

SPECIAL PUBLICATIONS
OF THE
JAPAN
HYMENOPTERISTS ASSOCIATION

NO. 15

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

X. REVISION OF THE FORMOSAN SPECIES

By K. TSUNEKI

M I S H I M A

MARCH 30, 1981 c

ERRATA (SPJHA, No. 15)

(1. 5 f.b. = line 5 from bottom, without f.b. always from top)

- p. 1, 1. 17 Formosan species → Formosan and Ryukyu species
- p. 18, 1. 5 f.b. G1=Ma 4 → G1=Ma × 4
 1. 7 f.b. A3=A1 and A2 2 → A3=A1 and < A2 × 2
- p. 20, 1. 5 A3=AW 3.5 → A3=AW × 3.5
 1. 10 f.b. IODs=10:9 → IODs=10:3.8
- p. 34, 1. 4 vurrow → furrow
 1. 9 A3=AW 2 → A3=AW × 2
- p. 35, 1. 24 irornatum → inornatum
- p. 39, 1. 4 f.b. hidd → hind
- p. 40 1. 31 wholl → wholly
- p. 48, 1. 16 tog → toge-
 1. 21 cer ainly → certainly
- p. 49, 1. 8 is → was considered at this time
 1. 5 f.b. dimply → simply
- p. 51, 1 21 f.b. originat ng → originating
- p. 52, 1. 15 A3=AW 4 → A3=AW × 4
- p. 54, 1. REFERERENS → REFERENCES
 L. 36 S hecidae → Sphecidae

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

X. REVISION OF THE FORMOSAN SPECIES

By K. TSUNEKI

During the course of the present study the holotype of Trypoxylon inernatum Matsumura et Uchida and one of the paratype specimens of T. hyperorientale Strand and of melanocorne Strand were examined. The specimen of inernatum had characters as had been explained, that of hyperorientale was quite different from my presumption through the original description and was identical with vallicola m. and that of melanocorne was the same one as taiwanum m. But the paratype of melanocorne was different from the chief parts of the original description of the species and it was presumed that T. melanocorne (based on 9 ♀ 1 ♂) might include at least two closely allied different species within. As the specimens that have been dealt with by me as T. melanocorne agree better with the description than the paratype this determination was retained and the paratype specimen was identified with taiwanum m.

Revision of the specimens hitherto investigated and study of added ones with the new method of classification supported with the accumulated knowledge brought about the following alteration, correction and addition to the Formosan species of this genus:

- T. pileatum var. subpileatum Strand → T. schmiedeknechti Kohl.
T. dubiosum Tsuneki → T. thaianum dubiosum Tsuneki.
T. shirozui Tsuneki → { T. fronticorne shirozui Tsuneki (STAT. NOV.)
T. fronticorne obliquum SSP. NOV.
T. koshunicon; Tsuneki, 1966, 71 → T. quadriceps Tsuneki.
T. chihpense Tsuneki → T. quadriceps Tsuneki. (SYN. NOV.).
T. venustum Tsuneki → T. quadriceps Tsuneki (SYN. NOV.).
T. fenchihuense; Tsuneki (♀, nec ♂) → T. sauteri SP. NOV.
T. formosicola inernatum: Tsuneki
→ { T. formosicola inernatum Mats. et Uchi.
T. formosicola amamiense Tsuneki (STAT. NOV.).
T. kumaso Tsuneki → T. takasago kumaso Tsuneki (STAT. NOV.).
T. vallicola Tsuneki → T. hyperorientale Strand (SYN. NOV.).
T. gracilescens var. petioloides Strand →
T. petioloides Strand (STAT. NOV.).
T. gracilescens; Tsuneki et auctt. → T. petioloides Strand.
T. isigakiense Tsuneki → T. petioloides isigakiense Tsuneki
(STAT. NOV.).
T. murotai Tsuneki — T. puliense Tsuneki (SYN. NOV.).
T. responsum taiwanum Tsuneki → T. taiwanum Tsuneki (STAT. NOV.).
T. responsum ryukyuense Tsuneki → T. regium ryukyuense Tsuneki
(STAT. NOV.).
T. melanocorne Strand → { T. melanocorne Strand
T. taiwanum Tsuneki
T. yoshimotoi SP. NOV. was described.

ABBREVIATIONS

Al, A2 and so on ... Antennal joint 1, Antennal joint 2 ...
Al0-12 ... Al0+Al1+Al2.
ASR ... Antennal socket rim (raised upper part of antennal socket) (see p. 55)
AW ... Apical width or Width at apex (always maximum width, in case of A3 very frequently in lateral view).
BW ... Basal width or Width at base (always maximum width near base).
CV1, CV2 ... Abacissa 1 of cubital vein, Abcissa 2 of cubital vein ... (see p. 55).
G1, G2 ... Gastral segment 1, Gastral segment 2 ...
GSR ... Gastral socket rim, really the dorsal rim of socket of lifting muscle of gaster (sometimes simple and not raised, but frequently highly, roundly or subtriangularly raised).
HL ... Head length at inner orbit in dorsal view (not in middle where particularly longer due to SAT).
HW ... Head width in dorsal view (always maximum width).
IAA ... Interantennal area.
IAF ... Interantennal furrow.
IOD ... Interocular distance or distance between eyes.
IODc ... Minimum IOD at about base of clypeus (frontal view).
IODv ... Minimum IOD at vertex (dorsal view).
IODs ... Ratio of IODv to IODc, usually shown by IODv as 10.
L/W ... Ratio of length to width.
Ma ... Maximum width (in case of gastral petiole dorsal view).
Mi ... Minimum width (ditto, usually just behind basal condyle, but sometimes in front of apical swelling).
2(Ma), 3(Ma) ... Length of G2 (Maximum width of G2), ditto of G3.
OOD (or OD) ... Ocellocular distance, namely the distance between inner margin of compound eye and outer margin of hind ocellus.
Od ... Ocellar diameter (transversely measured).
P ... Petiole = G1
PAF ... Post antennal furrow, transverse or oblique furrow between ASR and SAT.
PD ... Puncture diameter.
PIS ... Puncture interspace.
POD ... Postocellar distance, distance between inner margins of hind ocelli.
RC ... Radial cell of fore wing (see p. 12).
Rl ... Apical produced part of R1 beyond the meeting point with Rs, often very long.
SAT ... Supraantennal tubercle, nasiform or tuberiform, characteristic to species.
TCV ... Transverse cubital vein (see p. 12).
T1, T2 ... Tarsal joint 1, tarsal joint 2 ...
W:L ... Ratio of Width to Length.

FORMULAE

Formulae always show the relative length.

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

On the KEY TO THE SPECIES

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

KEY TO THE SPECIES

not included: tainanense

- 1 Frons with shield-shaped enclosure 2
- Frons without shield-shaped enclosure 3
- 2 Enclosure with upper lateral carinae roundly convergent upwards, lower lateral carinae gently upcurved, upper area above lateral angles appr. as long as lower area, 9- 11 mm, Formosa and the Ryukyus (Iriomote) and widely distributed over southern regions schmiedeknechti Kohl, 1906
- Upper lateral carinae of enclosure subparallel, then roundly convergent upwards, lower carinae straight, upper area distinctly longer than lower area, Ryukyus (Amami-Oshshima), nominate race with many ssp. widely spread over Oriental Region thaiantum dubiosum Tsuneki, 1964
- 3 Gastral petiole clavate, gradually widening apically, as long as, or shorter than G2+3 (propodeum with lateral carinae, mesoscutum microcoriaceous and superimposed with fine punctures) 4
- Gastral petiole flask-shaped, apical swelling rather sudden, with parallel-sided stalk part in front of it, usually longer than G2+3 29
- 4 G2 and 3 each with a minute fovea at apex (G1 comparatively long, sub-flask-shaped, without fovea at apex, antenna and gaster black, fore and mid legs broadly ferruginous, head subquadrate, IODs=4:1, RC=C-B, R1 long, reaching near wing apex), 6.3 mm, Ryukyus (Iriomote) iriomotense sp. nov.
- G2 and 3 without fovea at apex 5
- 5 ♀ 6
- ♂ 16
- 6 (Presumably) SAT low broad tuberiform, without apical transverse carina (legs except whitish spurs and brownish tarsi completely black, elevation of frons only gentle, without medial furrow), 7-9 mm, Formosa planifrons Tsuneki, 1977
- SAT nasiform or high-keeled as a whole, when somewhat low, legs broadly ferruginous 7
- 7 IODs=10:8 - 10:9 (head from above transverse, W:L=2:1) 8
- IODs=10:4 or less (SAT at apex transversely and triangularly carinated) 10
- 8 Antenna at least partly and gaster and legs broadly ferruginous (area dorsalis enclosed with furrow, at base obliquely, on median furrow transversely striate, SAT low broad nasiform, medial carina weak, OOD:POD=1:3, A3=AWx2, A3,4,5=1,1,1), 8.5 mm, hilly districts of Central and Southern Formosa taihorinsho Tsuneki, 1977
- Antenna, gaster and legs completely black (area dorsalis without lateral furrows, surface obliquely closely rugoso-striate, clypeus at medio-apical margin bluntly bidentate, SAT high nasiform, from apical middle a thin plate-like carina runs to postero-lateral part of ASR) about 8 mm, widely distributed over Palaearctic Region and high altitude of India and Formosa fronticorne Gussakovskij, 1936 .. 9

- 9 SAT with sides perpendicularly inclined and transversely, strongly sparsely striated, apical margin of clypeus: Fig. 1, mesoscutum rather sparsely punctured, G1 somewhat long, subparallel-sided. Formosa, high altitude (2000 m, or over) fronticorne shirozui Tsuneki, 1966
- SAT with sides somewhat obliquely inclined, without striae, apical margin of clypeus: Figs. 8 and 9, mesoscutum much more closely punctured, G1 from base gradually widening posteriorly. Formosa, medium height (1000-1500 m) fronticorne obliquum ssp. nov.
- 10 Head in frontal view rounded, in dorsal view not thick, W:L=2:1 - 5:3 (eye incision rather narrow and deep) 11
- Head in frontal view subquadrate, if somewhat rounded eye incision broad and shallow, with sinus broadly rounded, in dorsal view thick, W:L=3:2 or over 12
- 11 SAT fairly high acute nasiform (IODs=5:2, clypeus medianly at apex weakly bidentate, RC=B, R1 long, apices of coxae, trochanters wholly or except above, fore and mid femora and tibiae broadly, hind ones partly and articulations of tarsi ferruginous), 7.5 mm, Ryukyus (Okinawa) okinawanum Tsuneki, 1966
- (Presumably) SAT low long nasiform (IODs ?, mid and hind tibial spurs dark brown, RC=C, R1 moderately long), 9-10 mm, Formosa, medium height kansitakum Tsuneki, 1971
- 12 G2, 3 and 4 ferruginous, with a small brown or blackish mark on each ... 13
- G2, 3 and 4 at least largely black 14
- 13 (Presumably) G1, 5 and 6 at least largely ferruginous (SAT fairly high long nasiform, mesoscutum closely superimposed with medium-sized punctures, fore and mid legs except narrow bases of coxae ferruginous, hind leg broadly brownish), 7-8 mm, fairly high montanic district of Formosa fenchihuense Tsuneki, 1967
- G1, 5 and 6 at least largely black (IODs=3:1, OOD:POD=1:2, A3=AWX3.5, frontal furrow broad and shallow, SAT moderately high long nasiform, clypeus: Fig. 52, A1-2, fore and mid legs except coxae largely, hind leg partly but fairly broadly ferruginous), 8.5 mm, Formosa (southern low hill-land) sauteri sp. nov.
- 14 (Presumably) SAT high nasiform, but with sides obliquely inclined, apical top pointed and produced, and constricted behind apex (Figs. 70-73) (RC=B, R1 long, longer than TCV and reaching close to wing apex), 6-7 mm, Formosa, montanic district tengmen sp. nov.
- SAT nasiform, apical top not obliquely produced anteriorly, not constricted behind apex (R1 not long) 15
- 15 Sinus of eye incision broadly rounded, head in frontal view somewhat more rounded than in the following species (IODs=5:2, apical part of pronotal lamina ferruginous, G2, 3 and 4 each at base, on sides and beneath more broadly reddish), about 8 mm, Central Formosa (about 1000 m) chingi Tsuneki, 1971

- Sinus of eye incision narrow, subpointed, head in frontal view more distinctly quadrate (IODs=3:1, pronotal lamina black, G2, 3 and 4 on sides and beneath more narrowly reddish, sometimes nearly wholly black), Central and southern district of Formosa (10-500 m) quadriceps Tsuneki, 1971
- 16 (Presumably) G2 and 3 each with a fovea at apex above, frons deeply furrowed in middle (antenna and gaster completely and legs nearly wholly black), 7-8 mm, Ryukyus (Iriomote) iriomotense sp. nov.
- G2 and 3 without fovea, frons not so markedly furrowed in middle 17
- 17 SAT high narrow nasiform, with sides acutely inclined, antenna, gaster and legs completely black (IODs=10:8, OOD:POD=3:4, clypeus apically in middle more or less produced, Al3=A10-12, area dorsalis without lateral furrows, surface rugoso-striate or -reticulate), 6-8 mm, Formosa (high altitude) and India (ditto) and widely in Palaearctic Region
fronticorne Gussakovskij, 1936 ... 18
- SAT not so highly raised, with sides not so acutely inclined, the parts mentioned not completely black 19
- 18 SAT with sides perpendicularly inclined, with dorsum transversely coarsely striate, mesoscutum rather sparsely superimposed with punctures, G1 somewhat long, subflask-shaped. Formosa high altitude
fronticorne shirozui Tsuneki, 1966
- SAT with sides somewhat more obliquely inclined, without transverse carinae above, mesoscutum more closely punctured, G1 from base gradually widening posteriorly. Formosa, medium height
fronticorne obliquum ssp. nov.
- 19 Gaster completely black or nearly 20
- Gaster with more or less reddish area 21
- 20 Al3 only slightly longer than Al2, IODs=1:1, A6 excavated at base beneath (head in frontal view rounded, W:L=100:86, frons with surface flat, without median furrow, antenna black, legs black and apically brownish, SAT low, gently tectate, without apical transverse carina, clypeus on apical margin minutely bidentate in middle, area dorsalis not enclosed with furrow, finely rugoso-reticulate and -striate, tibial spurs ferruginous), 7 mm, Formosa (high altitude) planifrons Tsuneki, 1977
- Al3=A9-12, IODs=3:2, A6 not distinctly excavated beneath (head in frontal view more square than in preceding species, frons weakly furrowed in middle, Al-2 beneath, fore and mid legs nearly wholly, hind leg partly yellow, SAT moderately high long nasiform, with apical transverse carina, clypeus: Fig. 29, area dorsalis enclosed with furrow, disc obliquely and arcuately striate, mid spur apically and hind spurs wholly brownish black), 6 mm, Formosa (montanic region) quadriceps Tsuneki, 1971
- 21 Head seen from above transverse, W:L=2:1 22
- Head seen from above thicker, W:L=5:3 - 5:4 (SAT with anterior transverse carina) 24
- 22 (Presumably) gaster largely ferruginous, with a blackish mark on each of

- G1-4 or -5 (legs black and broadly maculated with yellow), 7-8 mm, Formosa (lowland area) taihorinsho Tsuneki, 1977
- Gaster black, partly reddish on sides, beneath or intersegmental areas .. 23
- 23 (Presumably) fore tarsus largely brown, mid one largely darker brown, hind one largely brownish black (cf. ♀, couplet 11), 6 mm or so, Ryukyus (Okinawa) okinawanum Tsuneki, 1966
- Fore tarsus except arolium pale yellow (IODs=5:4, eye incision broad and acutely narrowed towards apex, A3=AW×2.7, Al3=8(9)-12, curved, antenna without excavation on any joint beneath, SAT low broad nasiform, area dorsalis weakly enclosed with furrow, disc closely punctured, fore and mid legs broadly and hind leg partly amber-yellow, Al-2 dark ferruginous beneath), 7-8 mm, Formosa (montanic areas) kansitakum Tsuneki, 1971
- 24 Al3 as long as Al1+12 25
- Al3 longer than Al1+12 26
- 25 A3=A1, mid and hind tibial spurs black, spinules forming a longitudinal series on outer side of hind tibia 5 in number (Al-3, fore and mid legs largely and hind leg partly ferruginous, gaster on sides partly pale, frontal furrow shallow and fine, SAT narrowly keeled, eye incision triangular, not very deep, G1=Ma×4), 5.5 mm, Formosa (southern lowland area) koshunicon Strand, 1922
- Al > A3, mid tibial spur yellow, hind ones brown, the spinulte 7-8 in number (Al-2, G2-4 at sides and beneath, fore and mid legs wholly or largely and hind leg partly yellow, IODs=3:2, SAT high nasiform, produced and pointed at apex, RC=B-C, R1 long), 5.0 mm, Formosa (montanic region of moderate height) tengmen sp. nov.
- 26 At least G2-4 ferruginous or red, with a small dusky mark on each 27
- Gaster black above, at most obscurely reddish at intersegmental areas and beneath 28
- 27 Gaster wholly ferruginous and G1-4 or -5 each narrowly maculated above with black (IODs≠10:7, eye incision broad and shallow, SAT high long nasiform, PAF shallow, obliquely running down latero-posteriorly, clypeus medianly weakly produced, A3≠AW×2.7, A6 excavated at base beneath and produced at apex, Al3≠Al0-12 or slightly longer, curved at apex, area sorsalis enclosed with furrow, median furrow broad and transversely striate, disc on lateral areas somewhat closely punctured, Al-2, fore and mid legs except coxal base and hind leg partly yellow (rest brown), 6.5 mm, Formosa (montanic region) fenchihuense Tsuneki, 1967
- (Presumably) G1 and 5 both except apex and possibly 6-7 wholly black, 7 mm or so, Formosa, southern hilly district sauteri sp. nov.
- 28 Head in frontal view somewhat more rounded than in the following species, sinus of eye incision broadly rounded, A6 distinctly excavated at base beneath (IODs=5:3, OOD:POD=1:2, SAT fairly high, rather short nasiform, A3=AW×2.6, Al3 slightly longer than Al0-12, clypeus: Fig. 27, Al-2 ferruginous beneath, G1 on sides, G2-4 at base and beneath ferruginous), 6 mm,

- Formosa, montanic region (about 1000 m) chingi Tsuneki, 1971
- Head in frontal view more distinctly quadrate, sinus of eye incision minutely rounded or nearly pointed, A6 not so distinctly excavated beneath (IODs=3:2, OOD:POD=1:2, SAT moderately high long nasiform, A3=AW x 2.7, A13= A10-12, clypeus: Fig. 35-37, gastral colouration generally similar (see also couplet 20), 6 mm, Formosa quadriceps Tsuneki, 1971
- 29 Propodeum without lateral carinae (area dorsalis very feebly enclosed with furrow, HW:IODv=100:28(♀), ≠100:30(♂), IODs=10:7(♀), 10:8(♂), A13 somewhat longer than A10-12, SAT moderately high rounded nasiform, PAF in ♀ moderately deep and upcurved, in ♂ deep and flat-bottomed; mainly G2 and 3 red, each with a blackish mark above, clypeus rounded out, somewhat subtruncate at apex, in ♂ less produced, antenna in ♀ ferruginous - brown beneath; fore tibia and tarsus (in ♂ somewhat brownish), bases of tibiae and mid tarsus basally (♀) whitish yellow, in ♂ mid tarsus brown, mesoscutum finely, sparsely and weakly punctured), ♀ 12-15 mm, ♂ 10-12 mm, Formosa and Ryukyus (widely spread over Oriental Region and East Asia)
- petiolatum Smith, 1856
- Propodeum with lateral carinae 30
- 30 ♀ 31
- ♂ 43
- 31 Gaster completely black 32
- Gaster at least partly red 36
- 32 Legs completely black 33
- Legs at least fore tibia in front ferruginous (SAT not expanded apically into a transverse carina) 34
- 33 SAT at apical margin horizontally expanded into a transverse plate, connecting both ASRs with each other: Fig. 90; vertical view (IODs=10:8.5 - 10:9, clypeus at apical margin produced in middle, area dorsalis distinctly enclosed with furrow), 13-18 mm, Formosa (lowland area)
- formosicola Strand, 1922
- SAT at apical margin transversely carinate, carina connecting both ASRs with each other, usually the carina not well developed and frequently completely lacking (otherwise as in formosicola), Ryukyus (Okinawa) (see also P. 11, corrigendum) formosicola inornatum Matsumura et Uchida, 1926
- 34 Apical margin of clypeus simply rounded out (IODs=10:8, SAT moderately high broad nasiform and at verge to PAF edged and raised into carina, PAF deep, flat-bottomed, acute V-shaped in cross section, area dorsalis enclosed with weak furrow, legs except part of fore tibia black or dark brown), 14-17 mm, Ryukyus (Amami-Oshima and Tokunoshima)
- regium ryukyuense Tsuneki, 1966
- Apical margin of clypeus medianly produced (IODs=4:3, OOD:POD=1:2, SAT tuberiform, shortly carinated in middle, PAF broad and shallow, wide-V-shaped or rather down-curved in cross section, medio-apical prominence of clypeus gently emarginate, bluntly bidentate, A3=AW x 3.5, lateral furrows of

- area dorsalis distinct, disc smooth and shining, RC=C-M, R1 reaching close to wing apex) 35
- 35 Fore tibia in front, fore and mid tibial spurs and fore tarsus largely ferruginous white, bases of mid and hind tibiae also whitish, lateral furrows of area dorsalis fairly strong and distinct, PAF rather down-curved in cross section, microsculpture on frons weaker and punctures sparser than in kumaso), 13-14 mm, Formosa takasago Tsuneki, 1966
- Fore tibia in front partly ferruginous, mid and hind tibiae at base, tibial spurs and fore tarsus apically brown, lateral furrows comparatively weak (PAF finely grooved at bottom, microsculpture on frons stronger, with punctures much closer than in typical race, mesoscutum with stronger plumbeous shine and more closely punctured) takasago kumaso Tsuneki, 1966
- 36 Medial carina of nasiformed SAT at apical end enlarged into an obliquely inclined, round, flat and polished area carrying a fovea on it (PAF deep, flat-bottomed and oval in cross section) 37
- Medial carina of SAT not enlarged so 39
- 37 Antenna black, gaster from apex of G1 to end reddish ferruginous, always black above, often G2-3 brown or dark brown above, legs broadly (broader posteriorly) black (clypeus at apex narrowly brownish, medio-apical area slightly incrassate and minutely incised in middle, IODs=5:3 - 2:1, A3=AWx 4.5), 12-13 mm, Formosa hyperorientale Strand, 1922
- Antenna, gaster except G1 and legs largely ferruginous (lateral furrows of area dorsalis feeble and indistinct, IODs=4:3) 38
- 38 Legs except bases of coxae and arolia ferruginous, only hind leg partly brown or dark brown, antenna brownish above, A3=AWx5.5), 13-17 mm, Formosa petioloides Strand, 1922
- Fore leg slightly, mid leg considerably, hind leg broadly and antenna above dark brown or black, A3=AWx4.5), 12-14 mm, Ryukyus (Ishigaki) petioloides isigakiense Tsuneki, 1973
- 39 Trochanters at least largely ferruginous, apical margin of clypeus recurved in middle, recurved area medianly minutely depressed (mesoscutum somewhat strongly and distinctly punctured, IODs=2:1, SAT nasiform, PAF deep, flat-bottomed, fore and mid legs broadly yellowish white, A1-4 each at apex pale and flagellum brownish beneath), 10-11 mm, Formosa (widely distributed over the Oriental Region) errans Saussure, 1867
- Trochanters black, apical margin of clypeus not recurved in middle 40
- 40 Antenna from A5 apically brown to ferruginous beneath (gaster only medianly on sides and beneath ferruginous brown, IODs=10:7, clypeus: Fig. 113, SAT moderately high nasiform, comparatively thick, strongly carinated in middle, PAF deep, flat-bottomed, ASR usually tricarinate, area dorsalis enclosed with furrow, at base obliquely, on median furrow transversely, both strongly coarsely striate, sides of disc strongly punctured and striate, lateral furrows and outsides of the area transversely coarsely striate), 9.5-11 mm, Formosa puliense Tsuneki, 1967

- Antenna wholly black 41
 41 Gaster from apex of G1 till end ferruginous red, but always black above, clypeus on apical area broadly ferruginous (frontal elevations distinct, medial furrow fairly deep, surface weakly microcoriaceous and sparsely punctured, fairly glossy, clypeus: Fig. 129, apical margin not incrassate in middle, lateral furrows of area dorsalis deep and distinct, IODs=5:4, SAT-ASR: Figs. 125-128, fore tibia pale brown, slightly darker above), 13-14 mm, Formosa melanocorne Strand, 1922
 -- Gaster from apex of G1 to base of G4 red or ferruginous, often black above, clypeus till apex black (frontal elevations weaker, median furrow shallower, surface more strongly microcoriaceous, with punctures closer and almost mat) 42
 42 Clypeus: Fig. 119, at base roundly raised, with hair strongly sinuately convergent towards medial line, apical margin incrassate in middle, RC=C, lateral furrows of area dorsalis feeble and indistinct (SAT-ASR: Figs. 116-118, median part of gaster red, often black above), 17-18 mm, Formosa taiwanum Tsuneki, 1967
 -- Clypeus: Fig. 134, at base gently raised, with hair weakly turned towards medial line, RC=M, lateral furrows of area dorsalis distinct except basal area (SAT-ASR: Figs. 131-133, median part of gaster pale brown, darker above) 12 mm, Formosa yoshimotoi sp. nov.
 43 Antenna, gaster and legs completely black, only legs apically somewhat brownish (A13=A10-12, IODs= 10:8-9, SAT tuberiform, weakly carinate in middle, PAF broad and shallow, apical margin of clypeus weakly produced in middle, area dorsalis distinctly enclosed with furrow) 44
 -- Some of the parts mentioned ferruginous or yellowish or reddish 45
 44 SAT at apex expanded into transverse horizontal band connecting ASRs with each other, the band anteriorly roundly emarginate (Fig. 90, vertical view), surface shining, 10-12 mm, Formosa formosicola Strand, 1922
 -- SAT at apex transversely carinate, carina connected with ASR on both ends, the carina usually not well developed, weak and frequently completely lacking, 10-13 mm, Ryukyus (Okinawa) (see also p. 11, corrigendum) formosicola inornatum Matsumura et Uchida, 1926
 45 A13=A8-12 46
 -- A13=A9-12 or much shorter 47
 46 IODs=3:2, G1=AWx5-6, G2=AWx1.5 or shorter, G2-3 largely reddish, trochanters of all legs wholly or largely ferruginous or pale brown (fore tibia and tarsus and mid tarsus ferruginous white, clypeus weakly rounded out and medianly weakly recurved, SAT moderately high nasiform, somewhat rounded, PAF deep, flat-bottomed, scapal hollow covered with appressed hair, area dorsalis distinctly enclosed with furrow, mesoscutum comparatively strongly punctured), 8-11 mm, Formosa (widely spread over the Oriental Region) errans Saussure, 1867
 -- IODs=5:4, G1=AWx8, G2=AWx2 or longer, G2-3 black and partly brownish be-

neath, trochanters black (fore tibia on both ends, fore tarsus ferruginous, medial rounded prominence of clypeus larger, SAT-ASR generally similar, but scapal hollow polished, lateral furrows of area dorsalis broad and shallow, disturbed by striae and punctures, becoming indistinct, punctures on mesoscutum sparse, but markedly large and strong), 10-12 mm, Formosa

- puliense Tsuneki, 1967
- 47 Medio-apical area of SAT obliquely flattened into a smooth, shining and round area, carrying a fovea on it 48
- SAT without such an area 50
- 48 Gaster black, only G2-3 brownish beneath, often very indistinctly so, legs black, fore tibia and tarsus partly ferruginous yellow, rest brown (A13 < A10-12, apical margin of clypeus medianly incrassate, black, lateral furrows of area dorsalis distinct, median furrow anteriorly crenate, rest polished), 10 mm, Formosa hyperorientale Strand, 1922
- Gaster from apex of G1 to end wholly ferruginous, often posteriorly somewhat brownish, legs at least broadly amber yellow (A13=A10-12, apical margin of clypeus not incrassate, marginal area yellowish, lateral furrows of area dorsalis very feeble and indistinct, surface smooth and shining), 10-12 mm .. 49
- 49 Legs amber yellow, mid tarsus, hind femur, tibia and tarsus broadly brown to dark brown, antenna dark brown above, A3=AWx2.5, Formosa petioloides Strand, 1922
- Fore femur and tarsus partly, mid leg from middle of femur apically and hind legs largely brownish- or pure black, antenna brownish black above, A3=AWx2.2, Ryukyus (Ishigaki) petioloides isigakiense Tsuneki, 1973
- 50 G2-3 red, maculated with brown above (A13 slightly < A10-12, lateral furrows of area dorsalis indistinct, SAT tuberiform and medianly distinctly carinate, PAF deep, but bottom line up-curved, clypeus with apical margin somewhat produced in middle, fore tibia in front, tibial spurs and tarsi apically brown or pale brown), 10-12 mm, Formosa taiwanum Tsuneki, 1967
- Gaster black, sometimes somewhat brownish beneath 51
- 51 Mesoscutum without plumbeous shine, smooth and polished, ASR highly tricarinate, PAF deep, flat-bottomed, area dorsalis enclosed with distinct furrow (frons with median furrow deep and distinct, clypeus slightly curved out and obscurely notched in middle, A13=A10-12, fore tibia partly and fore tarsus pale brown, mid tarsus apically brownish, all spurs whitish, RC=C), 11-12 mm, Formosa melanocorne Strand, 1922
- Mesoscutum with strong plumbeous shine, distinctly punctured, ASR obliquely flatly expanded apically, PAF shallow, broad and down-curved in cross section, area dorsalis enclosed with feeble furrow (frons flat, almost without medial furrow, A13 similar, legs also similar in colour, but hind spurs brown, RC=C), 9-10 mm 52
- 52 Frons rather weakly microcoriaceous and sparsely punctured, surface fairly shining (fore tibia in front and tarsus and mid spurs brownish white), Formosa takasago Tsuneki, 1966

-- Frons strongly microcoriaceous and closely punctured, surface nearly
mat (fore tibia narrowly in front, fore and mid tibial spurs pale brown,
fore and mid tarsi apically dark brownish), Ryukyus (Okinawa)

takasago kumaso Tsuneki, 1966

C O R R I G E N D A

(couplet 33 and 34)

33 (44) SAT at apical margin with a transverse carina, carina well developed,
expanded horizontally into a broad transverse band, connecting both ASRs
(apical margin of the band usually roundly emarginate - Figs. 89 and 90)

Formosa

formosicola Strand, 1922

-- (--) SAT at apical margin either simply transversely carinate or without
carina A

A SAT without transverse carina at apical margin, often with very feeble
or incomplete carina, Is. Okinawa, Ryukyus

formosicola inornatum Matsumura et Uchida, 1926

- SAT always with transverse carina at apical margin, not so well de-
veloped as in formosicola s. str., with apical margin straight, Is. Amami-
Ohshima, Ryukyus

formosicola amamiense Tsuneki, 1964

DESCRIPTIONS AND RECORDS
OF THE SPECIES

1. TRYPOXYLON SCHMIEDEKNECHTI KOHL, 1906

- Trypoxylon schmiedeknechti Kohl, Denks. Math.-Natw. Kl. k. Akad. Wiss., 71:34, 1906 (♂, Java).
Trypoxylon pileatum var. subpileatum Strand, Intern. Ent. Zeits., 16 (19): 163, 1922 (♀ ♂, Formosa).
Trypoxylon subpileatum: Tsuneki, Etizenia (Fukui), 22: 3, 1967; 54: 1, 1971; 60: 1, 1972 (Formosa); Kontyu, 36 (1): 54, 1968 (Formosa).
Trypoxylon subpileatum: Haneda, Life Study (Fukui), 15 (1-2): 30, 1971; 16 (1-2): 4, 1972 (Formosa).
Trypoxylon subpileatum: Murota, Ibid., 17 (3-4): 117, 1973 (Formosa).
Trypoxylon subpileatum hungtouse Tsuneki, SPJHA, 2: 7, 1977 (Is. Hungtou).
Trypoxylon subpileatum hungtouse: Tano et Murota, Life Study, 17 (3-4): 117, 1973.
Trypoxylon subpileatum: Tsuneki, Ann. Hist. Nat. Mus. Hung., 69: 270, 1977.
Trypoxylon schmiedeknechti: Tsuneki, SPJHA, 7: 21, 1978 (Distribution, variation, subspecies, synonyms).

Specimens newly examined:

- 2 ♀, Ryukyus (Is. Iriomote: Komi), 21. VIII. 1978, T. Nambu (first record from the Ryukyus and from Japan). 3 ♀ 9 ♂, Formosa, 12-18. VIII. 1980, T. Nambu.
1 ♀, Formosa, Nantou Pref., Nanshanchi, 15. VIII. 1981, M. Terayama; 5 ♀ 3 ♂, Formosa, Kaohsiung (Takao), 15. IX., 11. X. 1907, H. Sauter (Mus. Bremen).

Remarks. This species is considerably variable in characters, especially in the form, depth and relief of the frontal enclosure, without connection with the locality. It is widely spread over the Oriental and Australian Region and is separated into two subspecies, schmiedeknechti schmiedeknechti and schmiedeknechti connexum Turner. The latter occurs in the Australian Region.

The discovery of the present species in the Ryukyus is worthy of special attention.

2. TRYPOXYLON THAIANUM DUBIOSUM TSUNEKI, 1964

- Trypoxylon dubiosum Tsuneki, Etizenia, 6: 4, 1964 (Ryukyus: Is. Amami-Oshima).
Trypoxylon dubiosum: Tsuneki, Ibid., 13: 6, 1966 (Amami-Oshima).
Trypoxylon dubiosum: Murota, Life Study (Fukui), 17 (3-4): 101, 1973 (Amami-Oshima).
Trypoxylon thaianum dubiosum: Tsuneki, SPJHA, 7: 49, 62, 1978.

Remarks. No new specimen could be examined. The curious distribution of this subspecies of thaianum merits special notice. A different subspecies occurs in the Philippines, but the species does not occur in Formosa and in the southern Ryukyus, whereas it is flourishing on the Island of Amami-Oshima, locating in the Central Ryukyus.

3. TRYPOXYLON TAINANENSE STRAND, 1922

- Trypoxylon tainanense Strand, Intern. Ent. Zeits., 16 (23): 188, 1922 (3 ♀, Tainan).
Trypoxylon nagamasae Tsuneki, Etizenia (Fukui), 4: 12, 1963 (1 ♂, Thailand: Chiengmai).
Trypoxylon taiwanense (!) : Tsuneki, Ibid., 13: 2, 6, 1966 (listed).
Trypoxylon tainanense: Tsuneki, Ibid., 22: 2, 1967 (keyed).
Trypoxylon tainanense: Haneda, Life Study (Fukui), 16 (1-2): 4, 1972 (2 ♀, Formosa: Ilan).
Trypoxylon tainanense: Tsuneki, Etizenia, 60: 1, 1972 (1 ♀, Formosa, redescription).

Trypoxylon tainanense: Tsuneki, Ann. Hist. Nat. Mus Nat. Hung., 69: 270, 1977 (1 ♂, Formosa: Kaohsiung (Takao), description, figs.).

Trypoxylon tainanense: Tsuneki, SPJHA, 7: 73, 1978 (♀ ♂, Formosa, Thailand, Sumba, Celebes, redescri. variat., figs.).

Remarks. This species is widely distributed over the Oriental Region, but is apparently everywhere rare.

4. TRYPOXYLON FRONTICORNE GUSSAKOVSKIJ, 1936

Trypoxylon fronticorne Gussakovskij, Trav. Zool. Acad. Sci. URSS, 3: 659, 1936 (♀ ♂, S. Europe, Transcaucasus Region, E. Siberia).

Trypoxylon fronticorne: Tsuneki, SPJHA, 9: 56, 1979 (ref. geogr. var., ssp. N. India, Assam, Nepal and Japan).

A. Trypoxylon fronticorne shirozui Tsuneki, 1966 (stat. nov.)

Trypoxylon shirozui Tsuneki, Etizenia, 13: 14, 1966 (1 ♀, Formosa, Nantou Pref.: Sungkang)

Trypoxylon shirozui: Tsuneki, Ibid., 22: 18, 1967 (♂, descr., Formosa: 2 ♂, Chienching; 2 ♀ 7 ♀, Mt. Ali, excluding specimens from Fenchiu and Shihtsulu).

Trypoxylon shirozui: Tsuneki, Kontyu, 36 (1): 55, 1968 (♀, Sungkang).

Trypoxylon shirozui: Tsuneki, Etizenia, 54: 14, 1971 (1 ♀, Chienching - Wushe).

Specimens newly examined: 2 ♀ 1 ♂, Formosa, Mt. Ali, about 2000 m, 2. VIII. 1981, M. Terayama.

Other specimens: 2 ♀ 1 ♂, Mt. Ali, about 2400 m, 27. VII. 1966; 2 ♂, Chienching, about 2300 m, 9. VII. 1966, K. Tsuneki.

Remarks. The Taiwanese specimens of this species differs from the Japanese population (ssp. japonense m.) in that the punctures on the mesoscutum are distinctly sparser (PIS mostly 1.5 times PD) and from the Indian populations (sspp. assamense and brevicorne) in that Al3 is not so long or so short and similar in this respect to the Japanese representatives. Further, punctures on mesoscutum are comparatively closer than in the Indian populations and in ♀ medio-apical emargination of the clypeus is much broader (Fig. 1), although in ssp. japonense the form of the area is more or less variable (Figs. 2-7). SAT-ASR similar in structure to that of ssp. japonense. Measurements in ♀ (within parentheses ♂):

HW, HL, IODv, A3, Al3, P=100, 51, 30, 18, --, 95 (100, 51, 38, 14, 27, 88). IODs=10:8.5 (10:7.5). OOD, Od, POD=2, 3, 4. (3, 4.5, 4.5). A3=AW*2.8 (AW*1.5). A3, 4, 5 10, 8, 8. (10, 10, 10). (Al3=BW*2 and slightly Al0-12). P, Ma, Mi, 2(Ma), 3(Ma)=100, 30, 16, 52(22), 50(50). (100, 38, 26, 58(50), 48(67)). RC=B, Rl short (do.). CV1=CV2*4-5 (CV2*3.5-4). TCV: CV2=9:8 - 5:3. TCV gently sinuate, angle 110-120° (105-110°).

The holotype specimen (Coll. Kyushu Univ.) is not reexamined, but judging from the locality of the specimen (Sungkang, about 2000 m) and from the figures in the original description there is no doubt that it has the same characters as had by the above listed specimens and not as in the following subspecies.

The genitalia and the 8th sternite in the present subspecies is identical in structure with that of the Japanese population (cf. Pt. III, Figs. 177, 178).

B. Trypoxylon fronticorne obliquum ssp. nov.

Trypoxylon shirozui: Tsuneki, Etizenia, 22: 18, 1967 (partim: specimens from Fenchiu and Shihtsulu).

The present race differs considerably in the external characters from the preceding subspecies and apparently belongs to a different species. The differences are constant to the population members without exception and not within the variation range of the East Asiatic forms of fronticorne, namely,

(1) ♀ ♂. SAT high nasiform, but with sides not so acutely and perpendicularly inclined as in other races, but obliquely sloped and its dorsal surface without the transverse rugosed striae or carinae as observed in other Asiatic populations of this species.

(2) A3 is relatively distinctly shorter, in ♀ =AWx2.2-2.4 and A3,4,5=10,9,9, in ♂ =AWx1.3 and A3,4,5=10,11,12-13.

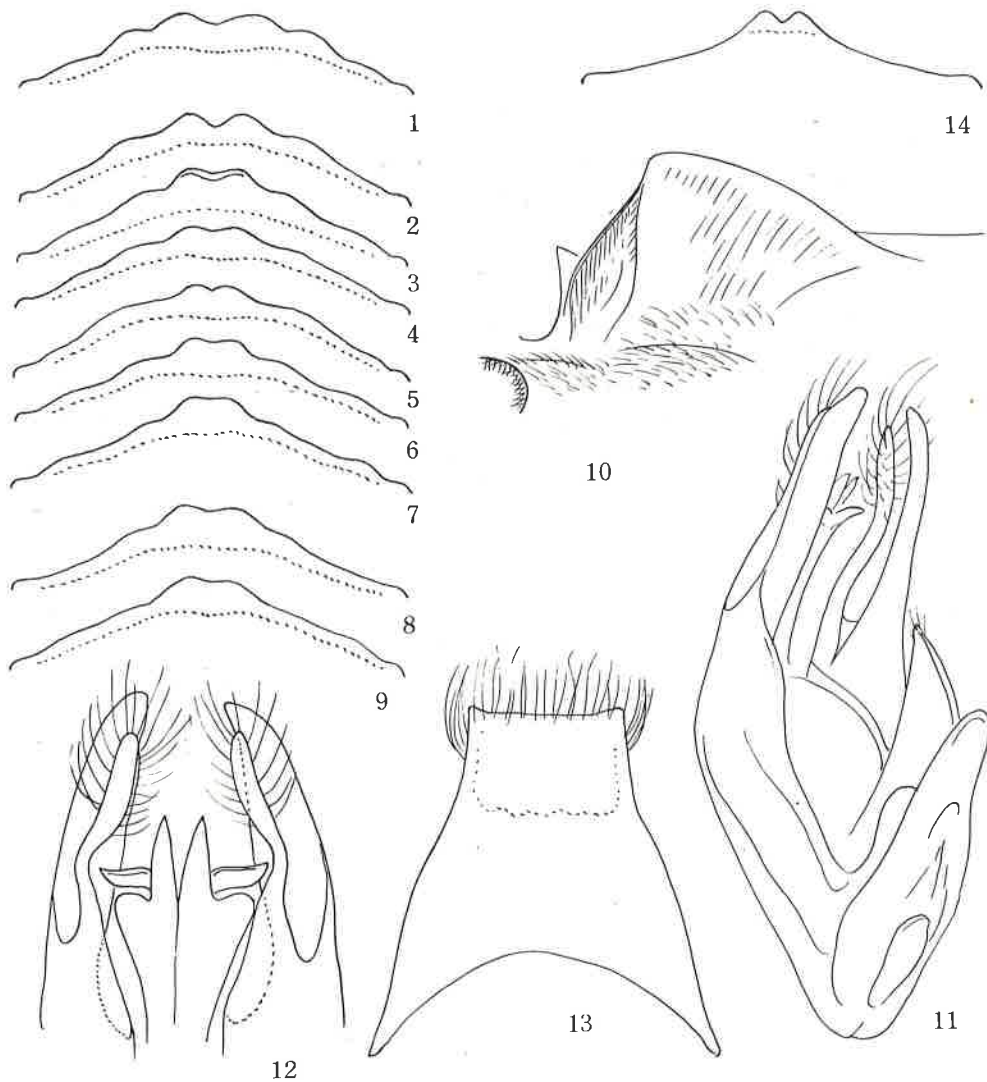
(3) Gastral petiole is gradually widening from base towards apex (strictly slightly before apex, apex is somewhat constricted) and not subflask-shaped as in usual forms of fronticorne.

Moreover, as compared with the Taiwanese other subspecies, shirozui,

(4) Mesoscutum much more closely- and mesopleuron much more finely and sparsely punctured (♀ ♂) and

(5) In the form of apical margin of clypeus in ♀ (Figs. 8, 9) the present subspecies is rather close to the Japanese population of fronticorne japonense, (Figs. 2-7) and distinctly differs from preceding shirozui (Fig. 1).

SAT-ASR in dorso-lateral view: Fig. 10. In the structure of genital organs and 8th sternite it is completely identical with other populations of fronticorne (Figs. 11 ... ventro-lateral view, 12 ... dorsal view; 13)



Figs. 1-14. (all ♀). 1: T. fronticorne shirozui. 2-7: T. fronticorne japonense. 8-13: T. fronticorne obliquum. Fig. 14: T. taihorinsho Tsuneki.

Measurements in ♀ (within parentheses: ♂):
HW:HL in frontal view =100:84 (100: 80). HW,HL,IODv,A3,A13,P=100,54,32,16,--,
104 (100,52,36,11,30,100). IODs=10:9 (10:7.5). OOD,Od,POD=2,4,4 (3,3.5,4). (A13=
BW×2.7 and slightly <A9-12. P,Ma,Mi,2(Ma),3(Ma)=100,25,14,48(38),48(50) (100,25,18,
56(39),50(52)). RC=B, R1 short, CV1=CV2×3.5, TCV:CV2=1:1 - 5:4. TCV gently sinu-
ate, angle in ♀ 120°, in ♂ 105°.

A13 relatively somewhat longer than in ssp. japonense and shirozui, but in form similar, markedly bent at apex.

Holotype: ♀, Formosa, Chiayi Pref., Shihtsulu (about 1500 m), 29. VII. 1966, K. Tsuneki (Coll. Tsuneki).

Paratypes: 1 ♀ 1 ♂, Chiayi Pref., Fenchihu (1350 m), 24-25. VII. 1966, K. Tsuneki (Coll. Tsuneki).

General remarks. The localities of ssp. obliquum are at the half way to Mt. Ali, at the height of about 1300-1400 m, while ssp. shirozui occurs much higher, at the height of about 2300-2500 m. The two subspecies must be differentiated, therefore on the basis of difference in altitude.

Haneda recorded twice (1971, 72) this species from Nantou Prefecture, 1 ♀ from Wushe and 2 ♀ 3 ♂ from Tsiufeng. Judging from the height the Tsiufeng specimens must belong to ssp. shirozui, but Wushe specimen seems to need confirmation.

5. TRYPOXYLON TAIHORINSHO TSUNEKI, 1977

Trypoxylon taihorinsho Tsuneki, Ann. Hist. Nat. Mus. Nat. Hung., 69: 274, 1977 (♀, Chiayi and Kaohsiung Prefs.).

Specimens: 1 ♀, Chiayi Pref., Talin, IV. 1910, H. Sauter; 1 ♀, Kaohsiung Pref. Mt. Hoozan, I. 1910, H. Sauter (HNHM).

Main characters:

♀. 8.5 mm, G1 clavate, short, but at basal area somewhat subflask-shaped, mesoscutum microcoriaceous, propodeum with lateral carinae, area dorsalis without lateral furrows. Head transverse, in frontal view with sides rounded, frons gently raised, without medial furrow, SAT moderately high broad nasiform, apical margin of clypeus: Fig. 14, pronotal lamina triangularly produced, with apex rounded, IODs=10:8, OOD: POD=1:3, A3=AW×2, A3,4,5=10,10,10, P,Ma,Mi,2(Ma),3(Ma)=100,33,16,53(56),46(65). Ferruginous are mandible, palpi, A1 and 2 at apices, humeral tubercle, tegula, gaster except a brown mark on posterior swelling of G1 and a small on G2 above and legs except the following: greater part of all coxae, fore and mid trochanters largely, all femora, inside of fore and mid tibiae, central part broadly of hind tibia and hind T1 at apex and following T2-5. Frons microcoriaceous and closely punctured, PIS=PD, mesoscutum also closely punctured, area dorsalis smooth and finely closely punctured, sides smooth and shining, only on posterior portion finely punctured.

Remarks. The specimens are not at my hand and the detailed structure of SAT-ASR can not be given here.

6. TRYPOXYLON KANSITAKUM TSUNEKI, 1971

Trypoxylon kansitakum Tsuneki, Etizenia (Fukui), 54: 8, 1971 (♂, Chiayi Pref.).

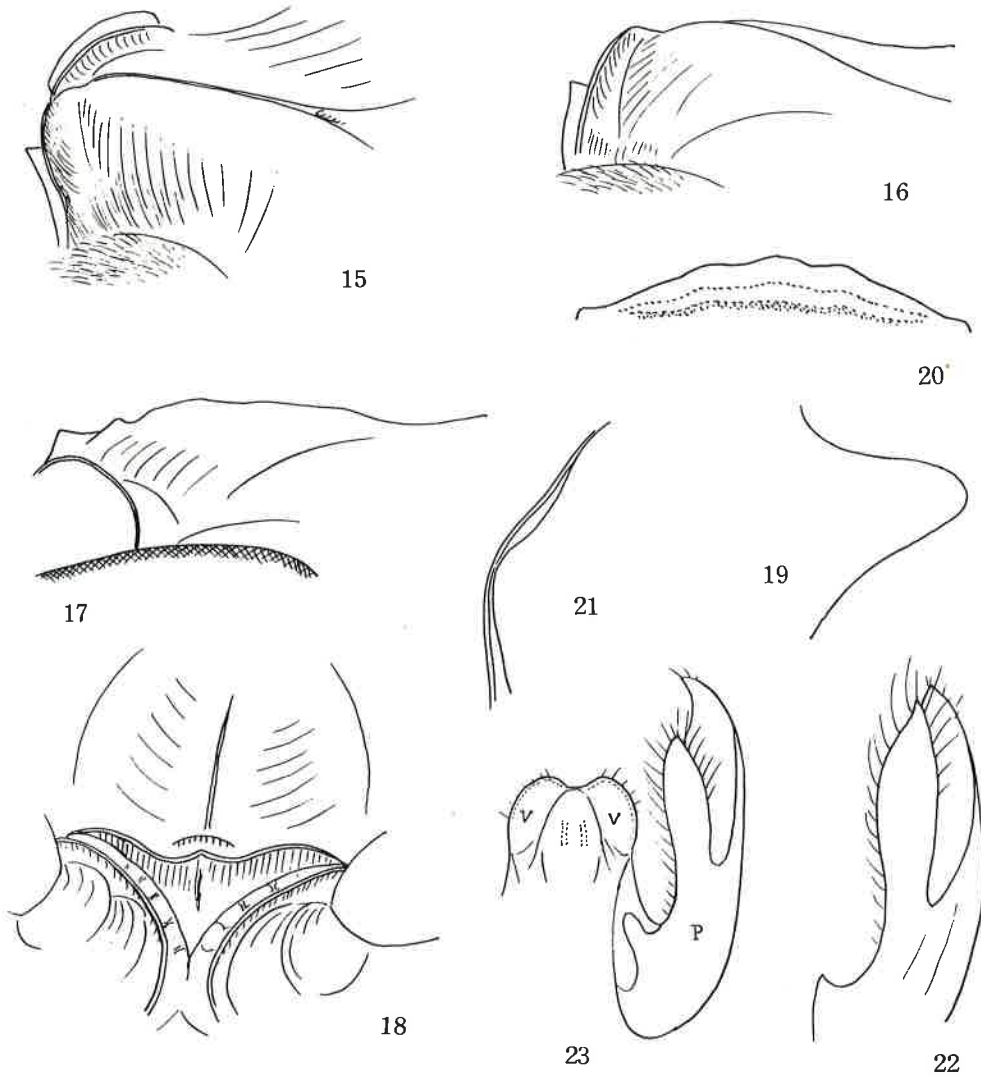
Among the exotic species T. luzonense m. is most closely allied to the present species, having SAT-ASR completely similar in structure and general other characters including male genital organs are also very similar. But in luzonense ♂ gaster is completely black, legs much more broadly darkened, frons without medial impressed line, clypeus somewhat different in the form of apical margin and dorsal one of apical two lobes of paramere of genitalia is slightly slenderer.

Main characters.

♂, 6.5-8.5 mm. G1 clavate, shorter than G2+3, mesoscutum microcoriaceous and superimposed with punctures, propodeum with lateral carinae, area dorsalis weakly enclosed with fine furrow. Head transverse, eye incision broad and shallow, IODs=10: 7.5, A3=AW×3, A13=BW×2 and =A9-12, with apex bent, OOD:POD=1:2, RC=B. Black, api-

cal margin of clypeus, humeral tubercle, tegula, fore and mid legs nearly wholly and hind leg broadly ferruginous, gaster at base of G2, 3 and 4 yellowish red, hair silvery.

Supplement. A1 except a large brown mark above and A2 at apex ferruginous, apical margin of clypeus comparatively broadly ferruginous (extreme apex dark brown), mandible on basal half yellow, apically ferruginous - reddish brown, palpi cream yellow, posterior part of collar discoloured, tubercle posteriorly broadly yellow, tegula and basal plate of wing ferruginous; G1 at extreme apex and on sides broadly, G2-4 at each base comparatively broadly and at each apex narrowly yellowish red, apices of G5-7 also discoloured, appearing somewhat ferruginous. Ferruginous-yellow on legs: Apices of coxae (in fore narrow, in mid broad and in hind moderate), rest of fore and mid legs except following brown: fore trochanter above, a short streak on fore femur and on fore and mid tibiae; on hind leg: trochanter wholly, femur at base and apex (rest covered with two dark brown and pale brown streaks), tibia at base broadly and beneath, T1 on basal 2/3 and T2-5 at each base (rest of tibia and tarsus brown or dark brown); fore tibial spurs ferruginous yellow, mid and hind ones dark



Figs. 15-23. *Trypoxylon kansitakum* Tsuneki, ♂

brown, arolia always black.

Head in frontal view with sides rounded, slightly convergent towards clypeus, vertex not depressed, dorsal margin of eye incision distinctly inclined outwards, each ocellus in a shallow hollow, frons moderately raised, median furrow broad and shallow, but bottom line distinct till near SAT, SAT moderately high nasiform, with sides somewhat roundly inclined and distinctly carinated in middle, carina widened at upper end and medianly impressed and at lower end connected with high round transverse carina which is attached at its end to the postero-lateral part of ASR, covering completely PAF, SAT-ASR in oblique dorso-lateral view: Fig. 15, in dorso-lateral view: Fig. 16, in lateral view: Fig. 17, in ventro-lateral view to see the lower aspect of SAT: Fig. 18, medio-apical part of SAT, just behind apical carina, depressed whence false PAF originated. Eye incision (left side): Fig. 19, apical margin of clypeus: Fig. 20, disc transversely broadly roundly elevated.

As to head in dorsal view, clypeus with variation in form of apical margin, antenna and genital organs with various views of penis valve see the original description. Here, apical part of paramere of genitalia in dorsal (Fig. 22) and dorso-apical view (Fig. 23) with apical view of volsella (V) are given supplementally.

Measurements: HW,HL,IODv,A3,Al3,P=100,51,34,18,23,82. IODs=10:7.5-8. OOD,Od,POD=2,3,4. A3=AWx3. A3,4,5=10,7,6. Al3=BWx2.1 and A9-12. P,Ma,Mi,2(Ma),3(Ma)=100,46,26,62(64),62(78). RC=B, somewhat close to C, Rl=A4, CV1=CV2x4.5-5. TCV:CV2=5:4, angle 110°-120°.

Occipital carina broadly disappeared behind buccal cavity. Anterior part of collar very short, narrow ridge-like, only slightly widened towards sides, posterior part discoloured, lamina on side: Fig. 21, subalar area normal, lateral carinae of propodeum ending far before posterior margin of the segment, area dorsalis with basal transverse elevation less than half the length of postscutellum, with lateral furrows fine and weak, medial furrow moderate in depth and width, lateral carinae of area apicalis not turned inwards at anterior ends, but area itself roundly impressed, appearing as if margined and provided with a longitudinal carina in middle.

Punctures on mesoscutum close, area dorsalis at base obliquely coarsely striate, striae usually short, but sometimes considerably long, covering basal part of the disc, median furrow usually transversely striate, but sometimes smooth, disc distinctly closely punctured; sides except femoral sinus obliquely closely striate. ♀, unknown.

Specimens: 35 ♂♂ (3 without head), Chiayi Pref., Kuonhua (=Kansitaku), about 1200 m, 1-2. VIII. 1968, K. Tsuneki (Coll. Tsuneki).

7. TRYPOXYLON CHINGI TSUNEKI, 1971

Trypoxylon ohingi Tsuneki, Etizenia, 54: 10, 1971 (♀ ♂, Chiayi Pref., about 1200 m).

Specimens: 6 ♀ 22 ♂, Chiayi Pref., Kuonhua, 6, 7. VIII. 1968, K. Tsuneki.

The original description is detailed and the comparison with the closely allied preceding species is also given. Here some undescribed characters alone will be presented below:

♂. 5-6 mm. Frontal median furrow somewhat deeper than in kansitakum, but without impressed bottom line, SAT slightly higher, with sides more acutely inclined, with medial excavation at upper end broader and more distinct, SAT-ASR in oblique dorso-lateral view: Fig. 24, in profile: Fig. 25, in ventro-lateral view: Fig. 26, apical margin of clypeus: Fig. 27, ditto in ♀: Fig. 30, eye incision (left side) in ♂: Fig. 28, in ♀: Fig. 31. Measurements in ♂ (within parentheses ♀):

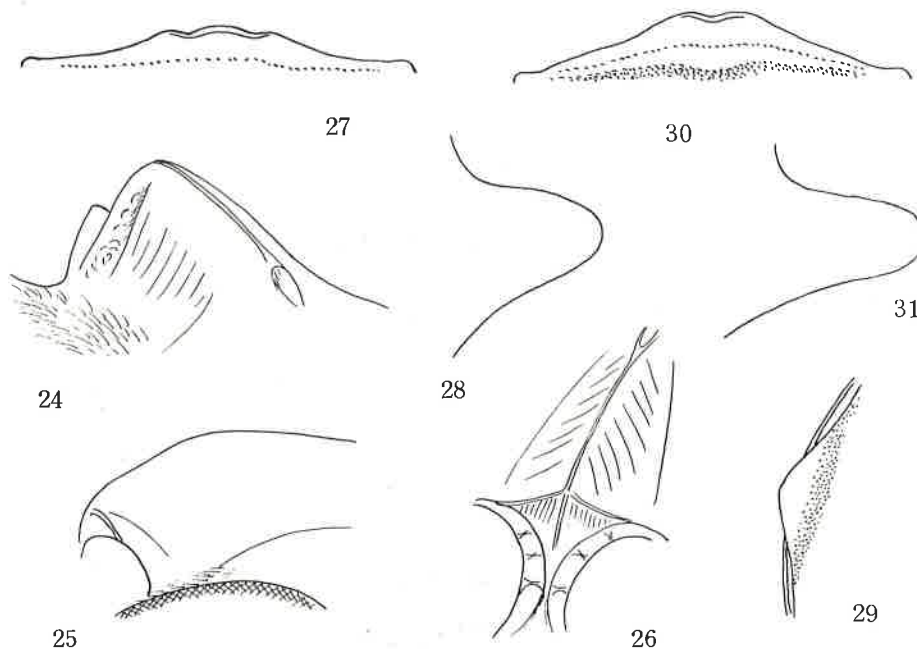
♂ HW,HL,IODv,A3,Al3,P=100,76,36,18,22,78 (100,60,32,20,--,92). IODs=10:6 (10:4). OOD,Od,POD=2,4.5,3. (2,7.5,5). A3=AWx2.6 (AWx3.6). A3,4,5=10,7,6.5. (10,7,6.5). Al3=BWx2 and A10-12. P,Ma,Mi,2(Ma),3(Ma)=100,34,22,64(48),62(56). (100,34,18,68(44),58(56)). RC=C somewhat close to B, Rl moderately long, CV1=CV2x3 (CV2x3.5), TCV:CV2=1:1, TCV gently bent inwards in middle, angle about 120° (ditto).

Occipital carina broadly disappeared behind buccal cavity (♂ ♀), pronotal lamina with apical area always ferruginous (♂ ♀) and broadly rounded at apex (Fig. 29, ♂ and ♀), subalar area of mesopleuron normal. Lateral carinae of propodeum distinct, but not reaching apex, lateral furrows of area dorsalis fine but distinct, lateral carinae of area apicalis not bent inwards at anterior ends, the area medianly carinated and deeply hollowed on both sides of the carina, GSR as a whole obliquely raised posteriorly.

Frons microcoriaceous and distinctly superimposed with medium-sized punctures,

PIS=PD, punctures on mesoscutum slightly finer but closer than on frons, area dorsalis at base obliquely, coarsely and posteriorly gradually turning transversely and finely striate, lateral series of striae of the segment indistinct, sides on dorsal area obliquely, finely and closely striate, remaining area except smooth femoral sinus distinctly microcoriaceous.

Remarks. In the original description figures of head in frontal view (♀), clypeus (♀), G1-3 (♀ ♂), A7-13, genitalia and penis valve (♂) are given.



Figs. 24-31. Trypoxylon chingi Tsuneki, 24-29: ♂, 29-31: ♀

8. TRYPXYLON KOSHUNICON STRAND, 1922

Trypoxylon koshunicon Strand, Intn. Ent. Zeits., 16 (18): 149, 1922 (♂, S. Formosa).

Characters treated in the original description:

♂. Length 5.5 mm. Black, pale yellow: A1-3 (somewhat dark), fore and mid legs, in hind leg apex of coxa, trochanter wholly, apex of femur, both ends of tibia, T4-5, both ends of T1, 2, 3, tegula, humeral tubercle and palpi. Mandible brownish yellow, at apex slightly darker, posterior part of collar somewhat yellowish, posterior margins of gastral segments at least on sides narrowly bright. Hair silvery, delicate pubescence on thorax and gaster. Tibial spurs of mid and hind legs black, very marked in contrast with the bright ends of the tibiae, wings slightly brownish, iridescent, stigma and veins dark brown.

Vertex is eaten by insect. Frontal furrow very shallow and fine, SAT narrow keel, eye incision triangular, not very deep, A3=A1 and A2 2, A13 as thick as A11 and 12 and =A11+12. Hind tibia at apical 2/3 of outer side provided with a series of 5 whitish spinules. G1=Ma 4, gaster as a whole slightly longer than head and thorax-complex combined.

Remarks. In my 1966 paper I combined a female specimen collected in the Kenting Park with the present species as its different sex, because of the resemblance in non-sexual characters and near-by localities of the specimens. In those days,

however, I was unaware of the presence of several closely allied species in Formosa and viewed from the present knowledge it is improper to combine them together. Detailed explanation for this will be given in connection with T. quadriceps.

9. TRYPOXYLON OKINAWANUM TSUNEKI, 1966

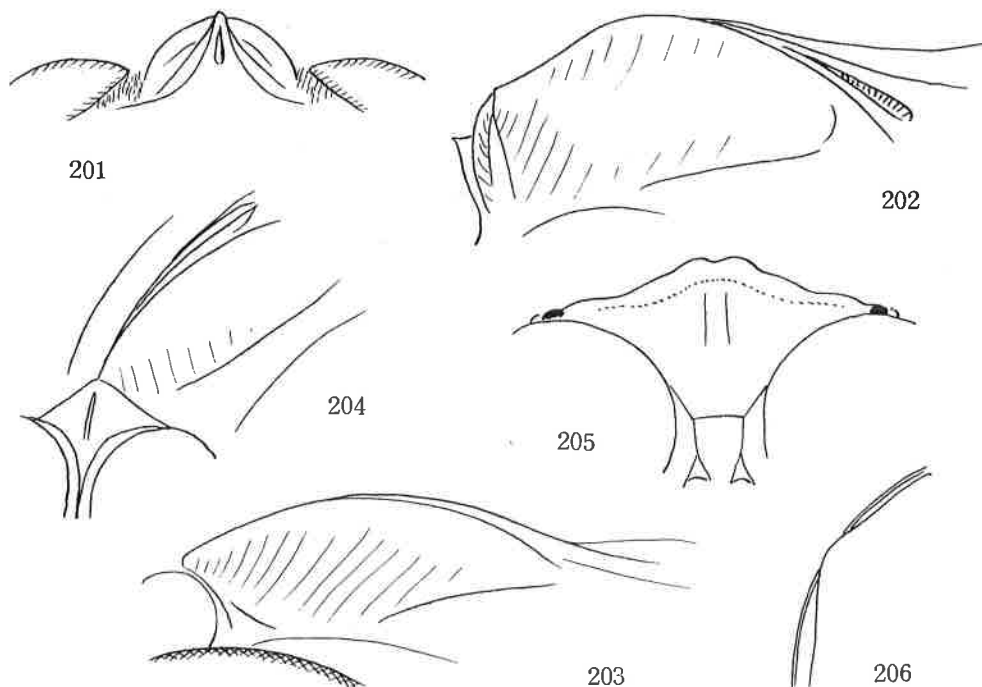
Trypoxylon koshunicon okinawanum Tsuneki, Etizenia, 13: 18, 1966 (♀, Ishigaki and Iriomote - the Ryukyus).

Trypoxylon okinawanum: Tsuneki, Ibid., 54: 14, 16, 18, 1971 (listed and keyed).

Revision of the holotype specimen.

♀. About 7.5 mm. Black; A1 and 2 slightly pale and 1 yellow beneath and 2 pale brown beneath, apical glabrous area of clypeus broadly pale castaneous, posterior part of collar discoloured, posterior margin of tubercle broadly yellow; apical sides of G1, sides of G2, sides and underside of G3 ferruginous brown and apical margins of G1-5 discoloured, somewhat yellowish. Ground colour of legs yellow, with following black: coxae except apices, fore leg: femur above and beneath, tibia externally and (apical half of T1 to T4 brown); mid leg: femur above and beneath, tibia externally and (T1-5 dark brown, with articulations paler); hind leg: femur and tibia both except base and apex (trochanter above pale brown, rest of femur, tibia and tarsus dark brown, articulations of tarsus pale).

Head in frontal view rounded (Fig. 31 of original description), W:L=100:88, vertex not depressed, tops of hind ocelli above level of tops of eyes, eye incision moderate in width, fairly deep and acutely narrowed towards sinus, sinus minutely rounded (nearly pointed), dorsal margin slightly inclined outwards, frontal elevation gentle, but anteriorly fairly high, with median furrow broad and shallow, on anterior area broadly, nearly flatly enlarged, SAT high acute nasiform, median ridge thick and strongly furrowed in middle, apical end margined with a transverse and roundly raised wall or high carina which is connected with postero-lateral part of



Figs. 201-206. Trypoxylon okinawanum Tsuneki, ♀

ASR. SAT-ASR in dorsal view: Fig. 201, in dorso-lateral view: Fig. 202, in lateral view: Fig. 203, apical vertical surface of SAT flat and medianly carinated (Fig. 204, in ventro-lateral view). Clypeus: Fig. 205, at base flat and anteriorly gently and roundly tectate. Occipital carina weak behind buccal cavity.

HW,HL,IODv,A3,P=100,60,32,19,98. IODs=10:4. OOD,Od,POD=2,6,5. A3=AW 3.5. A3,4,5=10,8,7. A3:IODc=10:6.5. P,Ma,Mi,2(Ma),3(Ma)=100,32,18,60(44),50(54). RC=B, Rl long, as long as A4, reaching about mid point of the distance to wing apex, CV1=CV2x5.2. TCV:CV2=7:5. TCV gently incurved, angle about 110°.

Pronotal lamina blunt triangular, apex broadly rounded, not conspicuous. Propodeum with lateral carinae, carinae at base and at apex broadly obsolete, basal elevation fine ridge-like, separated from postscutellum with a furrow, area dorsalis enclosed with weak but distinct furrow, surface of the area at base obliquely, strongly and coarsely striate, median furrow transversely striate, striae finer and closer posteriorly, disc finely, weakly, rather sparsely punctured with piliferous points, lateral furrows posteriorly disturbed with short transverse striae.

10. TRYPOXYLON QUADRICEPS TSUNEKI, 1971

Trypoxylon koshunicon: Tsuneki, Etizenia, 13: 16, 1966 (♀, Pingtung Pref., Kentin Park, nec ♂)

Trypoxylon quadriceps Tsuneki, Ibid., 54: 12, 1971 (♀, Nantou Pref., Pempuchi).

Trypoxylon chihpense Tsuneki, Ibid., 54: 13, 1971 (♀, Taitung Pref. Chihpenchi)(SYN. NOV.)

Trypoxylon koshunicon: Tsuneki, Ibid., 54: 16, 1971 (nec p. 19, ♂)

Trypoxylon venustum Tsuneki, SPJHA, 2: 8, 1977 (♂, Pempuchi) (SYN. NOV.).

Trypoxylon venustum: Murota, Hym. Comm. (Mishima), 5: 20, 1977 (1 ♂, Pempuchi).

Trypoxylon quadriceps: Murota, Ibid., 5: 20, 1977 (1 ♀, Pempuchi).

Specimens newly examined:

3 ♂, Formosa, Nantou Pref., Pempuchi (Central Mountain Valley, about 600-800 m), 18, 21. VIII. 1980, T. Nambu.

According to the detailed comparative study of the specimens hitherto collected it was brought to light that T. chihpense m. and T. venustum m. are the junior synonyms of the present species. The key to the synonymy was the structure of SAT-ASR and the measurements of the bodily parts.

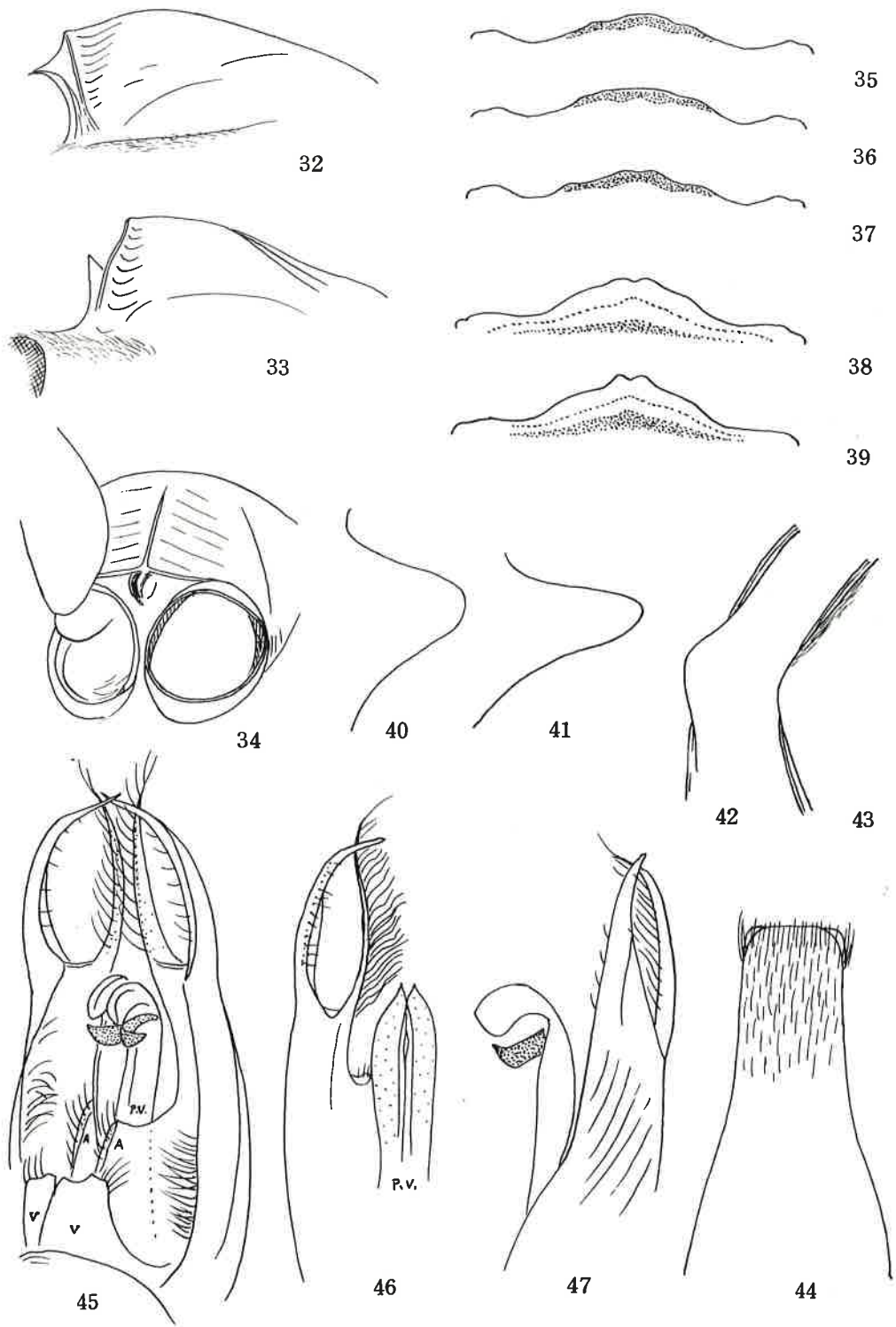
The present species is very close to T. chingi, but in the male A6 is not so deeply and distinctly excavated beneath and in the female eye incision is not so widely rounded at apex and, moreover, in both sexes gaster is much more broadly black and dark parts of legs are more distinctly black and can easily be separated from this species.

SAT-ASR very similar to that of chingi, in lateral view: Fig. 32, in dorso-lateral view: Fig. 33, in anterior view: Fig. 34. A6 in ♂ shows a slight tendency to be excavated beneath and A13 relatively slightly longer than in chingi and distinctly curved at apex (in chingi almost not curved), apical margin of clypeus slightly variable in form: Figs. 35, 36, 37 (♂, all collected in Pempuchi) and Figs. 38, 39 (♀, both from Pempuchi), eye incision (left side) in ♂: Fig. 40, in ♀: Fig. 41, subalar area without pent-roof structure, lamina on side of pronotum in ♂: Fig. 42, in ♀ Fig. 43, in ♀ more broadly rounded at apex in ♀, and in both sexes not ferruginous at apical area as is in chingi.

Measurements in ♂ (within parentheses ♀, first series: holotype of quadriceps and the second series: holotype of chihpense for comparison):

HW,HL,IODv,A3,A13,P=100,62,35,19,24,85. (100,67,34,22,--,110. 100,66,32,21,--,104.). IODs=10:9 (10:3.3. 10:3.5). OOD,Od,POD=2,4,4. (1,5,3. 1,6,3.5.). A3=AWx2.5. (AWx3.3. AWx3.3). A3,4,5=10,7,6. (10,7.5,6. 10,7.5,6.5). P,Ma,Mi,2(Ma),3(Ma)=100,42,21,60(54),51(60). (100,34,17,54(44),45(50). 100,37,16,50(45),46(52)). A13=BWx2.3 and >A10-12, but <A9-12. RC=B, Rl moderately long, ≠A4. CV1=CV2x2.6 (CV2x3.3. CV2x3.6). TCV≠CV2 (do. do.). Angle about 120°. (do. do.).

Sternite 8: Fig. 44, strange in form and state of pubescence. Genitalia seen from beneath: Fig. 45, paramere deeply bifid at apex, dorso-external layer on inner margin at base incrassate and fringed with hair (A in the figure), volsella (V in the figure) also fringed with hair at the top, penis without shoulder, but with a pair of primitive sickle-appendages.



Figs. 32-47. *Trypoxylon quadriceps* Tsuneki, 38, 39, 41, 43 ... ♀, others ... ♂.

Remarks. In the original description of quadriceps (♀) are given figures of head in frontal and dorsal views, apical margin of clypeus, G1-3 in dorsal and lateral views, and in that of chihpense (♀) figures of head in dorsal view, clypeus and G1-3 in dorsal view. Between the figures of head in dorsal view of both there is apparently a considerable difference in form. This is, however, due to the difference in direction from which the head is observed. See the measured values above compared. In the description of venustum (♂) are given figures of head in frontal and dorsal views, apical margin of clypeus, A8-13 in three directions, sternite 7 and paramere of genitalia. Genitalia figures are incomplete and are supplemented here.

The female specimen that was first combined with koshunicon ♂ and later correctly with venustum ♂ was captured in Kentin Park near Hengchun, the type locality of koshunicon Strand. The Park is not so markedly different from Hengchun in height, but distinctly so in the environmental condition. The Park is densely covered with forest and lived by many montanic species of insects, while Hengchun is an old village town in the cultivated field. Thus, koshunicon is a lowland species, while the female above mentioned is a montanic species and to combine them together is already questionable from the ecological point of view.

The female specimen from Kentin is comparatively bright in colour of gaster and legs: Ferruginous are G1 on sides, G2 on basal sides and G3-5 on sides of apical areas; fore leg except coxa, mid leg except basal half of coxa, hind leg on apex of coxa, trochanter wholly, both ends of femur, basal ring and apex of tibia and both ends of T1, 2 and 3. But fore femur above, mid femur and tibia both above, mit T1 at apex and mid and hind T4-5 more or less brownish.

In Pempuchi female specimens gaster more broadly black, only on sides of G1 and 2 and basal sides of G3 dark ferruginous or dark red; brownish parts of fore and mid legs in Kentin specimen become darker brown and of hind leg dark brown or black. In the male specimens gaster sometimes nearly completely black.

The conspicuous blackish spurs of mid and hind legs in contrast with yellowish apex of the tibiae and the longitudinal series of whitish spinules on outer side of hind tibia that were particularly described by Strand with respect to koshunicon (♂) were at first considered to be the specific characters. Both are, however, only the group characters and certainly can be observed in kansitakum, chingi, quadriceps, okinawanum and fenchihuense.

Speaking to the series of the spinules, however, this is in the female less conspicuous, usually more blackish in colour and in certain light light only appears whitish. In the male also the colour of the spinules more or less varied according to the direction observed, sometimes whitish, sometimes ferruginous and sometimes rather brown. The numbers of the spinules of the series varies more or less within a species, but the range of the variable numbers sometimes shows a tendency towards specific: in chingi more numerous (7-10) than in others (4-7).

11. TRYPOXYLON IRIOMOTENSE SP. NOV.

♀. Allied to gressitti occurring in Laos, having slender and non-foveate G1 and foveate G2 and 3, but the present species differs from this markedly in the coloration and in the distinct foveae on G2 and 3.

Diagnosis. ♀, 6.3 mm. Antenna and gaster black, fore and mid legs broadly and hind leg partly yellow, G1 clavate, but slender and long, G2 and 3 each with a fovea at apex, mesoscutum microcoriaceous and sparsely punctured, head subquadrate in both frontal and dorsal views, IODs=4:1, A3=AWX3, apical margin of clypeus: Fig. 52, frontal furrow very deep, SAT low short tuberiform, weakly carinate in middle, propodeum with lateral carinae, area dorsalis enclosed with fine furrow, RC=C, close to B, R1 long, hair silvery.

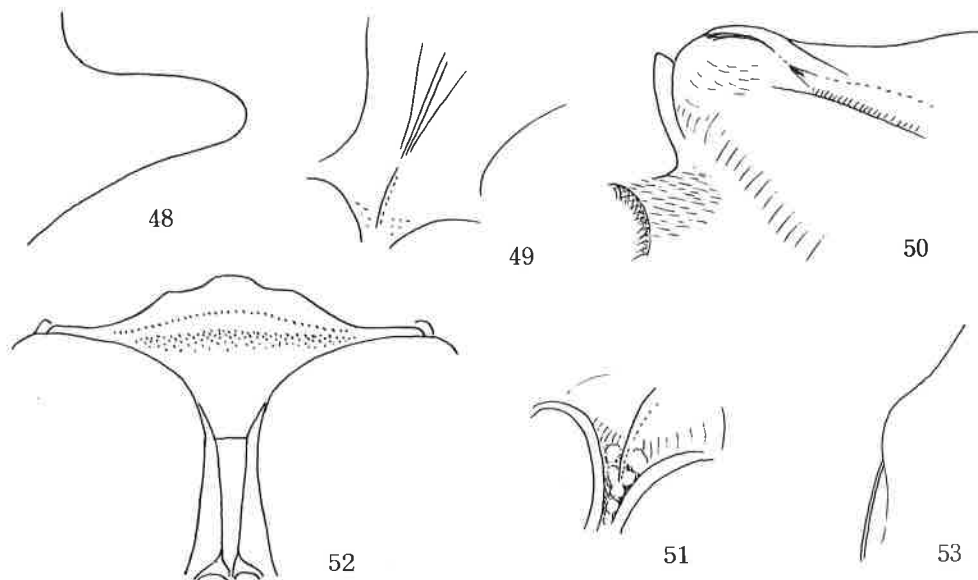
Supplement. Ferruginous or yellow: A1 and 2 at each apex, apical margin of clypeus, mandible, palpi, (posterior part of collar incompletely discoloured, in some light appears partly somewhat yellowish), posterior margin of humeral tubercle, tegula, apices of coxae, fore trochanter, both ends of other trochanters, of all femora and of hind tibia, fore tibia and tarsus, mid tibia and T1 and fore and mid tibial spurs. Fore femur above partly ferruginous, mid T2-5 brown, hind tibial spurs dark brown, nearly black.

Head in frontal view subsquare, nearly as wide as long, W:L=100:94, vertex not depressed, tops of hind ocelli distinctly above level of tops of eyes, eye incision: Fig. 48, with dorsal margin slightly inclined outwards, nearly horizontal, head in

dorsal view thick, $W:L=3:2$, occipital margin strongly roundly emarginate.

HW, HL, IODv, A3, P=100, 67, 32, 18, 134. IODs=10:2.5. OOD, Od, POD=1, 5, 3. A3=AW \times 3.6. A3, 4, 5=10, 7, 6.5. P, Ma, Mi, 2(Ma), 3(Ma)=100, 20, 10, 54(22), 46(28). Petiole subelask-shaped, Mi is not just behind basal condyle, but considerably behind spiracles (at about 1/3 from base, but apical swelling gradual and constricted towards apex. RC=C but close to B, R1 long, \neq TCV, reaching close to wing apex, CV1=CV2 \times 3.7. CV2 \neq TCV, angle about 120°.

Antenna markedly incrassate apically, width at base of A3 and of A12 appr. = 1:3. Ocelli in each hollow, hence vertex between hind ocelli raised, hollow at fore ocellus deeper and wider whence frontal furrow deeply runs down to dorsal end of short SAT, the furrow at bottom line finely and deeply impressed, especially deeply so near SAT, lateral elevations longer than usual, with apical sides (=inclined area) more obliquely located than usual, running from lateral inclination of SAT straightly to dorsal inner corner of eye incision. SAT-ASR in oblique vertical view: Fig.



Figs. 48-53. Trypoxylon iriomotense sp. nov., ♀

49, in dorso-lateral view: Fig. 50 and in ventro-lateral view: Fig. 51 (the insect is very small and very slender and the observation under high magnification is difficult, by being disturbed by irregular sculpture, shining hair, though mostly removed, and some unremovable dusts and the details can not be caught exactly), but apparently there is no transverse carina anteriorly that connects the apical top of median carina of SAT with postero-lateral margin of ASR. Clypeus: Fig. 52, basal area flattened, at extreme base rather slightly excavated, disc gently roundly tectate, apical area broadly ferruginous, IODs very narrow and supraclipeal area remarkably slender (Fig. 52). Occipital carina broadly disappeared behind buccal cavity. Pronotal collar thick, anterior part as long as posterior part in middle and incrassate towards sides, sides roundly swollen, in frontal view dorsal margin gently raised towards middle and minutely tuberculate there, posterior part almost not discoloured, narrowly brownish at posterior margin only, lamina on side: Fig. 53, subalar area normal, but subalar pit markedly deep and the longitudinal furrow including the pit also much deeper than usual. Lateral carina of propodeum distinct, straight and at apex curved down and connected with the bulged lateral carina of area apicalis which is incomplete, area dorsalis enclosed with fine impressed line, medial furrow fairly broad and deep, that of posterior inclination very broad and very deep, oval in outline, with distinct bottom line which reaches GSR, GSR broad, obliquely raised as a whole and, besides, roundly raised at posterior margin. G2 and 3 carrying re-

spectively a comparatively large distinct fovea above at apex, hind coxal tubercle strongly produced, rather toothed.

Coriaceous microsculpture on frons comparatively large and distinct (smooth and not granulate) and very sparsely superimposed with fine punctures, punctures only slightly larger than the micromeshes and very indistinct, towards median impressed line somewhat closer; microsculpture on mesoscutum similar, punctures also similarly fine but somewhat closer, PIS 1.5-2 times PD, propodeum with lateral series of striae, striae very short, rather crenate, area dorsalis smooth and shining, on medial furrow transversely finely closely striate, the striae weaker and disappeared posteriorly, posterior part of posterior inclination transversely striate, sides smooth and polished, but on antero-dorsal area feebly striate and posteriormost impressed area rugose.

♂, unknown.

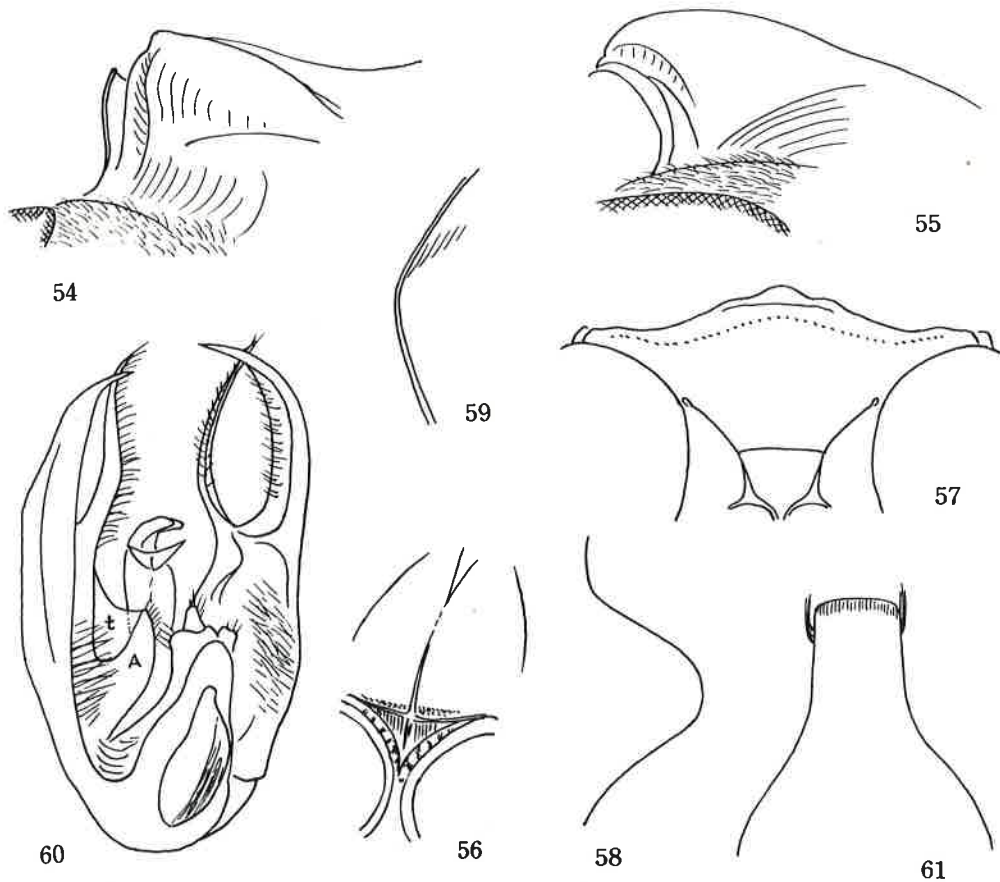
Holotype: ♀, Ryukyus: Is. Iriomote, Komi, 24. VIII. 1978, T. Nambu (Coll. Nambu).

12. TRYPOXYLON FENCHIHUENSE TSUNEKI, 1967

Trypoxylon fenchihuense Tsuneki, Etizenia, 22: 16, 1967 (♂, Nantou Pref. Fenchihu).

Trypoxylon fenchihuense: Haneda, Life Study (Fukui), 16 (1-2): 5, 1972 (1 ♂, Nantou Pref., Lishan, 1940 m).

Trypoxylon fenchihuense: Murota, Hym. Comm., 5: 20, 1977 (1 ♂, Wushe).



Figs. 54-61. Trypoxylon fenchihuense Tsuneki, ♂

Main characters:

♂, 6.5 mm. Black; A1-2 except above, gaster except a mark on each of G1-4, fore and mid legs nearly wholly, and hind leg partly ferruginous, G1 clavate, mesoscutum microcoriaceous and punctured, propodeum with lateral carinae, area dorsalis enclosed with fine groove, head thick, subquadrate in frontal view, IODs=4:3, antenna markedly incrassate towards apex, A3=AW×2.7, A6 excavated at base beneath, A13=A10-12 and curved at apex, RC=C, but close to B, R1 somewhat long, hair silvery.

Vertex not depressed, each ocellus in a shallow hollow, frons moderately raised, median furrow broad and shallow, surface on lower portion nearly flat, SAT-ASR in dorso-lateral view: Fig. 54, in lateral view: Fig. 55, in ventro-lateral view to see the medio-apical area of SAT: Fig. 56. Clypeus: Fig. 57, eye incision (left side): Fig. 58, very broad and shallow, with dorsal margin markedly inclined outwards, occipital carina broadly disappeared behind buccal cavity. Pronotum with anterior part short, narrow transverse ridge-like, only slightly incrassate laterally, posterior part discoloured, appr. thrice as long as anterior part in middle, lamina on side: Fig. 59. HW:HL in frontal view 100:85. (In the original description are given the figures of head in dorsal and frontal views, complete antenna and gaster and propodeum). HW, HL, IODv, A3, A13, P=100, 57, 35, 23, 24, 90. IODs=10:7.3. OOD, Od, POD=2, 5, 4. A3=AW×2.7 (in narrowest view =AW×3.0). A3, 4, 5=10, 8, 7. A13=BW×2 and ≠A10-12. P, Ma, Mi, 2(Ma), 3(Ma)=100, 38, 18, 58(54), 50(66). RC=C, somewhat close to B, R1 nearly half the length of TCV, CV1≠CV2×2.8, TCV≠CV2, TCV very gently sinuate, angle about 120°.

Genitalia are illustrated in the original description with two figures (ventral and lateral), but they are not always persuasive and here the ventro-lateral view is given (Fig. 60). Paramere deeply bifid at apex into slender asymmetric lobes, slender inner one fringed with hair on inner margin and the broader outer one covered with pubescence on inner side, expanded inner margin of basiparamere (here it is the main body of paramere) is partly almost transparent (shown with t in the figure) and makes the rest of the expansion as if an angled process (A in the figure). Penis valve with well developed sickle-appendages, but without shoulder as in other relatives. However, in this species the body of penis valve is gradually enlarged below sickle-appendages, showing a tendency towards the shoulder formation. Sternite 8: Fig. 61, also similar to that of the relatives.

In the figures of genitalia in the original description of this species two errors are made. 1: The apparent process at the base of outer lobe of paramere in Fig. 46, this is in reality only a flat bundle of hair; 2: The apparent large process that is fringed with hair at the base of basiparamere in Fig. 47, this is in reality only the angled apex of the rolled lamellate expansion of its inner side. The error was done because the organs were observed before complete desiccation after the dissection.

Apical margin of clypeus narrowly dark castaneous, apparently black, coxae except apices black, but in mid coxa ferruginous area is broader, fore femur with a dark brown streak in front, mid femur slightly brownish at base above, mid T1 and at each apex of T3-5 pale brown, hind femur and tibia except both ends castaneous, but tibia on inner side paler, hind tarsus except articulations also castaneous brown. As to blackish marks on gaster they are illustrated in the original description.

Remarks. In the key I presumed that in the female the convergence of inner orbits is stronger than in the male and IODs will be 3:1 or smaller. This is based on the form of the head in the male and on the character of the female of the closely allied other species.

13. TRYPOXYLON SAUTERI SP. NOV.

Trypoxylon fenchihuense: Tsuneki, Ann. Hist. Nat. Mus. Nat. Hung., 69: 272, 1977 (1 ♀, Pingtung Pref., Manchou, 100-200 m, leg. Sauter).

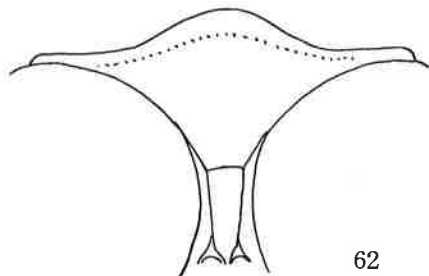
In the paper cited above I identified a female specimen from Manchou (S. Formosa, lowland hilly area) with fenchihuense as its unknown sex, based on the general resemblance of the structure and wide ferruginous colouration of the gastral segments. Viewed from the present knowledge, however, it seems rather a venture to do so, because (1) the localities of both the specimens are remotely separated and, moreover, (2) markedly different in altitude (fenchihuense ♂ always high altitude, over 1500 m). Still further, (3) the difference in the punctuation of the area dorsalis far

surpasses the usual standard of the difference between the sexes of the same species and (4) in the gastral colouration they are reverse to the general rule in this genus when the colouration of the gaster is different between the sexes — as a rule the male has the gaster much more broadly or completely black, while here in the female much more broadly black.

By such reasons I separated the female specimen in question from fenchihuense at the species rank and erected a new species upon it.

Main characters

♀, 8.5 mm. Head subsquare in frontal view (Fig. 30 in the original description), eye incision narrow and deep (in fenchihuense ♂ very broad and shallow, but such a combination is common), with dorsal margin slightly inclined outwards, frons without median furrow (in fenchihuense ♂ present), clypeus: Fig. 62 (cf. Fig. 57, the pattern of apical margin here also differs from the rule), SAT nasiform, long carinated in middle, apical margin transversely carinated, carina connected with ASR as in fenchihuense (Fig. 31 in the original description), lower aspect of SAT perpendicularly falling to ASR and medianly carinated.



62

Fig. 62. T. sauteri sp. nov., ♀, clypeus.

HW,HL,IODv=100,60,31. IODs=3:1, OOD:POD=1:2. A3=AW×3.5. A3,4,5=10,8,7.5. Pronotal lamina broadly rounded at apex, area dorsalis enclosed with fine furrow, with disc fairly closely covered with very minute piliferous punctures, not shining. P, Ma, Mi, 2(Ma), 3(Ma)=100, 33, 17, 51(39), 48(45). RC=C.

Black, ferruginous are apical margin broadly of olypeus, A1 nearly wholly, A2 beneath, posterior part of pronotal collar, tegula, Glat apex, G2, 3 and 4, each except a large central, obscurely outlined blackish mark above, base and apex of G5 and G6 beneath, fore leg except coxa, mid leg except basal half of coxa

and T3-5 above, hind femur at apex, tibia at base and on apical patch. Fore and mid femora each with a brownish streak or patch above.

Frons microcoriaceous and superimposed with fine punctures, PIS≠PD, mesoscutum similarly punctured and microsculptured, but on antero-lateral areas punctures somewhat closer; area dorsalis fairly closely covered with very minute piliferous punctures, surface smooth but not shining, outsides of the area and posterior inclination more largely and more closely and distinctly punctured, sides of the segment smooth and polished, only posterior portion sparsely covered with minute punctures.

♂, unknown.

Holotype: ♀, Teraso (now Manchou), Pingtung Pref., Formosa, II. 1909, H. Sauter (HNEM).

14. TRYPOXYLON PLANIFRONS TSUNEKI, 1977

Trypoxylon planifrons Tsuneki, SPJHA, 2: 9, 1977 (1 ♂, Nantou Pref., Wushe).

Trypoxylon planifrons: Murota, Hym. Comm., 5: 20, 1977 (1 ♂, Wushe).

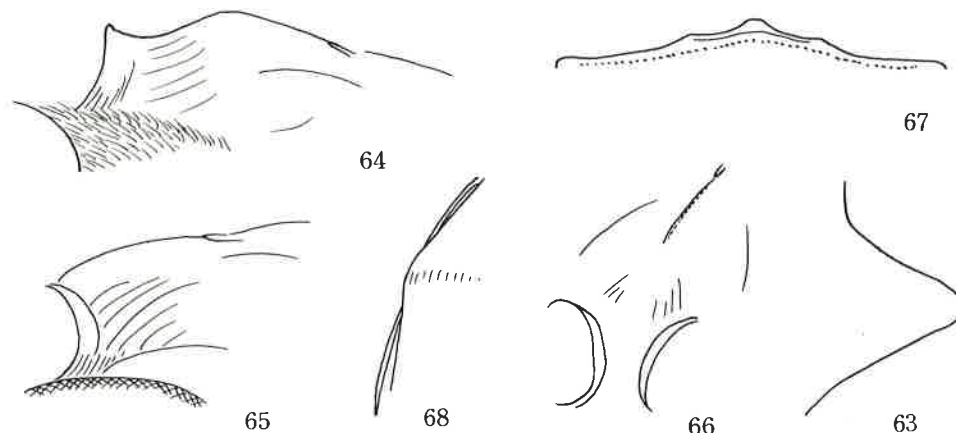
No new specimen.

Main characters.

♂, about 7 mm. G1 clavate, antenna, gaster and legs black, only tibial spurs and articulations of tarsi whitish, mesoscutum microcoriaceous and very closely superimposed with fine punctures, propodeum with lateral carinae, frons gently elevated, without medial furrow, microcoriaceous and very finely closely and indistinctly punctured, IODs=1:1, SAT low broad tuberiform, medianly indistinctly shortly carinated, without apical transverse carina, olypeus at medio-apical area slightly produced, A3-13 with distinct rhinaria, A13>A12, but < A11+A12, subalar area of mesopleuron notmal, area dorsalis practically without lateral furrows, medio-basal area minutely reticulate, rest finely closely and in the main transversely striate, G1, 2

and 3 slender, RC=B.

Supplement. Head in frontal view with sides almost rounded, W:L=100:86, vertex not depressed, tops of hind ocelli above level of tops of eyes, eye incision: Fig. 63 (left side), SAT in dorso-lateral view to see through PAF: Fig. 64, in lateral view: Fig. 65, in ventro-lateral view: Fig. 66, apical margin of clypeus: Fig. 67, lamina on side of pronotum: Fig. 68. As to head form (dorsal, frontal and lateral), clypeus, antenna, pronotum, gaster (dorsal and lateral), sternite 8 and genitalia see the figures in the original description.



Figs. 63-68. Trypoxylon planifrons Tsuneki, ♂

HW,HL,IODv,A3,A13,P=100,62,29,17,14,88. IODs=10:10. OOD,Od,POD=2,7,7. A3=AW×2.8. A3,4,5≠10,7,7. A13=BW×1.7 and >A12 but <A11+A12, P, Ma, Mi, 2(Ma), 3(Ma)=100,26,9,80(28),70(34). RC=B, Rl moderately long, only slightly shorter than TCV, CV1=CV2×4.5. TCV:CV2≠6:5, TCV gently incurved, angle about 100°.

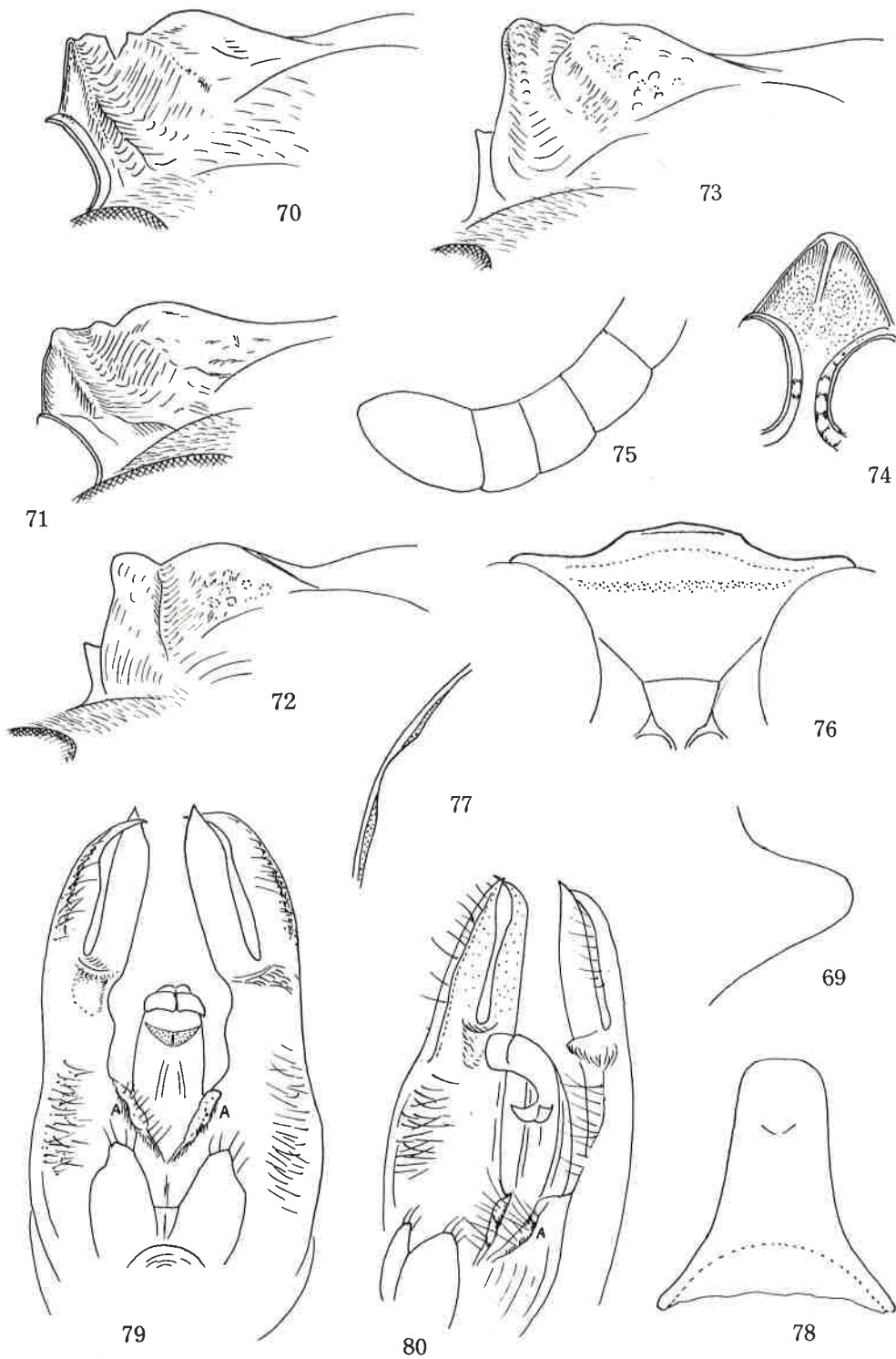
Remarks. This species is very distinct in the characters of frons, SAT-ASR, propodeum, gaster and genitalia, especially remarkable in the structure of the antennal flagellum. There is no allied species known up to the present.

15. TRYPOXYLON TENGMEN SP. NOV.

The present species (♂) considerably well agrees with koshunicon Strand, as far as the description goes, but in the present species A1 is much longer than A3 and mid and hind tibial apurs are not black in colour. Further, apart from the slight difference in coloration the whitish spinules forming a longitudinal series on the outer side of hind tibia are much more numerous than in koshunicon. It seems possible that in the characters that are not mentioned by Strand, e.g. the structure of SAT, there are more marked difference between the two, because the localities of the specimens are markedly different in altitude.

Diagnosis. ♂, 5.0 mm. Black; A1 and 2, G1 on sides, G2, 3 and 4 at each sides and beneath, fore leg nearly wholly, mid leg largely and hind leg partly ferruginous, hair silvery; G1 clavate, propodeum with lateral carinae, area dorsalis enclosed with fine furrow, mesoscutum microcoriaceous and punctured, IODs=3:2, A13=A11+A12, SAT high nasiform, pointed at apex, apical margin transversely and triangularly carinated, RC=B-C, Rl long.

Supplement. Black; A1 and 2 slightly brownish above, flagellar joints dark brown; ferruginous are clypeus at apical margin broadly, mandible (apex reddish brown), palpi, discoloured posterior part of collar (rather dark yellow), tubercle (rather yellow and provided with a transparent window within), tegula and basal



Figs. 69-80. *Trypoxylon tengmen* sp. nov., ♂

plates of wing, apical sides of G1, basal sides of G2, 3 and 4, and underside wholly or largely of G2-4 (somewhat reddish yellow); lower margin of pronotal side including apical part of lamina brownish; black or dark brown on legs: bases of coxae, arolia, fore T5, mid T2 except base, mid T3-5, hind femur except narrow base and apex, hind tibia except broad base and narrow apex, hind tarsus except pale brown articulations; mid T1 at apex, mid and hind T4 and hind spurs pale brown, fore and mid femora above and mid tibia on outer side appears in some light somewhat brownish.

Head in frontal view subquadrate, wider than long, W:L=100:92, eye incision broad and shallow (Fig. 69, left side), vertex not depressed, tops of hind ocelli above level of tops of eyes, hind ocellus in a very shallow hollow, in fore ocellus the hollow slightly deep, frons moderately raised, median furrow broad and shallow, SAT comparatively short, high nasiform, remarkable is the fact that it is constricted before apex: Figs. 70 (in holotype), 71 (in paratype, both in lateral view), Figs. 72 (holo), 73 (para, both in dorso-lateral view); SAT-ASR in ventro-lateral view to see lower surface of SAT: Fig. 74, median carina present there and on both sides of it deeply, roundly excavated. Antenna markedly incrassate towards apex, width at base of A3 appr. thrice as thick as that at base of A3, A3 short, swollen and acutely attenuate apically, apex not bent (Fig. 75); clypeus: Fig. 76, disc at base somewhat roundly raised, thence apically broadly roundly tectate, occipital carina broadly disappeared behind buccal cavity.

HW,HL,10Dv,A3,A3,P=100,63,34,14,16,83. IODs=10:6.7. OOD,Od,POD=2,5,3.5. A3=AW x 2.7. A3,4,5=10,7,6. A3=BW x 1.5 and =All+12 (strictly A3 slightly longer). P, Ma, M1, 2(Ma), 3(Ma)=100,44,22,56(52),52(60). RC=B, somewhat close to C, R1 markedly long, longer than TCV, CV1=CV2 x 3, TCV=CV2 (strictly TCV:CV2=7:8), angle about 110°.

Collar in frontal view with dorsal margin broad triangularly elevated, with top minutely rounded and very slightly swollen, in dorsal view short, narrow ridge-like, only slightly widened laterally, posterior part longer in middle than anterior part, discoloured as usual, lamina on side not strongly produced, apex broadly rounded (Fig. 77). Subalar area normal; propodeum with distinct lateral carinae, ending far before apex of lateral carinae of area apicalis and not directing towards there, but turning towards hind coxal base, area dorsalis completely enclosed with distinct furrow, basal elevation of the area only slightly shorter and slightly lower than postscutellum, medial furrow broad, area apicalis incomplete, lateral carinae curved inwards at anterior apex, but not extended and the area widely open dorsally, GSR broad band-like, obliquely raised as a whole and further roundly elevated and discoloured at apical area; intercoxal carina up-curved; longitudinal series of pale brownish spinules on outer side of hind tibia (in some light appearing whitish) inconstant in numbers and in state of row, sometimes 6, or 7, sometimes even 8 and usually in a straight line, but frequently some of them deviated from the line.

Sternite 8: Fig. 78, it was already pulled out by the collector and no fringe of hair present at apical margin. Genitalia in ventral view: Fig. 79, in ventro-lateral view (from right side): Fig. 80. Paramere bifid at apex into two elongate lobes and outer one on ventral surface medianly carinate, whence hairs arise, there is an indistinct self-like appendage at base of two lobes and inner margin of main body of paramere distinctly incrassate near its base (A in figures) and fringed with hair (just as in that of quadriceps, but in this species apical lobes much slenderer), outer marginal area of basiparamere also covered with long hair; penis valve without shoulder, but with a pair of sickle-shaped appendages, volsella somewhat different in form from that of quadriceps, but similarly carrying sparse fringe of hair on top area.

Frons strongly microcoriaceous and closely superimposed with medium-sized punctures, SAT coarsely sculptured and punctured, carrying comparatively thick silvery hairs, mesoscutum finely and very closely punctured, punctures connected with each other by very fine impressed lines, propodeum with strong series of striae along lateral carinae, area dorsalis at base obliquely striate, but medianly coarsely and irregularly punctured, median furrow transversely striate, disc strongly, closely punctured, sides on dorsal half coarsely, somewhat rugosely punctured, on the rest smooth and shining.

♀, unknown.

Holotype: ♂, Nantou Pref., Pempuchi, 21. VIII. 1980, T. Nambu (Coll. Nambu).
Paratype: 1 ♂, same data (Coll. Tsuneki).

Remarks. The present species belongs, no doubt, to the group of quadriceps - ohingi, bearing the male genital organs fundamentally similar in pattern of the structure, differing from any of them in the details of parameral structure, as well as in some other characters, such as SAT, clypeus and antenna.

16. TRYPOXYLON PETIOLATUM SMITH, 1857

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

Trypoxylon obsonator: Tsuneki, Etizenia, 13: 10, 1966; Kontyu, 36 (1): 55, 1968; Etizenia, 22: 10, 1967; Etizenia, 54: 5, 1971; Ann. Nat. Hist. Mus. Nat. Hung., 69: 271, 1977.

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

Trypoxylon petiolatum: Tsuneki, SPJHA, 9: 160 (list of syn. and ref.).

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

Trypoxylon obsonator of the Japanese authors (Haneda, 1971 and 1972; Murota, 1973, both, ♀ ♂ from Formosa or Ryukyus).

Specimens newly examined:

5 ♀ 7 ♂, Takao (Kaohsiung), 15. IX. 1907; 11. X. 1907, H. Sauter (Mus. Bremen); 1 ♀, Pingtung Pref., Ulampi, 13. VIII. 1980, T. Nambu; 1 ♀, Taitung Pref., Chi-pen, 14. VIII. 1980, T. Nambu; 1 ♀, Nantou Pref., Pempuchi, 21. VIII. 1980, T. Nambu.

1 ♂, Taihorin, IV. 1910, H. Sauter (HNHM).

2 ♀, Takao, 16. X. 1907, H. Sauter (RMNH).

1 ♀, Taihoku, 17. IX. 1927, T. R. Gardner (BPBM); 1 ♂, Fenchihu, Chiayi Pref., 1370 m, 10-12. IV. 1966, C. M. Yoshimots & B. D. Perkins (BPBM).

3 ♀, Okinawa, Chizuka, VII-IX. 1956, G. E. Bohart & C. L. Hanrnan (CAS); 1 ♀ 1 ♂, same data (USNM); 6 ♀, Iriomote I., Komi, 21, 21, 21, 21, 21, 24. VIII. 1978, T. Nambu (Coll. Nambu).

Main characters:

♀, 13-16 mm. G1 flask-shaped, propodeum without lateral carinae, mesoscutum simply, finely sparsely punctured, area dorsalis practically without lateral furrows. Black; antenna from A4 apically ferruginous beneath, gaster from apex of G1 to G4 red, only rarely black maculated above, fore tibia in front, mid and hind tibiae at base, fore tarsus except brown T5, mid T2-3, all tibial spurs whitish.

Head seen in front with sides roundly convergent towards clypeus, eye incision narrow and subparallel-sided, dorsal margin horizontal, frontal elevations on both sides of medial furrow moderate and rounded, SAT moderately high nasiform, with sides anteriorly somewhat roundly inclined, PAF moderately deep, short U- or V-shaped in cross section, bottom line upcurved, ASR dorsally tri- or quadri-, rarely bi-carinate, SAT-ASR in dorso-lateral view to see through PAF: Figs. 81, 82, 83, notice that SAT anteriorly roundly swollen, bearing subflattened area around apical part of median carina and this area bluntly edged at verge to PAF; clypeus: Fig. 84, at base roundly raised and at apex broadly, fairly strongly reflected, covering hairs at base very strongly, sinuately convergent towards medial line; occipital carina complete.

Main part of measured values in Table 1, rest most usually:

A3,4,5=10,7,6.5. OOD,Od,POD=2,6,3.5. P,Ma,Mi,2(Ma),3(Ma)=100,20,6,28(24),32(31) ... this value considerably variable. RC=B, R1 short, CV1=CV2×6 (usually 5-7). TCV:CV2=5:3, TCV incurved and CV2 downcurved, angle roughly about 90°.

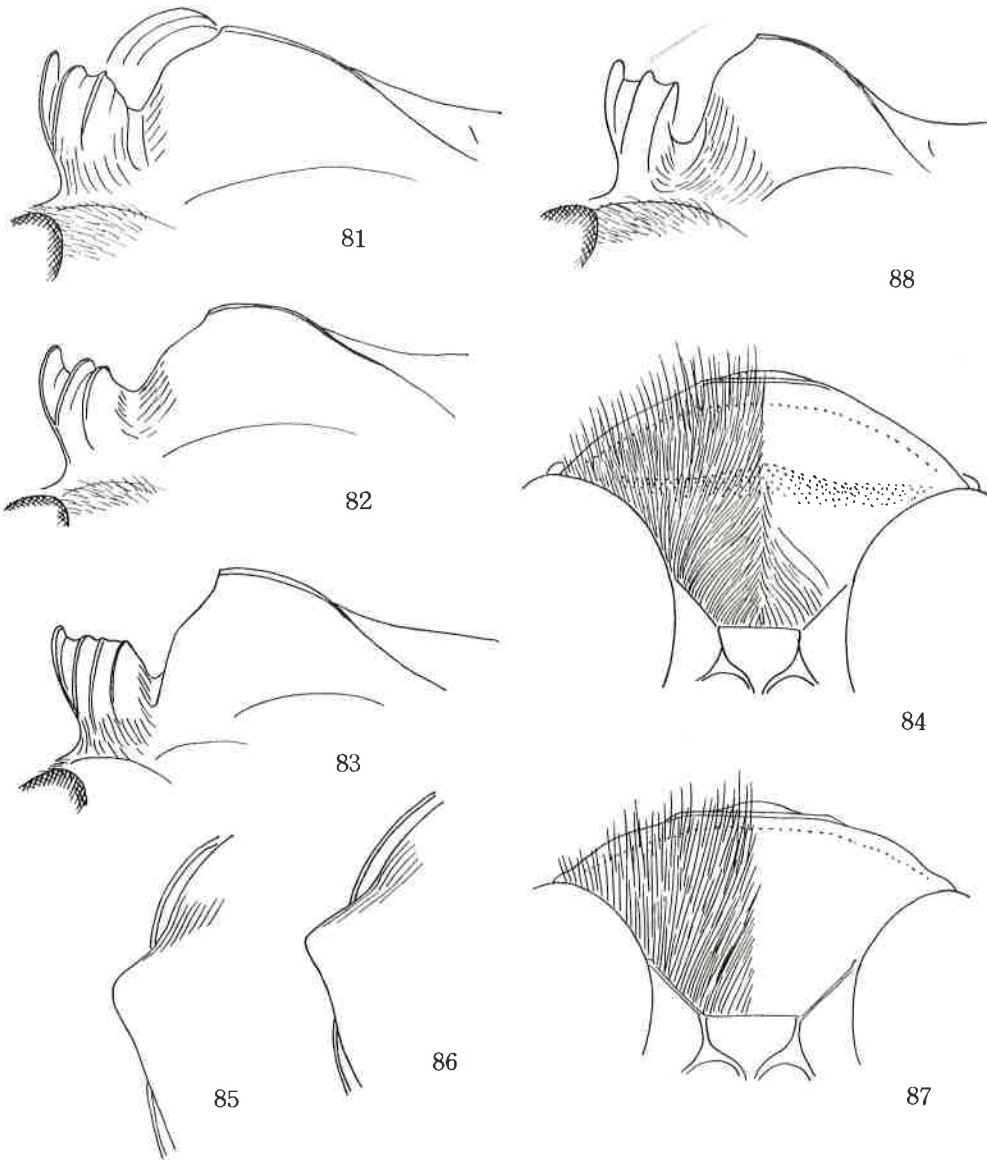
Lamina on side of pronotum triangularly produced, not toothed, in this respect distinctly differing from closely allied bicolor Smith (Fig 85, sometimes as in Fig. 86). Punctures on mesoscutum fine, weak, rather sparse. Propodeum always without lateral carinae and by this character the present species can be separated from all other Formosan species having flask-shaped gastral petiole.

♂, 10-13 mm. Generally similar to ♀, but antenna black, usually slightly brownish partly beneath, fore tibia in front partly ferruginous, fore tarsus pale brownish white, tibial spurs whitish, mid and hind tibiae as in ♀, mid tarsus brownish black, gaster from apex of G1 to G3 red, always black maculated above. Antennal joints shorter except A13 (Table 1), A13 slightly >A10-12, but <A9-12, gently curved. Clypeus shorter (Fig. 87), with disc less elevated, less reflected anteriorly, PAF deeper, deep U-shaped in cross section, flat-bottomed (Fig. 88).

Lateral series of striae on propodeum usually stronger than in ♀, sometimes outer ends of striae somewhat deeply impressed and partly contiguous to adjacent ones, giving rise to an incomplete impressed line lengthwise, outer margin of which appears to be a weak lateral carina.

As to genitalia and sternite 8 see p. 152 of Pt. III, or p. 112 of Pt. VI of the present paper.

Remarks. In order to compare some of the measurable characters between spe-



Figs. 81-88. *Trypoxylon petiolatum* Smith
 (81-84: ♀, 87, 88: ♂, 85, 86: ♀ ♂).

cimens of various districts (from south to north) of Formosa and of main Islands of the Ryukyus (from south to north) Table 1 is presented.

It becomes clear that in the relative width of the interocular distance at the vertex the Formosan specimens are intermediate between the tropical ones (typical ones and once recorded as *obsonator tropicale* Tsuneki) and the northern Palaearctic representatives (ssp. *obsonator* Smith). Among the Formosan specimens slight differences are observed, but the reason for this is uncertain whether it is due to difference in altitude, latitude or simply to fluctuation, but possibly to the last mentioned factor, since the differences are very slight.

On the other hand it is a remarkable fact that the specimens from Amami-Oshima show almost no difference in this character from those of southern Ryukyus and Formosa, although it lies closest to Japan Hondo. This is explained by reason that the

Table 1. Measurements on T. petiolatum Smith of Formosa and Ryukyus.

Loco	Sex	BL	IODv	IODs	A3 (L/W)	Al3 (L/W)	P (L/W)
F. Pingtung Pref.	♀	13	27	7.5	24 (4.5)	-- --	154 (5.5)
Taitung	♀	13	28	7.3	25 (4.6)	-- --	158 (6.3)
Chiayi	♀	14	27	7.5	25 (4.6)	-- --	156 (6.0)
Iran	♀	15	27	8.0	25 (4.5)	-- --	155 (4.8)
Taipei	♀	13	26	8.0	25 (4.4)	-- --	166 (6.4)
F. Pingtung	♂	12	30	8.0	17 (2.3)	23 (3.1)	152 (6.0)
Taitung	♂	12	30	8.0	18 (2.2)	25 (3.0)	154 (7.7)
Chiayi	♂	11	30	7.6	18 (2.3)	23 (2.9)	154 (6.2)
Chiayi	♂	11	30	8.0	16 (2.2)	24 (3.3)	150 (6.5)
Nantou	♂	11	30	8.0	16 (2.1)	24 (3.0)	154 (6.7)
R. Iriomote I.	♀	15	28	7.5	24 (4.6)	-- --	164 (6.5)
"	♀	14	28	7.5	24 (4.8)	-- --	164 (6.3)
"	♀	13	28	7.3	25 (4.5)	-- --	160 (6.0)
"	♀	15	29	8.0	24 (4.8)	-- --	160 (5.7)
"	♀	13	28	7.3	25 (5.0)	-- --	156 (6.0)
Okinawa I.	♀	14	28	7.5	25 (5.0)	-- --	160 (5.3)
"	♀	14	28	7.5	25 (5.7)	-- --	160 (5.7)
"	♀	14	28	7.3	25 (5.0)	-- --	162 (5.6)
"	♀	14	29	7.5	25 (5.0)	-- --	160 (5.5)
Amami	♀	16	27	7.5	26 (4.8)	-- --	158 (5.0)
"	♀	15	28	7.5	26 (4.8)	-- --	160 (5.2)
"	♀	14	28	7.5	26 (4.8)	-- --	162 (5.3)
"	♀	14	27	7.5	26 (4.8)	-- --	160 (5.3)
"	♀	14	28	7.5	26 (5.0)	-- --	160 (5.7)
"	♂	13	30	8.0	16 (2.2)	23 (2.7)	144 (6.0)
"	♂	13	30	8.0	16 (2.3)	23 (2.5)	152 (5.8)

Remarks. IODv, A3, Al3, P ... HW=100 is omitted.

Island is included within the range of the Oriental Zoological Region.

In one male specimen captured in Manchou, Pingtung Prefecture, the gaster is nearly completely black, only on spical sides of G1 and narrow base and -sides of G2 alone dark red. While in this specimen bases of tibiae, tibial spurs and fore tarsus are more distinctly whitish than in others and mid T1 also somewhat whitish on basal area. Certainly this is an aberratio.

17. TRYPOXYLON FORMOSICOLA STRAND, 1922

- Trypoxylon formosicola Strand, *Intn. Ent. Zeits.*, 16 (18): 148, 1922 (♀ ♂, Formosa)
Trypoxylon formosicola: Yasumatsu, *Trans. Nat. Hist. Soc. Formosa*, 28 (174): 93, 1938 (Botel Tobago I.).
 16 Trypoxylon formosicola: Tsuneki, *Etizenia*, 6: 3, 1964.
Trypoxylon formosicola: Tsuneki, *Ibid.*, 13: 8, 1966 (1 ♀, Pingtung Pref., Kentin).
Trypoxylon formosicola: Tsuneki, *Kontyu*, 36 (1): 54, 1968.
Trypoxylon formosicola: Tsuneki, *Etizenia*, 22: 4, 1966.
Trypoxylon formosicola: Tsuneki, *Ibid.*, 54: 2, 1971.
Trypoxylon formosicola: Haneda, *Life Study*, 15: 30, 1971.
Trypoxylon formosicola: Haneda, *Ibid.*, 16 (1-2): 4, 1972.
Trypoxylon formosicola: Murota, *Ibid.*, 17 (3-4): 117, 1973.
Trypoxylon formosicola: Murota, *Hym. Comm.*, 5: 19, 1977.
Trypoxylon formosicola: Tsuneki, *Ann. Hist. Nat. Mus. Nat. Hung.*, 69: 272, 1977.

Specimens newly examined:

1 ♂, Taihorin, IV. 1910, H. Sauter (BMNH - paratype); 3 ♀, Kuraru, Hengchun Park, 250 m, 2. IV. 1965, C. M. Yoshimoto (BPEM); 2 ♀, Hengchun, Pingtung Pref., in drainage Gutter, 4. IV. 1965, C. M. Yoshimoto (BPEM); 1 ♀, Kuantzeling, Tainan Pref.,

250 m, 6-7. IV. 1965, C. M. Yoshimoto (BPBM); 1 ♂, Kiapan, XII. 1913, H. Muor (BPBM).
1 ♀, Nantou Pref., Pempuchi, 17. VIII. 1980; 2 ♀, same loco, 18. VIII. 1980,
T. Nambu.

1 ♀ 1 ♂, Nantou Pref., Nanshanchi, 14-15. VIII. 1980, M. Terayama.

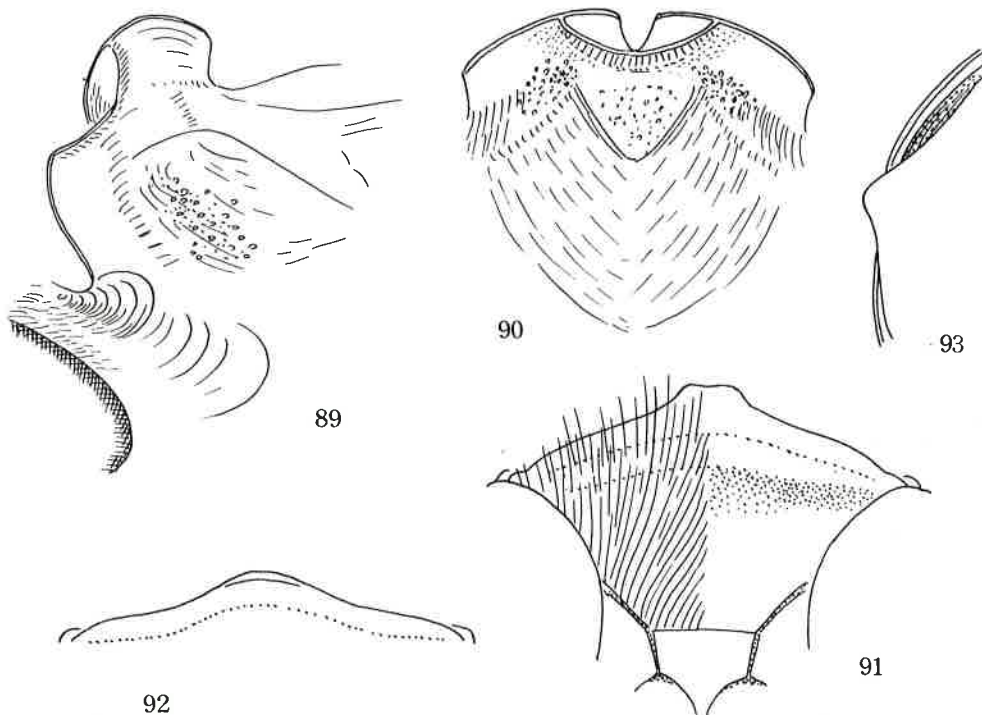
1 ♀, Takao, 11. X. 1907, H. Sauter (Mus. Brehmen).

Remarks. The descriptions of the Formosan *Trypoxylon* by E. Strand begin always with the comparison with the incomplete descriptions of the known species treated in the main by F. Smith and P. Cameron (especially the redescrptions of the Smith's species by Cameron with doubtful specimens). During the course he describes some characters concerned and finally gives some supplementary comments on the ocellar disposition, frontal elevation or eye incision and punctuation. In these respects his description is certainly comparatively detailed among the contemporary authors, but always without figure (and far inferior to that of F. F. Kohl in this regard).

As to the character of SAT-ASR (ref. Figs. 89 and 90) of *formosicola* he describes "die stirn ... unmittelbar oberhalb der Fühlerbasis durch einen kleinen Keil und sich anschliessende Wölbung ersetzt wird". As to Al3 in ♂ his description is "es .. reichlich so dick and reichlich so lang wie die beiden vorhergehenden Gliedern zusammen ist". This is incorrect, it should be "so lang wie die drei vorhergehenden Glieder zusammen ist" (cf. Figs. 15 and 17 of my 1966 paper, or Fig. 3 of my 1971 paper). The two instances seem sufficient to indicate clearly how inaccurate and how misleading his description is at least at some time. This is also shown by the following fact:

During my present study I happened to find out among the specimens of British Museum (Natural History) the paratypes of *Trypoxylon melanocorne* Strand and *T. hyperorientale* Strand, together with *T. formosicola* Strand, ♂. To my surprise, the first two types are quite different species from those which had been believed to be the respective species through the description of his paper.

In regard to the first two species mention will be made in the section of the respective species. Here the male paratype of *T. formosicola* will be treated:



Figs. 89-93. *Trypoxylon formosicola* Strand. 91: ♀, 92: ♂.

Observation of paratype ♂.

About 11 mm. G1 flask-shaped, propodeum with distinct lateral carinae, mesoscutum without microsculpture, with weak plumbeous shine and finely, sparsely punctured, area dorsalis with strongly crenate lateral furrows, subalar area of mesopleuron normal, IODs=10:8.5, frons flat, with fine weak medial furrow, SAT low broad tuberiform, apical margin flatly expanded into a transverse band, the band emarginate on anterior margin and laterally connected with ASR (cf. Figs. 89 and 90). Clypeus with apical margin rounded out and recurved or produced in middle (in this specimen only gently so), at base roundly raised and roundly tectate on disc, A3=AW 2, pronotal lamina triangularly produced. Black, tibial spurs and tarsi apically brownish, mandible except base ferruginous, palpi pale brown, basally darker, posterior part of collar with marginal area only narrowly discoloured, Hair silvery.

HW,HL,IODv,A3,A13,P=100,48,33,14,21,140. IODs=8.5. OOD,Od,POD=1,1,1. A3=AW×2, A3,4,5=10,8,7.5. A13=BW×2.3 and =A10-12, not bent at apex. P,Ma,Mi,2(Ma),3(Ma)=100,16,7,34(22),36(33). RC=C, close to M. R1 short, CV1=CV2×4.5. TCV:CV2=4:3. TCV gently sinuate, angle about 110°.

This species is as usually explained by the later investigators.

In connection with formosicola Strand gives account on var. kankauense (♀, collected in Kankau = Koshun, now Hengchun), in which tegula is pale brownish yellow (normally dark brown), bases of all tibiae and tibial spurs, fore tarsus and palpi yellowish, length 12 mm. No such a specimen could I find out among the abundant material of this species recently collected in Formosa. Possibly this is a different species and on this form mention will be made later in connection with T. takasago.

He also described an aberratio, calcaralis in ♂ in which mid and hind spurs are whitish. This is also not found in the material before me.

The present species is easily separable from others by the characters of SAT-ASR (Figs. 89, oblique dorso-lateral view, and 90, vertical view), clypeus (Figs. 91 ♀ and 92 ♂) and wholly black body, pronotal lamina (Fig. 93) is also somewhat characteristic. Measurements with ♀:

HW,HL,IODv,A3,P=100,48,27,23,186. IODs=10:8. OOD,Od,POD=2,5.5,4. A3=AW×4. A3,4,5=10,8,7. P,Ma,Mi,2(Ma),3(Ma)=100,14,5,26(16),30(26). RC=C, R1 short, CV1=CV2×6, TCV:CV2=5:3, TCV sinuate, angle at apex about 120°, at base about 100°.

This species is common and abundant in Formosa.

A. Trypoxylon formosicola inornatum Matsumura et Uchida, 1926

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

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

Trypoxylon inornatum Tsuneki, Etizenia, 6: 3, 1964 (compared).

Trypoxylon inornatum: Tsuneki, Etizenia, 13: 7, 1966 (♀ ♂, redescription, figs.).

Specimens newly examined:

7 ♀, Okinawa, Chizuka, VII.-IX. ----, G. E. Bohart & C. L. Harnage (USNM); 2 ♀, same data (CAS).

1 ♀ (holotype of the species), without data label, but "Okinawa" in the original description (Ent. Inst. Hokk. Univ.).

Observation of the holotype.

Through the courtesy of Dr. Y. Takagi, Entomological Institute, faculty of Agriculture, Hokkaido University, I could examine the holotype of Trypoxylon inornatum Matsumura et Uchida. I thank him for his kindness.

It has the characters as usually interpreted by us. Important points:

(1) At anterior inclination of SAT there is no transverse and flatly expanded band connecting both ASRs, even there is no transverse carina there, only a very feeble trace of carina defined on each side of the normal position of the carina near ASR. (2) Measurements: HW,HL,IODv,A3,P=100,52,28,25,152. IODs=10:8. HW:HL in frontal view =100:85. OOD,Od,POD=4,6,5. A3=AW×4. A3,4,5=10,7,6.5. P,Ma,Mi,2(Ma),3(Ma)=100,18,6,30(22),34(31). RC=? (both wings folded at apex and can not confirm), R1 short, CV1=CV2×6.4, TCV:CV2=2:1. TCV gently incurved, angle about 100°.

On other Okinawa specimens. (♀ ♀).

In seven out of nine specimens observed there is no transverse carina on anterior part of SAT between ASRs, but in two of them a feeble ridge or a weak carina is present there.

IODs is always 10:8, $A3=AW \times 3.8-4.2$, distinctly somewhat variable in relative length, partly, however, depending on the condition of the segment. OOD, Od, POD is mostly =1,2,1, but sometimes 2,5,3, RC always M-type, R1 short, $CV1=CV2 \times 6-7$, TCV: $CV2 \neq 5:3$, TCV gently sinuate, angle formed by TCV and CV2 at base about 90° , at apex about 100° . Apical margin of clypeus always produced in middle as in T. malaisei, with apex truncate or feebly emarginate. Subalar area of mesopleuron with lateral margin at posterior part acutely edged and slightly produced over subalar pit, but not expanded to form the pent-roof structure, the wall of the pit only flattened and smooth, but without rugosed carinae. Propodeum with lateral carinae, area dorsalis enclosed with distinct furrow, medial furrow moderately broad, elongated oviform and moderately deep. Area apicalis complete, margined with curved carina, GSR roundly and highly raised, discoloured at apical area, lateral series of striae strong, posteriorly extended inwards to form a zone of arcuate striae in front of area apicalis, area dorsalis at base obliquely, coarsely, medial furrow transversely and coarsely striate, lateral furrows strongly crenate, rest of the area and outsides of it covered sparsely with piliferous fine punctures, sides except femoral sinus finely sparsely punctured, posterior depressed area coarsely rugose.

B. Trypoxylon formosicola amamiense Tsuneki, 1964 (Stat. Nov.)

Trypoxylon amamiense Tsuneki, Etizenia, 6: 2, 1964 (♀ ♂, Amami-Oshima, Ryukyus, with figs. of male antenna, genitalia and female clypeus).

Trypoxylon iornatum: Tsuneki, Ibid., 13: 7, 1966 (synonymized).

Transverse carina at anterior part of SAT between both ASR always present, but not so well developed as in typical species, usually a simple carina, but sometimes slightly expanded anteriorly into a transverse narrow band, but always with apical margin straight, not incised nor emarginate. In ♂ the carina better developed than in ♀, always narrow band-like and at extreme apical margin slightly thickened into a weak carina. The width of the carina varies according to the development of it, when well developed becomes greater. Measurements of holotype ♂ (within parentheses one of paratypes, ♀):

HW, HL, IODv, A3, A13, P=100, 50, 31, 16, 21, 120 (100, 48, 27, 24, --, 154). IODs=10:8 (do.)
OOD, Od, POD=1, 1, 1. (4, 8, 5). $A3=AW \times 2.2$. ($AW \times 4$). $A3, 4, 5 \neq 10, 7, 7$. ($\neq 10, 7, 6$). $A13=$
 $BW \times 2.4$ and $\neq 10-12$. P, Ma, Mi, 2(Ma), 3(Ma)=100, 22, 8, 35(32), 30(44). (100, 22, 7, 33(30),
30(37). RC=C. (=M), R1 short (do.), $CV1=CV2 \times 5$. ($=CV2 \times 6.5$). TCV:CV2=5:3. ($\neq 2:1$).
TCV gently (distinctly) incurved, angle at base about 90° and at apex about 105° .
(do.).

Distribution: Known from Is. Amami-Oshima only, the Ryukyus (lying about 200 km NNE of Okinawa).

Holotype (♂) and paratypes (♀ ♂) are already designated in the original description.

18. TRYPOXYLON TAKASAGO TSUNEKI, 1966

? Trypoxylon formosicola var. kankauense Strand, Intn. Ent. Zeits., 16:149, 1922

(1 ♀, Pingtung Pref., Hengchun).

Trypoxylon takasago Tsuneki, Etizenia (Fukui), 13: 11, 1966 (1 ♀, Kee Lung Shih, Formosa)

Trypoxylon takasago: Tsuneki, Kontyu, 36 (1): 55, 1968 (listed).

Trypoxylon takasago: Tsuneki, Etizenia, 22: 2, 1967 (keyed).

Trypoxylon takasago: Tsuneki, SPJHA, 2: 10, 1977 (♂, figs. Nantou Pref. Pempuchi).

Trypoxylon takasago: Murota, Hym. Comm. (Mishima), 5: 19, 1977 (listed).

Trypoxylon takasago: Tsuneki, Ann. Nat. Hist. Natn. Hung., 69: 275, 1977 (3 ♀ 2 ♂, Chiayi Pref. Tathorin (Talin) and Pingtung Pref., Hoozan).

Specimens newly examined:

1 ♀, Formosa, Pingtung Pref., Kuraru, Kentin Park, 250 m, 2. IV. 1965, C. M.

Yoshimoto (BPEM); 1 ♀, Formosa, Pingtung Pref., Kentin, 4. IV. 1965, T. Saigusa.

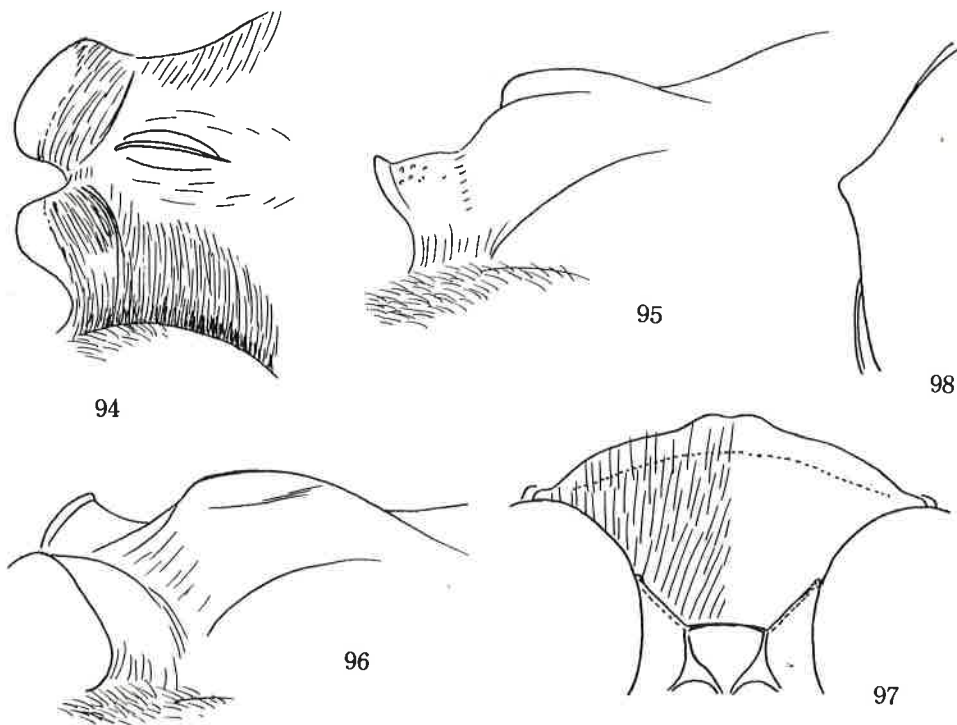
Main characters:

♀, 12-13 mm. Black; wing tegula, fore tibia in front, all tibiae at base, all spurs and fore tarsus largely ferruginous; mesoscutum simply punctured, with plumbaceous shine, propodeum with lateral carinae, area dorsalis distinctly enclosed with furrow, IODs=10:7.5, SAT-ASR: Fig. 94 (nearly vertically from left side), 95 (dorso-lateral, 96 (lateral), SAT without transverse carina or band-like expansion at anterior margin. Clypeus: Fig. 97, with hair silvery and at base gently turned towards medial line, eye incision moderate in width, gently narrowed towards bottom, bottom rounded, dorsal margin horizontal; occipital carina complete. Pronotal lamina: Fig. 98.

♂ (cf. SPJHA, 2:10-11). Smaller, 8-9 mm, generally similar to ♀, but hind tibiae at base dark brown, hind tibial spurs, especially longer one, brown to dark brown, fore tarsus also more strongly brownish than in ♀, clypeus less produced anteriorly, antennal joints shorter, Al3 deformed. As to genitalia and 8th sternite see my 1977 paper, Figs. 56-58.

Measurements of ♀ (within parentheses ♂):

HW,HL,IODv,A3,Al3,P=100,56,28,21,---,180 (100,56,33,13,22,134). IODs=10:7.5 (10:8). OOD,Od,POD=2,5,3.5 (3,5,3.5). A3=AW×3.5 (AW×1.7). A3,4,5=10,7,6 (10,10,10). (Al3=BW×2.2 and ≠Al0-12). P,Ma,Mi,2(Ma),3(Ma)=100,16,6,32(19),34(27) (100,16,7,36(20),34(30)). RC=M, Rl rather short, but reaching close to wing apex, CV1=CV2×5, TCV:CV2=3:2, TCV gently sinuate, angle at apex about 110° (RC=C, somewhat close to B, Rl short, CV1=CV2×4.2, TCV:CV2=3:2, TCV weakly sinuate, angle at apex about 120°).



Figs. 94-98. Trypoxylon takasago Tsuneki, ♀

Remarks. It seems highly probable that Trypoxylon formosicola var. kankauense Strand is identical with the present species, because (1) except anterior structure of SAT the present species resembles closely T. formosicola, (2) the present species is similar in colour of wing tegula and legs to var. kankauense, (3) among abundant

material of formosicola at my hand no such an aberrant specimen as var. kankauense could be found out and (4) both occur in lowland districts.

The probable difference of kankauense from formosicola at the species level was already pointed out in my 1966 paper and the possible synonym of kankauense and takasago was also presumed in my 1977 paper in Ann. Mus. Nat. Hung. (p. 276). But the final determination is postponed until the type specimen is reexamined, because the Strand's species frequently have characters that are unpresumable from his description.

B. Trypoxylon takasago kumaso Tsuneki (STAT. NOV.)

Trypoxylon kumaso Tsuneki, Etizenia (Fukui), 13: 12, 1966 (♂, Okinawa).

Specimens examined:

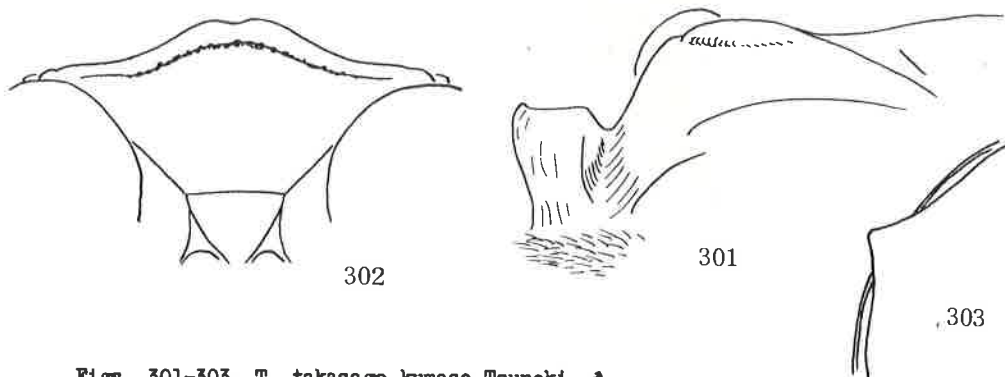
1 ♂ (holotype), Okinawa (Nago), 15. III. 1964, T. Takara leg (BFBM); 1 ♀, Okinawa, Chizuka, VII-IX. ----, G. E. Bohart & C. L. Harnage (CAS); 1 ♀, same data (USNM).

Supplement to the characters of ♂.

Through the courtesy of Dr. G. M. Nishida, Bernice P. Bishop Museum, Honolulu, I could reexamine the holotype specimen of T. kumaso and confirm the new status of the species. I express hearty thanks to him for his kindness.

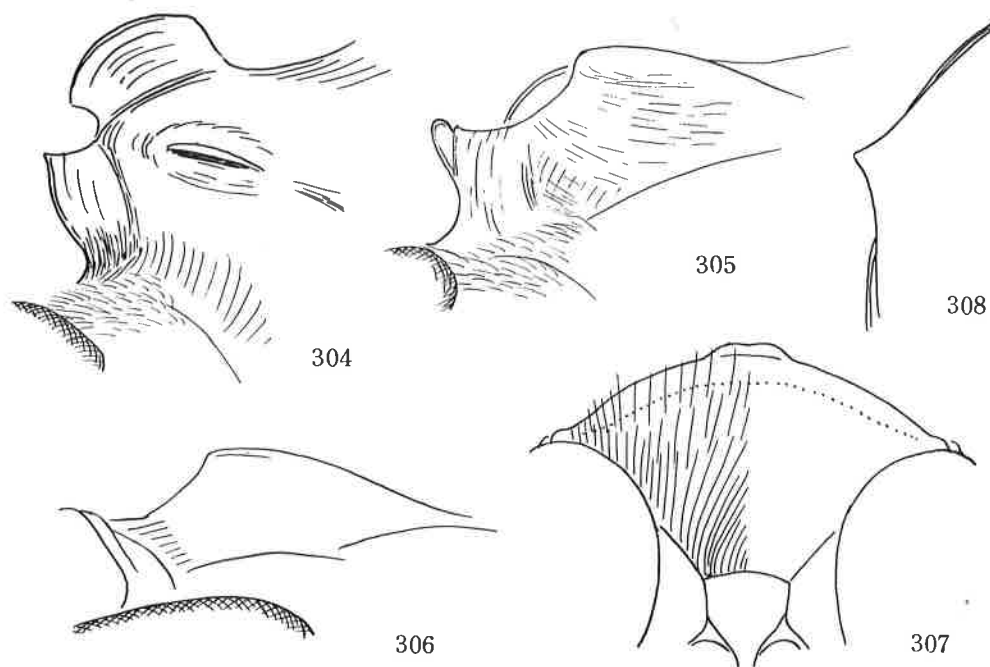
Distinctly larger (9.5 mm) than the male of Formosan typical form (7.5 mm, but constant?). Microsculpture on frons stronger, punctures closer, $PIS \leq PD$, with surface less shining than in typical form. PAF more distinctly and thoroughly furrowed at bottom (bottom line upcurved - Fig. 301) (in takasago bottom line on inner inclination only weakly furrowed, in dorso-lateral view not furrowed - cf. Fig. 95), accordingly in kumaso SAT bluntly edged at verge to PAF (in takasago not), mesothorax with very strong plumbeous shine, half mat, scutum and pleuron both sparsely finely punctured; propodeum with distinct lateral carinae, accompanied just inside with series of short transverse striae, area dorsalis enclosed with distinct furrow, at base obliquely, shortly and coarsely striate, median furrow shallow, but on basal half with distinctly impressed bottom line, the furrow and the disc covered with indistinctly outlined, very shallow but large punctures, lateral furrows finely closely punctured, posterior inclination posteriorly strongly, closely but irregularly rugoso-striate, sides weakly microcoriaceous and on dorsal area along lateral carina of dorsal aspect sparsely scattered with comparatively large shallow punctures, posterior depressed area coarsely rugoso-striate. Measurements:

HW, HL, IODv, A3, Al3, P=100, 55, 34, 14, 22, 124. IODs=10:7.5. OOD, Od, POD=8, 9, 8 (under eye measurement 1, 1, 1). A3=AWx2. A3, 4, 5=10, 7, 7. A3:IODc=10:18. Al3=BWx2.3, and ≠ Al0-12. P, Ma, Mi, 2(Ma), 3(Ma)=100, 22, 8, 38(34), 41(40). Mi not behind basal condyle, but at mid point between spiracles and apical swelling. RC=C, somewhat close to B, Rl somewhat longer than usual "short", slightly longer than half TCV, attenuate apically, CV1=CV2x5.5, TCV:CV2=9:5, TCV gently incurved, angle about 100° at base and 120° at apex.



Figs. 301-303. T. takasago kumaso Tsuneki, ♂

♀, 12-14 mm. Differs from typical form just as in the case of the male, namely, in the body size and in the stronger and closer sculpture and punctuation of frons. Structure of SAT-ASR (Figs. 304, latero-vertical; 305, dorso-lateral and 306, lateral), clypeus (Fig. 307) and pronotal lamina (Fig. 308) within the variation range of takasago s. str.



Figs. 304-308. Trypoxylon takasago kumaso Tsuneki, ♀

Measurements: HW, HL, IODv, A3, P=100, 54, 25, 20, 148. IODs=10:7.5. OOD, Od, POD=2, 7, 3.5. A3=AW×3.4. A3, 4, 5=10, 7, 6. P, Ma, Mi, 2(Ma), 3(Ma)=100, 18, 6, 34(23), 36(31). RC=C, close to M, Rl rather short, but fairly close to wing apex, CV1=CV2×6, TCV:CV2=5:3, TCV gently sinuate, angle at apex about 100°.

Structure of subalar area of mesopleuron, punctuation and sculpture of propodeum and character of GSR similar to those of ♂.

Remarks. According to the measurements in the species, takasago, OOD:POD is in ♀ appr. 1:2, while in ♂ appr. 1:1 and IODv as against HW in ♀ much narrower than in ♂. In other words, change in width of IODv depends upon the change in width of OOD. In connection with IODv it was made clear that in ssp. kumaso ♀ IODv is distinctly smaller than in ssp. takasago ♀, while in ♂ it is similar in both to each other. On the other hand, RC in ♀ close to M, while in ♂ rather close to B. This is common in both Formosan and Okinawa populations.

19. TRYPOXYLON HYPERORIENTALE STRAND, 1922

Trypoxylon hyperorientale Strand, *Intn. Ent. Zeits.*, 16 (18): 156, 1922 (♀ ♂, Kankau, now Hengchun).

Trypoxylon obsonator: Tsuneki, *Etizenia*, 22: 10, 1967 (synonymized).

Trypoxylon melanocorne: Tsuneki, *Ibid.*, 22: 11, 1967 (partim, only Pempuchi specimen).

Trypoxylon vallicola Tsuneki, *Ibid.*, 54: 6, 1971 (♀ ♂, Pempuchi).

Trypoxylon vallicola: Murota, *Life Study (Fukui)*, 17 (3-4): 117, 1973 (2 ♀ ♀ ♂, Pempuchi, Formosa). *Hym. Comm.*, 5: 19, 1977 (8 ♀ 5 ♂, Pempuchi, formosa).

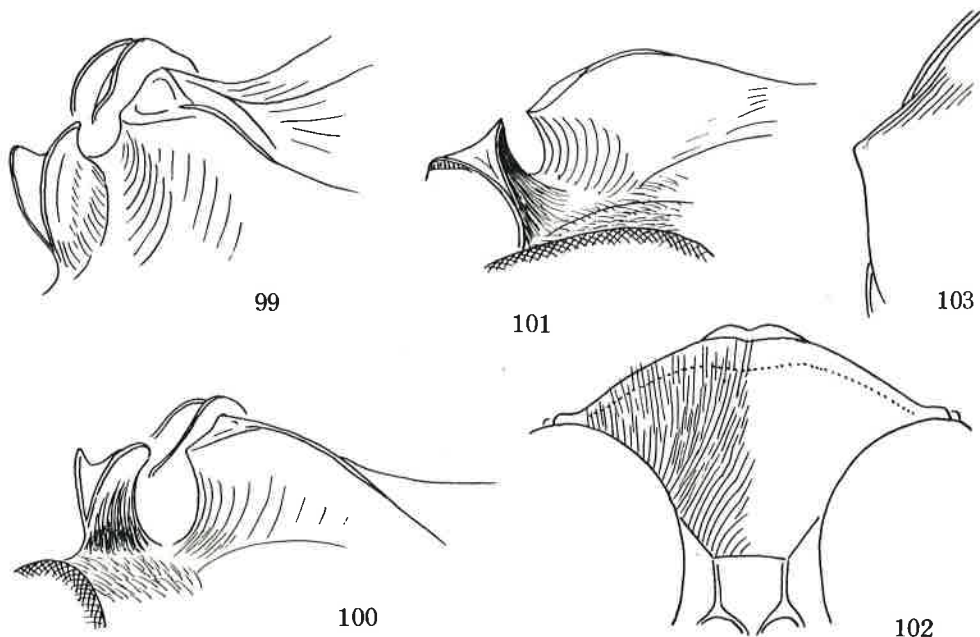
Trypoxylon vallicola: Tsuneki, *SPJHA*, 2: 7, 1977 (♀ ♂, Nantou Pref.).

As was mentioned earlier in connection with *Trypoxylon formosicola*, I could find out one of the paratype specimens of this species (♀, Kankau, =Koshun, now Hengchun, Pingtung Pref., Formosa, 1912, leg. H. Sauter) among the specimens sent by British Museum (Natural History) and could determine that the species is not a synonym of *Trypoxylon petiolatum* (=obsonator) Smith, as was presumed by me basing on the description, but was a distinct species. According to the observation:

Description of paratype ♀.

13 mm. Black; antenna dark brown, A1, 2 and 4 at base and at apex and A3 beneath narrowly pale brown, clypeus at apical margin narrowly castaneous, mandible at base yellow (extreme base black), medianly ferruginous and at apex reddish brown, palpi yellow, posterior part of collar incompletely discoloured, brownish, tegula and basal plates of wing pale brown, gaster on side of apical swelling and at extreme apex of G1, and from G2 to caudal end slightly dusky red and obscurely black marked above, bearing scattered dusky patches on sides and beneath, possibly originating from the rotten visceral substance and visible through translucent epidermis. ground colour of legs brownish black, ferruginous to pale brown are apices of coxae, articulations of trochanters, femora and hind tarsus; pale yellow are all tibiae at base, tibial spurs, fore tarsus and mid T1 and 2, rest of fore tibia ferruginous brown (somewhat dark on folded side); mid T3-5 brown, hind tarsus apically somewhat paler. Hair silvery, on clypeus strongly sinuately convergent towards medial line.

Head in frontal view wider than long, with sides rounded, slightly narrowed below (much less narrowed than in *petiolatum* ♀), W:L=100:84, vertex almost not depressed, tops of hind ocelli in a line with tops of eyes, eye incision narrow and gently narrowed towards bottom, bottom narrowly rounded; frons moderately raised, medial furrow fairly deep, with distinct bottom line till base of SAT, lateral elevations suboval in outline, comparatively large and distinctly roundly raised, SAT moderately high nasiform, not particularly long, with lateral inclinations oblique and long carinated in middle, carina at apex broadly enlarged into flat and round area carrying a large concave hollow on it, the area at verge to PAF edged and somewhat produced over PAF, ASR highly elevated, acutely bicarinate on top, hind carina much higher, slightly twisted and markedly reflected posteriorly, PAF deep. flat-bottomed and oval in cross section, the structure in oblique dorso-lateral view: Fig. 99, in dorso-lateral view to see through PAF: Fig. 100, in lateral view: Fig. 101; clypeus;



Figs. 99-103. *Trypoxylon hyperorientale* Strand, ♀

Fig. 102, disc medianly roundly raised and anteriorly subtectate, apical reflection rather weak; occipital carina complete, weakly depressed behind buccal cavity.

HW,HL,IODv,A3,P=100,56,28,24,160. IODs=10:6. OOD,Od,POD=2,4,3. A3=AWx5. A3,4,5=10,6.5,6.5. P,Ma,Mi,2(Ma),3(Ma)=100,16,5,28(20),31(27). RC=B-C, R1 short, CV1=CV2x5.5, TCV:CV2=8:5, TCV bent inwards at 1/3 from angle, angle at base about 95° and at apex about 110°.

Collar subtriangularly roundly raised and weakly tuberculate in middle, anterior part short in middle and rather weakly incrassate towards sides, posterior part discoloured, appearing brownish, lamina on side triangularly produced and pointed at apex (Fig. 103). Subalar area normal; propodeum with lateral carinae, carinae near spiracle narrowly and at apical area broadly disappeared, area dorsalis with basal elevation about half the length of postscutellum, low and smooth, with lateral furrows fine and fairly deep, medial furrow elongated oval in outline, moderately deep, area apicalis nearly complete, in dorsal middle narrowly interrupted by the extension of medial furrow of posterior inclination, GSR elevated roundly.

Frons very finely microcoriaceous and closely superimposed with medium-sized flat-bottomed punctures, punctures on top areas of elevations slightly sparser, mesoscutum finely sparsely punctured, propodeum with lateral series of striae distinct, on posterior inclination extended on to disc, forming a zone of arcuate striae in front of area apicalis, area dorsalis at base coarsely crenate, medial furrow on basal area transversely, strongly striate, striae posteriorly finer, closer and weaker, lateral furrows also posteriorly transversely finely striate, disc finely and sparsely punctured, sides polished, anterior part comparatively distinctly, fairly closely punctured, posteriorly punctures finer and sparser, at posterior depressed area very coarsely transversely striate.

Other specimens examined:

1 ♀, Nantou Pref., Pempuchi, 13. VII. 1966, K. Tsuneki; 2 ♀ 1 ♂, same place, 11, 17, 25. VIII. 1968, K. Tsuneki; 1 ♂, same loco, 29. VII. 1976, T. Tano; 2 ♀ 7 ♂, same loco, 17, 18, 21. VIII. 1980, T. Nambu.

Supplement to ♂.

In ♂ gaster is nearly wholly black, only on apical part of G1 to end beneath somewhat irregularly brown patched or brown banded and mid tarsus completely blackish brown; eye incision wider and more distinctly narrowed apically, but dorsal margin horizontal. Measurements (with two ♂):

HW,HL,IODv,A3,Al3,P=100,54*30,18,19,164; 100,51,30,17,19,150. IODs=10:7.2; 10:7.5. OOD,Od,POD=4,6,4.5; 3.5,5,4. A3=AWx2.8; AWx2.7. A3,4,5=10,7.5,7; 10,7.5,7. Al3=BWx2.2; BWx2.2. Al3>Al1+12 but <Al0-12; ditto. P,Ma,Mi,2(Ma),3(Ma)=100,13,5,24(16),30(24); 100,13,5,28(18),30(25). RC=B but somewhat close to C, R1 short, CV1=CV2x4.7, TCV:CV2=7:3, TCV nearly straight, angle at base about 95° and at apex 110°. RC=B somewhat close to C, R1 short, CV1=CV2x4.2, TCV:CV2=3:2, TCV gently incurved, angle similar.

Al3 is almost not swollen, tapering towards apex, as a whole gently bent, not curved at apex. Apical margin of clypeus similar to ♀, but less produced anteriorly, with medial incision weaker. As to the structure of 8th sternite and genital organs see my 1971 paper.

20. TRYPOXYLON PETIOLOIDES STRAND, 1922 (STAT. NOV.)

Trypoxylon gracilescens Sm. var. petioloides Strand, *Intn. Ent. Zeits.*, 16 (18): 150, (11 ♀ 7 ♂, Pingtung Pref., Hengchun and Chiayi Pref., Talin).

Trypoxylon gracilescens: Tsuneki, *Etizenia* (Fukui), 13: 10, 1966 (1 ♀, Nantou Pref., Nanshanchi).

Trypoxylon gracilescens: Tsuneki, *Ibid.*, 22: 9, 1967 (1 ♀, Tainan Pref., 3 ♀, Nantou Pref., 1 ♀ 2 ♂, Chiayi Pref.).

Trypoxylon gracilescens: Tsuneki, *Ibid.*, 54: 4, 1971 (3 ♀ 9 ♂, Nantou Pref.).

Trypoxylon gracilescens: Haneda, *Life Study*, 15 (1-2): 30, 1971 (1 ♀, Nantou, 1 ♂, Chiayi); *Ibid.*, 16 (1-2): 4, 1972 (1 ♀, Nantou).

Trypoxylon gracilescens: Murota, *Hym. Comm.*, 5: 19, 1977 (2 ♀ 1 ♂, Nantou).

Trypoxylon gracilescens: Tsuneki, *Ann. Hist. Nat. Mus. Nat. Hung.*, 69: 272, 1977 (2 ♀ 2 ♂, Pingtung Pref., 7 ♀ 2 ♂, Chiayi Pref., H. Sauter - HNHM).

According to Strand the specimens dealt with by him agree completely with the description of gracilescens by Bingham, but differ from the original description by

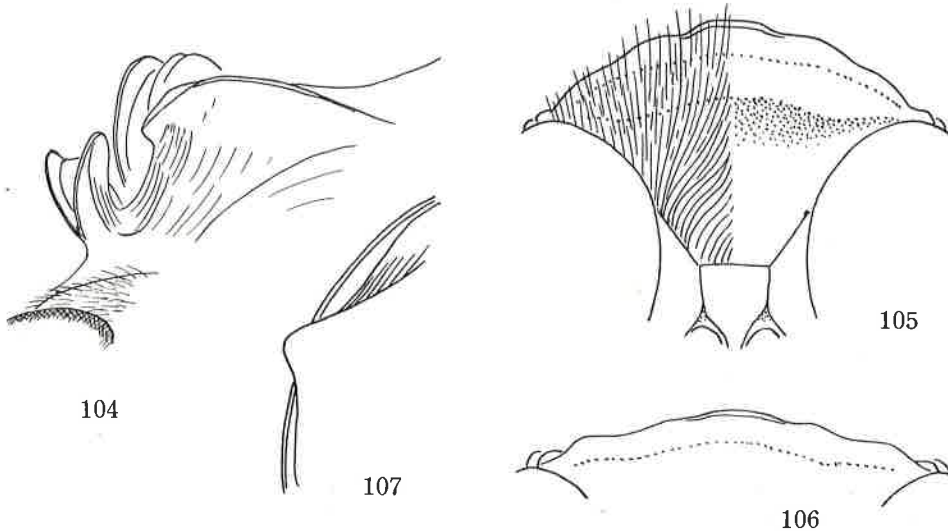
Smith in the colour of extreme apex of gastral petiole and in the state of medial furrow of area dorsalis (both practically nonsense!) and on the bases he gave the Formosan specimens new var. name.

Through the clarification of the true characters of Trypoxylon gracilescens Smith by my recent study of its lectotype it has become obvious that the Taiwanese specimens in question which have long been believed to belong to gracilescens are different from this species. Thus a new species name becomes necessary for the Taiwanese specimens and that variety name which was given by Strand on the doubtful basis has come to be raised to the species rank.

T. petioloides differs from gracilescens in that the propodeum is provided with distinct lateral carinae and that the clypeus is not simply rounded at the apical margin. The species is rather closer to Bornean collinsi, but larger, with IODs smaller, with petiole distinctly longer and the subalar area normal. It is somewhat similar to T. ferox Smith, but is easily distinguished from this by the colour of the gaster and the legs and by the larger IODs.

Specimens newly examined:

1 ♀, Kosempo (now Chiasien, Kaohsiung Pref., near Chisian (Kizan), 100 m or so), 7-19. VII. 1908, H. Sauter (RMNH); 1 ♀ 1 ♂, Taihorinsho (now Talin, Chiayi Pref.), X. 1909, H. Sauter (USNM); 1 ♀, Kuraru, Hengchun Park, 250 m, 2-4. IV. 1965, C. M. Yoshimoto (BPEM); 1 ♀, Fenchihu, Chiayi Pref., 1370 m, 10-12. IV. 1965, C. M. Yoshimoto & B. D. Perkins (BPEM).



Figs. 104-107. Trypoxylon petioloides Strand. 105: ♀, 106: ♂.

Main characters:

♀, 12-16, ♂, 10-13 mm. Black, with silvery or white hair; antenna wholly (often partly brownish above), legs nearly wholly (hind leg partly brown) and gaster from apical part of G1 till end ferruginous, in ♂ antenna dark brown, basally paler beneath and hind leg more broadly dark brown. Vertex depressed, eye incision in ♀ narrow and deep, subparallel-sided, with bottom rounded and dorsal margin horizontal, in ♂ shallower and broader and narrowed apically, but with dorsal margin horizontal; frontal elevations distinctly but low roundly raised, SAT moderately high long nasiform, medial carina at anterior slope enlarged into a flattened round shining area, carrying a large fovea on it, ASR highly raised, bicarinate on top, hind carina reflected, PAF deep, flat-bottomed and oval in cross section (Fig. 104, dorso-lateral view); clypeus: Fig. 105 in ♀, Fig. 106 in ♂; occipital carina complete, but roundly depressed behind buccal cavity; collar of pronotum not thick, posterior part distinctly discoloured, lamina on side: Fig. 107. Subalar area normal, propodeum with lateral carinae, at base and at apex broadly obliterated, area dorsalis enclosed with

furrow, area apicalis nearly complete, GSR a band-like carina, not particularly elevated roundly at apical margin. Measurements (within parenthesis ♂):

HW:HL in frontal view 100:88 (100:78). HW,HL,IODv,A3,A13,P=100,48,25,28,--,180 (100,48,24,16,22,142). IODs=10:7 (10:8). OOD,Od,POD=3,7,4 (2,3,2). A3=AW×5.8 (AW×2.2). A3,4,5=10,6.5,6.5 (10,8,8). (A13=BW×2.4 and ≠A10-12). P,Ma,Mi,2 (Ma),3(Ma)=100,15,5,24(15),30(22) (100,14,6,30(18),30(28)). RC=C, R1 very short, CV1=CV2×7 (CV2×5.2). TCV:CV2=5:3 (do.). TCV incurved, angle at base 90° and at apex about 100° (do.).

As to the structure of the male genital organs and the 8th sternite see my 1971 paper.

A. Trypoxylon petioloides isigakiense Tsuneki, 1973 (STAT. NOV.)

Trypoxylon isigakiense Tsuneki, Etizenia, 65: 11, 1973 (1 ♀, Ryukyus: Is. Isigaki).

Specimens examined:

1 ♀, Is. Isigaki, Mt. Omoto, 14. VIII. 1978, T. Nambu (holotype); 1 ♀, Is. Iriomote, Komi, 21. VIII. 1978, T. Nambu; 1 ♂, Is. Iriomote, Kanbire-taki, 23. VIII. 1978, T. Nambu.

In the specimens of petioloides from the Souther Ryukyus the antenna and the legs are much more broadly black:

♀: A2-13 black above, apically brownish, fore femur above and near apex, fore tibia apically on outer side dark brown, mid femur above and on apical half, mid tibia on outer side wholly and hind femur except narrow base and apex and hind tibia except basal ring completely black; mid T2-4 and hind tarsus except articulations wholly black.

♂: Antenna dark brown to black, A1-3 only narrowly yellowish beneath; in melanic pattern of legs generally similar to ♀, but black areas much broader and more distinct, especially on femora and tibiae.

In general structural characters, however, both sexes are similar to the Formosan typical race.

Measurements of ♀ (♂ within parentheses):

HW:HL in frontal view 100:84 (100:80). HW,HL,IODv,A3,A13,P=100,50,25,26,--,156 (100,50,28,16,22,126). IODs=10:7 (10:7.7). OOD,Od,POD=2,5.5,3. (3,5,3). A3=AW×4.8 (AW×1.8). A3,4,5=10,7,6.5 (10,9,9). (A13=BW×2.5 and >A10-12 but <A9-12. P,Ma,Mi,2(Ma),3(Ma)=100,17,6,30(22),30(28) (100,17,7,34(22),36(32)). RC=B, somewhat close to C. R1 short, CV1=CV2×4.2, TCV≠CV2, both nearly straight, angle at apex about 100°. In other ♀: RC=B-C, R1 short, CV1=CV2×6, TCV:CV2=5:3, angle at apex about 100°. In ♂ RC=B-C, R1 short, CV1=CV2×5, TCV:CV2=5:4, angle about 100°; TCV nearly straight.

According to the measurements in this subspecies A3 is relatively shorter than in Formosan typical race, while A13 is relatively slightly longer.

21. TRYPOXYLON ERRANS SAUSSURE, 1867

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

Trypoxylon errans: Tsuneki, SPJHA, 13: 115, 1980 (Philippine representative, with list of references and synonyms).

Trypoxylon tanoi Tsuneki, Etizenia, 22: 13, 1967 (6 ♀ 7 ♂, Pingtung Pref.).

Trypoxylon tanoi: Haneda, Life Study, 15 (1-2): 30, 1971 (3 ♀ 1 ♂, Nantou Pref.).

Trypoxylon tanoi: Tsuneki, Etizenia, 54: 7, 1971 (listed).

Trypoxylon tanoi: Haneda, Life Study, 16 (1-2): 4, 1972 (6 ♀ 7 ♂, Nantou Pref., Puli).

Trypoxylon tanoi: Murota, Hym. Comm. (Mishima), 5: 19, 1977 (1 ♀, Nantou Pref., 1 ♂, Pingtung Pref.).

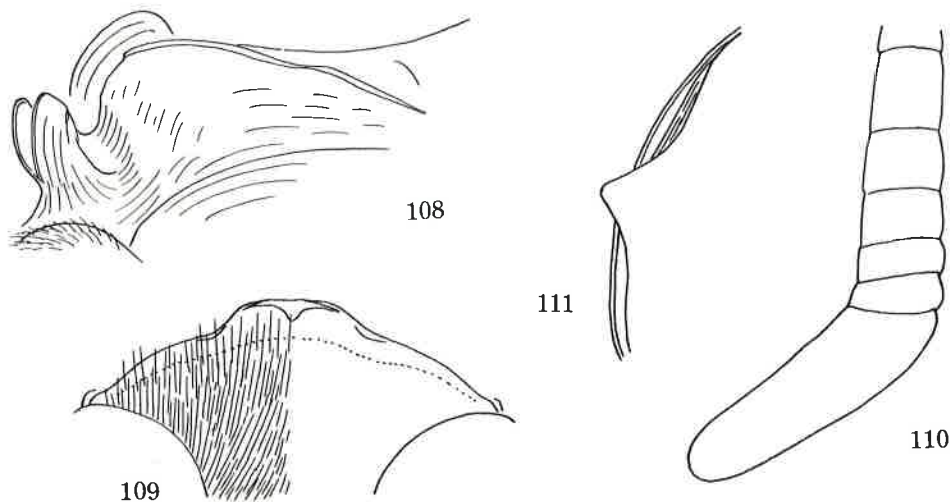
No new specimen could be examined.

Measurements of paratype ♀ and its holotype ♂ (within parentheses):

HW:HL in frontal view 100:88 (100:80). HW,HL,IODv,A3,A13,P=100,55,30,22,--,

142 (100,55,31,14,30,140). IODs=10:5.5 (10:6.5). OOD,Od,POD=2,4.5,4 (3,4.5,4). A3=AW×6 (AW×2.5). A3,4,5≠10,7,6 (10,7.5,6.5). (A13=BW×3 and ≠A8-12). P, Ma, M1,2(Ma),3(Ma)=100,20,7,28(24),30(34) (100,20,7,28(26),28(36)). RC=B, somewhat close to C, R1 short, CV1=CV2×4, TCV:CV2≠3:2, TCV only gently incurved, angle about 100°. (in ♂ generally similar).

Head in frontal view in ♀ with vertex not depressed, tops of hind ocelli above level of tops of eyes, eye incision narrow and deep, subparallel-sided, dorsal margin horizontal; in ♂ vertex similar, but eye incision broader and shallower, narrowed towards sinus, dorsal margin inclined outwards; frons with medial furrow moderately deep, broadly open anteriorly, but with bottom line distinct till base of SAT; in ♂ medial furrow broader and shallower, anteriorly almost disappeared, with surface almost flattened; SAT moderately high long nasiform, medial carina acute, ASR bi- or tri-carinate on top, PAF deep, flat-bottomed, U-shaped in cross section in both sexes (Fig. 108, dorso-lateral view). Clypeus: Fig. 109 in ♀, disc at base gently roundly elevated, with covering hair curved towards medial line, apical margin strongly recurved in middle; in ♂ less produced anteriorly, medial recurving at apical margin also weaker, basal elevation not strong and with hair almost parallel. A13 in ♂: Fig. 110, long, straight and characteristic in subparallel-sided form. Occipital carina complete, lamina of side of pronotum: Fig. 111.



Figs. 108-111. Trypoxylon errans Saussure, 109: ♀, 110: ♂

Lateral carinae of propodeum distinct, accompanied just inside with a series of striae, area dorsalis distinctly enclosed with furrow, area apicalis also complete, but with dorsal marginal carina weak. Punctures on mesoscutum comparatively strong, PIS 1-2 times PD.

In ♀ all trochanters pale ferruginous, in the Formosan representatives usually all with brown mark above, in ♂ mid and hind trochanters nearly wholly brown or dark brown. In the Ryukyu specimens trochanters similar in colour to the Formosan specimens in both sexes. In ♀ antenna brown beneath.

As to the male genitalia and 8th sternite see my 1967 paper. It also gives other illustrations.

22. TRYPOXYLON PULIENSE TSUNEKI, 1967

Trypoxylon puliense Tsuneki, Etizenia (Fukui), 22: 15, 1967 (3 ♀, Nantou Pref., Puli).
Trypoxylon puliense: Tsuneki, Ibid., 54: 8, 1971 (1 ♀, Puli).
Trypoxylon puliense: Haneda, Life Study (Fukui), 15 (1-2): 31, 1971 (2 ♀, Puli).

Trypoxylon murotai Tsuneki, Life Study, 17 (3-4): 44, 1973 (2 ♂, Puli, figs. incl. genitalia) (SYN. NOV.)

Trypoxylon murotai: Murota, Hym. Comm., 5: 19, 1977 (3 ♂, Nantou Pref., Pempuchi)
Trypoxylon puliense: Murota, Ibid., 5: 19, 1977 (1 ♀, Pempuchi).

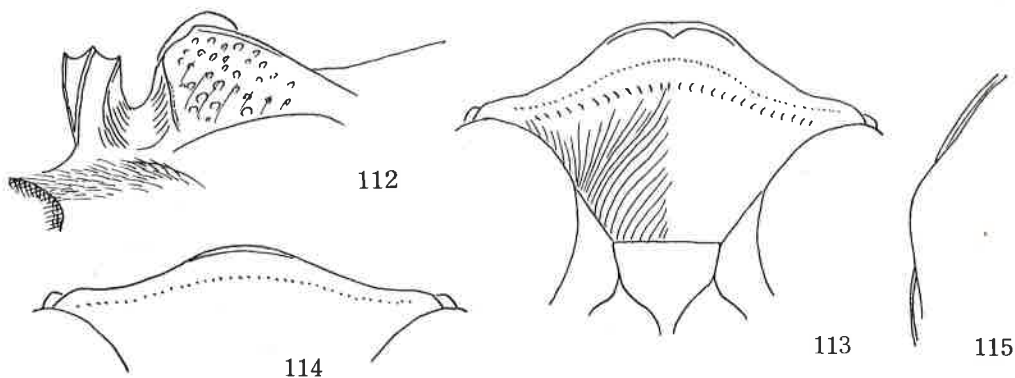
Specimens newly examined:

3 ♀, Pempuchi, 18. VIII. 1980, T. Nambu.

The present species is very similar to T. errans in the general appearance and in the structure of SAT-ASR, clypeus, antenna (especially A13 in ♂) and propodeum and in the punctuation and or sculpture of mesoscutum and propodeum, but can be distinguished therefrom by the following distinctions:

Head slightly less thick (♀ ♂), SAT shorter and more rounded in outline and in inclination (♀ ♂), also more acutely edged at verge to PAF, gaster slender (♀ ♂), recurving at anterior margin of clypeus less marked (♀ ♂), A13 weakly curved at apex (♂), punctures on frons sparser and on mesoscutum stronger (♀ ♂), G2-3 on sides only reddish or brown (♀) or gaster completely black (♂), antennal flagellum more distinctly ferruginous beneath (♀ ♂), trochanters completely black (♀ ♂), mid and hind legs except brownish bases of tibiae wholly black (♂).

SAT-ASR in dorso-lateral view: Fig. 112 (♀ ♂ similar), clypeus: Fig. 113 (♀), Fig. 114 (♂), lamina on side of pronotum: Fig. 115.



Figs. 112-115. Trypoxylon puliense Tsuneki, 113: ♀, 114: ♂

Measurements in ♀ (♂: within parentheses):

HW, HL, IODv, A3, A13, P=100, 50, 33, 23, --, 168 (100, 51, 34, 13, 30, 150). IODs=10:7 (10:7.5). OOD, Od, POD=4, 5, 5 (3, 4, 3). A3=AW×4.2 (AW×2.1). A3, 4, 5=10, 7, 6 (10, 7, 7). (A13=BW×3.2 and ≠A8-12). P, Ma, Mi, 2(Ma), 3(Ma)=100, 12, 5, 30(16), 27(22) (100, 12, 5, 36(14), 31(23)). RC=B, R1 short, CV1=CV2×4, TCV≠CV2, TCV gently sinuate, angle about 95°. (in ♂ the same).

As to genitalia of the male see my 1973 paper

On the problem regarding Trypoxylon melanocorne Strand, 1922

Trypoxylon melanocorne Strand, Intern. Ent. Zeitschr., 16 (19): 157, 1922 (9 ♀,

In my 1971 paper wherein I separated melanocorne: Tsuneki, 1967 into two different species, namely, melanocorne: Tsuneki, 1971 and vallicola Tsuneki, new species, I commented that Strand may also admixed above two species in his melanocorne, judging from the detailed examination of his description.

During the course of the present study I happened to find out one of the female paratypes of melanocorne (with paratype label by the hand of Strand) among the specimens of British Museum (Natural History). To my surprise, the specimen was not melanocorne: Tsuneki, 1971, but responsum taiwanum: Tsuneki, 1967 and 1971.

First I will describe the paratype specimen to clarify the characters of it, then compare it with his original description and finally give discussion and conclusion.

♀, length about 16-17 mm (body not stretched). Black; mandible slightly darkened brown, at base black, palpi dirty yellow, posterior part of collar incompletely discoloured, brownish posteriorly, tegula pale translucent brown, basal plates of wing dark brown; G1 at extreme apex, G2-3 ferruginous red, broadly black above except narrow base, fore tibia on basal half in front and at inner side and fore tibial spurs ferruginous, rest of tibiae at base narrowly and rest of spurs and fore T3-5 brown, apically paler, all articulations of legs brownish. Hair silvery, on clypeus strongly sinuately convergent towards medial line.

Head in frontal view with sides rounded, slightly narrowed below (less strongly so than in petiolatum ♀), W:L=100:88, vertex slightly depressed, tops of hind ocelli slightly below level of tops of eyes, eye incision moderate in width and narrowed towards bottom, bottom minutely rounded, dorsal margin horizontal; frons weakly raised, median furrow at base moderately deep and moderately broad, and shallower and broader below, but with medial impressed shining line distinct, SAT-ASR generally similar to that of petiolatum except that PAF is deep and flat-bottomed, clypeus also similar to that of this species, but apical margin more broadly rounded (disc at base roundly raised and bluntly carinate in middle).

HW,HL,IODv,A3,P=100,46,24,24,196. IODs=10: 8. OOD,Od,POD=3,5,3.5. A3=AW×4.6. A3,4,5=10,7.5,7. P,Ma,M1,2(Ma),3(Ma)=100,14,4,26(14),32(20). RC=C, somewhat close to B, R1 short, CV1=CV2×7.5. TCV:CV2=2:1. TCV strongly incurved, angle about 90° at base and 110° at apex.

In the specimen collar is largely crushed, but side of anterior part fairly broadly rounded, lamina on side triangularly produced, also very similar to that of petiolatum ♀, subalar area of mesopleuron normal. Propodeum with distinct lateral carinae, but carina at base and at apex broadly obliterated, basal elevation of area dorsalis low, about half as long as postscutellum, lateral furrows very feeble, practically lacking, medial furrow elongated oval in outline, moderately deep, area apicalis complete, GSR roundly elevated, brown in colour and slightly reflected.

Frons very finely microcoriaceous and sparsely but distinctly superimposed with medium-sized, flat-bottomed punctures, PIS 1-3 times PD, punctures on mesoscutum comparatively large and distinct, PIS 1-2 times PD, propodeum with lateral series of strong striae, striae posteriorly extended inwards to form a zone of arucuate striae in front of area apicalis, area dorsalis at base coarsely crenate, medial furrow feebly striate, disc finely and sparsely punctured, sides polished and except anterior femoral sinus rather strongly, somewhat sparsely punctured, posterior depressed area transversely and closely rugoso-striate.

According to the description the paratype differs from the original description of T. melanocorne more or less in the following distinctions:

- (1) Die hinteren Ozellen sind von den Netzaugen unendlich weniger als ihren Radius entfernt! See OOD:Od in the above measurements!
- (2) Clypeus erscheint nicht oder kaum carinat. In the paratype bluntly carinated in middle.
- (3) Die Körper schwarz, jedoch kann Abdomen grösstenteils rot sein, nur auf der Oberseite geschwärzt; (Petiolus ist meistens grösstenteils schwarz, nur unten, insbesondere apicalwärts und an den äussersten Spitze rötlich; bisweilen sind die 2-3 Engglieder des Abdomen einfarbig schwarz.)
- (4) ... an den schwarzen Beinen sind jedoch die Basis der Tibien, die Tarsen I-II sowie die Tibialsporen meistens etwas bräunlich oder gar gelblich.
- (5) Die apicale Erweiterung des Petiolus ist fast unmerklich (No such a species is present in the genus Trypoxylon! This is too exaggerated expression, however slender it may be.).

Comparing with the inconsistencies above listed between the characters of the paratype in question and the description of melanocorne it seems to me that my melanocorne: 1971 agrees much better with the original description of melanocorne than does the above paratype. The fact seems to suggest that T. melanocorne Strand may include at least two different species within, namely, melanocorne: Tsuneki, 1971 (= melanocorne Strand) and taiwanus: Tsuneki, 1967 (at present raised to species, see later treatment).

(By the way vallicolla Tsuneki = hyperorientale is not included; in his description of melanocorne Strand gives particular comparative notes with hyperorientale.)

Based upon the above knowledge the following conclusion is given:

(1) Trypoxylon melanocorne: Tsuneki, 1971 is true melanocorne, and

(2) the paratype specimen of melanocorne Strand dealt with here is not melanocorne, but a specimen of taiwanum Tsuneki which was misidentified by Strand.

(Such misidentification is not always a surprising fact in the present genus, a rather probable error between the members of a species group that are very closely related. I have also committed the similar errors and later corrected. This is an unavoidable course, especially when the material is not sufficient enough to grasp the range of variation.)

23. TRYOXYLON TAIWANUM TSUNEKI, 1967 (STAT. NOV.)

Trypoxylon melanocorne Strand, Intern. Ent. Zeits., 16 (19): 157, 1922 (♀, partim; ♂).

Trypoxylon responsum taiwanum Tsuneki, Etizenia, 22: 8, 1967 (♂ ♀, Pempuchi).

Trypoxylon responsum taiwanum: Tsuneki, Ibid., 54: 4, 1971 (♂, Pempuchi).

Specimens examined:

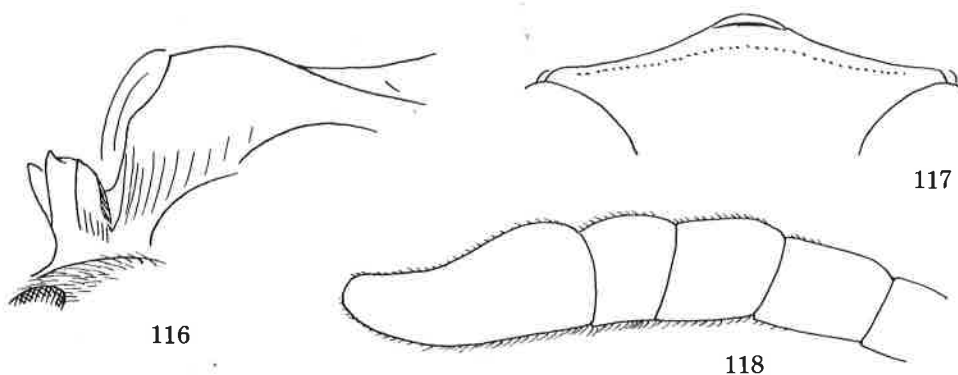
1 ♀, Taihorinsho (now Talin), Chiayi Pref., 1909, H. Sauter (paratype of melanocorne Strand) (BMNH); 1 ♀, Kuraru, Hengchun Park, 250 m, 2-4. IV. 1965, C. M. Yoshimoto (BPBM); 1 ♀ (head and gaster lacking, but possibly this species), Kosempo (now Chiasien, Kaohsiung Pref.), 6-31. VII. 1908, H. Sauter (RMNH); 3 ♀ 1 ♂, Pempuchi, Nantou Pref., 13, 14. VII, and 25. VIII. 1966, 68, K. Tsuneki; 2 ♀, Chihpenchi, Taitung Pref., 15. VIII. 1980, T. Nambu; 1 ♀, Wulai, Taipei Pref., 23. VIII. 1980, T. Nambu.

As to the characters of the female see my 1967 paper and the description of the misidentified paratype female of T. melanocorne given in the preceding page and as to the male see also my 1967 paper (with figs. of antenna, clypeus, 8th sternite and genitalia).

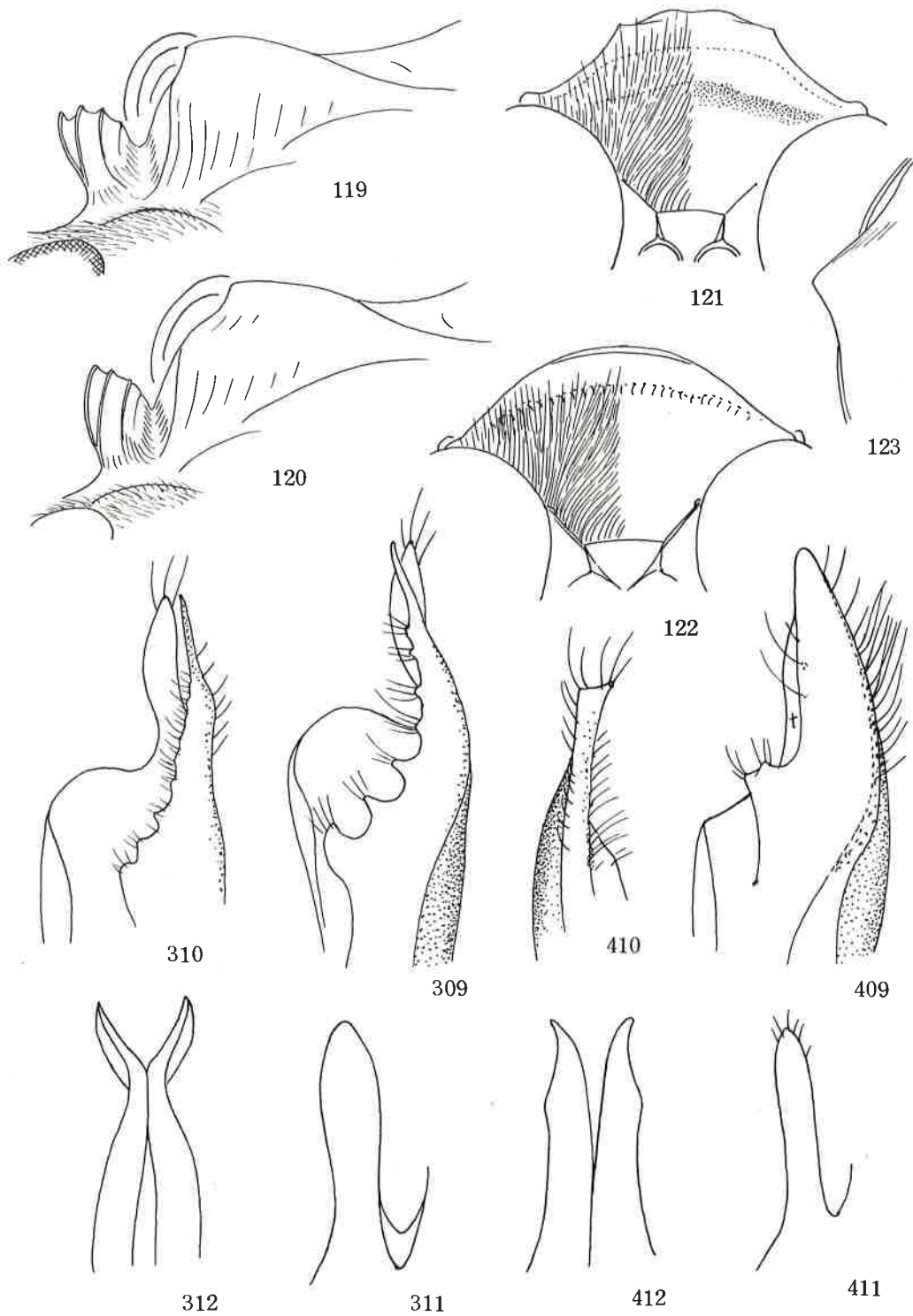
Some supplements

♂. 10-13 mm. HW:HL in frontal view 100:80. HW,HL,IODv,A3,Al3,F=100,50,29,16,20,130. IODs=10:8. OOD,Od,POD=8,9,8. A3=AW×2.3. A3,4,5=10,7,7. Al3=BW×2.2 and >Al1+12 but <Al0-12. P,Ma,Mi,2(Ma),3(Ma)=100,19,8,40 (24),42(38). RC=C, but close to B, R1 short, CV1=CV2×5.5. TCV:CV2=3:2. TCV gently incurved near angle, angle about 105° at apex.

Vertex more weakly depressed than in ♀, tops of hind ocelli nearly in same level of tops of eyes, eye incision wider and more narrowed towards apex than in ♀ and dorsal margin slightly inclined outwards, frontal furrow shallower, on lower area broadly enlarged into broad, shallow excavation. SAT-ASR in dorso-lateral view to see through PAF: Fig. 116, apical margin of clypeus: Fig. 117, median carina on disc somewhat more weakly raised than in ♀, apical part of antenna: Fig. 118, Al3 relatively shorter than in regium hatogayuum to which the present species has been compared; lamina on side of pronotum as in ♀ (Fig. 123). Lateral carinae of propodeum



Figs. 116-118. Trypoxylon taiwanum Tsuneki, ♂



Figs. 119-123: Trypoxylon taiwanum Tsuneki, ♀. Figs. 309-312: Ditto, ♂.
 Figs. 409-412: Trypoxylon regium hatogayuum Tsuneki, ♂.

distinct and long, but not reaching apex, accompanied just inside with a series of short strong striae, lateral furrows of area dorsalis very feeble, practically absent, but in one of the specimens (δ) the furrow represented by a series of short striae and the area slightly depressed, area apicalis complete, but the margining carina at dorsal part weak, represented by the posteriormost one of the zone of striae that are extended from the lateral series of striae to front of area apicalis. GSR roundly highly raised, but not discoloured.

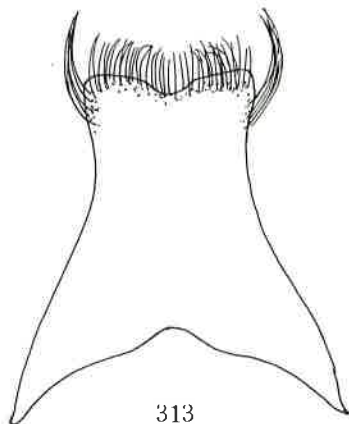
♀. SAT-ASR in dorso-lateral view to see through PAF: Fig. 119, in one of the other specimens: Fig. 120, notice the difference in the inclination of SAT and of ASR, the width of PAF is also somewhat different. Clypeus in fresh specimens: Fig. 121, in the worn-out ones: Fig. 122. Lamina of pronotum: Fig. 123. Hind coxal organ near mid point of its length, weakly tuberculate, apex turned into ferruginous in colour, bearing a comparatively large pit on top.

Relationships to *T. regium hatogayuum* Tsuneki

The present species was, in my 1967 and 71 papers, allocated within the range of *T. responsum* Nurse which was presumed to have similar external characters, together with *ryukyuese*, *hatogayuum* and *regium*, as its local races. Now, it has become clear that *T. responsum* is only a synonym of *T. petiolatum*, having no bearing upon the above listed group. On this occasion I reexamined these races except *regium*, an Ussuri form and unavailable to me, and recompared them with each other.

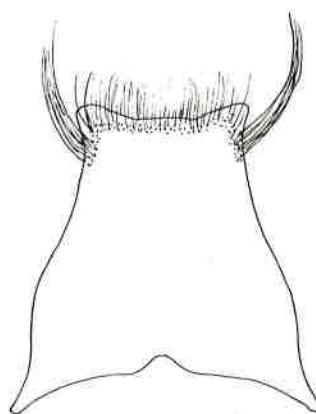
The females of them are certainly similar in appearance, except slight difference in colouration, to each other, but in the male, apart from *ryukyuese* where in the male is still undiscovered, the Taiwanese specimens are distinctly different from the Japanese representatives in the structure of the genital organs and the 8th sternite of the gaster and there is no doubt that they should be separated at the species rank.

T. taiwanum and *hatogayuum* are certainly similar to each other in the character that the penis valve is without shoulder and sickle-shaped appendages, but in the structure of the apical part of the paramere they are markedly dissimilar. In *taiwanum* apex deeply bifurcate into lobiform and stick-like branches, the inner margin of of the latter provided with a series of small processes, the top of which fringed with short hair (Fig. 309, right paramere seen from beneath; Fig. 310, ditto seen somewhat more inside). In *hatogayuum* apex not bifurcate (Fig. 409, right paramere seen from beneath), but shortly truncate in lateral view (Fig. 410, left paramere seen from left side) and provided with a medium-sized trapezium which is also fringed with hair (Fig. 409, t - translucent membrane). Volsella broader in *taiwanum* (Fig. 311) than in *hatogayuum* (Fig. 411) and strictly penis valve also considerably different (Fig. 312 in *taiwanum* seen vertically from dorsal side, apical area bent ventrally in nearly right angle, cf. Fig. 412 in *hatogayuum* seen in the same condition). The 8th sternite is in *taiwanum* comparatively slender (Fig. 313), while in *hatogayuum* markedly stumpy (Fig. 413)



313

Fig. 313, *taiwanum*, ♂



413

Fig. 413, *hatogayuum*, ♂

Remarks. Besides the internal differences T. taiwanum differs from the hatogayuum-group in some external distinctions:

- (1) G1 relatively much longer ($P/Ma = 7$, in the compared group = 5).
- (2) Area dorsalis practically without lateral furrows.
- (3) Al3 relatively distinctly shorter.

23. TRYPOXYLON REGIUM RYUKYUENSE TSUNEKI, 1966

was considered at this time

Trypoxylon amamiense Tsuneki, Etizenia, 6: 2, 1964 (♀, partim: montanic form; amamiense is a junior synonym of T. formosicola inornatum Mats. et Uch.).

Trypoxylon ryukyuense Tsuneki, Ibid., 13: 9, 1966 (3 ♀, Amami-Ohshima, 1 ♀, Tokunoshima).

Trypoxylon responsum ryukyuense: Tsuneki, Ibid., 22: 7, 1967.

Trypoxylon responsum ryukyuense: Murota, Life Study (Fukui), 17 (3-4): 101, 1973 (1 ♀, Amami-Ohshima).

Specimens examined:

3 ♀, Is. Amami-Ohshima, Ryukyus, 26. VI. 1961, K. Tsuneki; 1 ♀, Is. Tokunoshima, Amami Group, Ryukyus, 22. VII. 1963.

The race, ryukyuense, together with hatogayuum, has been treated as different local races with taiwanum and allocated within the same specific category. Now, however, taiwanum has been raised to species rank and separated from hatogayuum. The islands on which ryukyuense occurs lie intermediate between the localities of hatogayuum and taiwanum and, therefore, the point of interest regarding ryukyuense has come to see whether it belongs to the specific range of taiwanum or to that of hatogayuum. The biogeographical view seems to favour the former, since Amami-Group of the Ryukyus belongs to the Oriental Zoological Region and, certainly there occur formosicola amamiense and thaiantum dubiosum.

However, according to the result of the comparative study of the specimens concerned, although the male has not ever been found in ryukyuense, we must place it within the specific range of hatogayuum-group, because in ryukyuense area dorsalis is distinctly enclosed with furrow, gastral petiole is comparatively short, the length range of the body is smaller than in taiwanum and clypeus is not so abruptly reflected at the apical margin.

Hereupon it has become an exception to the distributional pattern of the insect fauna of the Islands.

But it differs from hatogayuum in that the gaster is completely black, IO-Dv is relatively smaller and IODs is also comparatively smaller (see measurements) and it is worthy of separation from it at the subspecies level.

The Japanese race, hatogayuum m., 1956, is preceded by the Ussurie race, regium Gussakovskij, 1932 and, therefore, becomes its subspecies in nomenclature.

Measurements (within parentheses hatogayuum, ♀): HW, HL, IO-Dv, A3, P=100, 46, 23, 25, 156 (100, 50, 29, 24, 140). IODs=10:7 (10:8). OOD, Od, POD=2, 4, 3 (7, 10, 8). A3=AW×4.3 (AW×4). A3, 4, 5=10, 6.5, 6 (do.). P, Ma, Mi, 2(Ma), 3(Ma)=100, 19, 7, 30(24), 36(32), G4 relatively 37 (100, 21, 7, 38(26), 42(38) G4 relatively 36). HC=C (do.), somewhat close to B (not), R1 short (do.), CV1=CV2×7.8 (CV2×8.0), TCV:CV2=2:1 (do.). TCV strongly bent inwards (sinuate), angle at base about 90°(do.) and at apex 110° (100°).

Remarks. In the fresh specimens the clypeus is not dimply rounded out anteriorly, but medianly slightly recurved and weakly incised and depressed in middle as given in Fig. 124. SAT-ASR is generally similar in structure, with ASR usually rather acutely inclined posteriorly and quadricarinated on dorsum.

In Amami-Ohshima this subspecies lives in the montanic area only.

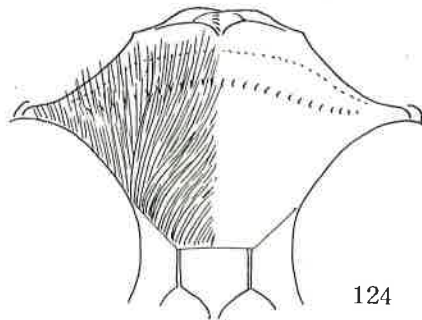


Fig. 124. T. f. ryukyuense Tsuneki, ♀

Trypoxylon melanocorne Strand, Intern. Ent. Zeits., 16 (19): 157, 1922 (♀, partim, nec ♂).

Trypoxylon melanocorne: Tsuneki, Etizenia, 22: 11, 1967 (♀, partim: Chulu specimen only).

Trypoxylon melanocorne: Tsuneki, Ibid., 54: 5, 1971 (♀).

Trypoxylon melanocorne: Tsuneki, SPJHA, 2: 7, 1977 (♂, Pempuchi, figs.)

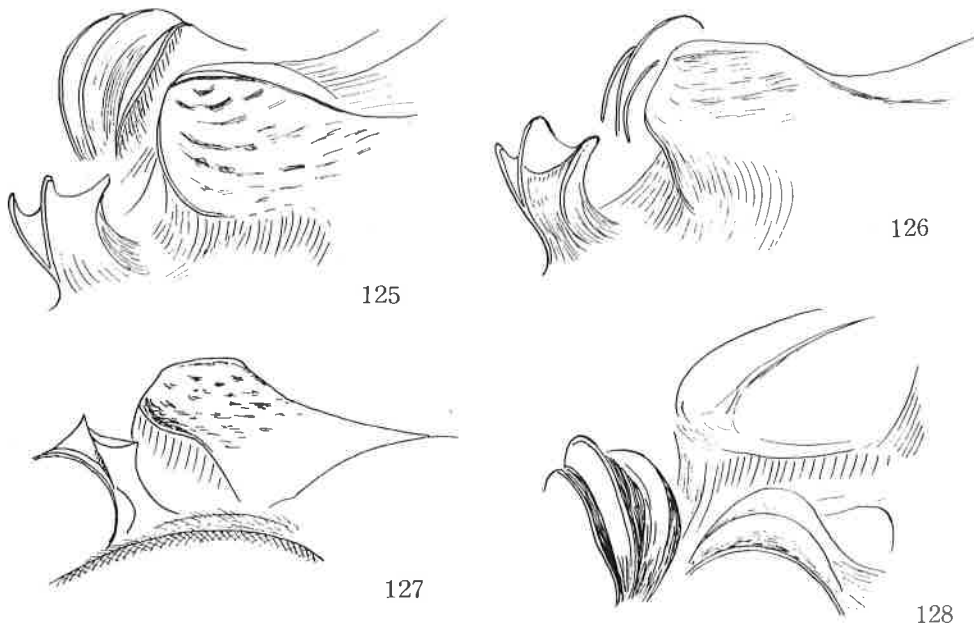
Specimens examined:

1 ♀, Chihpenchi, Taitung Pref., 1-2. VII. 1968, K. Tsuneki; 1 ♀, Chulu, Taitung Pref., 12. VIII. 1966, K. Tsuneki; 2 ♂, Fenchihu, Chiayi Pref., 1370 m, 10-12. IV. 1965, C. M. Yoshimoto & B. D. Perkins (BPRM); 1 ♂, Pempuchi, Nantou Pref., 25-28. VII. 1976, T. Murota.

As discussed in connection with T. taiwanum, melanocorne Strand is a questionable species. But, judging from the original description the following is considered to represent the characters of true melanocorne (holotype ? or at least the specimen that formed the basis of his description of this species).

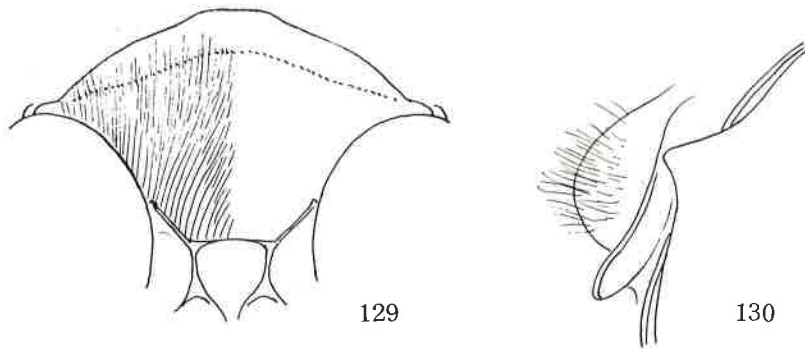
Diagnosis. ♀ 12-14, ♂ 10-12 mm. G1 flask-shaped, mesoscutum simply punctured, propodeum with lateral carinae, area dorsalis with lateral urrows, apical margin of clypeus medianly subtruncate, sometimes shortly emarginate, IODs=5:4 (♀ ♂), SAT tuberciform, apical margin rounded and edged, ASR tricarinate, hind carina strongly reflected, PAF deep, flat-bottomed, oval in cross section, Al3 > Al0-12, but < A9-12, gaster in ♀ from apex of G1 to end ferruginous red and black above, in ♂ totally black, only slightly brownish beneath, bases of all coxae, fore bitia basally in front and all tibial spurs ferruginous, fore tarsus brown to pale brown. Hair silvery, RC=M.

Supplement. Al and 2 at apices narrowly, clypeus at apical margin, mandible (apex reddish brown) and tegula brownish ferruginous, palpi pale yellow, all tibiae at base and fore tarsus brown, but base of T1, nearly whole of T5 and all underside fer-



Figs. 125-128. Trypoxylon melanocorne Strand, SAT-ASR.

ruginous and mid tarsus apically pale brownish. Hair on clypeus silvery, at base distinctly convergent towards medial line.



Figs. 129-130. Trypoxylon melanocorne Strand, ♀

Head in frontal view with sides rounded, slightly narrowed below, $W:L=100:80$, vertex slightly depressed, tops of hind ocelli level with tops of eyes, eye incision narrow and deep, occipital carina markedly high, distinctly complete and slightly e-marginate behind buccal cavity.

HW, HL, IODv, A3, P=100, 51, 25, 27, 202. IODs=10:8. OOD, Od, POD=1, 6, 3. $A3=AW \times 5.2$. $A3, 4, 5=10, 6, 5.5$. P, Ma, Mi, 2(Ma), 3(Ma)=100, 12, 4, 27(15), 27(23). RC=M, Rl somewhat long, nearly half the length of CV2, reaching very close to wing apex, $CV1=CV2 \times 5$, $TCV:CV2=5:4$, TCV sometimes incurved or bent inwards, but sometimes nearly straight, angle about 100° (when curved, at apex).

Head in dorsal view with each ocellus in a shallow hollow, medial line between hind ocelli distinctly raised; frons moderately elevated, medial furrow broad and fairly deep, elevations on both sides distinctly rounded, oval in outline and large, reaching upwards the sides of fore ocellus; SAT moderately high broad nasiform (nearly tuberiform), distinctly carinated on top, apical margin transversely rounded and acutely edged or carinated at verge to PAF and slightly producing over there, ASR highly tricarinate, median carina higher than the fore and hind one strongly reflected. SAT-ASR in oblique dorso-lateral view: Fig. 125, straightly dorso-lateral: Fig. 126, in profile: Fig. 127 and in ventro-lateral view: Fig. 128. General structure of SAT-ASR very similar to that of hyperorientale Strand (= vallicola m.), but SAT without the flattened and foveate area in front; clypeus: Fig. 129, disc at base gently roundly elevated, not so strongly tectate as in hyperorientale, with covering hair only gently turned towards medial line. Anterior part of pronotal collar comparatively thick, slightly thicker than in hyperorientale and roundly enlarged laterally, posterior part incompletely discoloured, appearing brownish posteriorly, lamina on side shortly toothed (Fig. 130); subalar area of mesopleuron normal, only postero-lateral margin acutely edged, connected with mesopleural flange and slightly produced over sublar pit, but not expanded; lateral carinae of propodeum originating more remotely from spiracle than in hyperorientale, ending similarly far before apex, lateral furrows of area dorsalis distinct, complete, area apicalis also complete, distinctly enclosed with carina, GSR highly elevated.

Frons distinctly microcoriaceous and closely superimposed with medium-sized punctures, punctures on top areas of elevations somewhat sparse; mesoscutum with plumbeous shine, finely and sparsely punctured; propodeum with strong lateral series of striae, striae posteriorly extended inwards, forming a zone of arcuate striae in front of area apicalis, area dorsalis with basal and medial furrows without striae, sometimes the latter weakly striate on anterior area, disc finely and sparsely punctured.

♂. Except sexual characters generally similar to ♀, slight differences:

SAT at medio-apical area with narrow flat area around apex of medial carina (like round shelf, as observed in petiolatum), lateral series of striae on propodeum weaker, striae short, not extending inwards to form a zone of striae in front of area apicalis, but area apicalis completely enclosed with carina; medial furrow of area dorsalis with bottom line crenate, but sometimes smooth.

HW HL in frontal view =100:80, eye incision broader, gently narrowed towards bottom, bottom broadly rounded. HW, HL, IODv, A3, A13, P=100, 49, 28, 17, 23, 172. IODs=10:8. OOD, Od, POD=2, 5, 3. $A3=AW \times 2.5$. $A3, 4, 5=10, 7, 6.5$. $A13=BW \times 2.3$, slightly shorter than A9-12, in some condition appearing as long as A9-12. P, Ma, Mi, 2(Ma), 3(Ma)=100, 12, 5, 28(14), 30(20). RC=M, but somewhat close to C, Rl moderately long, $CV1=CV2 \times 5$,

TCV:CV2=10:7. (As to the form of clypeus and A13 and structure of genitalia figures were already given in my 1977 paper - Figs. 27-30).

25. TRYPOXYLON YOSHIMOTOI SP. NOV.

The present species (♀) is closely allied to puliense Tsuneki, but can be separated from this by the difference in the type of RC and in the colour of antenna and fore leg. It resembles considerably taiwanum Tsuneki also, but can be distinguished from this by the characters of RC, IODs, lateral furrows of area dorsalis and PAF, and somewhat also by the colour of G2-3. Further, the present species is somewhat similar to melanocorne Strand and hyperorientale Strand, but differs from the former in the colour and form of gaster, in the characters of frons, SAT-ASR and clypeus, and from the latter in the colour of antenna, gaster and legs and in the characters of SAT-ASR and clypeus.

Diagnosis. ♀, 12 mm. G1 flask-shaped, mesoscutum without microsculpture, strongly punctured, propodeum with lateral carinae, area dorsalis enclosed with furrow, IODs =5:3, A3=AW 4, clypeus bluntly bidentate at apex in middle, RC=M, gaster medianly pale brown on sides and beneath, all tibiae at base, fore tibia further in front ferruginous, hair silvery.

Supplements. Black, A1 and 2 at apices brown, clypeus till apex completely black, mandible ferruginous, at base broadly black and at apex reddish brown, palpi cream yellow, apical sides of G1, G2-3 on sides and beneath yellowish ferruginous and dark brown above, tibial spurs and fore T4-5 also ferruginous; hair on clypeus silvery, weakly convergent towards medial line.

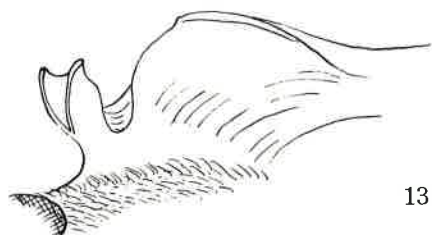
Head in frontal view with sides rounded, very slightly narrowed below, W:L=100:81, vertex not depressed, tops of hind ocelli slightly above level of tops of eyes, eye incision broad, but subparallel-sided and broadly rounded at bottom, dorsal margin slightly inclined outwards.

HW,HL,IODv,A3,P=100,48,30,22,142. IODs=10:6. OOD.Od,POD=3,4,3.5 (apparently 3,4,4). A3=AWx4. A3,4,5=10,6.5,6.3. P,Ma,Mi,2(Ma),3(Ma)=100,19,7,36(20),36(28). RC=M, somewhat close to C, R1 short, but reaching fairly close to wing apex. CV1=CV2x5.5. TCV:CV2=5:3, TCV sinuate, angle roughly about 110°.

Hind ocellus not in a hollow, fore ocellus in a shallow hollow, frontal elevations moderate, medial furrow shallow and broad, surface anteriorly broadly and shallowly concave. SAT tuberiform, apical margin roundly edged, top medianly strongly carinated, carina not long, ASR bicarinate on top, PAF deep, flat-bottomed, U-shaped in cross section, SAT-ASR in dorso-lateral view to see through PAF: Fig. 131, in lateral view: Fig. 132, in ventro-lateral view: Fig. 133, hind carina of ASR slightly reflected; clypeus: Fig. 134, apical glabrous marginal area fairly strongly reflected, disc at base raised and medianly broadly roundly tectate. Occipital carina complete. All=Ma x1.5, Al2=Ma x1.7 and =BW x2.7. Collar of pronotum gently roundly raised in frontal view and very slightly tuberculate in middle, in dorsal view anterior part short, weakly widened laterally, posterior part incompletely discoloured, with marginal area appearing brownish, lamina on side: Fig. 135 (with ante-coxa tubercle), parapsidal sutures normally in impressed lines, comparatively long, as long as its fore space of the scutum and shorter than its hind space; subalar area of mesopleuron normal. Propodeum with distinct lateral carinae, originating at a short distance behind spiracle, but ending far before apex, basal elevation of area dorsalis inconspicuous, lateral furrows of the area broad and fairly deep, but anteriorly obsolete, medial furrow broad, elongated obiform, posteriorly shallower, area apicalis with long curved lateral carinae, but dorsal area margined with a series of transverse striae, the area roundly impressed, surface smooth and shining, without medial longitudinal carina, GSR highly, subtriangularly elevated, apical area discoloured.

Frons strongly microcoriaceous and rather sparsely superimposed with comparatively large punctures, PIS on broad top areas of elevations 2-3 times PD and anteriorly narrower - PIS=PD; mesoscutum with plumbeous shine, fairly closely covered with comparatively large strong punctures, punctures posteriorly finer and sparser; propodeum with distinct lateral series of striae, the striae posteriorly extended inwards to form a zone of transverse arcuate striae in front of area apicalis, area dorsalis at base obliquely and coarsely, on median furrow transversely, finely and closely striate. the striae posteriorly weaker, lateral furrows on bottom line crenate, disc finely, but distinctly and sparsely punctured, rest of dorsal and posterior aspect sparsely covered with fine piliferous punctures, sides polished, on dorsal area

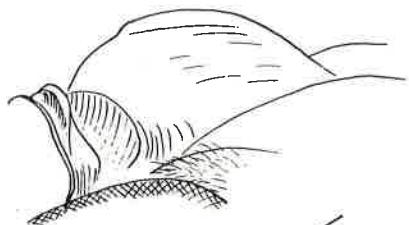
distinctly and sparsely punctured, on posterior impressed area strongly rugulose.
♂, unknown



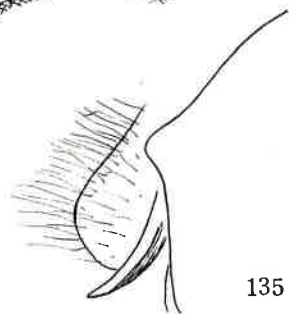
131



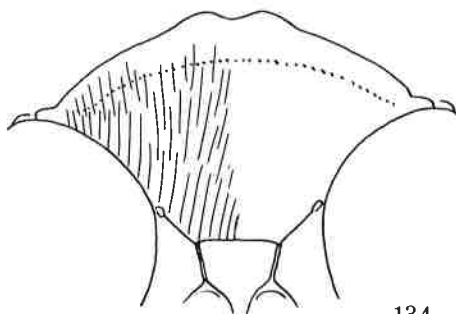
133



132



135



134

Figs. 131-135. Trypoxylon yoshimotoi sp. nov., ♀

Holotype: ♀, Taiwan, Pingtung Hsien, Hengchun, in drainage gutter, 4. IV. 1965,
C. M. Yoshimoto (BPEM).

R E F E R E N C E S

- Haneda, Y. 1971. Sphecidae collected in Formosa in 1970. Life Study (Fukui), 15 (1-2): 29-33 (in Japanese).
- Haneda, Y. 1972. Sphecidae collected in Formosa in 1971. Ibid., 16 (1-2): 1-7 (in Japanese).
- Matsumura, S. and T. Uchida. 1926. Die Hymenopteren-Fauna von den Riukiu-Inseln. Insecta Matsumurana, 1 (1): 32-52.
- Murota, T. 1973. Aculeata Hymenoptera collected in the Amami-Group of the Ryukyus. Life Study (Fukui), 17 (3-4): 100-102 (in Japanese).
- Murota, T. 1977. Sphecidae collected in Formosa in 1976. Hymen. Comm. (Mishima), 5: 12-25 (in Japanese).
- Murota, T. and T. Tano. 1977. Wasp-hunting excursion to Is. Lan Hsu, South Formosa, with a list of the collected species. Ibid., 5: 25-34 (in Japanese).
- Sabi, K., Nozaka, C., Kurokawa, H. and T. Tano. 1977. Wasp-collecting journey to Formosa. Ibid., 5: 34-42 (in Japanese).
- Strand, E. 1922. H. Sauter's Formosa Ausbeute: Crabronidae und Scoliidae IV. (Die Gattungen Trypoxylon, Bombus und Oxybelus).
- Tsuneki, K. 1956. Die Trypoxylonen der nordöstlichen Gebiete Asiens (Hymenoptera, Sphecidae, Trypoxyloninae). Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci., 6 (1): 1-42.
- Tsuneki, K. 1961. Some fossorial Hymenoptera collected by the Osaka City University Biological Expedition to Southeast Asia 1957-58. Nature and Life of Southeast Asia, Vol. I, 283-293.
- Tsuneki, K. 1963. Chrysididae and Sphecidae from Thailand (Hymenoptera). Etizenia, 4: 1-50. 1963.
- Tsuneki, K. 1964. On some aculeate Hymenoptera of Japan. Etizenia, 6: 1-7.
- Tsuneki, K. 1966. Taxonomic notes on Trypoxylon of Formosa and the Ryukyus, with descriptions of new species and subspecies (Hymenoptera, Sphecidae). Ibid., 13: 1-19.
- Tsuneki, K. 1967. Studies on the Formosan Sphecidae (II). The subfamily Trypoxyloninae (Hymenoptera). Ibid., 22: 1-21.
- Tsuneki, K. 1968. Sphecoidea from the Ryukyus and Formosa (Hymenoptera). Kontyu, 36 (1): 54-58.
- Tsuneki, K. 1971. Studies on the Formosan Sphecidae (X). Revision of and supplement to the subfamily Trypoxyloninae (Hymenoptera). Etizenia, 54: 1-19.
- Tsuneki, K. 1972. Studies on the Formosan Sphecidae (XIV). Notes on some specimens newly examined, with a description of a new related Japanese subspecies (Hymenoptera). Ibid., 60: 1-13.
- Tsuneki, K. 1973. New and the first recorded species and subspecies of Sphecidae and Mutillidae from Japan, with taxonomic notes on some species (Hymenoptera). Ibid., 65: 1-28.
- Tsuneki, K. 1973. Studies on the Formosan Sphecidae (XV). On some species collected by Mr. T. Murota in 1972, with descriptions of new species (Hymenoptera). Life Study (Fukui), 17 (3-4): 39-49.
- Tsuneki, K. 1977. H. Sauter's Sphecidae from Formosa in the Hungarian Natural History Museum (Hymenoptera). Ann. Hist.-Nat. Mus. Nat. Hung., 69: 261-296.
- Tsuneki, K. 1977. Further notes and descriptions on some Formosan Sphecidae (Hymenoptera). SPJHA (Spec. Publ. Jap. Hym. Ass.), 2: 1-32 (with 10 Pls.).
- Tsuneki, K. 1977. Studies on the genus Trypoxylon Latreille of the Oriental and Australian Regions (Hymenoptera, Sphecidae). I. Group of Trypoxylon scutatum Chevriier, with some species from Madagascar and the adjacent islands. SPJHA (Spec. Publ. Jap. Hymen. Ass.), 7: 1-87.
- Tsuneki, K. 1978. Idem. II. Revision of the type series of the species described by F. Smith, P. Cameron, C. G. Nurse, W. H. Ashmead, R. E. Turner and O. W. Richards. Ibid., 8: 1-84.
- Tsuneki, K. 1979. Idem. III. Species from the Indian Subcontinent including Southeast Asia. Ibid., 9: 1-178.
- Tsuneki, K. 1979. Idem. IV. Species from Sri Lanka. Ibid., 10: 1-20.
- Tsuneki, K. 1979. Idem. V. Species from Sumatra, Java and the Lesser Sunda Islands. Ibid., 1-68.
- Tsuneki, K. 1980. Idem. VI. Species from Borneo, Celebes and Moluccas. Ibid., 12: 1-118.
- Tsuneki, K. 1980. Idem. VII. Species from the Philippines. Ibid., 13: 1-130.

- Tsuneki, K. 1981. Studies on the genus *Trypoxylon* Latreille of the Oriental and Australian Regions (Hymenoptera, Sphecidae). VIII. Species from New Guinea and South Pacific Islands. SPJHA (Spec. Publ. Jap. Hymen. Ass.), 14: 1-98.
- Tsuneki, K. 1981. Idem. IX. Species from Australia. Ibid., 14: 99-106.
- Yasumatsu, K. 1938. Beitrag zur Synonymie einiger Hymenopteren-Arten von den Ryukyu-Inseln (Vespoidea, Sphecoidea und Apoidea). Trans. Nat. Hist. Formosa, 28 (183): 446-447.

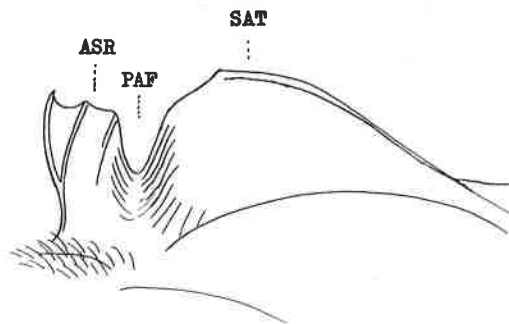


Figure to show SAT, ASR and PAF.

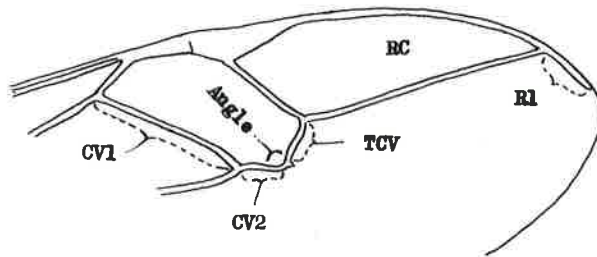


Figure to show named parts of fore wing.

I N D E X

<u>amamiense</u> Tsuneki	35	<u>quadriceps</u> Tsuneki	20
<u>chihiense</u> Tsuneki	20	<u>responsum</u> hatogayuum Tsuneki ..	48
<u>chingi</u> Tsuneki	17	<u>r. ryukyuense</u> Tsuneki	49
<u>dubiosum</u> Tsuneki	12	<u>r. taiwanum</u> Tsuneki	46
<u>errans</u> Saussure	42	<u>ryukyuense</u> Tsuneki	49
<u>fenchihuense</u> Tsuneki	24	<u>sauteri</u> sp. nov.	25
<u>fenchihuense</u> : Tsuneki (♀)	25	<u>schmiedeknechti</u> Kohl	12
<u>formosicola</u> Strand	32	<u>shirozui</u> Tsuneki	13
<u>f. amamiense</u> Tsuneki	35	<u>subpileatum</u> Strand	12
<u>f. inornatum</u> Mats. et Uch.	34	<u>taihorinsho</u> Tsuneki	15
<u>f. var. kankauense</u> Strand	35, 36	<u>tainanense</u> Strand	12
<u>fronticorne</u> Gussakovskij	13	<u>taiwanum</u> Tsuneki	46
<u>fr. obliquum</u> ssp. nov.	13	<u>takasago</u> Tsuneki	35
<u>fr. shirozui</u> Tsuneki	13	<u>takasago</u> kumaso	37
<u>gracilescens</u> auctt. nec Smith	40	<u>thaiantum</u> <u>dubiosum</u> Tsuneki	12
<u>gracilescens</u> var. <u>petioloides</u> Str.	40	<u>tanoi</u> Tsuneki	42
<u>hyperorientale</u> Strand	38	<u>tengmen</u> sp. nov.	27
<u>inornatum</u> Mats. et Uchi.	34	<u>vallicolla</u> Tsuneki	38
<u>iriomotense</u> sp. nov.	22	<u>venustum</u> Tsuneki	20
<u>isigakiense</u> Tsuneki	42	yoshimotori sp. n.	52
<u>kankauense</u> Strand	35, 36		
<u>kansitakum</u> Tsuneki	15		
<u>koshunicon</u> Strand	18		
<u>koshunicon</u> : Tsuneki nec Strand .	20		
<u>kumaso</u> Tsuneki	37		
<u>melanocorne</u> Strand s. lat.	44, 46		
<u>melanocorne</u> Strand s. str.	50		
<u>melanocorne</u> : Tsuneki	38		
<u>murotai</u> Tsuneki	44		
<u>nagamasae</u> Tsuneki	12		
<u>obliquum</u> ssp. nov.	13		
<u>obsonator</u> Smith	30, 38		
<u>okinawanum</u> Tsuneki	19		
<u>petiolatum</u> Smith	30		
<u>petioloides</u> Strand	40		
<u>p. isigakiense</u> Tsuneki	42		
<u>pileatum</u> var. <u>subpileatum</u> Str. .	12		
<u>planifrons</u> Tsuneki	26		
<u>puliense</u> Tsuneki	43		

SPECIAL PUBLICATIONS OF
THE JAPAN HYMENOPTERISTS ASSOCIATION

NO. 15

Published on March 30, 1981

Price Y. 1500. Order should be made through one of
the book dealers in Japan

All the communications relating to the Publications should be
addressed to

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