at the top.

(2) T. bicolor (♂) specimen. Similarly prepared, with the same red "5" label and the Museum reference label as in (1), but it is added between the two a name la-

bel, 21x15 mm, with "Trypoxylon tinctipennis Cam." (not correctly as *tinctipennis*) written in 3 lines by the hand of Cameron with blue black ink (now faded). The specimen lacks also the antennae completely and tibia and tarsus of left hind leg.

Comparison with the original description. Of the two specimens, *T. bicolor* ♂ (nec ♀) better agrees with the original description of *T. tinctipennis* in the length relation between certain antennal joints and interocular distance, surface condition of mesoscutum, colour of mandible and legs:

In the original description $A3:A4 = 4:3$, $IODv = A2+A3$, both are the cases in *T. bicolor* ♂ (in the specimen concerned antennae are lacking), but not in ♀ of this species as well as in *errans* ♀. Furthermore, Cameron describes that A3 and A4 slightly curved on the lower side. This is, together with the characters above mentioned, the proof that the specimen dealt with by him is the male and not the female. He describes also "thorax shining, almost impunctate and with a plumbeous shine". This agrees with the characters of *bicolor* ♂, but not with the punctuation of *errans* ♀ in which punctures on mesoscutum are distinct. Cameron describes "mandibles rufous at tips", in the specimen of *bicolor* mandible is black at base, ferruginous in middle and reddish brown at apex, while in the other it is wholly ferruginous yellow, with apex brownish (without blackish area). As to the colour of legs he says nothing, except "nigrum ... calcaria albis" in the synopsis; in the *errans* specimen all trochanters largely, fore tibia and tarsus, base and apex of mid and hind tibiae and mid tarsal joints 1-4 largely ferruginous, while in the *bicolor* specimen, as above noted, legs are nearly wholly black except pale coloured tibial spurs. In other general characters, for instance, structure of frons and propodeum and pubescence of body, both specimens agree generally with the description. Therefore, both may be syntypes, but the specimen of the *bicolor* ♂ (nec ♀) is designated as the lectotype of *T. tinctipennis* Cameron.

Main structural characters. Measurements in Table 1. SAT in profile: Fig. 142, SAT and ASR seen through PAF: Fig. 143, Clypeus: Fig. 144, ditto in profile: Fig. 145, lamina on sides of pronotum as in *cognatum* (Fig. 151), propodeum with a longitudinal series of short transverse striae on each lateral margin, outer ends of striae forming a straight line, but without a raised line (carina) just at the outside of it, lateral furrows of area dorsalis shallow but distinct. Venation of fore wing also the same as in *cognatum* (Fig. 152); gaster from apical part of petiole to base of segment 4 ferruginous red. Genitalia from beneath: Fig. 146, just the same as in *bicolor*.

Remarks. (1) In the original description is given "clypeus slightly concave", this may possibly mean the slight depression on supra-clypeal area, or a misprint of "convex". Metanotum and median segment there used by Cameron must respectively be area dorsalis and posterior inclination of propodeum. (2) The specimen has the legs markedly blackish; Fore tibia in front at base only very obscurely brownish ferruginous, fore tarsus also dark brown, only apically somewhat paler, mid and hind legs wholly dark brown except pale brown tibial spurs and claws and articulations of segments. Basal whitish rings of mid and hind tibiae very indistinct, only on front side faintly defined. Such colouration of the legs are the cases met with in *rejector* Sm. and *cognatum* Cam. As to the relationships to the two species explanation is given in connection with *cognatum*. (3) In the relative length of $IODv$ to width of head the specimen is rather similar to *obsonator* ♂ (ssp. of *bicolor*) than to *bicolor* s. str. ♂ (Table 1). It is also similar to *cognatum* ♂ in this regard. (4) Compared with lectotype of *bicolor*, area dorsalis in this specimen is broader, almost not narrowed posteriorly (subquadrate, with postero-lateral corners rounded), lateral furrows broader and somewhat deeper, and more distinctly transversely striate. But similar variation in the form, depth and sculpture of the lateral furrows of area dorsalis (independently variable) are not uncommon among the specimens of *bicolor* captured in India and Malaya, as far as examined by me. (5) Sternite 8 is as given in Fig. 142-A. This is essentially the same as in *bicolor* (Fig. 15). According to my study of the *bicolor*-specimens in Japan (= ssp. *obsonator*) the form of this segment is more or less variable (sometimes the same form as Fig. 142-A can be met with among them), but it is common to the species that the apex is triangularly incised and the general outline is similar to Fig. 142-A.

Based upon the consistency of many important characters *tinctipennis* Cameron is synonymized with *bicolor* Smith. But further studies are necessary upon the form of the ultimate antennal joint, variation range of colour of legs and of relative length of $IODv$, and a part of these will be treated in other Parts of the present paper.

17. TRYPOXYLON CANALICULATUM CAMERON, 1889

(= T. errans Saussure)

Trypoxylon canaliculatum Cameron, Mem. Manch. Lit. Phil. Soc., (4), 11: 122 (Sex undescribed, India: Barrackpore, Tirhoot, Mussoorie Hills).

There are three syntypes of Trypoxylon canaliculatum Cameron (all ♀) in the collection of UMO, one of which is attached with the name label written by the hand of Cameron and as it is well agrees with the description this specimen is designated as the lectotype.

States of the syntypes.

(1) Lectotype. It is pinned at medio-anterior part of mesoscutum with a 24 mm fine (No. 0) pin, a complete specimen except that the right antenna is from joint 10 apically lacking. With 3 labels, from the top: a small subquadrate label, with "8"

handwritten with red ink; a name label, 21 x 13 mm, with "Trypoxylon canaliculatum Cam." handwritten in 3 lines with blue black ink; Museum reference label, with "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines and handwritten in at the top "canaliculatum CAM." with black ink. I attached further the identification label and the lectotype label. The specimen is mounted on a small oblong piece of polyethylene compound.

(2) Syntype 1. Pinned at mesoscutum with a 25 mm nickel-plated pin of about No. 4 in thickness, a complete specimen. With 2 labels: a small subsquare label, with "9" handwritten with black ink; a Museum reference label, the same as in lectotype.

(3) Syntype 2. Pinned at mesoscutum with a 25 mm brass pin of about No. 3 in thickness. It is also a complete specimen, with the same Museum reference label only.

There is no doubt that the specimens are the females of T. errans Saussure (= T. intrudens Smith). The synonymy of canaliculatum with intrudens was already presumed by me in my 1974 paper.

In all the specimens the clypeus is typically recurved on the apical margin, gastral segments from apex of petiole to base of segment 4 (in lectotype and syntype 1 covered with the preceding segment) reddish, with an obscure brownish mark on tergites 2 and 3 and in fore wing CV1 appr. 3 times as long as CV2. No particular character is present, they are the common form that has been known under the name of T. intrudens Smith.

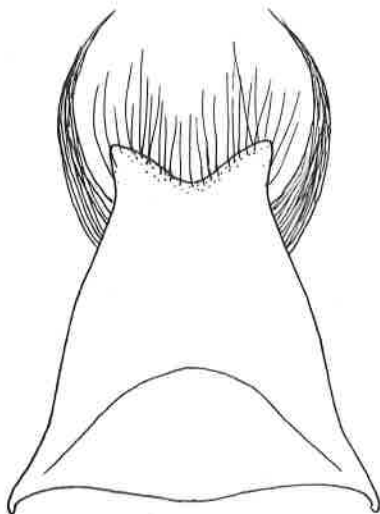


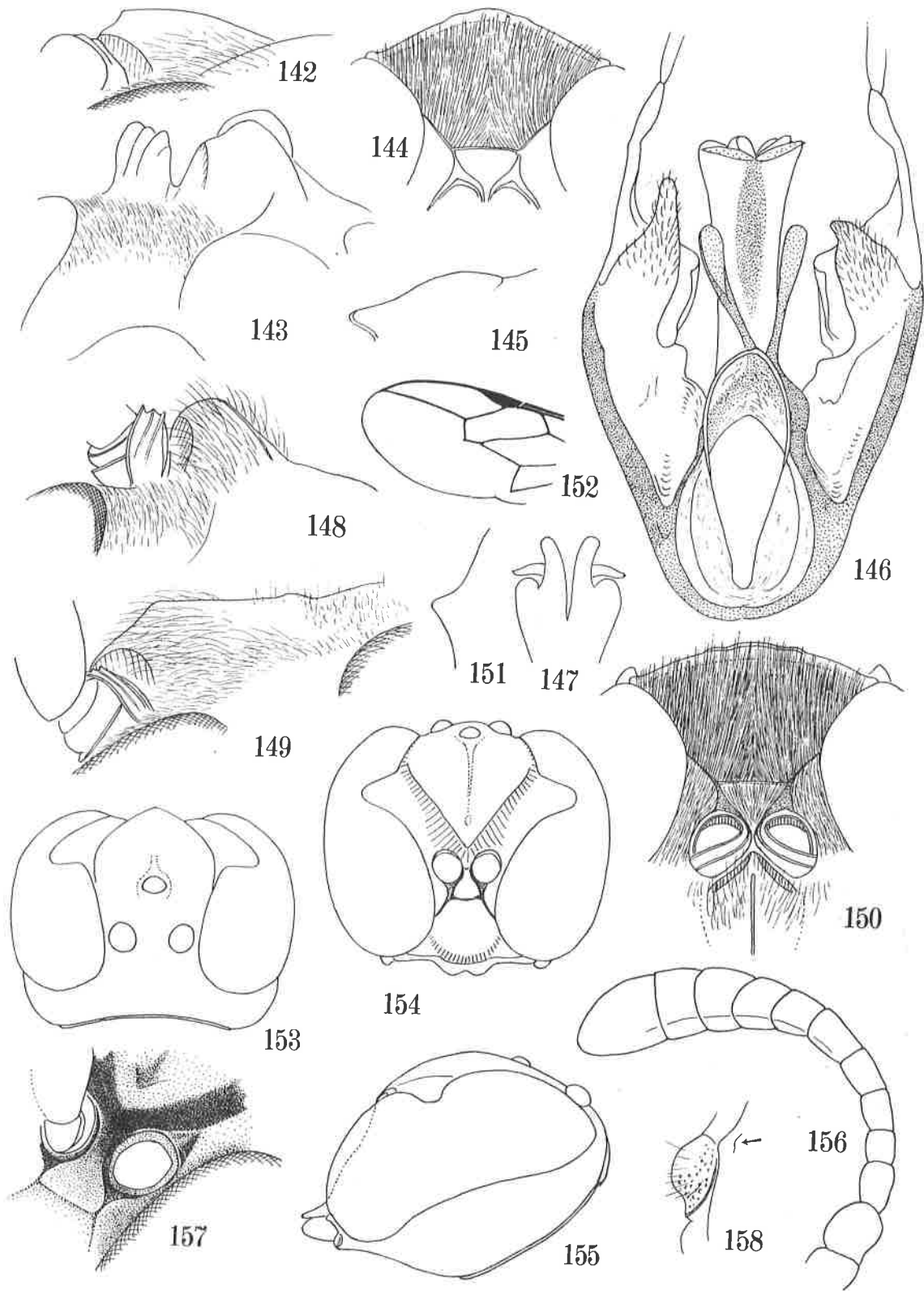
Fig. 142, A. Sternite 8 of Trypoxylon tinctipenne Cameron, ♂.

type 1 covered with the preceding segment) reddish, with an obscure brownish mark on tergites 2 and 3 and in fore wing CV1 appr. 3 times as long as CV2. No particular character is present, they are the common form that has been known under the name of T. intrudens Smith.

Explanation to Figs. 142-158.

- Figs. 142-147. Trypoxylon tinctipenne Cameron (= bicolor Smith), ♂.
 148-152. Trypoxylon cognatum Cameron (= bicolor Smith), ♂.
 153-158. Trypoxylon pygmaeum Cameron, ♂ (to be continued).

142, 149: SAT and ASR in profile. 143, 148: Ditto seen through PAF. 144 150: Clypeus and antennal area. 145: Clypeus in profile. 146: Genitalia from beneath. 147: Apical part of penis valve, vertically from dorsal side. 151. 158: Lamina on left side of pronotum (in 158 shown with arrow). 152: Venation of fore wing. 153, 154, 155: Head. 156: Antenna. 157: Antennal area seen obliquely from side.



18. TRYPOXYLON COGNATUM CAMERON, 1897

(= T. bicolor Smith, a form)

Trypoxylon cognatum Cameron, Mem. Manch. Lit. Phil. Soc., 41 (13): 26, 1897 (♀, Himalaya).

State of the holotype.

A single specimen labeled as cognatum is in the collection of UMO. It is pinned at mesoscutum with a 22 mm nickel-plated business pin of about No. 5 in thickness and the posterior 2/3 of the scutum is broken, left mesopleuron is split off anteriorly and ventrally, and narrowly attached by the dorsal and posterior sides only. From the specimen left antenna from joint 7 and the right from joint 4 apically and left hind leg except coxa and gaster completely lacking. Two labels, top is a name label, 20×13 mm white paper, with "Trypoxylon cognatum Cam. type" written in 3 lines by the hand of Cameron with blue black ink (now faded), and the Museum label, with "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed and "cognatum Cam." handwritten in at the top (the second label is pinned up-side-down).

Sex of the specimen. In the holotype apical part of both antennae and gaster wholly are lacking, therefore, the sex can not simply be decided. Cameron described as ♀, but judging from the less produced clypeus, comparatively short antennal joints remained, broad IODc and especially lack of hind coxal organ it is doubtlessly a male.

Relationships to T. rejector. In his description Cameron compares cognatum with rejector Smith (through description) the type specimen of which is missing at present and says that (rejector) differs from his species in having "an impressed line in front of the anterior ocellus, terminating at an elevated carina just above the insertion of the antennae". In his description of cognatum Cameron gives "the front with a shallow longitudinal depression in the centre". To me it seems that both the descriptions are practically identical. Moreover, Smith's sexing is quite doubtful and I think that rejector is in reality a male and cognatum Cameron is a synonym of that species.

Redescription.

Diagnosis. ♂, 11 mm. (after Cameron); wholly black except whitish tibial spurs, ferruginous mandible (and median red band of gaster); fore tarsus pale brownish. The form of head bicolor-style, IOD comparatively wide, IODs = 4:3, OOD:Od:POD = 2:2:3, (gastral petiole longer than 2 following segments united), SAT low nasiform, PAF deep, flat-bottomed, clypeus weakly roundly produced, frontal elevations moderately high, separated by a broad median furrow, pronotal lamina triangularly produced, apex fairly pointed, mesoscutum without microsculpture, very finely sparsely punctured, propodeum without distinct lateral carinae, area dorsalis with distinct lateral furrows. GSR weakly roundly produced.

Supplement. At present antennae and legs considerably brownish, fore tibia in front broadly pale brown, hind tibia at base in front narrowly pale brown, basal ring of mid tibia indistinct, fore tarsus wholly and mid tarsus apically somewhat paler, of tibial spurs the longer bent one of hind tibia is considerably brownish, tegra of wing semitransparent castaneous, basally paler, stigma and veins dark brown, posteriorly paler. Hair silvery, considerably abundant, short pubescence on vertex and frons greyish.

Measurements in Table 1. Noteworthy is the comparatively wider vertex (IODv) and wider OOD. Hind ocellus from outer side to the posterior encircled with comparatively broad furrow, thus post-ocellar area transversely furrowed and posteriorly bluntly ridged, fore ocellus in a hollow, the hollow narrowed anteriorly, running down as a comparatively broad frontal furrow, frontal elevations on both its sides rather small, not extending upwards beyond the level of eye incisions where they become level with median furrow (but slightly higher than eye incisions), incisions broadly rounded at the sinus. SAT closely covered with silvery hair, with sides roundly inclined, but antero-laterally against ASR acutely, nearly perpendicularly cut (Fig. 149, in profile), forming a narrow deep, flat-bottomed PAF (Fig. 148, seen through the furrow), medio-anteriorly roundly inclined to interantennal area, carina on top straight in profile, about 1/3 the length of the distance to fore ocellus; ASR fairly markedly expanded anteriorly, with the dorsal surface acutely tricarinate (Fig. 148); clypeus: Fig. 150, disc gently raised and rather weakly reflected anteriorly, with covering hairs only on basal area weakly convergent towards median line, anterior margin with about medial third somewhat incrassate and weakly waved. Antennal joints 3, 4, 5 with relative length 10, 8, 7.5; maxillary palpus with relative length of joints 4, 5, 6 appr. 3, 3, 4, at apex 4 thicker than 5, 6 subparallel and slenderer than the preceding. Occipital carina not high, but complete, triangu-

larly emarginate behind buccal cavity. Collar of pronotum with posterior part obscurely discoloured, in some direction brownish, in other direction somewhat whitish, lamina on side: Fig. 151, mesoscutum with parapsidal suture in a short somewhat raised line, mesopleuron without pent-roof structure; dorsal side of propodeum with a series of transverse striae along each lateral margin, outer ends of the striae lying on a longitudinal line and interval between the ends slightly impressed, as a result extreme outer margin of the series appears in some condition weakly carinated, the tendency somewhat more marked than in *tinctipenne*, but there are no distinct lateral carinae on the propodeum; area dorsalis with lateral furrows broad but distinct, sparsely crossed with short striae, median furrow of posterior inclination wedge-shaped, with lateral inclinations sparsely striate, GSR gently roundly raised, intercoxal carina nearly straight, venation of fore wing: Fig. 152.

Vertex and frontal furrow very weakly microcoriaceous and finely fairly closely punctured, frontal elevations more distinctly microcoriaceous and very minutely and sparsely punctured, nearly mat; mesoscutum with punctures fine and sparse, punctures on scutellum slightly larger, PIS = PD, mesopleuron with epimeral area finely sparsely punctured, on prepectus and lower part of episternum punctures as on scutellum, side of propodeum with antero-ventral area rather broadly covered with fine close striae, on broad central part sparsely punctured, punctures comparatively large and hair-bearing, but finer below, posterior part finely and broadly rugose.

Remarks.

It is certain that *T. cognatum* Cameron, 1897 is a complete synonym of *T. tinctipenne* Cameron, 1889 and both are synonyms of *T. javanum* Taschenberg, 1875. Still further, these three are possibly synonyms of *T. rejector* Smith, 1870. As mentioned in the remarks to *T. tinctipenne* I believe that these four are a special form of *T. bicolor* Smith, 1856, a quite variable species, on the basis of constancy of many important characters. However, there remains still some doubt as to whether this conclusion is definite or not. Further studies as to confirmation of certain unobserved characters (e.g. Al3) and variation of general characters are necessary (see appendix).

19. TRYPOXYLON PYGMAEUM CAMERON, 1900

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

State of the holotype (UMO).

It is glued on to a slit of card paper, about 7 × 5 mm, with the left side up. The eye, antenna and legs of the right side are largely covered with glue. Ultimate antennal joint, fore leg except coxa and trochanter and mid leg except coxa of the left side are lacking. Moreover, the left eye appears somewhat depressed from the side, having the outline, though slight, emarginate seen in front. It is accompanied with 2 labels: top is a name label, 20 × 13 mm white card paper, with "*Trypoxylon pygmaeum* Cam. Type Barrackpore" written by the hand of Cameron in 4 lines with blue black ink, and the 2nd is a Museum label, 15 × 13 mm, pale blue paper, with "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines and handwritten in at the top with black ink "*pygmaeum* Cam.". The Museum label is pinned up-side-down.

As the type series is but a single it is considered the holotype of the species.

Redescription.

Diagnosis. ♂ nec ♀, 4.5 mm; black, antenna dark brown, ferruginous beneath, clypeus anteriorly fairly broadly, mandible, pronotal tubercle posteriorly and tegula ferruginous; fore and mid tibiae largely, fore tarsus wholly and mid tarsus largely, hind tibia at base, all tibial spurs yellowish white, articulations of legs pale. Hair silvery. Head thick, subquadrate in dorsal and frontal view (Figs. 153-155), frons gently raised as a mass, medial furrow very weak, SAT not particularly raised, without medial carina, smoothly connected with ASR without PAF, ASR slightly raised, slightly expanded anteriorly; antenna 12-jointed: Fig. 156; collar with posterior part discoloured, frons and mesoscutum microcoriaceous and finely closely punctured, episternal suture markedly bent (Fig. 159), propodeum with lateral carinae, surface except sides minutely irregularly reticulate, area dorsalis practically without lateral furrows, gastral petiole: Fig. 160, venation: Fig. 161.

Supplement. Mandible with apical third brownish, fore and mid tibiae above except apex brown, fore tarsus except brownish arolium completely yellowish white, mid tarsus with apical 3 joints brown above, whitish ring of hind tibia occupies basal

third, hind metatarsus largely (except obscure brown mark apically above) and base and apex of following joints also whitish, articulations of coxae, trochanters and femora of all legs comparatively broadly pale, wings apically somewhat clouded, stigma and veins castaneous.

Measurements in Table 1 (measured on the basis of left half, since right eye is depressed at the side). Head from above (Fig. 153) with ratio of W:L at inner orbit appr. 5:4, OOD markedly narrow, vertex with depression around each hind ocellus very weak and indistinct, that of fore ocellus more distinct and larger, but not deep, narrowly, shallowly, very indistinctly extended as a medial furrow; head in frontal view with IODs appr. 5:3, frons from ocellar area till above antennal base gently elevated as a mass, elevation occupying full width of interocular area above eye incisions, gradually higher below, ending in a triangular SAT, without any constriction or depression behind this (Fig. 155, in profile), antero-lateral inclination of SAT smoothly connected with ASR (Fig. 157), ASR almost not expanded anteriorly; clypeus distinctly longer in middle than wide at minimum IOD, disc flattened and flattened area roundly margined anteriorly by a gentle inclination (as given with hatched zone in Fig. 154), the depressed anterior marginal area distinctly reflected and medianly shortly bidentate at apex (ditto); occipital carina complete, triangularly emarginate behind buccal cavity (characters of maxillary palpus unobservable), head in profile: Fig. 155; pronotal collar in frontal view with dorsal line gently roundly curved, without distinct medial tubercle, mesoscutum with admedian area margined on each side with a short raised line, parapsidal suture in an impressed line; thorax-complex in lateral view: Fig. 159, notice the curvature of episternal suture and of intercoxal carina, lateral lamina of pronotum very short and very minutely produced (Fig. 158, shown with arrow, also in Fig. 159); propodeum without well marked area dorsalis, but the part corresponding to the area roundly flattened and inclined laterally and in some light a feeble furrow-like depression is defined on about anterior half, median furrow distinct, not deep and posteriorly enlarged; medial furrow of posterior inclination deep, wedge-shaped, GSR parallel-sided, acutely ridged across middle, gastral segments 1 and 2: Fig. 160 (genitalia not observed), in fore wing (Fig. 161) CV2 slightly longer than TCV and just half the length of CV1, radial cell not reaching close to the wing apex.

Vertex on interocellar area and impression around each ocellus very finely and somewhat sparsely punctured, PIS > PD, PIS practically without microsculpture (under 80x magnification definable), with surface shining, on lateral and posterior areas punctures similarly fine, but very close, PIS much smaller than PD, with distinct microreticulation (punctures are so fine that they can hardly surpass 3 meshes combined), surface somewhat mat; punctures and microreticulation on mesoscutum and prepectus of mesopleuron as on frons, on scutellum microsculpture weaker, on epimeral area punctures weaker and much sparser, microreticulation almost vanished, but below scrobe punctures gradually stronger, closer and microreticulation distinct and general appearance becomes as on scutum except that meshes of microreticulation transversely elongate, appearing somewhat microstriate; propodeum without a series of transverse striae on each side along lateral carina, area apicalis subtriangular, upper half minutely coriaceous and posteriorly smooth and polished, sides of propodeum obliquely somewhat arcuately very finely and closely striate all over, only on anterior and lower areas striae weak.

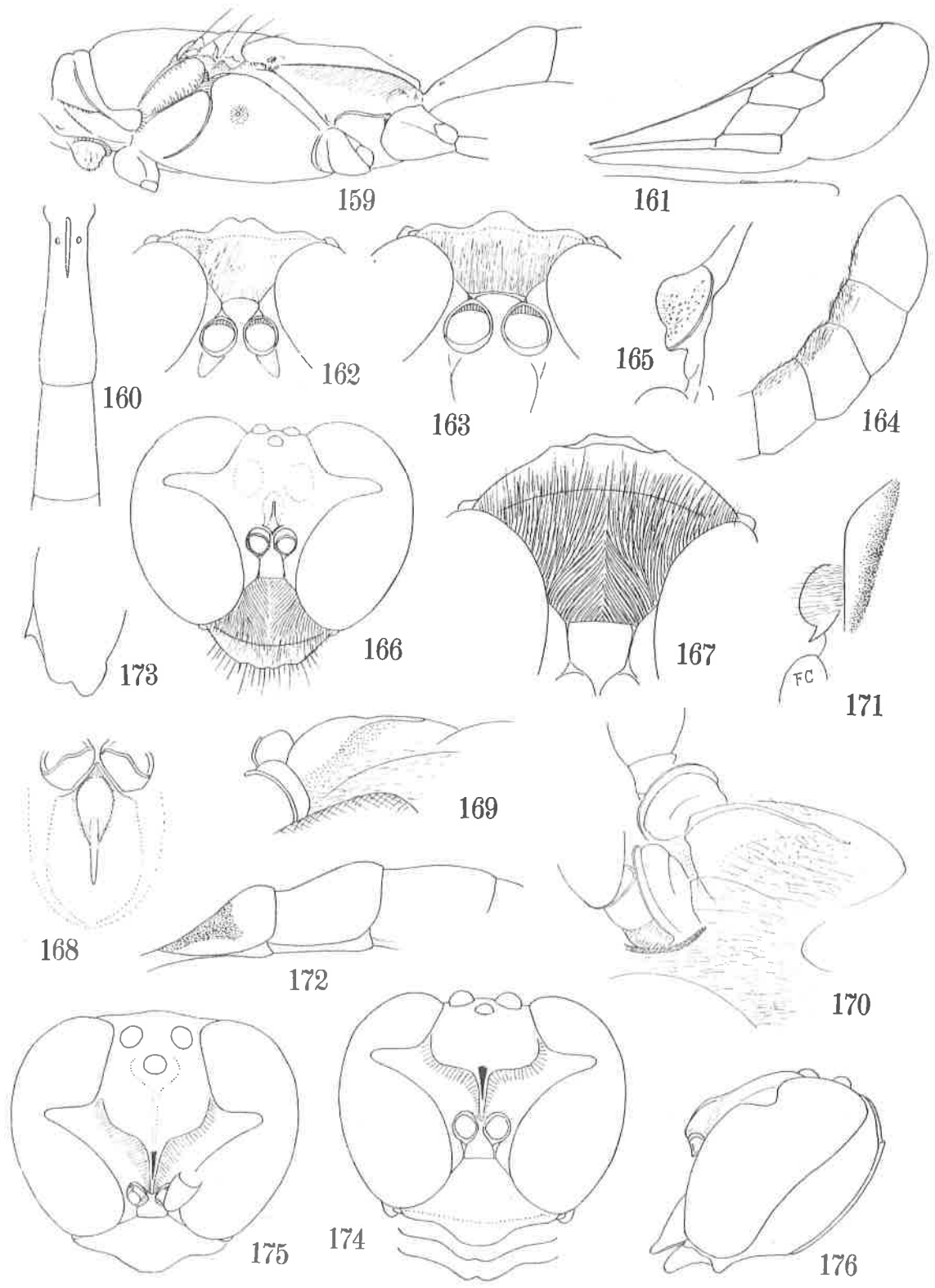
On the male of T. mandibulatum Richards, 1933

The allotype male of T. mandibulatum in the collection of BMNH is very similar in appearance to T. pygmaeum and apparently conspecific with this. According to my

Explanation to Figs. 159-176.

- Figs. 159-162. Trypoxylon pygmaeum Cameron, ♂.
163-165. Trypoxylon mandibulatum Richards, ♂.
166-173. Trypoxylon varipilosum Cameron, ♀.
174-176. Trypoxylon trochanteratum Cameron, ♀ (to be continued).

159: Thorax-complex and gastral petiole in profile. 160: Gasteral segments 1 and 2. 161: Venation of fore wing. 162, 163, 167: Clypeus and supraclypeal area. 164: Apical 4 joints of right antenna. 165, 171: Pronotal lamina and antecoxal tubercle of propleuron (left). 166, 174, 175, 176: Head (174 with variation of anterior margin of clypeus, 175 seen vertically to frons). 168: SAT and ASR vertically from dorsal side. 169: Ditto in profile. 170: Ditto seen through PAF. 172: Gasteral segments 1-3 in profile (petiole in part only). 173: Hind coxa.



comparative observation of both specimens it differs from pygmaeum considerably as follows:

1. Clypeus much wider (wider at minimum IOD at base of clypeus than long in middle), with medio-apical margin simply roundly produced (Fig. 163, cf. Fig. 162), disc much less elevated, nearly flattened and apical marginal area black, only apically dark brownish. Supraclypeal area very short, very low triangular (Fig. 163, cf. Fig. 162).

2. Punctures superimposed on ground microreticulation of head and mesothorax relatively larger, with surface less glossy, especially on mesopleuron, epimeral area also distinctly fairly closely punctured.

3. Propodeum with area dorsalis thoroughly margined with furrow, though not strong and not deep, median furrow of posterior inclination very much shorter and shallower, ending far before GSR and replaced thence by a central carina (in pygmaeum wedge-shaped, much longer and deeper, reaching close to GSR), sculpture on dorsal and posterior aspects distinctly coarser than in pygmaeum, striae on sides of propodeum also coarser and on posterior portion mixed with a few strong punctures.

4. Pronotal lamina without minute process (Fig. 165, cf. Fig. 158), interocular distance at vertex and at base of clypeus much larger (compare the measurement of the two species in Table 1).

The differences above given may fall within the range of specific variation, if the species concerned is markedly plastic in nature, such as T. bicolor Sm. However, at present such a fact remains quite unknown. On the other hand, to treat them to be in a subspecific relationships, the localities from where they derived are situated too near, without any considerable barrier, namely, pygmaeum from Barrackpore and mandibulatum from Bengal, Pusa. It seems to me better to deal with them rather provisionally as representing a different species respectively.

20. TRYPOXYLON VARIPILOSUM CAMERON, 1901

Trypoxylon varipilosum Cameron, Proc. Zool. Soc. London, 2 (2): 28, 1901 (♀, Singapore).

State of the holotype (BMNH).

Pinned with a long nickel-plated pin of about No. 2 in thickness (already partly rusted) at the right side of mesoscutum. It is mounted on a slit of card paper (20 × 7 mm) and the pin is cut at 2mm above the insect. It has wings laterally expanded and legs also arranged, but the right antenna from joint 6 and the left from joint 3 apically lacking, apical tarsal joint of hind leg is also lost. During the present mailing the gaster dropped off and it was mounted on card point and attached to the specimen. With 4 labels, from the top: Type label, 7 mm round label, encircled with red band, with "Type" pressed at the centre; data label, 13 × 6 mm, with the pressed "Singapore" and handwritten "Sept. 1888" in two lines; name label, 18 × 13 mm, with "Trypoxylon varipilosum Cam. Type Singapore" written in 4 lines by the hand of Cameron; Museum label, about 10 mm square, with "B. M. TYPE HYM" pressed in 2 lines and "21. 454" handwritten in below.

Redescription.

Diagnosis. ♀, 16 mm, antennae, gaster except petiole, greater part of legs ferruginous, hairs brassy; form of head and petiole bicolor-stype, SAT low nasiform, ASR highly raised and broadly expanded anteriorly, with surface striate, PAF deep, flat-bottomed, clypeus: Fig. 167, mesoscutum without microsculpture, propodeum without lateral carinae, area dorsalis with weak, rather indistinct lateral furrows, in fore wing radial cell C-type, CVI about 7 times as long as CV2.

Supplement. Length about 15.5 mm (gaster curved downwards and separately measured, Cameron says correctly 16 mm). Black, with a weak plumbeous shine on mesoscutum and scutellum; ferruginous are apical margin of clypeus very broadly (about 2/5 of its total length, with extreme apical margin brownish), mandible except brownish apex (Cameron says "paler, more yellowish towards the apex", but it is incorrect), mouth parts, antenna (joints 4 and 5 slightly brownish above), antero-lateral corner of pronotal neck (at the part of lamina), tubercles, posterior part of collar (discoloured), tegula (semitransparent) and basal plates of wing, gaster from apex of petiole (on sides somewhat extended anteriorly) to end segment (segments 5 and 6 somewhat brownish and brown of 5 appeared on posterior part of 4 through semitransparent sclerite) and legs except black coxal bases and arolia and some brownish parts of mid

and hind legs. Brown on mid leg: apical 3 joints above partly, on hind leg: femora above including two darker streaks, tibia except basal portion, somewhat darker on outer side and all tarsal joints except base and apex of each. Wings hyaline, apical margin very faintly fuscous, veins dark brown, stigma ferruginous. Covering hair on head and thorax brassy, long and appressed, but on clypeus considerably mixed with half erected hair, hair on clypeus, temple, neck region, side of thorax and especially on posterior part of propodeal side in some light appears silvery, pubescence on frons, dorsal aspects of head and thorax and side of propodeum except posterior area shorter and finer and very sparse; gaster closely covered with short pubescence on ventral side pubescence scarce, posterior margins of sternites 2 and 3 with 2-, those of 4 and 5 with 4 long hairs, those on 6 sparsely scattered all over the surface.

Head from above transverse, W:L = 2:1, measurements in Table 1, intercellular area gently roundly raised, ocelli in an equilateral triangle, fore ocellus slightly smaller and in a hollow, thence frontal furrow runs down, on both sides frons gently convex, raised degree as in bicolor, but with median furrow much broader; head in frontal view: Fig. 166, eye incision narrow and deep, SAT low (Fig. 169, in profile), seen vertically from back side: Fig. 168, lateral inclination on posterior part gentle and flat, anteriorly strong and acute, medio-anterior part obliquely truncate, forming a broad flattened space (Fig. 168), raised ASR expanded anteriorly, with surface smooth and shining, PAF deep, flat-bottomed (Fig. 170, seen through the furrow), IODs = 7:6, clypeus: Fig. 167, disc on basal half gently convex and apically broadly reflected, with anterior margin sinuate, covering hairs as in Fig. 167; antennal joints 3, 4, 5 with relative length 10, 6, 5,5. Collar of pronotum with anterior part medianly very short, in frontal view dorsal margin broad-triangularly raised towards middle and bluntly tuberculate there, lamina on side very obtuse (Fig. 171), mesoscutum with admedian furrow broad and short, notauli almost lacking, mesopleural flange acutely edged, but not expanded into pent-roof structure; propodeum without lateral carinae, instead with a longitudinal series of short striae on each lateral margin, ranging from about 1/3 from base till apex, the outer ends of the striae forming a line and in some light it appears to be an impressed line; lateral furrows of area dorsalis shallow and indistinct, in oblique light only weakly defined, roundly curved, median furrow posteriorly elliptically enlarged, with a distinct glittering bottom line; median furrow of posterior inclination broad and deep, wedge-shaped, narrowing and shallowing posteriorly, reaching directly GSR, area apicalis indistinct, anteriorly covered with several arcuate fine carinae, gastral petiole markedly slender and long (Table 1), spiracles located at about 1/5 from base, slight depression in front of apical swelling at about 3/10 from apex, dorsal curvature of gastral segments 1-3: Fig. 172; in fore wing CV2 about 2/3 of TCV. Hind coxa: Fig. 173.

Vertex very weakly microcoriaceous between fore and hind ocelli, impression around the former and frontal median furrow much more weakly microsculptured, without puncture and surface fairly shining, on frontal elevations microsculpture strong, surface mat and superimposed with fine, shallow punctures, PIS 1-2 times as large as PD, but anteriorly punctures partly subrugosely confluent; pro- and mesonotum and scutellum without microsculpture, very finely, shallowly and very sparsely punctured, mesopleuron with puncture similar, but surface smooth, nearly polished, propodeum except lateral series of striae practically impunctate, smooth and shining, only posterior part of the sides densely covered with hair points, not shining; gaster covered with delicate pile points, on ventral side pubescence scarce, shining.

Remarks. The present species is very closely related to T. coloratum Smith, 1857, as was already compared by Cameron himself in his description of varipilosum. Judging from the variation of structural characters, the main difference between the two lies in the colouration of the gastral petiole, antennae and coxae of legs, and apparently they are conspecific. Final determination whether they represent different local races or mere fluctuative variations, however, will be done after the study of further material from various district of the Oriental Region.

21. TRYPOXYLON ERYTHROZONATUM CAMERON, 1901

(= T. bicolor Smith)

Trypoxylon erythrozonatum Cameron, Hym. in Gardiner's Faun. Geogr. Maldive & Laccadive Arch., p. 54, 1901 (♀)

State of the lectotype specimen (present designation).

A single female syntype specimen at BMNH is pinned at mesoscutum with a 30 mm insect pin of about No. 4 in thickness. The pin is already headless and heavily rusted, appearing black. The specimen is also headless, but the thorax-complex with wings, legs and gaster are complete. It is accompanied with 4 labels, from the top: a 7 mm round label encircled with red band, with "Type" pressed at the centre; data label, 10×7 mm, with "Maldives Gardiner 20. V. 1900" pressed in 3 lines and "Hulule" handwritten in at the top with black ink; Museum reference label, 8×4 mm, with "Brit. Mus. 1931-156" pressed in 2 lines (it is placed up-side-down); name label, 19×11 mm, with "Trypoxylon erythrozonatum Cam. Type Maldives" written in 4 lines by the hand of Cameron with black ink; type label, 10×10 mm, with "B. M. TYPE HYM." pressed in 2 lines and "21.457" handwritten in below.

Observation.

Although the most important head is lacking general characters of the thorax-complex and gaster indicate that it is doubtlessly within the category of T. bicolor Sm., ♀. Colour of legs: Black, all tibiae at base on outer side narrowly ferruginous, somewhat brownish; in fore tibia the colour shortly, narrowly and obscurely extended till about mid point of the segment; apices of fore and mid tibiae also ferruginous; all tibial spurs, fore tarsus wholly (apical 3 joints somewhat brownish) and basal 2 joints of mid tarsus pale yellow (apices slightly brownish), apical 3 joints of mid tarsus nearly dark brown. This colouration is rather intermediate between those of nominate form and black-legged form, but strictly closer to the former. Gaster from apex of petiole to base of segment 4 ferruginous red. Mesoscutum with fairly strong plumbeous shine.

Pronotal lamina produced, but not acutely pointed at apex, apical angle nearly 90°. Longitudinal series of short transverse striae on each side of dorsal aspect of propodeum not strong, lateral furrows of area dorsalis also weak and indistinct, but median furrow comparatively deep, posteriorly triangularly enlarged, smooth and shining, GSR very slightly rounded out. Measurement of gastral segments 1-3 (to the total length of petiole 100): Ma Mi 2 3 = 15, 5, 28, 28. Punctures on mesoscutum fine and sparse, PIS larger than PD, but the punctures somewhat larger and more distinct than usual.

Remarks. Cameron in his description says "The upper part of the front bears a narrow longitudinal keel". The underlined words are possibly a mistake of either lower or furrow.

Lectotype designation of TRYPXYLON MELANURUM CAMERON, 1901

Trypoxylon melanurum Cameron, Hym. in Gardiner's Faun. Geogr. Maldives & Laccadives Arch., p. 54, 1901 (♂).

Trypoxylon melanurum: Tsuneki, Spec. Publ. Jap. Hymen. Ass., 7: 41, 1978 (♀ ♂).

A single male syntype specimen is preserved at BMNH. It well agrees in characters with the original description of T. melanurum. An account of its present state and the detailed redescription of its characters were already given in Part I of the present paper. The specimen is formally designated here as the lectotype of the species.

22. TRYPXYLON GENICULATUM CAMERON, 1902

(= T. errans Saussure)

Trypoxylon geniculatum Cameron, Entom., 35: 313, 1902 (♀, Khasia Hills).

There are 2 syntypes in UMO and 2 in BMNH, all are females. Of these syntypes, one in UMO and one in BMNH are accompanied each with a formal name label, 21×15 mm and 19×14 mm, "Trypoxylon geniculatum Cam. type Khasia" written in 4 lines by the hand of Cameron with blue black ink (now faded into brownish). Possibly the 2 specimens were mainly used by Cameron in his description of this species. Of the two the UMO specimen lacks completely the right antenna and gaster, while that of BMNH lacks the right antenna and right hind tarsal joints 2-5 only. I, therefore, designate the latter as the lectotype of T. geniculatum.

The lectotype is pinned at mesoscutum and mounted on a slit of card paper and further accompanied with 3 labels: a 7 mm red circled "Type" label; a deliviation

label, with "P. Cameron Coll. 1901-261" pressed in 2 lines; a Museum label "B. M. TYPE HYM." pressed and "21.448" handwritten in below. I added a lectotype label and identification label.

The other specimen of BMNH bears similar name label, but without "type", the other UMO specimen has a slit of name label, 33 x 5 mm, with "geniculata Cam." handwritten by Cameron himself. The former lacks the left antennal joints 8-12 and the latter the left antennal joints 4-12 and with the gastral segments from 2 apically detached and glued on to the name label. All belong to the same species.

Measurements of the 4 specimens above mentioned are given in Table 1; in all the specimens all trochanters brown to dark brown above and mid tarsi from apex of joint 2 apically brown to dark brown. Fore tarsus also apically somewhat brownish.

There is no doubt that *T. geniculatum* Cameron, 1902, is a complete synonym of so called *T. intrudens* Smith, 1870, and again that of *T. errans* Saussure, 1867.

23. TRYPOXYLON TROCHANTERATUM CAMERON, 1902

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

The present states of the syntypes.

There are 3 syntypes in UMO and 2 in BMNH, all are females. Of these, two of the three in UMO lack the gaster completely, greater part of the antennae and parts of the legs, one of which carries a name label, 21 x 17 mm, with "Trypoxylon trochanteratum Cam. Type khasia" written in 4 lines by the hand of Cameron with blue black ink (now faded into brownish), and both are accompanied with the Museum label, "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines and topped with "trochanteratum Cam." handwritten with black ink. Both are pinned at mesoscutum with 38 mm black steel insect pin of about No. 1 in thickness. While the third of UMO syntypes is pinned at mesoscutum with the same steel pin, but of about No. 3 in thickness and accompanied with only the same Museum reference label as in others. It lacks left antenna completely, right mid leg from trochanter apically and apical 2 joints of left hind leg.

One of the syntypes of BMNH is heavily covered with dead mould and it was very difficult to clean without giving damage so as to enable the measurements. It is pinned with similar steel pin of No. 3 in thickness at the mesoscutum. It lacks the left antenna completely and right wing partly. It is accompanied with a name label, 22 x 12 mm, with "Trypoxylon trochanteratum Cam. Khasia" handwritten in 4 lines (without "Type") by Cameron with blue black ink (faded into brownish at present). The other of BMNH syntypes is pinned at mesoscutum with a 15 mm nickel-plated pin of No. 0 in thickness and mounted on a slit of card paper. It is accompanied with 4 labels: a 7 mm red circled "Type" label; a deliviation label, 11 x 3 mm, with "Cameron coll. 1901-261" pressed in 2 lines; a name label, 18 x 14 mm, "Trypoxylon trochanteratum Cam. type Khasia" written by the hand of Cameron in 4 lines with blue black ink (do) and a Museum reference label "B. M. TYPE HYM. (pressed) 21-447 (handwritten) in 3 lines. The specimen is complete, except that left hind tarsal joints 2-5 are lacking, right hind leg is glued between coxa and trochanter and part of left antennal joints 5 and 12 is eaten by insect. Its wings regularly opened laterally.

Based on the conditions mentioned the last syntype is designated as the lectotype of *T. trochanteratum* Cameron, 1902 and all others as the paralectotypes.

Redescription.

Diagnosis. ♀, length 12-13 mm; black, gaster except dorsal side of petiole, mandible and legs largely reddish ferruginous. Head in frontal view: Fig. 174, petiole: Fig. 182, frons and mesoscutum microcoriaceous and very finely and closely punctured, nearly mat; frons raised as a mass, anteriorly narrowed suddenly into long bill-shaped SAT (Fig. 175, vertically seen) which is on top narrowly excavated from above (Fig. 178), clypeus rounded out and medianly recurved, recurved area sometimes incised in middle (Fig. 174); mesopleural flange acutely edged (Fig. 181), but not expanded into pent-roof structure; propodeum with distinct lateral carinae, area dorsalis marked with distinct lateral furrow, GSR ridged across middle, radial cell in fore wing B-type, CV2 about 1/3 the length of CV1; hair silvery.

Supplement. Antenna black, joints 1 and 2 ferruginous beneath, mandible ferruginous, apically dark brown, palpi light or dark ferruginous, collar posteriorly discoloured, brown to dark brown, tubercle posteriorly dark brownish, tegula semitransparent brown, petiole at base brownish black, dorsal side dark brown, apically paler

or with indistinctly outlined pale patches, apical margin on sides and beneath reddish ferruginous, tergites 2 and 3 with one or two small dark brown patches (lectotype) or 2, 3, 4 considerably broadly darkened posteriorly (one of paralectotypes); apices of coxae, trochanters beneath (brown to dark brown above), both ends narrowly of femora, fore and mid tibiae except underside, hind tibia at base and apex and on inner side, fore tarsus wholly, mid tarsus with joints 1-3 at base (in metatarsus broadly) and 4, 5 nearly wholly and all tibial spurs reddish ferruginous; arolia dark brown; wings hyaline, veins and stigma light castaneous. Hairs on clypeus decumbent, almost parallel, only at base somewhat convergent towards median line and on anterior portion mixed with scattered long erect brownish hairs.

Head from above with W:L = 50:27 (at inner orbit), measurements in Table 1. Vertex with impressions around hind ocelli very weak and narrow, that of fore ocellus broader and deeper, but frontal furrow in a very fine feeble impressed line, frontal elevations vertically seen: Fig. 175, anteriorly stoutly keeled and top of keeled area with a narrow wedge-shaped impression in middle, appearing to have a slender V-shaped carina, lower end of the keel connected with a slightly raised ASR by an oblique carina (Fig. 177, frontal view), the area in dorso-lateral view: Fig. 178. Head seen in front: Fig. 174, clypeus with apical margin medianly recurved as in errans, sometimes minutely incised in middle, with disc very slightly raised and anteriorly weakly reflected. Head seen in profile: Fig. 176. Antennal joints 3, 4, 5 with relative length appr. 10, 7, 6, penultimate joint slightly longer than wide. Pronotal collar seen in front: Fig. 179, lamina on side broadly rounded, only very slightly produced (Fig. 180), mesoscutum with parapsidal suture in glittering impressed line, conspicuous due to nearly mat surroundings, mesopleuron with episternal furrow slightly curved (Fig. 181); propodeum with area dorsalis slightly longer than wide at base, with sides gently roundly convergent apically, apex broadly rounded, medial furrow comparatively deep, gradually widened posteriorly, medial furrow of posterior inclination varied in form, sometimes narrow and deep, with apical portion attenuate, reaching near GSR, sometimes suboval, with deep bottom furrow, ending far before GSR, GSR not swollen out posteriorly, ridged across middle; gastral petiole appr. as long as 2 following segments united (Table 1), hind coxal process very minutely toothed.

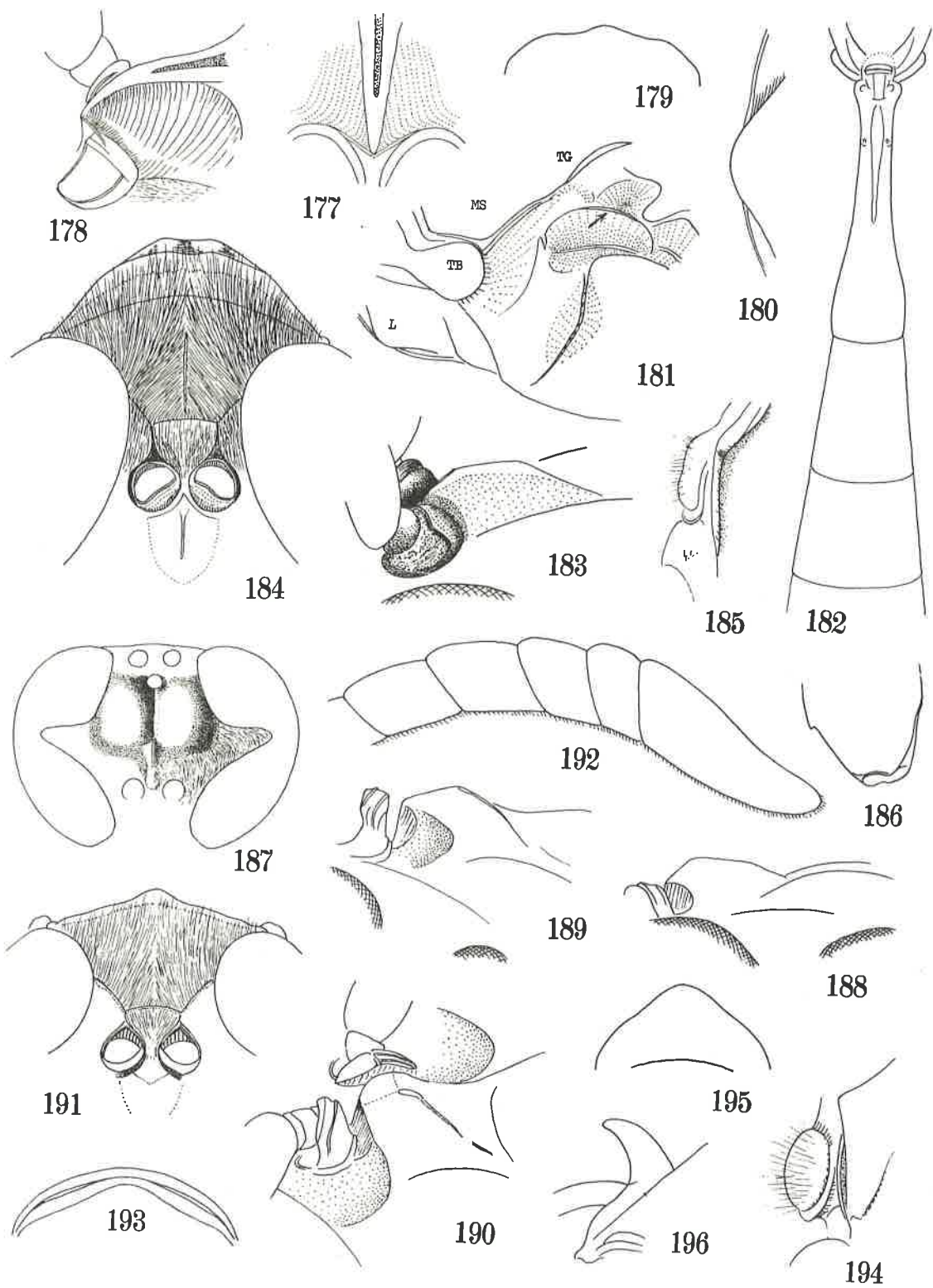
Microreticulation on vertex, anterior inclination of collar and mesopleuron weak with surface somewhat shining, frons and mesoscutum more strongly microreticulate, with surface nearly mat, punctures on frons fine and close, partly subrugosely confluent, on mesoscutum slightly finer and fairly close, on prepectus somewhat larger, but weaker and fairly close, on epimeral area finer, weaker, much sparser, with surface nearly polished, below scrobe punctures gradually stronger, slightly larger, but always sparse. Area dorsalis at base obliquely coarsely, on medial furrow transversely finely closely, on disc somewhat more strongly and slightly sparsely striate, with interspace minutely rough, not shining, lateral furrows also crossed by striae, outside the furrow surface minutely closely punctured, posterior inclination with only very fine and weak pubescence points, shining, sides of the segment smooth and polished.

24. TRYPOXYLON ANNULIPES CAMERON, 1903

(= T. kalimantan Menke)

Explanation to Figs. 177-196.

- Figs. 177-182. Trypoxylon trochanteratum Cameron, ♀.
183-186. Trypoxylon annulipes Cameron (= kalimantan Menke), ♀.
187-196. Trypoxylon placidum Cameron (= montanum Schulz = orientale Cam.) ♂.
177: SAT and ASR seen vertically in front. 178: Ditto, obliquely from side.
179: Pronotal collar, frontal view. 180, 185, 194: Pronotal lamina on left side, in 185, 194 with antecoxal tubercle. 181: Mesopleuron (left side; L.. pronotal lamina, TB... Pronotal tubercle, MS... mesoscutum, TG... tegula, arrow ridge of mesopleural flange). 182: Gastral segments 1-3. 183, 188: SAT and ASR in profile. 184, 191: Clypeus and antennal area. 186: Hind coxa. 187: Head seen vertically to frons. 189: SAT and ASR seen through PAF. 190: Ditto, obliquely from side, to show structure of ASR. 192: Apical part of right antenna. 193: Pronotal collar, frontal view. 195: GSR, showing posterior expansion. 196: Ditto seen from right side.



Trypoxylon annulipes Cameron, J. Str. Br. R. Asiat. Soc., 39: 164, 1903 (nec Taschenberg, 1875) (♀, Borneo, Sarawak, Mt. Matang).
Trypoxylon kalimantan Menke, World Sphecid., p. 346, 1976 (nom. nov.).

State of the holotype.

The specimen is the female and pinned at the right side of mesoscutum with a 35 mm nickel-plated insect pin of No. 4 in thickness, with the wings well opened laterally. The gaster is dropped off during the mailing and glued on to card point and attached to the pin. Otherwise, except lacking of mid tarsal joints 4 and 5 it is complete. Two labels: Museum label, 12×4 mm, with "Cameron Coll. 1903-121" pressed in 2 lines, and name label, "Trypoxylon annulipes Cam. Borneo", written in 4 lines by the hand of Cameron. (Coll. BMNH)

Redescription.

Diagnosis. ♀, 16.5 mm. Black, with legs partly ferruginous and gaster medianly very slightly reddish, hair golden, frontal elevations low, SAT also low (Fig. 183, in profile), IODs = 6:5, clypeus: Fig. 184, pronotal lamina: Fig. 185, mesoscutum not distinctly microsculptured, mesopleuron without pent-roof structure, propodeum without lateral carinae, area dorsalis not marked off with furrows, GSR nearly simple, petiole long, flask-shaped, Radial cell B-type, CVI about 6 times as long as CV2.

Supplement. Antennal joints 1 and 2 with apex narrowly brown, clypeus at apical margin ferruginous, mandible at extreme base black, then ferruginous and apical half glossy light castaneous, mouth parts dark brown, apically paler, palpi light ochre yellow, pronotum with posterior part not distinctly discoloured, in some light somewhat brownish, tegula semitransparent castaneous, gastral segments 2 and 3 slightly reddish brown on sides; all tibiae at base broadly, fore and mid tibiae at apex narrowly also, tibial spurs, fore tarsus wholly, except black arolium and latero-apical spots of mid and hind tarsal joint 5, yellowish ferruginous; in fore tibia basal yellow ring slightly more extended along outer side, rest of all tibiae brown, with articulations and claws slightly paler; wings hyaline, apical margin somewhat fuscous, veins and stigma dark brown. Hair on head except vertex, frons and top area of SAT, on posterior margin of pronotal tubercle, lateral and posterior margins of mesoscutum, sides of postscutellum and posterior portion of propodeum especially dense.

Head from above appr. twice as wide as long at inner orbit, measurements in Table 1, vertex slightly depressed below level of eyes, surface nearly flattened, without elevation between hind ocelli, hollow around fore ocellus also weak, frontal furrow moderately deep, with bottom line narrowly glittering, but elevations on both sides gentle, SAT low, broad nasiform, carina on top acute, ending upwards before mid point to anterior ocellus, SAT anteriorly obliquely truncate, forming a small triangular flat area, PAF deep, straight, flat-bottomed, shining, ASR highly raised, anteriorly extended, with surface weakly striate, anterior margin carinated, SAT and ASR in slightly obliquely lateral view: Fig. 183, clypeus (Fig. 184) basally roundly elevated, apically broadly reflected (border line of reflection is shown with a curved line in the figure, but really it is broad rounded depression), basal elevation fairly distinctly tectate, apical margin medianly markedly incrassate. Antennal joints 3, 4, 5 with relative length appr. 10, 6.5, 6; pronotum with lamina on side broadly rounded, only slightly produced (Fig. 185, dotted area); area dorsalis with median impression elongated triangular, weakly transversely striate, on posterior margin strongly striate, deep median furrow of posterior inclination reaching anterior margin of area apicalis which is only laterally enclosed with carinae, carina anteriorly weak, turning into only one of many arcuate carinae covering the area broadly, hind coxal organ very shortly toothed (Fig. 186).

Vertex microcoriaceous, except post-ocellar area sculpture feeble and surface fairly glossy, punctures on post- and intercellular areas fine and close, on glossy area sparse, frontal elevations more strongly distinctly microreticulate and sparsely superimposed with slightly larger flat-bottomed punctures, PIS mostly 2-3 times as great as PD. Mesoscutum practically without microsculpture, well shining (under 50× enlargement feeble microsculpture defined), with punctures somewhat large, irregular in distribution, PIS 1-4 times (mostly 2-3 times) as large as PD, punctures medio-posteriorly finer, weaker and sparser; punctures on scutellum as on antero-lateral part of mesoscutum, postscutellum without microsculpture, transversely subrugosely punctured; mesopleuron without microsculpture, on prepectus punctures as on scutum, on other parts of episternum punctures much finer and sparser; propodeum on dorsal side finely fairly closely punctured, on lateral marginal areas and posterior inclination transversely finely closely striate, striae on area apicalis arcuate, sides except anterior narrow glabrous part very minutely sparsely punctured, on posterior

portion transversely rugoso-striate. Gaster on petiole sparsely, on other tergites except smooth shining posterior margins fairly closely covered with very minute pubescence point, ventral side till segment 5 almost glabrous except medio-posterior part of segments 2-5.

Remarks. Head in frontal view similar in outline to that of varipilosum, but the depression on vertex below level of upper margins of eyes much weaker, frontal elevations broader and weaker, but the median furrow narrower and more distinct.

25. TRYPOXYLON PLACIDUM CAMERON, 1904
(= T. orientale Cameron)

Trypoxylon placidum Cameron, Ann. Mag. Nat. Hist., (7) 13: 216, 1904 (nec Smith, 1864) (♂, India: Assam).

Trypoxylon orientale Cameron, Ibid., p. 218, 1904 (♀, India: Assam).

Trypoxylon montanum Schulz, Spolia Hym., 1906, p. 212 (nom. nov. for placidum Cam.).

States of the syntypes.

There are two syntype specimens that carry the name label written by the hand of Cameron, one in UMO and the other in BMNH, both are the males, despite that Cameron describes as ♀ ♂, although his description concerns merely the male. The specimen of UMO is a complete one, while that of BMNH lacks greater part of antennae (left from 4, right from 6 apically) and parts of legs (right hind tarsal joints 4 and 5). I designate the former as the lectotype and the latter paralectotype.

The lectotype specimen is pinned at mesoscutum with a 38 mm black steel pin of about No. 0 in thickness and supported at mid height of the pin. It is accompanied with 2 labels: a name label, 17×16 mm, with "Trypoxylon placidum Cam. Type Khasia" written in 4 lines with blue black ink (now faded into brownish), and the Museum label, 15×8 mm, with "HOPE DEPT. UNIV. MUSEUM OXFORD", pressed and "placidum CAM" handwritten in at the top. It has the antennae extended laterally, wings lifted up and gaster stretched straight. The paralectotype is similarly pinned, but it is now mounted on a slit of card paper and accompanied with 5 labels, from the top: a 7 mm red circled "Type" label; a deliviation label, 13×3 mm, with "P. Cameron Coll. 1914-110" in 2 lines; a name label by Cameron, 15×12 mm, with "Trypoxylon placidum Cam. Type Assam" in 4 lines; the other name label, 20×7 mm, with "= montanum Schulz" handwritten in 2 lines by some entomologist with blue black ink; Museum type label "B. M. TYPE (pressed) 21.450 (handwritten)" in 3 lines; Museum reference label, with "B. M. 1977 Under (pressed) montanum (handwritten)" in 2 lines. It has the gaster curved down and whole the body draws a semicircle in lateral view.

Redescription.

Diagnosis. ♂, 12-13 mm. Black; only palpi largely whitish, tegula brown, mandible apically and gaster medianly beneath somewhat brownish. Hair on face, temple, sides of thorax and propodeum silvery; form of head and gaster bicolor-style, IODs = 4:3, OOD nearly equal to POD, Al3 appr. as long as 3 preceding joints united, SAT low, broad, rounded, ASR deep, flat-bottomed, apical margin of clypeus medianly recurved; lamina of pronotum triangularly produced, apex minutely rounded, mesopleural flange acutely edged, but not expanded, propodeum with lateral carinae, area dorsalis margined with furrow, GSR triangularly produced, apex rounded, frons strongly microcoriaceous, mat, mesoscutum smooth and shining, finely sparsely punctured.

Supplement. Basal joints of maxillary and basal one of labial palpi blackish. Legs fairly brownish, especially so apically, fore tibial spur and all claws paler, mid and hind tibial spurs rather dark brown. Pubescence on dorsal side of head and thorax greyish white, in some light somewhat brownish, hair on temple, side of thorax and apical portion of propodeum markedly long, but rather sparse, especially on mesopleuron, wings apically somewhat clouded, stigma and veins dark brown.

Measurements in Table 1. Head from above W:L = 50:23, in front 50:38, with outer margins roundly, fairly distinctly convergent below; vertex nearly flat, weakly impressed around each ocellus, frons raised as a mass, with weak medial furrow, the furrow very much shallower as compared with level of inner orbits, but distinctly separating gentle rounded elevations on both sides (Fig. 187, seen vertically to frons) SAT separated by a weak depression from elevation of frons (Fig. 189, in profile), SAT low, with lateral inclinations flat on upper area, but rounded on lower area and obliquely broadly flattened on anterior inclination (in paralectotype the area slightly excavated, with its dorsal margin somewhat edged) and separated by a deep narrow and

flat-bottomed PAF from ASR (Fig. 189, seen through PAF, Fig. 190, slightly from above) ASR highly raised, with dorsal surface expanded anteriorly and transversely striated on outer half, but smooth and polished on inner half, with the top border line forming an acute longitudinal ridge crossing the rim (Fig. 190, notice the right ASR), antennal area and clypeus; Fig. 191, clypeus at base roundly, fairly markedly raised, but not tectate, with hair directing forwards, only on medio-basal area somewhat convergent towards median line, apical reflection on each lateral area considerable, but on median area very weak. Antennal joints 3, 4, 5 with relative length appr. 10, 7, 7, joint 8 about 1.5 times as long as wide, apical 5 joints; Fig. 192; occipital carina complete, weakly emarginate behind buccal cavity, joints 4, 5, 6 of maxillary palpus with relative length appr. 7, 6, 8; 5 about 5 times as long as its maximum width; collar in frontal view: Fig. 193, its posterior part not completely discoloured, dark brownish, lamina on side (left): Fig. 194 (with ante-coxal tubercle), fairly markedly produced; mesoscutum with admedian area margined on each side by a fine impressed line, comparatively broad and long, mesopleural flange distinctly carinated, the carina produced somewhat sideways, but not expanded into pent-roof structure, episternal furrow nearly straight as in bicolor; propodeum with spiracle large, from a short distance behind it arisen the lateral carina, running till apex, area dorsalis with lateral furrow roundly convergent posteriorly, with apex about half the width at base, the furrow comparatively deep and distinctly crenate, medial furrow similarly deep, wider apically and transversely strongly striated on basal $\frac{2}{3}$, but smooth and polished on apical third, with only feeble sparse striae, area apicalis with marginal carinae only laterally high and distinct, but anteriorly very weak, surface striate above and smooth below, medial furrow of posterior inclination wedge-shaped, reaching upper margin of area apicalis, GSR in dorsal view: Fig. 195, lateral view: Fig. 196, intercoxal carina straight; petiole very slender and long, flask-shaped, especially in paralectotype (Table 1), at segment 3 markedly dilated (when relative length of petiole 100 relative width at apex of segments 1, 2, 3 in lectotype 16, 20, 36, in paralectotype 12, 15, 28). Genitalia taken out of another specimen from Malaya were examined (Figs. 197-202), paramere at apex deeply split into two lobiform layer, the ventral one is fairly well chitinized, shorter, apically triangularly pointed, with short curved and thick hairs on inner margin and with ventral surface covered with soft pubescence, the dorsal one longer, slender, lamellate, apically broadened and gently emarginate and sparsely fringed with stiff hairs, basiparamere on ventral side at about mid point of total length produced inwards into a plate-like expansion, on dorsal margin thinly expanded and half rolled inwards (Figs. 198, 199, 200), seen from apex: Fig. 201, volsella slightly wider and shorter than in bicolor. In fore wing radial cell C-type, CV2 shorter than TCV (5 : 6-8) and about $\frac{1}{5}$ (5 : 20-28) the length of CV1; TCV bent inwards, forming an angle of about 90° with CV2.

Vertex with microreticulation weak, surface fairly shining, with fine close punctures superimposed, frons except median furrow strongly microcoriaceous and sparsely superimposed with somewhat large punctures, SAT closely punctured; thorax without microsculpture, smooth and shining and rather sparsely punctured with hair-bearing fine points, on scutum PIS mostly 2-3 times as large as P'D, on mesopleuron punctures finer and sparse, and sparser and larger below, on side of propodeum as on lower portion of mesopleuron, disc of area dorsalis finely sparsely punctured, lateral area along lateral carinae transversely coarsely striate, striae on posterior portion covering whole the area.

Remarks. Since Schulz altered the name the present species has been known as T. montanum Schulz, 1906. However, this study could reveal the fact that T. placidum Cameron nec Smith is nothing else than the male of T. orientale Cameron which he published at the same time as a distinct species. Hereupon T. montanum has become unnecessary. The female of this species is very similar to the male, differing mainly in the sexual characters only. Details will be given at the place of T. orientale.

26. TRYPOXYLON FULVOCOLLARE CAMERON, 1904

Trypoxylon fulvocollare Cameron, Ann. Mag. Nat. Hist., (7) 13: 217, 1904 (♀, Khasia Hills).

Present state of the holotype specimen.

The specimen at UMO is pinned at mesoscutum with a 38 mm steel pin of about No. 4 in thickness. The pin is already considerably rusted. With 2 labels: name label, 20 × 16 mm, with "Trypoxylon fulvocollare Cam. type Khasia" written in 4 lines by the

hand of Cameron and the Museum label. From the specimen right antenna from joint 4 apically, left fore tarsus wholly and ultimate tarsal joint of right mid leg are missing; further right temple is mechanically pressed down, with abnormal outline seen from above and in front.

Redescription.

Diagnosis. ♀, about 15 mm. Black, antenna on basal half, clypeus anteriorly, mandible, collar and tubercle of pronotum, gastral petiole at base and on sides, segments 2 and 3 at base broadly, greater part of fore and mid legs and hind legs partly ferruginous. Hair on head and thorax-complex golden to brassy. Head in form bicolor-style, IOV = IOc, OOD = POD, Clypeus with anterior margin broadly rounded (Fig. 204) frontal elevations moderate and rounded, SAT low nasiform, PAF shallow, up-curved, pronotal lamina: Fig. 206, mesoscutum without microsculpture, finely closely punctured, mesopleural flange acutely carinated, but not expanded, propodeum with lateral carinae, area dorsalis without lateral furrows, GSR strongly roundly raised, petiole flask-shaped, but comparatively short, very slightly longer than 2 following segments united; radial cell C-type, CV1 6 times as long as CV2.

Supplement. In the specimen gaster roundly curved down, when stretched body length will reach amply 16 mm, Cameron gives 13 mm. Mesoscutum with distinct plumbeous shine; ferruginous colour of antenna more broadly extended apically beneath (to base of joint 6) than above; mandible at base yellow and at apex dark brown, palpi, outer sides of fore and mid tibiae, base of hind tibia and basal 2 joints of fore tarsus yellow; brown to dark brown on legs: coxae (rather brownish black), fore trochanter above, whole of mid and hind trochanters, a streak on fore femur above, streaks on mid femur above and beneath, all not reaching apex, hind femur wholly, mid tarsus except base of metatarsus and hind tibia and tarsus; spurs apically brownish, articulations everywhere pale, arolia black. Wings considerably yellowish, veins basally dark brown, apically ferruginous. Hair on head and thorax beautifully golden, on posterior inclination of propodeum yellowish tinge weak, rather brassy, on posterior part of the sides nearly silvery, on vertex, elevations of frons, dorsum of scutum, scutellum and area dorsalis fine and soft, rather pubescence, greyish white; gaster similarly pubescent, but sternite 1 wholly, 2-5 except apical area and 6 at base glabrous; long hairs at apical margin of sternites 2-5 as usual, on 2 and 3 two and 4 and 5 four in number.

Measurements in Table 1. vertex seen in front depressed much below level of upper margins of eyes, surface flat, with a depression behind each hind ocellus and an elevation between them; ocelli somewhat higher than equilateral triangle, fore ocellus slightly smaller; frontal elevations longer than wide and distinctly separated from each other by fairly deep medial furrow, SAT low, broad, with lateral inclinations flat, and as a whole slightly widened forwards, hence strictly not nasiform, but rather tectate, anterior end radiately inclined, seen in profile: Fig. 203, ASR obliquely raised and connected with SAT at mid way of its antero-lateral inclination, forming an up-curved PAF between them, surface of raised rim strongly bicarinate (Fig. 203). Clypeus and antennal area: Fig. 204, basal elevation on disc of clypeus rather small, triangular in outline, tending to be tectate, with hair roundly converging towards median line, marginal area of clypeus broad, glabrous, only slightly reflected; relative length of joints 2-6 of maxillary palpus appr. 8, 8, 9, 9, 9.5, that of joints 1-4 of labial palpus 10, 8, 6, 6. Head seen in profile: Fig. 205, occipital carina complete, not emarginate behind buccal cavity; pronotal collar with posterior part discoloured, pale yellowish, lamina on side strongly produced, but with apex broadly rounded (Fig. 206), mesoscutum with parapsidal suture in an impressed line, mesopleuron with episternal sulcus nearly straight; median furrow of area dorsalis at base shallow and indistinct, posteriorly suboval, moderately deep, area apicalis margined anteriorly with weak carina, GSR strongly produced as in Fig. 195, 196. Gastral segments 1-3: Fig. 207. Hind coxal tubercle very weak, only minutely, very slightly swollen.

Frontal elevations strongly microcoriaceous and irregularly superimposed with medium-sized punctures, mesothorax without microsculpture, punctures on mesopleuron normal, propodeum covered with sparse fine hair points, along lateral carinae a series of short transverse striae present, on posterior portion the fine striae arcuately covering whole the area and mixed with punctures, area apicalis strongly punctured along anterior margin, rest of area shining, but not flatly smooth, sides of propodeum finely, fairly closely punctured, except smooth and polished anterior and ventral areas, punctures on upper part larger and sparser, posterior portion obliquely striate.

Remarks. This species is comparatively easily separated from other species by its characteristic colouration.

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

The present state of the holotype.

The holotype preserved at UMO is pinned at the posterior part of mesoscutum with a 38 mm nickel-plated insect pin of about No. 3 in thickness and accompanied with 2 labels: a name label, about 20×15 mm, with "Trypoxylon khasiae Cam. type Khasia" written in 4 lines by the hand of Cameron with blue black ink (now somewhat faded to brownish) and a Museum label, with "TYPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines and handwritten in at the top "khasiae CAM.". The Museum label is placed up-side-down. From the specimen gaster is completely missing and left antenna from joint 7 and the right from joint 5 apically and the apical tarsal joint of both hind legs are also lost.

Redescription.

Diagnosis. ♀, 20 mm (after Cameron). Ferruginous are antenna basally and beneath (brownish beneath), apex of clypeus broadly, mandible, palpi, posterior part of collar and tubercle of pronotum, tegula, (abdomen except black petiole), fore and mid legs except bases of coxae and arolia, and greater part of hind leg. Hair silvery, but on eye incisions in some light appears somewhat brassy. In form of head and petiole bicolor-style, IODs appr. 5:4, OOD:POD = 2:3, frontal elevations small, moderately high, median furrow deep, SAT low nasiform, ASR highly raised, PAF deep cutting, flat-bottomed, clypeus: Fig. 212, pronotal lamina: Fig. 214, propodeum practically without lateral carinae, area dorsalis practically without lateral furrows, GSR slightly roundly produced, (gaster appr. twice the length of head and thorax-complex united), radial cell B-type, CV2 2/3 the length of TCV and appr. 1/5 that of CV1.

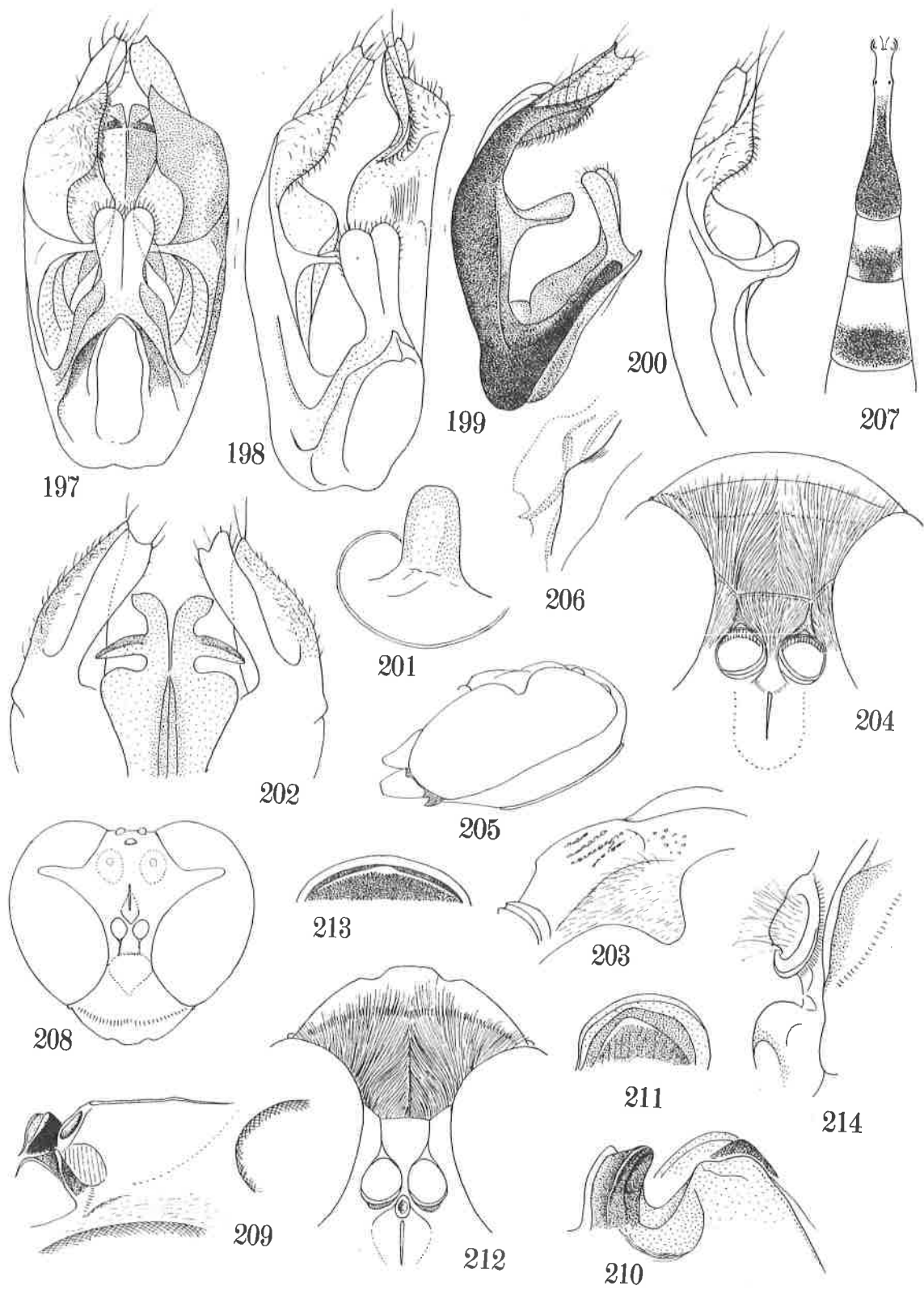
Supplement. Antenna at least till joint 6 ferruginous beneath, mandible pale ferruginous, apex light reddish brown (mandibles yellow, their teeth black - Cameron), palpi pale ferruginous, fore and mid femora brownish above, mid tarsal joints 2-4 brown above, hind femur above and apical half on outer side except knee dark brown, hind tibia on outer side apically and tarsus except base and apex of each joint dark brown. Pronotum on side at antero-lateral portion including a part of lamina somewhat ferruginous. In the original description Cameron says "the base and sides of mesonotum with a distinct fulvous-yellow band". If such is true (up-turned U-shaped band on mesoscutum) the colouration is very strange and exceptional. Upon examination of the holotype it is clarified that his yellow band at base is nothing else than the discoloured posterior part of collar of pronotum and the band on sides is possibly the dorsal look of pronotal tubercles. Hair on vertex, frontal elevations and dorsum of thorax and of propodeum soft and greyish, on basal portion of clypeus distinctly convergent towards median line.

Head with vertex comparatively narrow (Table 1), markedly depressed below level of upper margins of eyes (Fig. 208), eye incision narrow, ocelli in a triangle somewhat higher than equilateral one, interocellar area not raised, frontal elevations ranging from anterior marginal line of fore ocellus to upper end of supraantennal carina, smaller than usual (Fig. 208, shown with dotted lines, inner circlets showing the summit of elevation), distinctly convex (but in lateral view hidden under surface line of eye, invisible) and separated from each other by deep median frontal furrow, SAT low nasiform, with anterior inclination obliquely broadly flattened and broadly hollowed out, supraantennal area seen obliquely in profile: Fig. 209, seen through

Explanation to Figs. 197-214.

- Figs. 197-202. Trypoxylon placidum Cameron (=orientale Cameron), ♂.
203-207. Trypoxylon fulvocollare Cameron, ♀.
208-214. Trypoxylon khasiae Cameron, ♀.

197: Genitalia from beneath. 198: Ditto, obliquely from side. 199: Ditto, lateral. 200: Left paramere from left side. 201: Ditto from apex to show expansions of both sides. 202: Apical parts of genitalia, dorsal. 203, 209: SAT and ASR, profile (in 209 somewhat in front). 204, 212: Clypeus and antennal area. 205, 208: Head. 206, 214: Pronotal lamina and antecoxal tubercle. 207: Gastral segments 1-3. 210: SAT and ASR seen through PAF. 211: ASR from behind (left). 213: Pronotal collar seen in front.



PAF: Fig. 210, highly raised ASR on dorsal aspect somewhat expanded anteriorly and transversely bicarinate, anterior marginal carina thin and rounded, while posterior carina thick and triangular (Figs. 209, obliquely from side and above, 210, seen through PAF, 211, vertically from above), which is on posterior aspect perpendicularly inclined and roundly excavated, PAF is rather a cutting, deep, flat-bottomed and comparatively broad; clypeus and antennal area: Fig. 212, elevation at base of clypeus comparatively small, reaching anteriorly mid point of its length, considerably high, somewhat tectate and longitudinally weakly ridged in middle, apical reflection considerable; antennal joints 3, 4, 5 with relative length 10, 6.5, 5.5, Occipital carina unobservable on head beneath; relative length of joints 2-6 of maxillary palpus appr. 5, 4.5, 5.5, 5, 7; collar in frontal view: Fig. 213, lamina on side: Fig. 214 (dotted area), marginal brim of ante-coxal tubercle of propleuron markedly broad (Fig. 214), mesopleural flange on subalar area acutely edged, but not expanded into pent-roof structure, propodeum with a longitudinal series of short transverse striae on each lateral margin, outside of which appears in some light to be a weak raised line, but in reality there is no longitudinal carina nor furrow, area dorsalis roundly raised above level of surrounding areas and fairly distinctly marked off by the periphery of elevation, but in reality periphery is not impressed into a furrow, medial furrow elongated oval, anteriorly narrowly attenuate.

Frontal elevations microcoriaceous and superimposed with somewhat large, fairly close punctures, on vertex microsculpture weaker, punctures somewhat finer and irregular in distribution, with surface fairly shining, mesoscutum very finely, fairly closely punctured, PIS on mid-lateral area 1-2 times as large as PD, but slightly larger and sparser inwards, mesopleuron rather sparsely covered with somewhat large punctures, but on epimeral area punctures very fine and very sparse; area dorsalis with medial furrow anteriorly weakly crenate, posteriorly transversely weakly striate, disc covered with very sparse fine hair-bearing points, posterior inclination including deep median furrow transversely arcuately, very finely closely striate, area apicalis similarly but more sparsely striate, sides very finely, fairly closely punctulate, on posterior portion transversely very finely weakly striate.

28. TRYPOXYLON ORIENTALE CAMERON, 1904

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

The present state of the syntype specimen.

A single syntype specimen preserved at UMO is pinned at postscutellum with a 38 mm steel insect pin of about No. 1 in thickness and accompanied with 2 labels: a name label of white card paper, 16×12 mm, with "Trypoxylon orientale Cam. type. Khasia" written in 4 lines by the hand of Cameron with blue black ink and a Museum label, 18×11 mm, "HOPE DEPT. UNIV. MUSEUM OXFORD" pressed in 3 lines and "orientale Cam." handwritten in at the top with black ink. The specimen is heavily damaged. Both antennae, left wings, left fore leg from femur apically, left mid leg except coxa, right mid tarsal joint 5, left hind leg except coxa and right hind leg from femur apically lacking. Gaster has been dropped off in the course of present mailing. It is mounted on the card point and attached to the pin.

The specimen well agrees in character as far as observed with the description of T. khasiae Cameron. However, it is different in the body length: Cameron describes as 22 mm, while the present specimen is only 15 mm in length. The specimen carrying the Cameron's type-label is at present but a single. Therefore, the present specimen is designated as the lectotype.

Redescription.

Diagnosis. ♀, about 15 mm, black, almost without plumbeous shine, palpi ochreous yellow, tegula semitransparent brown; gastral petiole at apex narrowly and on sides of apical swollen part, segment 2 at base and apex narrowly and on sides comparatively broadly, segment 3 on sides obscurely, ferruginous brown; legs black, spurs pale brown. Hair silvery. Head and petiole bicolor-style, IODs ÷ 1:1, OOD:POD = 2:3, SAT low nasiform, PAF deep, flat-bottomed (Fig. 215), anterior margin of clypeus medianly produced (Fig. 216), pronotal lamina broad triangular, with apex angulated (Fig. 217) mesoscutum smooth and polished, finely sparsely punctured, mesopleuron without pent-roof structure, propodeum with weak lateral carinae, area dorsalis margined with furrow, the furrow anteriorly obsolete, petiole as long as 3 following segments united, radial cell C-type, CV1 appr. 5 times as long as CV2.

Supplement. Pronotal collar not discoloured on its posterior part, only slightly brownish. Hair on vertex, frontal elevations and dorsum of thorax and propodeum fine and soft, somewhat brownish.

Measurements in Table 1. Vertex not strongly depressed below level of upper margins of eyes, flat, without impression around hind ocellus, ocelli in an equilateral triangle, frontal elevations large but weak, medial furrow shallow and broad, SAT low nasiform, anteriorly obliquely truncate, forming a broad nearly flattened, but not smooth triangular area, with surface somewhat excavated and minutely rugulose, PAF in a deep flat-bottomed cutting, raised ASR strongly bicarinate, the anterior carina thin, flattened, semicircular, while the posterior thick, subtriangular, but in this species on the inner side of the rim the carinae disappeared and the surface becomes smooth and polished. Supraantennal area seen through PAF: Fig. 215, clypeus and supra-clypeal area: Fig. 216, basal elevation of clypeus rather low, with the top at about 1/3 from base, with the inclination not rounded, but nearly flat; occipital carina complete, minutely, weakly emarginate behind buccal cavity; relative length of joints 2-6 of maxillary palpus: 4, 4, 5, 4, 5. Collar in frontal view generally as in *Khasi-ae* (Fig. 214), lamina: Fig. 217, mesopleural flange thinly flattened, but not expanded outwards; propodeum with a longitudinal series of short transverse striae on each lateral margin, just outside of which is a very fine weak carina, area dorsalis on apical half margined with shallow furrow, the furrow not formed of its own depression but of gentle elevation of the outside of the area, accordingly as outside elevation disappeared anteriorly the furrow also disappeared, medial furrow comparatively deep, posteriorly not strongly widened, medial furrow of posterior inclination wedge-shaped as usual, reaching dorsal margin of area apicalis which is very weak. GSR markedly roundly produced. CV2 about 2/3 the length of TCV, TCV bent inwards, forming a distinct angle. Hind coxal organ shortly toothed.

Frons strongly microcoriaceous and rather sparsely superimposed with medium-sized punctures, nearly mat, on vertex and SAT microsculpture weaker and finely closely punctured, surface fairly shining, mesoscutum smooth and polished, with very fine and very sparse punctures, punctures much sparser on median area, mesopleuron punctured as on scutum, but on epimeral area punctures weaker and sparser and gradually somewhat larger downwards; area dorsalis at base with a few short weak oblique striae, median furrow transversely striate, disc baso-laterally weakly irregularly rugulose, apically finely sparsely punctured, outside of the area till series of striae smooth and shining, posterior inclination finely closely striate, striae inside median furrow weak and on its lateral elevations obsolete, area apicalis smooth and polished. Sides of the segment smooth and polished, on upper part very finely sparsely punctured and on posteriormost area obliquely strongly striate. Gastral sternites very sparsely punctured.

29. TRYPOXYLON TESTACEICORNE CAMERON, 1907

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

State of the holotype (BMNH).

The small insect is pinned at mesoscutum with a 15 mm black pin of about No. 1 in thickness and about half of the sclerite is broken. It is mounted on a white oblong synthetic gum and accompanied with 4 labels, from the top: a 7 mm round red circled "Type" label; a data label, 11×10 mm, with "Deesa 10. 99" typewritten in 2 lines (as is usually the case in the specimen collected by C. G. Nurse); a name label, 18×15 mm, with "Trypoxylon testaceicorne Cam. Type Deesa" written in 4 lines by the hand of Cameron with black ink; a reference label, 12×5 mm, with "Col. C. G. Nurse Collection 1920-72" pressed in 3 lines; a Museum TYPE label, "B. M. TYPE HYM. 21.456" in 3 lines, 21.456 is handwritten in.

Redescription.

Diagnosis. ♀, 6 mm. Black; antennae and legs dark brown, the former broadly pale beneath, apical margin of clypeus, mandible, tegula of wing ferruginous; pronotal tubercle, a medianly interrupted basal mark of gastral segment 3, palpi, fore leg largely, mid and hind legs partly yellowish white. Head: Figs. 218-220, with silvery hair, IODs ÷ 5:4, A3 appr. 3.5 times as long as wide at apex, without interantennal transverse carina, pronotal lamina indistinct, frons and mesoscutum microcoriaceous and very finely and closely punctured, propodeum with lateral carinae, area dorsalis with lateral furrows, transversely closely striate, gastral segment 1 clavate, short-

er than 2 + 3, wing venation: Fig. 224.

Supplement. Mandible slightly fuscous at base, but not towards apex, apices of coxae, trochanters and femora of all legs pale brown, fore and mid femora at base also; fore tibia and tarsus wholly (arolia brownish), mid tibia at base and apex comparatively broadly, basal third of hind tibia, tibial spurs and basal half of mid and hind metatarsi yellowish white, rest of mid and hind tarsi pale brown; gastral segment 1 with a pale brownish streak on each side; wings clear hyaline, stigma and veins pale brown.

Head from above: Fig. 218. Interocellar area very gently roundly raised, frontal elevation from behind fore ocellus gently raised as a mass, with a large elongate triangular depression from around fore ocellus to below middle of elevation, but not reaching the median carina of SAT, SAT forms the lower triangular end of frontal elevation, not particularly raised, flatly, very weakly inclined laterally and again widened and smoothly connected with the raised ASR, almost without PAF, carina on top of SAT very short and weak, observable within the range of anterior inclined part only. Head seen in front eye incisions located comparatively low, rather similar to those of buddha, but outer margins of head roundly, though not strongly, convergent below: Fig. 219. Clypeus broadly roundly and very weakly raised on basal half, not tectate, with hairs subparallel, broad apical marginal area distinctly reflected and triangularly produced as a whole (Fig. 219); occipital carina incomplete, leaving the area behind buccal cavity broadly smooth, the carina low, seen in profile not appearing tooth-like at its lower end (Fig. 220), antennal joints 3, 4, 5 with relative length 10, 9, 8, joint 7 appr. 1.5 times as long as wide at apex; general measurements in Table 1. Maxillary palpus semitransparent yellowish white, apical 3 joints subequal in length, 4 slightly thicker apically, 5 subparallel, 6 attenuate towards apex, 4, 5, 6, respectively 3.5-, 4- and 4.5-times as long as wide at each maximum. Pronotum not particularly thick, with posterior part of collar discoloured, appearing somewhat whitish, lamina on side very indistinct (Fig. 221, dotted area, right side), mesoscutum roundly raised above level of pronotal collar, narrow admedian area margined on each side with a fine raised line, parapsidal suture represented by a short weak raised line, mesopleuron without pent-roof structure; propodeum with lateral carinae arising from a short distance behind spiracle till apex, distinct, area dorsalis broadly, fairly deeply furrowed in middle, with bottom transversely rounded and comparatively highly raised at the disc and again strongly inclined to lateral furrow, thus the surface line in cross section at mid point of its length appr. as given in Fig. 222, median furrow of posterior inclination deep, broad, nearly rounded in outline, with a narrow distinct impressed line in middle, GSR roundly produced posteriorly. Gaster: Fig. 223. Tarsi comparatively long, but in mid leg rather short, their length ratios (excluding arolium) to each tibia (as 10) from fore leg respectively 12, 12, 11.

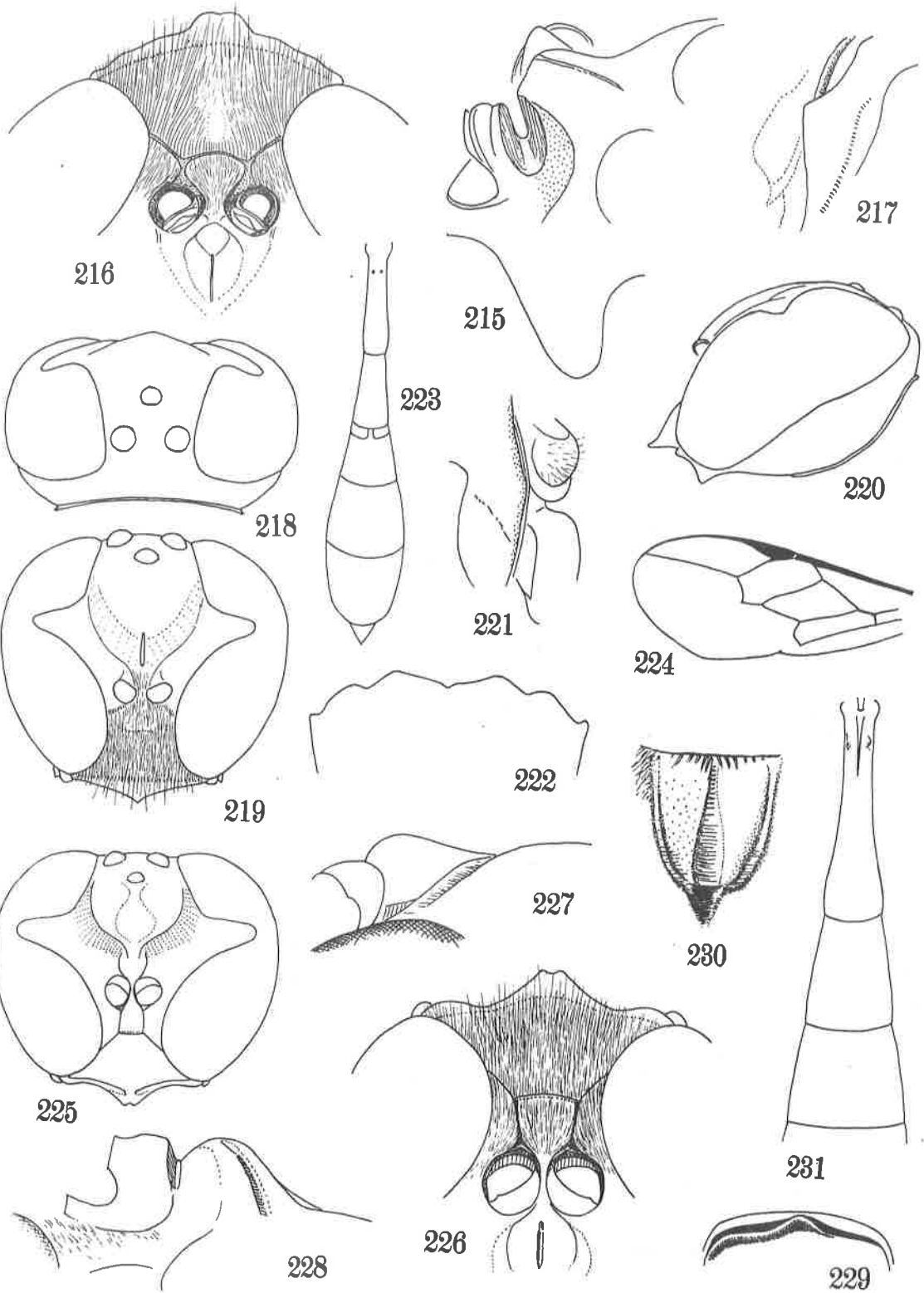
A line of hair along inner orbit above eye incision present, but the incision itself covered sparsely with very fine, soft, not glittering greyish pubescence as on vertex and frons, appearing almost glabrous, while inner orbits below eye incision, supraantennal area widely (including SAT), supraclypeal area and clypeus except apical margin densely covered with appressed silvery hair, the hair is so dense that the bordering impressed line between clypeus and supraclypeal area becomes indistinct; dorsal side of propodeum at baso-lateral areas and posterior inclination wholly densely covered with silvery hair and surface sculpture invisible.

Vertex without microsculpture (under 50x magnification, but under 70x very feebly defined), shining and very finely, fairly closely punctured, frons more distinctly microcoriaceous and closely superimposed with fine punctures, mesoscutum sculptured as on frons, mesopleuron on upper portion smooth and polished and very finely sparsely

Explanation to Figs. 215-231.

- Figs. 215-217. Trypoxylon orientale Cameron, ♀.
218-224. Trypoxylon testaceicorne Cameron, ♀.
225-231. Trypoxylon simulaense Cameron (nom. nud., = nodosicorne Turner) ♀
(to be continued).

215, 228: SAT and ASR seen through PAF. 216, 226: Clypeus and antennal area.
217, 221: Pronotal lamina and anteconchal tubercle (217, left; 221 right, with procoxa). 218, 219, 220, 225: Head. 222: Presumed cross section of propodeum at area dorsalis. 223: Gaster. 224: Venation of fore wing. 227: SAT and ASR in profile. 229: Pronotal collar, frontal view. 230: Area dorsalis. 231: Gastral segments 1-3.



punctured, from about scrobe below and on prepectus microcoriaceous and finely (but slightly more largely than on upper area), closely punctured; propodeum on dorsal side wholly, except pubescent area, transversely closely striate, at base of area dorsalis mixed with a few oblique striae, striae on medio-basal area partly rugulose with somewhat a finely reticulate appearance, sides of propodeum smooth and polished, on upper portion along lateral carina of dorsal aspect very finely and closely striate.

30. TRYPOXYLON GARDINERI CAMERON, 1907

(= T. errans Saussure)

Trypoxylon gardineri Cameron, Trans. Linn. Soc. London, Zool. (2) 12: 76, 1907 (♀, Seychelles; Soetivy).

Present states of syntypes.

Two female syntypes of the present species are preserved in BMNH. One is pinned at the centre of mesoscutum with a No. 1 insect pin and now mounted on an oblong card paper. It is a complete specimen and accompanied with 5 labels, from the top: a 7 mm round red circled "Type" label; a data label, 20×7 mm, with "Seychelles Islands Coetivy" pressed in 2 lines and added below with "J. S. G." (= J. S. Gardiner) handwritten; a name label, 21×15 mm, with "Trypoxylon Gairdneri Cam. Type Seychelles" in 4 lines by Cameron with blue black ink (now faded); Museum reference label, with "B. N. TYPE HYM. 21. 464" pressed and handwritten; a 2nd Museum label, with "B. N. 1977. Under (pressed) gardineri (handwritten) in 2 lines. While the other is pinned at scutellum with a 38 mm insect pin of No. 1 in thickness. This specimen lacks right antenna from joint 4 apically, but otherwise complete. With 3 labels, from the top: a data label, the same as above; a name label, with "Trypoxylon Gairdneri Cam. Uahe" written in 4 lines by the hand of Cameron (notice the specific trivial name !); Museum reference label of 1977, the same as above. The first one is designated as the lectotype of T. gardineri Cameron, 1907. (not gardneri ... Bohart and Menke, 1976).

Observation and remarks.

There is no doubt that the syntype specimens belong to T. errans Saussure (= T. intrudens Smith). Cameron's description on the present species is comparatively detailed, but the following slight differences are observed: Mid tarsus from joint 3 apically brown to dark brown above (darker in lectotype); mesonotum distinctly punctate, PIS mostly PD×1-2, partly ×3; radial cell strictly not "reaching to the apex of the wing", but in the state of type-C.

Cameron in his comparison of the present species with T. errans Saussure says as if the petiole in his species is longer than thorax-complex - "errans... with a long petiole (but only of the length of the thorax) ... the petiole in the present species is longer than usual". But the measurement of the syntypes of gardineri shows that the two parts are equal in length or the thorax-complex is even slightly longer (if the neck region is included). He further says "its apex seen from the side, forms a longish triangle; it is not much dilated laterally", but such is only a variation. At any rate, the syntypes of gardineri, according to my comparison, completely agree with the descriptions of errans by Saussure (1867 and 1890). Measurements in Table 1. The synonymy was already made by Bohart and Menke (1976).

31. TRYPOXYLON ORNATIPES CAMERON, 1913

(= T. errans Saussure)

Trypoxylon ornatipes Cameron, Ind. For. Rec., 4 (2): 24, 1913 (♂, India: Deesa Dun) (nec W. Fox, 1891).

Trypoxylon indicum Menke, World Sphecid Wasps., p. 346, 1976 (nom. nov.).

Questionable points in his description.

Cameron's description of this species is rather good as compared with those of his early days. He does not give anything, however, about the characters of the antenna and clypeus. Moreover, there are three doubtful points in his description, namely: (1) Metanotal area (= area dorsalis) with central depression longish oval,

narrower at the apex than at the base. (2) Abdominal petiole nearly as long as the following 3 segments united, the apex not forming a distinct node, gradually, weakly widened towards the apex. (3) The furrow on apical slope of the metanotum (= propodeum)... slightly roundly narrowed towards the apex and with a keel in the centre.

The reasons are that (1) in such a case usually wider at apex than at base, (2) in such a case the petiole is usually flask-shaped, not clavate, (3) no such instance has been known, it may be a mistake of a glittering impressed bottom line, or the insufficient expression of the median short carina on area apicalis, often observed in some species. Furthermore, his description "the front which is roundly bilobate" is strange. Bearing such questions in mind I observed the holotype specimen with special interest.

The state of the so-called holotype specimen (BMNH).

It is not a male, but is a female. It is pinned together with the mounting card paper from beneath the thorax. The pin is a nickel-plated one of about No. 1 in thickness, shortly cut below the card paper, but is nearly wholly covered with rusts of minute branched black spinules. From the specimen left antenna wholly, the right from joint 4 apically, tarsal joints 2-5 of the left fore and 4-5 of the right fore legs, right hind leg wholly and left hind leg except coxa are lacking. Gaster is glued to the apex of the propodeum together with the apical part of left wings and base of folded right hind leg. As a result dorsal part of propodeum becomes almost unobservable. The labels accompanied are from the top: a 7 mm "Type" label encircled with red band; a 4-folded data label, 28 x 14 mm, with "I.F.R.I. at light Dehra Dun 28-7-10" in 4 lines, 28 and 7 are handwritten in with blue black ink, others pressed, on the left side transversely "V. S. Iyer", possibly the collector's name, is also pressed, I.F.R.I. is the abbreviation of Indian Forest Research Institute; a deliviation label, 13 x 5 mm, with "P. Cameron Coll. 1914. 110" pressed; name label, 18 x 12 mm, with "Trypoxylon ornatipes Cam. Type" written by the hand of Cameron with black ink; Museum reference label, "B. M. TYPE HYM. 21.449", 21.449 is handwritten in, others pressed.

Observation and remarks.

Judging from the characters of the head (form of clypeus, relative length of A3, IODs, elevations of frons, SAT, ASR, microsculpture and puncture etc.) and thorax-complex (lamina of pronotum, punctuation of thorax, the states of area dorsalis, lateral carinae of propodeum etc) there is no doubt that the specimen is nothing else than the female of T. errans Saussure (= intrudens Smith) and from this determination the Cameron's description on the form of gastral petiole could be understood. But how misleading is his description! Measurements on head and antenna are given in Table 1.

But the gaster glued to the specimen is that of quite a different species and different from the description of Cameron also. It is completely black, with petiole distinctly clavate like that of T. figulus (Linné), and shorter than the 2 following segments combined. Measurements of this gaster: P Ma Mi Sp 2 3 4 = 100 28 14 ? (glued) 62 54 58. Possibly some one erroneously combined the detached gaster of other species to the specimen.

32. TRYPXYLON SIMLAENSE CAMERON (NOM. NUD.)

(= T. nodosicorne Turner, ♀)

Trypoxylon simlaense (Cameron): Turner, Mem. Dept. Agr. Ind., Ent. Ser., 5 (4): 203, 1917.

Trypoxylon simlaense (Cameron): Richards, Trans. Ent. Soc. London, 82: 315, 1934.

Trypoxylon simlaense Cameron is a nomen nudum, but it was formerly twice referred to by two authorities in regard to its character as above cited, especially Turner compared his nodosicornis with "simlaense Cameron". This is due to that specimens named as such (one with a "Type" label) are preserved in BMNH.

There are two specimens of a species which Cameron intended to name "simlaense" and gave a name label respectively as such. Both are females and according to my comparative study of the specimens with the holotype male of T. nodosicornis Turner, 1918 there is little doubt that they represent different sexes of one and the same species, because they differ from each other in the sexual characters only, although Turner published a negative opinion to combine them together.

The states of the specimens labeled as simlaense.

(1) Pinned at mesoscutum with a black steel pin of about No. 1 in thickness and

at present mounted on a slit of card paper. It is a complete specimen and well prepared, with the antennae, wings and legs laterally extended, as is usually the case with the specimens collected by C. G. Nurse, and accompanied with 4 labels, from the top: a 7 mm round, red circled "Type" label; data label, 10 x 10 mm, with "Simla 9. 98" typewritten in 2 lines (as usually done by Nurse); reference label of Museum, with "P. Cameron Coll. 1914 110" pressed in 2 lines; name label, 16 x 11 mm, with "Trypoxylon simlaense Cam. Type Simla" handwritten in 4 lines by Cameron with blue black ink. (2) Similar to (1) in preparation, but with eyes laterally crashed, left antenna turned anteriorly downwards and glued to the body with a resin and greater part of left prepectus pressed and hollowed. With 3 labels: similar data label, with "Simla 8. 98" typewritten in 2 lines; name label, 18 x 13 mm, with the same handwritten letters as in (1); Museum reference label, 12 x 6 mm, "Col. C. G. Nurse Collection 1920 72" pressed in 3 lines.

The specimens of so-called simlaense are considered to be the female sex of T. nodosicorne Turner which will be treated later in the present paper and as the female of this species remained unknown the description of it is attempted on this occasion.

Description of T. NODOSICORNE TURNER, ♀.

Diagnosis. 9.0-9.5 mm; black, fore tibia in front ferruginous; hair silvery, head in frontal view: Fig. 225, IODs = 10:7, SAT low, broad, rounded, PAF moderately deep, but flat-bottomed, clypeus minutely bidentate on apical margin in middle, A3 appr. twice as long as wide at apex, occipital carina complete, strongly emarginate behind buccal cavity, mesoscutum microcoriaceous and finely closely punctured, half mat, propodeum with lateral carinae, area dorsalis with lateral furrows, gastral petiole clavate, thick, appr. as long as 2 following segments united, fore wing venation: Fig. 232.

Supplement. Mandible dark brown, basally black, apically paler, posterior part of collar discoloured, yellowish brown, tegula semitransparent pale brown, tibial spurs and fore and mid tarsi partly pale brown (fore tarsus: underside and apex of joints 1-3 and joints 4,5 wholly; mid tarsus: joints 4, 5 wholly), articulations of legs, hind tibial spurs and rest of tarsi brown to dark brown. Wings hyaline, with apical margin narrowly clouded, veins and stigma light castaneous. Silvery hair normal in distribution, on disc of clypeus all parallel, not convergent towards median line even at base, on sides of thorax and posterior part of propodeum long and fairly abundant; pubescence on dorsal side of body short and grey-white, sternites 1-5 except apex of each segment glabrous.

Head from above with W:L = 2:1, seen in front (Fig. 225) with lateral marings more roundly convergent below than in bicolor; measurements in Table 1. Vertex not depressed around hind ocellus, interocellar area not raised, frons moderately raised as a mass and broadly excavated along median line, the excavation broadly roundly enlarged below (Fig. 225), lateral elevations subreniform, SAT short, broad, nearly rounded in outline and roundly raised (Fig. 227, in profile) at the top very shortly carinated (rather a glittering spot), the carina posteriorly replaced by a glittering short impressed line, PAF at mid height of inclination of SAT, but flat-bottomed, anteriorly inclined and shining, the area seen through the furrow: Fig. 228, ASI highly raised, as high as SAT, broadly expanded anteriorly, carinated at anterior margin, with surface smooth and polished, SAT smoothly inclined towards interantennal area; clypeus (Fig. 226) with disc somewhat roundly tectate, bluntly ridged in middle, apical margin as in Fig. 226; antennal joint 2 markedly large, nearly globular, joints 3, 4, 5 with relative length appr. 10, 9, 9, joints 3-11 subequal in length, but considerably thicker apically, joint 7 1.5 times, 11 1.1 times as long as wide at maximum; joints 4, 5, 6 of maxillary palpus with relative length 7, 5, 7. Pronotal collar in frontal view: Fig. 229, lamina on side: Fig. 233, L; ante-coxal tubercle: Do. ACT, roundly highly raised, with the brim markedly broad, mesopleuron without pent-roof structure, episternal sulcus slightly curved; lateral carinae of propodeum distinct, area dorsalis: Fig. 230, area apicalis without distinct carina on anterior margin, GSR obliquely roundly produced, gastral segment 1-3: Fig. 231, in lateral view petiole markedly, segments 2 and 3 less markedly constricted above at apex; legs comparatively short, robust, relative length of tibia and tarsal joints 1-5 of mid leg: 20 11 8 4 2 6; in fore wing notice the curvature of TCV and the angle formed between TCV and CV2 (Fig. 232).

Frons and SAT distinctly microcoriaceous and closely superimposed with medium-sized punctures, on vertex microsculpture weaker, posteriorly fairly closely, anteriorly sparsely punctured, mesoscutum as on frons, but punctures somewhat smaller, PIS smaller than PD, mesopleuron with microsculpture weaker, on epimeral area almost lacking, surface smooth and polished, but below scrobe punctures as on scutum, but much

sparser, on prepectus close but weak; series of short transverse striae along lateral carinae of propodeum very coarse, rather appearing sparsely crenate, area dorsalis at base longitudinally coarsely striate, lateral furrows posteriorly weakly striate, medial furrow closely striate, striae posteriorly weak, disc and outside of the area finely, fairly closely punctured; sides smooth and polished, only posteriorly scattered with fine hair points and a few transverse striae.

Remarks. The female specimens concerned here are, on the other hand, somewhat similar to the European species, *T. attenuatum* Smith, 1851, but in the present species IODv relatively narrower, inner orbits more strongly convergent towards clypeus, inter-antennal transverse carina absent, pronotal collar with posterior part discoloured, lamina broadly rounded and area dorsalis with lateral furrows and with disc simply punctured.

III. SPECIES DESCRIBED BY C. G. NURSE

33. *TRYPOXYLON MEDIATOR* NURSE, 1903

Trypoxylon mediator Nurse, J. Bombay Nat. Hist. Soc., 15 (1): 8, 1903 (♀ ♂, Quetta).

There are 10 ♀ 5 ♂ specimens of the present species preserved in BMNH, all collected by C. G. Nurse at Quetta, bearing his characteristic data label, about 13×10 mm, with "Quetta, date - e.g. '5. 03' (= May, 1903)" typewritten in 2 lines. Of these 1 ♀ 1 ♂ are each accompanied with a "Type" (handwritten) label and collected in 1902 (♀, 8.02, ♂, 5.02), while all others without "Type" label and collected in 1903-1904 (♀: 6.03, 6.03, 6.03, 7.03, 7.03, 7.03, 8.03, 8.03, 5.04; ♂: 5.03, 7.03, 8.03, 5.04). Judging by the publication date of his paper the first two specimens are considered syntypes.

The present states of the syntypes.

♀. Pinned at mesoscutum with a 15 mm nickel-plated fine pin of about No. 000 and mounted on a small oblong piece of synthetic gum and accompanied with 7 labels, from the top: a 7 mm red circled "Type" label of Museum; data label, with "Quetta 8.02" typewritten in 2 lines; sex label "♀" handwritten; possible type label of the author, with "Type" handwritten, the 3 labels are so piled up as to enable reading from above; Museum reference label "Col. C. G. Nurse Collection 1920-72" pressed in 3 lines; name label, with "Trypoxylon mediator (Nurse)" handwritten in 3 lines; another type label with "B. M. TYPE HYN. 21.446", numerals are handwritten in. I added to these a lectotype label.

The specimen is nicely prepared, with the wings, antennae and legs finely extended, only the right mid leg from mid point of the tibia apically and the palpi partly are lacking. The apical 2 gastral segments are strongly curved downwards and the direct measurement of the body length is impossible.

♂. Similarly nicely prepared, with similar data (Quetta, 5.02), sex and Type labels by the author, and the same Museum reference label and location label, "B. M. 1977 Under mediator", the last specific trivial name being handwritten in. From the specimen the right fore leg from femur apically and the left mid leg from apex of coxa apically lacking. This is added with paralectotype label.

Redescription.

Diagnosis. ♀, 10 mm or so. Black, tibiae and tarsi of fore and mid legs broadly, those of hind leg partly pale yellowish, hair silky white, long, abundant; head bicolor-style, petiole scutatum-style (Fig. 238), IODs = 2:1, OOD, Od, POD appr. 2, 3, 3, frontal elevations moderately high SAT broad nasiform, acutely ridged in middle, anterior margin expanded, reflected, thin-plate-like, covering the raised ASR (Fig. 234), hence PAF invisible, clypeus simply rounded out (Fig. 235), A3 apical width×3, A10 ×1, mesoscutum smooth, polished, finely sparsely punctured, propodeum with lateral carinae, area dorsalis with lateral furrows, at base obliquely, the rest transversely, very coarsely rugoso-striate or rugoso-reticulate; radial cell B-type, CV2 slightly longer than TCV and appr. half the length of CV1.

♂, 8-9 mm, similar to ♀, legs more broadly blackish, OOD, Od, POD appr. 2, 4, 3, A3 appr. apical width×2, A13: Fig. 240.

Supplement. ♀ 9-11 mm, black without plumbeous shine on thorax, antenna dark brown, paler beneath, anterior margin of clypeus narrowly brown to dark brown. Ferruginous are mandible (apically reddish, basally yellowish), palpi, tegula, articulations of legs, all tibiae at base more or less broadly, fore tibia in front (rest brown), apex narrowly of mid and hind tibiae, fore and mid tarsi (in fore tarsi apically pale brown above, in mid tarsus slightly darker brown), base of each joint of hind tarsus (rest brown); posterior part of pronotal collar very narrowly discoloured (indistinct due to dense hair), wings with veins brown to dark brown. Silky white hair characteristically dense, on eye incisions and SAT surface completely invisible except median carina of the latter, hair on collar except anterior inclination and lateral swollen areas, marginal areas of mesoscutum, scutellum and postscutellum except medial areas, mesopleuron, mesosternum, all coxae in front and propodeum except area dorsalis and both sides, long, comparatively thick, silvery or silky white, very dense, appressed, complicatedly directed, at baso-lateral areas of propodeum curled, the surface covered by the hair becomes completely invisible.

Measurements in Table 1. Vertex around hind ocellus narrowly and shallowly impressed, around fore ocellus impression wide and fairly deep, frontal furrow triangular, wider and deep at base, elevations on both sides only gentle, SAT (with hair removed) seen obliquely from side and above; Fig. 234, clypeus with anterior margin in middle tends to be subtruncate (Fig. 235, 236), maxillary palpus with apical 3 joints equal in length, apically narrower, antennal joints 3, 4, 5 with relative length appr. 10, 8, 7, occipital carina complete, without emargination behind buccal cavity, collar seen in front wide triangular, top minutely tuberculate, lamina on side distinctly produced, but with margin broadly rounded (Fig. 237), mesoscutum with admedian lines and parapsidal sutures distinctly impressed, mesopleuron without pent-roof structure, episternal suture nearly straight, gently curved only on lower portion, propodeum with lateral carinae not strong, lateral furrows of area dorsalis broad and fairly deep, medial furrow broader and similarly deep, both become indistinct due to strong coarse striae crossing, posterior inclination completely covered with hair radiating from 2 centres at the antero-lateral corners of area apicalis, when hair removed medial furrow broad and deep, suboval in form, area apicalis subtrapeziform, enclosed with carinae, the carina low on anterior margin, CSR strongly roundly produced posteriorly, the produced part semitransparent brown in colour. Gastral petiole: Fig. 238, long clavate, subequal in length to segments 2 and 3 combined; fore wing with apical portion more rounded than in bicolor, hind coxal tubercle distinct, not tooth-shaped, with top minutely hollowed out.

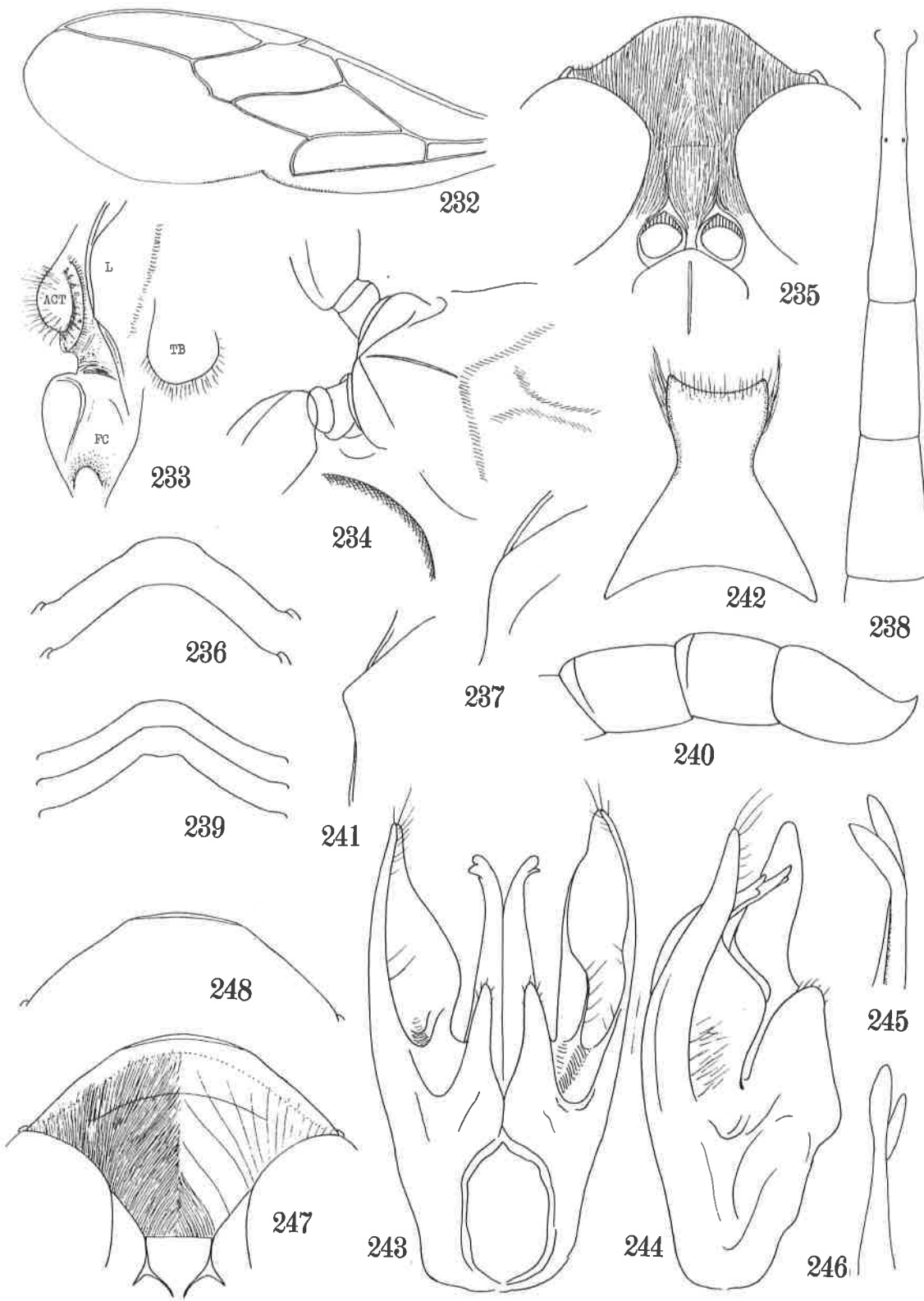
Vertex and frons without microsculpture, punctures on vertex weak and slightly sparse, on frons distinct, close, partly rugosely confluent, mesoscutum smooth and polished, very finely, sparsely punctured, mesopleuron similar, but punctures on prepectus and lower portion of episternum stronger, posterior inclination of propodeum finely closely striate (usually invisible), inside of medial furrow and area apicalis broadly smooth and polished, sides from anterior to ventral part smooth, remaining area obliquely rugoso-punctate, rugae stronger and distinct upwards, posterior portion narrowly obliquely striate.

♂. Generally similar to ♀, slightly smaller, head in frontal view slightly shorter (W:L = 100:43, in ♀ 100:46), IOBs similarly 2:1 (exceptional), antennal joints shorter, joint 3 appr. 2.3 times as long as broad at apex, relative length of 3, 4, 5 appr. 10, 8, 7.5, ultimate joint comparatively short, strongly curved, acutely pointed at apex, only slightly longer than penultimate joint (Fig. 240); clypeus similar, variation in form of apical margin; Fig. 239; lamina of pronotal collar: Fig. 241, venation of fore wing also similar. Sculpture similar, on sides of propodeum similar

Explanation to Figs. 232-248.

- Figs. 232-233. Trypoxylon simulaense Cameron (nom. nud. = nodosicorne Turner) ♀.
 234-246. Trypoxylon mediator Nurse, 234-238... ♀, 239-246... ♂.
 247-248. Trypoxylon responsum Nurse (= bicolor Smith), ♀.

232: Venation of fore wing. 233: Pronotal lamina on left side (L... lamina, TB... tubercle, ACT... antecoxal tubercle of propleuron, FC... fore coxa).
 234: SAT and ASR seen obliquely from above. 235: Clypeus and antennal area.
 236, 239, 248: Variation in form of apical margin of clypeus. 237, 241: Lamina on left side of pronotum. 238: Gastral segments 1-3. 240: Apical three joints of antenna. 242: Sternite 8. 243: Genitalia from beneath. 244: Do., from left side. 245: Apical part of penis valve (left half from beneath).
 246: Ditto, from above. 247: Clypeus.



in pattern, but much stronger. Measurements in Table 1.

Sternite 8: Fig. 242, genitalia from beneath; Fig. 243, from left side; Fig. 244, apical part of penis valve; Figs. 245 (ventral), 246 (dorsal). Characteristic is that the paramere is not bifid at apex, volsella markedly stout and large and penis valve with apical structure very slender and not conspicuous, with sickle-shaped processes not laterally produced and without shoulder in front of them.

34. TRYPOXYLON RESPONSUM NURSE, 1903

(= T. bicolor Smith)

Trypoxylon responsum Nurse, Ann. Mag. Nat. Hist., (7) 11: 518, 1903 (♀, India: Mt. Abu).

Mr. C. R. Vardy of BMNH kindly annotated that 2 female specimens under T. bicolor Smith are possibly the syntypes of T. responsum Nurse, although they are not accompanied with the name label of this species. (Syntypes used by Nurse are to be 3 according to the original description) Certainly they agree with the original description not only in the locality they derived (Mt. Abu), but also in general characters. I, therefore, designated ♀1 as the lectotype and ♀2 as the paralectotype of T. responsum Nurse, 1903.

State of the syntypes.

♀1 complete specimen, ♀2 only left hind apical joints of tarus lacking. Both pinned at mesoscutum and nicely prepared, with wings, antennae and legs extended laterally. At present mounted on a small oblong piece of synthetic gum. ♀1 with 4 labels: data label, with "Ab" typewritten; sex label, "♀" handwritten; type label, "Type" handwritten; Museum reference label, with "Col. C. G. Nurse Collection 1920-72" pressed in 3 lines; annotation label, with "In B. M. under bicolor but possible syntype of responsum" handwritten in 4 lines by Mr. Vardy.

♀2. Type label is not attached, otherwise with the same labels as in ♀1.

Observation and remarks. As was dealt with in BMNH it is easily known that the specimens are the common form of T. bicolor Smith. But anterior margin of clypeus in middle tends to be broadly truncate (Figs. 247 in lectotype, 248 in the other). Lateral furrows of area dorsalis almost lacking. Measurements in Table 1. Colour of legs: black; yellowish white are bases and apical spurs of all tibiae, apices of fore and mid tibiae, fore tarsus except black arolium (but slightly brownish above towards apex) and mid tarsal joints 1-3; fore tibia in front largely and joints 4 and 5 of mid tarsus light castaneous. Antenna dark brown, from apical part of joint 3 apically reddish brown beneath. PAF moderately deep, narrow, flat-bottomed, ASR strongly bicarinate.

As a result of present synonymy it was made clear that T. regium Gussakovskij, 1933, is not a subspecies of T. responsum, but a distinct species. Accordingly other subspecies that have been placed under responsum, namely hatogayum from Japan, ryukyense from the Ryukyus and taiwanum from Formosa should be combined with T. regium as subspecies, since among them this is the earliest name published.

IV. SPECIES DESCRIBED BY R. E. TURNER

35. TRYPOXYLON NODOSICORNE TURNER, 1917

Trypoxylon nodosicornis Turner, Mem. Dept. Agr. Ind. Ent. Ser., 5 (4): 203, 1917 (♂, India).

Trypoxylon nodosicorne: Bohart and Menke, World Sphecid., p. 347, 1976.

The present state of the holotype.

The specimen in BMNH is pinned at the right side of scutellum with a 16 mm fine nickel-plated pin and mounted on a slit of card paper. As the pin is not acutely

pointed the scutellum is broken and the right fore wing is obliquely twisted, otherwise the specimen is complete. With 5 labels, from the top: a 7 mm round "Holotype" label, encircled with red band, with "Type H. T." pressed in 2 line; a data label, 19 x 12 mm white card paper, with "Hazara Dist. Dungagali 8000 ft 21-24.V.1915 Fletcher coll." handwritten in 4 lines; a name label, 24 x 11 mm white card paper, with "Trypoxylon nodosicornis Type Turner" written by the hand of Turner with black ink; a first Museum reference label, 10 x 8 mm, with "1915 323" handwritten in 2 lines; a second Museum reference label, "B. M. TYPE HYM." pressed in 2 lines and "21. 445" handwritten in below.

Redescription.

Diagnosis. ♂ 8 mm. Black, fore and mid legs variegated with ferruginous or whitish tinge. Hair silvery. Cypeus on apical margin in middle bidentate (Fig. 250), mesoscutum microcoriaceous and superimposed with medium-sized punctures, propodeum with lateral carinae, area dorsalis with lateral furrows, gastral petiole short, clavate, antenna markedly modified, joint 6 longer than others and strongly excavated beneath, 7 stoutly tooth beneath (Fig. 252), tibial spurs and tarsi of fore (somewhat) and mid (considerably) legs also deformed; wing venation: Fig. 232.

Supplement. As mentioned earlier in connection with so-called T. simlaense Cam. (nomen nudum) the present species represents the male sex of that species, differing only in the sexual characters, despite the negative opinion of Turner. The following redescription will prove the fact.

Ferruginous: apical half of mandible (reddish), tegula, palpi, fore femur except under half, -tibia except brownish streak in front, -tarsus (largely whitish) except arolia, mid femur above and on inner side (rather castaneous and darker basally), -tibia in front, -tarsus except scattered brown patches and all tibial spurs. Articulations of hind leg brownish, basal plates, veins, stigma of wings dark brown, sides of apical part of petiole and of segment 2 somewhat brownish. Hair on clypeus parallel, on vertex, frons and mesoscutum short, fine, greyish white.

Measurements in Table 1. Head from above with relative width to length at inner orbit appr. 2:1 (30:16), vertex nearly flat, seen in front very similar in outline to ♀ (Fig. 225), with sinus of eye incision broadly rounded, only the upper margin of incision more strongly inclined outwards than in ♀, configurations of frons, structure of SAT, ASB, PAF (Fig. 249) and clypeus (250) also similar, only the clypeus somewhat less produced anteriorly (one of sexual characters); right antenna seen from above: Fig. 251 (apical 3 joints are drawn in the extended state), from behind: Fig. 252 (in natural state). Structure and sculpture of thorax-complex and gaster (Fig. 253) as in ♀. Fore leg: Fig. 255 (from behind) and 256 (tarsus seen in front), mid leg: Fig. 257 (from side, apical portion twisted), 258 (tibial spur short and broad), A: tarsal joint 2 from broad side). Apical part of gaster in lateral view: Fig. 254 (this part was dissected and original appearance was lost).

Genitalia very peculiar and quite exceptional; seen from beneath: Fig. 259, seen from apex: Fig. 260, right volsella seen obliquely from left side to show the up-rising state of digitus: Fig. 261; apical part of paramere not completely split into 2 lobes, but split except outer margin and split part is folded beneath the main body (Fig. 260, P, cross section). Volsella markedly developed and differentiated into conspicuous cuspis and digitus; basal part seen from beneath (Fig. 259) forming a subquadrate broad flat plate, it bends at upper margin at right angle to form a horizontal lobe (in the natural state it is perpendicular) which is divided into outer cuspis and inner digitus; cuspis apically roundly enlarged and densely fringed with long curved hair (Fig. 261, C), while digitus, after forming a broad flat plate, narrowed apically and curved up (somewhat inwards) (Fig. 261, D), with apex covered densely with long hair. Penis valve simple, without shoulder, without a pair of sickle-shaped appendages, smoothly tapering apically and bifid at apex.

Remarks. Somewhat similar (but markedly different) development of male genitalia is observed in T. buddah Cameron (ref. T. monstruosum Tsuneki, Pols. Pism. Ent., 44: 635, 1974).

36. TRYPXYLON FLETCHERI TURNER, 1918

Trypoxylon fletcheri Turner, Ann. Mag. Nat. Hist., (9) 1: 363, 1917 (♀, India: Shillong).

The present state of holotype.

A complete specimen with fore and mid pairs of legs folded beneath thorax. Pinned at posterior margin of mesoscutum with a 16 mm fine nickel-plated pin and mounted on the oblong piece of white synthetic gum, with 4 labels, from the top: a 7 mm red circled type label, with "Type H. T." pressed in 2 lines at the centre; a data label, 14×11 mm, white card paper, with "Shillong 5000 ft Oct. 1916 Fletcher coll." hand pressed in 4 lines; a name label, 17×3 mm, with "Trypoxylon fletcheri Turn. Type" written in 3 lines by the hand of Turner; a Museum reference label, 10×10 mm with "B. M. TYPE HYM." pressed in 2 lines and handwritten in below "21. 452".

Redescription.

Diagnosis. ♀, 8 mm. Black; mandible, gaster (fuscous posterior beneath) and considerable part of legs reddish ferruginous; petiole clavate, short, appr. as long as segments 2 and 3 combined, antennal joints short, joint 3 nearly twice as long as broad at apex, in fore wing radial cell reaching fairly close to wing apex, CV1 4-times as long as CV2, IODs 10:8.5, OOD, Od, POD \div 1, 6, 5, frontal elevation broadly roundly excavated on lower portion, SAT low, rounded, tuberculate, medial carina absent, instead with a short impressed line, PAF shallow, up-curved, ASR expanded forwards, smooth, clypeus weakly triangularly produced, apical margin bidentate in middle, collar posteriorly half discoloured, lamina not pointed, mesoscutum weakly microcoriaceous, closely covered with somewhat large punctures, propodeum with lateral carinae, area dorsalis with weak lateral furrow.

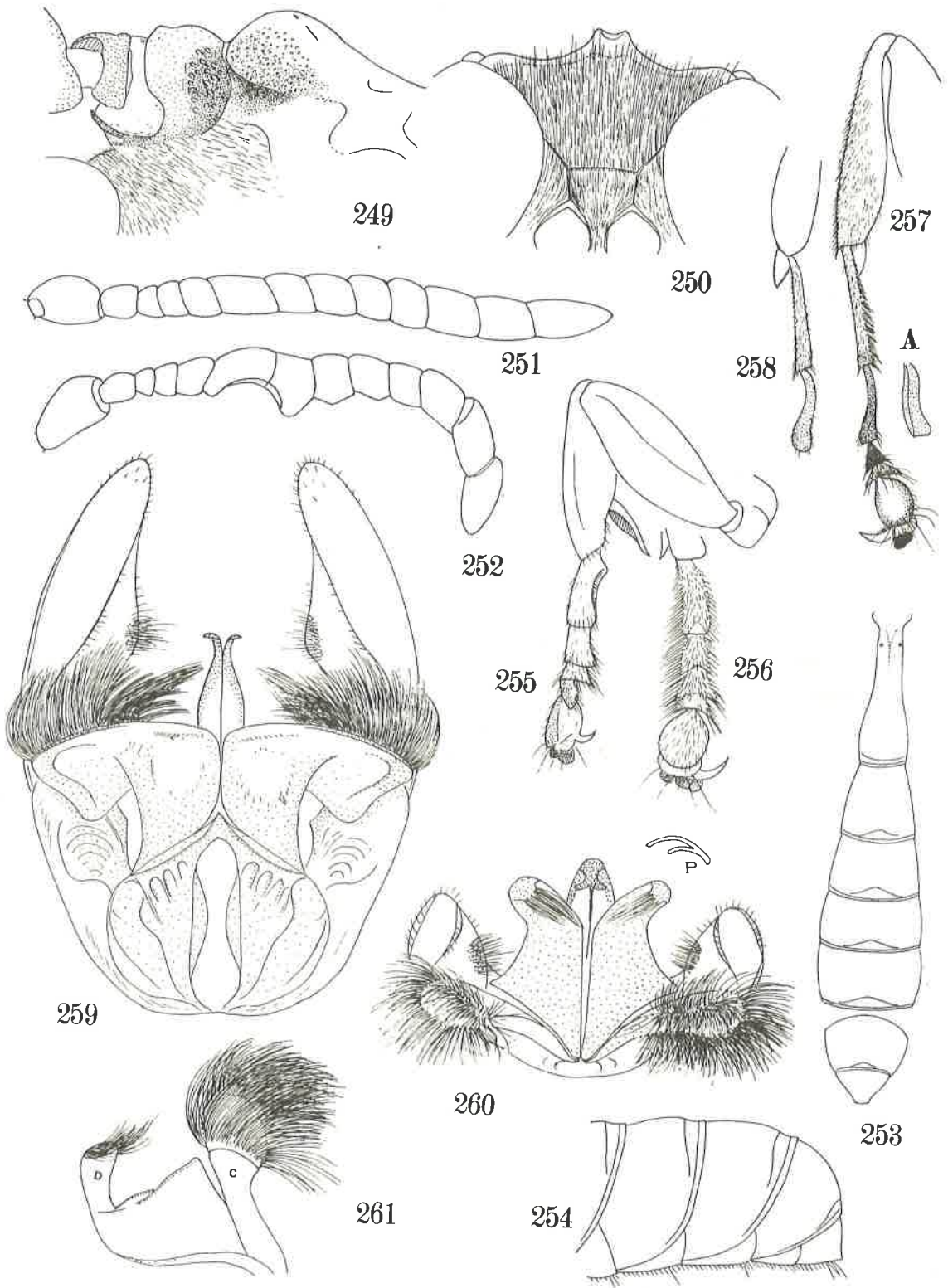
Supplement. Mandible concolourous, only at extreme base somewhat darkened; antennal joints 1-3 at apices and beneath largely pale brown, palpi yellowish white, relative length of apical 4 joints of maxillary palpus from base 5, 6, 5, 6. Legs black, ferruginous; apices of trochanters (narrowly) and femora (broadly) of fore and mid leg, fore and mid tibiae (mid one posteriorly fuscous) and tarsi, hind coxa on apical half, -trochanter wholly, -femur except vaguely outlined dark brownish mark on apical half (roughly), -tibia wholly (apically somewhat brownish) and -tarsal joints 1, 4, 5 largely and 2 at base. Gaster with petiole light ferruginous, posteriorly reddish brown, segments 3-5 black beneath, 6 wholly ferruginous red. Wings with stigma and veins dark brown.

Measurements in Table 1. Head from above with W:L = 2:1, vertex almost not hollowed around each hind ocellus, head seen in front slightly wider than long (10:9), with outline as in nodosicorne ♀ (Fig. 225), eye incisions also broad, with upper margins of both side nearly in a straight line, fore ocellus in a hollow, the hollow lengthened anteriorly into triangle, but not turning into medial furrow, instead a broad rounded concave excavation on lower portion of frontal elevation, seen in profile the area flattened and nearly smoothly connected with SAT (Fig. 262), usual shining carina lacking on medial line of SAT, only its vestigial end as a smooth and shining spot present, posteriorly it turns into a fine shallow impressed line, very indistinct among covering hair, SAT rounded in outline, low convex, anterior end flattened into a subrhombic area, but the surface not smooth, not shining, PAF shallow, open, wide V-shaped seen through the furrow (Fig. 263) and curved upwards, ASR raised and expanded anteriorly, with surface smooth, only on anterior margin weakly carinated, clypeus and antennal area: Fig. 264, occipital carina complete, fairly closely approaching posterior margin of buccal cavity where it is slightly incised; anterior part of collar in frontal view: Fig. 265, posterior part half-discoloured, but in some direction appears completely discoloured, lamina on side distinctly produced, but with apical margin rounded (Fig. 266); mesoscutum with parapsidal sutures in fine raised lines, mesopleuron without pent-roof structure, with episternal furrow nearly straight, area dorsalis distinctly raised, border lines of elevation on both

Explanation to Figs. 249-261.

Figs. 249-261. Trypoxylon nodosicorne Turner, ♂.

249: SAT and ASR seen through PAF. 250: Clypeus and supraclypeal area. 251: Antenna from above (apical part extended). 252: Ditto from side (natural state). 253: Gaster (apical 2 segments separately drawn). 254: Apical part of gaster, from left side. 255: Left fore leg from behind (apical part twisted). 256: Left fore tarsus seen in front. 257: Left mid leg, from behind. 258: Ditto, obliquely from front side to show the form of spur. 259: Genitalia from beneath (volsella markedly expanded beneath and bent at a right angle, apical surface invisible). 260: Ditto from apex, to show structure of apical surface of volsella. 261: Right half of volsella seen obliquely from left side; C... cuspis, D... digitus).



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sides appearing to be lateral furrows, medial furrow comparatively deep, moderately wide, parallel-sided except basal portion, medial furrow of posterior inclination deep, elliptic in form, with a glittering bottom line in middle, area apicalis not margined anteriorly, GSR slightly rounded out, intercoxal carina gently upcurved, posteriorly shortly downcurved, gastral petiole: Fig. 267; legs comparatively thick, fore femur with relative length to maximum width appr. 3:1; wing venation: Fig. 268.

Frons distinctly microcoriaceous and closely superimposed with fine punctures, punctures somewhat transversely subrugosely confluent, mesoscutum more weakly microcoriaceous and more finely, more sparsely (PIS > PD) punctured, on prepectus slightly larger, closer, stronger, epimeral area smooth and polished, below scrobe punctures gradually larger and closer (PIS \approx PD) downwards; propodeum smooth and shining, only along lateral carinae transversely finely closely striate, area dorsalis smooth and polished, at base crenate, on medial furrow except apical portion finely closely striate, sides polished.

Remarks. Except for the marked difference in colour of the gaster, legs and antennae, *T. fletcheri* is very similar in structural and sculptural characters to *T. nodosicorne* ♀ (= so-called *simlaense* Cam.) and it is rather difficult to fine out the structural difference between them. Slight differences observed:

In *fletcheri* (1) Frons and mesoscutum more strongly glossy (due mainly to the weaker microsculpture, punctures similar in size and distribution). (2) Propodeum also more shining (due mainly to finer and sparser punctuation, in part also to more glossy ground surface). (3) Lateral furrows of area dorsalis weaker and more inconspicuous (due to that outer area of the furrow is not raised). (4) Petiole relatively somewhat much shorter and robuster (but this may vary considerably in both species). (5) In fore wing vestigial cubital cell 2 and discoidal vein observable, the former with upper abscissa $1/3$ the length of the lower. (6) OOD:POD = 2:9 (in *nodosicorne* usually 2:6).

Lectotype designation of *Trypoxylon connexum* Turner, 1908

(= *Trypoxylon schmiedeknechti connexum* Turner)

Trypoxylon connexum Turner, Proc. Zool. Soc. London, 30: 522, 1908 (♀ ♂, Australia, Queensland, Mackay).

Trypoxylon schmiedeknechti connexum: Tsuneki, Spec. Publ. Jap. Hym. Ass., 7:40, 1977.

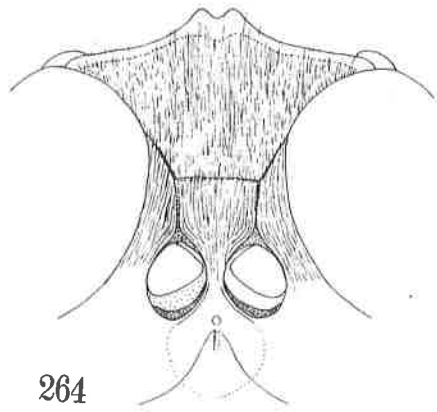
Redescription of *connexum* was already given in detail in Part I of the present paper.

There are 8 (4 ♀ 4 ♂) syntype specimens in the collection of BMNH, all are pinned at mesoscutum and all but one male are mounted on the small oblong piece of polyethylene compounds. Dates of collection: 1 ♀ 3 ♂**, 2. 91 (Febr. 1891); 1 ♀, 2. 92; 1 ♀ 1 ♂, 3. 92; 1 ♀, 2.99 (* gaster partly lost). They are all accompanied with 4 or 5 labels. Of these syntypes the female collected in February, 1899 and with the following 5 labels is considered to have been used mainly by Turner in his description of *connexum*, ♀ (main description): 1. Seven mm round label, encircled with red band, with "Type" pressed at the centre. 2. Data label, about 8×5 mm, with "Mackay (pressed), 2. 99 (handwritten)" in 2 lines. 3. Museum reference label with "Turner coll. 1909-49" in 2 lines. 4. Name label, about 20×4 mm, with "Trypoxylon connexum Turner" written by the hand of Turner and "Type" also handwritten at the left end of line 2. 5. Museum reference label, 10 mm square, with "B. M. TYPE HYM. 21. 459" pressed and handwritten in 3 lines. This specimen is well prepared and complete and it is designated as the lectotype of *T. connexum* Turner, 1908.

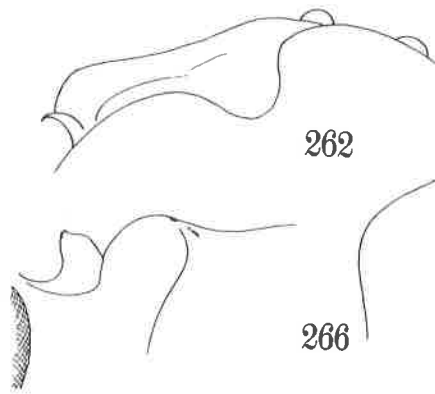
Explanation to Figs. 262-275.

- Figs. 262-268. *Trypoxylon fletcheri* Turner, ♀.
269-272. *Trypoxylon philippinense* Ashmead (= *errans* Saussure), ♂.
273-275. *Trypoxylon elongatum* Ashmead (= *ashmeadi* Baltazar), ♀.

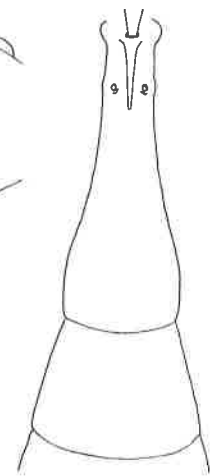
262: SAT in profile. 263: SAT and ASR seen through FAF. 264: Clypeus and antennal area. 265: Pronotal collar seen in front. 266: Pronotal lamina (left). 267: Gastral segments 1 and 2. 268: Venation of fore wing. 269, 270, 271, 273, 274, 275: Head. 272: Apical part of antenna.



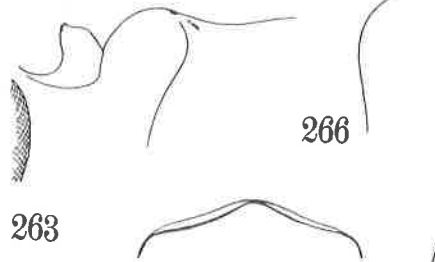
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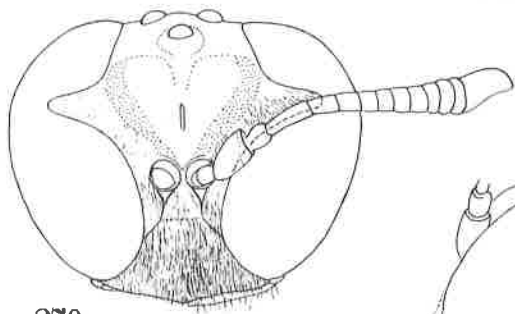


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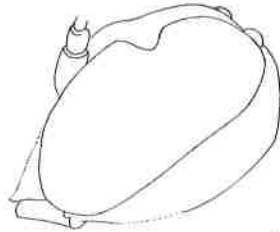
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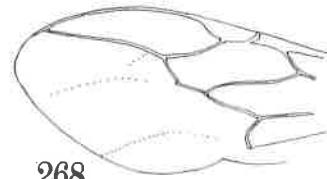
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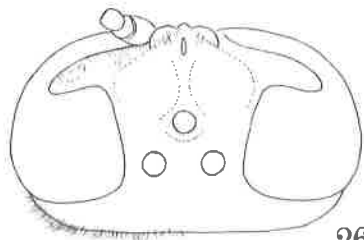
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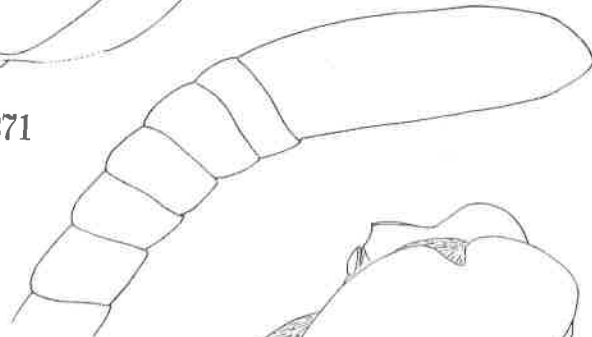
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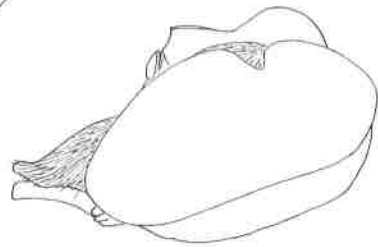
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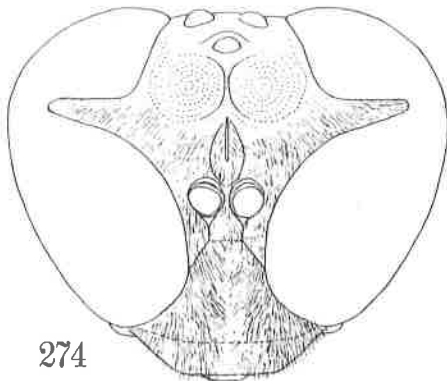
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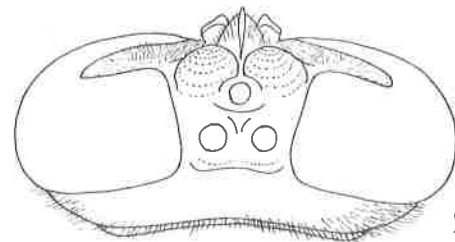
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37. TRYPOXYLON PHILIPPINENSE ASHMEAD, 1904
(= T. errans Saussure)

Trypoxylon philippinense Ashmead, Can. Entom., 36 (10): 283, 1904 (♂, Manila)

In his explanation of the present species Ashmead described, except for the coloration, only the lateral furrows of area dorsalis and the medial furrow of posterior inclination of propodeum and, therefore, philippinense remains as a doubtful species until now. Upon the examination of the type of the species it was at a glance clarified that it was nothing else than the male of T. intrudens Smith, now synonymized with T. errans Saussure, and at the same time that it was the same species as T. tanoi that I described from Formosa and later found among specimens from Thailand.

The holotype specimen (♂) is preserved at USNM and 3 labels are attached to it: data label, with "Manila, W.A. Stanton"; type label, "Type, No. 8106" and name label, "Trypoxylon philippinense Ashmead".

Redescription.

Diagnosis. ♂, 6.5 mm; black, gastral segments 2 and 3 ferruginous red, bases of all tibiae, fore and mid tarsi wholly or largely yellowish white, hind tarsal joint 4 remarkably pale. Hair silvery. Head: Figs. 269-271, IODs = 3:2, OOD:POD = 2:3, A3 = Apical width × 2.5, Al3 as long as 5 preceding joints united (Fig. 272), SAT low nasiform, ASR strongly bicarinate, PAF deep, flat-bottomed, clypeus as in Fig. 270, mesoscutum practically without microsculpture, distinctly fairly closely punctured, propodeum with lateral carinae, area dorsalis with lateral furrows, gastral petiole flask-shaped.

Supplement. Antenna dark brown, apices of joints 1 and 2 ferruginous, apical glabrous part of clypeus and mandible also ferruginous, the latter basally yellowish, tubercle castaneous, peripheral area ferruginous, fore tibia on basal third and at apex, fore tarsus wholly, mid tarsus except pale brown patch on apical joint and joint 4 of hind tarsus yellowish white, rest of legs brown to dark brown, all arolia black.

Microsculpture stronger on frontal elevation than on vertex, with superimposed punctures comparatively large, PIS < PD, ocelli in a slightly lower than equilateral triangle; antennal joint 7 as long as wide, collar of pronotum with posterior part discoloured, lamina on side slightly produced, with apex bluntly angulated, mesoscutum apparently without microsculpture, but under 50× magnification feeble network of impressed lines observable, punctures on it comparatively large, fairly close (PIS = PD), but on medial area sparser; disc of area dorsalis rather closely, partly longitudinally subrugosely punctured, lateral and medial furrows transversely striate, lateral areas along lateral carinae covered with a longitudinal series of short transverse striae, inside the series very finely closely punctured, GSR roundly expanded posteriorly, intercoxal carina gently up-curved, relative length and maximum and minimum width of gastral petiole: 100, 16, 7.

38. TRYPOXYLON ELONGATUM ASHMEAD, 1905
(= T. ashmeadi Baltazar)

Trypoxylon elongatum Ashmead, Proc. U. S. Nat. Mus., 28: 961, 1905 (♀, Philippines: Manila) (nec Smith, 1856, W. Africa: Sierra Leone).

Trypoxylon ashmeadi Baltazar, Philip. Ins. Monogr., 8: 336, 1966 (nom. nov.).

This species is also quite incompletely described. In the original description, except the relative length of gaster to head and thorax-complex and of gastral petiole to thorax-complex, nothing is given as to the structure and punctuation of the species, only the colour and the hair are treated. I, therefore, presumed formerly that this species may be a synonym of T. obsonator, now a subspecies of bicolor Sm., because, as far as the description goes it well agrees with elongatum. A glance of the type specimen revealed at once that it differed markedly from bicolor in the structure of the frons. It is strange why Ashmead ignores the characteristic tubercles on the frons.

State of the holotype.

Pinned at mesoscutum; a complete specimen except that the right antenna is from joint 5 apically lacking; with 3 labels: Data label, with "Manila Robt. Brown"; name label by the hand of Ashmead, "Trypoxylon elongatum Ashmead"; Museum reference label, "Cat. No. 8334, U.S.N.M."

Redescription.

Diagnosis. ♀ about 17 mm; black, antennal flagellum broadly ferruginous beneath, mandible ferruginous, gastral segments 2 and 3 reddish ferruginous except large dorsal blackish mark on each, base and apical spurs of all tibiae, fore and mid tarsi and all claws yellowish white. Hairs silvery. Head: Figs. 273-275, frontal elevations remarkably highly convex (ditto), IODs \div 4:3, OOD:Od:POD = 2:4:3, A3 = Apical width \times 4.5, SAT high nasiform (Fig. 275), ASR bicarinate, PAF moderately deep, up-curved, collar posteriorly narrowly discoloured, lamina triangular, apex obtuse, mesoscutum without microsculpture, finely sparsely punctured, propodeum without lateral carinae, without series of transverse striae, lateral furrows of area dorsalis very weak, rather indistinct, gastral petiole long, flask-shaped, in fore wing radial cell B-type, CVI appr. 4.5 times as long as CV2.

Supplement. Length with gaster curved 16.5 mm, when stretched possibly attains 17.5 mm. Antenna from joint 3 apically ferruginous beneath, clypeus with apical marginal area dark brown, mandible apically reddish, palpi (basally brown), knees yellowish white; longer spur of hind tibia brownish basally, apical 1-2 joints of fore and mid tarsi more or less brownish, articulations of hind tarsus pale brown, all arolia black; tegula semitransparent brown, gastral petiole at apex, segments 2 and 3 except a large blackish mark on each tergite ferruginous red. Hairs on sides of thorax long, fairly abundant, silky white.

HW, IODv, IODc, A3, A11, A12, P = 100, 25, 18, 28, 20, 29, 173; A3 in widest view 4.5 times, in narrowest view 5.5 times as long as broad at apex, maximum width of petiole appr. 1/6 of its total length; ocelli in a triangle, slightly higher than equilateral one, impression around hind ocellus slight, intercellular elevation only feeble, frontal furrow narrow and deep between highly raised frontal elevations, SAT anteriorly smoothly inclined to interantennal area, carina on top about half length of the distance from its upper end to fore ocellus, in profile frons strongly bisinuate (Fig. 275), ASR considerably broadly expanded, with anterior margin highly crenate, posterior wall roundly inclined, smooth, with interspace transversely bicarinate, supraclypeal area slightly wider than high, disc of clypeus markedly roundly raised at base, with hair curved towards median line, forming a hair ridge, clypeus (Fig. 274) from about 3/5 from base begins to reflect, glabrous anterior marginal area about half the length of the reflected area, anterior margin broadly truncate at apex and with a minute platform in middle, the part strongly thickened, anterior part of pronotal collar with medial tubercle weak, on mesoscutum PIS = PD \times 2-4, punctures on mesopleuron sparse and fine, area dorsalis enclosed with smooth, shallow and rather indistinct groove, defined in oblique light only, medial furrow elongate triangular, smooth and shining, disc finely sparsely punctured, rest of the dorsal side and posterior inclination smooth, without transverse striae, area apicalis enclosed with curved carinae, GSR simple, as to gastral petiole P, Ma, Mi, 2, 3 = 100, 17, 8, 34, 36, relative width at apex of 2 and 3 respectively 20 and 27.

VI. SPECIES DESCRIBED BY O. W. RICHARDS

39. TRYPXYLON MANDIBULATUM RICHARDS, 1933

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

States of holo- and allotype specimens.

Holotype (♀). Pinned at mesoscutum with a 15 mm micropin and mounted on an oblong piece of synthetic gum. A complete specimen accompanied with 4 labels: 8 mm round red-circled "Holotype" label; data label, 17 \times 15 mm, with "CEYLON COLOMBO 13. APRIL 1914 FLETCHER COLL" handpressed in 3 lines; name label, about 35 \times 10 mm, with "T. mandibulatum Richards Type ♀" written in 2 lines by the hand of Richards with blue black ink (back of the spoiled note-book paper is used); Museum reference label, with

" B. M. TYPE HYM (pressed) 21, 1932 (handwritten)".

Allotype (δ). Similarly prepared except micropin is a steel pin. Specimen is also complete, with 3 labels: data label, "Pusa Bengal G. R. Dutt (handpressed), 29. iii. -9 (handwritten)"; reference label, "1915 323" handwritten in 2 lines, with a transverse line between the two; name label, similar piece as in η , with "T. mandibulatum R. δ allotype" handwritten in 2 lines by Richards.

Redescription.

Original description is detailed, but without figure; for comparison:

Diagnosis. η , 6.3 mm. Closely resembles pygmaeum. Antenna clavate, markedly thick apically, dark brown, ferruginous beneath; mandible thick, broad, inner margin with a tooth before apex, yellow, apically reddish; tibiae and tarsi of fore and mid legs, base of tibia and of metatarsus of hind leg pale orange-yellow. Head thick, subquadrate in frontal view (Fig. 276), in lateral view: Fig. 277, frons raised till SAT as a mass, with weak median furrow, but without carina on SAT, smoothly inclined to ASR, without PAF, ASR not highly raised, clypeus and mandible: Fig. 278, collar of pronotum posteriorly discoloured, mesoscutum distinctly very closely punctured, propodeum with lateral carinae, area dorsalis with weak lateral furrows, finely, irregularly reticulate, petiole short, thick, clavate, shorter than 2 following segments united, radial cell B-type, CV1 twice as long as CV2, CV2 subequal to TCV, both curved, forming angle about 90° between them.

δ , 5.3 mm. Similar to η , antenna 12-jointed (very similar to Fig. 156), mandible simple; head in frontal view shorter, more rounded than in η (with outline very similar to Fig. 154).

Supplement. Articulations of legs pale brown, knee of mid leg somewhat yellowish, mid tarsal joint 3 and rest of hind tarsus brown, arolia dark brown.

Measurements, η : (δ ... in Table 1)

HW	IODv	IODc	(OOD Od POD)	A3 (L/W)	A12 (L/W)	Pet	(Ma Mi 2 3)
100	34	26	(1 5 5.5)	11 (1.4)	17.5 (1.5)	83	(32 34 72 68)

Pronotal lamina lacking, antero-lateral corner just above ante-coxal tubercle of propleuron the margin duplicate, the upper margin with a weakly angulate top (a possible tendency towards lamina). Hind coxal tubercle lacking, in lateral view with the corresponding part weakly angulate.

Male genital organs. Genitalia taken out of a recently collected specimen observed. Contrary to my expectation they are simple and rather primitive. Seen from beneath: Fig. 283, from side: Fig. 284. Paramere simple at apex, not bifurcate, but its ventral surface covered with long stiff hairs, particularly marked on inner and outer margins. Volsella not lamellate, roughly an elongated trigonal pyramid, seen from beneath apical part on outer margin irregularly obtusely spinulose, but without fringe of hairs; penis valve without shoulder, without sickle-shaped appendages before apex, simply attenuate apically, but abruptly bent ventrally at a considerable distance from apex (Fig. 284). The 8th sternite: Fig. 282; it is remarkably short, apical margin separated by a median emargination into two lobes, which are covered uniformly with uniform hairs, without particularly long curved tuft of hairs on each side.

Remarks. T. mandibulatum is a distinct species, not a synonym of T. pygmaeum. Recently I could observe female specimens that are considered to belong to T. pygmaeum and could confirm that the difference in characters between mandibulatum and pygmaeum in the female is the same as in the male (p. 44), except the relative length to width of the clypeus. To sum up the differences in the female with new findings: In mandibulatum (1) Punctures on frons and mesoscutum comparatively larger and closer, surface less glossy (the difference is conspicuous). (2) The reticulate sculpture on area dorsalis of propodeum comparatively coarser (ditto). (3) Clypeus not or very feebly emarginate at apex in middle (Figs. 278, 279), in pygmaeum always distinctly emarginate (Fig. 286). (4) Antennal joints shorter and thicker (Fig. 281 cf. Fig. 289 in pygmaeum), joint 3 about 1.5 times as long as wide at apex, in pygmaeum amply twice so. (5) Eye incision narrower, with lower margin forming a blunt angle (Fig. 280), in pygmaeum wider, lower margin smoothly curved down (Fig. 288), in profile the difference is more marked (Fig. 277, cf. Fig. 285). (6) Area dorsalis enclosed with shallow furrow (not conspicuous due to coarse sculpture), in pygmaeum not.

The difference is considered specific, since at least in one place (Colombo) it is known that both forms occur in sympatric without intermediate forms accompanied.

In the newly examined specimens of mandibulatum (η δ) and pygmaeum (η) the minimum interocular distance at base of clypeus is always greater than length in middle (when bidentate, till its apex). Further study is needed in the male.

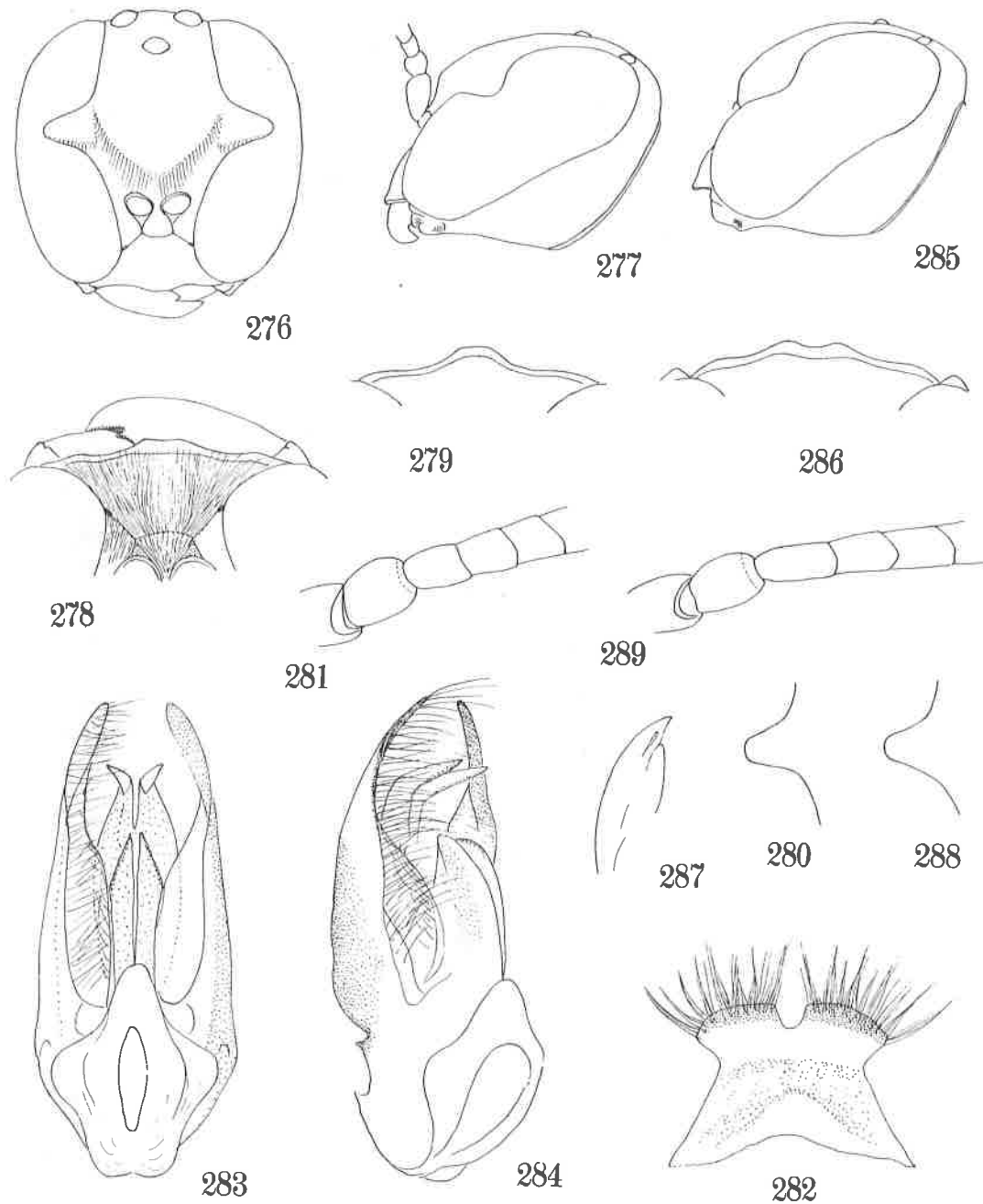


Fig. 276-284. *Trypoxylon mandibulatum* Richards, 276-281... ♀, 282-284... ♂.

285-289. *Trypoxylon pygmaeum* Cameron, ♀.

276: Head (frontal). 277, 285: Head (lateral). 278: Clypeus and mandible.
 279, 286: Apical margin of clypeus. 280, 288: Eye incision (right). 281, 289:
 Antennal joints 2-5. 282: Gastral sternite 8. 283: Male genitalia (ventral).
 284: Ditto (lateral). 287: Mandible.

KEY TO THE SPECIES (♀ ♂)

- 1 In fore wing CV1 about twice the length of CV2 (hair silvery) 2
 - CV1 3-7 times as long as CV2 5
- 2 Frons highly raised, with medial furrow, surface smooth, polished and strongly, grossly and closely punctured, mesoscutum punctured as on frons (head thick gastral petiole clavate, in ♀ antenna and legs not deformed, the former black, the latter partly ferruginous; in ♂ antenna and fore leg deformed, both maculated with white, cf. Figs. 131-141), 8-9 mm, widely spread over Oriental Region
buddha Cameron, 1889
 (= monstruosum Tsuneki, 1974, ♂)
- Frons microcoriaceous and superimposed with fine punctures (mesoscutum not coarsely punctured, propodeum with lateral carinae, legs black variegated with yellowish white) 3
- 3 Length 9-11 mm, head transverse, in frontal view roundly convergent below, IODs appr. 2:1, antenna not strongly clavate, petiole long, subflask-shaped, gradually widening apically, as long as 2 following segments united or slightly longer (frontal furrow distinct, SAT with distinct medial carina, mesoscutum smooth, polished, finely sparsely punctured, propodeum comparatively grossly rugoso-reticulate or rugoso-striate, cf. Figs. 234-246), Pakistan
mediator Nurse, 1903, ♀
- Length 5-6 mm, head thick, in frontal view subquadrate, IODs appr. 3:2, antenna strongly clavate, petiole short, thick, clavate, shorter than 2 following segments united (frontal furrow almost lacking, SAT without medial carina, mesoscutum distinctly closely punctured, propodeum with lateral carinae; ♀ with mandible bidentate at apex, ♂ with antenna 12-jointed) 4
- 4 Punctures on frons and mesoscutum fine and sparse, apical margin of clypeus bidentate in middle, area dorsalis without lateral furrows, surface very minutely reticulate (in ♀ antennal joint 3 appr. twice as long as wide at apex, ref. Figs. 153-162, 285-289), India, Ceylon
pygmaeum Cameron, 1900
- Punctures on frons and mesoscutum somewhat larger and stronger, close, apical margin of clypeus slightly produced in middle, with apex truncate or subtruncate, area dorsalis margined with furrow, comparatively coarsely rugoso-reticulate (in ♀ antennal joint 3 appr. 1.5 times as long as wide at apex, ref. Figs. 163-165, 276-284), India, Ceylon
mandibulatum Richards, 1933
- 5 Gastral petiole clavate, usually not, at most very slightly, longer than 2 following segments united (propodeum with lateral carinae, area dorsalis with lateral furrows, sometimes weak, PAF not deep, lamina on side of pronotum not acutely pointed) 6
- Gastral petiole flask-shaped, distinctly longer than 2 following segments united 11
- 6 Frontal elevations strongly convex, IODs appr. 2:1, clypeus rounded out and broadly subtruncate in middle, with hairs on basal elevation strongly convergent towards medial line, mesoscutum without microsculpture, sparsely covered

with rather medium-sized punctures (antenna black, gaster till segment 3 ferruginous, 3 dusky above, all tibiae and fore and mid tarsi ferruginous to pale brown, SAT nasiform, shining, without apical transverse carina, PAF not deep, up-curved, radial cell C-type, OOD:POD = 2:5, ref. Figs. 96-104), 8 mm, Is. Myssol

placidum Smith, 1864, ♀

- Frontal elevation not so highly raised, IODs 3:2 - 5:4, clypeus medianly produced anteriorly, bi- or unidentate at apex, with hairs not convergent medially mesoscutum microcoriaceous and superimposed with punctures 7

7 Antenna brown, clypeus triangularly produced, with apex pointed, PAF almost completely lacking (fore tibia and tarsus wholly yellowish white, gaster black with whitish marks on segment 3 at base, SAT low nasiform, IODs = 5:4, A3 appr. 3.5 times as long as wide at apex, OOD, Od, POD = 1, 6, 5.5, ref. Figs. 218-224), 6 mm, India (Deesa)

testaceicorne Cameron, 1907, ♀

- Antenna black, sometimes on basal portion ferruginous beneath, clypeus apically in middle minutely bidentate, PAF present, shallow - moderately deep.... 8

8 Gaster largely or nearly wholly ferruginous red (a few basal joints of antenna ferruginous beneath, legs broadly reddish) 9

- Gaster black (antenna black beneath except apices of joints 1 and 2, legs at most partly ferruginous) 10

9 Relative length of antennal joints 3, 4, 5 appr. 10, 7, 6, joint 3 about 4.5 times as long as broad at apex, IODs 3:2, gastral petiole dark brown above (OOD:Od:POD = 1:3:3, mesoscutum half mat, radial cell B-type, CV2 = TCV and appr. 1/3 the length of CV1, ref. Figs. 174-182), 12-13 mm, India (Assam)

trochanteratum Cameron, 1902, ♀

- Antennal joints 3, 4, 5 subequal in length, each appr. twice as long as broad at apex, IODs 5:4, gastral petiole wholly reddish ferruginous (OOD:Od:POD = 1:5:4, mesoscutum fairly shining, closely punctured, ref. Figs. 262-268, including wing venation), 8 mm, India (Assam)

fletcheri Turner, 1918, ♀

10 Antenna deformed, joint 5 markedly excavated beneath and 6 strongly produced beneath, fore and mid legs also deformed, fore femur, mid femur and tibia all ferruginous in front, mid tarsus partly yellowish white (OOD:Od:POD = 2:3:3, side of propodeum with central part obliquely very feebly striate, ref. Figs. 249-261), 8 mm, India (Hazara distr. 2400 m)

nodosicorne Turner, 1917, ♂

- Antenna normal, but flagellar joint much shorter than usual, legs normal and except spurs fore tibia (partly) and tarsus (largely) black or dark brown (OOD:Od:POD = 2:7:6, side of propodeum smooth and polished, ref. Figs. 225-233), 9-10 mm, India (Simla)

nodosicorne Turner, 1917, ♀
(= simlaense Cameron, nom. nud.)

11 Hairs on head golden to brassy 12

- Hairs on head silvery 15

12 Collar of pronotum largely orange yellow (gastral segments 1-3 ferruginous but 1 from spiracles posteriorly fuscous above, 2 and 3 with a fuscous band

posteriorly, antenna ferruginous with apical half black, clypeus on anterior margin broadly subtruncate, IODs = 1:1, PAF moderately deep, V-shaped in cross section, with bottom up-curved; propodeum with lateral carinae, area dorsalis almost without lateral furrows, ref. Figs. 203-207), 15 mm, India (Assam: Khasia Hills)

fulvocollare Cameron, 1904, ♀

- Collar of pronotum with anterior part black (sometimes antero-lateral area somewhat brownish, clypeus with apical margin bluntly bidentate or minutely truncate in middle, IODs = 10:7 - 10:8.5, PAF deep, flat-bottomed, propodeum without lateral carinae) 13

13 Gaster black, with weak reddish tinge on sides of median part, antenna wholly and all legs till apex of femora dark brown to black (head in frontal view not strongly depressed below level of upper margins of eyes, SAT low nasiform with anterior end not obliquely truncate, collar posteriorly not discoloured, ref. Figs. 183-186), 17 mm, Borneo (Sarawak)

kalimantan Menke, 1976, ♀

(= annulipes Cameron, 1903, nec Taschenberg, 1875)

- Gaster with considerable part ferruginous, antenna largely or partly ambur-yellow, trochanter - tibia of fore and mid legs wholly ferruginous (head in frontal view with vertex considerably depressed below level of upper margin of eyes, SAT with anterior end obliquely subtruncate, collar of pronotum posteriorly discoloured) 14

14 Antenna dark brown, basally ferruginous; gaster black-maculated on each segment above (all coxae and hind tibia ferruginous, IODs = 10:7, A3 5-times as long as wide at apex, area dorsalis without lateral furrow, ref. Figs. 22-28), 16-17 mm, Borneo (Sarawak)

coloratum Smith, 1857, ♀

- Antenna wholly and gaster from apex of petiole to end segment ferruginous (both partly brownish, coxae at base and hind tibia except basal ring black, IODs = 10:8.5, A3 6.5-times as long as wide at apex, area dorsalis with weak lateral furrows, ref. Figs. 166-173), 16 mm, Borneo (Sarawak)

varipilosum Cameron, 1901, ♀

- 15 Propodeum with distinct lateral carinae 16
- Propodeum without lateral carinae 19

16 Gaster black, at most medianly very narrowly ferruginous or brownish (legs and antenna black, clypeus with medio-apical part slightly produced, IODs = 1:1, PAF deep, flat-bottomed, mesoscutum without microsculpture, finely and sparsely punctured, area dorsalis with lateral furrows) 17

- Gaster at least medianly ferruginous or reddish 18

17 A3 appr. 4.3 times as long as wide at apex, ultimate joint 2.8 times as long as wide at base and about 1.5 times longer than penultimate joint (OOD: Od:POD = 2:4:3, clypeus slightly longer than wide at base, ref. Figs. 215-217), 15 mm, India (Assam: Khasia Hills)

orientale Cameron, 1904, ♀

- A3 appr. 2.7 times as long as wide at apex, ultimate joint 2.5 times as long as wide at base and appr. as long as 3 preceding joints united (OOD:

Od:POD = 2:2.2:2, clypeus as long as wide at base, ref. Figs. 197-202),
12-13 mm, India (Assam: Khasia Hills)

orientale Cameron, 1904, ♂

(= placidum Cameron, 1904, nec Smith, 1864, = montanum Schulz, 1906)

- 18 Antenna, legs and gaster except 2 apical segments bright ferruginous, hair on thorax brassy (pronotal lamina obtuse triangle with apex rounded, A3 in ♀ 5 times as long as wide at apex, IODs in ♂ 5:4, A13 in ♂ nearly as long as 4 preceding joints united, in ♀ femora of legs strongly incrassate, in ♂ pent-roof structure on mesopleuron well developed, ref. Figs. 48-71), ♀ 12 mm, ♂ 10 mm, Celebes (Makassar)

ferox Smith, 1860

- Antenna dark brown, legs black variegated with ferruginous tint, gaster black, from apex of petiole to segment 3 reddish, hair silvery (pronotal lamina triangular, acutely pointed at apex, A3 in ♀ 3.5 times as long as wide at apex, IODs in ♂ 3:2, A13 in ♂ appr. as long as 5 preceding joints united, ref. Figs. 115-126), 8-10 mm, widely spread over the Oriental Region

errans Saussure, 1864

(= intrudens Smith, 1870, canaliculatum Cameron, 1889, philippinense Ashmead, 1904, gardineri Cameron, 1907, ornatipes Cameron, 1913, nec W. Fox, 1891, tanoi Tsuneki, 1967, indicum Menke, 1976, nom. nov. f. ornatipes Cameron, 1913)

- 19 Gaster black, sometimes medianly beneath slightly brownish (antenna black, mesoscutum without microsculpture, area dorsalis with lateral furrows) 20

- Gaster with more or less ferruginous or reddish area 21

- 20 Clypeus rounded out and broadly truncate in middle, with hair on basal elevation strongly convergent towards median line (SAT highly tuberculate, connecting with ASR without PAF, forming a thick Y-shaped elevation, pronotum not discoloured posteriorly, IODs = 3:2, OOD:Od:POD = 3:4.3:3, A3 appr. 5.5 times as long as wide at apex, fore tibia pale brown in front, fore tarsus largely and mid tarsus basally yellowish white, ref. Figs. 80-95), 20-22 mm, Bachian, Gilolo and Celebes

providum Smith, 1860, ♀

- Clypeus rounded out and medianly triangularly produced, with hairs almost completely parallel (SAT low nasiform, highly carinated on top, separated from ASR by a V-shaped upcurved PAF, pronotum posteriorly half discoloured, brownish, IODs = 7:6, OOD:Od:POD = 3:6:4, A3 about thrice as long as wide at apex, fore and mid tibiae brown to dark brown, the former paler in front, fore tarsus yellowish white, mid tarsus brownish white, more whitish apically, ref. Figs. 105-114), 17 mm, Mysol

gracillimum Smith, 1864, ♂

- 21 Gaster at least from segment 2 apically ferruginous (at least fore and mid legs except coxal bases ferruginous or amber yellow, clypeus anteriorly widely, mandible largely, discoloured posterior part of collar wholly ferruginous, eye incisions narrower than usual, SAT low nasiform, anteriorly obliquely truncate and shallowly excavated, ASR highly raised, PAF deep, flat-bottomed

see also
p. 81
(bottom)

- mesoscutum without microsculpture, finely somewhat sparsely punctured) 22
- Gaster mainly on segments 2 and 3 alone reddish or ferruginous 24
- 22 Large (20 mm) and robust species, with antenna and hind leg fairly blackish, hair on thorax silvery (anterior margin of clypeus emarginate on each side of median area, raised ASR transversely bicarinate, lateral furrows of area dorsalis very shallow and indistinct, IODs = 7:6, OOD:Od:POD = 2:5.5:3, A3 about 6 times as long as wide at apex, ref. Figs. 208-214), India (Assam: Khasia Hills)
- khasiae Cameron, 1904, ♀
- Medium-sized (12-16 mm) and slender species, with antenna and hind leg ferruginous, hair on thorax brassy (ASR strongly bicarinate, carinae lamellate, anterior one rounded and ferruginous, posterior one subtriangular, more highly raised and black, both shining, femora of legs not strongly incrassate, hind coxal tubercle comparatively large) 23
- 23 Gastral petiole except apical swollen part black, clypeus rounded out, with anterior area minutely depressed in middle (lateral furrows of area dorsalis present, not deep, not distinct, posteriorly transversely weakly striate, dorsal and posterior aspects of propodeum closely covered with fine striae, except finely and sparsely punctured disc of area dorsalis, IODs 3:2, OOD:Od:POD = 2:5.3:3.5, A3 5-times as long as wide at apex, ref. Figs. 72-79), 12-13 mm, Celebes (Makassar)
- gracilescens Smith, 1860, ♀
- Gaster wholly ferruginous, clypeus rounded out and distinctly emarginate on each side of medial area (lateral furrows of area dorsalis almost lacking, propodeum smooth, without striae all over the area, IODs 5:4, OOD:Od:POD = 2:4.5:2.5, A3 appr. 6 times as long as wide at apex, ref. Figs. 40-47), 17 mm, Celebes (Makassar)
- elegantulum Smith, 1860, ♀
- 24 Mesoscutum distinctly fairly closely covered with medium-sized punctures, surface not shining, clypeus rounded out and broadly truncate in middle, with a small median triangular process (antenna wholly black, PAF up-curved, ref. Figs. 29-39, 89-95, A-C on p. 23), 16-18 mm, Is. Aru, Key and Celebes
- eximium Smith, 1859, ♀
- Mesoscutum finely, rather sparsely punctured, surface shining (with more or less plumbeous shine), clypeus roundly produced, sometimes subtruncate in ♀, but without median process (in ♀ antenna ferruginous to dark brown beneath, PAF usually deep, flat-bottomed. Markedly variable in characters), ♀ 12-17 mm, ♂ 10-16 mm, widely spread over the Oriental Region and parts of the Palaearctic Region.
- bicolor Smith, 1856 25
- 25 IODv comparatively broad, ratio to HW (100) in ♀ 28-30, mostly 29; in ♂ 30-34, mostly 32 (lateral furrows of area dorsalis weak to almost indistinct, punctures on mesoscutum very fine and very sparse, in ♂ A13 usually as long as 3 preceding joints united), Japan and adjacent regions
- bicolor obsonator Smith, 1873
- IODv comparatively narrow, ratio to HW (100) in ♀ 24-27, mostly 26; in ♂ 29-30, mostly 29 (variable locally or individually, see p. 81)
- bicolor bicolor Smith, 1856

A P P E N D I X

Variation in characters of T. bicolor bicolor Smith, 1856

- (1) Reddish colour of gaster:
From apex of petiole to basal half of segment 4 → Segments 2 and 3 only, with blackish mark on each tergite, variable in extension.
- (2) Colour of legs (ground colour black)
 - (A) Bright coloured form: Base fairly broadly of all tibiae, all tibial spurs, fore and mid tarsi yellowish white; fore tibia in front broadly ferruginous (♀ ♂).
 - (B) Dark coloured form:
 - ♀. Base of all tibiae brown to dark brown; all tibial spurs and fore tarsus wholly except arolium yellowish white; fore tibia in front at base ferruginous.
 - ♂. Fore tibia in front on inner side brown, base of hind tibia slightly brownish; tibial spurs except longer one of hind tibia whitish; rest of legs completely black. (rejector Sm., javanum Tasch., tinctipenne Cam., and cognatum Cam.)
 - (C) Intermediate forms:
 - ♀. Base of all tibiae brown to whitish; apical 1, 1-2, 1-3 joints of fore tarsus brown to dark brown, rest of the tarsus yellowish white; mid tarsal joints 1, 1-2, 1-3 yellowish white, rest of the tarsus brown to dark brown.
 - ♂. Base of all tibiae brownish to whitish, all tibial spurs whitish.
 - (a) Fore tibia more broadly and fore tarsus wholly brown.
 - (b) Tibia ditto, fore tarsus pale brown above and yellowish white beneath.
 - (c) Tibia ditto, fore tarsus largely yellowish white, mid tarsal joints on basal 1 or 2 joints partly yellowish white.
- (3) Ultimate antennal joint in ♂.
Usually as long as 4 preceding joints united, but in some populations as long as 3 (e. g. Ceylonese population).
- (4) Lateral carinae of propodeum.
Usually lacking, but in some males weakly defined, in such a case the series of striae accompanied just inside is stronger than usual.
- (5) Lateral furrows of area dorsalis.
Variable from distinct to almost obsolete; usually in the specimens from the Indian Subcontinent and the Lesser Sunda Islands more of them showing the furrows.
- (6) Mesoscutal punctuation.
More or less varied in size and density, but generally punctures fine and sparse.
- (7) Pronotal lamina.
From acutely pointed to merely angulated, however the apical angle is usually less than 90 degrees.

Remarks. Most recently I could confirm the certainty of the combination of the darker legged female and black legged male in the population of the Island of Sumba, with a number of specimens of both sexes.

The presence of many intermediate instances in the leg colouration of the males is also confirmed with a number of specimens in the Ceylonese population.

However, in both cases no female specimen having wholly black legs could be discovered among them.

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

After the MS was sent to press I found several specimens from New Guinea that well agree in character with Trypoxylon placidum Smith, but they have, contrary to my presumption, the long flask-shaped gastral petiole. Accordingly the Key should be corrected as follows:

- 18 Gaster segments 1-4 ferruginous, frontal elevations normal ferox Smith
- Gaster segments 2-3 ferruginous, frontal elevations normal errans Saussure
- Gaster seg. 1-3 ferruginous, frontal elevations highly convex placidum Smith

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I N D E X

<u>accumulator</u> Smith, 1875	32	<u>philippinense</u> Ashmead, 1904	72
<u>annulipes</u> Cameron, 1903	48	<u>placidum</u> Cameron, 1904	51
<u>ashmeadi</u> Baltazar, 1966	72	<u>placidum</u> Smith, 1863	23
<u>bicolor</u> Smith, 1856	3	<u>providum</u> Smith, 1860	20
<u>bituberculatum</u> Tsuneki, 1977	28	<u>pygmaeum</u> Cameron, 1900	41
<u>buddha</u> Cameron, 1889	33	<u>rejector</u> Smith 1870	30
<u>canaliculatum</u> Cameron, 1889	38	<u>responsum</u> Nurse, 1903	66
<u>cognatum</u> Cameron, 1897	40	<u>simlaense</u> Cameron (nom. nud.)	61
<u>coloratum</u> Smith, 1857	8	<u>tanoi</u> Tsuneki, 1971	72
<u>connexum</u> Turner, 1908	70	<u>testaceicorne</u> Cameron, 1907	57
<u>elegantulum</u> Smith, 1860	12	<u>tinctipenne</u> Cameron, 1889	36
<u>elongatum</u> Ashmead, 1905	72	<u>trochanteratum</u> Cameron, 1902	47
<u>errans</u> Saussure, 1867	28	<u>varipilosum</u> Cameron, 1901	44
<u>erythrozonatum</u> Cameron, 1902	45		
<u>eximium</u> Smith, 1859	9		
<u>ferox</u> Smith, 1860	13		
<u>fletcheri</u> Turner, 1918	67		
<u>fulvocollare</u> Cameron, 1904	52		
<u>gardineri</u> Cameron, 1907	60		
<u>geniculatum</u> Cameron, 1902	46		
<u>gracilescens</u> Smith, 1860	18		
<u>gracillimum</u> Smith, 1863	24		
<u>indicum</u> Menke, 1976	60		
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<u>ornatipes</u> Cameron, 1913	60		
<u>petiolatum</u> Smith, 1857	46		

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