

SPECIAL PUBLICATIONS
OF THE
JAPAN
HYMENOPTERISTS ASSOCIATION

NO. 17

REVISION OF THE TRYPOXYLON SPECIES OF JAPAN AND
NORTHEASTERN PART OF THE ASIATIC CONTINENT,
WITH COMMENTS ON SOME SPECIES OF EUROPE
(HYMENOPTERA, SPHECIDAE)

By K. TSUNEKI

M I S H I M A

AUGUST 20, 1981 e

REVISION OF THE TRYPOXYLON SPECIES OF JAPAN AND
NORTHEASTERN PART OF THE ASIATIC CONTINENT,
WITH COMMENTS ON SOME SPECIES OF EUROPE
(HYMENOPTERA, SPHECIDAE)

By K. TSUNEKI

S y n o p s i s

Hitherto known 34 species, including 11 subspecies, are reviewed with new knowledge and redescribed, with results of the following name alterations:

- T. pappi Tsuneki, 1974 → T. sapporoense Tsuneki, 1960
Korean T. fronticorne Gussakovskij →
T. fronticorne seoulense ssp. nov.
T. frigidum chongar Tsuneki, 1956 →
T. frigidum cornutum Gussakovskij, 1933
Japanese T. frigidum cornutum →
T. frigidum yamatonis ssp. nov.
T. petiolatum obsenator Smith, 1873 →
T. petiolatum Smith, 1857
T. pulawskii Tsuneki, 1956 → T. errans Saussure, 1867
T. saitamaense Tsuneki, 1973 →
T. errans Saussure ♂, aberratio
T. regium ryukyuense Tsuneki, 1966 →
T. ryukyuense Tsuneki, 1966
T. puliense Tsuneki, 1967 → T. nipponicum Tsuneki, ssp.

F o r e w o r d

During the course of the present revisional study, through the courtesy of Dr. S. Erlandsson, Swedish Museum of Natural History, Stockholm, I could have examined the type series of the species described by V. Gussakovskij with the specimens collected by R. Malaise in the Ussuri region, East Siberia. As a result it was made out that T. frigidum chongar n. described from North Korea was nothing else than T. frigidum cornutum Gussakovskij itself and the Japanese representative of this species that had been treated as identical with cornutum came to be given a new subspecific name.

The alterations of the names of the Japanese taxa of this genus made in the present reviewing work, including those above mentioned, are as given in the above synopsis.

On this occasion, the relationships between North American T. pennsylvanicum and Japanese T. fronticorne japonense (= former T. pennsylvanicum japonense) and between North American T. frigidum and East Asiatic T. cornutum-group were reinvestigated. As to the former the conclusion given in No. 9 of this Publication was reconfirmed, namely, japonense should be separated from pennsylvanicum and combined with fronticorne, and as to the latter the determination made in the first study of the Japanese species was reconfirmed, namely, East Asiatic cornutum-group should be allocated within the specific category of frigidum as local races. These conclusions are based fundamentally upon the comparative morphological study of the genital organs and the eighth sternite of the gaster in the male.

In T. pacificum, ♀, found in Japan there are two forms in the colour of the gaster: red marked one and wholly black one, the former is common and widely spread, while the latter (typical) is rare and confined to northern districts, thus showing a tendency towards subspeciation. At present, however their distribution can not clearly be separated locally and the subspecific treatment of them is shelved.

The female of T. pacificum is, except colorific characters, very close to or even identical with T. trochanteratum Cameron, known from the Himarayan areas and the highland of the Malay Peninsula, but the conclusion as to their subspecific relationships is also shelved here, because in trochanteratum the male remains still unknown and without the knowledge of the male it is too venturesous to give conclusion as to their subspecific relationships.

There is a good instance for this in Japan. In the female, T. monticola resembles so closely the black-gastered form of T. pacificum that it is very difficult and often rather impossible to separate them from each other. Yet in the male they can clearly be distinguished from each other by the difference in the genital organs and by some external distinctions.

Similar instances are also known among the members of this genus occurring in New Guinea (ref. SPJHA, No. 14).

Such being the case, the conspecific conclusion based on the female resemblance alone is quite dangerous, however close it may appear. The separation of T. ryukyuense from T. regium was done in taking the above mentioned fact into consideration.

The suppression of the subspecific name, obsonator Smith is based upon the comparative study of the variation in the values of IODV of the specimens of petiolatum occurring in Japan and in the various districts of the Oriental Region.

The invasion of T. petiolatum and errans, both the widely spread Oriental species, up to Japan seems to show their strong adaptive nature for various environmental conditions. Yet they do not as yet spread their distribution range to Hokkaido.

KEY TO THE SPECIES

(As to abbreviation see p. 91)

not included: *coreanum*

- 1 Frons with shield-shaped enclosure (Ryukyus) 2
 - Frons without shield-shaped enclosure 3
 2 Upper area above lateral angles of frontal enclosure distinctly longer than lower area, sides of upper area subparallel (in ♂ $A13 \neq A10-12$), 9-12 mm, Amami-Ohashima *thaianum dubiosum* Tsuneki, 1964
 - Upper area of frontal enclosure subequal in length to lower area, lateral margins of upper area roundly convergent upwards (carinae of lower area distinctly upcurved near lateral angles, in ♂ $A13 > A10-12$, but $< A9-12$), 10-12 mm, Iriomote Is. (common in southern regions of Asia) *schmiedeknechti* Kohl, 1906
 3 G1 clavate, gradually widening apically, = or $< G2+3$ (sometimes subflask-shaped, in such a case M1 of G1 comparatively broad, about half or more of Ma and G1 always not more than $G2+3$ in length) 4
 - G1 flask-shaped, with apical swelling more sudden, with parallel-sided petiolated part behind spiracles, usually $> G2+3$ 37
 4 Mesoscutum without microsculpture, but surface mat (G1 comparatively long, $\neq Ma \times 4$, body, antenna and legs black, SAT tuberiform, with weak median carina, PAF deep, flat-bottomed, clypeus medianly produced and gently emarginate, $IODs \neq 3:2$, $A3 \neq AW \times 3$, $OOD:POD \neq 2:3$, propodeum with lateral carinae, area dorsalis enclosed with furrow, $RC=M$), 9 mm, N. Korea *sapporoense* Tsuneki, 1960, var., ♀ (= *pappi* Tsuneki, 1974)
 - Mesoscutum microcoriaceous and superimposed with punctures, or finely and closely granulately punctured, surface always mat or half mat 5
 5 Propodeum without lateral carinae None
 - Propodeum with lateral carinae 6
 6 G2 and 3 each with a minute fovea at apex in middle (G1 comparatively long, subflask-shaped, $\neq Ma \times 5$, without fovea at apex, G2 also long, $\neq Ma \times 2.5$, antenna and gaster black, fore and mid legs broadly ferruginous, head subcubic, $IODs=4:1$, clypeus gently roundly produced in middle, $RC=C-B$, R1 long, reaching near wing apex), 6.3 mm, Ryukyus (Iriomote Is.) *iriomotense* Tsuneki, 1981, ♀
 - G2 and 3 without fovea at apex 7
 7 Fore tibia completely black (gaster wholly black, clypeus with apical margin medianly produced, sometimes apex emarginate, SAT transversely carinate at apex) 8
 - Fore tibia with more or less ferruginous area in front 16
 8 SAT moderately high tuberiform, with distinct median carina 9
 - SAT high nasiiform, rather a thick keel as a whole 13
 9 PAF deep, flat-bottomed, apical carina of SAT medianly indistinct and not reaching ASR ($IODs \neq 3:2$, disc of clypeus roundly raised at base, $G1 \neq Ma \times 4$, $A3 \neq AW \times 3.5$ in ♀ and $AW \times 1.5$ in ♂, $A13 \neq A10-12$, $OOD:POD \neq 2:3$, area dorsalis enclosed with furrow), ♀ 8.5-10 mm, ♂ 7.5-9.0 mm, Hokkaido, Honshu and Korea *sapporoense* Tsuneki, 1960
 - PAF almost lacking, apical carina of SAT complete and reaching ASR (disc of clypeus not roundly raised at base) 10
 10 Apical margin of clypeus rounded and medianly produced, in ♂ antennal flagellum without tyloidea beneath and $A13 < A11+12$, 8-10 mm, Korea *chosenense* Tsuneki, 1956
 - Apical margin of clypeus except extreme lateral parts broadly truncate and medianly produced, appearing more strongly waved than in preceding species, in ♂ antennal flagellum with tyloidea beneath, $A13 \neq A10-12$, 8-11 mm (larger form not known from East Asia), Japan and Korea (also Europe and N. America) *figulus* (Linnaeus, 1758) 11
 11 HW:IODv=100:28-30 (♀), 100:32-35 (♂), HW:A3=100:18-19 (♀), 100:14-16 (♂) *figulus figulus* (Linnaeus, 1758)
 - HW:IODv=100:32-36 (mostly 34-35, ♀), 100:35-37 (♂) Asiatic forms ... 12
 12 Apical transverse carina of SAT stronger, distinct, apical margin of clypeus somewhat less strongly undulate, HW:A13=100:28-30, Korea *figulus koma* Tsuneki, 1956
 - Apical transverse carina of SAT weak, sometimes obsolete, apical margin of clypeus more strongly undulate, HW:A13=100:24-25, Japan (Hokkaido and

- Honshu) figulus yezo Tsuneki, 1956
- 13 $Gl=Ma \times 2.7-3.2$ (SAT with sides very steeply falling down, $Al3 \approx Al0-12$, 7-10.5 mm, Europe - Japan and Himalayan areas
- $Gl=Ma \times 2.0-2.5$, SAT with sides more or less obliquely inclined, $Al3 \neq$ or $< Al1+12$, 8.3-9.5 mm, East Asia 14
- 14 In ♀ HW:IODv=100:30, SAT higher, with lateral inclinations almost perpendicular (surface transversely costate), Japan fronticorne Gussakovskij, 1936 15
- In ♀ HW:IODv=100:35, SAT comparatively lower, with lateral inclinations slightly oblique (but steeper than in frigidum-group, surface not costate), Korea fronticorne seculense ssp. nov. (♀)
- 15 SAT obliquely inclined laterally, especially on upper part, nearly wide nasiform (similar to North American typical race), in ♂ $Al3 < Al1+12$, Ussuri and Korea frigidum cornutum Gussakovskij, 1933 $\left(\delta = \text{frigidum chongar} \text{ Tsuneki, 1956} \right)$
- SAT more steeply inclined laterally, in ♂ $Al3 = Al1+12$ or slightly longer, Japan frigidum yamatonis ssp. nov.
- 16 Spiracles of Gl on top of a remarkably raised tubercle, SAT without transverse carina anteriorly (G2 and 3 more or less brownish at base and beneath, mid and hind trochanters largely ferruginous, fore tarsus pale yellow, fore & mid tibiae partly, mid T1-5 also yellowish, clypeus gently rounded out, SAT low nasiform, gently tectate, median carina thickly carinate, $Al3 \approx A9-12$), 9 mm, Honshu (also in Oriental Region) errans Saussure, ♂ aberratio (= saitamaense Tsuneki, 1973)
- Spiracles of Gl normal, SAT with a transverse carina anteriorly 17
- 17 ♀ 18
- ♂ (in okinawanum and varipes nasutum unknown) 29
- 18 IODs=3:2 (head in frontal view rounded, clypeus on apical margin in middle bidentate, SAT low tuberiform, median carina at posterior end replaced with fine furrow, PAF deep, flat-bottomed, $A3 \approx AW \times 2$, area dorsalis enclosed with furrow, antenna, gaster and legs, except fore tibia and tarsus, black), 8-9 mm, Japan (Honshu) shimoyamai Tsuneki, 1958
- IODs=2:1 - 4:1 19
- 19 IODs=3:1 or less (head thick, subcubic, apical margin of clypeus stoutly tridentate in middle, SAT flattened, with apical margin acutely edged and produced anteriorly, covering completely PAF, surface without median carina, Gl and 2 partly reddish beneath, antenna basally, clypeus apically, fore tibia and tarsus and mid tibia and T1 yellowish ferruginous, humeral tubercle yellow, RC=B, RI markedly long), 7-8 mm, Japan (Honshu) nambui Tsuneki, 1966
- IODs=2:1 (5:2 - 5:3) 20
- 20 All trochanters amber yellow (head considerably thick, fore and mid legs largely amber yellow, often partly stained with brown, SAT moderately high, narrow and tectate, apex widely expanded laterally as highly raised carina and connected with ASR, bearing false PAF behind, area dorsalis enclosed with furrow, clypeus broad triangular, apex rounded, often with a minute incision in middle, marginal area brown to amber yellow) 21
- Trochanters largely or wholly black 24
- 21 Gaster medianly broadly reddish yellow (fore and mid legs except base of coxae completely amber-yellow, head in frontal view subquadrate, $A3 = AW \times 3$, $Gl = Ma \times 2$), 7 mm, Japan (Honshu) kodamanum Tsuneki, 1972
- Gaster black (fore and mid femora and tibiae more or less maculated with brown) 22
- 22 Head in frontal view subquadrate, $A3 = AW \times 4$ (IODs=10:4.5-5.0), 7-9.5 mm, Japan, Korea and Ussuri varipes Pérez, 1905 23
- Head in frontal view with sides rounded, $A3 = AW \times 3$ (IODs=10:4), 7.5 mm, Ryukyus (Okinawa Is.) okinawanum Tsuneki, 1972
- 23 SAT with structure generally as given in couplet 20, with lateral inclinations obliquely flattened, median ridge narrow, pointed in cross section, Japan varipes varipes Pérez, 1905
- SAT thicker, more steeply inclined laterally, median ridge thick, rounded in cross section on top, North Korea varipes nasutum Tsuneki, 1974
- 24 Clypeus with disc broadly roundly swollen (with apical margin bidentate in middle, apical margin of SAT bordered with transverse carina, carina con-

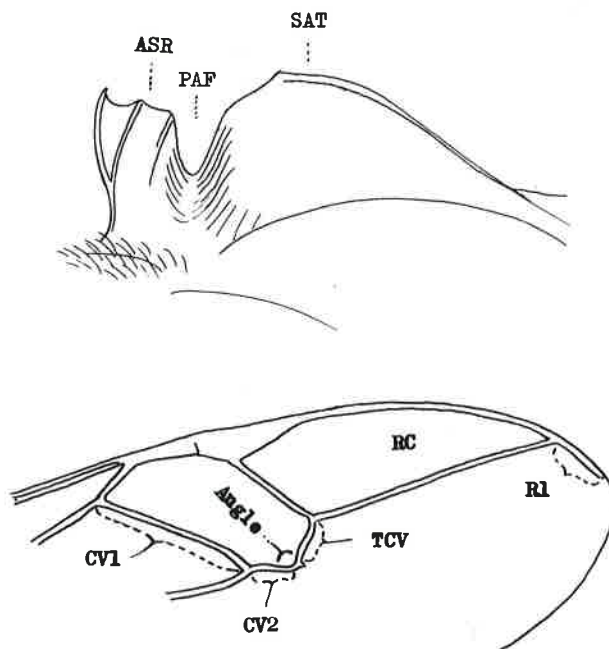
Also Altai: Yazulu, Chulyshman River (27); B. Yulonaa (18); Uymen River (18); all from Zool. Mus. Moscow, 15 May 1982

- nected with ASB, fore tibia and tarsus and mid tibia and part of tarsus ferruginous) 25
- Clypeus with disc gently roundly tectate 26
- 25 Dorsal part of SAT comparatively broader, with lateral inclinations less steep ($A3=AW \times 2.6$, $IODs=10:5.5$, disc of area dorsalis usually transversely, closely rugoso-striate), 6 mm, Ussuri and Korea
clavicerum gussakovskiji Tsuneki, 1974
- Dorsal part of SAT comparatively narrower, with lateral inclinations much steeper, nearly perpendicular (dorsal part of SAT transversely costate, median carina at posterior end replaced with deep wedge-shaped excavation, $A3=AW \times 2.5-2.5$, $IODs=10:5.5-6.0$, disc of area dorsalis variable in striation), 4.5-7.0 mm, Japan (from Hokkaido to Kyushu)
clavicerum exiguum Tsuneki, 1956
- 26 5-7.5 mm, mid tibia and tarsus both partly ferruginous (SAT very high and thick, with sides almost perpendicular, posterior part obliquely inclined and deeply furrowed in middle, $A3=AW \times 3$, $Gl=Ma \times 2.5-2.5$, apical margin of clypeus minutely bidentate in middle, gaster black), Japan (except Kyushu)
koikense Tsuneki, 1956
- 8-13 mm, mid leg black, often narrowly brownish (SAT nasiform, sides obliquely inclined, dorsal ridge narrowly carinate, gaster medianly red or completely black, apical margin of clypeus recurved, sometimes recurved area shallowly incised in middle) 27
- 27 Gaster medianly with more or less reddish area, Japan (from Hokkaido to Kyushu)
pacificum Gussakovskij, 1933, red-marked form
- Gaster completely black 28
- 28 $IODs \neq 5:3$, median carina of SAT reaching upwards middle of frons, eye incision narrow and deep, supraclypeal area usually wider than high, 9-13 mm, Japan (Hokkaido, Honshu), Korea and Ussuri region
pacificum Gussakovskij, 1933, black-gastered form
- $IODs \neq 2:1$, median carina of SAT not reaching middle of frons, eye incision shallower and broader, supraclypeal area as wide at base as high in middle, or slightly higher than wide, 8-10 mm, Japan (Hokkaido and northern half of Honshu)
monticola Tsuneki, 1956
- 29 A7 and 8 stoutly toothed beneath ($A13 \neq A11+12$, apical margin of clypeus medianly produced and minutely bidentate, $IODs=5:4$, area dorsalis enclosed with furrow, fore and mid legs broadly ferruginous), 7 mm, Japan (Honshu)
shimoyamai Tsuneki, 1958
- A7 and 8 not toothed 30
- 30 A6 excavated at base beneath and produced at apex ($IODs \neq 3:2$, gaster black) 31
- A6 normal 33
- 31 5-6 mm, $A3 < AW \times 3$, $A13 < A10-12$, (mid tarsus broadly ferruginous), Japan
koikense Tsuneki, 1956
- 8-10 mm, $A3 > AW \times 3$, $A13 > A10-12$ 32
- 32 $A3, 4, 5=10, 7, 6$, $A5 > A6$, A5, 6 and often 7 with tyloidea beneath (mid tarsus black, at most T1 basally ferruginous), Japan, Korea and Ussuri
pacificum Gussakovskij, 1933
- $A3, 4, 5=10, 7, 5$, $A5=A6$, A5-7 without tyloidea (mid tarsus largely ferruginous), Japan
monticola Tsuneki, 1956
- 33 Antenna at base yellow or ferruginous (mid tibia wholly and tarsus largely yellow, $A13=A10-12$) 34
- Antenna at base black or dark brown (gaster completely black) 35
- 34 Gaster medianly reddish amber-yellow, hind tarsus also amber-coloured ($A3=$ or $> AW \times 2$, $R1 < TCV$, mid and hind trochanters reddish amber-yellow), about 5 mm, Japan (Honshu)
kodamanum Tsuneki, 1972
- Gaster completely black, hind tarsus largely brown or dark brown ($A3$ longer than $AW \times 2$, $R1=TCV$, mid and hind trochanters yellow), 4.5-5 mm, Japan (Honshu)
nambui Tsuneki, 1966
- 35 All trochanters yellow (disc of clypeus gently roundly tectate, apical margin bluntly tridentate, median tooth broader, $A13 \neq A10-12$, SAT moderately high nasiform, with sides obliquely inclined), 8-10 mm, Japan, Korea and Ussuri region
varipes Pérez, 1905
- All trochanters black (disc of clypeus markedly roundly swollen, apical margin triangular, medianly bidentate, $A13 \neq A9-12$), 5-7 mm 36
- 36 SAT with sides somewhat oblique, with dorsal area broader than in follow-

- ing race, Ussuri and Korea clavicerum gussakovskiji Tsuneki, 1974
- SAT with sides more steeply inclined, on anterior portion nearly perpendicular, with dorsal area narrower than in preceding subspecies, Japan clavicerum exiguum Tsuneki, 1956
- 37 Mesoscutum microcoriaceous and superimposed with fine punctures (propodeum with lateral carinae) 38
- Mesoscutum without microsculpture, simply punctured, surface shining 44
- 38 Mesoscutum distinctly longitudinally furrowed in middle (comparatively small slender species, less than 10 mm, apical margin of clypeus, mandible, fore leg nearly wholly, mid leg fairly broadly and hind trochanter ferruginous or pale brown, tubercle of pronotum partly yellow, G1 and 2 partly reddish) 39
- Mesoscutum without median longitudinal furrow 42
- 39 ♀ 40
- ♂ 41
- 40 8.5-10 mm, apical margin of clypeus medianly produced, produced area shallowly incised in middle ($A_3=AW \times 3.5$, $A_4=AW \times 2.8$, SAT moderately high short nasiform, medio-apical inclined area usually with a transverse carina, sometimes carina indistinct, lateral furrows of area dorsalis strong and distinct), Japan (Honshu and Kyushu) imayoshii Yasumatsu, 1938
- 5.5-6.5 mm, apical margin of clypeus not produced in middle, weakly undulate ($A_3=AW \times 3$, $A_4=AW \times 2.5$, SAT low tuberiform, medio-apical area without transverse carina, lateral furrows of area dorsalis weak), Japan (Central Honshu) ambiguum Tsuneki, 1956
- 41 $Al_3 > Al_1 + l_2$ (parapsidal suture a raised line), 8-10 mm, Honshu and Kyushu imayoshii Yasumatsu, 1938
- $Al_3 < Al_1 + l_2$ (parapsidal suture an impressed line), 6-8 mm, Honshu ambiguum Tsuneki, 1956
- 42 Legs completely black (pronotal lamina not toothed, lateral furrows of area dorsalis broad and shallow, apical margin of clypeus medianly broadly produced, without emargination, SAT low, short nasiform, at apex transversely carinate, carina connected with ASR, microsculpture on mesoscutum distinct, punctures fine and close), 10-12 mm, Japan (Honshu) konosuense Tsuneki, 1968, ♀
- Legs at least fore tarsus ferruginous, (lamina on side of pronotum toothed, area dorsalis enclosed with deep distinct furrow, microsculpture on mesoscutum weak, not conspicuous) 43
- 43 Gaster in ♀ medianly red, in ♂ black, often medianly somewhat brownish, legs (♀♂) broadly ferruginous or whitish (SAT low nasiform, strongly carinated in middle, PAF deep, flat-bottomed, $Al_3 \approx A_9 - 12$, trochanters in ♀ largely pale ferruginous, in ♂ broadly brown, apical margin of clypeus recurved in middle, in ♂ less produced, lamina on side of pronotum strongly toothed (see also couplet 48), 8-11 mm, Japan (Honshu) (widely in Oriental Region) errans Saussure, 1867
- Gaster black, legs except fore tibial spurs and tarsus black (SAT low tuberiform, PAF shallow, down-curved in cross section, clypeus angulated on each side of medial prominence, ♂ unknown), 11 mm, Ogasawaras (Is. Chichidzima) (see also couplet 55) chichidzimaense Tsuneki, 1973
- 44 Propodeum without lateral carinae (lateral furrows of area dorsalis very feeble, punctures on mesoscutum fine, weak and sparse, in ♀ antenna ferruginous beneath, clypeus roundly produced, apex broadly subtruncate, SAT moderately high broad nasiform, nearly tuberiform, PAF moderately deep and up-curved in ♀, deep and flat-bottomed in ♂, $IODs \approx 4:3$ in ♀, $\approx 5:4$ in ♂, $A_3 \approx AW \times 4.5 - 5$ in ♀, $AW \times 2.3 - 2.5$ in ♂, $Al_3 = Al_0 - 12$ or slightly longer, fore and mid tibiae and tarsi largely yellowish white in ♀, brown or black in ♂, gaster from apex of G1 to G3 or to base of G4 red, frequently black maculated above), ♀ 12-15 mm, ♂ 11-13 mm, widely spread over Oriental Region, common in Japan except Hokkaido petiolatum Smith, 1857
(= bicolor auctt., obsonator Smith, tricolor Sickmann etc.)
- Propodeum with lateral carinae (area dorsalis with distinct lateral furrows) 45
- 45 Gaster from G2 apically till end ferruginous red, posteriorly somewhat brownish (fore and mid legs largely, hind leg partly amber-yellow, in ♀ Al and reat beneath, in ♂ Al-3 beneath, in both clypeus anteriorly and humeral tubercle yellow, $IODs \approx 10:7$ in ♀, $\approx 10:8$ in ♂, $A_3 \approx AW \times 5$ in ♀, $\approx AW \times 2$ in ♂,

	Al3≠Al0-12, apical margin of clypeus rounded and weakly undulate, SAT moderately high nasiform, medio-apical part obliquely flattened into smooth, shining area, carrying a round fovea on it, PAF deep, flat-bottomed, ASR bicarinate, hind carina highly and triangularly raised and reflected), 11-13 mm, South Ryukyus (Is. Ishigaki and Iriomote)	
	<u>petioloides isigakiense</u> Tsuneki, 1973	
—	Gastral colouration different	46
46	♀	47
—	♂	57
47	Gaster medianly more or less red (PAF at least moderately deep)	48
—	Gaster completely black	53
48	All trochanters ferruginous, often partly brownish above, pronotal lamina acutely toothed (see also couplet 43)	
	<u>errans</u> Saussure, 1867	
—	Trochanters black, pronotal lamina not acutely toothed	49
49	Antenna ferruginous or castaneous beneath (all tibiae at base and apex, spurs and fore and mid tarsi wholly or largely ferruginous, IODs=10:7, A3≠AW×5, clypeus rounded out and recurved in middle, recurved area medianly weakly incised, SAT low nasiform, subtuberiform, carinated in middle, PAF deep, flat-bottomed and curved down at outer end, from A5 or 6 apically yellowish beneath), 10-13 mm, Japan (Honshu)	
	<u>nipponicum</u> Tsuneki, 1956	
—	Antenna wholly black	50
50	Mandible dark brown, basally black, with a conspicuous white fleck near apex on outer side, clypeus with apical margin rounded triangular (IODs=10:9, OOD:POD≠4:5, A3≠AW×4, SAT low nasiform, carinated in middle, Gl=Ma × 5.5, legs completely black), about 16 mm, Japan (Kyoto)	
	<u>kyotoense</u> Tsuneki, 1966	
—	Mandible without a whitish fleck, clypeus different in form of apical margin	51
51	Apical margin of clypeus with distinct prominence in middle, mandible black, apical half dark brown (SAT low broad nasiform, strongly carinated in middle, medio-apical area without transverse carina, PAF deep, bottom line gently up-curved, V-shaped in cross section, IODs≠10:8, A3≠AW×4.5, legs completely black), 13-16 mm, Japan, Korea, Ussuri region and NE Burma	
	<u>malaisei</u> Gussakovskij, 1933	
—	Apical margin of clypeus simply rounded, in fresh specimens medianly minutely emarginate, mandible nearly wholly ferruginous (SAT-ASR similar to above, PAF slightly deeper and nearly flat-bottomed, otherwise similar to <u>malaisei</u>), 12-15 mm,	
	<u>regium</u> Gussakovskij, 1933..	52
52	Legs completely black, Ussuri region	
	<u>regium regium</u> Gussakovskij, 1933	
—	Knees, bases of all tibiae, tibial spurs and fore T2-5 ferruginous, Japan	
	<u>regium hatogayuum</u> Tsuneki, 1956	
53	Legs completely black (tarsi apically somewhat brownish, SAT low broad tuberiform, PAF broad and shallow, down-curved in cross section, apical margin of clypeus medianly produced, area dorsalis enclosed with furrow, IODs=5:4, A3≠AW×4), 12-15 mm, Ryukyus	54
—	Fore legs at least with more or less ferruginous areas	55
54	SAT at medio-apical inclined area without transverse carina, often with a feeble transverse carina, Is. Okinawa	
	<u>formosicola inornatum</u> Matsumura et Uchida, 1926	
—	SAT at medio-apical inclined area with a transverse carina, carina reaching ASR and usually in horizontal band-like, not so well developed as in <u>formosicola</u> s. str., always with apical margin straight, Is. Amami-Oshima	
	<u>formosicola amamiense</u> Tsuneki, 1964	
55	Apical margin of clypeus ferruginous, fore and mid legs partly ferruginous (IODs=10:9, A3≠AW×4, SAT tuberiform, with a short thick carina in middle, ASR broadly expanded anteriorly, surface smooth, medio-apical area of SAT transversely feebly carinated, carina connected with ASR at its medio-basal area, P, Ma, Mi=100, 18, 6 - see also couplet 43), 11 mm, Is. Chichidzima, Bonin Is.	
	<u>chichidzimaense</u> Tsuneki, 1973	
—	Clypeus black, fore tibia at least partly brown or pale brown (apical margin of clypeus produced in middle)	56
56	Fore tibia at base and in front and fore T5 pale brown, rest of legs black, PAF deep, flat-bottomed (SAT moderately high nasiform, IODs=10:8, A3≠AW×5, area dorsalis distinctly enclosed with furrow), 14-17 mm, Ryukyus (Is. Amami-Oshima)	
	<u>ryukyuense</u> Tsuneki, 1966	

- Fore tibia in front, all tibiae at base and spurs and fore tarsus largely ferruginous, PAF broad and shallow, simply down-curved in cross section (SAT low tuberiform, medianly strongly carinated, ASR widely expanded anteriorly, lateral furrows of area dorsalis broad and shallow, but distinct, mesoscutum with strong plumbeous shine, finely and closely punctured), 12-14 mm, Is. Okinawa takasago kumaso Tsuneki, 1966
- 57 A13 = or > A9-12, fore tarsus at least largely pale ferruginous (often G2 and G3 both at base brownish) 58
- A13=A10-12, distinctly < A9-12, fore tarsus black, at most apically brownish, gaster always completely black 59
- 58 Mid tarsus with broad pale yellow area at base of each joint, trochanters pale brown to ferruginous beneath, lamina on side of pronotum acutely pointed at apex (fore tibia except folded side pale ferruginous, A13 in dorsal view subparallel-sided and rather abruptly narrowed and rounded at apex), 8-9 mm, Japan (Honshu) (widely in Oriental Region) errans Saussure, 1867
- Mid tarsus brown to dark brown, trochanters black, lamina on side of pronotum triangularly produced, but not acutely pointed at apex (fore tibia at base, apex and on fore side ferruginous, rest dark brown or black, A13 in dorsal view gradually attenuate apically and pointed at tip), 8-10 mm, Japan (Honshu) nipponicum Tsuneki, 1956
- 59 PAF deep, flat-bottomed, U-shaped in cross section 60
- PAF shallow and broad 61
- 60 Apical margin of clypeus medianly produced, 10-12 mm, Ussuri, Korea, Japan and Burma malaisei Gussakovskij, 1933
- Apical margin of clypeus gently rounded and medianly weakly emarginate, 10-13 mm, Japan (Honshu) regium hatogayuum Tsuneki, 1956
- 61 SAT at medio-apical inclined area with transverse carina, carina band-like and connected with ASR at each end, PAF down-curved in cross section, 11-12 mm, Ryukyus (Is. Amami-Ohshima) formosicola amamiense Tsuneki, 1966
- SAT at medio-apical area without transverse carina, PAF slightly impressed into shallow groove, with bottom line up-curved), 9-10 mm, Ryukyus (Okinawa) takasago kumaso Tsuneki, 1966



1. TRYPOXYLON SCHMIEDEKNECHTI KOHL, 1906

Trypoxylon pileatum var. subpileatum Strand, *Intn. Ent. Zeits.*, 16 (19): 163, 1922
(♀ ♂, Formosa).

Trypoxylon subpileatum: Tsuneki et Japanese authors, 1971-1978.

Trypoxylon schmiedeknechti: Tsuneki, *SPJHA*, 7: 21, 1978 (list of references, distribution, synonyms, subspecies).

Trypoxylon schmiedeknechti: Tsuneki, *SPJHA*, 15: 12, 1981 (list of references regarding Formosa and the Ryukyus).

Specimens: 2 ♀, Is. Iriomote (Komi), 21. VIII. 1978, T. Nambu.

Distribution: Widely spread over Oriental and Australian Regions.

Remarks. As to the characters of this species see my 1971 and 1978 papers.

2. TRYPOXYLON THAIANUM DUBIOSUM TSUNEKI, 1964

Trypoxylon dubiosum Tsuneki, *Etizenia*, 6: 4, 1964 (55 ♀ 3 ♂, Amami-Oshima).

Trypoxylon dubiosum: Tsuneki, *Life Study* (Fukui), 13 (1-2): 25, 1969 (1 ♀, Okinoerabu)

Trypoxylon thaianum dubiosum: Tsuneki, *SPJHA*, 7: 62, 1978.

Trypoxylon thaianum dubiosum: Tsuneki, *SPJHA*, 15: 12, 1981 (list of ref.)

Remarks. It is an interesting fact that T. thaianum has not been known from Formosa, despite the repeated explorations by the Japanese hymenopterists, whereas it occurs in northern islands of the Ryukyus. On the Continent it was collected in Peking, North China.

3. TRYPOXYLON IRIOMOTENSE TSUNEKI, 1981

Trypoxylon iriomotense Tsuneki, *SPJHA*, 15: 22, 1981 (♀, Ryukyus, figs. SAT-ASR, eye incision, clypeus and pronotal lamina).

Specimen.

1 ♀, Is. Iriomote (Komi), 24. VIII. 1978, T. Nambu.

4. TRYPOXYLON SAPPOROENSE TSUNEKI, 1960

Trypoxylon sapporoense Tsuneki, *Kontyu*, 28: 241, 1960 (4 ♂, Sapporo, figs.)

Trypoxylon sapporoense: Tsuneki, *Etizenia*, 65: 15 (♂ comp.), 16 (♀), 1973 (7 ♀, Fukui, 1 ♀, Saitama).

Trypoxylon sapporoense: Tsuneki, *Life Study* (Fukui), 17 (3-4): 113, 1973 (1 ♀ 3 ♂, Fukui).

Trypoxylon pappi Tsuneki, *Ann. Hist.-Nat. Mus. Natn. Hung.*, 66: 363, 1974 (1 ♀, N. Korea) (SYN. NOV.).

Trypoxylon sapporoense: Murota, *Hym. Comm.*, 5: 7, 1977.

Trypoxylon sapporoense: Suda, *Ibid.*, 8: 4, 1978 (1 ♀, Yamanashi).

Trypoxylon sapporoense: Nambu, *Saitama Anim.*, p. 193, 1978 (2 ♂, Saitama, Kanagawa).

Trypoxylon sapporoense: Murota, *Hym. Comm.*, 12: 4, 1980 (2 ♂, Fukui).

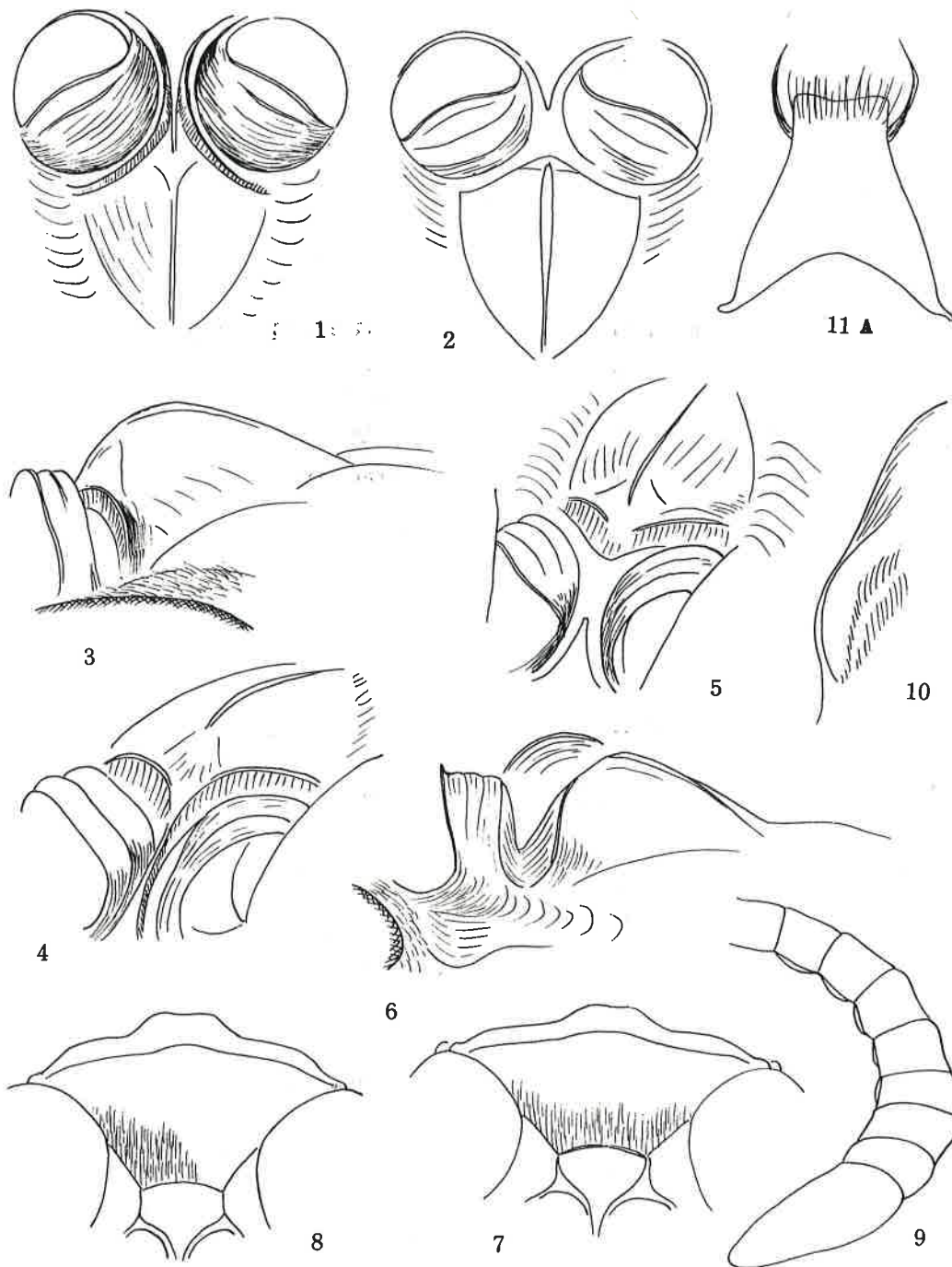
Specimens reexamined:

9 ♀ 4 ♂, Fukui Pref. (Arashi, Taniyama, Akato, Kamiuchinami, Mt. Hino); 1 ♀, Saitama (Chichibu); 5 ♂, Sapporo.

Supplementary notes to the previous descriptions.

Head in frontal view wider than long, W:L=100:84-86 (♀), 100:80 (♂), with sides rounded, very slightly narrowed below, vertex not depressed, tops of hind ocelli above level of tops of eyes, eye incision broad and narrowed towards sinus, sinus widely rounded, dorsal margin inclined towards sinus, frons gently elevated, median furrow broad and shallow, sometimes with a shining bottom line in middle, sometimes not,

rounded elevation on both sides only gentle, surface anteriorly broadly and shallowly concave, SAT moderately high broad nasiform, nearly tuberiform, in vertical view most usually posteriorly rounded in outline, but sometimes nearly subisosceles triangular, in both cases anteriorly steeply inclined to IAA and PAF, angle formed by PAF to medi-



Figs. 1-11. Trypoxylon sapporoense Tsuneki, 1, 7, 9, 11: ♂; 2, 8: ♀, rest common.

an axis of SAT much more acute in ♂ (Fig. 1, vertical view) than in ♀ (Fig. 2), in ♀ both PAFs forming a nearly straight furrow, dorsum of SAT medianly acutely carinated and shining, sides obliquely, nearly flatly inclined, in lateral view dorsal margin roundly curved (Fig. 3), anterior steep inclination of SAT sometimes, especially in ♂, medianly acutely longitudinally carinate, carina running down on IAA, but more frequently carina weak and indistinct, in such a case PAF of both sides almost completely connected with each other to form a curved furrow in front of SAT (Fig. 5), PAF deep, narrow, flat-bottomed, U-shaped in cross section (Fig. 6, dorso-lateral view to see through PAF), SAT at verge to PAF slightly raised to blunt carina, ASR highly raised, well expanded anteriorly, apical margin highly carinate, dorsum usually bluntly bicarinate, sometimes tricarinate, sometimes carinae indistinct and simply striate, scapal hollow at outside of ASR-SAT deep, hairless and expanded upwards shallowing, clypeus: Figs. 7 (♂) and 8 (♀), the form of medio-apical prominence more or less variable (in relative length and width and in the state of apical emargination), disc broadly, gently and roundly elevated, with top of elevation slightly above central point, apical margin weakly reflected, reflection comparatively stronger in ♀, with the line of reflection forming a fine transverse groove. Measurements in two ♂♂ (within parentheses ♀):

HW, HL, IODv, A3, Al3, P=100, 53, 39, 14, 28, 100; =100, 52, 37, 12, 28, 96 (100, 53, 32, 20, —, 114). IODs=10:6.7; 10:6.5 (10:6.7). OOD, Od, POD=4, 4, 5; 4, 4, 5 (3, 5, 5). A3=AW×1.6; AW×1.5 (AW×3.6). A3, 4, 5=10, 7, 7; 10, 7, 7 (10, 7, 6.5). Al3=BW×2.3; BW×2.3. In both Al3 > A9-12, but < A8-12. P, Ma, Mi, 2(Ma), 3(Ma)=100, 26, 16, 50(38), 52(48); =100, 32, 16, 54(40), 58(54) (100, 24, 11, 46(30), 50(40)). RC=C, somewhat close to M, Rl moderately long, slightly longer than half TCV, CV1=CV2×3.5; CV2×3.8. (CV2×5.3). TCV:CV2=1:1, =1:1 (5:3). Angle about 120° in all.

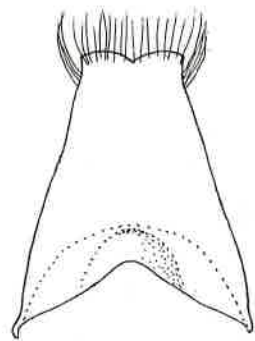
A6-10 or -11 with tyloidea, namely, carinated on posterior margin, seen from above each rounded out posteriorly (Fig. 9, ♂), in ♀ without tyloidea. Collar of pronotum with anterior part short in middle, about 1/4 the length of posterior part, but widened towards sides and rounded, thus anterior margin roundly emarginate seen from above, posterior part not discoloured, only hind marginal area slightly brownish, in frontal view dorsal margin of collar subtriangularly raised and minutely and weakly tuberculate in middle, in ♂ tubercle frequently indistinct, lamina on side roundly produced, marginal area thickly swollen (Fig. 10). Mesopleuron normal at subalar area. Propodeum with distinct lateral carinae, but carinae broadly obsolete at base and apex, area dorsalis margined with feeble furrow, basal elevation about half length of postscutellum, only weakly elevated, area apicalis completely enclosed with carina, surface smooth and polished and medianly carinated, but the carina not reaching dorsal margin, GSR highly and roundly elevated, but not discoloured, sometimes weakly reflected posteriorly. Gl comparatively long, in ♀ frequently subflask-shaped, with somewhat parallel-sided area in middle, but the segment thick, Mi about half Ma and as a whole as long as G2+3, in ♂ more distinctly clavate, gradually widening apically.

Sternite 8; Figs. 11, A and B. Genitalia in ventro-lateral view: Figs. 12, A and B (A somewhat right side, B somewhat from left side). Paramere simple at apex, outer margin fringed with short hair, ventral surface at apical half covered with yellowish pubescence, inner margin expanded, but not roundly rolled as usually done, but acutely folded over the ventral surface of main body and folded area fringed with long curved bristles, that the expansion of inner margin is confined to narrow area near base is also characteristic; volsella spatulate, penis valve with a pair of well developed triangular (not sickle-shaped) appendages, but with shoulder only poorly developed (Fig. 13, ventral view).

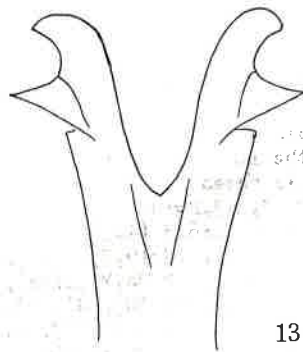
Frons microcoriaceous and sparsely superimposed with comparatively large flat-bottomed punctures, PIS 1-3 times (mostly 2-3 times) PD; mesoscutum dull and opaque, under high magnification sometimes feeble microsculpture can be seen, but usually microsculpture indistinct, punctures close, PIS=PD or less, in part subcontiguous to adjacent ones; punctures on mesopleuron distinct, slightly larger than on scutum and sparser, and much sparser upwards; propodeum at base longitudinally, then obliquely and rather coarsely, and on the broad remaining area transversely, finely and closely striate, the extent of longitudinal - oblique striae considerably variable, frequently, especially in ♂, reaching middle of the area dorsalis, lateral series of striae along lateral carinae distinct, each striae longer than usual and on posterior inclination connected with transverse striae of disc, but on anterior portion weaker and replaced with sparse punctures, sides smooth and polished, but dorsal area finely and closely striate, the range of striated area also considerably variable.

Variation in characters.

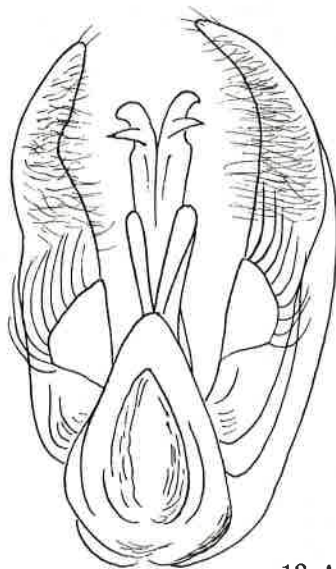
1. As mentioned in the foregoing page, median longitudinal keel at anterior inclination of SAT (=IAA) variable in strength. In the male, especially in Sapporo specimens, better developed.
2. Apical margin of clypeus varies more or less in form.
3. Antennal tyloidea in ♂. On A6-10 always distinct, but on 11 sometimes distinct and sometimes obsolete.
4. Wing venation is always considerably variable and without statistic result



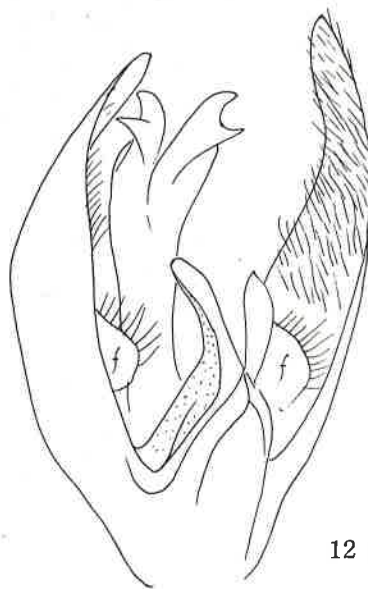
11 B



13



12 A



12 B

Figs. 11-13. Trypoxylon sapporoense Tsuneki, ♂

can not safely be utilized as specific or subspecific distinction. In two Sapporo ♂ CV1=CV2×3.5 and ×3.8, in both CV2=TCV, while in two other Sapporo ♂ CV1=CV2×4.2 and ×4.4, and CV2:TCV=4:5 in both, TCV always straight and angle mostly about 120°; but often 110°. While in Fukui ♂, CV1=CV2×4.2, 4.2, 4.6 and 6.2 and CV2:TCV=4:5, 4:5, 3:5 and 3:5. In 4 Fukui ♀ CV1=CV2×5.0, 5.3, 6.0 and 7.5, and CV2:TCV=2:3, 3:5, 3:5, 3:5, but TCV always straight and angle in three about 120° and in one about 110°.

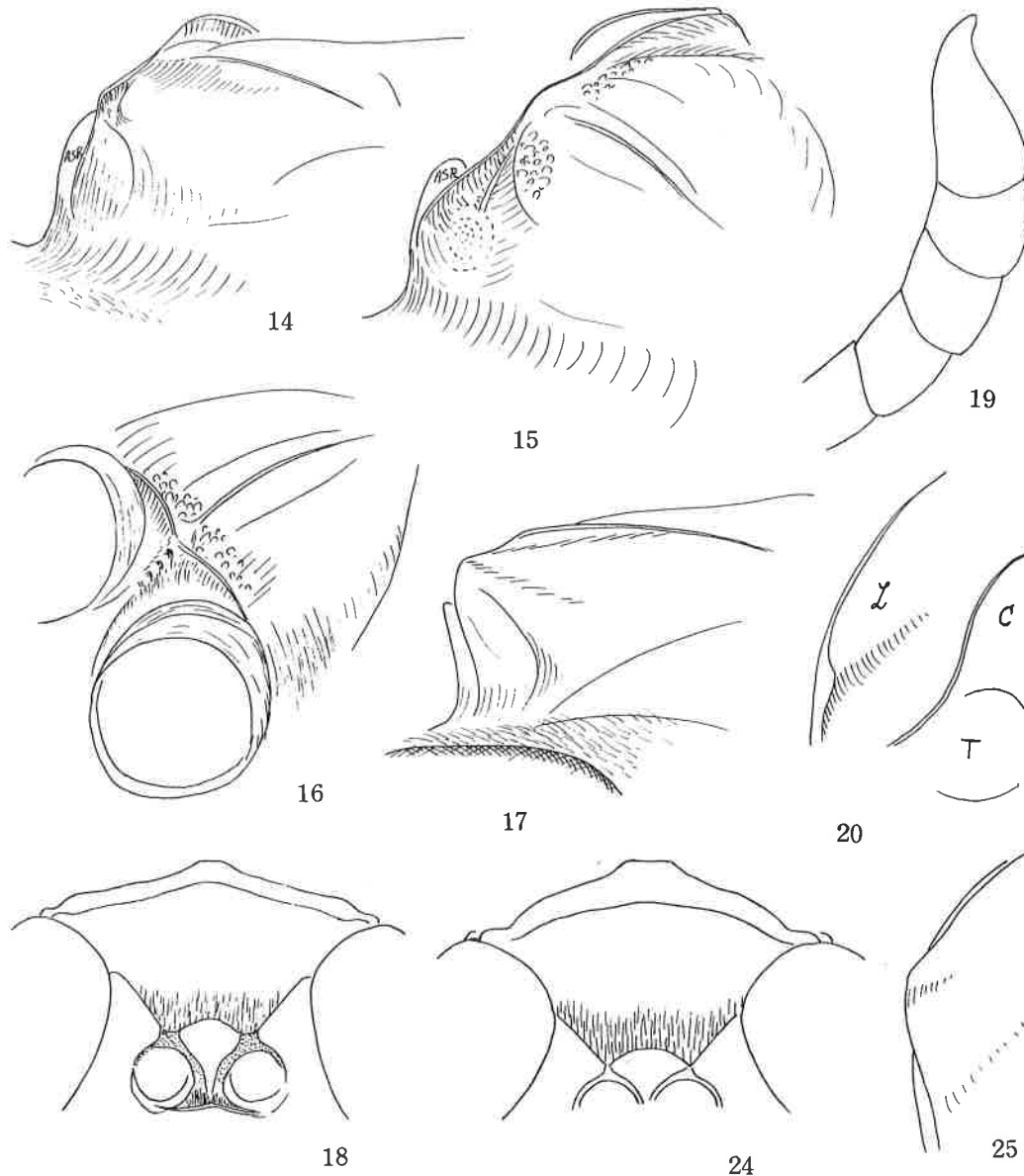
Remarks. In the North Korean specimen (♀) that was once recorded as T. pappi IODs=10:6.5, A3=AW×2.8, OOD, Od, POD=2, 3, 3. P, Ma, M, 2 (Ma)=100, 29, 9, 54 (25). RC=M.

5. TRYPOXYLON CHOSENENSE TSUNEKI, 1956

Trypoxylon chosense Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ. II, Nat. Sci., 6 (1): 25, 1956 (♀ ♂, Korea, with figs. of A9-13, G1, dorsal and lateral, clypeus and genitalia, dorsal and ventral).

Specieens examined:

1 ♀ 2 ♂ (paratypes), Korea, Seoul, northern suburbs, 27. IX. 1942; 22, 29. VI. 1943, K. Tsuneki; 1 ♀ (holotype), 1 ♂ (paratype), Shoyosan, Central Korea, 30. V, 17. IX. 1943, K. Tsuneki.



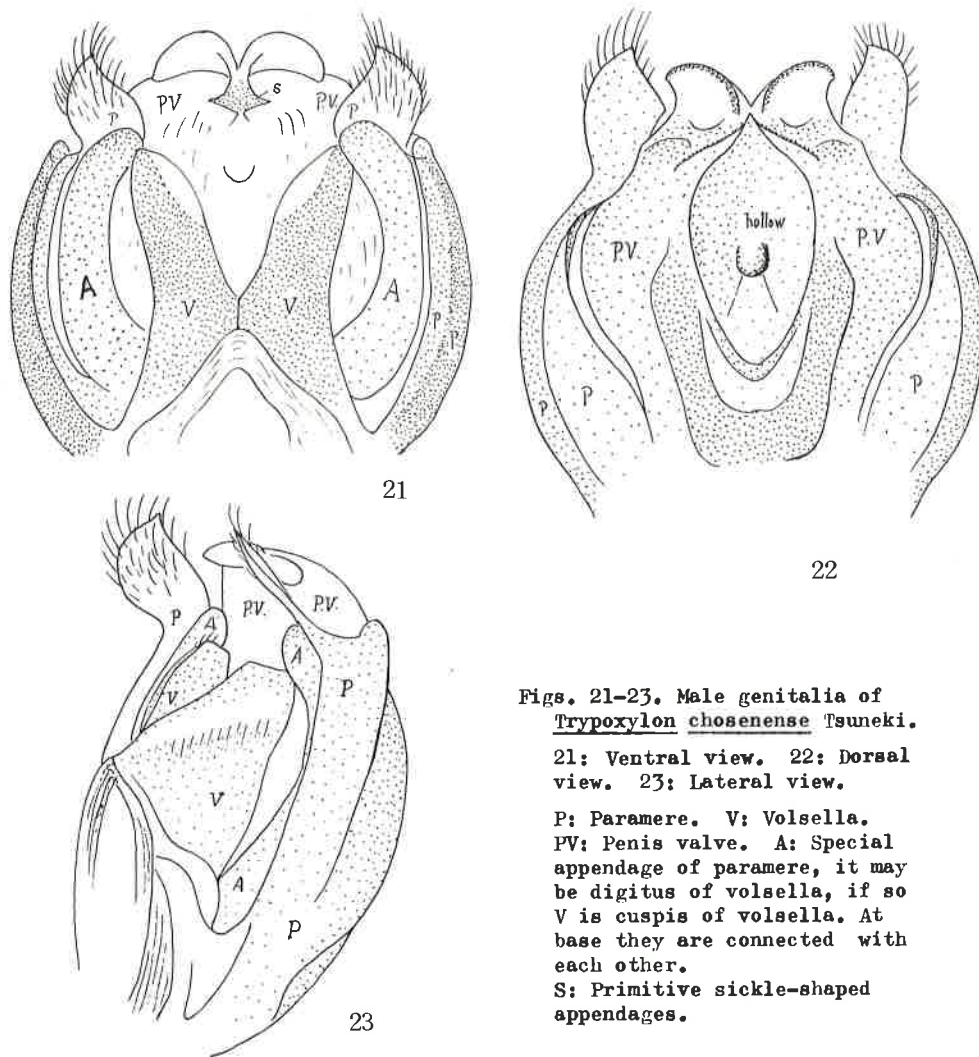
Figs. 14-20 (♂), 24-25 (♀). Trypoxylon chosense Tsuneki

The reexamination of the specimens above listed made it clear that this species is very similar in external characters to *T. medium* Beaumont, 1945, but is different from this in that in ♂: antennal flagellum without tyloidea and basal joints relatively somewhat longer and slenderer, sculpture of area dorsalis not obliquely rugose and genitalia with constituent parts (P, V, PV) much more broadened and curious (Figs. 21-23); in ♀ clypeus not so strongly produced anteriorly in middle and dorsum of propodeum not obliquely striate, but irregularly reticulate. In the form of apical margin of clypeus the female of *chosenense* rather closer to other forms of *figulus*, but can easily be distinguished from them by the sculpture of propodeum. In the structure of SAT-ASR (Figs. 14-17) the present species is very similar also to *T. ferrugineum* (cf. SPJHA, 9, Figs. 146-147 and *Ibid.*, 12, Figs. 75-76), but is markedly differs from it at least in the general colouration and in the structure of antenna.

Supplement to original description

♂. Tibial spurs ferruginous, fore tarsus brown, sometimes fairly pale, sometimes considerably dark, mid and hind tarsi also more or less brownish.

Head in frontal view wider than long, W:L=100:88, sides rounded, very slightly convergent towards clypeus, frons gently roundly raised, medial furrow very weak, SAT-



Figs. 21-23. Male genitalia of *Trypoxylon chosenense* Tsuneki.

21: Ventral view. 22: Dorsal view. 23: Lateral view.

P: Paramere. V: Volsella. PV: Penis valve. A: Special appendage of paramere, it may be digitus of volsella, if so V is cuspis of volsella. At base they are connected with each other. S: Primitive sickle-shaped appendages.

ASR: Figs. 14 (dorso-lateral), 15 (obliquely from above), 16 (ventro-lateral), 17 (nearly lateral), anterior transverse carina laterally becomes higher due to posterior excavation (Fig. 15), medio-apical inclined area (=IAA) medianly bluntly ridged, but not acutely carinate (Fig. 16). Clypeus: Fig. 18, disc broadly roundly raised, with top of elevation slightly above middle, apical marginal area weakly reflected, antennal flagellum without tyloidea, $Al_3=Al_1+12$ and markedly attenuate apically and strongly curved (Fig. 19). Occipital carina complete, but weak behind buccal cavity.

Measurements in allotype δ :

HW, HL, IODv, A3, Al3, P=100, 56, 34, 16, 16, 82. IODs=10:8.7. OOD, Od, POD=3, 5, 5. $A_3=AW \times 1.8$. $A_3, 4, 5=10, 9, 9$. $Al_3 \div BW \times 2$ and $\neq Al_1+12$. P, Ma, Mi, 2(Ma), 3(Ma)=100, 42, 22, 60(68), 54(80). RC=B. Rl short, $CV_1=CV_2 \times 3$. $TCV:CV_2 \div 5:4$. TCV medianly bent in, angle at base about 105° and at apex about 120° . (Venation except RC and Rl variable, in two other males $CV_1=CV_2 \times 3.4$ and 2.9, $TCV:CV_2 \div 1:1$ and 1:1, TCV in one straight and in the other weakly bent in medianly, angle at apex 110° and 120° .)

Collar of pronotum with anterior part narrow ridge-like, only slightly widened towards sides, but anterior margin straight, hence posterior part narrowed laterally and with posterior half discoloured, appears brown, lamina on side not well developed, rounded and slightly incrassate (Fig. 20, L, left one, C: collar, T: tubercle), parapsidal suture on mesoscutum in a fine shining raised line, mesopleuron at subalar area normal; propodeum with lateral carinae, carinae distinct, originating at a short distance behind spiracle and reaching middle of outer side of lateral carina of area apicalis, area dorsalis completely without lateral furrows, area apicalis deeply hollowed, surface shining and medianly longitudinally ridged, posterior margin (=GSR) thick, only gently roundly elevated.

Dorsal and ventral views of male genital organs were already given in original description (Pl. 4, Figs. 9 and 10). Remarkable is the fact that penis valve markedly roundly expanded laterally (Figs. 21, ventral and 22, dorsal views) and constricted before apical lobe, but without distinct shouldered areas, sickle-shaped appendages not well developed, only a pair of small triangular process (Fig. 21, S), dorsal side of penis valve bearing a broad hollow at the centre (Fig. 22); paramere also broad and lamellate, simple at apex and slightly constricted before apical lobe, volsella very well developed and large (V in Figs. 21 and 23), accompanied with one other pair of appendages behind it and on both sides of penis valve (A in Figs. 21 and 23); certainly volsella developed into cuspis and digitus, A: digitus and V: cuspis. Apical half of paramere covered with pubescence on ventral side.

Frons microreticulate, without puncture, but in some condition some of the meshes appear to be very minute flat-bottomed punctures, mesoscutum very finely and very closely punctured, PIS filled with micronetwork and surface nearly mat, punctures on mesopleuron somewhat larger and sparser, weak microsculpture also somewhat larger and as a whole much finer and weaker upwards, hence epimeral area fairly shining; area dorsalis usually finely rugoso-reticulate, at base coarsely and apically finely and weakly so, but sometimes whole the surface irregularly rugoso-reticulate, sometimes at base strongly and coarsely crenate and sometimes somewhat stronger rugae defined on disc; lateral series of striae rather sparse and somewhat stronger posteriorly, interspaces of striae feebly microcoriaceous, sides obliquely, closely and distinctly striate.

♀ . Similar to δ in general, except sexual characters, but pronotal lamina more regularly roundly produced (Fig. 24), clypeus more produced (Fig. 25). Measurements:

HW, HL, IODv, A3, P=100, 56, 29, 15, 92. IODs=10:7.5. OOD, Od, POD=4, 9, 10. $A_3=AW \times 2.2$. $A_3, 4, 5=10, 9, 9$. P, Ma, Mi, 2(Ma), 3(Ma)=100, 35, 19, 60(52), 64(67). RC=B, Rl short, $CV_1=CV_2 \times 3.6$. $TCV:CV_2 \div 5:4$. TCV considerably markedly incurved, angle at base about 105° and at apex about 120° .

On TRYPOXYLON FIGULUS (LINNEUS, 1758)

In connection with characters of the East-Asiatic forms of this species the re-examination of European specimens of *T. figulus* (Linné) will be made with new method.

J. de Beaumont in his 1945 paper divided the European specimens of *figulus* into three forms, namely major Kohl, medium (he called media) Beaumont and minor Beaumont. He gives further comments on these three forms in his 1963 paper and 1964 book.

According to his explanation f. major is a larger form (♀ 9-12, ♂ 7.5-10 mm) in which punctures on mesopleuron fine, sparse but distinct, dorsum of propodeum longi-

tudinally, fairly regularly striate, clypeus in ♀ moderately produced, hind coxa with a comparatively large piliferous fovea beneath (= modified hind coxal tubercle) and AL3 in ♂ \geq A9-12; medium is the medium-sized form (♀ 6.5-10, ♂ 6-8.5 mm) in which punctures on mesopleuron dense but not very clear, dorsum of propodeum obliquely striate, clypeus in ♀ strongly produced, hind coxal fovea less developed, and AL3 A10-12; while in smallest minor (♀ 6-9, ♂ 5-7.5 mm) punctures on mesopleuron sparse and not very distinct, dorsum of propodeum more or less irregularly striate, clypeus in ♀ weakly produced anteriorly, hind coxal fovea little developed and AL3 as in major. These forms are not distinctly geographically segregated and can not be separated as subspecies, though in Switzerland major frequents Alpine area and minor flatland, while medium is very scarce.

Some authors, e. g. Blüthgen, 1951, Wolf, 1959, Bohart & Menke, 1976, consider them as a subspecies respectively, while some others, e. g. Noskiewitz & Pulawski, 1960, Valkeila, 1961, Balthazar, 1962, deal with them as variations within a species.

Heinrich Wolf, 1959, dealt with these forms as subspecies (he called these majus medium and minus) and presented a new key, especially as regards ♂ he used the characters of genital organs. But the external characters used by him (e. g. anterior impressed lines of mesoscutum, punctures at epimeral area of mesopleuron, sculpture on area dorsalis) are considerably variable ones (the former two in connection with size of body) and the characters of male genitalia are not always consistent with my own observation. His minus var. rubi is, as pointed out by Beaumont, 1963, certainly nothing else than medium itself and this fact indicates at the same time that his key is unreliable.

On the other hand, the Valkeila's opinion is worth listening. "Professor J de Beaumont hatte die Freundlichkeit, einige finnische Stücke der Art zu identifizieren. Ich hatte zu diesem Zweck nur solche Exemplare ausgewählt, die aus vielzelligen Nestern gezogen waren. Alle drei Formen waren in diesem Material vertreten und sind wahrscheinlich in Finland häufig. Alle Individuen aus einem Nest gehören gewöhnlich ein und derselben Form an, es wurden aber auch zwei Formen, z.B. die var. major und var. minor, in demselben Nest gefunden, und ich glaube auf Grund von diesen und auch anderen Zuchtbeobachtungen, dass verschiedene Varietäten tatsächlich in ein und demselben Nest als Nachkommen eines einzigen Weibchen vorkommen können.

Auf Grund dieser Beobachtungen halte ich es für sehr wahrscheinlich, dass die oben erwähnten Formen keinen subspezifischen Wert haben. Im Vergleich zu mehreren europäischen Raubwespen wie T. figulus, auch wenn die Art in diesem Sinne aufgefasst wird, nicht besonders variabel, und es erscheint mir unnötig, die Formen mit besonderen Namen zu belegen.

He further says that here might be mentioned, that Tsuneki (1956) aus dem Fernen Osten zwei Unterarten von T. figulus beschrieben hat, nämlich koma Tsun. aus Korea und yezo Tsun. aus Japan. Im Hinblick auf die Variabilität der Art in Europa wäre eine Nachprüfung des taxonomischen Wertes dieser Formen sicher angebracht.

Later I will answer his presentation (but regret he has already died).

J. de Beaumont inclines to the opinion of Valkeila, because these forms are not segregated either ecologically or geographically from each other and frequently occur intermediate and doubtful forms between them.

In my opinion the punctuation of the thorax and the sculpture of area dorsalis (though in figulus area dorsalis is not distinctly marked off) are considerably variable in most of the species of this genus and the use of these characters must be based on the statistic result, and yet we must except the occurrence of some exception. The state of the fovea on top of the coxal organ is also variable according to the size of the specimens.

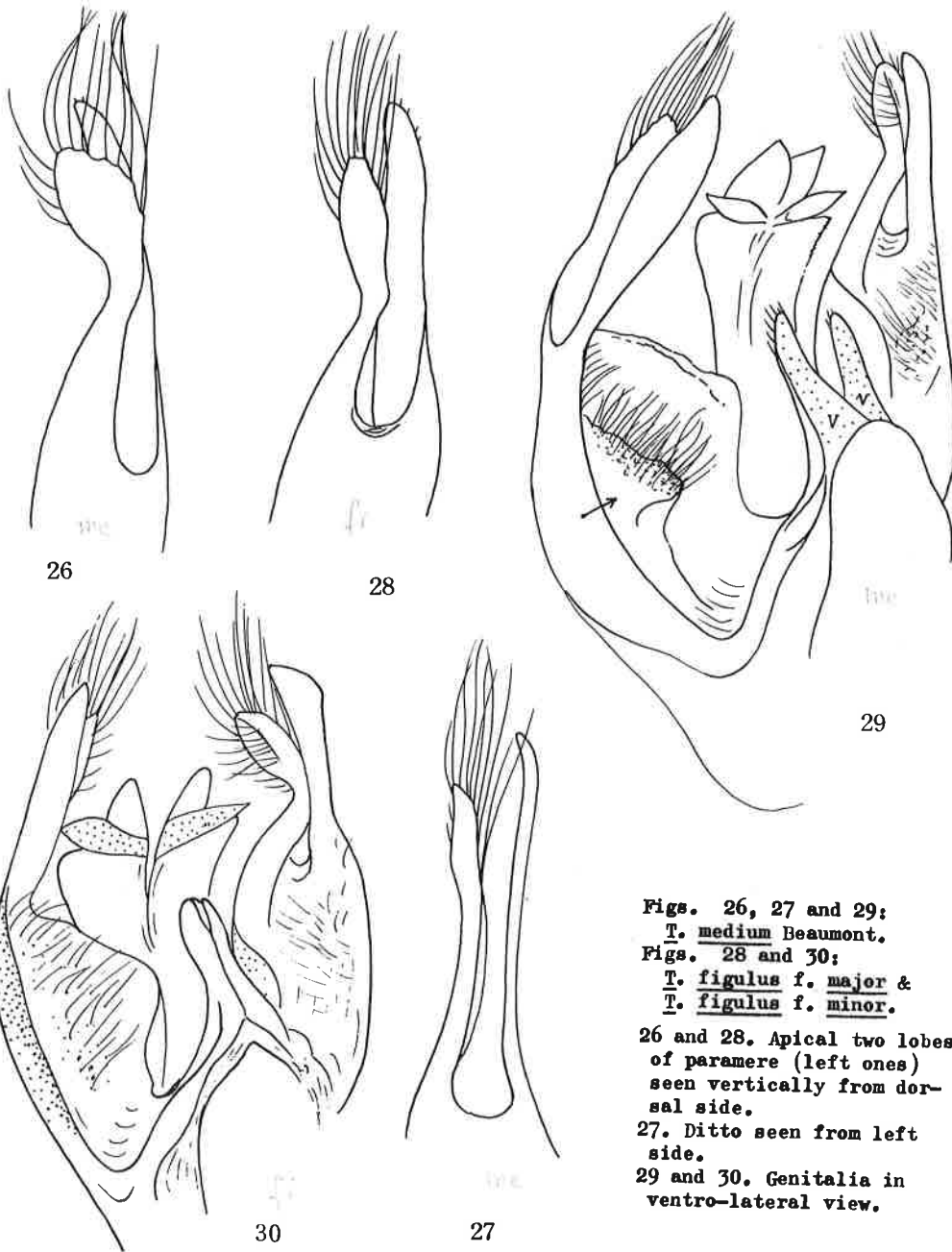
I reexamined the specimens of this species from Europe in my collection with new method (see Table 1). The conclusion arrived at by me is that forms major Kohl and f. minor Beaumont are simply the variation within figulus (Linné), while medium Beaumont is a good species, different from figulus. The main reason for this is that medium is different in the detailed structure of the paramere of the male genital organs: (1) Dorsal one of apical two lobes, seen vertically from dorsal side, has the apical enlarged area much broader and more rounded (Fig. 26) than in major and minor (Fig. 28, in both similar) and (2) basiparamere has a subtriangular swelling carrying a tuft of pubescence on ventral surface as given in Fig. 29 (genitalia in ventro-lateral view), while in two others the area simply sparsely pubescent, without prominence (Fig. 30). Beaumont already mentioned the presence of abundant pubescence on ventral surface of paramere, but he did not notice the presence of the haired prominence, Wolf says that in major (his majus) "Squamra des Stipes auf der Innenkante ohne jede Bewimperung", but this is incorrect, in a complete condition apical area of dorsal

lobe fringed with long curved hairs, while ventral one almost hairless, only with a few very short indistinct hairs at apical margin (Figs. 26-30).

The specific difference of so-called forma medium is already suggested by the marked difference in the form of clypeus (♀) and A13 (♂) from other formae. As to clypeus compare Fig. 43 (medium) and Figs. 34 (major) and 35 (minor) and as to A13 it is distinctly shorter than A10-12, while in the others it is A10-12 and A9-12.

My conclusion above mentioned is not contradictory with the rearing results by Valkeila. He does not mention that medium and other forms come out from one and the same nest, though according to his conclusion it appears that such is the case.

As to the East Asiatic forms the subspecific status of each of them is reconfir-



Figs. 26, 27 and 29;

T. medium Beaumont.

Figs. 28 and 30;

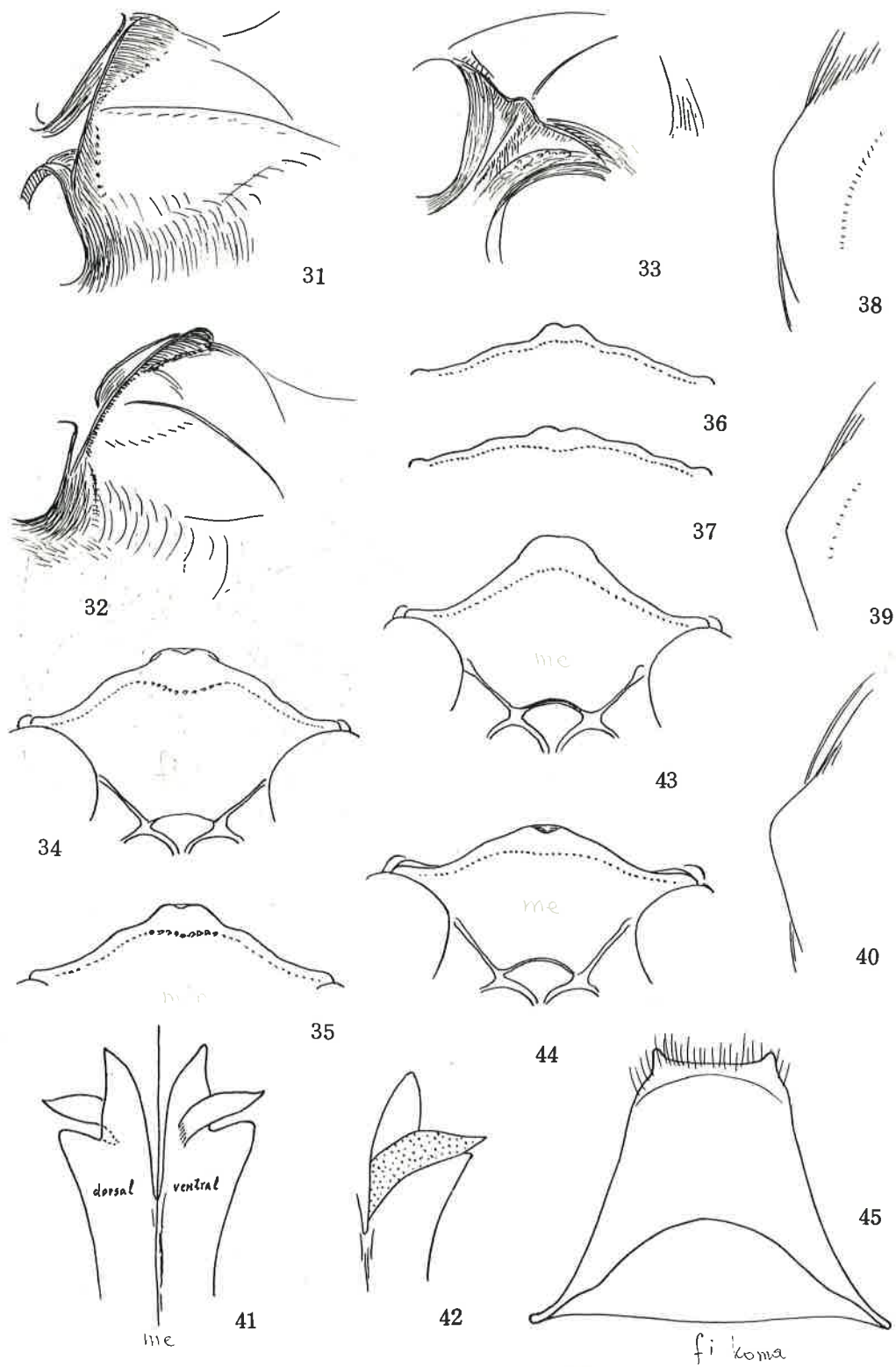
T. figulus f. major &

T. figulus f. minor.

26 and 28. Apical two lobes of paramere (left ones) seen vertically from dorsal side.

27. Ditto seen from left side.

29 and 30. Genitalia in ventro-lateral view.



Figs. 31-45. 31-42 and 45: *T. figulus* (Linnaeus); 33-44: *T. medium* Beccant.

ed, mainly from the statistic results (Table 1).

In the Korean specimens (*ssp. koma* m.) IODv is relatively much wider and IODs is relatively smaller (♀ ♂), A3 is slightly shorter (♀), apical margin of clypeus more strongly undulate (and TCV is nearly straight, especially in ♀); while in the Japanese specimens (*ssp. yezo* m.) apical transverse carina of SAT is generally weaker at median area and frequently disappeared there and the matters concerning IODv and IODs, apical form of clypeus (and TCV) are as in *koma* and strictly more markedly so. In *yezo* further, in the relative width of IODv there is an averaged difference between the specimens from Hokkaido and those from Honshu (Table 1), but there some exceptions and they can not clearly be separated by this character into two forms.

Details on the sculpture of the body of the East Asiatic forms will be treated in the respective section of the two subspecies.

On some other characters.

(1) Trypoxylon figulus (Linneus)

Head in frontal view with sides rounded, not convergent below, W:L=100:90 (♀, major and minor) or =100:85 (♂, ditto), eye incision broad and shallow, strongly narrowed towards sinus, sinus fairly broadly rounded, dorsal margin inclined outwards, frons gently raised, median furrow shallow and fine (♀), or shallow and somewhat broad (♂), SAT-ASR seen from above and obliquely from left side: Fig. 31, somewhat from more dorsally: Fig. 32, in ventro-lateral view: Fig. 33, anterior aspect of SAT (in this case = IAA) medianly bluntly ridged, but sometimes the ridge feeble or incomplete, clypeus in ♀: Figs. 34 (larger form), 35 (smaller form), in ♂: Fig. 36 (large form), 37 (small form), disc broadly, gently roundly raised, in ♂ A4 (or 5)-A10 (or 11) provided with blunt tyloidea beneath, on A9-11 weaker, in lateral view distinctly roundly swollen out beneath on A4-8.

Measurements (with medium - asterisked -, and *ssp. koma* and *yezo*) in Table 1.

Lamina on side of pronotum: Figs. 38 (mainly in large ♀ and most ♂), 39 or 40 (small ♀). Male genitalia in ventro-lateral view: Fig. 30, apical part of left paramere in dorso-vertical view: Fig. 28, apical part of penis valve: Fig. 41 (left half dorsal, right half ventral), notice the well developed and raised shoulder' base of sickle-shaped appendages sometimes as in Fig. 42 (ventral). Sternite 8 as in Fig. 45.

By the measurements an interesting fact regarding *figulus* ♀ has been brought to light. It is that the IODc is somewhat greater than IODv, namely frons is somewhat wider at base of clypeus than at vertex. This is quite exceptional among the members of the present genus.

Propodeum with lateral carinae, carinae at base and at apex disappeared, series of striae along lateral carinae distinct, but rather sparse, area dorsalis not enclosed with furrow, but sometimes posterior portion feebly marked off with feeble furrow, disc from base longitudinally, somewhat obliquely closely striate or rugoso-striate, degrees of "oblique" are considerably varied, median furrow transversely striate, striae frequently on posterior portion become arcuate and sometimes circled concentrically, size of its outline considerably varied, when circle is large, striae on disc become more oblique; in small specimens medio-apical circled sculpture and oblique or rugosed striae on disc are certainly very frequent and in large ♀ this is not the case, but nearly longitudinally and regularly closely striate as explained by Beaumont on major Kohl, but in some small form the sculpture of area dorsalis is completely as in major ♀ and in some large ♂ it is completely as in most of small form. Sides of propodeum obliquely closely striate.

Frons distinctly microcoriaceous and somewhat sparsely superimposed with fine flat-bottomed punctures, punctures sometimes very indistinct; mesoscutum strongly microcoriaceous and closely superimposed with fine punctures and at posterior margin coarsely crenate.

(2) Trypoxylon medium Beaumont

As mentioned earlier this species is externally very close to T. figulus except antenna (♂) and clypeus (♀).

Eye incision appears somewhat broader and more broadly rounded at sinus than in figulus. Clypeus in ♀: Fig. 43, in ♂: Fig. 44. SAT-ASR as in Figs. 31-33. Pronotal lamina as in Figs. 39 or 40. Male genitalia in ventro-lateral view: Fig. 29, apical part of paramere in dorsal view: Fig. 26, in lateral view: Fig. 27.

Superimposed punctures on frons somewhat deeper than in figulus and not flat-bottomed, dorsum of propodeum in the present female from Holland somewhat coarsely

longitudinally striate, on median furrow almost without transverse striae, intervals of striae partly finely rugulose; in the present male basal half of the area obliquely coarsely rugoso-striate, on the rest finely, irregularly rugoso-reticulate, median furrow on basal area coarsely rugoso-striate, main striae transverse, on apical area

Table 1. Measurements of Trypoxylon figulus (L.) and T. medium Beaum.*

Loco	S	BL	HL	IODvA3(L/W)	Aul(L/W)	P	IODs	ODOdPD	A4A5Ma	Mi	2(Ma)	3(Ma)	CV1	T:C	Ang.					
Pol.	♀	12.3	54	28	19(3.3)	18(2.3)	94	11.0	3	5	5	8	8	39	18	58(54)	52(57)	4.8	7:5	110
Holl.	♀	12.5	55	29	18(2.8)	19(2.4)	90	11.0	3	5	6	8	8	42	20	60(62)	56(73)	4.0	5:5	100
Holl.	♀	12.5	53	30	19(3.0)	18(2.3)	94	10.5	3	4	5	8	8	39	18	65(60)	60(70)	4.0	5:5	95
Pol.	♀	7.5	54	28	19(3.0)	18(2.2)	87	11.0	4	7	9	9	8	46	22	56(65)	52(76)	4.0	6:5	100
Pol.	♀	9.0	54	29	18(2.7)	19(2.2)	86	11.0	3	5	6	9	9	47	22	62(62)	60(72)	4.4	7:5	95
Pol.	♀	9.5	55	28	18(2.5)	17(2.2)	90	11.0	3	5	6	8	8	47	22	60(64)	54(74)	4.4	7:5	100
Holl.	♀*	8.0	56	31	18(2.5)	18(2.0)	86	10.0	3	5	6	8	8	48	21	58(60)	56(72)	4.0	7:5	100
Pol.	♂	8.5	56	34	16(2.0)	30(2.7)	86	8.5	3	4	4	8	8	45	21	60(66)	60(75)	3.5	5:5	105
Pol.	♂	10.0	56	32	16(1.8)	30(2.9)	85	9.0	3	3	5	9	8	44	23	60(64)	60(78)	4.4	7:5	105
Holl.	♂	7.5	57	34	14(1.7)	28(2.3)	87	8.0	3	4	5	8	8	47	20	56(68)	48(84)	4.4	7:5	105
Holl.	♂	8.7	56	35	16(1.7)	28(2.3)	90	8.0	3	3	4	8	8	46	21	60(70)	50(76)	3.8	6:5	105
Pol.	♂	6.5	57	32	16(1.8)	26(2.3)	80	8.5	3	4	5	8	8	48	22	56(70)	54(80)	3.2	6:5	110
Pol.	♂	6.0	53	32	15(1.7)	26(2.6)	76	8.0	3	4	5	9	8	54	24	58(72)	54(86)	4.0	7:5	95
Holl.	♂*	7.0	54	33	14(2.3)	18(1.9)	74	8.5	3	3	5	9	9	52	24	56(72)	52(82)	4.6	8:5	100
Korea																				
Kodai	♀	8.5	52	34	17(2.6)	18(2.2)	80	9.2	3	4	5	8	7	46	22	60(66)	63(80)	3.6	6:5	95
Kodai	♀	7.5	54	34	17(2.7)	18(2.1)	74	9.0	4	5	7	9	8	52	23	56(72)	62(84)	3.4	5:5	100
Seoul	♀	9.0	52	34	18(2.7)	19(2.3)	80	9.0	3	4	5	9	9	52	23	62(62)	62(70)	3.9	5:5	95
Kodai	♀	9.3	54	34	19(3.1)	19(2.3)	86	9.5	2	2	3	9	8	46	22	54(66)	56(80)	4.2	7:5	90
Kodai	♂	7.5	57	37	15(1.9)	27(2.5)	82	7.8	5	5	6	9	9	48	23	60(64)	58(78)	3.5	6:5	105
Kodai	♂	6.5	56	36	16(2.0)	30(2.6)	74	8.0	4	5	7	8	8	46	24	62(64)	64(84)	3.6	6:5	105
Sambo	♂	7.0	56	35	15(1.7)	28(2.7)	76	8.1	4	4	5	8	8	46	22	56(72)	53(84)	3.5	6:5	100
Kodai	♂	6.5	57	36	14(1.8)	29(2.5)	78	8.0	4	4	6	8	8	49	24	56(50)	50(72)	2.8	5:5	110
Kodai	♂	6.5	54	38	15(1.7)	30(2.7)	75	7.5	5	4	6	8	7	52	22	52(70)	60(86)	3.1	5:5	105
Japan																				
Hokk.	♀	8.5	55	36	20(3.0)	20(2.5)	84	8.5	3	3	5	8	8	46	22	56(66)	54(78)	3.7	9:8	95
Hokk.	♀	8.0	52	35	19(3.1)	19(2.4)	80	8.0	4	4	5	9	8	47	23	60(68)	50(76)	4.5	6:5	95
Hokk.	♀	8.5	53	35	18(2.5)	18(2.3)	80	8.0	4	4	5	9	8	54	25	58(68)	50(77)	3.7	6:5	95
Fukui	♀	8.5	52	32	18(3.1)	18(2.4)	74	8.7	5	6	7	9	8	60	27	60(76)	56(94)	4.1	7:5	90
Kyoto	♀	9.2	54	32	18(2.9)	17(2.2)	84	9.0	3	3	5	8	7	44	21	58(60)	50(70)	3.2	6:5	95
Fukui	♀	8.5	52	32	18(2.9)	19(2.5)	84	9.0	6	7	9	8	8	42	21	58(55)	50(67)	3.8	6:5	90
Fukui	♀	7.8	54	34	18(2.9)	18(2.3)	84	9.0	4	4	5	8	7	43	20	56(63)	56(72)	2.8	8:9	95
Fukui	♀	8.0	52	36	18(2.7)	18(2.3)	86	8.7	4	4	5	8	7	40	22	58(58)	54(70)	4.5	7:5	90
MtHak	♂	7.0	55	35	15(1.8)	24(2.4)	80	8.0	4	4	5	8	8	40	22	52(60)	46(68)	3.4	5:5	90
Fukui	♂	7.3	56	36	16(2.0)	24(2.3)	82	7.5	4	4	6	8	7	42	22	52(58)	54(70)	2.9	5:5	95
Fukui	♂	6.5	52	37	15(2.0)	25(2.5)	76	7.3	4	4	5	9	8	42	24	62(60)	58(74)	3.0	5:5	90

Remarks. S... Sex. BL... Body length. HL... Head length (seen from above). IODv... Interoocular distance at vertex. A3... Antennal joint 3. L/W... Ratio of length to width. Aul... Ultimate antennal joint (in ♀ Al2 and in ♂ Al3). P... Gastral petiole. IODs... Ratio of IODs (IOD at base of clypeus) to IODv. ODOdPD... Ratio between OOD, Od and POD (see Abbreviation..p. 91). CV1... Ratio of CV1 to CV2. T:C... TCV:CV2. Ang. = Angle between TCV and CV2.

Pol., Poland. Holl., Holland. Hokk., Hokkaido. MtHak, Mt. Haku.

striae gradually weaker, reticulation finer and finally surface almost without striae and shining. Sides of the segment obliquely, very finely and very closely striate all over, without smooth area even on hind-femoral sinus.

6, A. TRYPOXYLON FIGULUS KOMA TSUNEKI, 1956

Trypoxylon figulus koma Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci.,

6 (1): 28, 1956 (♀ ♂ Korea).

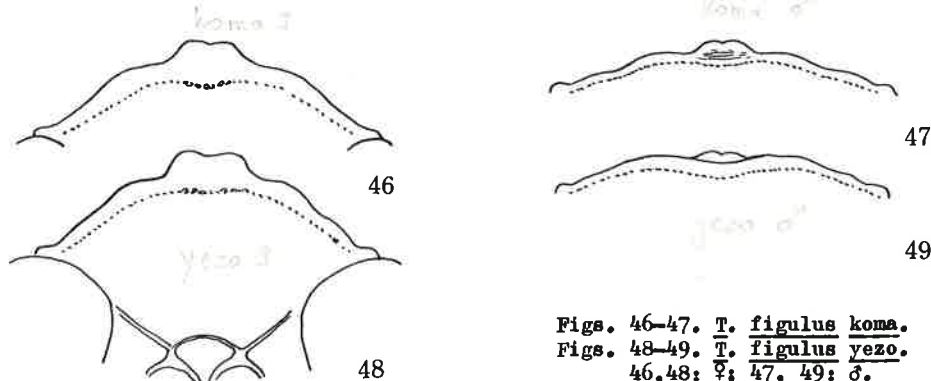
Specimens examined:

3 ♀ 4 ♂, Korea, Mt. Kodai (near 38 line, at present in N. Korea), 22, 24. IV, 2, 9. V. 1943; 1 ♂, Mt. Sambe (ditto), 10. V. 1941; 1 ♀, Seoul (northern suburbs), 29. V. 1943, all leg. K. Tsuneki.

♀ 7.5-9.5 mm, ♂ 6.5-7.5 mm. IODv is relatively greater and IODs distinctly smaller than in European specimens (Table 1), TCV always nearly straight, only rare- in ♂ gently incurved, never acutely bent in middle as done in the European.

Eye incision as in typical, frontal elevations also similar, surface nearly flat, but always with a fine shallow, fairly shining impressed line in middle, SAT-ASR as in European forms, but sometimes with anterior transverse carina of SAT feeble in median area, clypeus in ♀: Fig. 46, in ♂ usually as in Fig. 47, but in one as in Fig. 37. Structure of male antenna as in typical, A13 A10-12, but A9-12, tyloidea defined on A5-11, sometimes also on 4 and on 12, though very feeble. Measurements (♀ ♂) in Table 1. Pronotal lamina mostly as in Figs. 39 Or 40, but in one ♀ as in Fig. 38. Sternite 8: Fig. 45; genitalia as in Fig. 30, penis valve as in Figs. 41, 42. Body size not so large as in *f. major*.

Mesopleuron microcoriaceous and always closely and distinctly superimposed with fine punctures, but in ♂ somewhat less distinct due to stronger microreticulation on PIS, in general much weaker on epimeral area. Sculpture on dorsum of propodeum more or less variable: ♀, in two specimens longitudinally striate (in one close, in one sparse), in two others obliquely so (in one close and in the other sparse), in the latter medio-apical area with circled striae, in one of them circle large, while in other small; ♂, in allotype obliquely, very finely and closely rugoso-striate, in some direction almost finely and irregularly reticulate; in one of the rest nearly longitudinally, closely striate, but on medio-apical area striae minutely circled, in two others obliquely coarsely striate or rugoso-striate. Sides obliquely, finely and closely striate all over.



Figs. 46-47. *T. figulus koma*.
Figs. 48-49. *T. figulus yezo*.
46, 48: ♀; 47, 49: ♂.

6, B. TRYPOXYLON FIGULUS YEZO TSUNEKI, 1956

Trypoxylon figulus yezo Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci.,

6 (1): 29, 1956 (1 ♀, Hokkaido: Jozankei, 1 ♂, Honshu: Mt. Haku, 1 ♀, Kyoto).

Trypoxylon figulus yezo: Haneda, Life Study (Fukui), 12 (1-2): 44, 1968 (1 ♀ 2 ♂, Ishikawa); Ibid., 12 (3-4): 55, 1968 (3 ♂, Nagano).

Trypoxylon figulus yezo: Nambu, Saitama Seibutsu, 9: 17, 1969 (8 ♀ 6 ♂, Saitama).

Trypoxylon figulus yezo: Haneda, Life Study, 13 (3-4): 68, 1969 (3 ♀ 5 ♂, Yamanashi).

Trypoxylon figulus yezo: Tsuneki, Ibid., 14 (2): 40, 1970 (1 ♀, Fukui).

Trypoxylon figulus yezo: Murota, Hym. Comm., 5: 21, 1978 (1 ♀ 1 ♂, Hokkaido: Kamikawa)

Trypoxylon figulus yezo: Suda, Ibid., 8: 4, 1978 (3 ♀ 4 ♂, Yamanashi).

Trypoxylon figulus yezo: Nambu, Saitam Anim., p. 193 (rare).

Trypoxylon figulus yezo: Tsuneki, Ins. Niigata Pref., p. 9, 1979 (1 ♀, Niigata).

Specimens reexamined:

3 ♀, Hokkaido (Jozankei, 9. VIII. 1952, K. Tsuneki; Mt. Hakodate, 21. VII. 1958, M. Munakata; Esashi, 10. VI. 1959, M. Munakata); 1 ♀, Kyoto, 4. VIII. 1936, T. Kimura; 1 ♂, Ishikawa (Mt. Haku), 13. VII. 1955, K. Tsuneki; 4 ♀ 2 ♂, Fukui, VI. VII, VIII, X. 1959-73, K. Tsuneki.

Closely resembles in general characters the Korean subspecies, but in yezo apical transverse carina of SAT is very frequently obsolete in middle and if defined very feeble and indistinct, in ♀ A3 slightly longer and in Hokkaido specimens IODs distinctly somewhat smaller (Table 1), in ♂ Al3 relatively slightly shorter and angle between TCV and CV2 more acute (Table 1) and in both sexes apical margin of clypeus more strongly undulate (Figs. 48 and 49, cf. Figs. 46 and 47).

But the structure of male genital organs and sternite 8 are similar to those of European and Korean specimen of figulus Linné.

Punctures on mesopleuron in Hokkaido ♀ less distinct than in koma, but in Honshu ♀ ♂ as distinct as in this. In Hokkaido specimens striae on dorsum of propodeum oblique and coarse, at medio-apical area concentrically circled or half circled, giving rise to oblique striae on disc; in Honshu ♀ ♂ generally similar, but in one ♀ striae nearly longitudinal, because medio-apical area without circled striae and the striae close to medial furrow gently outcurved to form a lenticular enclosure. Hind coxal fevea in both Hokkaido and Honshu ♀ ♀ always fairly large, but shallow and not marked.

Apical form of clypeus in ♀: Fig. 48, in ♂: Fig. 49, but in one ♂ as Fig. 47. Lamina on side of pronotum most as Fig. 37 or 40, but in one Hokkaido ♀, in one Honshu ♀ and in one Honshu ♂ close to Fig. 38.

7. TRYPOXYLON FRIGIDUM CORNUTUM GUSSAKOVSKIJ, 1933

Trypoxylon frigidum Smith, Cat. Hym. Ins. Brit. Mus., 4: 381, 1856 (♀, Hudson Bay, U. S. A.)

Trypoxylon cornutum Gussakovskij, Ark. Zool., 24 A (10): 11, 1933 (♀ ♂, Ussuri and Kantschatka).

Trypoxylon cornutum: Gussakovskij, Trav. Inst. Zool. Akad. Sci. USSR, 3: 656 (do.).

Trypoxylon frigidum cornutum: Tsuneki, Mem. Fac. Lib. Arts Fukui Univ., Ser. II, Nat. Sci., 6: 24, 1956 (Ussuri specimens, nec Japanese).

Trypoxylon frigidum chongar Tsuneki, Ibid., p. 25, 1956 (♂, Korea) (SYN. NOV.).

Present state of the syntype specimens:

♀. Pinned with No. 1 black insect needle (not steel), right antenna from A4 apically and left hind leg from tibia apically lost, wings expanded laterally and gaster curved down, about 8 mm in length. With 5 labels, from top: (1) 6 4 mm white slit, with Elisovo 5.VIII.28 handwritten in two lines, (2) 8 4 mm, Kantsch. Malaise pressed in two lines, (3) 16 6 mm, name label, Trypoxylon cornutum m. ♀ handwritten by Gussakovskij with black ink in two lines, with V. Gussakovskij det, pressed below, (4) Museum label, 15 6 mm blue card, with Riksmuseum Stockholm, pressed in two lines, (5) red number label, about 8 mm square, with 117, pressed and 81 handwritten in two lines.

♂. Similarly pinned, complete specimen, with wings obliquely raised posteriorly, with gaster stretched, 7.7 mm; with 5 labels: (1) 6 7 mm white label, 22.VI.30, handwritten with black ink, (2) 10 5 mm, Vladivostok Sedanka Malaise, pressed in 3 lines, (3) name label, 15 4 mm, folded in two, with cornutum m ♂, handwritten by Gussakovskij and V. Gussakovskij det, pressed below (the part of Trypoxylon is cut off), (4) and (5) are same as above.

Observation.

The specimens are same in colorific and structural characters as the Japanese specimens, even in the form of eye incisions and in the sculpture of area dorsalis, but Al3 is relatively distinctly shorter. Measurements of ♀ (within parentheses ♂): HW, III, IODv, A3, Al3, P=100, 52, 30, 16, —, 86 (100, 54, 34, 16, 16, 86). IODs=10:10 (10:8). OOD, Od, POD=3, 4, 4 (4, 4, 4). A3=AW×2 (AW×1.9). A3, 4, 5=10, 9, 8 (10, 9, 9). (Al3=BW×1.5 and > Al2, but < Al1+12). P, Ma, Mi, 2 (Ma), 3 (Ma)=100, 44, 22, 54 (36), 58 (70) (100, 42, 22, 60 (60), 56 (74)). RC=B, Rl short, CV1=CV2×3.2 (left), ×4.3 (right), TCV:CV2=5:4 (left), =5:3 (right) TCV bent in middle, angle at base about 100°, at apex about 110° (RC=B, Rl short, CV1=CV2×3.9 (left), ×4.1 (right), TCV:CV2=5:4 (left), =3:2 (right), TCV medianly strongly bent in, angle at base about 95°, at apex about 120° in both wings).

The female specimen is designated as lectotype, because it was mainly described by the original author.

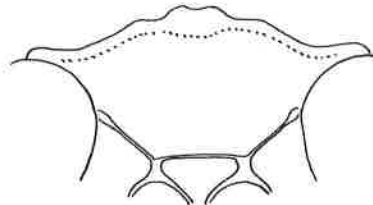
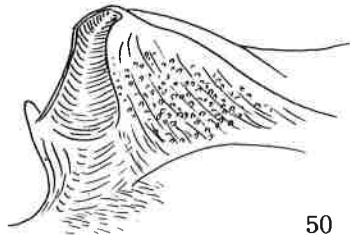
As to the structure of SAT-ASR mention will be made in connection with the North Korean specimen.

On the Korean specimen (δ) which was once called T. f. chongar m.

The specimen was collected by me on Mt. Nansetsu-rei, North Korea on July 24, 1943.

In regard to the East Asiatic specimens of T. frigidum it was considered at first that the Japanese representative of this species was identical with the Ussuri specimens and so the difference in some characters of the Korean relative led me to treat it as a different race. Now, by direct comparison it was made clear that the Korean specimen was the same as the Ussuri ones. On this occasion, therefore, some supplemental explanation on some important characters of the specimen will be made below:

In the structure of SAT-ASR the specimen is closer to typical race of frigidum occurring in North America than to the Japanese race, namely, SAT moderately high nasiform, with lateral inclinations oblique, with transverse carina anteriorly which is connected with ASR at ends, but antero-lateral furrow just behind transverse carina much deeper than in typical race (Fig. 51, dorso-lateral view), median carina at medio-apical area of SAT (= IAA in this case) markedly higher than in both compared. Further, Al_3 is relatively shorter (see measurements) than Al_1+12 and in this character differing from both compared. Relative value of $IODv$ closer to Japanese race, of A_3 intermediate between them and of $IODs$ distinctly smaller than in both. In clypeus similar to both (Fig. 51); lamina on side of pronotum broadly rounded as in Fig. 38, but more distinctly produced over peripheral line; punctures on frons more distinct



T. frigidum cornutum Guss., Korean specimen δ

and close, on mesopleuron also distinct and close. Striae on area dorsalis more distinctly and strongly rugulose all over and the surface appears irregularly reticulate.

Length about 8 mm, A_4-10 with tyloidea beneath, genitalial structure quite identical with those of other races. Measurements:

HW, HL, $IODv$, A_3 , Al_3 , $P=100, 56, 35, 15, 16, 86$. $IODs=10:8$. $OOD, Od, POD=4, 4, 5$. $A_3=AW \times 1.8$. $A_3, 4, 5=10, 10, 10$. $Al_3 \div BW \times 1.7$ and distinctly Al_1+12 . $P, Ma, Mi, 2(Ma), 3(Ma)=100, 41, 23, 54(60), 52(68)$. $RC=B$, Rl short, $CV1=CV2 \times 3.6$, $TCV:CV2=7:5$, TCV nearly straight, angle about 100° .

7. B. TRYPOXYLON FRIGIDUM YAMATONIS SSP. NOV.

Trypoxylon frigidum cornutum: Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci., 6 (1): 24, 1956 (δ , Japanese specimens, nec Ussuri specimens).

Trypoxylon frigidum cornutum: Tsuneki and Japanese authors, 1956-80.

Specimens reexamined: 43 δ 101 δ , Hokkaido, Aomori, Niigata, Tochigi, Ishikawa, Fukui, Tokyo, Shizuoka and Hyogo.

As mentioned above I have considered that the Japanese specimens of T. frigidum have the identical characters with the Ussuri race, because as far as the description goes we can not find any difference between both and so I adopted the same subspecific name, cornutum Gussakovskij. However, through the direct comparison with the syntype specimens of cornutum it has been clarified that the Japanese specimens differ from the Ussuri race in that SAT is more highly raised, with lateral inclinations much steeper

and in ♂ Al3 is relatively somewhat longer — amply as long as All+12, in *cornutum* distinctly less than All+12 —. Here it has been discovered that *T. f. shongar* (♂) is a complete synonym of *T. f. cornutum*. Thus it has become necessary to give a new subspecific name to the Japanese race.

In the structure of SAT ssp. *cornutum* is rather closer to typical race than to the Japanese, but in the measured values of bodily parts it differs from the typical and rather close to the Japanese (Table 2) and, moreover, in the relative length of Al3 it differs from both the typical and Japanese races.

Table 2. Measurements of *Trypoxylon frigidum* Smith and its Japanese race

Loco	S	BL	HLIODVA3(L/W)	Anl(L/W)	P	IODs	ODOdPD	A4A5	Ma	Mi	2(Ma)	3(Ma)	CVI	T:C	Ang					
W Va*	♀	8.5	54	27	18(2.5)	17(2.1)	90	11.0	2	5	5	9	8	38	20	60(52)	58(70)	4.0	6:5	95°
Wyo*	♀	8.5	54	30	18(2.6)	18(2.2)	80	10.5	4	8	7	9	8	40	19	60(56)	58(67)	4.0	6:5	95
W Va*	♀	8.7	56	27	18(2.3)	17(2.2)	92	11.0	4	9	9	9	8	39	18	58(56)	56(68)	3.6	6:5	100
Mieh*	♂	7.0	56	30	16(1.8)	18(1.8)	94	9.0	4	7	8	8	8	40	20	56(56)	46(64)	3.8	7:5	100
Mieh*	♂	8.0	56	30	15(2.0)	19(1.8)	83	9.0	3	4	4	10	9	43	21	54(60)	50(74)	3.4	6:5	95
Mieh*	♂	8.0	54	30	14(2.2)	19(2.0)	95	9.0	3	5	6	10	9	37	18	58(50)	48(64)	4.0	6:5	95
Hokk.	♀	9.0	52	32	16(2.2)	18(2.2)	94	10.0	3	4	4	10	9	41	21	56(54)	57(68)	3.2	5:5	95
Hokk.	♀	8.5	52	30	16(2.3)	18(2.2)	94	10.5	3	5	5	10	9	44	20	54(64)	50(74)	3.1	5:5	95
Aomori	♀	8.0	53	30	17(2.4)	18(2.2)	90	9.7	3	5	6	10	10	39	17	50(50)	52(67)	3.5	5:5	100
Niiga.	♀	8.5	52	31	16(2.3)	18(2.2)	86	10.0	3	5	6	10	9	50	24	50(64)	60(80)	3.7	5:5	100
Fukui	♀	8.0	52	30	16(2.2)	18(2.2)	90	10.5	3	5	6	10	9	37	20	58(54)	48(63)	4.2	6:5	95
Tochi.	♀	8.5	52	30	16(2.2)	17(2.2)	90	10.0	3	5	6	10	9	40	19	52(52)	52(62)	4.3	6:5	105
Tokyo	♀	7.5	54	32	16(2.3)	18(2.2)	90	10.0	3	5	6	9	9	44	20	54(64)	52(76)	3.0	5:5	95
Hokk.	♂	6.5	57	37	14(1.7)	19(1.9)	80	8.5	3	3	4	10	9	43	22	56(60)	61(77)	3.0	5:5	95
Hokk.	♂	6.5	54	36	14(1.7)	17(1.7)	90	8.0	3	3	4	10	9	44	22	56(64)	52(76)	3.0	5:5	115*
Hokk.	♂	7.0	56	34	14(1.7)	18(1.8)	82	8.5	4	4	5	10	9	45	24	54(62)	50(74)	3.1	5:5	100
Hokk.	♂	8.0	52	34	14(1.7)	18(1.9)	92	9.0	4	4	5	10	9	50	22	54(66)	45(77)	3.3	5:5	95
Hokk.	♂	6.7	56	35	14(1.7)	17(1.8)	86	8.5	4	4	5	10	10	40	20	56(58)	52(68)	3.5	5:5	105
Aomori	♂	6.5	55	35	14(1.7)	18(1.8)	82	8.0	4	4	5	10	10	40	20	54(58)	46(72)	3.5	5:5	115
Fukui	♂	7.2	54	32	14(1.8)	18(2.0)	80	8.7	4	5	6	10	9	50	22	54(66)	54(82)	3.2	5:5	95
Fukui	♂	7.2	54	33	14(1.7)	19(2.0)	84	8.7	3	4	5	10	9	42	20	52(64)	52(76)	3.1	6:5	100
Tokyo	♂	6.2	54	35	14(1.8)	18(1.8)	80	8.0	4	5	5	10	10	40	18	58(58)	50(72)	3.2	5:5	100
Sizoka	♂	7.0	55	35	15(1.9)	18(1.9)	84	8.0	4	4	5	10	9	42	20	54(56)	48(68)	3.0	5:5	105
Hyogo	♂	6.5	53	35	14(1.7)	18(1.8)	86	8.5	4	4	5	10	10	38	18	56(54)	48(64)	3.3	5:5	100

Remarks. Abbreviation same as Table 1. Values of veins measured with left wing.

Angle is at apex (TCV mostly gently curved in). 115*... In right wing 95°.

Loco: Asterisked ... U.S.A. Hokk. ... Hokkaido. Niiga. ... Niigata.

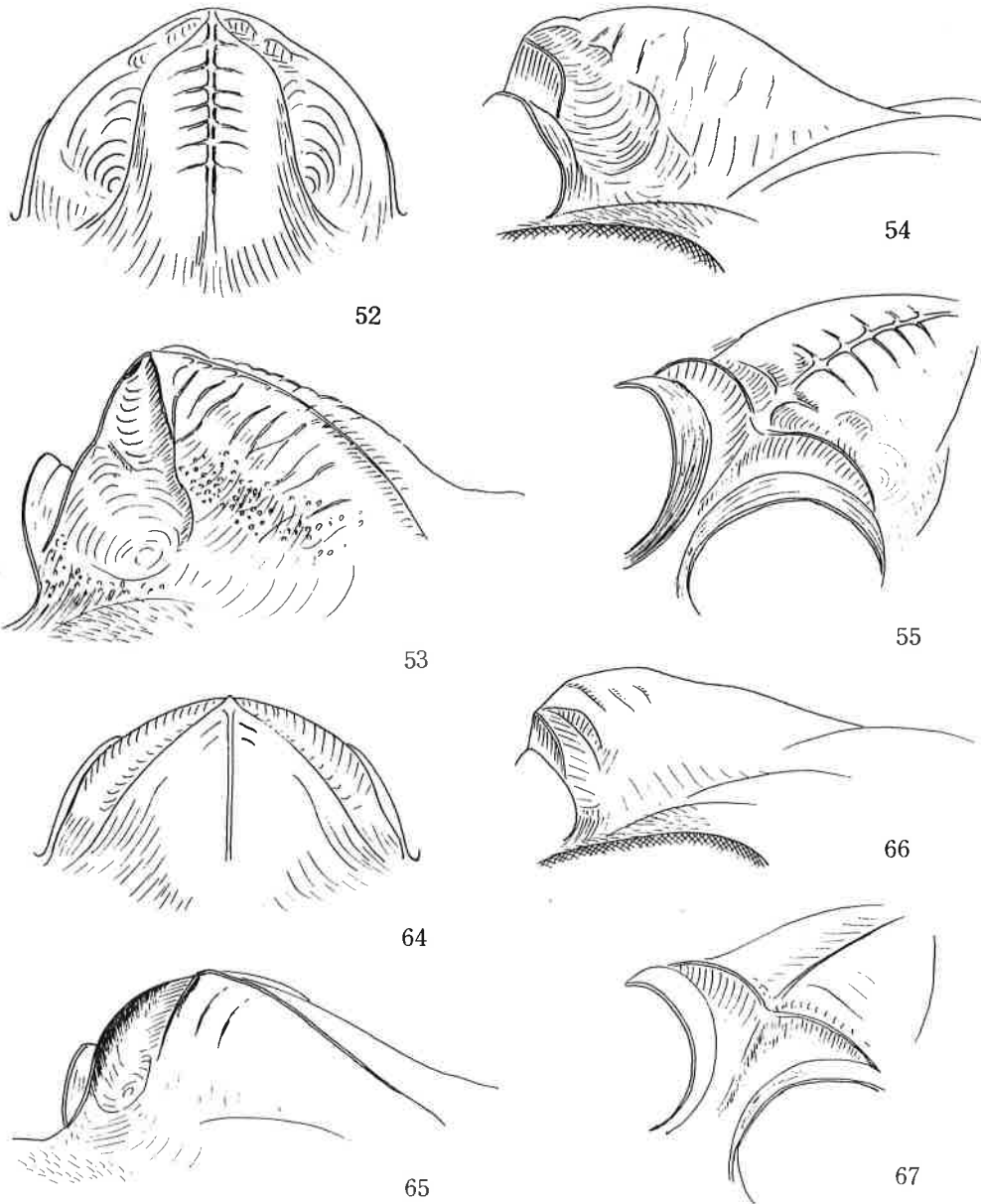
Tochi. ... Tochigi.

The Japanese race of *T. frigidum* Smith, 1856, differs from the typical race occurring in North America mainly in the raised state of SAT, namely it is thick high nasiform, with dorsum rounded and ribbed with carinae and at sides nearly perpendicularly inclined like the single track rail way tunnel in cross section (Figs. 52, dorsal view; 53, dorso-lateral; 54, lateral; 55, ventro-lateral), while in the typical race SAT is moderately high tectiformed nasiform, with top longitudinally narrowly carinated, without rib-like carinae (only a few feeble transverse striae on anterior part - Fig. 65) and at sides obliquely nearly flatly inclined (Figs. 64, dorsal; 65, dorso-lateral; 66, lateral; 67, ventro-lateral). In both apical margin transversely highly carinated (Figs. 55 and 67). The difference is very marked and we are tempted to separate them at the species rank, but in the structure of the male genital organs (Figs. 60-63) and sternite 8 (Fig. 59) (6 instances in Asiatic races and 3 in typical race examined) there is no note-worthy difference between them. The fact indicate the possibility of gene flow between them, if they have no evolutionary impeding factor between.

Supplements to original description of the Japanese race

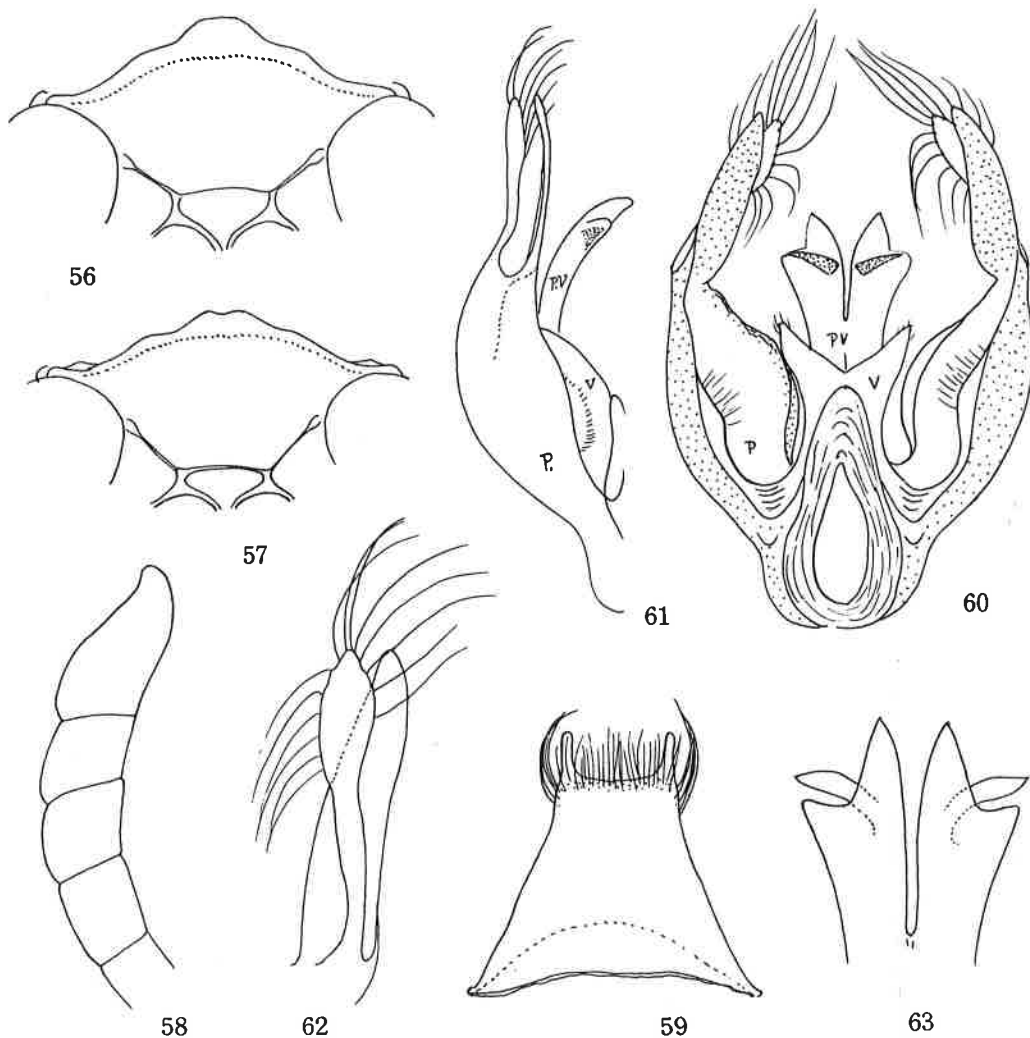
♀ ♂. Head in frontal view with sides rounded, almost not convergent towards clypeus,

vertex not depressed, eye incision broad and shallow, distinctly narrowed towards sinus, yet sinus broadly rounded, dorsal margin inclined outwards, frons gently raised, median furrow broad and very weak, surface of frons nearly flat, SAT in dorsal view: Fig. 52, in dorso-lateral view: Fig. 53, in lateral view: Fig. 54 and in ventro-lateral view: Fig. 55, in typical race: Figs. 64, 65, 66 and 67 respectively, in the Japanese race SAT higher, thicker, with sides acutely, nearly perpendicularly inclined, in the typical rather tectiform. Usual form of clypeus in ♀: Fig. 56, in ♂ Fig. 57. Relative length to width of A3 and ultimate joint (in ♀ A12 and in ♂ A13) and relative length of A3, 4, 5 are given in Table 2 (the values are more or less varied according to the condition of the segments, length of A13 is measured from middle of basal line



Figs. 52-54. *T. frigidum yamatonis* sp. nov. Figs. 64-67. *T. f. frigidum* Smith

to apex, as basal line is usually located obliquely when antenna smoothly stretched sideways). In ♂ A4-10 with tyloidea on ventro-posterior corner, on 4 and 10 very weak and sometimes even on 11 and 12 feebly defined, but usually on 5-9 well defined and in lateral view the segments roundly swollen out beneath, strictly the carina not reaching apex, leaving a short empty space before apex; A13: Fig. 58 (in typical race similar in structure). Occipital carina narrowly interrupted behind buccal cavity, the area roundly depressed. Collar of pronotum with posterior part not discoloured, with

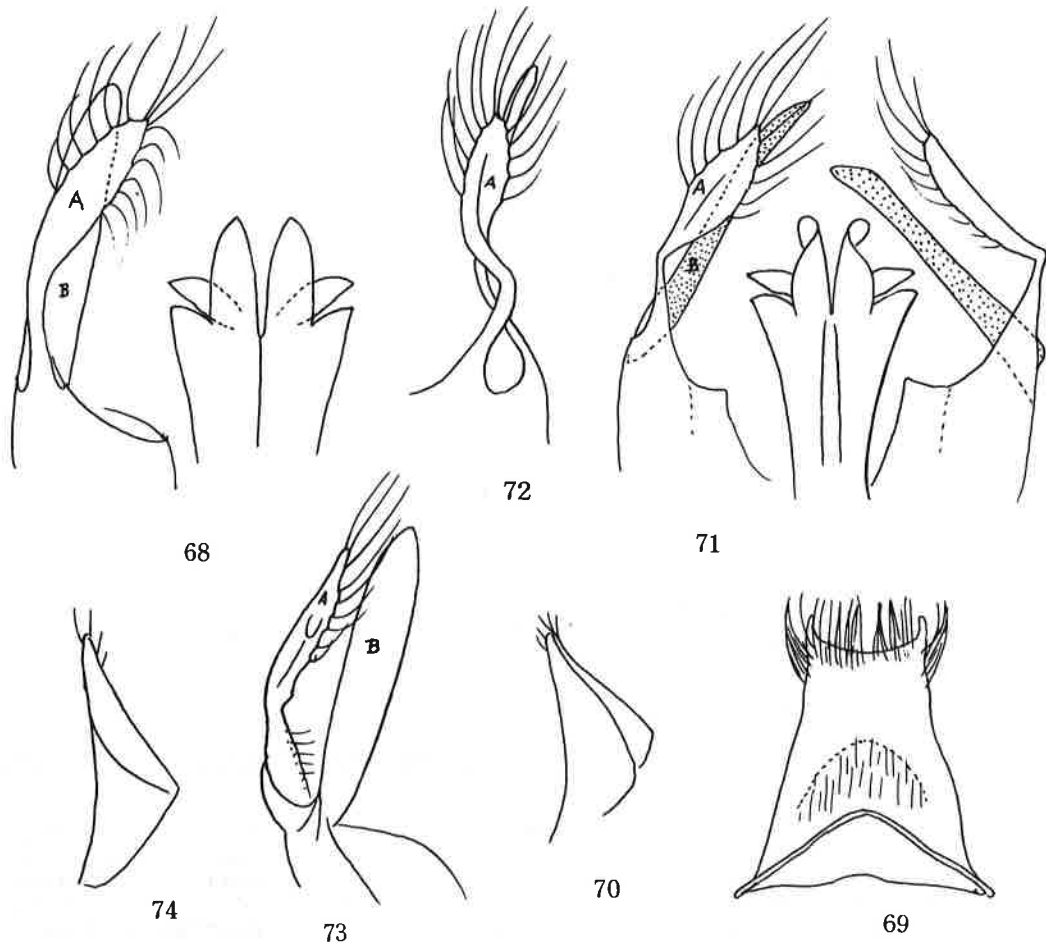


Figs. 56-63. *Trypoxylon frigidum yamatonis* ssp. nov. 56, ♀; rest ♂.

lamina on side as in Figs. 39, 40 (in *figulus*). Subalar area normal, mesopleural flange outstanding between hollows above and beneath, metapleural flange horizontally and shortly stretched like a round shelf; propodeum with distinct lateral carinae, area dorsalis not enclosed with furrow, median furrow broad and shallow, that on posterior inclination deep and distinct, area apicalis enclosed with high carinae except medio-dorsal area where the carinae interrupted by the apex of medial furrow of posterior inclination, surface of area apicalis smooth and polished, GSR roundly raised, but not discoloured. Sternite 8; Fig. 59, notice the horn-shaped processes at latero-apical corners; genitalia in ventral view: Fig. 60 (P... paramere, V... volsella, PV... penis

valve), in lateral view: Fig. 61, apical part of paramere in dorso-vertical view: Fig. 62, of penis valve: Fig. 63. The general appearance of genitalia is very similar to those of *T. figulus* Linné, but dorsal one of apical two lobes of paramere without median longitudinal ridge (feeble) on ventral side and basiparamere with haired triangular prominence on ventral side near outer margin as in *medium* (but less developed than in this). Dorsal lobe fringed with long strong hairs, while ventral one only with a few very short hair at apical marginal area, volsella also with sparse short hairs at apex, structure of penis valve as in *figulus*.

Frons very minutely and delicately microcoriaceous, mat and sparsely superimposed with very fine, shallow and flat-bottomed punctures on anterior portion, punctures very indistinct, defined under high magnification only. Mesoscutum more strongly and distinctly microcoriaceous and closely and distinctly superimposed with fine (but far larger than those on frons) deep punctures, mesopleuron similarly microcoriaceous and punctured, but punctures much sparser. Area dorsalis most usually obliquely, rather coarsely striate, frequently somewhat rugosely so, with more or less intersecting carinae between them, median furrow transversely striate, striae on posterior portion weaker and arcuate and frequently circled; density, rugosity and grade of subreticulation of carinae on the disc of area dorsalis considerably variable, sometimes carinae nearly longitudinal and curved at apical area inwards or outwards. In general in ♂ rugosity is stronger and variation is more marked than in ♀. Sides of propodeum finely and very closely striate all over, sometimes striae partly weaker and the area shining.



Figs. 68-74. *Trypoxylon frigidum* Smith (s. l.)

Remarks. In the Japanese race the apical parts of the male genital organs seen vertically from dorsal side; Fig. 68. Penis valve with well developed, highly raised shoulder and sickle-shaped appendages; the roundly raised shoulder is very similar to that of *T. fronticorne japonense* (cf. Figs. 75 and 76). Paramere deeply bifid at apex into asymmetric lobes, dorsal one consisting of basal petiolated part and apical slightly enlarged area, fringed with long hair, ventral one flat, subparallel-sided membranous plate, carrying sparse short hair at apical margin. Volsella triangular, with short sparse pubescence at apex.

In the first of the North American specimens of *frigidum* examined genitalia in dorso-vertical view appear as Fig. 71, dorsal lobe abruptly bent at the border to petiolate part which is seen vertically as Fig. 72,A, while ventral lobe seen vertically: B in Fig. 73, but 8th sternite completely agrees with that of the Japanese race (Fig. 69), bearing a short horn-like process at each corner of apical margin. So, I dissected two other male specimens and examined the genitalia and found that the organs completely agreed with with Fig. 68, showing that Fig. 71 was in abnormal state, due possibly to the condition at the time of desiccation of the material, because in external characters and in structure of sternite 8 they are completely consistent with each other. Volsella sometimes appears slightly longer in N. American specimen (Fig. 74) than in the Japanese (Fig. 70), but this is within the range of variation in the Japanese specimens.

8. TRYPOXYLON FRONTICORNE JAPONENSE TSUNEKI, 1956

Trypoxylon fronticorne Gussakovskij, Trav. Zool. Akad. Sci. USSR, 3: 659, 1936 (♀ ♂, South Europe, transcaucasus, Siberia till Pacific coast).

*Trypoxylon pennsylvanicum japonense Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. Trypoxylon pennsylvanicum japonense: Tsuneki et Japanese authors, 1956-80.

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

Trypoxylon fronticorne japonense: Tsuneki, SPJHA, 9: 58, 1979.

Specimens in my collection:

118 ♀ 48 ♂. From Korea (Seoul), Hokkaido (Sounkyo, Nopporo, Sapporo, Jozankei, Hakodate, Is. Okushiri), Aomori, Niigata, Ishikawa, Fukui, Gumma, Tochigi, Saitama, Tokyo, Kanagawa, Shizuoka, Mie, Kyoto, Hyogo, Ehime, Kochi, Fukuoka.

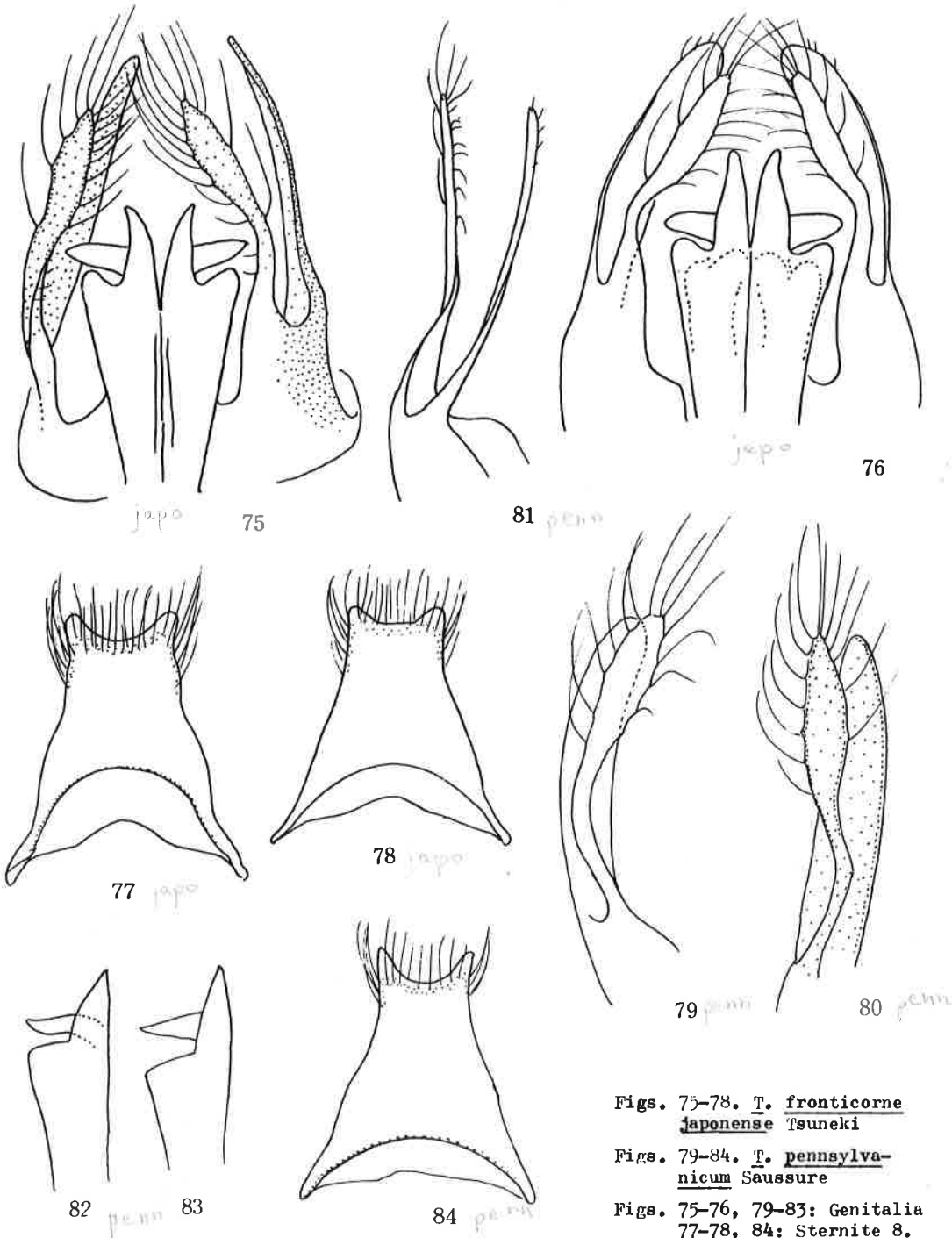
The present subspecies of *fronticorne* resembles very closely the North American species, *T. pennsylvanicum* Saussure, 1867, and at first it was identified with this species as its local race. Recently, however, in connection with the study of its relatives occurring in the Hymalayan areas, both the American and the Japanese forms were reinvestigated comparatively in detail and as a result they were separated from each other at the specific rank and the Japanese representative was ascribed to *Palae-arctic fronticorne* Gussakovskij, 1936, as its subspecies. The main reason of its separation from *pennsylvanicum* lies in the slight but definite difference in the structure of the male genital organs (see Remark). In external characters difference of *japonense* from *pennsylvanicum* is very similar to the case of *frigidum yamatonis* from *frigidum frigidum*, namely SAT much more highly raised, with sides more steeply, nearly perpendicularly inclined. In addition IODv is relatively much greater (ref. Pt. III of mu Indo-Australian *Trypoxylon*, p. 57, Table 1, 1979) and legs more distinctly black (less brownish).

Area dorsalis usually obliquely (nearer to longitudinal), fairly closely striate, with median furrow more or less transversely so, but sometimes disc rugoso-striate and median furrow rugoso-subreticulate, variation in sculpture of the area considerable and can not be used as specific distinction.

The genitalial structure of the male is closely similar to that of *frigidum*, but in the present species ventral one of apical two lobes of paramere comparatively wider and dorsal one narrower and with expanded area slenderer and more elongated than in *frigidum*.

Remarks. In my first comparative study of *T. fronticorne japonense* and *T. pennsylvanicum* I thought that the genital organs of both were essentially identical and I placed the former under the specific category of the latter. In my revisional study with new material and with more trained eyes certain differences have been discovered between them, namely, although the organs are very similar in structure to each other yet in *japonense* basal narrowed part of dorsal one of apical two lobes of paramere is

distinctly shorter (Figs. 75 and 76, dorso-vertical view) than in pennsylvanicum (Fig. 79, right one seen vertically from dorsal side; Fig. 80, left one, ditto and Fig. 81, left one in lateral view) and, moreover, shoulder of penis valve roundly raised (Figs. 75 and 76) as in frigidum, not inclined outwards as in pennsylvanicum (Figs. 82, dorsal view, 83, dorso-vertical view, both right half). Lateral angles of apical margin of 8th sternite much less produced in japonense and less pointed (Figs. 77, 78) than in pennsylvanicum (Fig. 84).



Figs. 75-78. T. fronticorne japonense Tsuneki

Figs. 79-84. T. pennsylvanicum Saussure

Figs. 75-76, 79-83: Genitalia
77-78, 84: Sternite 8.

In one of my previous papers (Kontyu, 44: 297, 1976) a male and a female specimens of T. pennsylvanicum japonense were recorded from Miaoershan, 100 km east of Harbin, Manchuria, Judging from my present knowledge they are considered to belong to the nominate race of fronticorne or to the Korean subspecies below described. No detailed comparative observation was not made, however, and it is impossible to identify them at the subspecific rank.

8. B. TRYPOXYLON FRONTICORNE SEOULENSE SSP. NOV.

The Korean specimen differs considerably from the Japanese ones just as in the case of cornutum and yamatonis of frigidum-group. IODv is relatively greater (ref. SP-JHA, 9: 7, 1979) and in this respect markedly differs from the Japanese specimens and much more so from pennsylvanicum and rather close to ssp. assamense n., and SAT somewhat lower and somewhat less steep in lateral inclinations (in this respect much closer to pennsylvanicum accordingly, but strictly somewhat higher and steeper than in this). Based on these distinctions the Korean representative is separated from the Japanese at the subspecies level.

♂, unknown.

Holotype: ♀, northern suburbs of Seoul, Korea, 22. V. 1943, K. Tsuneki leg.

9. TRYPOXYLON SHIMOYAMAI TSUNEKI, 1958

Trypoxylon shimoyamai Tsuneki, Akitu, 7: 7, 1958 (2 ♀, Towada, Aomori Pref.).

Trypoxylon shimoyamai: Tsuneki, Ibid., 7: 53, 1958 (1 ♀ 3 ♂, Sapporo).

Trypoxylon shimoyamai: Tsuneki, Life Study (Fukui), 17 (1-2): 35, 37, 1973 (keyed).

Trypoxylon shimoyamai: Bohart and Menke, World Sphecid., p. 348, 1976 (listed).

Trypoxylon shimoyamai: Suda, Hym. Comm., 8: 4, 1978 (1 ♀, Yamanashi).

Trypoxylon shimoyamai: Nambu, Saitama Anim., p. 197, 1978 (1 ♀, Saitama, Chichibu).

Trypoxylon shimoyamai: Nakamura, Hym. Comm., 9: 9, 1979 (1 ♀, Ishikawa).

Trypoxylon shimoyamai: Murota, Ibid., 12: 14, 1980 (1 ♀ 2 ♂, Fukui).

Specimens examined:

3 ♀, Aomori Pref., Towada, 6. 21, 21. IX. 1961, 67, K. Shimoyama; 2 ♂, Mt. Haku, 1. VIII. 1961, 30. VII. 1966, K. Tsuneki; 2 ♀ 3 ♂, Sapporo, 8. IV. 1958, T. Nambu, 21. IX. 1958, S. Momoi.

This species is rarely occurs in Hokkaido and northern half of Japan proper. In Central Japan it is found in montanic regions of high altitude.

Diagnosis. ♀ 8-9mm ♂ 6-8 mm. Gl clavate, propodeum with lateral carinae, mesoscutum microcoriaceous, mat, in ♀ fore leg broadly, in ♂ fore and mid legs broadly ferruginous, head in frontal view: Fig. 85, IODs=3:2 (♀♂), SAT low broad nasiform, without apical transverse carina, PAF moderately deep, gently up-curved, narrow U-shaped in cross section, clypeus: Fig. 86, antenna in ♂: Figs. 87, 88, area dorsalis enclosed with fine furrow, RC=C, hair silvery, male genitalia: Figs. 97, 98.

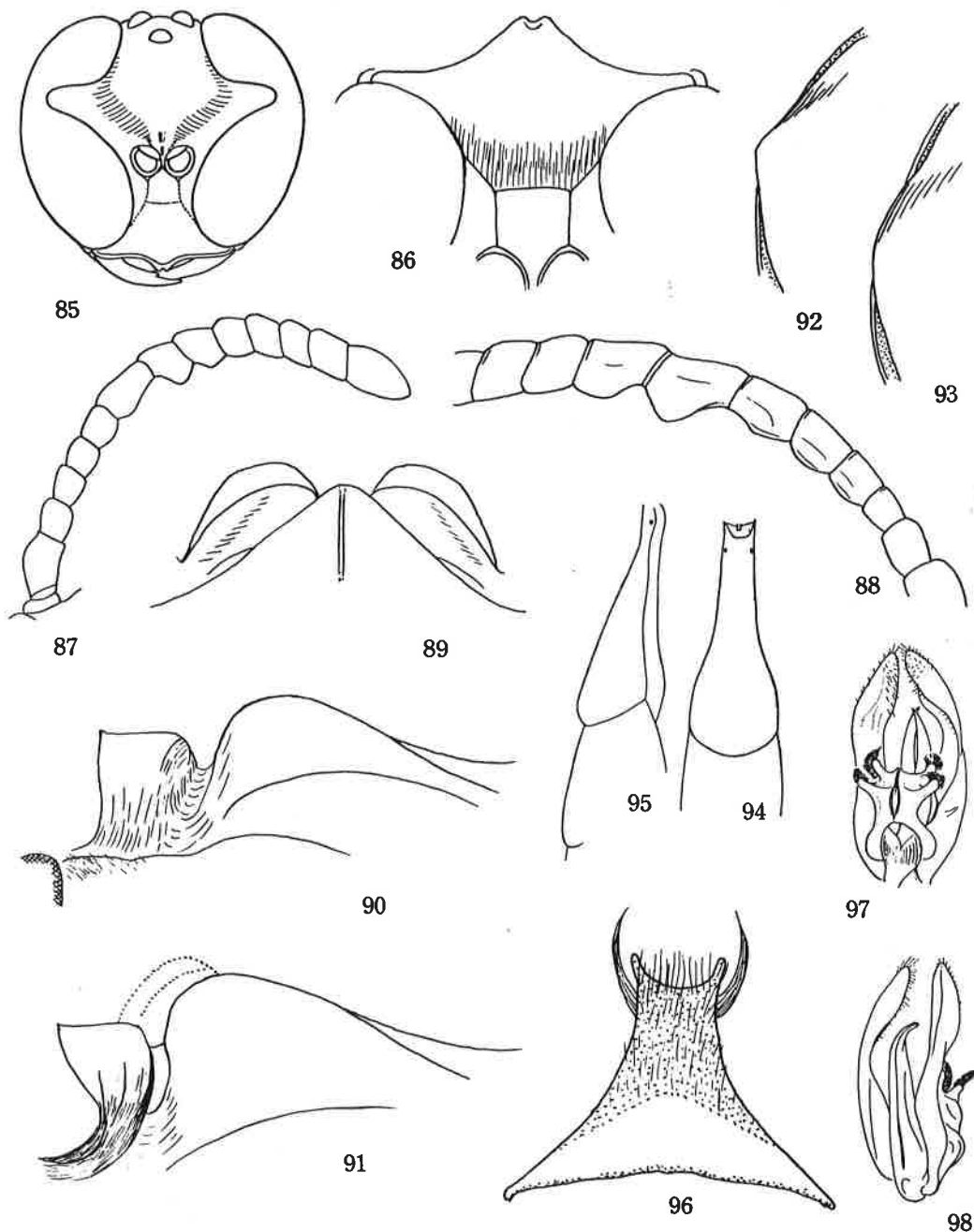
Ferruginous: Mandible, palpi, posterior part of collar at posterior marginal area pronotal tubercle posteriorly, tegulae (translucent), fore femur apically in part (♀) or wholly except beneath (♂), fore tibia and tarsus (♀ ♂, but in ♀ tibia in front often blackish and ferruginous colour near to pale castaneous), mid femur largely and tibia-tarsus wholly (in ♂ only, in ♀ except articulations dark brown to black), hind tibia at base (♀♂, but in ♀ castaneous) all tibial spurs (in ♂ pale yellow, in ♀ pale castaneous) and articulations of hind tarsus.

SAT low broad nasiform, with sides gently tectate (Fig. 89, dorsal view), at anterior area medianly highly ridged, SAT-ASR in dorso-lateral view to see through PAF: Fig. 90, from somewhat more above: Fig. 91, ASR transversely weakly striate, but on top area broadly smooth and shining; occipital carina complete, but lowered behind buccal cavity. Measurements of ♀ (♂: within parentheses):

Head in frontal view W:L=100:90 (100:90). HW, HL, IODv, A3, A13, P=100, 56, 28, 14, —, 100. (100, 56, 31, 8, 19, 102). IODs=10:7 (10:7). OOD, Od, POD=2, 5, 5 (≅2, 4, 4). A3=AW×2.2 (AW×1.1). A3, 4, 5≅10, 10, 9 (10, 11, 14). (A13=BW×1.7 and ≅A11+12). P, Ma, Mi, 2(Ma), 3(Ma)=100, 30, 15, 54(52), 52(62) (100, 36, 17, 52(53), 48(64)). RC=C, but close to M, Rl moderately long, CV1=CV2×3.8-4.0. TCV:CV2=6.5, TCV gently sinuate, angle about 130°. In ♂

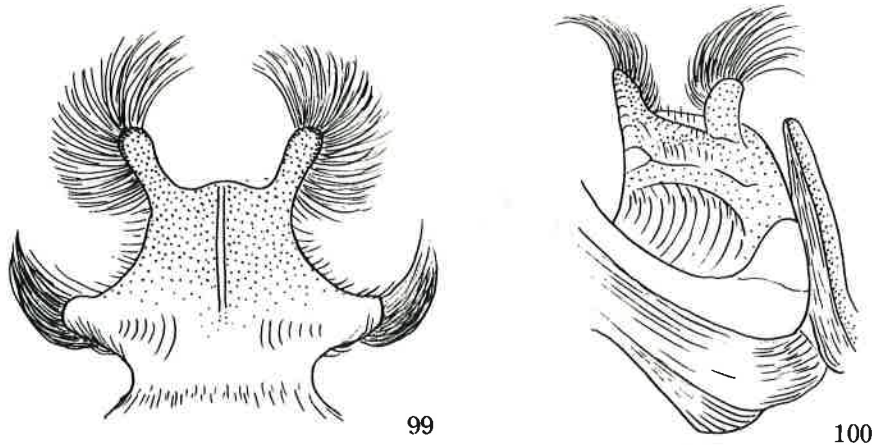
generally similar, but TCV:CV2 frequently 5:3.

Clypeus: Fig. 86, disc broadly roundly swollen, with inclination to tectate, antenna in ♂ provided with tyloidea on A4-9 beneath, on 4-6 and 9 linear and simply roundly raised, but on 7 and 8 thick and markedly subconically produced (Figs. 87 and 88), A13 not bent (Fig. 87). Anterior part of collar short, narrow transverse ridge-like, posterior part broad and discoloured, yellowish, lamina on side usually as in Fig. 92, sometimes with apex more rounded, subalar area normal, mesopleural flange



Figs. 85-98. *Trypoxylon shimoyamai* Tsuneki. 87-88, 96-98, ♂.

membraneous, metapleural one horizontally expanded like a shelf; area apicalis not completely enclosed with carina, but the area impressed and medianly longitudinally carinae, GSR not particularly elevated, rather band-like, G1 in dorsal and lateral views: Figs. 94 and 95; sternite 8; Fig. 96, genitalia in ventral view (somewhat from right side); Fig. 97, in dorso-lateral view; Fig. 98, paramere simple at apex, volsella in ventral and somewhat from apical view; Fig. 99, very well developed into digitus and cuspis, each lobe densely fringed with long curved hair, in lateral view; Fig. 100, penis valve without shoulder and without sickle-shaped appendages, tapered curved ventrally at apex.



Figs. 99-100. T. shimoyamai Tsuneki, ♂, volsella of genitalia

Frons and mesoscutum distinctly microcoriaceous and fairly closely superimposed with medium-sized punctures, punctures stronger and deeper on mesoscutum, but similar in size, mesopleuron without microsculpture, strongly punctured, PIS slightly PD, punctures finer and weaker upwards and on epimeral area somewhat closer, PIS=PD. Area dorsalis at base longitudinally, coarsely striate, on median furrow and areas close to it longitudinally, somewhat rugosely striate, disc fairly closely covered with fine punctules, but punctures finer and weaker laterally.

10. TRYPOXYLON NAMBUI TSUNEKI, 1966

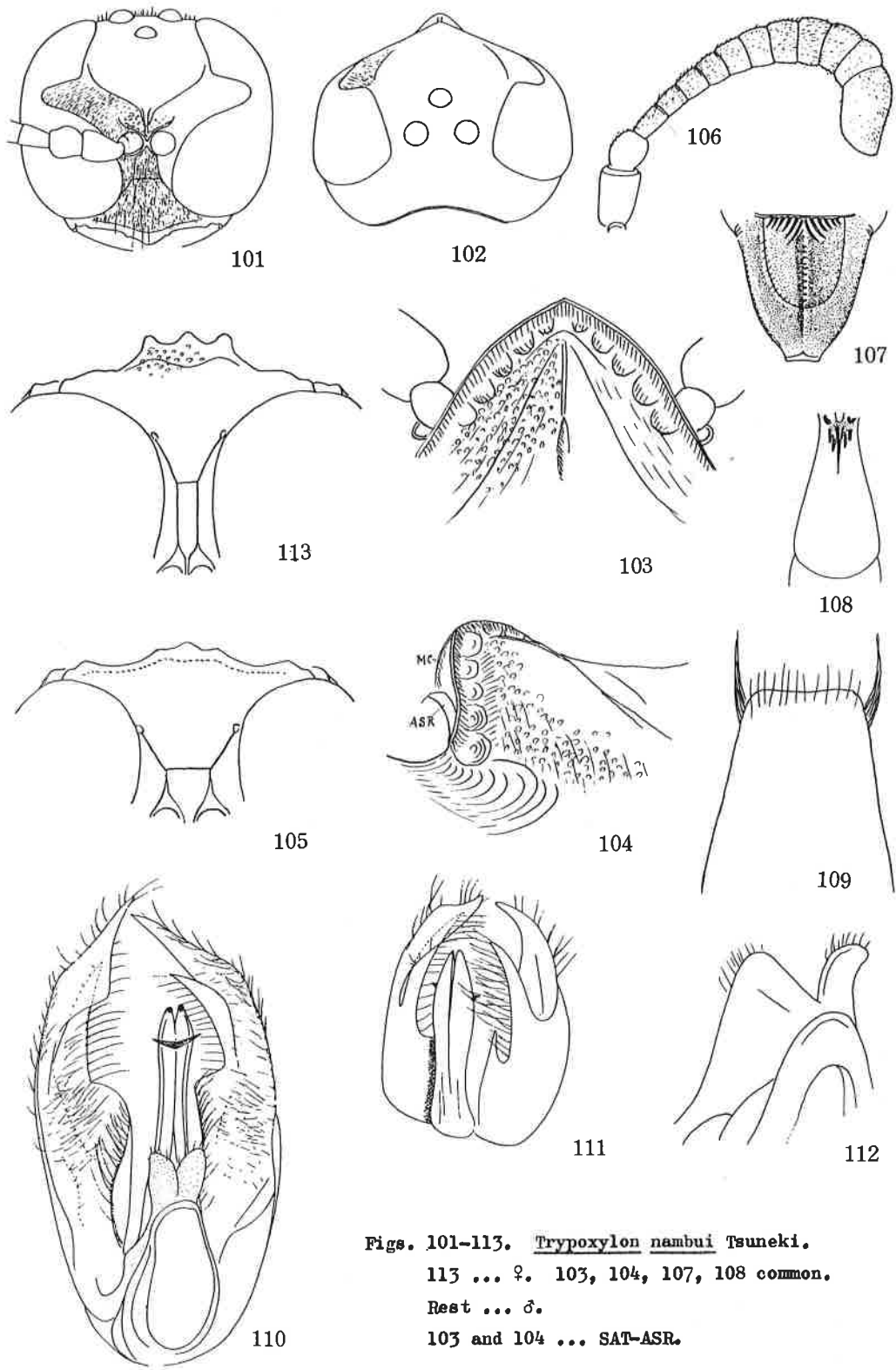
- Trypoxylon nambui Tsuneki, Etizenia (Fukui), 16: 1, 1966 (♀ ♂, Saitama; 2 ♂ 7 ♀).
Trypoxylon nambui: Nambu, Life Study (Fukui), 12 (1-2): 22, 1968 (28 ♀ 5 ♂, Saitama).
Trypoxylon nambui: Haneda, Ibid., 12 (3-4): 55, 1968 (1 ♂, Nagano).
Trypoxylon nambui: Nambu, Saitama Seibutsu, 9: 18, 1969 (Saitama and Miyagi).
Trypoxylon kinkadzanense Tsuneki, Life Study, 15 (1-2): 16, 1971 (1 ♂, Gifu).
Trypoxylon nambui: Nambu, Ibid., 16 (1-2): 9-14, 1972 (biology; Iwate and Nagano).
Trypoxylon nambui: Tsuneki, Ibid., 17 (1-2): 34, 37, 1973 (keyed).
Trypoxylon nambui: Kurokawa et Murota, Hym. Comm., 12: 22, 1980 (Fukui).
Trypoxylon nambui: Nambu, Saitama Anim., p. 102, 1978 (7 ♀ 15 ♂, Saitama).

Specimens reexamined:

5 ♀ 2 ♂, Saitama Pref. (Chichibu, Hodosan), 8,24,26,27. VIII. 1966, T. Nambu; 3 ♀ 1 ♂, Saitama Pref. (Kodama), 1. VIII. 1971, T. Nambu; 3 ♀, Saitama Pref. (Chichibu, Minano), 3. VIII. 1973, T. Nambu.

Redescription.

♀, 5-6, ♂ 4-5 mm. Black, ferruginous - yellow: Al-2, base of 3, apical margin of clypeus, mandible palpi, posterior part (discoloured) and tubercle of pronotum, tegula and basal plates of wing, G2 and 3 at each base and apex of sides and beneath (♀ only, in ♂ as a rule wholly black), fore and mid legs nearly wholly (coxal base and arolia



Figs. 101-113. Trypoxylon nambui Tsuneki.
 113 ... ♀. 103, 104, 107, 108 common.
 Rest ... ♂.
 103 and 104 ... SAT-ASR.

black) and hind leg partly (apical half of coxa, whole of trochanter, base and apex of tibia and articulations of tarsus).

Head thick, subcubic (Figs. 101 and 102), Gl clavate (Fig. 108), mesoscutum microcoriaceous, propodeum with lateral carinae, area dorsalis distinctly enclosed with furrow (Fig. 107), subalar area normal.

Frons gently raised, median furrow shallow, eye incision broad and shallow, rounded at sinus, dorsal margin inclined outwards (δ), SAT moderately high nasiform, apical margin transversely strongly carinated, carina triangularly elevated and pointed at top, seen vertically from above completely covering ASR, just behind the carina apical part of SAT deeply furrowed and coarsely foveolate, in lateral view appearing strongly constricted there, apical inclination of SAT before the transverse carina (= in this case IAA) medianly strongly carinated, median carina of SAT incomplete, only shortly defined on anterior area, median line just behind the carina longitudinally excavated in wedge-shape. The structure in dorsal view: Fig. 103, in dorso-lateral view: Fig. 104 (MC... median carina of IAA). Scapal hollow at the outer side of SAT very deep; clypeus in δ : Fig. 113, in δ : Fig. 105; antenna markedly incrassate toward apex, in δ $Al_3 > Al_0-12$ but $< A_9-12$, in some condition appears $\approx A_9-12$ or Al_0-12 , apex curved (Fig. 106), without tyloidea on any joint. IODs= $4:1$ (δ), $\approx 2:1$ (δ). Occipital carina broadly interrupted behind buccal cavity where the area deeply roundly depressed. Pronotal collar not thick, anterior part narrow ridge-like, slightly widened laterally, in frontal view blunt-triangularly raised, without tubercle in middle, posterior part amply twice as long in middle as anterior part, lamina on side broadly roundly produced, not conspicuous. Measurements of δ (δ within parentheses):

HW, HL, IODv, $A_3, Al_3, P=100, 67, 36, 16, —, 100$ (100, 64, 36, 14, 20, 80). IODs= $10:2.5$ (10: 5.7). OOD, Od, POD= $1, 4, 3$ (4, 8, 7). $A_3=AW \times 1.7$ ($AW \times 1.7$). $A_3, 4, 5 \approx 10, 8, 7$ (10, 7, 7). ($Al_3= BW \times 1.7$). P, Ma, Mi, 2(Ma), 3(Ma)= $100, 40, 20, 56$ (50), 48(60) (100, 44, 22, 56(54), 56(68)). RC=C, but somewhat close to B, Rl long, as long as TCV and slightly longer than A_3 (about 9:8), but not reaching wing apex (apical margin of wing broadly rounded), CV1=CV2 $\times 3$, TCV \approx CV2, TCV nearly straight, angle usually $95^\circ-100^\circ$, rarely 120° . (In δ generally similar).

Sternite 8: Fig. 109, genitalia with paramere deeply bifid at apex, lobes resulted asymmetric, penis valve without shoulder, but with a pair of sickle-shaped appendages, in ventral view (slightly from left side): Fig. 110, in dorso-lateral view (somewhat from apex): Fig. 111, volsella in ventro-lateral view: Fig. 112.

Frons distinctly microcoriaceous and closely superimposed with fine punctures, surface mat, mesoscutum similar, but punctures finer and closer, on mesopleuron microsculpture weaker, punctures also weaker and sparser, surface more shining; propodeum at base obliquely and coarsely striate, on disc and medial furrow transversely anterior part somewhat obliquely) striate, density and strength of striae variable, sometimes in δ median furrow longitudinally striate on anterior half and the striae more or less rugulose, sides smooth and polished, on antero-dorsal area with oblique striae.

11. TRYPOXYLON KODAMANUM TSUNEKI, 1972

Trypoxylon kodamanum Tsuneki, Etizenia (Fukui), 59: 9(δ), 11(δ), 1972 (1 δ 1 δ , Saitama, 14 figs.: head in frontal and dorsal views - δ , δ -, Gl-3 - δ , δ -, antenna in various direction, δ -, propodeum, male genitalia, paramere and volsella). Trypoxylon kodamanum: Nambu, Saitama Anim., p. 192, 1978 (7 δ 3 δ , Saitama: Kodama & Chichibu)

Specimens:

1 δ 1 δ , Saitama Pref., Kodama, 21. VIII, 8. IX. 1971, T. Nambu; 1 δ , Saitama (Minano), 8. IX. 1971, T. Nambu.

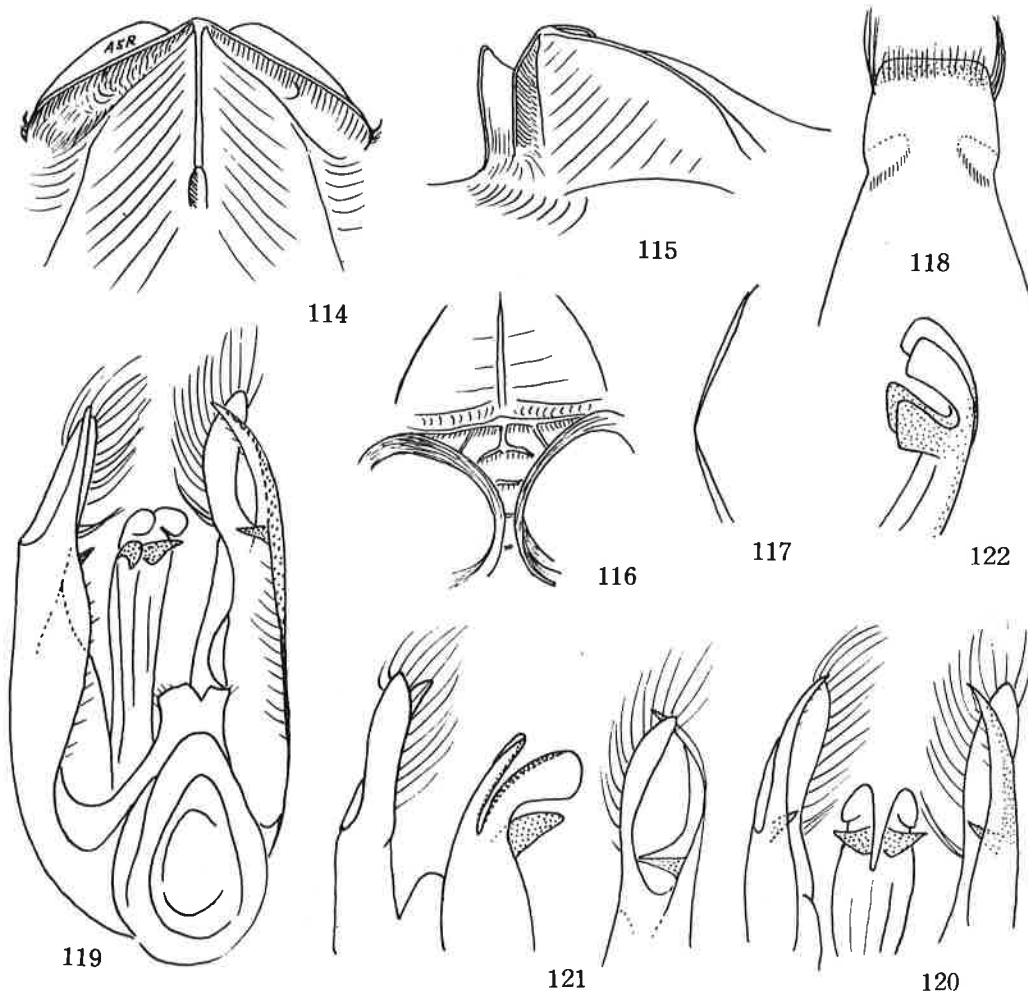
Diagnosis. δ 5.3, δ 7.0 mm. Gl clavate, short, mesoscutum microcoriaceous, propodeum with lateral carinae, area dorsalis enclosed with furrow, head thick, IODs \approx 3:2 (δ), $\approx 2:1$ (δ), apical margin of clypeus medianly bluntly trisinate (δ), minutely bilobed (δ), antenna short and thick, in δ Al_3 slightly longer than Al_0-12 , without tyloidea, paramere of male genitalia fairly deeply bifid at apex, penis valve without shoulder, but with sickle-shaped appendages; gaster partly red, antenna basally, fore and mid legs nearly wholly, hind leg partly but fairly broadly yellow.

Supplements to original description.

SAT-ASR similar in general to that of nambui, but anterior transverse carina of SAT somewhat lower, seen from above not so completely covering ASR and anterior aspect without median longitudinal carina. SAT slightly higher nasiform, with sides tectate and with long distinct median carina (Fig. 114, in oblique dorsal view), in dorso-lateral view: Fig. 115, anterior aspect (=IAA) triangular in form, steeply inclined and very coarsely reticulate with about 6 foveae (Fig. 116, in frontal view). Occipital carina broadly lacking behind buccal cavity. Anterior part of collar narrow ridge-like, without median tubercle, posterior part longer in middle than anterior part, discoloured, lamina on side also similar to that of nambui (Fig. 117), subalar area of mesopleuron normal, both meso- and metapleural flanges shortly horizontally expanded into shelf. Propodeum with lateral carinae, area dorsalis enclosed with furrow, area apicalis margined with carina, but dorso-medial part interrupted with apex of median furrow of posterior inclination, thence till apex distinctly keeled in middle, GSR band-like, not raised at apical margin. Sternite 8: Fig. 118.

Measurements of ♀ (♂ within parentheses):

HW, HL, IODv, A3, A13, P=100, 60, 33, 18, —, 86. (100, 57, 36, 16, 20, 70). IODs=10:4.5 (10:6.7). OOD, Od, POD=2, 6, 4. (2, 3, 3). A3=AWx2.7 (AWx2.5). A3, 4, 5=10, 8, 7.5. (10, 7, 6). (A13=BWx2 and >A10-12 but <A9-12). P, Ma, M1, 2(Ma), 3(Ma)=100, 48, 24, 66(60), 62(68) (100, 52, 26, 56(72), 56(72)). RC=C, Rl moderately long, about half length of TCV, CV1=CV2x3.4 (=CV2x2.6), TCV=CV2 (do.). TCV gently sinuate or incurved, angle at apex about 130° (do.).



Figs. 114-122. Trypoxylon kodamanum Tsuneki, ♂

Genitalia in ventro-lateral view: Fig. 119, paramere fairly deeply bifurcate at apex, similar in length, but differing in width, dorsal lobe wider, lamellate, fringed with long hair at apical area and on inner margin, ventral one slender, somewhat thick and tapering apically, bearing a few short hair at apical area and provided with a dark tooth at its base on inner margin (Figs. 119, ventro-lateral view of genitalia, 120, ventral view), volsella short, also fringed with a few short pubescence at apex, penis valve without shoulder, but with a broad triangular sickle-shaped appendages (Figs. 119, 120, 121, dorso-lateral view), seen from right side: Fig. 122.

Frons and mesoscutum microcoriaceous and closely superimposed with medium-sized punctures, area dorsalis at base obliquely coarsely, on the rest striae curved from oblique to transverse, in general striae weaker posteriorly, in ♂ median furrow at basal area transversely weakly striate, on disc only near median furrow feebly transversely striate, rest smooth and polished; sides smooth and feebly obliquely striate, striae on dorsal area near lateral carina of the segment fairly strong.

Remarks. This species is very rare, known from Saitama Prefecture (western district) only.

12. TRYPOXYLON VARIPEZ PEREZ, 1905

Trypoxylon varipes Pérez, Bull. Mus. Nat.-Hist. Paris, 11: 157, 1905 (♀, Japan).

Trypoxylon varipes: Gussakovskij, Ark. f. Zool., 24 A, 10: 12, 1933 (♂, Ussuri, no description).

Trypoxylon varipes: Gussakovskij, Trav. Zool. Akad. Sci. USSR, 3: 664, 1936 (4 ♀ 2 ♂, North China and East Siberia, simple description in Latin and Russian, with fig. of male antenna).

Trypoxylon varipes: Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci., 6 (1): 30, 1956 (12 ♀ 4 ♂, Tokyo, Tochigi, Fukui, Ishikawa, description with figs. of Antenna, clypeus and genitalia).

Trypoxylon varipes: Tsuneki and Japanese authors, 1956-80.

Trypoxylon varipes: Tsuneki, Life Study, 17 (1-2): 34, 38, 1973 (keyed).

Trypoxylon varipes: Murota, Hym. Comm., 7: 21, 1978 (2 ♀ 1 ♂, Hokkaido: Kitami).

Specimens examined: 32 ♀ 8 ♂ from Hokkaido (Hakodate), Aomori, Iwate, Ishikawa, Fukui, Tochigi, Saitama, Chiba, Tokyo, Kyoto, Nagasaki, Kagoshima.

Main characters:

Gl short, clavate, mesoscutum microcoriaceous and finely closely punctured, propodeum with lateral carinae, area dorsalis enclosed with furrow, IODs=2:1 (♀), 3:2 (♂), frons moderately raised, surface flat, eye incision comparatively broad and shallow, strongly narrowed towards sinus, sinus minutely rounded, dorsal margin somewhat inclined outwards, SAT moderately high long nasiform, with sides obliquely, but fairly steeply inclined (Fig. 123, dorsal view), medianly longitudinally and apically transversely carinated, apical carina high and produced anteriorly, with sides reaching outer part of ASR, in vertical view broadly covering ASR (Fig. 124, dorso-lateral view), anterior aspect (=IAA) medianly stoutly keeled, clypeus in ♀: Fig. 125, in ♂ similar, but less produced; collar as in kodamanum, posterior part discoloured, yellowish, lamina on side most usually as Fig. 38; subalar area of mesopleuron normal. Area dorsalis at base obliquely coarsely striate, on median furrow most usually finely, irregularly rugoso-reticulate, sometimes longitudinal rugae more distinct, sometimes transverse ones so, always striae posteriorly weaker, disc finely, fairly closely punctured, sometime punctures transversely contiguous, area apicalis not enclosed with carina, but surface gently concave and the area well defined, without medial keel, GSR not elevated.

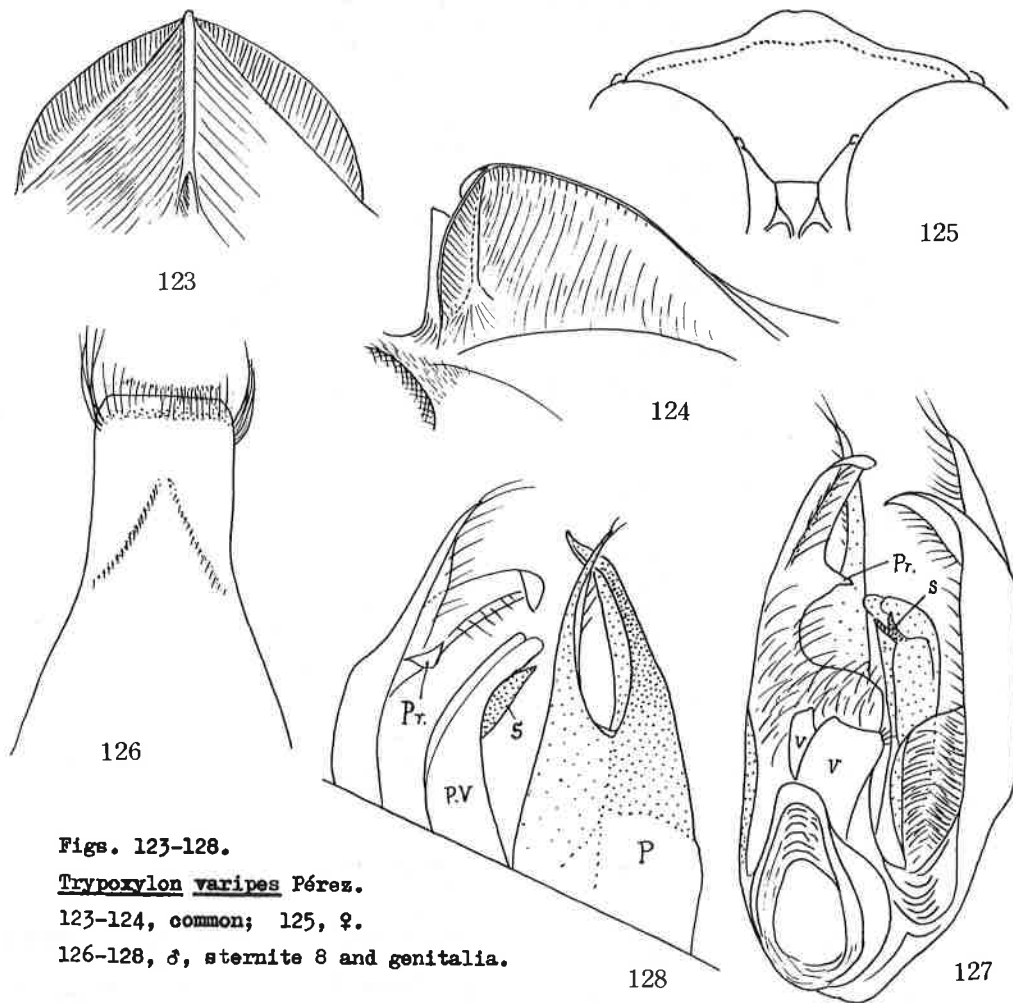
Measurements of ♀ (♂ within parentheses):

HW:HL in frontal view 100:90 (100:90). HW,HL,IODv,A3,A13,P=100,60,34,20,--,98 (100,60,36,16,20,88). IODs=10:4.5 (10:7.0). OOD,Od,POD=2,5,4 (2,5,4). A3=AW×4.3 (AW×2.2). A3,4,5=10,7,6 (10,7,6), (A13=BW×2.0 and ≈A10-12). P,Ma,Mi,2(Ma),3(Ma)=100,36,19,60(46),60(58) [100,42,22,60(54),57(61)]. RC=C. Rl somewhat long, about half length of TCV. CV1≈CV2×4. TCV:CV2≈5:4. TCV nearly straight. Angle about 110°. In ♂ generally similar, but in the measured specimen CV1≈CV2×3 and TCV≈CV2.

Colouration. In most of the specimens legs more broadly yellowish than in the original description (toutes les articulations des pattes; tibias plus ou moins roussâtre; devant des tibias antérieur un peu jaunâtre --- such is very rare) and the

the Gussakovskij's specimens.

♀. Yellow: Apices of coxae, trochanters broadly, base and apex of femora, fore tibia completely or except a line in front, fore tarsus (T2-5 feebly ferruginous), mid tibia at base and broadly beneath, hind tibia at base, fore and mid tibial spurs and fore and mid T1 except apex. Ferruginous or pale brown: rest of trochanters, fore and mid femora broadly, rest of mid tibia, tibial spurs and articulations of hind tarsus. Gaster usually completely black, but frequently intersegmental area of G1-2-3, except above, more or less reddish, in one specimen collected at Uchiura, Wakasa, Fukui Pref. the areas broadly reddish yellow. Moreover, though not well visible under natural condition, apical margin of each segment always discoloured and transparent yellowish. As to other parts, A1 and 2 usually black above and brown beneath, but sometimes brown above and yellow beneath and at each apex; clypeus at apical margin brown, mandible at base broadly yellow and rest ferruginous, palpi opaque yellow, pronotal tubercle on apical margin yellow, tegra translucent pale brown, basal plate of wing pale brown.



Figs. 123-128.

Trypoxylon varipes Pérez.

123-124, common; 125, ♀.

126-128, ♂, sternite 8 and genitalia.

♂. Generally similar except that the gastral reddish mark is very rare and if present rather inconspicuous.

Length ♀ 8-10.5 mm, mostly 9 mm or so, ♂ 7-7.5 mm.

Sternite 8: Fig. 126, similar to that of *nambui* and *kodamarum*.

Genitalia of male in ventro-lateral view: Fig. 127, also similar to those of two

species compared, especially of kodamanum. In nambui ventral one of apical two lobes of paramere without tooth-shaped process at its base, while in kodamanum the process present as in the present species. In kodamanum, however, the organs generally much slenderer, without pubescence on ventral surface of main body of paramere and its apical two lobes are different in form and different from the present species in the condition of fringe of hair of the lobes.

The apparent tooth-like process (Fig. 127, Pr.) on inner margin at base of ventral one of apical two lobes of paramere is in reality a semioval expansion produced from base of the lobe, forming a round shelf there (Fig. 128, Pr. ... apical part of genitalia in dorso-lateral view, drawn from the mounted specimen); ventral lobe is broader than the dorsal (in this respect different from the two compared) and provided with a longitudinal ridge in middle of ventral surface whence a series of hair arisen (Fig. 127). Penis valve without shoulder, but with so-called sickle-shaped appendages which are not slender like a sickle, but broad triangular and not produced sideways as done usually, but obliquely raised upwards (in this character similar to those of the two species above compared).

Remarks.

The present species is closely related to T. quadriceps Tsuneki known from Formosa. Genitalial structure and 8th sternite are also closely similar to those of this species. In quadriceps, however, ventral one of apical two lobes of paramere is on its dorsal half semitransparent membranous (as if separated by longitudinal border line) and the basal expansion (= tooth-like process of varipes) broadly developed, arriving at base of dorsal lobe and as a whole forming a round concave film (it is a nearly transparent yellow membrane and difficult to observe). Furthermore, dorsal lobe different slightly in form and markedly so in curvature, especially at the bifurcating area where the sinus much broader than in varipes.

12. B. TRYPOXYLON VARIPES NASUTUM TSUNEKI, 1974

Trypoxylon varipes nasutum Tsuneki, Ann. Hist.-Nat. Mus. Nat. Hung, 66: 365, 1974

(1 ♀, North Korea, Kaesong, Mt. Pakyon).

The Korean specimen of this species is much more broadly brownish in the colour of the legs than the usual form of the Japanese representative and in the form of SAT which is much thicker and more steeply inclined at the sides.

The North Chinese and East Siberian specimens recorded by Gussakovskij are, judging from his descriptions, considered to belong to the present subspecies.

Specimen:

1 ♀ (holotype), North Korea, Kaesong, Mt. Pakyon, popo, Pakyon, 27 km NE of Kaesong, 10-12. IX. 1971, Hung. Exped. (Coll. Mus. Nat. Hung.).

13. TRYPOXYLON OKINAWANUM TSUNEKI, 1966

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

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

Trypoxylon okinawanum: Tsuneki, SPJHA, 15: 19, 1981 (redescri.).

Specimens:

1 ♀ (holotype), Ishigaki Is. Karayama, 14-18. III. 1964, C. M. Yoshimoto and J. Harrell (BPBM); 1 ♀ (paratype), Iriomote Is., 11-12. III. 1964, C. M. Yoshimoto and J. Harrell (BPBM); 1 ♀ (do.), Ishigaki Is., 22. V. 1964, J. L. Gressitt (BPBM).

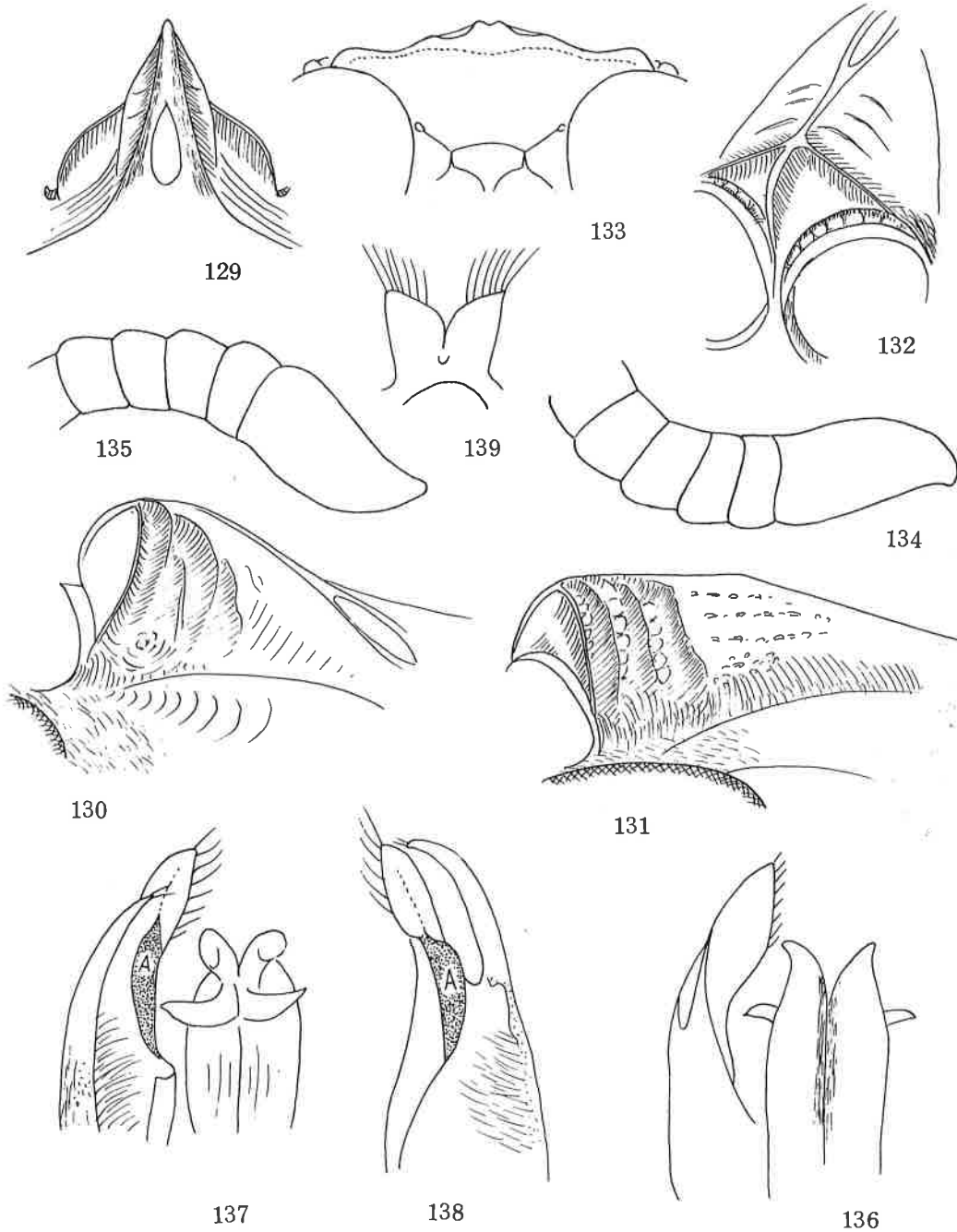
Remarks. Thanks to the kindness of Dr. G. M. Nishida, Bernice P. Bishop Museum, Honolulu, I could reexamine the holotype specimen of this species with new method. Detailed explanation is given in SPJHA, No. 15 above listed.

14. TRYPOXYLON KOREANUM TSUNEKI, 1956

Trypoxylon koreanum Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci., 6
 (1): 32, 1956 (2 ♂, Korea, with figs. of head in frontal view, in lateral view,
 antenna, G1 and genitalia in dorsal and lateral views).

Specimens reexamined:

1 ♂ (holotype), Seoul, 30. V. 1943, K. Tsuneki; 1 ♂ (paratype), same loco, 7.
 VI. 1943, K. Tsuneki (Coll. Tsuneki).



Figs. 129-139. Trypoxylon koreanum Tsuneki, ♂

Supplements to the original description

Eye incision broad and shallow, sinus broadly rounded, dorsal margin inclined outwards, frons nearly flat, broadly, shallowly concave, SAT high narrow nasiform, but in lateral view upper margin in a line with frontal surface, in middle stoutly carinated, carina at dorsal end replaced with a large elongated oval hollow, apical margin transversely highly carinate, carina reaching dorso-lateral part of ASR, apical aspect (= IAA) steeply inclined and medianly stoutly keeled, surface of SAT strongly and closely punctured, sides at anterior portion transversely distinctly tricarinate, interspaces of carinae coarsely foveolate. The structure of SAT-ASR in oblique dorsal view: Fig. 129, in dorso-lateral view: Fig. 130, in lateral view: Fig. 131, in ventro-lateral view: Fig. 132. Clypeus: Fig. 133, antenna strongly incrassate towards apex, without tyloidea, without excavation on any joint, A8-13 seen in different directions: Fig. 134 and 135; occipital carina weak and broadly disappeared behind buccal cavity. Collar of pronotum with anterior part narrow ridge-like, posterior part broad and discoloured, lamina on side broadly rounded and slightly produced, subalar area of mesopleuron normal. Propodeum with lateral carinae, area dorsalis without enclosing furrow, but in some light a shallow indistinct furrow can be seen on posterior half, area apicalis roundly hollowed, with distinct lateral carinae, carinae curved inwards at anterior ends, but not connected with each other, leaving dorsal margin widely opened, instead with a distinct median keel. Measurements of holotype:

HW:HL in frontal view 100:85. HW,HL,IODv,A3,A13,P=100,55,35,14,24,72. IODs=10:7. OOD,Od,POD \pm 3,4,5. A3=AW \times 2. A3,4,5 \pm 10,6,5,6. A13=BW \times 2.1 and \neq A9-12. P,Ma,Mi,2(Ma),3(Ma)=100,52,19,70(60),68(74). RC=B, somewhat close to C, R1 short, CV1=CV2 \times 3.6. TCV:CV2=8:7, TCV feebly sinuate, CV2 strongly down-curved as usual, angle about 120°.

Genitalia apparently similar to those of varipes, but in the present species dorsal one of apical two lobes of paramere broader than the ventral and provided with an elongated thickened plate (A in Figs. 137 and 138) on inner margin which is darkened and conspicuous in the amber-yellow surroundings; penis valve thick, without shoulder, but with a pair of sickle-shaped appendages that are wider than usual, but produced laterally as usual, not obliquely standing. Right paramere and penis valve in dorsal view: Fig. 136, left paramere and penis in ventral view: Fig. 137 (A is above-mentioned plate), right paramere in oblique ventral view (from inner side in order to observe the state of apical splitting of paramere): Fig. 138 (notice the position of A), volsella: Fig. 139 (ventral view).

Frons strongly microcoriaceous and closely superimposed with comparatively large punctures, mesoscutum distinctly microcoriaceous and punctured, punctures somewhat smaller than those on frons, but much closer, on mesopleuron microsculpture much weaker, punctures sparse and surface fairly strongly shining. Area dorsalis at base obliquely, coarsely, on the rest transversely (somewhat obliquely) finely and closely striate, striae on disc weaker and not marked, lateral series of striae sparse and only on anterior portion defined, rest of dorsal and posterior aspects finely and closely punctured, sides except smooth femoral sinus obliquely, closely striate, mixed with fine punctures, striae generally weaker downwards.

Remarks. This species is similar in general characters to T. clavicerum Lepelletier et Serville, but is fundamentally different from this in the structure of male genital organs (much narrower ventral one of apical two lobes of paramer, presence of A of Figs. 137 and 138 and much shorter sickle-shaped appendages of penis valve). It can be separated from clavicerum externally by the lack of lateral furrows of area dorsalis.

15, A. TRYPOXYLON CLAVICERUM EXIGUUM TSUNEKI, 1956

Trypoxylon pygmaeum: Yasumatsu (nec Gussakovskij, nec Cameron), Zool. Mag. (Tokyo), 50 (11): 453, 1938.

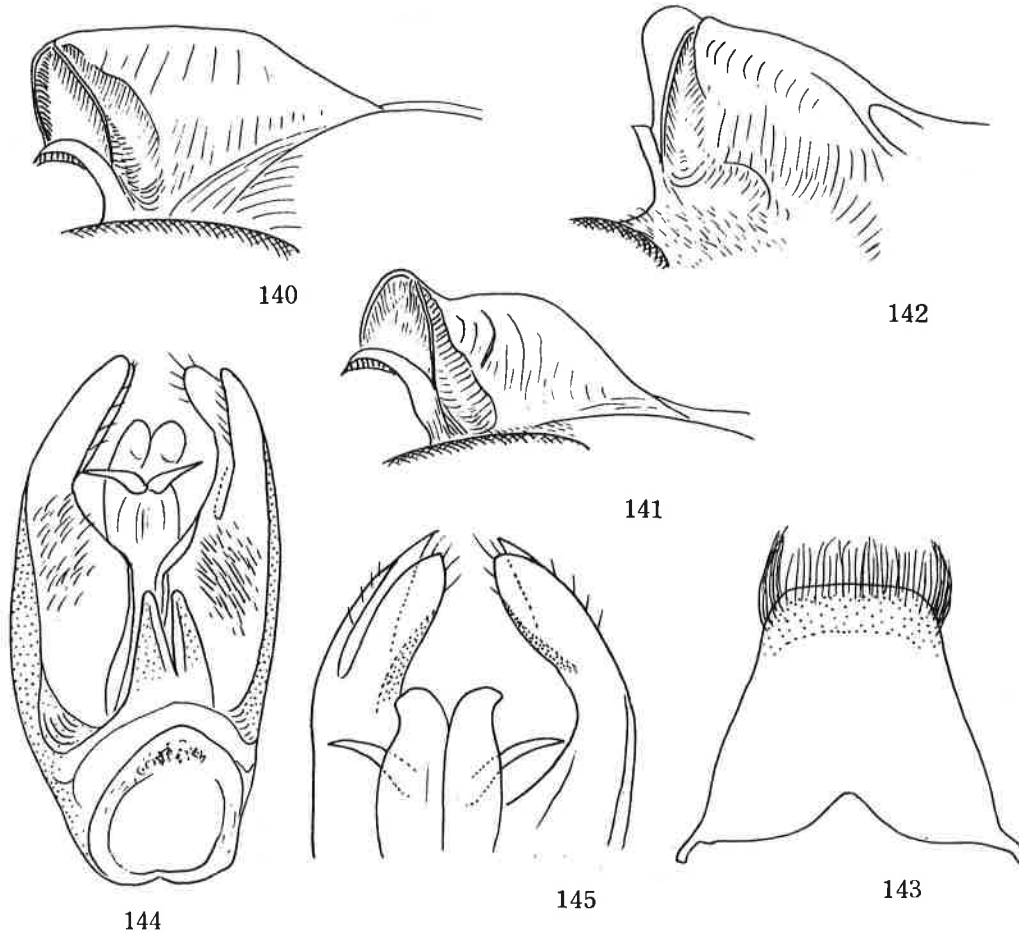
? Trypoxylon pygmaeum: Masuda (ditto), Mushi (Fukuoka), 15 (1-2): 1 -, 1943 (biology).
Trypoxylon clavicerum exiguum Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci., 6 (1): 37, 1956 (♀ ♂, Japan).

Specimens.

Hundreds of ♀ and ♂ from Hokkaido, Honshu, Shikoku and Kyushu.

The Japanese representative of T. clavicerum Lepelletier et Serville, 1928, differs from the nominate race in the structure of SAT, namely in exiguum it is narrower

and much higher, most usually bearing narrow dorsal aspect which is somewhat enlarged at anterior part, but in the extreme case almost without dorsal aspect, simply acutely ridged, just as in the preceding species (cf. Fig. 129), but in lateral view dorsal margin always more highly elevated than level of frons (Figs. 140, 141, variation). In clavicerum s. str. dorsal side of SAT broadly flattened, not nasiform, carrying thick shining median carina anteriorly - lenticular in form - and longitudinal excavation - varying in form and depth - posteriorly. In exiguum dorsal shining median carina is usually lacking and posterior longitudinal excavation (Fig. 142 - dorso-lateral view) similarly quite variable in form and depth, sometimes it is also lacking. Median keel or ridge at IAA (perpendicular anterior aspect of SAT) is well developed, highly produced and first roundly, then nearly perpendicularly curved down. Anterior transverse carina in dorsal view more highly raised than in nominate race, showing more acute triangle.



Figs. 140-145. Trypoxylon clavicerum exiguum Tsuneki

Supplements to the original description

Clypeus at apical margin in middle bidentate as in koreanum (cf. Fig. 133), in ♀ more strongly produced anteriorly than in ♂, disc broadly roundly elevated (an important key point to distinguish it from closely allied other species)(in koreanum broadly roundly tectate). Al3 similar in form to that of koreanum (cf. Figs. 134, 135), lamina on side of pronotal collar most usually with apex bluntly pointed, but frequently broadly rounded (just as in Figs. 39, 40 or 38). Sternite 8: Fig. 143, genitalia in ventral view (slightly from left side): Fig. 144, apical part in dorso-lateral

view: Fig. 145. Notice that dorsal lobe is broader than the ventral and sickle-shaped appendages very slender and long, but shoulder is not as yet developed, although round-

Measurements of holotype ♀ (allotype ♂ within parentheses):

HW:HL in frontal view 100:96 (100:90). HW,HL,IODv,A3,A13,P=100,62,36,17,--,80. (100,60,38,12,20,74). IODs=10:5 (10:7.5). OOD,Od,POD=1,3,3 (2,3,5). A3=AW×2.2 (AW×1.3). A3,4,5=10,7,6.5 (10,7,6.7). (A13=BW×1.7, #A9-12). P,Ma,Mi,2(Ma),3(Ma)=100,43,23,60(58),66(68) (100,42,24,66(60),52(72)). RC=C. R1 moderately long, nearly as long as A3 (A3:R1=10:9). TCV:CV2=3:2. CV1=CV2×4. TCV gently incurved, CV2 down-curved as usual. Angle about 120°. (RC=C. R1=CV2=A3. CV1=CV2×3.8. TCV nearly straight. Angle about 120°).

Frons and mesoscutum rather weakly microcoriaceous, with surface fairly shining, punctures fine and fairly close on frons, PIS=PD, on mesoscutum punctures finer and much closer. Area dorsalis distinctly enclosed with furrow, at base obliquely, divergently and coarsely striate, on median furrow usually transversely, on disc obliquely striate or rugoso-striate.

Remarks. In Japan occur several other species that have appearance closely similar to the present species. It can easily be distinguished from them, however, by the roundly raised disc of the clypeus. The character is special to the present species at least in Japan.

As to SAT-ASR of the nominate race see Appendix.

15, B. TRYPOXYLON CLAVICERUM GUSSAKOVSKIJ TSUNEKI, 1974

Trypoxylon pygmaeum Gussakovskij, 1933 (nec Cameron, 1900), Ark. f. Zool., 24 A, 10: 13, 1933 (1 ♀ 1 ♂, East Siberia).

Trypoxylon clavicerum pygmaeum: Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, N Nat. Sci., 6 (1): 36, 1956.

Trypoxylon clavicerum gussakovskij Tsuneki, Ann. Hist.-Nat. Mus. Nat. Hung., 66: 365, 1974 (2 ♀, N. Korea).

Gussakovskij in describing his pygmaeum says that T. clavicerum simile, sed stature minore, areae dorsali segm. Med. fere tota transverse-rugoso-striata differt. (♀ 6 mm, ♂ 5 mm). He further says in his German explanation "durch die ganz gestreiften des Seg. Med. zu unterscheiden". However, all the characters he listed to separate it from clavicerum s. str. are variable in nature and within the scope of variation of clavicerum. The specimens used by him to describe the species are but 1 ♀ and 1 ♂.

According to my observation of the syntype specimens of pygmaeum Gussakovskij the female is certainly slightly smaller than the average length of the European female of clavicerum, but clearly within the range of variation of the species and the male is nearly average in length. Some Polish males at my hand are much smaller than his type. Sculpture of area dorsalis in the specimens observed are:

♀, except basal oblique coarse striae, median furrow and disc transversely, somewhat arcuately, distinctly striate. ♂, basal oblique striae longer, reaching almost middle of the area, thence transversely, less distinctly than in the female, striate, striae mixed with weak punctures and disturbed all over the surface.

But the sculpture of area dorsalis is considerably variable in this genus and, without statistic support, not a good key character to separate the species.

SAT (♀♂) is intermediate in the state of elevation and in the width of dorsal aspect between the European typical race and the Japanese subspecies. It is not so highly and not so acutely raised as in the Japanese specimens, bearing a fair degree of dorsal width which is, however, distinctly narrower than in the typical race.

Clypeus, in the structure of roundly raised disc and medianly minutely bidentate apical margin, similar to the typical and the Japanese races. A13 as long as A10-12, in the typical and the Japanese specimens it is slightly longer than A10-12 usually, but roughly appearing almost as long as A9-12.

In the colour of legs the Ussuri specimens are also intermediate between the western and eastern races, more broadly and distinctly yellowish in fore and mid tibiae and tarsi than the western, but less so than the eastern.

Fore tibia and tarsus yellow (♀♂), mid tibia except brown or dark brown outer and inner sides, ferruginous (♀), or light brown (♂), mid T1 except apex and T2-5 at each base lightly ferruginous (♀), T1 largely ferruginous and rest wholly brown (♂). In the Japanese race mid tibia usually wholly ferruginous yellow, rarely on outer side

brown. In the European specimens fore and mid tibiae considerably broadly brown or dark brown. Measurements of type ♀ (♂ within parentheses):

HW, HL, IODv, A3, Al3, P=100, 56, 34, 17, --, 80 (100, 58, 40, 12, 22, 80). IODs=10:5.5 (10:7). OOD, Od, POD=2, 6, 5 (3, 3, 5). A3=AWx2.6 (AWx1.3). A3, 4, 5=10, 7, 6 (10, 6, 6). (Al3=BWx1.7 and ≈Al0-12). P, Ma, Mi, 2(Ma), 3(Ma)=100, 54, 22, 68(57), 60(68) (100, 44, 20, 56(60), 56(64)). RC=B, Rl moderately long, slightly longer than half TCV, CV1=CV2x4.2, TCV: CV2≈3:2, angle about 120° (RC=B, Rl ditto, CV1=CV2x3.5, TCV≈CV2, angle about 120°). TCV in ♀ nearly straight, CV2 down-curved as usual, angle at base about 140 and at apex about 120°, while in ♂ angle at base about 130° and at apex about 120°; others similar. Al3 strictly slightly > Al0-12 and slightly shorter than A9-12. ♀ 6, ♂ 5 mm.

Genitalia not examined, because in the two other races the organs are same in structure.

The female specimen is designated as lectotype.

Remarks. (1) In my collection there are 4 ♀ from Quelpart Is., South Korea, lying between Korea and Japan, captured on Mt. Hanna at about 800 in height. These specimens agree completely in the characters of clypeus and SAT-ASR and no doubt belong to ssp. gussakovskiji, though the sculpture of area dorsalis is considerably variable. (2) In 2 ♀ from North Korea, collected at half way to Mt. Baegdu, differ slightly in the character of the clypeus. In them disc is not so roundly swollen, but rather roundly tectate. This is quite exceptional and the examination of the male genitalia is considered necessary.

16. TRYPOXYLON KOIKENSE TSUNEKI, 1956

Trypoxylon koikense Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II. Nat. Sci., 6

(1): 35, 1956 (♀ ♂, Fukui, Ishikawa, Aomori, figs. head in frontal view, clypeus, male antenna, G1, male genitalia).

Specimens examined:

Many ♀ ♂, from Hokkaido (Mt. Muine, Hakodate, Hidaka, Sapporo), Aomori, Niigata, Ishikawa, Fukui, Tochigi, Mie.

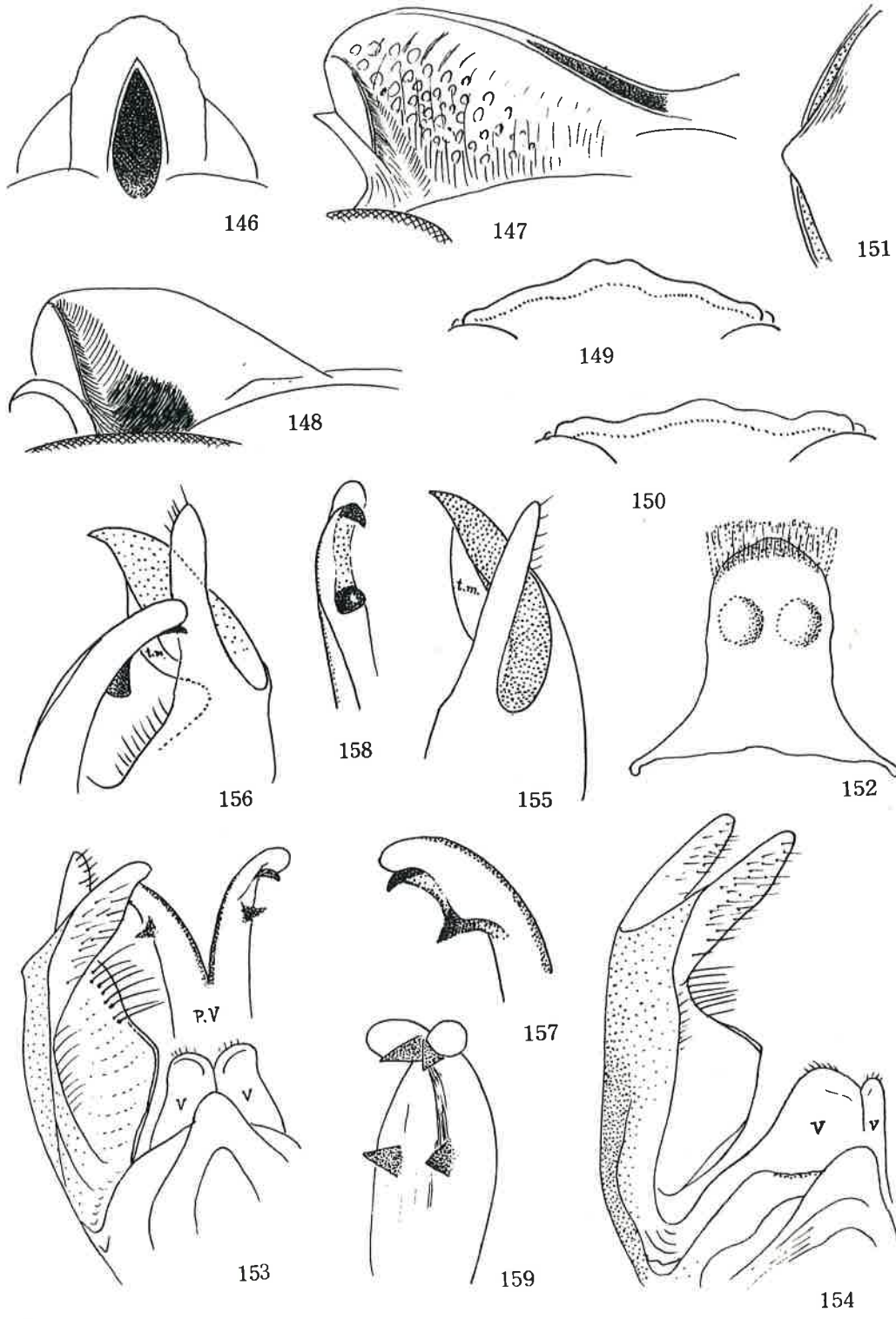
Distribution. Known to occur rather commonly in montanic areas of Hokkaido, Honshu and Shikoku, but has not been collected from Kyushu and the Ryukyus.

Supplement to the original description.

The description is detailed and only a little is left to be added to it.

Apparently closely resembling T. clavicerum exiguum, but on an average slightly larger (especially in ♀), with clypeal disc distinctly tectate (♀ ♂), in ♂ A6 excavated at base beneath and produced at apex and Al3 shorter, distinctly less than Al0-12 (in some condition appearing =All+12) and not bent at apex. In structure of penis valve of genitalia the present species is characteristic in having two pair of sickle-shaped appendages - this is quite exception to the genus.

Eye incision in ♀ moderately broad and moderately deep, strongly narrowed towards sinus, sinus minutely rounded, dorsal margin nearly horizontal, in ♂ much broader and shallower and broadly rounded at sinus, dorsal margin distinctly inclined outwards. Frons gently raised, medial furrow broad and shallow, but more distinct than in exiguum. SAT very similar to that of exiguum, high narrow nasiform (somewhat higher than in this) with dorsum more or less rounded in cross section, without medial carina, but always with a large, deep, longitudinal excavation or hollow at posterior part of medial line where, seen in profile, distinctly inclined posteriorly to level of frons, just as in exiguum, but the excavation is not so variable in strength as in this. SAT-ASR: Figs. 146, dorsal; 147, dorso-lateral; 148, lateral. Apical margin of clypeus: Figs. 149 (♀) and 150 (♂). Occipital carina disappeared behind buccal cavity where surface deeply depressed. Lamina on side of pronotum most usually: Fig. 151. Subalar area of mesopleuron normal, metapleural flange in a horizontal shelf. lateral carina of propodeum long, reaching near apex of lateral carina of area apicalis, but slightly deviated from it, area dorsalis distinctly enclosed with fine furrow, at base always obliquely and coarsely striate, but sculpture on the rest of the area considerably variable, most usually obliquely, nearly transversely, fairly closely striate, but sometimes striae wholly oblique on disc and only on median furrow transverse, sometimes nearly longitudinal on inner part of disc close to medial furrow, sometimes striae variably rugose or rugulose, partly appearing subreticulate, strength and dens-



Figs. 146-159. *Trypoxylon koikense* Tsuneki.
 149, ♀; 146-149, 151, common; rest ♂

ity considerably variable. Area apicalis without carina at dorsal margin, but distinct due to its rounded depression and separated into two parts with medial keel, GSR obliquely raised posteriorly as a whole, apical margin in vertical view rounded.

In ♂ sternite 8: Fig. 152, slightly differs from that of exiguum. Genitalia generally similar to those of clavicerum-group, but differ in the distribution state of hair, in the form of volsella and particularly in the sickle-shaped appendages of penis valve. Genitalia in ventral view: Fig. 153 (right paramere omitted), left paramere and volsella in ventro-lateral view: Fig. 154, apical part of left paramere in dorso-lateral view: Fig. 155 (t.m., transparent membrane), ditto with left half of penis valve in dorsal view: Fig. 156 (dotted area, ventral lobe), ventral lobe provided with a transparent membrane on inner margin which is not visible without particular care.

Very strange and characteristic is that penis valve bears 2 pair of sickle-shaped appendages; when it is widely open they are as given in Fig. 153 (densely dotted area) and in the much more enlarged condition: Fig. 157 (left half), the same seen vertically from left side: Fig. 158, when penis valve is closed: Fig. 159. In some condition they appear to be connected at the base with each other.

Measurements of ♀ (within parentheses ♂):

HW:HL in frontal view 100:95 (100:90). HW,HL,IODv,A3,A13,P=100,60,32,18,--,96. (100,60,35,18,19,80). IODs=10:4.5. (10:6.5). OOD,Od,POD=2,7,4.(=2,4,3). A3=AW×2.8 (AW×2.4). A3,4,5,6=10,7.5,7,6. (10,7,7,6.5). (A13=BW×1.4 and slightly >A11+12). P, Ma,Mi,2(Ma),3(Ma)=100,32,15,68(43),60(50). (100,39,21,63(48),48(63)). RC=C, R1 moderately long, about as half TCV, CV1=CV2×3.0-3.4, TCV=CV2, TCV gently sinuate or nearly straight, angle at apex about 120° (in ♂ generally similar).

17. TRYPOXYLON PACIFICUM GUSSAKOVSKIJ, 1933

Trypoxylon pacificum Gussakovskij, Ark. f. Zool., 24 A, 10: 12, 1933 (3 ♀ 1 ♂, Ussuri)

Trypoxylon pacificum: Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., II, Nat. Sci., 6 (1): 33, 1956 (♀ ♂, Japan (Hokkaido, Honshu, Shikoku), Korea (Seoul)).

Trypoxylon pacificum: Tsuneki and Japanese authors, 1956-80.

Trypoxylon pacificum: Nambu, Life Study, 10 (1-4): 25-, 1966; 11 (1-2): 6-, 1967 (biology).

Trypoxylon pacificum: Tsuneki, SPJHA, 16: 86, 1981 (1 ♂, Siberia: Okeanskaya).

On the syntypes of the species

I could examine 2 of the 3 female and one male syntypes of the present species preserved at Natural History Museum of Stockholm.

Present state of the type series.

♀. Complete specimen, pinned with No. 1 insect needle, with wings stretched posteriorly, not folded. It is attached with 5 labels, from the top: a slit of 6 2 mm white paper, with 8.VI.30 handwritten with black ink; 10 6 mm white data label, Vladivostok, Sedanka, Malaise, pressed in 3 lines; 16 6 mm name label, Trypoxylon pacificum sp. n. ♀ V.Gussakovskij, written by the hand of Gussakovskij in 3 lines with black ink; 15 6 mm blue-green Museum label, with Riksmuseum Stockholm pressed in two lines; 7 mm red square label, with 119 pressed and 81 handwritten. Length 10 mm.

♀. Right antenna from A9 apically lacking, otherwise complete, but with hair glued and appressed, as if once dipped in water, wing not well arranged, the specimen pinned as above. With similar 5 labels: top same, second similar date label, but "Vladivostok, Tigrovaja Malaise, pressed in 3 lines; name label same; museum label same; red number label, with 120 pressed and 81 handwritten in. About 10.5 mm.

♂. Pinned as above, complete specimen except lack of right hind T5, with wings posteriorly stretched, not folded. 5 labels, but without date one. Top, Putiatin island, handwritten with black ink, possibly by Malaise himself. Locality label, Vladivostok, ---, Malaise; name label same except ♂, Museum label same; red number label, 121 pressed and 81 handwritten in below. Length 6.8 mm (gaster well stretched).

Observation.

The female specimens completely agree in characters with the black-gastered form of Japan and Korea. The second specimen has G2 and 3 obscurely reddish at each base. Posterior part of pronotal collar not completely black as given in the original description, but distinctly discoloured, in some light only it appears largely black, yet marginal area yellowish brown, and in other light nearly completely yellowish. This is always the case when the discoloured sclerite closely overlaps black base. The state completely agrees with that of the specimens of our country. (In the com-

pletely non-discoloured specimen the area is under every condition black. Gussakovskij says that in the female the area is not discoloured and in the male distinctly discoloured; this is certainly strange).

While the male specimen differs considerably from the Japanese same sex in the colour of legs and in the relative length of Al3 and, moreover, it is markedly smaller in body size. In the general appearance it is rather closer to the male of monticola of Japan.

In the syntype male fore and mid femora castaneous, with both ends yellowish, fore tibia and tarsus completely yellow, mid tibia except brownish outer side ferruginous, mid tarsus also ferruginous except brown T5, hind tibia at base yellowish and except outer side pale brown, hind tarsus pale brown and broadly yellowish white at base of T1 and 2. Fore tibial spurs yellow, mid spur ferruginous and in some light apically castaneous, hind spurs always castaneous. The colouration is rather closer to that of monticola than to that of pacificum of Japan. Al3 as long as A9-12, in some condition appearing slightly shorter, nearly as long as A10-12. In both the Japanese forms compared it is amply as long as A9-12, in some condition appearing as long as A8-12. (Fig. 1 of Gussakovskij is quite accurate, notice that the length of Al3 is measured from mid point of basal line to apex).

Posterior part of pronotum distinctly discoloured as described by Gussakovskij, its tubercle posteriorly broadly yellowish.

Sculpture of area dorsalis markedly different from that of ♀ as given by original author, but the fact is not important, because it is markedly variable in this group of species, for reference in the specimen area dorsalis weakly margined with fine furrow, basal elevation broad and high, only slightly shorter than postscutellum in middle, it extended inclining posteriorly at median area, forming subtriangular slope at base of median furrow, basal raised area transversely, finely closely striate and transverse arcuate furrow just behind it smooth and polished and obliquely, divergently and coarsely striate, median furrow shallow and from base longitudinally carinated in middle, surface on basal obliquely striate, but posteriorly microcoriaceous, disc largely shining and sparsely, weakly punctured, on it inner part along median furrow obliquely feebly striate in addition and on postero-lateral part arcuately and finely rugulose.

Measurements of ♀, ♀ and ♂ observed are in Table 3.

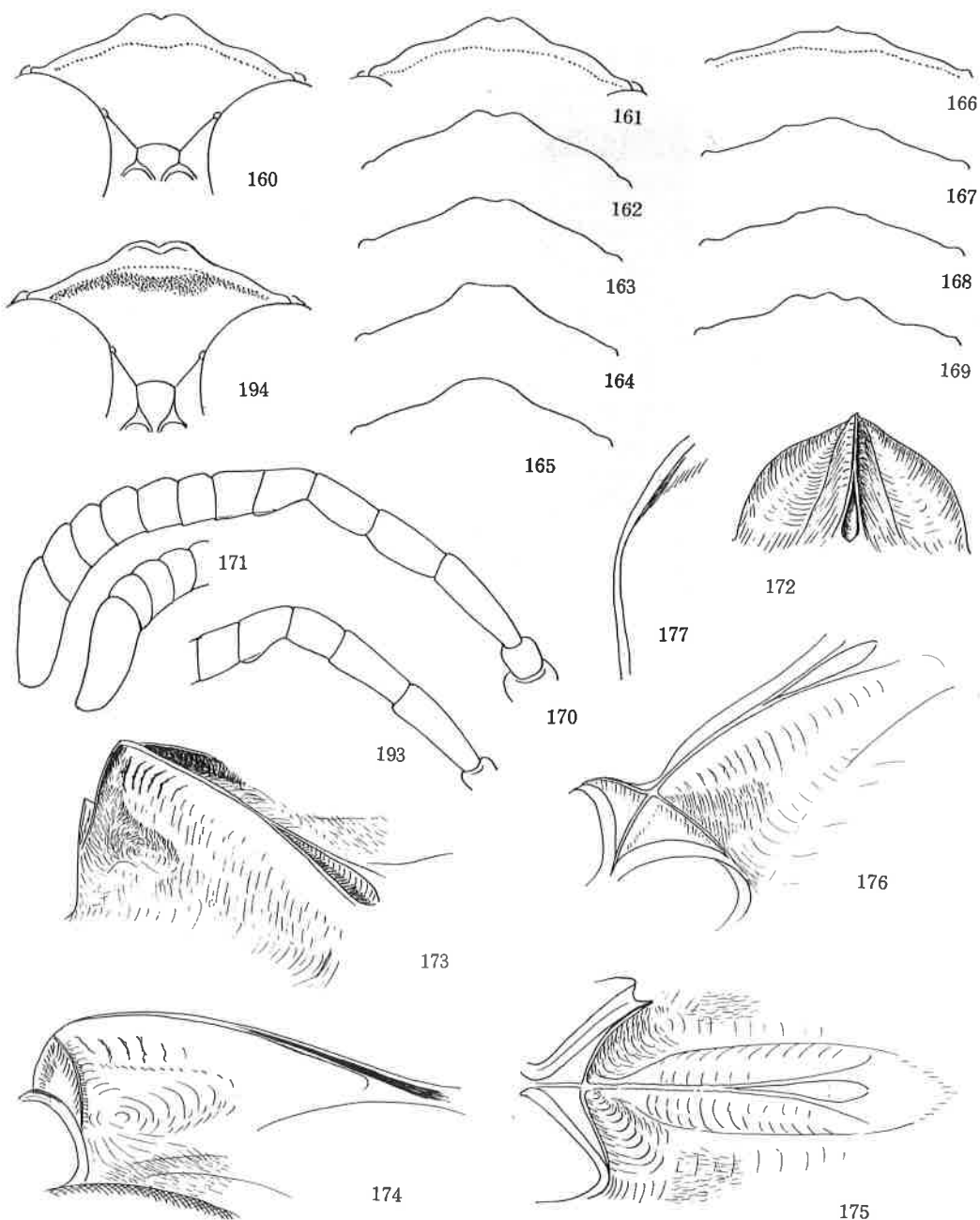
As mentioned above, in the Ussuri male legs are much more broadly pale than in the Japanese male and in this regard rather similar to monticola male, while in the relative length of A5 and 6 the former distinctly longer than the latter just as in pacificum and different from monticola (here A5=A6, ref. Figs. 170 and 193). It was considered therefore that the Ussuri male may belong to some species different from both of the Japanese forms mentioned. In order to confirm the taxonomic relationships of the Ussuri male the genitalia and 8th sternite were taken out and examined. They were completely consistent in structure with those of the Japanese males of T. pacificum. As a result it was made out that the difference in colour of legs of the Ussuri male was merely a variation within the category of pacificum. It was undecided, however, whether the variation was local to the population of the Island of Putiatin or general to the population of the Ussuri region. But the following fact seems to be interesting in connection with this colour variation:

A male specimen from South Korea (Quelpart Is.) has the mid leg somewhat paler than usual: tibia, except dark brown outer side, somewhat pale brown and tarsus at base of T1 and 2 broadly yellowish white, rest of tarsus slightly paler brown than usual. Judging from the fact that the Korean female specimens belong all to black-gastered form as the Ussuri female, the colour of the male seem to have some significance. However, in the Japanese males there is no such specimen as above mentioned, although the black-gastered form sometimes occurs among the common form that has the red-marked gaster.

On the Japanese form

The female of common form of this species in Japan has the gaster medianly more or less marked with red, but sometimes black-gastered form is also present, though rather rarely and confined to the northern district only in the main, while the male is always black-gastered. Otherwise the female is similar to the Ussuri type.

♀ 10-13 mm, ♂ 8-10 mm. Gl clavate, mesoscutum microcoriaceous, propodeum with lateral carinae, area dorsalis weakly but distinctly enclosed with furrow, IODs in ♀ 3:2 - 5:3, in ♂ 4:3 - 5:4; clypeus: Fig. 160 (♀), variation of its apical margin: Figs. 161-165 (♀), Figs. 166-169 (♂), 168 is an exception; A3=AW 3 (♀ ♂), in ♂ A6 excavated at base beneath and produced at apex (Fig. 170), Al3=A9-12 (Figs. 170, 171), frons gently raised, raised area at anterior margin nearly transverse, thence inclin-



Figs. 160-177. *T. pacificum* Guss. 160-165, ♀; 166-171, ♂; rest common.

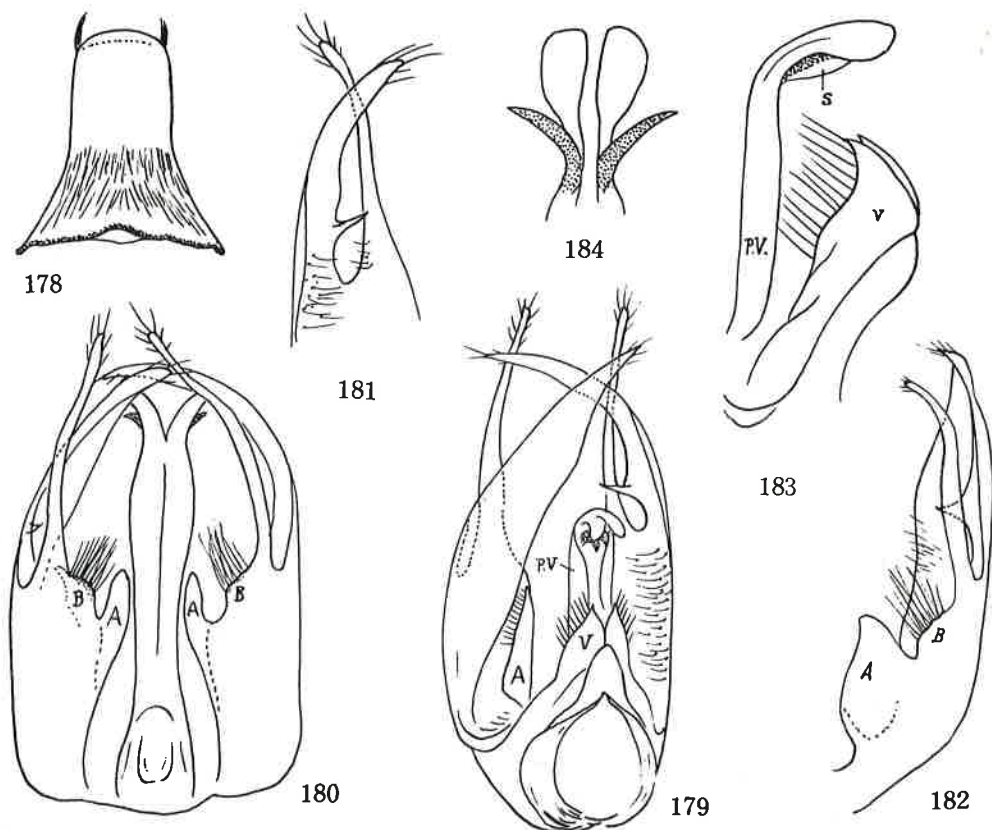
Figs. 194-195. *T. monticola* Tsun. 194, ♀; 195, ♂.

en anteriorly, surface of frons nearly flat, SAT narrow long high nasiform, apical margin transversely highly carinate, carina connected with outer part of short ASR, sides of SAT steeply, nearly perpendicularly inclined and anteriorly behind transverse carina deeply excavated, dorsum medianly carinated, carina gradually enlarged posteriorly and finally deeply excavated in middle into an elongated oval hollow (Figs. 172, dorsal; 173, dorso-lateral; 174, lateral; 175, vertical from lateral; 176, ventro-lateral view of SAT-ASR), posterior end of the carina reaching mid point of the distance between

antennal base and fore ocellus. Posterior part of pronotal collar distinctly discoloured. RC=C-B, CV1=CV2 4.0-4.5 (usually), angle mostly about 120°. Fore tibia and tarsus ferruginous, articulations of legs brown, hair silvery.

Measurements in Table 3. Eye incision moderately broad and deep and strongly narrowed towards sinus, sinus minutely rounded, dorsal margin horizontal (♀), in ♂ rather shallow and broad, with dorsal margin distinctly inclined outwards. Occipital carina abruptly ending beneath head, leaving area behind buccal cavity widely open. Anterior part of collar narrow ridge-like, only slightly incrassate laterally, posterior part discoloured, Sometimes appearing narrowly so, lamina on side broadly rounded and only slightly produced (Fig. 177), parapsidal suture a fine shining impressed line, about 1/3 length of scutum, subalar area of mesopleuron normal; lateral carina of propodeum broadly obsolete at base and apex, apex ending far before anterior end of lateral carina of area apicalis and usually not in a line with it, medial furrow of area dorsalis varied considerably in form, always not sharply outlined, medial furrow of posterior inclination always narrow and deep, with shining bottom line, not reaching area apicalis, its form, depth, state of inclination towards medial line considerably varied, area apicalis always roundly impressed and midially longitudinally keeled, but with dorsal margin incomplete, GSR wide band-like, transversely roundly raised as a whole, not thinly, membranously elevated at posterior margin. In fore wing RC=C, but somewhat close to B, rather intermediate between C and B, R1 not very short, usually about 1/3 length of TCV.

Sternite 8: Fig. 178, its form and state of hair at apical margin characteristic, basal part of ventral (outer) surface always covered with appressed long yellowish hair. Genitalia (5 instances observed) in ventro-lateral view in one instance: Fig. 179, in dorsal view in one other: Fig. 180, paramere deeply bifurcate at apex, dorsal lobe slender and long, ventral one broader, similar in length and provided with an acute tooth on inner margin near its base (Fig. 179, 181, 182), both lobes sparsely



Figs. 178-184. *Trypoxylon pacificum* Gussakovskij, ♂

Table 3. Measurements of *Trypoxylon pacificum* Gussakovskij.

Loco	S	BL	HLIODvA3(L/W)	Al3(L/W)	P	IODs	ODoDPD	A4A5	Ma	Mi	2(Ma)	3(Ma)	CVI	T:C	Ang
Ussuri*♀	10.0	54	31	22(3.7)	--(---)	104	6.0	1 3 2	7 6	38 20	54(50)	53(58)	3.7	8:7	110
Ussuri ♀	11.0	54	32	22(3.4)	--(---)	102	6.1	2 5 4	7 6	38 18	60(50)	54(58)	3.8	1:1	120
Ussuri ♂	6.8	54	33	22(2.7)	22(2.2)	90	8.0	3 5 5	7 6	40 20	60(54)	52(62)	2.7	4:5	120
Korea ♀	11.7	54	31	22(3.5)	--(---)	104	6.3	1 3 2	7 6	33 17	62(55)	60(60)	4.0	5:4	120
Korea ♂	8.0	52	34	22(2.7)	23(2.2)	90	7.6	3 4 5	7 6	38 19	58(56)	62(65)	3.4	1:1	120
Hokkai*♀	10.5	54	33	22(3.0)	--(---)	94	6.0	2 3 3	-	33 18	60(50)	56(60)	4.1	5:4	120
Hokkai*♀	12.0	54	31	22(3.3)	--(---)	100	6.5	3 6 5	7 6	36 18	60(54)	58(60)	4.1	5:4	120
Aomori ♀	12.0	54	30	22(3.3)	--(---)	100	6.0	2 5 4	7 6	34 16	60(46)	54(54)	4.3	5:3	120
Aomori ♀	9.5	53	33	22(3.5)	--(---)	100	5.5	3 8 6	7 6	31 17	64(60)	58(52)	4.0	5:4	130
Isikaw.♀	10.5	55	32	22(3.3)	--(---)	98	6.0	1 2 2	8 7	34 17	60(45)	60(52)	4.4	5:4	120
Fukui ♀	12.0	55	32	22(3.5)	--(---)	100	6.6	1 2 2	8 7	34 19	58(46)	60(62)	4.4	3:2	120
Fukui ♀	11.0	55	33	22(3.2)	--(---)	106	6.2	3 5 5	7 6	36 18	60(48)	58(58)	5.0	5:3	130
Tochi. ♀	10.0	54	33	22(3.3)	--(---)	110	6.4	1 3 2	7 6	31 16	58(46)	50(55)	4.3	4:3	120
Sizu. ♀	13.0	55	31	22(3.3)	--(---)	108	5.7	2 5 4	7 6	34 18	60(48)	60(58)	4.4	5:4	120
Kyoto ♀	12.5	54	30	22(3.3)	--(---)	102	6.5	2 5 4	7 6	36 18	58(48)	58(58)	3.8	1:1	120
Ehime ♀	11.0	54	32	22(3.3)	--(---)	106	6.0	1 2 2	7 6	35 17	60(52)	53(60)	4.7	5:4	120
Fukoka ♀	11.3	54	30	22(3.1)	--(---)	108	5.7	2 6 5	7 6	35 17	60(53)	58(63)	4.0	5:4	120
Hokkai.♂	7.7	55	34	22(3.1)	23(2.3)	90	8.0	3 4 4	7 6	38 18	60(48)	60(69)	4.0	4:3	120
Aomori ♂	9.0	54	32	22(3.1)	22(2.2)	88	8.0	3 4 5	7 6	46 20	62(60)	56(70)	3.4	1:1	120
Isikaw.♂	9.0	55	35	22(3.0)	23(2.1)	96	7.7	3 4 4	7 6	42 20	60(58)	60(70)	4.7	1:1	120
Fukui ♂	8.5	53	35	20(3.0)	22(2.3)	92	7.5	3 4 4	7 6	36 19	62(54)	63(64)	3.2	1:1	120

Remarks. Abbreviation as in Table 1.

Ussuri*... Lectotype. Hokkai. Black-gastered.

Notice! OD:PD(♀)=1:2.

fringed with hair at apical area; basiparamere provided with a strange lamellate appendages on inner margin at base, on each side of penis valve (A in Figs. 179, 180, 182), in Fig. 179 rolled inwards; this is the modification of the lamella at inner margin which is usually rolled inwards to form a semicylinder of basiparamere, and further, with a round swelling above A, which is thickly covered with a tuft of very long hair (B in Figs. 180, 182). Fig. 181: left paramere at apical area seen from beneath and somewhat from inner side, Fig. 182: left paramere in dorsal view, the tooth at base of ventral lobe is seen through translucent dorsal lobe. Volsella (V in Figs. 179, 183) characteristic in form and long stiff dorsal hairs; penis valve without shoulder, but wutg well developed long sickle-shaped appendages which stand obliquely (PV in Figs. 179, 180, 183... lateral view), both sides of penis rolled inwards to form a subcylinder (Fig. 179), apical part seen vertically from beneath: Fig. 184.

Colour of gaster. Of the 88 female specimens collected from Hokkaido to Kyushu in Japan 77 have a more or less red area on G2 and 3, but in 8 of which the red is strongly darkened and narrowly restricted to bases of G2 and 3, that is to say, nearly wholly black. In the brightest specimens gaster from apex of G1 to apex of G3 red, almost without black mark above, but such specimens are rather rare, in most of the specimens G2 and 3 each either black marked above or black banded posteriorly and width of the black area and brightness of the red hue are broadly variable. While in 10 specimens including one from Central Korea gaster is completely black and some of them are quite doubtful as to whether they really belong to the present species or to the closely allied next species (=monticola m.).

The red-marked specimens are common in lowland area and distributed till moderate height of inland districts, while the black-gastered form is apparently confined to northern districts or montanic regions of moderate to fairly high altitude

Localities of nearly black specimens: Aomori (2 ♀, Towada), Ishikawa (3 ♀ Tsurugi, 1 ♀ Futakuchi), Fukui (1 ♀ Ikegahara), Hyogo (1 ♀ Sasayama).

Localities of completely black specimens: Hokkaido (2 ♀ Mt. Hakodate; 1 ♀ Mt. Kariba), Aomori (3 ♀ Towada), Ishikawa (1 ♀ Tsurugi), Fukui (1 ♀ Taniyama, 1 ♀ Arashi).

(* From Mt. Hakodate one red marked female is also collected.)

Colour of legs: ♀, ♂. Articulations of all legs always more or less brownish, sometimes fairly pale, sometimes rather dark, fore tibia and tarsus usually pale brown,

but sometimes dorsal side considerably darkened, bases of mid and hind tibiae and of T1 also usually brown or pale brown, but sometimes the areas are darkened and marks become indistinct, spurs usually brown, but hind ones dark brown or black. In general in the male legs are somewhat paler than in ♀, though similar in pattern of maculation.

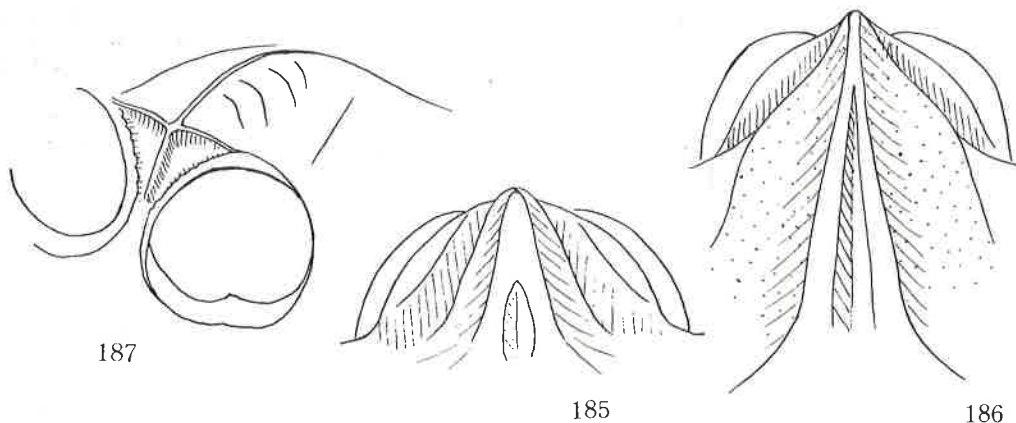
Mandible from base pale brown or ferruginous and at apex darkened, clypeus at apical area somewhat brownish, A1 and 2 often brown beneath, apical margin of pronotal tubercle sometimes brown or ferruginous, sometimes completely black, tegula translucent brown, palpi considerably darkened brown.

Frons distinctly microcoriaceous and closely superimposed with comparatively fine punctures, punctures usually obliquely or transversely contiguous to neighbouring ones forming irregular puncture lines. Mesoscutum also microcoriaceous and more finely and more closely punctured, mesopleuron with microreticulation weaker and punctures sparser and much finer, sparser and weaker upwards; lateral series of short striae along lateral carinae of propodeum sparse and not strong, area dorsalis at base obliquely and coarsely striate, on median furrow transversely, on disc oblique-transversely striate, density, rugosity and strength of striae markedly variable, sometimes median furrow rugoso-reticulate or at base longitudinally rugoso-striate, sometimes median furrow longitudinally carinated in middle, intervals of striae on disc always punctured; outsides of the area and posterior inclination finely closely punctured, not shining, sides except anterior femoral sinus obliquely striate and punctured.

Taxonomic relationships

(1) T. pacificum is very closely related to Southeast-Asiatic T. trochanteratum Cameron and very similar to this in general characters, except colour of gaster and legs. Moreover, as colour of gaster and legs is considerably variable within the specific range of trochanteratum (ref. SPJHA, 9: 40, 1979 and 16: 33-34, 1981) and of pacificum (see above) we are tempted to consider them conspecific, only representing local forms. However, in trochanteratum the male remains still unknown and without the knowledge of the male characters it is a rather venture to discuss the specific relationships between them (ref. cases of the New Guinean species and the case of T. monticola below described) and, therefore, pacificum is dealt with here as distinct. There is no doubt, however, that pacificum is in a very close relationships with trochanteratum. SAT-ASR in this species: Figs. 185(dorsal), 186 (vertical) and 187.

(2) In Japan two forms of pacificum are present, red-marked form and black-gastered form, the former is widely spread over the country from Kyushu to Hokkaido and from flatland to montanic area, while the latter has a strong tendency to occur in northern district or montanic area. The nominate specimens collected in Ussuri region and Korea belong no doubt to the latter form. Apparently the two forms can be separated into two local races, southern and northern. In reality, however, there is an intermediate form between them, namely nearly black form above mentioned, and, furthermore, in a considerably wide range (e.g. Mt. Hakodate and Towada) both forms occur in sympatric and actually the separation of them is difficult in both morphological character and distributional data. So that the subspecific treatment of them is not made here.



Figs. 185-187. Trypoxylon trochanteratum Cameron, ♀

18. TRYPOXYLON MONTICOLA TSUNEKI, 1956

Trypoxylon monticola Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II. Nat. Sci., 6 (1): 34, 1956 (5 ♀ 1 ♂, Towada, Mt. Haku, Chudzenji, Koike, Ikao).

Trypoxylon monticola: Tsuneki et Shimoyama, Life Study (Fukui), 7 (3-4): 49, 1963 (Towada, not common).

Trypoxylon monticola: Iida, Ibid., 12 (1-2): 21, 1968 (Fukui).

Trypoxylon monticola: Tsuneki, Ibid., 17 (1-2): 35, 37, 1973 (keyed).

Trypoxylon monticola: Bohart & Menke, World Sphecid., p. 347, 1976 (listed).

Trypoxylon monticola: Suda, Hym. Comm., 8: 4, 1978 (2 ♀, Yamanashi).

Trypoxylon monticola: Nambu, Saitama Anim., p. 192, 1979 (3 ♀, montanic area of Saitama Pref.).

Specimens examined:

1 ♂, Gumma (Ikaho), 19. VII. 1927, K. Takeuchi; 1 ♂, Fukui (Arashi), 25. IX. 1971, K. Tsuneki; 1 ♂, Hokkaido (Nukabira), 1. VIII. 1972, K. Shimoyama.

9 ♀, Aomori (Towada, Nurukawa, Kuzukawa); 1 ♀, Hokkaido (Mt. Hidaka); 3 ♀, Tochi-gi (Chudzenji, Senjugahara); 4 ♀, Fukui (Koike, Mt. Akato, Mt. Hyakken); 1 ♀, Shizuoka (South Japan Alps, Denzuke Pass).

The present species is very similar to the black-gastered form of the preceding species and the separation of it from this species is rather difficult, especially in the female. In the structure of the male genital organs, however, it is distinctly different from pacificum, although very similar in pattern in general, and there is no doubt that they are different at the species rank. Differences in the genital organs are:

- (1) In the present species apical split of paramere comparatively shallower.
- (2) Difference in form of the two lobes not so striking as in pacificum, that is to say, dorsal lobe much broader (Figs. 188, right paramere, ventral view; 189, apical part of left paramere, lateral view; 190, ditto, dorsal view).
- (3) Fringe of hair of the two lobes more abundant and not restricted to the apical part only, and the hair much longer.
- (4) Ventral lobe without tooth on inner margin near its base.
- (5) Volsella much shorter, not so pointed at the top as in pacificum (Fig. 191, ventro-lateral, cf. Fig. 202 in pacificum).
- (6) Sickle-shaped appendages of penis valve shorter and broader (Fig. 192, dorsal view).

But paramere is similarly provided with inner basal lamellate prominence (A) and long haired tubercle (B) above it as in pacificum and main body of penis valve with lateral margins curved ventrally (U-shaped in cross section).

External differences in ♂:

- (1) A5 relatively shorter (Fig. 193, p. 47, cf. Fig. 170 in pacificum), namely $A5 \approx A6$ in monticola, while $A5 > A6$ in pacificum and $A3, 4, 5 = 10, 7, 5$ in monticola, but $A3, 4, 5 = 10, 7, 6$ in pacificum.
- (2) Mid leg much more broadly ferruginous yellow: articulation more broadly so, especially on tibia (rest of tibia pale brown, only outer and inner sides narrowly brown), T1 completely yellow and T2-5 ferruginous to pale brown.
- (3) Hind leg also more broadly ferruginous at each articulation and tibia at base broadly yellow and T1-5 each at base distinctly yellowish.
- (4) Tyloidea on A7, 8 and 9 lacking as far as examined (in pacificum usually present, at least in part).

Differences in ♀:

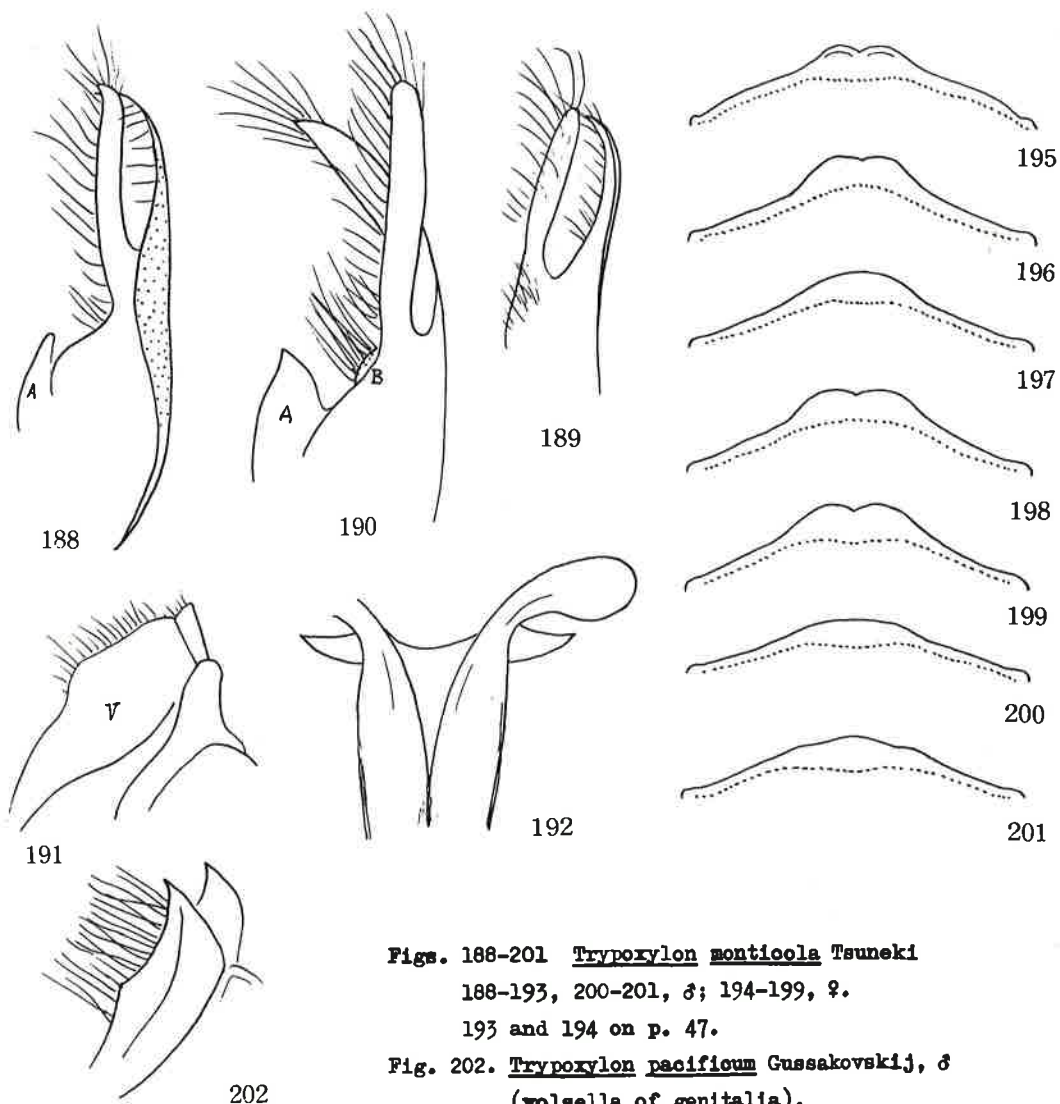
- (1) Gaster completely black (pacificum also often so).
- (2) IODs=10:5.0-5.5 (in pacificum 10:5.5-6.5).
- (3) SAT not reaching upwards mid point of the distance between antennal base and fore ocellus (in pacificum reaching mid point, but the difference is delicate).
- (4) Colour of mid leg generally more broadly pale brown (some in pacificum similar).
- (5) Supraclypeal area, as a rule longer (Fig. 194, p. 47, cf. Fig. 160).
- (6) Eye incision with sinus comparatively broader (delicate).
- (7) On an average G1 slenderer and relatively longer (Table 4, cf. Table 3).
- (8) Averaged body length slightly smaller (ditto).
- (9) Clypeus generally similar in form to that of pacificum, but medio-apical produced part is transversely somewhat broader on the average than in pacificum (Figs. 195-199 (♀), 200-201 (♂); cf. Figs. 160-164 (♀), 166-169 (♂)).

Table 4. Measurements of Trypoxylon monticola Tsuneki

Loco	S	BL	HL	IOD	vA3(L/W)	A13(L/W)	P	IODs	OD	ODpD	A4A5	Ma	Mi	2(Ma)	3(Ma)	CVI	T:C	Ang	
Tochig ♀	10.0	58	30	22(3.5)	--(---)	100	5.5	2	5	4	7	6	31	17	62(54)	60(54)	4.4	3:2	120
Ishika ♀	10.0	56	30	22(3.5)	--(---)	104	5.0	2	6	5	7	6	31	17	58(40)	54(52)	4.3	3:2	120
Sizoka ♀	10.5	55	31	22(3.7)	--(---)	104	5.2	2	6	5	7	6	30	16	58(43)	52(54)	4.0	1:1	125
Gumma ♂	7.5	56	35	21(3.4)	25(2.1)	87	8.0	3	5	5	7	5	35	20	64(48)	60(60)	4.1	5:4	120
Hokkai ♂	9.0	56	36	21(3.2)	21(2.2)	86	8.0	3	4	4	6	5	40	19	60(55)	60(65)	4.0	4:3	120
Fukui ♂	7.5	54	35	20(3.3)	24(2.2)	92	8.0	3	6	5	6	5	38	19	58(50)	55(60)	4.4	4:3	110

Remarks. Abbreviation as in Table 1.

All these differences are, however, very delicate and frequently overlapped in part of extremities or contiguous to each other and the actual separation of this species from black-gastered form of pacificum is very difficult.



Figs. 188-201 Trypoxylon monticola Tsuneki

188-193, 200-201, ♂; 194-199, ♀.

193 and 194 on p. 47.

Fig. 202. Trypoxylon pacificum Gussakovskij, ♂
(volsella of genitalia).

15. TRYPOXYLON IMAYOSHII YASUMATSU, 1938

- Trypoxylon imayoshii Yasumatsu, Zool. Mag. (Tokyo), 50: 451, 1938 (♀, Kyushu).
Trypoxylon imayoshii: Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II. Nat. Sci.,
 6 (1): 21, 1956 (6♀ 4♂, Fukui, 2♀ Ishikawa, 1♂ Tochigi, 1♀ Kyoto, 2♀ Hyogo,
 1♀, Fukuoka).
Trypoxylon imayoshii: Tsuneki et Shimoyama, Life Study (Fukui), 7 (3-4): 49, 1963
 (Aomori: Towada).
Trypoxylon imayoshii: Tano, Ibid., 12(1-2): 32, 1968 (1♂ Ishikawa).
Trypoxylon imayoshii: Itami, Ibid., 13 (3-4): 50, 1969 (1♀ Niigata).
Trypoxylon imayoshii: Haneda, Ibid., 14 (1): 12, 1970 (2♂ Fukui: Mt. Akato).
Trypoxylon imayoshii: Murota, Hym. Comm. (Mishima), 7: 20, 1978 (1♀ Hokkaido: Asahi-
 gawa).
Trypoxylon imayoshii: Nambu, Saitama Anim., p. 190, 1978 (4♀ Saitama).

Specimens examined:

1 ♀, Fukuoka (Mt. Hikosan), 2 ♀, Hyogo (Sasayama), 1 ♀ 1 ♂, Kyoto (Sanyo, Hiei),
 9 ♀ 5 ♂, Fukui (Koike, Arashiguchi, Ikegahara, Mt. Iburi, Mt. Hino, Yashirodani), 6 ♀
 13 ♂, Ishikawa (Iwama, Ichinose, Tsurugi, Nukadani - 4 ♀ 11 ♂, 30. V. 1974, K. Tsuneki)
 1 ♀, Tochigi (Utsunomiya), 1 ♀, Aomori (Towada).

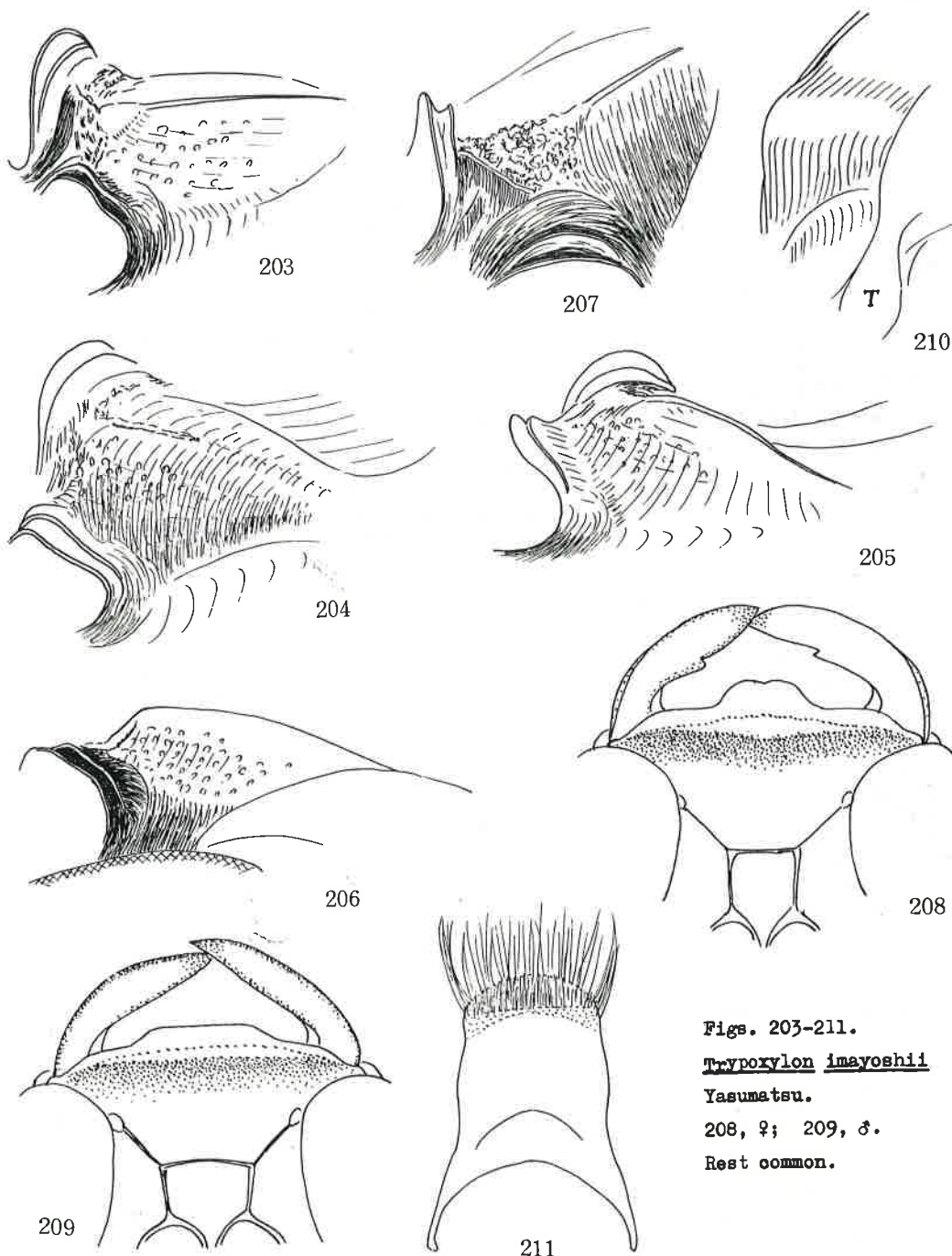
♀ 7.5-10 mm (mostly 9 mm or so), ♂ 6-8 mm (mostly 7-8 mm), having long flask-shaped gastral petiole and medianly distinctly longitudinally furrowed mesoscutum and easily distinguished from all other species, except the following ambiguum, by the last mentioned character.

Mesoscutum distinctly microcoriaceous, fairly well shining and closely superimposed with fine punctures, PIS=PD, propodeum with long distinct lateral carinae, area dorsalis with fine deep furrow, IODs=10:10 (♀), =10:8 (♂).

Eye incision broad and shallow, strongly narrowed apically, sinus minutely rounded in ♀, broadly so in ♂, dorsal margin slightly inclined outwards (nearly horizontal) in ♀, distinctly inclined in ♂, frons gently raised, median furrow broad and moderately deep and much broader anteriorly, SAT short broad nasiform, sometimes nearly tuberculate, moderately high, with lateral inclinations oblique and medianly carinate, carina sometimes long, sometimes short and confined to anterior highest area only and, further, sometimes without carina, in this case dorsum of SAT slightly rounded and not tectate; SAT always anteriorly rounded seen from above and usually transversely irregularly rugoso-carinate, carina weak, sometimes single, sometimes double and sometimes rather indistinct, the area always irregularly, coarsely punctate-reticulate and, furthermore, covered with a few long, curved, silvery hairs and without removing them the surface condition not well visible; usually the carina or a part of rugae crossed PAF at its top and connected with ASR, PAF shallow, up-curved, ASR anteriorly amber-yellow and usually bicarinate, anterior carina highly raised; anterior aspect of SAT (=IAA) always without median longitudinal carina. The structure in one instance seen obliquely from above and left side: Fig. 203, in one other: Fig. 204, in the first in dorso-lateral view: Fig. 205, in lateral view: Fig. 206, anterior inclination of SAT (=area above IAA) in antero-lateral view: Fig. 207, surface condition of the area virable according to the states of rugae or carinae. Clypeus and mandible: Fig. 208 (♀), 209 (♂), antenna in ♂ closely covered with rather coarse and piliferous punctures, the hair fuscous, flagellum slightly incrassate apically, without excavation on any joint, even Al2 slightly longer than wide, Al3 long, not curved at apex, longer than Al1-12, but shorter than Al0-12; occipital carina broadly disappeared behind buccal cavity. Measurements in ♀ (♂ within parentheses): HW:HL in frontal view 100:90 (100:86) (with sides rounded). HW, HL, IODv, A3, Al3, P=100, 54, 28, 23, --, 180 (100, 57, 34, 18, 26, 150). IODs=10:9.5 (10:8.3). OOD, Od, POD=2, 5, 4 (2, 3, 3). A3=AW×4.3 (AW×2.5). A3, 4, 5=10, 9, 8 (10, 8, 7). (Al3=BW×2.7). P, Ma, Mi, 2(Ma), 3(Ma)=100, 17, 5, 24(23), 23(29) (100, 19, 7, 33(26), 28(33)). RC=C, Rl moderately long, about half length of TCV, CV1=CV2×3.5-4.0, TCV≅CV2, TCV weakly incurved, CV2 fairly markedly down-curved, angle roughly about 100°. (RC, Rl similar, CV:CV2:TCV variable, CV1=CV2×4.0-2.0. TCV:CV2=5:4-5. angle about 100°)

Collar of pronotum comparatively thick, anterior part in middle nearly as long as posterior part and distinctly roundly tuberculate, lateral areas also incrassate and roundly swollen, thus anterior part appearing trituberculate, median tubercle higher but smaller, posterior part discoloured, lamina on side transversely bluntly ridged, apex rounded and slightly produced (Fig. 210, left-hand one), parapsidal suture an impressed line, sometimes outer margin carinate and raised, slightly less than 1/3 the length of scutum, subalar area of mesopleuron without pent-roof structure, mesopleural

flange first horizontally shelved, black, posteriorly changed to vertical and brown, basal elevation of propodeum in most specimens short, rather fine ridge-ridge-like, but sometimes broader and obliquely inclined posteriorly and obliquely irregularly rugoso-striate, lateral carinae of propodeum arising somewhat behind spiracle and reaching very close to anterior end of lateral carina of area apicalis, forming almost a straight line with this, medial furrow of area dorsalis comparatively broad and deep, except anterior part almost parallel-sided, but without marginal edge, area apicalis



Figs. 203-211.

Trypoxylon imayoshii

Yasumatsu.

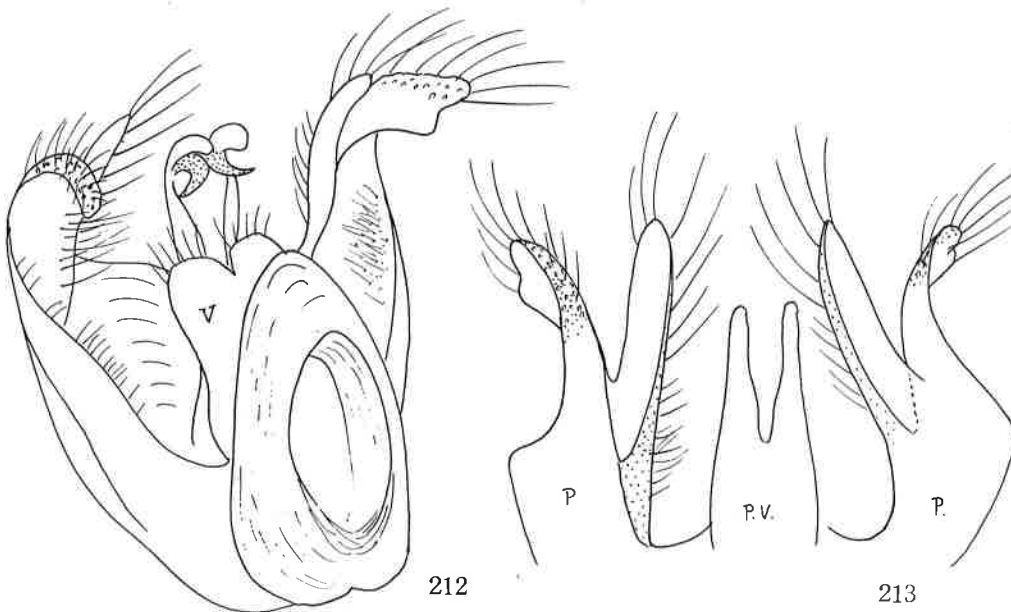
208, ♀; 209, ♂.

Rest common.

roundly impressed and medianly stoutly keeled, dorsal margin not bordered with carina and median wedge-shaped broad furrow of posterior inclination reaching here and replaced with the median ridge of area apicalis, GSR forming posterior margin of enlarged median ridge and shortly carinate and roundly raised.

In ♂ sternite 8: Fig. 211. Genitalia in ventro-lateral view: Fig. 212, apical part in dorsal view: Fig. 213; paramere asymmetrically bifid at apex, but similar in length, ventral lobe broader, apical area turned ventrally and emarginate at apical margin, carrying a tuft of hair on dorsal side, dorsal lobe broadly transparent and fringed with hair on inner margin (non-dotted area in the figures transparent membranous), main body simply lamellately expanded on inner margin and rolled ventrally, without any appendage, volsella (V in Fig. 212) not spatulate, with dorsal margin fringed with long hair. Penis valve without shoulder, but with well developed sickle-shaped appendages which are produced laterally, main body of penis thin, lamellate and turned ventrally at the margin.

Frons distinctly microcoriaceous and closely superimposed with comparatively large punctures, punctures shallow; scutellum and postscutellum almost without micro sculpture (sometimes under high magnification feeble microstriae observed on PIS), finely and closely punctured, mesopleuron punctured as on scutellum, but punctures sparse, piliferous and sparser and weaker upwards, area dorsalis at base obliquely, closely, on the rest transversely closely striate, striae on median furrow stronger and posteriorly becoming arcuate, very frequently medio-basal area of the furrow irregularly reticulate, outsides of the area closely, shallowly punctured, posterior inclination irregularly rugoso-striate, main trend of striae sometimes transverse, sometimes longitudinal, sides smooth and polished, sometimes showing feeble oblique striae partly.



Figs. 212-213. Male genitalia of Trypoxylon imayoshii Yasumatsu

Colouration. ♀. Gaster at base of G2 and 3 reddish ferruginous, extent of reddish area variable, in the brightest specimen dorsal black of G2 and 3 shrunk to a small round dusky mark respectively and whole the rest reddish yellow. Antenna black - dark brown, at apices of A1 and 2 narrowly ferruginous, but in the bright-coloured specimens from A1 to about middle area of flagellum ferruginous beneath, in the intermediate one A1 and 2 only ferruginous beneath. Other ferruginous areas: clypeus at anterior marginal area, mandible (apex brown to dark brown), palpi, posterior margin of pronotal tubercle, apices of coxae, trochanters wholly (sometimes marked with black above), fore and mid femora except dorsal brown (sometimes also except ventral brown, brownish area sometimes becomes considerably dark and usually broader on mid

femur), both ends of hind femur, fore and mid tibiae and base of hind tibia broadly, fore tarsus (sometimes apical part brownish), mid T1 (sometimes T2 also and underside of the rest) and tibial spurs (usually mid and hind ones brownish or apically brownish) ♂. Gaster as a rule completely black, but sometimes G2 and 3 dark red at base, of other parts very rarely completely as in ♀, but usually antenna wholly black, clypeus narrowly castaneous at apex (mandible, palpi and humeral tubercle similar), posterior part of pronotal collar more narrowly discoloured, tegula brown or dark brown, of legs coxae at apices, trochanters except brown mark above, fore femur partly, mid and hind femora at base and apex, fore and mid tibiae, base of hind tibia, tibial spurs, fore tarsus and mid T1 ferruginous, rest of fore femur brown or dark brown.

Remarks. this is a montanic species and rather rare. The capture of 4 ♀ 11 ♂ at Nukadani-valley, at the foot of Mt. Haku, on May 30, 1974 is quite exceptional.

20. TRYPOXYLON AMBIGUUM TSUNEKI, 1956

Trypoxylon ambiguum Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci., 6 (1): 21, 1956 (2 ♂, Fukui).

Trypoxylon ambiguum: Tsuneki, Akitu (Kyoto), 7: 54, 1958 (9 ♀ 2 ♂, Toyama, University Campus)

Trypoxylon ambiguum: Tsuneki, Life Study (Fukui), 17 (1-2): 32, 36, 1973 (keyed).

Trypoxylon ambiguum: Itami, Rep. Nat. Env. Lake Fukushima-gata and Hyōko, Niigata Pref. p. 101, 1975

Trypoxylon ambiguum: Nambu, Saitam Anim., p. 192, 1978 (1 ♀).

Specimens newly added:

1 ♂, Kyoto (Mt. Aoba), 27. VII. 1971, K. Tsuneki.

The present species is similar to the preceding species in general characters, having very slender gastral petiole and medianly longitudinally furrowed mesoscutum, but can be distinguished therefrom by that A13 in ♂ is relatively shorter, shorter than A11+12 and medio-apical prominence of clypeus less produced anteriorly in ♀ and ♂. In the genitalial structure both species is closely similar, but in the structure of basiparamere and volsella both are distinctly different from each other. In the averaged body length ambiguum is somewhat smaller than imayoshii, namely ♀ 6.5-8.0 and ♂ 5.0-6.0 mm.

Frons and eye incision similar in general to those of imayoshii (♀ ♂), SAT always low broad tuberiform as far as examined, very shortly carinated in middle at top area of elevation, closely covered with piliferous punctures, punctures sometimes somewhat coarse anteriorly, but usually fine, without transverse carina or ruga on anterior inclination, seen obliquely from above: Fig. 214, in dorso-lateral view: Fig. 215, in lateral view: Fig. 216; apical margin of clypeus in ♀: Figs. 217, 218, 219 (complete clypeus), in ♂: Figs. 220 and 221, in ♂♂ collected in the montanic area of Fukui medial tooth-like prominence marked, while in others from Toyama and Kyoto without prominence; mandible as in imayoshii. A10-13 of male antenna: Fig. 222.

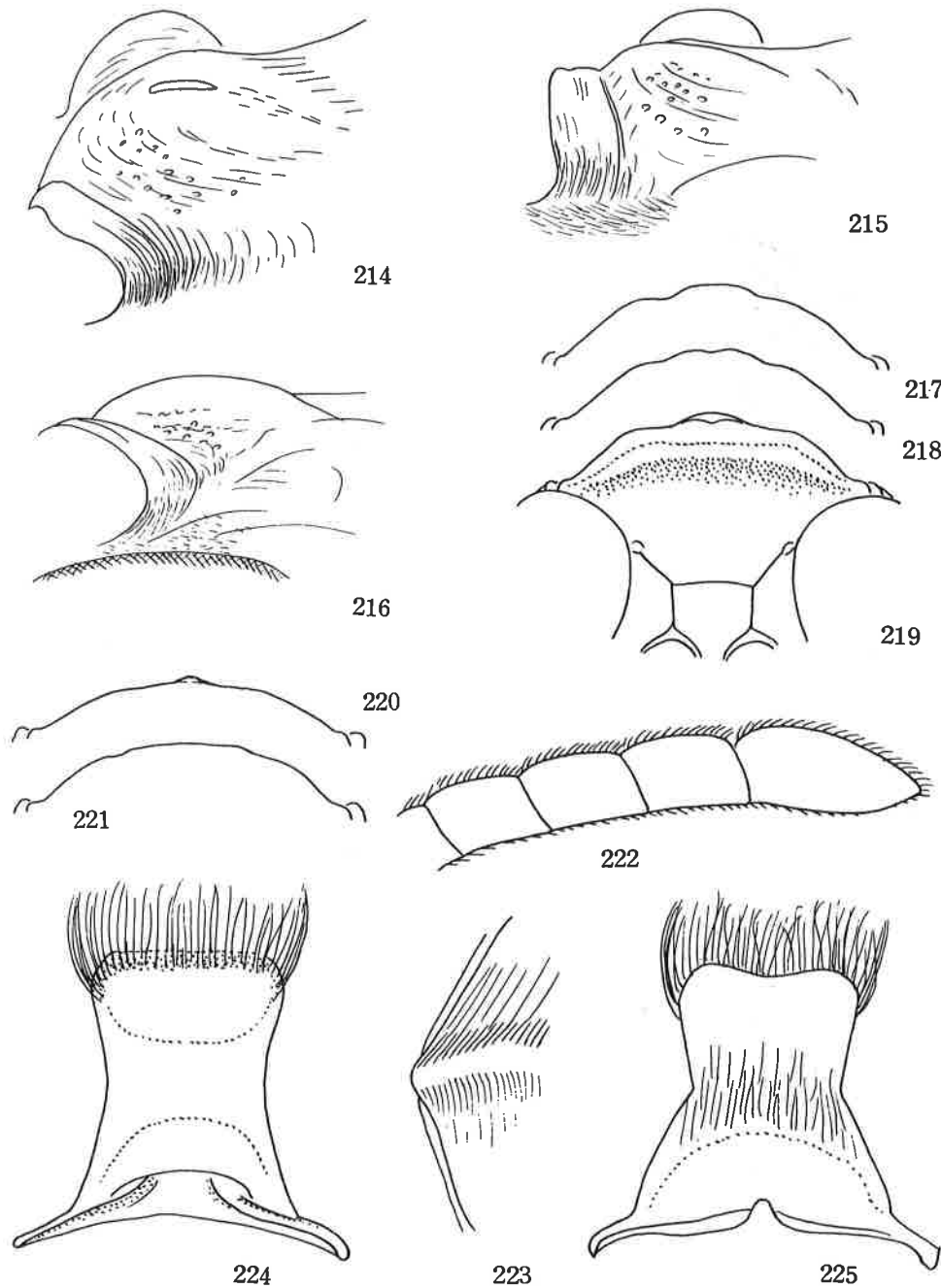
Measurements of ♀ (ex. from Toyama, within parentheses ♂ from Mt. Aoba, Kyoto and from Sakatani-mura, Fukui):

HW:HL in frontal view 100:92 (100:92, 100:92). HW,HL,IODv,A3,A13,P=100,56,31,21, --,160 (100,60,34,20,20,154; 100,57,36,19,20,148). IODs=10:9 (10:9, 10:9.5). OOD, Od,POD=1,2,2 (4,7,7; 4,6,5). A3=AWx3.7 (AWx2.5, AWx2.6). A3,4,5=10,8.5,8 (10,6,7; 10,7,7). P,Ma,Mi,2(Ma),3(Ma)=100,20,7,26(29)30(34) (100,20,7,31(27),30(34); 100,22,7,34(32),32(38)). RC=C-B, R1 somewhat long, about half length of TCV, CV1=CV2x4 (CV2x3, CV2x3), TCV:CV2=5:4 (1:1, 1:1), angle about 110°. (Without parenthesis same in ♂♂).

Occipital carina disappeared behind buccal cavity. Collar comparatively thick, anterior part as long in middle as posterior part, medianly distinctly tuberculate and enlarged towards sides, but not swollen there, thus dorsal surface not appearing tri-tuberculate, lamina on side similarly transversely raised as in imayoshii, but with apex more produced and more pointed (Fig. 223). Structure of mesoscutum, mesopleuron and propodeum generally similar to those of imayoshii; but basal elevation of propodeum longer and obliquely inclined posteriorly, sometimes roundly raised as if to be a second postscutellum, surface of this area usually without striae and well shining, area apicalis more broadly extended posteriorly than in imayoshii but medianly keeled as in this, lateral hollow enclosed with medial keel and lateral carina somewhat shallower, anterior border not margined with carina, GSR = posterior margin of area apica-

lis, roundly raised seen from behind.

Sternite 8 in holotype male from eastern montanic district of Fukui: Fig. 224, distinctly different from that of *imayoshii* (Fig. 211) in the form and state of hair at apical margin. In the male from Mt. Aoba, at the norther border of Kyoto Prefecture, slightly different in apical form (Fig. 225, ventral or outer view, Fig. 224 is dorsal or inner view), but this is considered within the range of variation of this species.

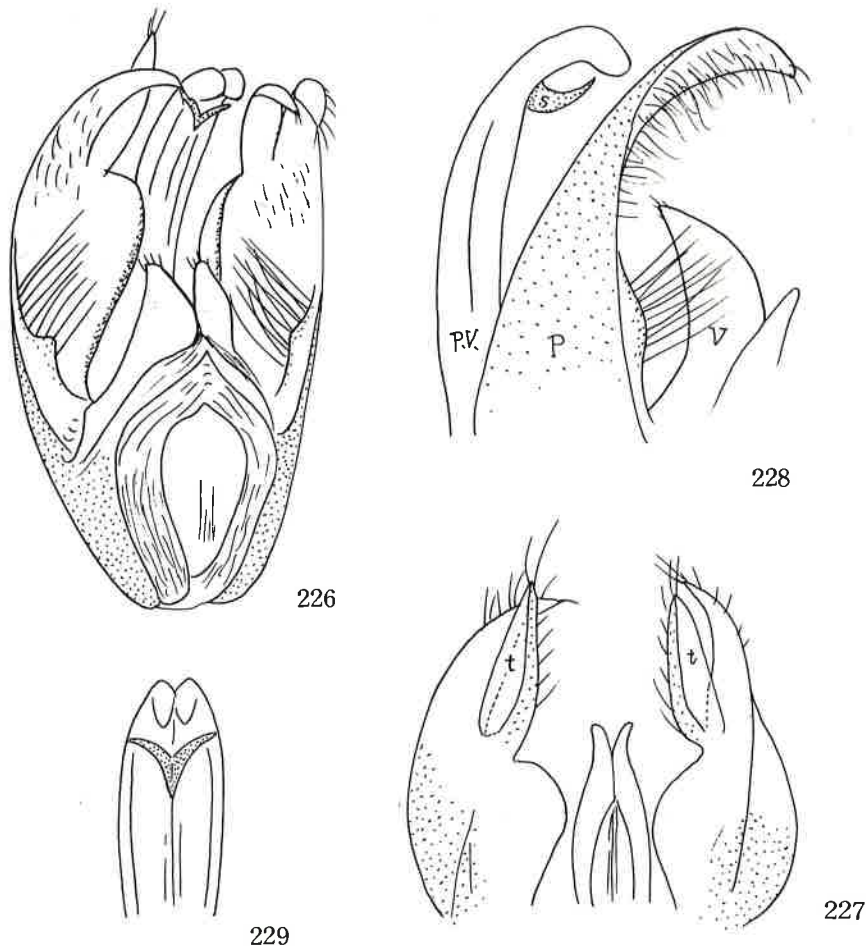


Figs. 214-225. *Trypoxylon ambiguus* Tsuneki. 220-223, 224-225, ♂.

Genitalia in ventro-lateral view: Fig. 226, apical part in dorso-vertical view: Fig. 227, in lateral view: Fig. 228, penis valve in ventral view: Fig. 229.

Paramere generally similar to *imayoshii* in structure, in the state of apical bifurcation and in that dorsal lobe is broadly thin and nearly transparent (t in Fig. 227), but different in that ventral lobe is smoothly attenuate apically and not so broader than dorsal one as in compared species. Moreover, main body of paramere provided with a subtriangular swelling which carries a row of long stiff yellowish hairs, volsella more pointed at apex than in *imayoshii*. Penis valve similar, without shoulder but with fairly well developed sickle-shaped appendages which stand obliquely.

Colouration. Similar in general to *imayoshii*, in ♀ collar similarly incompletely discoloured, gaster similar, but sometimes G4 at base also yellowish red, legs with yellow-ferruginous area much broader, especially on coxae, trochanters, mid femur and hind tibia, sometimes fore leg except extreme base of coxa and arolium and mid leg from near base of coxa to apex of T1 completely yellow; in ♂ yellowish colour usually



Figs. 226-229. *Trypoxylon ambiguum* Tsuneki, male genitalia

much less developed, antenna and clypeus usually completely black, sometimes posterior part of collar without discoloured area and tegula dark brown, gaster with G2 and 3 usually dark red at base, sometimes completely black, of legs coxae largely, femora except base and apex black or dark brown, remaining parts as in ♀. The difference in colour between sexes is also similar to the case of *imayoshii*.

Frons strongly microcoriaceous and fairly closely superimposed with fine shallow punctures, punctures weaker upwards and indistinct, surface fairly shining; mesoscutum more weakly microcoriaceous and more finely and more closely punctured than on frons, surface more shining, sometimes, especially in ♂, microsculpture feeble and indistinct. Area dorsalis with basal raised area smooth and shining, then first obliquely and gradually turning to transversely striate, median furrow strongly coarsely striate, but the strength and density of striae considerably variable and usually mixed with punctures posteriorly; sides smooth and polished and usually with oblique striae, fairly close but feeble on dorsal area.

Remarks. This species is rare and has been collected at some restricted areas of Fukui, Toyama, Kyoto, Niigata and Saitama Prefectures only.

21. TRYPOXYLON ERRANS SAUSSURE, 1867

Trypoxylon errans Saussure, Voyage de Novara, Hym., p. 84, 1867 (♀, Is. Mauritius).

Synonyms: T. 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. pulawskii Tsuneki, 1956; T. tanoi Tsuneki, 1967; T. saitamaense Tsuneki (aberratio).

Trypoxylon pulawskii is nothing else than T. errans Saussure (SYN. NOV.). In the male of pulawskii, however, Al3 is somewhat shorter than in the typical and in the female gaster is somewhat more broadly reddish, but the differences are statistic result and not surpassing the range of variation in the typical population. Certainly it shows a tendency towards subspeciation, but it can not actually be separated from others and so the subspecific treatment of the Japanese population of this species is not made here. Recent references of this species:

Trypoxylon tanoi Tsuneki, Etizenis, 22: 13, 1967 (♂ ♀, Formosa).

Trypoxylon tanoi: Haneda, 1971, 1972; Tsuneki, 1971; Murota, 1977 (Formosa).

Trypoxylon tanoi: Tsuneki, Pols. Pism. Ent., 44: 630, 1974 (♀ ♂, Thailand, ? = intrudens Smith, ? = canaliculatum Cameron).

Trypoxylon errans: Tsuneki, SPJHA, 8: 1 (syn.), 28 (= intrudens Sm.), 38 (= canaliculatum Cam.), 60 (= gardineri Cam.), 60 (= ornatipes Cam. -- indicum Menke), 1978.

Trypoxylon errans: Tsuneki, Ibid., 9: 114 (Indo-Malayan region, variation).

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

Trypoxylon errans: Tsuneki, Ibid., 11: 28, 1979 (Sumatra, Java, Sumba).

Trypoxylon errans: Tsuneki, Ibid., 12: 87, 1980 (Celebes).

Trypoxylon errans: Tsuneki, Ibid., 13: 115, 1980 (Philippines).

Trypoxylon errans: Tsuneki, Ibid., 14: 45, 1981 (Gam, Hawaii).

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

Trypoxylon errans: Tsuneki, Ibid., 16: 29 (India), 49 (Burma), 78 (Hongkong), 85 (E. Africa).

References to pulawskii for distribution within Japan:

Trypoxylon pulawskii Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci., 6 (1): 22, 1956 (♀ ♂, Tochigi, Tokyo, Kyoto).

Trypoxylon pulawskii: Haneda, Life Study, 4 (1): 13, 1960 (4 ♀ 1 ♂, Fukui).

Trypoxylon pulawskii: Tsuneki, Ibid., 11 (3-4): 44, 1967 (Hyogo).

Trypoxylon pulawskii: Tsuneki, Ibid., 13 (1-2): 25, 1969 (Ohsaka).

Trypoxylon pulawskii: Nambu, Hym. Comm., 1: 1, 1974 (Yamagata).

Trypoxylon pulawskii: Suda, Ibid., 8: 3, 1978 (Yamanashi).

Trypoxylon pulawskii: Nambu, Saitam Anim., p. 191, 1979 (Saitama, common).

Trypoxylon pulawskii: Nambu, Life Study, 10:26-34, 1966 and 11: 6-11, 1967 (biology).

Trypoxylon saitamaense Tsuneki, Etizenia, 65: 13, 1973 (SYN. NOV., aberratio).

Main characters of errans occurring in Japan

♀ 9-11 mm, ♂ 8-10 mm. G1 flask-shaped, propodeum with lateral carinae, area dorsalis enclosed with furrow, mesoscutum without microsculpture, fairly closely covered with comparatively large distinct punctures, IODs=2:1 in ♀, =3:2 in ♂, apical margin of clypeus medianly recurved and minutely incised in middle, in ♂ less produced, A3=AW 4.5 in ♀, =AW 2.5 in ♂, Al3=A9-12 or slightly shorter, RC=M, SAT low broad short nasiform, nearly tuberiform, medianly carinate, without anterior transverse carina, PAF deep, flat-bottomed, pronotal lamina strongly toothed, in male genitalia paramere

simple at apex, volsella spatulate, penis valve with shoulder and sickle-shaped appendages. Gaster medianly ferruginous red (in ♀ broader beneath, sometimes nearly wholly, in ♂ narrower, bases of G2 and 3 only, sometimes without reddish area), trochanters largely in ♀ (in ♂ largely dark brown to black), fore tibia and tarsus, bases of mid and hind tibiae, mit T1 (in ♀ mid T2-4 or -5 also) yellow or ferruginous.

Refer to the figures and tables given to the following descriptions or remarks! Tsuneki, 1956, Figs. 10-17; 1967, Figs. 32-38; 1978 (SPJHA, 8), Figs. 115-126; 1979a (SPJHA, 9), Figs. 449-453 and Tables 4 and 5; 1979b (Ibid., 11), Table 1; 1981b (Ibid., 15), Figs. 108-111; 1981c (Ibid., 16), Figs. 109-110.

Colouration and its variation.

Clypeus anteriorly broadly ferruginous in ♀, narrowly castaneous in ♂, mandible (apically brownish) and posterior margin of pronotal tubercle also ferruginous, palpi yellow, discoloured posterior part of collar yellowish, tegula translucent brown, basal plate of wing opaque brown, all articulations of legs ferruginous or brown.

♀. Antenna. Ground colour dark brown above and slightly paler beneath, most usually A1 at base and apex and A2 at apex ferruginous, but sometimes A1 or A1+2 beneath and sometimes plus A3 largely beneath ferruginous; rarely A2 and 3 even on dorsal side largely ferruginous.

Gaster. From apical area of G1 (broader beneath) to G6 ferruginous, with G2 and 3 brown marked above and G4-6 broadly black marked above, sometimes marks on G4-6 extended, becoming vaguely outlined bands, varying in width and range of extension.

Legs. Fore tibia usually on folded side more or less darkened, fore T3-5 sometimes brownish above; mid and hind trochanters often with a brownish mark above, mid tibia usually dark brown except narrow base and apex, but sometimes broadly yellow except median pale brown, yellow extent of mid tarsus broadly variable, usually T1 only yellow, but frequently T1-2 or 1-3 or 1-4 and rarely completely (except arolium) yellow, tibial spurs always yellow, basal ring of hind tibia varies in width and basal rings of hind tarsal joints also variable in extension, T4 usually wholly ferruginous, on others except T1 sometimes pale colour completely lacking.

♂. Antenna. Generally as in ♀, but sometimes from base to beyond middle ferruginous beneath.

Gaster. Never so bright as in ♀, sometimes largely darkbrown except pale underside of G2 and 3, but rarely completely black.

Legs. Articulations more narrowly ferruginous or brown, especially marked on hind tibia at base; fore tarsus as in ♀, mid tarsus very rarely wholly yellow; but usually except base and apex brown or dark brown, hind tarsus except brownish T4 usually completely dark brown.

Measurements of ♀ (holotype of pulawskii, allotype ♂ within parentheses).

HW, HL, IODv, A3, Al3, P=100, 51, 30, 23, --, 132 (100, 50, 33, 15, 26, 124). IODs=10:5.7 (10:6.2). OOD, Od, POD=1, 2, 2 (4, 5, 5). A3=AW×4.3 (AW×3.0). A3, 4, 5=10, 6, 5 (10, 6, 6). (Al3=HW×3.1, ≈A9-12). P, Ma, Mi, 2(Ma), 3(Ma)=100, 23, 7, 32(24), 40(58) (100, 20, 7, 32(26), 40(42)). RC=M, Rl rather short, slightly less than half TCV, CV1=CV2×5.5, TCV:CV2≈5:3, TCV nearly straight, angle about 100° (♂ generally similar, CV1=CV2×5-6, TCV:CV2 sometimes 3:2).

Variation in relative values of HW:P.

HW:P=100: 124, 116, 126, 120. The values are somewhat longer than usual within the variation range of this species.

Distribution in Japan.

Hitherto known from Prefs. Yamagata, Tochigi, Saitama, Nagano, Ishikawa, Fukui, Yamanashi, Tokyo and Kyoto, but possibly more broadly occurs in Japan. This species, however, has not been collected in the Ryukyus, although not rare in Taiwan.

Remarks. This is a widely spread species. It has been known from Africa, Islands of Indian Ocean and throughout the Oriental Zoological Region. The discovery of it in Palaearctic Japan is rather exceptional.

On TRYPOXYLON SAITAMAENSE TSUNEKI, 1973

Trypoxylon saitamaense Tsuneki, Etizenia, 65: 13, 1973 (1 ♂, Saitama, figs.).

Trypoxylon saitamaense: Nambu, Saitama Anim., p. 191, 1978 (listed).

Trypoxylon errans, aberratio, Tsuneki, the present paper.

Specimens:

Holotype of T. saitamaense: 1 ♂, Saitama: Kōnosu, Ryumadō, 7. VI. 1972, T. Nambu.

Remarks. Except the gastral petiole the specimen is almost identical in characters, including those of the structure of SAT-ASR, genital organs and sternite 8 as well as of measured values of bodily parts, with T. errans saussure, so that it is determined to be an aberratio of this species.

G1 is very short, less than head width (HW) in length, in form rather clavate and with the spiracles on tops of markedly grossly swollen tubercles.

As the gastral petiole can not fully be extended under the suppressed condition at the time of emergence of the insect, such Trypoxylonid bearing the abnormally shortened gastral petiole as the present specimen appears from time to time and several instances are recorded from tropical areas (Tsuneki, 1979, SPJHA, 9: 115, Tables 4 & 5). T. saitamaense is only one of the similar instances that appear in the Japanese population of this species.

In the present specimen, however, microsculpture on mesoscutum is more distinct than usual, pale parts of legs (for instance trochanters) much more clearly yellow and, as mentioned above, spiracles of G1 abnormally swollen. In these characters also the specimen is certainly an aberratio. Measurements:

HW:HL in frontal view =100:82. HW,HL,IODv,A3,A13,P=100,50,32,16,26,80. IODs=10:6.7. OOD,Od,POD \approx 3,5,4. A3=AW \times 2.7. A3,4,5=10,6,5. A13=BW \times 2.8 and \approx A9-12. P,Ma,Mi,2(Ma),3(Ma)=100,35,15*,52(42),56(68). RC=C, R1 not long (about 1/3 of TCV and \approx A4) and tapered apically, CV1=CV2 \times 5.6, TCV:CV2 \approx 3:2, angle about 110°.

22. TRYPOXYLON KONOSUENSE TSUNEKI, 1968

Trypoxylon konosuense Tsuneki, Etizenia (Fukui), 27: 4, 1968 (♀, Saitama, Aomori, figs. head in frontal view, antenna, propodeum and G1, dorsal and lateral).

Trypoxylon konosuense: Nambu, Saitama Anim., p. 193, 1978 (listed).

Diagnosis. ♀ 10-11 mm. Wholly black except dark brown mandible, palpi and fore tibial spurs. G1 flask-shaped, propodeum with lateral carinae, area dorsalis enclosed with furrow, mesoscutum distinctly microcoriaceous and punctured, IODs=1:1, HW:IODv=3:1, clypeus: Fig. 235, SAT low tuberiform, long carinated in middle and transversely so at apical margin, but without median carina on IAA, only gently keeled, RC=C-B, hair silvery.

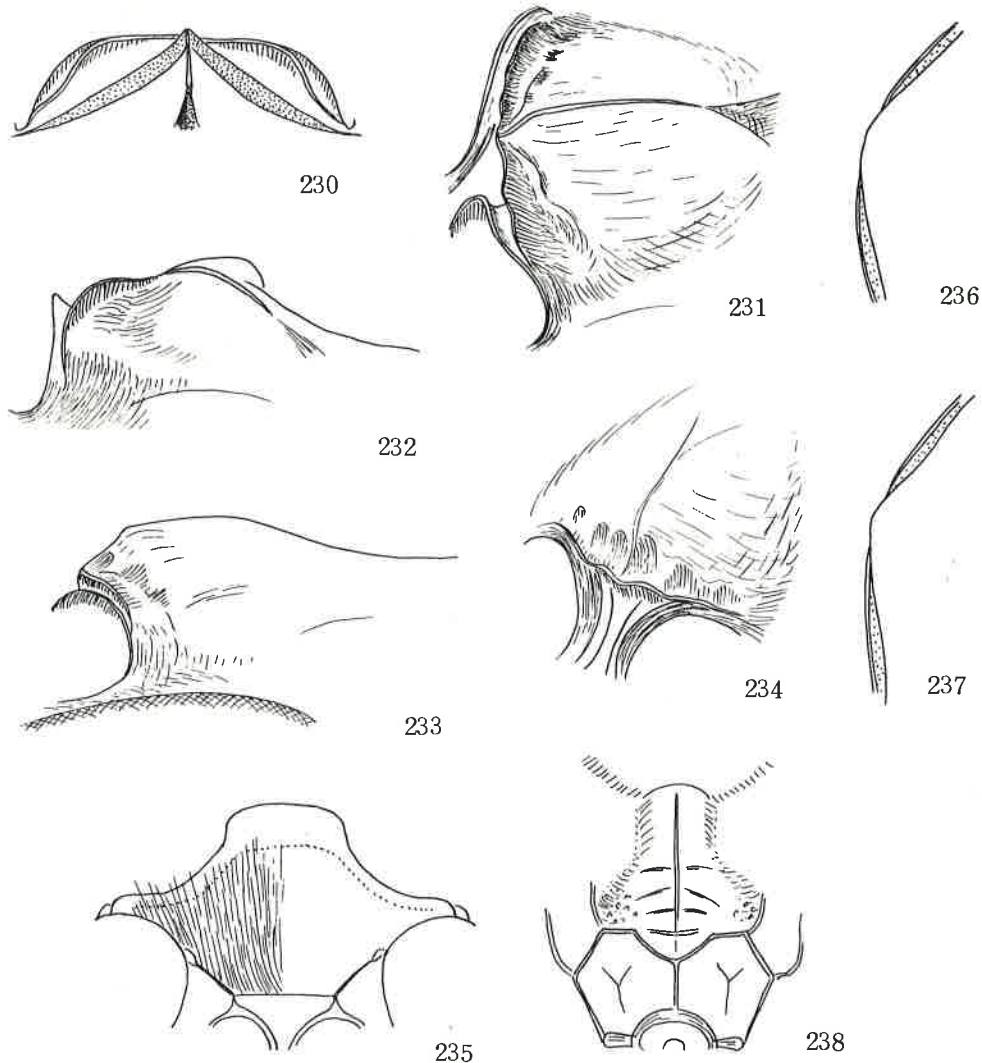
Measurements of holotype ♀. HW:HL in frontal view =100:88. HW,HL,IODv,A3,P=100,48,32,19,124. IODs=10:10. OOD,Od,POD \approx 3,4,5. A3=AW \times 2.7. A3,4,5 \approx 10,8,7. P,Ma,Mi,2-(Ma),3(Ma)=100,27,9,38(43),40(52). RC=C-B, R1 short, CV1=CV2 \times 4.4. TCV:CV2 \approx 4:3, TCV gently sinuate, nearly straight, CV2 down-curved at apex, angle at base about 120°, at apex about 110°.

Supplement to the original description.

Vertex outside hind ocelli inclined outwards and depressed anteriorly, fore ocellus in a hollow, median furrow of frons at base deep, anteriorly shallower, frontal elevations on both its sides only gentle, with top of elevation on baso-lateral area against fore ocellus, surface except median furrow flat, eye incision moderately broad and rather shallow, narrowed apically and minutely rounded at sinus, dorsal margin slightly inclined outwards. SAT: Figs. 230 (dorsal), 231 (obliquely dorso-lateral), 232 (dorso-lateral), 233 (lateral) and 234 (ventro-lateral). Apical transverse carina of SAT reaching outer top of ASR, intercepting PAF (Figs. 231 and 234), clypeus: Fig. 235, disc gently, broadly and roundly swollen, sometimes somewhat tectate, medio-apical prominence thin, lamellate, but not discoloured, black; supraclypeal area with lateral margins very short, nearly low broad triangle in form; occipital carina low and weak, disappeared behind buccal cavity.

Anterior part of pronotal collar short, narrow ridge-like, slightly incrassate laterally, but not swollen out anteriorly, with anterior margin nearly straight, and slightly tuberculate in middle, sometimes tuberculate area expanded posteriorly and, together with latero-posterior swellings, forming bisinuate transverse furrow across middle, posterior part not discoloured; lamina on side distinctly produced, triangular, with apex sometimes broadly, sometimes narrowly rounded (Figs. 236, 237). Parapsidal suture on mesoscutum a shining raised line, less than 1/3 length of scutum, subalar area of mesopleuron normal, mesopleural flange vertically raised, while metapleuron one horizontally shelved. Basal elevation of propodeum narrow transverse ridge, separated from postscutellum with fine furrow and laterally enlarged, lateral furrows of area dorsalis broad and shallow, rather becoming distinct by the elevation of its outer area, medial furrow moderately deep, parallel-sided, lateral carinae of propodeum distinct, posteriorly connected with lateral carinae of area apicalis, accompa-

nied just inside with a series of strong coarse transverse striae, interspaces of which roundly impressed into longitudinal series of foveae, surface of which smooth and shining; area apicalis also enclosed with strong carinae and medianly highly keeled, giving rise to a pentagonal deep fovea on each side (Fig. 238), GSR roundly raises in posterior view (ditto), but not lamellate, intercoxal carina nearly straight, tergite 6 medianly distinctly keeled.



Figs. 230-238. *Trypoxylon konosuense* Tsuneki, ♀

Frons very minutely microreticulate, rather microgranulate, with superimposed punctures small, rounded, shallow, flat-bottomed and fairly close, but they are rather indistinct and sometimes quite indistinct and almost lacking, surface nearly mat, except shining bottom line of frontal median furrow; mesoscutum somewhat more largely and strongly microcoriaceous and fairly closely superimposed with fine, deep and pinpricked punctures, puncture-density more or less varied with specimens, posterior margin strongly crenated, 2 median crenae longer than others, mesopleuron with microsculpture much more feeble, with punctures larger and stronger than on scutum, but finer and weaker upwards and on epimeral area very fine, surface of pleuron fairly strongly shining; scutellum fairly closely, strongly punctured, area dorsalis from

base to disc obliquely strongly, coarsely striate, on median furrow transversely so, the striae on disc and on median furrow connected with each other to form arcuate striae across area dorsalis, median broad and deep furrow of posterior inclination anteriorly a round hollow, smooth and polished, but near margins obliquely rugoso-striate, posteriorly it enlarged and shallowed to a large pentagonal depression, also smooth and shining and transversely crossed with a few strong carinae, between the furrow and lateral series of coarse foveae, as well as outsides of area dorsalis, very finely and closely rugoso-striolate and punctulated with piliferous points (this curious sculpture of propodeum is illustrated in the original description), area apicalis shining, but not smooth, sides obliquely, finely and closely striate, striae posteriorly turning transverse and very strong and coarse.

Remarks. This species is very rare, only three females have been collected, two from Saitama Prefecture (Kōnosu, 22. VI. 1962, T. Nambu leg.) and one from Aomori Prefecture (Kizukuri-machi, Nishitsugaru-gun, 9. VIII. 1967, K. Shimoyama leg.).

23. TRYPOXYLON PETIOLATUM SMITH, 1857

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

Synonyms: rejector Smith, 1870; obsonator Smith, 1873; accumulator Smith, 1875; javanum Taschenberg, 1875; tinctipenne Cameron, 1889; cognatum Cameron, 1897; erythrozonatum Cameron, 1902; responsum Nurse, 1905; obsonator tropicale Tsuneki, 1961.

Remarks. T. bicolor Smith, 1856, is a species different from T. petiolatum Smith, 1857. But T. bicolor of almost all the authors, including myself before 1989, is in reality not true bicolor Smith, but is present petiolatum. T. bicolor is a rare species, different from petiolatum, fundamentally in the structure of the male genital organs, although very closely related to it in the external characters. While T. petiolatum is a common and widely spread species.

References (simply listed ones are omitted):

Trypoxylon obsonator, rejector, bicolor: Bingham, Fauna Brit. Ind., Hym., I: 226, 227, 1897.

Trypoxylon bicolor: Tsuneki, SPJHA, 8: 1, 1978 (partim, except for bicolor s. str.).

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

Trypoxylon obsonator: Tsuneki, Ibid., 31, 1978 (redescrip. of syntypes).

Trypoxylon accumulator: Tsuneki, Ibid., 8: 32, 1978 (ditto).

Trypoxylon tinctipenne: Tsuneki, Ibid., 8: 36, 1978 (ditto).

Trypoxylon cognatum: Tsuneki, Ibid., 8: 40, 1978 (redescrip. of holotype).

Trypoxylon erythrozonatum: Tsuneki, Ibid., 8: 45, 1978 (redescrip. of lectotype).

Trypoxylon responsum: Tsuneki, Ibid., 8: 66, 1978 (redescrip. of syntypes).

Trypoxylon petiolatum: Tsuneki, Ibid., 9: 1 (separation from bicolor), 152-157 (comp. w. bicolor), 160 (distr. in Indo-Malayan region), 1979.

Trypoxylon petiolatum: Tsuneki, Ibid., 11: 39, 1979 (Sumatra, Java, Lesser Sunda Is., characters).

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

Trypoxylon petiolatum: Tsuneki, Ibid., 13: 82, 1980 (Philippines, characters).

Trypoxylon petiolatum: Tsuneki, Ibid., 14: 75, 1981 (Ogasawaras, Hawaii, characters).

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

Trypoxylon petiolatum: Tsuneki, Ibid., 16: 29 (Indo-Malay, Java), 45 (Burma), 67 (Borneo: Brunei, Celebes), 73 (S. China), 77 (Hongkong), 1981 (each w. characters).

References to N E. Asiatic regions:

Trypoxylon obsonator Smith, Trans. Ent. Soc. London, 1973 (2): 194, 1973 (♀ ♂, Hyogo, but ♂ is in reality a "♀" of T. malaisei Guss., ref. Tsuneki, 1978, SPJHA, 8: 31).

Trypoxylon tricolor Sickmann, Zool. Jahrb., Abt. Syst., 8 (2): 209, 1894 (♀, 14 mm, Tientsin) (SYN. NOV.).

Trypoxylon tricolor: Gussakovskij, Trav. Inst. Zool. Akad. Sci. USSR, 3: 651, 1936 (♀ ♂, North China, but his ♂ is doubtful).

Trypoxylon obsonator: Matsumura, Thous. Ins. Jap., Suppl., 3: 120, 1911.

Trypoxylon obsonator: Matsumura, Ill. Thous. Ins. Jap., II, Hym., p. 21, 1930.
Trypoxylon obsonator: Yano, Hym. in Icon. Ins. Jap., Ed. I, p. 279, 1932.
Trypoxylon obsonator: Yasumatsu, Hym. in Ins. Jap. Ill. Icon. etc., p. 371, 1939.
Trypoxylon obsonator: Yasumatsu, Hym. in Icon. Ins. Jap., Ed. II, p. 1468, 1950.
Trypoxylon obsonator: Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci.,
 6 (1): 12, 1956. (♀ ♂, Kyushu, Shikoku and Honshu).
Trypoxylon obsonator: Japanese authors after 1956 (before 1956 doubtful).
Trypoxylon obsonator: Itami, Life Study (Fukui), 12 (1-2): 15, 1968 (3 ♀, Yamagata
 Pref., Mt. Iide) (northernmost record of distribution of this species).
Trypoxylon obsonator: Tsuneki, Ibid., 12 (3-4): 50, 1968 (1 ♀, Quelpart Is.).

Prefectures of the Japanese specimens examined:

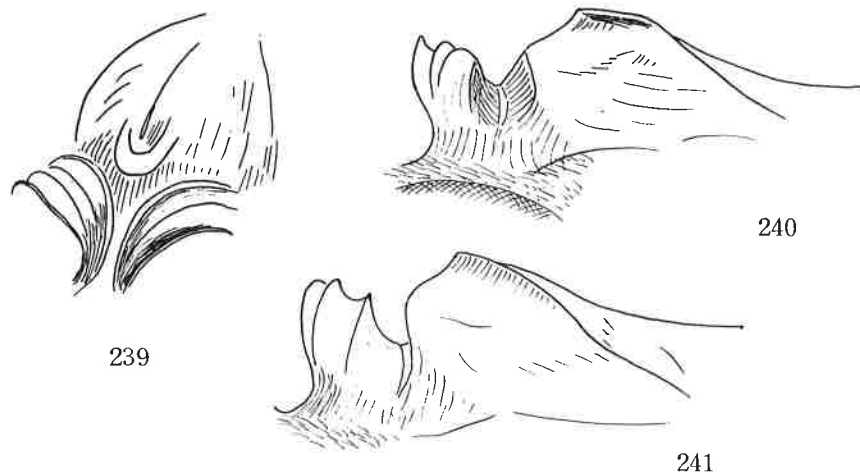
Okinawa (Okinawa, Iriomote), Kagoshima (Okinoerabu, Tokunoshima, Amami-Oshima, Sata-misaki, Kagoshima), Oita, Nagasaki, Fukuoka, Kohchi, Ehime, Hyogo, Kyoto, Shizuoka, Yamanashi, Tokyo, Saitama, Tochigi, Fukui, Ishikawa, Niigata.

Other specimens (excluding those from Formosa):

1 ♀, Korea, Quelpart Is., Cheju City, 22. VII. 1978, Y. Nishida; 2 ♀, North China, Peking, 10. VIII. 1938, K. Tsuneki; 1 ♀, Bonin Is. (Ogasawaras), Chichidzima, 16. VIII. 1978, Y. Haneda.

On some characters of the Japanese specimens.

SAT-ASR. SAT low broad nasiform, with lateral inclinations oblique, medianly acutely carinate, at top area, around anterior end of median carina, horizontally flattened like a round shelf, then steeply inclined to IAA and PAF (Figs. 239, 240 - ♀, and 241 - ♂). PAF in ♀ moderately deep, bottom line distinctly up-curved, V-shaped in cross section (Figs. 239 - ventro-lateral, 240 - dorso-lateral to see through PAF), in ♂ deeper, flat-bottomed, U-shaped in cross section (Fig. 241 - dorso-lateral). The character of SAT and PAF in both sexes is very constant throughout the areas the species occurs.



Figs. 239-241. SAT-ASR in Trypoxylon petiolatum Smith. 240 - ♀, 241 - ♂.

ASR highly raised, most usually tricarinate on dorsum, but sometimes bicarinate or quadricarinate and the state of the carinae can not be used to distinguish the species. Under normal condition SAT thickly covered with silvery hair and it must be removed to observe the structure in detail.

Colouration. ♀. Gaster from apical area of G1 to base of G4 red, almost always without black mark above. Antenna from apical area of A3 to A12 brown - ferruginous beneath. Mandible yellow, at extreme base black and apically brown - dark brown, palpi yellow, maxillary palpus with basal 3 joints more or less brown or dark brown. Fore tibia brown - ferruginous except blackish folded side, but usually with an obscurely outlined dusky band beyond middle, the band considerably variable in width and

in regularity (usually narrow on front side, with a ferruginous stripe). Fore tarsus sometimes completely yellow except black arolium, but usually on T3-5 or T4-5, or T5 only, more or less brownish or blackish, when T5 only strongly darkened the contrast is very marked. Mid tibia and tarsus as in fore leg, but black area of tibia usually broader. All tibial spurs always ferruginous. Hind tibia with yellowish basal ring, fairly broad.

♂. Red of G1 and G4 narrower or lacking, G2 and 3, sometimes G2 only, with dark brown or castaneous mark, sometimes G3 broadly black on posterior part above. Usually fore tibia narrowly at base and in front ferruginous or brown, fore tarsus greyish brown and apically more darkened (densely covering short hair greyish white), frequently completely greyish black above; mid and hind tibiae at base obscurely brownish, more frequently completely black, tarsus always wholly blackish, tibial spurs only distinctly ferruginous. Rarely fore legs coloured as in dark form of ♀, but mid leg at most at base of tibia only pale brown.

Thus the Japanese male of this species can be said as a whole to belong to the black-legged form.

Quelpart ♀. Antenna from A4 apically very narrowly dark brown beneath, very inconspicuous; fore tibia at base and in front, mid tibia at base only ferruginous, fore T1-4, mid T1-2 light ferruginous, rest of tarsi dark brown.

Peking ♀. Small specimens, measuring about 12.0 and 12.5 mm. Antenna from apex of A3 apically light brown. Legs in one of them just as in Quelpart Is. specimen, but in the other brighter, fore and mid tarsi pale yellow, only fore T5 pale brown above and mid T5 dark brown above, tibiae as in the other.

Comparison on some characters with Indo-Malayan specimens

In the British Museum (Natural History) specimens there are 8 ♀ 4 ♂ of Malayan representatives that were obtained through rearing by H. T. Pagden at Kuala Lumpur in 1937. Comparison is mainly made with the set of the specimens.

As to (1) body length, (2) IODv as against HW as 100, (3) IODi (= IOD at bottoms of eye incisions) as against HW as 100, (4) A3, do., (5) A12 (♀) or A13 (♂) (ultimate antennal joint: Aul in abbreviation), do., (6) relative length to maximum width (L/W) of A3 and Aul the results are given in Table 5. (Length ratio of OOD, Od, POD is measured, but omitted, because it is too variable, due partly to the difficulty of measurement).

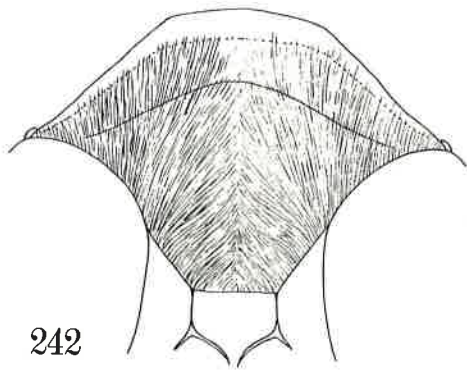
IODv. Of the characters compared IODv is most interesting, because it varies considerably according to the localities the specimens derive, namely in the specimens from Indo-Malayan region it is distinctly smaller than in the Japanese representative. In ♀ it is mostly 25-26 as against HW as 100 and in ♂ mostly 28-30, while in the latter it is in ♀ mostly 28-31 and in ♂ 30-34. Based upon this character the Indo-Malayan population was once separated by me from the Japanese one at the subspecific rank as obsonator tropicale. In the intermediate areas from Borneo to the Ryukyus the values are on the average intermediate, in ♀ mostly 27-28 and in ♂ 29-30. As to the details of comparison refer to the tables already given that are listed below:

SPJHA, 9: 157, Table 9 (Malaya, Thai, Laos, Assam, Burma, Bengal, India).
SPJHA, 12: 111, Tables 9 and 10 (Ambon, Celebes, Borneo).
SPJHA, 13: 83, Table 6 (Philippines).
SPJHA, 14: 75, list of values of HW:IODv (Hawaii).
SPJHA, 15: 32, Table 1 (Formosa and the Ryukyus).
SPJHA, 16: 29, 46, 67, 77 (Indo-Malay, Burma, Borneo, Celebes, Hongkong).

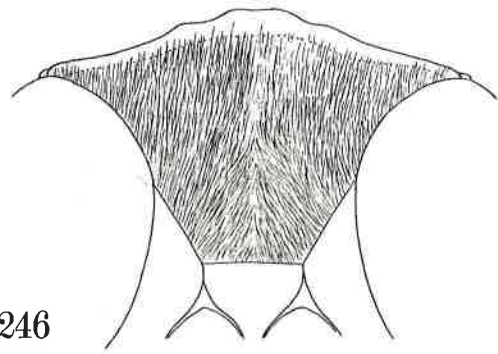
If taxonomically rearranged at the present knowledge they are to be named as follows:

Indo-Malayan and Javanese population	<u>petiolatum tropicale</u> m.
Intermediate areas	<u>petiolatum</u> s. str.
Japanese population	<u>petiolatum obsonator</u>

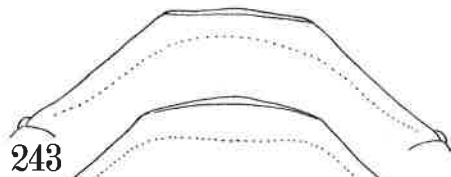
However, the difference between the populations is statistic and actually a considerable overlapping is present, and, moreover, the separation is technically not easy, so that it seems better to consider them as cline, without subspecific treatment. This seems to be supported by the fact that in the Japanese specimens those from Kyushu belong to the intermediate form according to the measurement, while those from Shikoku and Honshu belong to the northern form, and if they are called by the different subspecific names it seems very queer, because Kyushu and Honshu or Kyushu and Shikoku are not separated by any evolutionary barrier, although a narrow strait is there between them. The fact itself is interesting and further detailed investigation



242



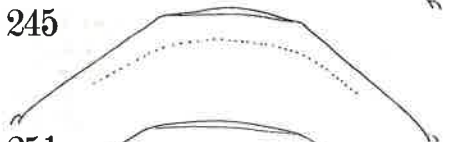
246



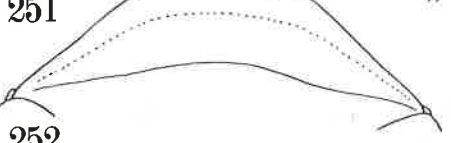
243



244



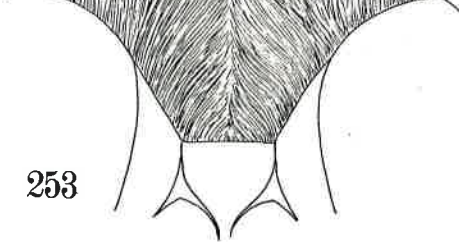
245



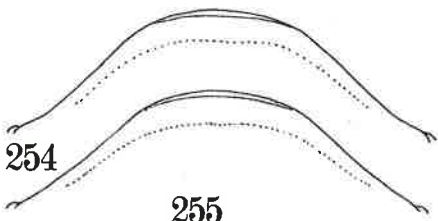
251



252



253



254

255



247



248



249



250



256



257



258



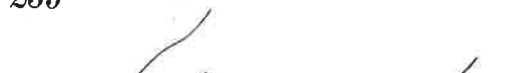
259



260



261



262



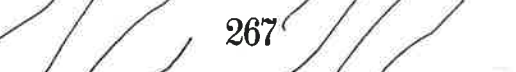
263



264



265



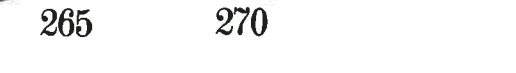
266



267



268



269



270

(because the specimens studied are not always sufficient) and analysis are considered necessary, but their different subspecific assignment seems to go too far.

Such being the cases, the name, obsonator Smith is suppressed as a synonym of petiolatum Smith, without letting it revive as an intraspecific taxon.

Bingham separated in his book of Indian Hymenoptera, I, obsonator from bicolor (in his case =petiolatum) by the form of SAT, the former tuberiform and the latter tectate nasiform. According to my observation of the specimens identified by him with obsonator (2 ♀ from Tenasserim, Nos. 19 and 20 in Table 5), however, the form of their SAT is only within the variation range in petiolatum and the difference is very slight and indistinct. But they are distinctly somewhat larger than usual in their body size and their IODv is distinctly smaller than in the Japanese specimens (Table 1).

Clypeus. The specimens obtained through rearing by Pagden at Kuala Lumpur in 1937 are fresh and valuable to confirm the original state of apical margin of the clypeus. It is in ♀ as given with Figs. 242-245 and in ♂ as with Figs. 246-250.

While, in the females collected (in Tenasserim) and identified by Bingham with obsonator it is as in Figs. 251 and 252.

On the other hand, clypeus in the lectotype female specimen of obsonator Smith collected in Hyogo: Fig. 253. In one of Hyogo females (fresh one) in my collection: Fig. 254 and in one of Fukui females (do.): Fig. 255.

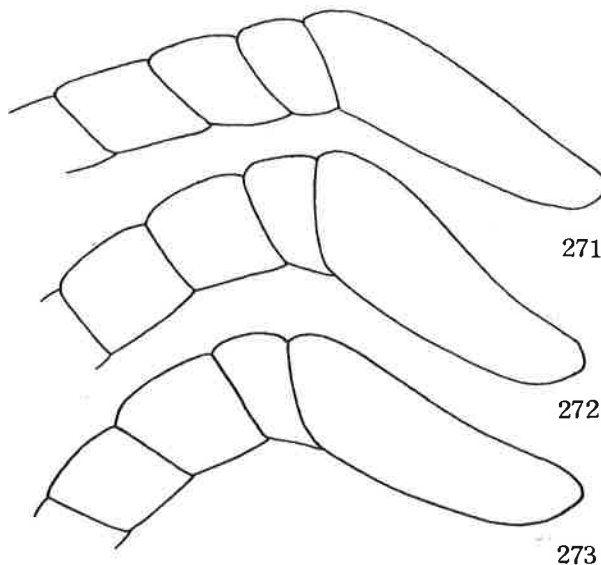
While in the Japanese males apical margin of clypeus: Figs. 256 (Hyogo, Fukui, Fukui), 257 (Tochigi), 258 (Fukui, Fukui, Tokyo, Ohita) and 259 (Hyogo, Kohchi).

In the Japanese specimens medio-apical subtruncate area seems to be somewhat more rounded in ♀ and slightly narrower in ♂, but the difference is delicate and of little practical use to determine even roughly the region they derived.

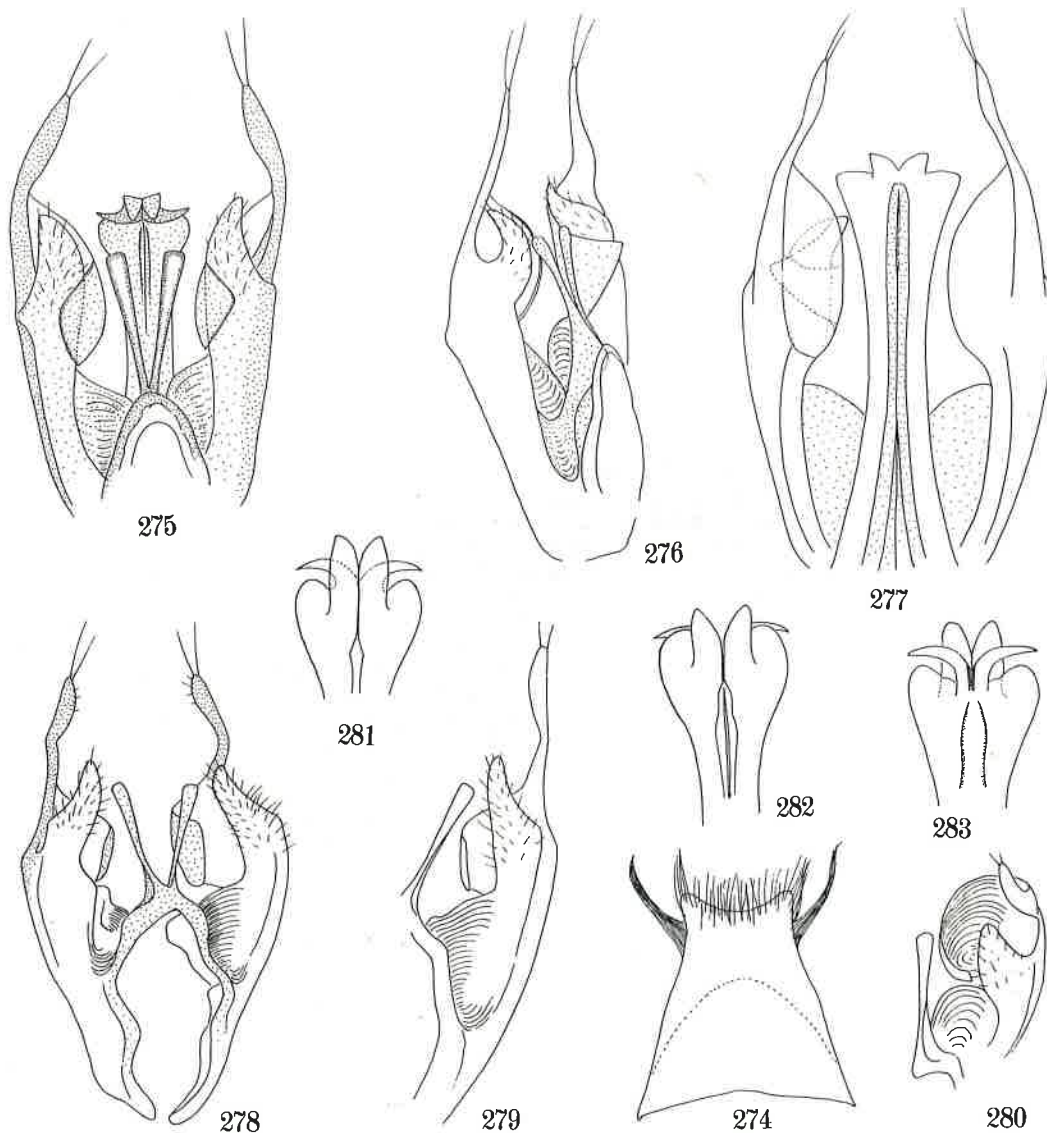
Disc of clypeus is usually at base elevated and somewhat tectately inclined anteriorly till apical reflection. This is stronger and more marked in ♀ than in ♂. As a result hairs covering the disc strongly, sinuately convergent towards median line in ♀ (Figs. 242, 253) and at base only weakly convergent in ♂ (Fig. 246). But the state of elevation of disc seen in profile considerably varied as given with Figs. 260-265 in ♀ and with Figs. 266-270 in ♂.

Remarks. 260... 3 Kuala Lumpur; 261... 1 Kuala Lumpur, 2 Tenasserim (= obsonator: Bingham), 1 Quelpart I., 1 Parit Buntan, 1 Matheran, 1 Fukuoka, 1 Peking; 262... 3 Kuala Lumpur, 1 Matheran, 1 Peking, 2 Hyogo, 1 Kyoto, 2 Fukui; 263... 2 Abu (= responsum Nurse); 264... 1 Hyogo (= obsonator type), 2 Kagoshima, 1 Tokyo; 265... 1 Kagoshima; 266... 2 Kuala Lumpur, 1 Hyogo, 1 Fukui, 1 Tochigi; 267... 1 Kuala Lumpur, 1 Fukui, 1 Ohita; 268... 2 Fukui, 1 Kyoto, 1 Hyogo; 269... 1 Kuala Lumpur, 1 Fukui, 1 Tochigi; 270... 1 Fukui. (bicolor Smith, lectotype... Fig. 268, do., paralectotype... Fig. 266).

Antenna. It is difficult to measure antennal segments correctly, because they are always covered densely with short pubescence that makes the exact margin invisible, at least obscure and by the more or less estimation of the thickness of its layer the value of L/W is considerably varied. Moreover, the length of the segment is strongly varied according to its condition whether the antenna is smoothly stretched or more or less curved or bent and according to the direction in which it is viewed (especially Al3). In my measurement in order to lessen as far as possible the error due to pubescence it is made under highest possible magnification (under low magnification, such as under "Lupe" width becomes to include that of pubescence), and to catch the correct length under smooth-



Figs. 271-273. T. petiolatum Smith, ♂



Figs. 274-283. *Trypoxylon petiolatum* Smith, ♂

ly stretched condition. When the antenna is curved each segment is measured vertically to the curved plane from basal middle to apical middle (A13 seen from the widest side - "Width" is always maximum width - with basal margin always lying oblique and length is measured from mid point of basal line to apex).

According to the measurements of a fair number of the specimens from Indo-Malayan region and from Japan (Table 5) there is no note-worthy local difference between them. The form of A13 is generally similar (Figs. 271 in specimens Pagden reared and 272 in Fukui specimen and 273 in Hyogo specimen), only in the former relatively somewhat longer (Table 5).

Sternite 8: Fig. 274 in the Japanese specimens (Kohchi, Tochigi, Fukui ex.) (of. SPJHA, 9: 152, Fig. 673; p. 160, Figs. 696-698), in both regions similar.

Genitalia also similar. In Malayan population: Figs. 275, ventral; 276, ventro-lateral; 277, dorsal (drawn from the organs extracted from one of the reared specimens by Pagden). In the Japanese population: Figs. 278, ventral, somewhat lateral) penis omitted), 279, lateral, from right side, and 280, left one from inner apical. Apical part of penis valve in Pagden's specimen: Fig. 281, dorso-vertical; 282, do., but somewhat more dorsal; 283, ventro-vertical. In the Japanese specimens completely similar.

Table 5. Measurements of *T. petiolatum* Smith from S. Asia and Japan

No.	Loco	Sex	BL	IODv	IOD1	A3(L/W)	Aul(L/W)	P(L/W)	IODs	Ma	Mi	G2	G3
1	Malaya K. Lumpur	♀	14	26	84	26(5.2)	17(3.2)	176(6.2)	7.2	16	5	24	28
2	Malaya " "	♀	14	26	85	26(5.0)	17(3.0)	170(5.8)	7.4	17	6	26	30
3	Malaya " "	♀	13	26	84	25(5.1)	17(3.3)	174(5.8)	7.3	17	6	26	30
4	Malaya " "	♀	15	26	83	26(5.1)	16(3.0)	174(5.7)	7.4	18	5	26	30
5	Malaya " "	♀	15	26	83	26(5.2)	15(3.1)	174(5.7)	7.5	17	5	28	30
6	Malaya " "	♀	14	26	84	26(4.8)	17(3.2)	166(6.0)	7.0	17	5	24	30
7	Malaya " "	♀	14	26	84	26(5.1)	16(3.2)	174(6.2)	7.2	16	5	28	30
8	Malaya " "	♀	12	28	85	25(5.0)	17(3.2)	166(5.9)	6.7	17	6	26	30
9	Malaya Selangor	♀	14	26	83	25(5.1)	15(3.0)	176(6.2)	7.0	16	6	26	30
10	Malaya P. Buntan	♀	14	26	83	25(5.0)	16(2.8)	170(6.5)	7.2	15	5	24	30
11	Malaya " "	♀	14	26	84	26(5.1)	16(2.9)	172(6.2)	7.2	16	5	24	30
12	India Matheran	♀	12	27	83	26(4.6)	16(2.7)	162(5.9)	7.6	17	6	28	32
13	India Matheran	♀	12	28	84	25(4.7)	17(2.6)	156(5.6)	7.3	18	6	28	32
14	South India	♀	14	26	83	---	---	166(6.2)	7.5	16	5	28	28
15	N. India Abu*	♀	14	26	82	26(4.9)	16(2.7)	158(5.3)	7.7	19	6	30	32
16	N. India Abu*	♀	14	28	82	26(4.9)	16(2.7)	158(5.6)	7.6	18	6	30	34
17*	Sikkim	♀	13	26	83	26(4.8)	---	160(5.6)	7.2	18	6	26	28
18*	Sikkim	♀	15	28	82	26(4.8)	15(2.8)	162(5.7)	7.3	18	6	28	32
19*	Tenasserim	♀	16	25	83	27(5.0)	16(2.8)	166(5.7)	7.4	18	6	28	30
20*	Tenasserim	♀	15	25	83	26(5.0)	16(2.7)	158(5.4)	7.4	19	6	26	28
21	Ryukyus Amami	♀	15	28	83	26(4.8)	16(2.7)	164(5.9)	7.3	17	6	28	30
22	Ryukyus "	♀	16	27	83	26(4.8)	16(2.8)	158(5.0)	7.5	18	6	27	30
23	Ryukyus "	♀	14	28	84	26(4.8)	16(2.7)	162(5.3)	7.5	17	6	28	32
24	Kago. Satamisaki	♀	14	27	84	26(5.2)	15(2.6)	152(5.2)	8.0	19	6	30	31
25	Kago. " "	♀	14	26	85	25(4.6)	17(3.0)	164(5.5)	8.0	18	5	28	34
26	Kagoshima-shi	♀	14	26	85	---	---	164(5.5)	7.5	19	6	30	32
27	Amakusa	♀	14	29	83	24(4.4)	---	152(5.6)	7.6	18	6	28	32
28	Nagasaki	♀	14	26	85	26(4.7)	16(2.7)	156(5.6)	8.0	18	6	28	33
29	Fukuoka	♀	14	28	84	25(4.6)	16(2.7)	156(5.6)	7.2	18	5	30	34
30	Quelpart I.	♀	14	29	82	25(4.6)	16(2.7)	152(5.2)	7.0	19	7	30	36
31	Shikoku, Koohi	♀	14	30	82	25(4.5)	17(2.7)	146(4.5)	7.5	22	7	32	34
32	Hyogo*	♀	15	26	---	22(4.4)	15(2.4)	156(5.6)	7.7	18	6	28	32
33	Hyogo Sasayama	♀	14	28	82	26(5.0)	16(2.7)	160(4.7)	7.5	21	6	26	30
34	Hyogo "	♀	13	30	84	25(4.1)	18(2.7)	144(4.5)	7.3	22	7	28	36
35	Hyogo "	♀	16	28	81	26(5.1)	17(2.7)	156(4.5)	7.7	22	5	29	35
36	Hyogo "	♀	15	28	83	26(4.5)	18(2.7)	148(4.5)	7.5	22	6	30	34
37	Hyogo "	♀	14	27	81	24(4.8)	18(2.5)	160(4.5)	8.0	22	6	28	30
38	Hyogo "	♀	12	31	84	26(4.3)	17(2.7)	158(5.0)	7.3	20	6	30	32
39	Hyogo "	♀	13	29	82	24(4.4)	16(2.5)	158(4.7)	7.7	21	6	28	30
40	Kyoto	♀	14	30	84	25(4.2)	16(2.5)	150(5.0)	7.3	20	6	30	36
41	Kyoto	♀	15	31	84	26(4.2)	17(2.7)	150(5.5)	7.2	18	6	30	32
42	Fukui	♀	15	29	84	25(4.5)	17(2.8)	150(5.0)	7.0	20	6	30	36
43	Fukui	♀	15	28	84	26(4.8)	17(2.9)	162(5.0)	7.4	20	6	30	34
44	Fukui	♀	16	30	83	26(5.0)	16(2.7)	160(5.0)	7.5	20	6	30	34
45	Fukui	♀	15	28	83	25(5.0)	18(3.0)	154(4.3)	7.5	23	7	32	40
46	Tokyo	♀	14	29	82	26(4.8)	17(3.0)	150(4.5)	7.5	22	7	30	34
47	Tokyo	♀	14	29	83	25(4.7)	18(3.0)	150(5.2)	7.5	19	7	30	36
48	Niigata	♀	15	29	83	26(5.0)	17(2.8)	174(4.5)	7.7	22	7	31	37
49	N. China Peking	♀	13	29	83	25(5.0)	---	152(5.2)	7.5	19	6	30	36
50	N. China Peking	♀	12	29	83	25(5.0)	16(2.7)	161(5.5)	7.0	18	5	28	36
51	Malaya K. Lumpur	♂	11	29	84	16(2.3)	28(3.6)	158(7.3)	8.0	14	5	28	28
52	Malaya " "	♂	12	29	82	16(2.4)	26(3.8)	160(6.2)	8.0	16	6	30	30
53	Malaya " "	♂	12	30	85	16(2.4)	28(3.7)	156(6.2)	7.7	16	6	30	32
54	Malaya " "	♂	12	29	83	16(2.3)	27(3.6)	160(6.7)	8.0	15	5	28	28
55	Malaya Selangor	♂	11	30	83	17(2.5)	27(3.5)	152(6.8)	7.7	15	5	26	32
56	Malaya Penang I.	♂	12	28	82	16(2.3)	26(3.8)	136(5.4)	7.4	19	8	36	38
57	Malaya Pahang	♂	12	28	83	16(2.7)	29(3.9)	158(6.8)	7.0	15	5	29	30
58	Ryukyus Amami	♂	13	30	82	17(2.3)	24(3.0)	150(6.2)	8.0	16	5	30	34
59	Kyushu Ohita	♂	11	30	82	16(2.4)	23(3.0)	152(6.2)	8.0	16	5	30	34
60	Shikoku Kohohi	♂	13	30	83	16(2.1)	26(3.1)	140(4.7)	8.0	21	8	32	36
61	Honshu Hyogo	♂	12	33	81	16(2.2)	27(3.3)	138(5.0)	7.6	20	8	34	36
62	Honshu Fukui	♂	12	33	84	17(2.3)	27(3.4)	120(3.6)	7.7	28	9	38	46
63	Honshu "	♂	11	34	82	17(2.3)	27(3.1)	140(5.6)	8.2	18	7	30	36
64	Honshu Toohigi	♂	11	32	83	17(2.2)	24(3.0)	146(6.2)	7.4	16	6	30	34

Remarks. IOD1 IOD at bottoms of eye incisions. Others as in Table 1.

Nos. 15 and 16, Abu* Syntypes of *T. responsum* Nurse.

Nos. 17*, 18*, 19* and 20* are collected and identified by C. T. Bingham with *T. obsonator* Smith.

No. 32 Hyogo* is the lectotype of *T. obsonator* Smith.

24. TRYPOXYLON PETIOLOIDES ISIGAKIENSE TSUNEKI, 1973

Trypoxylon isigakiense Tsuneki, Etizenia, 65: 11, 1973 (2 ♀ 1 ♂, Ryukyus: Is. Isigaki and Iriomote).

Trypoxylon petioloides isigakiense: Tsuneki, SPJHA, 15: 42, 1981 (new combination).

References to petioloides Strand:

Trypoxylon gracilescens Smith var. petioloides Strand, *Intn. Ent. Zeits.*, 16 (18): 150, 1922 (11 ♀ 7 ♂, Formosa).

Trypoxylon gracilescens: Tsuneki and Japanese authors, 1966-1977 (♀ ♂, Formosa).

Trypoxylon petioloides: Tsuneki, SPJHA, 15: 40, 1981 (new status).

Remarks on petioloides Strand.

E. Strand, when he identified the Formosan specimens with gracilescens Smith he stressed the difference of his specimens from the description of gracilescens by Smith in that G1 was at apex narrowly red. However, in the simple description of the species of this genus when G2 and 3 are red, the narrow red at the apex of G1 is usually ignored. The difference pointed out by Strand was presumed by me, therefore, substantially meaningless and so I suppressed his var. name. Whereas, by my recent study it was made clear that so-called gracilescens of Formosa was different from true gracilescens Smith and an undescribed species. As a result and by the nomenclatorial rule his nonsensical var. name has come to revive as specific.

As to the detailed explanation of petioloides and its ssp. isigakiense vide No. 15, 1981 of the present Publication. In short the Ryukyu specimens of this species differs from the typical ones occurring in Formosa in the colour of antenna and legs, but in ♂ somewhat differs also in the relative length of A3 and A13.

25. TRYPOXYLON NIPPONICUM TSUNEKI, 1956

Trypoxylon nipponicum Tsuneki, *Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci.*, 6 (1): 18, 1956 (40 ♀ 10 ♂ from Fukui, Ishikawa, Nagano, Aomori and Hokkaido - Sapporo, Jōzankei, Hakodate, with figures of clypeus, antenna, genitalia and sternite 8).

Trypoxylon puliense Tsuneki, *Etizenia*, 22: 15, 1967 (3 ♀, Formosa)(SYN. NOV.)

Trypoxylon puliense: Tsuneki, *Ibid.*, 54: 8, 1971 (1 ♀, Formosa).

Trypoxylon nipponicum: Tsuneki, *Life Study*, 17 (1-2): 33 (♀), 36 (♂), 1973 (keyed).

Trypoxylon murotai: Tsuneki, *Ibid.*, 17 (3-4): 44, 1973 (2 ♂, Formosa, with figures of genitalia).

Trypoxylon puliense: Tsuneki, SPJHA, 15: 43, 1981 (full redescrip. ♀ ♂, figs. clypeus, SAT-ASR, pronotal lamina).

Specimens examined:

Abundant specimens have been collected by me from Prefs. Fukui (92 ♀ 14 ♂), Ishikawa (13 ♀ 8 ♂), and a considerable numbers from Hokkaido (8 ♀, South and Central), Aomori (11 ♀ 5 ♂, mainly Towada) and a few from Toyama and Hyogo.

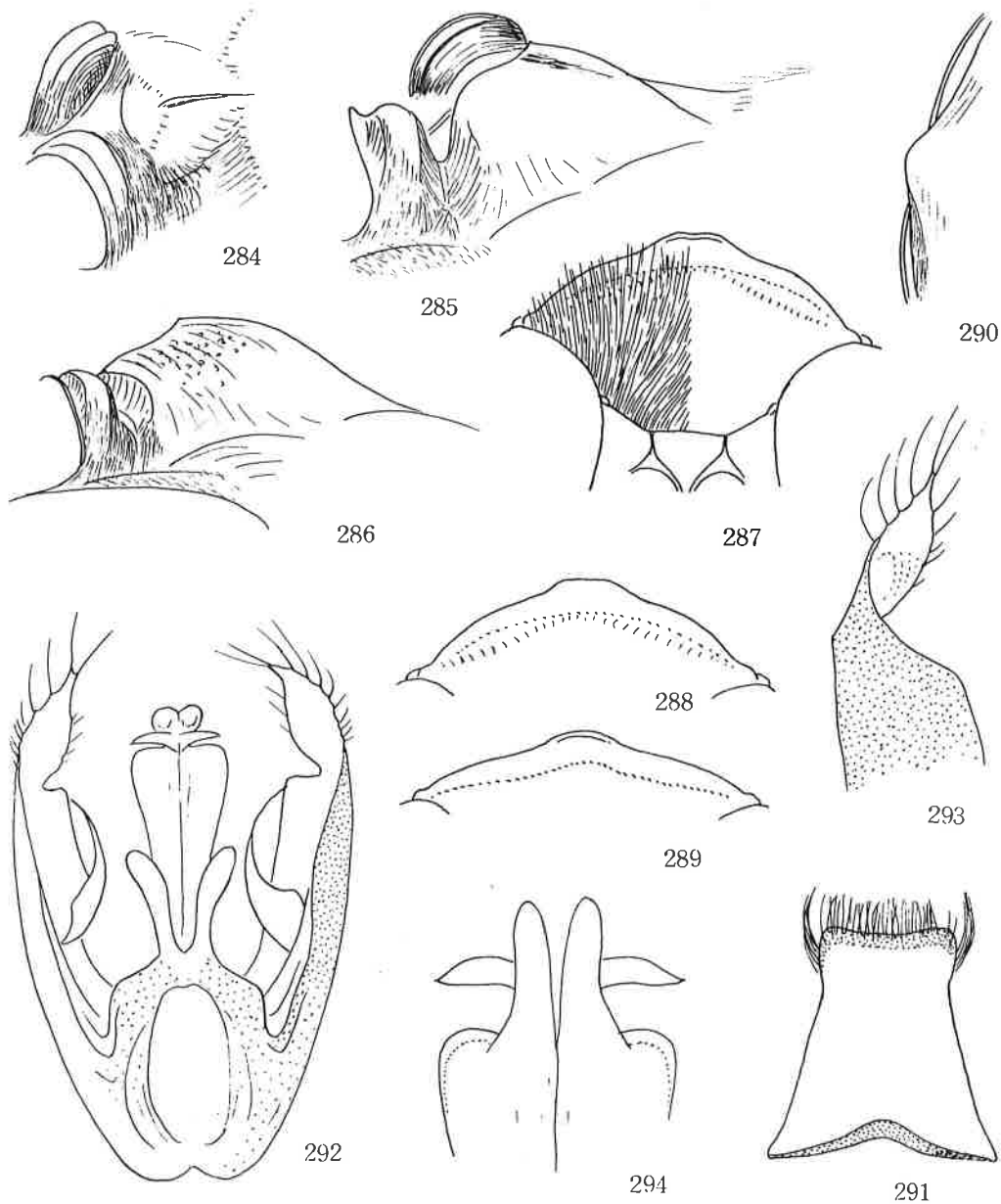
Other Prefs. hitherto recorded to occur: Saitama (Nambu, 1978), Gumma (Tano, 1968; Haneda, 1968), Akita (Haneda, 1970), North Hokkaido (Murota, 1978), Nagano (Yamada, 1974), Yamanashi (Suda, 1978), Kumamoto (Tano, 1977).

Main characters

Length 10-12 mm (♀), 9-10 mm (♂), G1 flask-shaped, mesoscutum without microsculpture, propodeum with lateral carinae, area dorsalis distinctly enclosed with furrow, SAT moderately high tuberiform, medianly carinate, PAF fairly deep, bottom line gently upcurved, U-shaped in cross section. ♀: gaster from apex of G1 to base of G4 red, usually black maculated above, antenna from A4 or A5 apically ferruginous beneath, all tibiae at base, fore and mid ones at apex also, all spurs, fore and mid tarsi at least largely ferruginous white; clypeus slightly produced at medio-apical area, IODS = 3:2 - 5:4, A3=AW 4.5-5; ♂ gaster black, sometimes from apical area of G1 to base of G4 on sides alone brown, antenna from about middle apically feebly brownish beneath, sometimes fairly distinctly so, fore tibia partly (variable) brown, fore tarsus largely ferruginous, spurs all yellowish white, apical margin of clypeus weakly recurved,

IODs=4:3, A3=AW 2, A13 slightly longer than A9-12.

Colouration. Mandible and mouth parts ferruginous, the former at apex and on inner margin brown, palp sometimes basally darkened, fore tibia in bright specimens ferruginous except folded side and outer margin both on median area, in dark specimens only at base and apex ferruginous, usually fore side broadly ferruginous. Mid tarsus variable, rarely completely yellowish, frequently T3 alone brown, sometimes T3-4, T3-5 or T2-5, rarely from apex of T1 spically dark brown. Maculation of reddish area of gaster variable, rarely completely lacking, or dorsal side broadly black, usually G2 and 3 red and maculated above with brownish black, often apical red area of G1 also black maculated above, maculae varied in size, frequently G3 alone maculated above.



Figs. 284-294. *Trypoxylon nipponicum* Tsuneki. 287-288, ♀; 289, 291-294, ♂

♂. Mandible and palpi similar, fore tibia at base and apex brownish ferruginous, more or less broader in front, fore tarsus ferruginous and usually vaguely brownish on basal area of T1, 2 and 3, mid tibia at base and apex narrowly ferruginous, mid tarsus usually wholly dark brown, sometimes T4 and 5 somewhat pale. Hind tibia usually without basal ring, but sometimes brownish ring present, T4 and 5 somewhat pale as in mid leg. In one specimen reared and studied in Sasayama, Hyogo Pref. by Dr. Miyamoto all tibiae and mid and hind tarsi black, spurs ferruginous and fore tarsus deep brown on outer side.

Structure. SAT-ASR in latero-vertical view: Fig. 284, dorso-lateral view: Fig. 285, in lateral view: Fig. 286; clypeus in holotype ♀: Fig. 287, more frequently medio-apical prominence without medial emargination (Fig. 288), in ♂: Fig. 289.

♀. Head in frontal view with sides roundly, very slightly convergent towards clypeus, $W:L=100:86$ (holotype ♀), vertex slightly depressed, tops of hind ocelli level with tops of eyes, eye incision narrow and deep, dorsal margin horizontal, frons very weakly raised, medial furrow broad and shallow, but with bottom line distinct. Occipital carina highly raised and complete, but low and depressed behind buccal cavity.

Measurements in holotype ♀ (within parentheses a Fukui - Taniyama - ♀):

HW, HL, IODv, A3, P=100, 48, 33, 24, 152 (100, 48, 32, 25, 148). IODs=10:7.5 (10:7). OOD, Od, POD=3, 4, 4 (=3, 4, 4). $A3=AW \times 4.0$ ($AW \times 4.3$) - widest lateral view, in narrowest view $\neq AW \times 5$ in both. $A3, 4, 5=10, 6.5, 6.$ (10, 7, 6.5). P, Ma, Mi, 2(Ma), 3(Ma)=100, 21, 8, 31(22), 40(32) (100, 16, 7, 32(20), 34(29)). RC=B, somewhat close to C, R1 short, $CV1=CV2 \times 5$, TCV: $CV2 \pm 5:4$, TCV very gently sinuate, angle about 100° , (except angle about 90° , completely same).

Anterior part of pronotal collar nearly as long in middle as posterior part, slightly widened towards sides, dorsal margin in frontal view triangularly raised and tuberculate in middle, posterior part incompletely discoloured, in some light medial area appears yellowish, but otherwise posterior margin alone narrowly brownish; lamina on side: Fig. 290; subalar area of mesopleuron without pent-roof structure, only postero-lateral area with a weak longitudinal carina which is extended posteriorly into mesopleural flange. Basal elevation of area dorsalis a narrow ridge-like, separated from postscutellum with a fine furrow, medial furrow of area dorsalis comparatively broad and deep, slightly enlarged apically, area apicalis enclosed with carina, surface smooth and shining, without medial keel, GSR gently roundly raised, not discoloured, not reflected.

Frons distinctly microcoriaceous and comparatively largely and somewhat sparsely punctured, punctures on top areas of elevations sparser, mesoscutum with plumbeous shine, strongly and fairly closely punctured, punctures irregular in size and density, on median area finer and posteriorly weaker, mesopleuron more regularly but sparsely covered with strong punctures, but punctures on epimeral area weaker; lateral series of striae along lateral carina of propodeum strong and close, on posterior inclination striae extended on to disc, covering closely the area; area dorsalis at base obliquely and coarsely striate, median furrow except posterior part transversely, strongly and closely striated, disc closely punctured except inner area and mixed with weak oblique striae, sometimes basal striae strongly extended onto disc, sides closely punctured except femoral sinus, sometimes sinus also weakly punctured; punctures posteriorly larger and sparser and gradually replaced with transverse striae, posterior-most depressed area transversely coarsely rugoso-striate.

♂. Generally similar to ♀. Head in frontal view shorter, $W:L=100:81$, clypeus shorter: Fig. 289. Measurements of Fukui (Taniyama) specimen (within parentheses Hyogo specimen): HW, HL, IODv, A3, A13, P=100, 48, 34, 15, 28, 134 (100, 50, 35, 14, 30, 128). IODs=10:7.5 (10:8). OOD, Od, POD=7, 7, 8 (4, 4, 4). $A3=AW \times 2.2$ ($AW \times 1.9$). $A13=BW \times 3.0$ (do.), and $\neq A9-12$ ($\neq A8-12$). P, Ma, Mi, 2(Ma), 3(Ma)=100, 15, 7, 34(19), 35(30). (100, 22, 9, 34(30), 38(42)). RC=B, somewhat close to C (sometimes RC=C and close to B), $CV1=CV2 \times 4-5$, TCV: $CV2=1:1-3:4$, TCV sometimes nearly straight, sometimes strongly bent in middle, angle $90-100$ (when TCV bent varied at base and apex ($90^\circ-120^\circ$)). (RC=B, close to C, $CV1=CV2 \times 5.4$, TCV: $CV2=5:3$, angle about 95°).

Punctures and sculptures similar.

Eight sternite: Fig. 291 (ventral or outer view). Genitalia in ventral view: Fig. 292, apical area of paramere in dorsal view: Fig. 293. Paramere simple at apex, with inner margin expanded and rolled ventrally as usual, outer margin also expanded inward but not rolled, and embraced by the expanded lamella of inner margin, both expanded areas and apical portion membranaceous, while rest of paramere well chitinized, castaneous brown. Apical part of penis valve seen vertically from back side: Fig. 294.

Sculpture and punctuation of frons and mesoscutum similar, on propodeum generally similar, on area dorsalis usually obliquely striate and mixed with punctures, but

on median furrow variable, sometimes as in ♀, sometimes longitudinally irregularly striate and sometimes at base irregularly reticulate.

On TRYPOXYLON NIPPONICUM PULIENSE TSUNEKI, 1967 (STAT. NOV.)

At the time of the first description of T. puliense m., ♀ it was pointed out that the species was very closely allied to T. nipponicum and suggested that when the male is discovered in future it may be made clear that the species are in subspecific relationships.

The discovery of the male of puliense which was at first described as a different species (= murotai Tsuneki, 1973, the specimen was collected in a montanic valley as against the town dweller, puliense) made it possible to compare both the species with each other.

The result is, as suggested at first, that they are conspecific, showing the same characters in the structure of antenna, sternite 8 and genitalia. But the Formosan representative has the gasteral petiole much slenderer and longer, and in the female apical margin of the clypeus somewhat different in form (ref. SPJHA, 15: 44, fig. 13, cf. Fig. 287 of the present paper) and the red area of the gaster much more blackish and very narrowly restricted.

Based upon such differences as mentioned T. puliense is treated as a subspecies of T. nipponicum m.

26. TRYPOXYLON MALAISEI GUSSAKOVSKIJ, 1933

Trypoxylon malaisei Gussakovskij, Arch. f. Zool., 24 A, 10: 10, 1933 (3 ♀, Ussuri region: Sutshan, Dedanka and Tigrovaja).

Trypoxylon malaisei: Gussakovskij, Trav. Inst. Zool. Akad. Sci., USSR, 3: 653, 1936 (listed and redescribed).

Trypoxylon malaisei: Yasumatsu, Hym. in Icon. Ins. Jap. etc., p. 1468, 1950 (♀, Japan).

Trypoxylon malaisei: Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci., 6 (1): 14, 1956 (♀ ♂, Korea, Hokkaido, Honshu, Shikoku and Kyushu, keyed and described with Japanese and Korean specimens, with figs. of clypeus (♀ ♂), antenna, genitalia and sternite 8).

Trypoxylon malaisei: Nambu, Life Study, 10: 25-34, 1966; 11 (1-2): 6-16, 1967 (partim, biology).

Trypoxylon malaisei: Tsuneki, Etizenia, 45: 11-13, 14-16, 1970 (biology).

Trypoxylon malaisei: Tsuneki, SPJHA, 16: 53, 1981 (1 ♀, NE Burma, 2000 m, with redescription of a paratype female).

This species is common and abundant in Japan from Hokkaido to Kyushu and was erroneously included under the specific name, T. obsonator Smith, in the classic work of Japan, just as done by F. Smith himself in his description of T. obsonator (ref. SPJHA, 8: 31, 1978).

Specimens in my collection: 93 ♀ 42 ♂ from Central Korea (3 ♀, Mt. Temma, Mt. Shōyō), Is. Tsushima (1 ♂, leg. T. Shirozu), Prefs. Fukuoka, Ohita, Kagoshima (including Sata Prom.), Kohchi, Hyogo, Kyōto, Mie, Fukui, Ishikawa, Tokyo, Saitama, Shizuoka, Niigata, Iwate, Aomori, Hokkaido (South and Central).

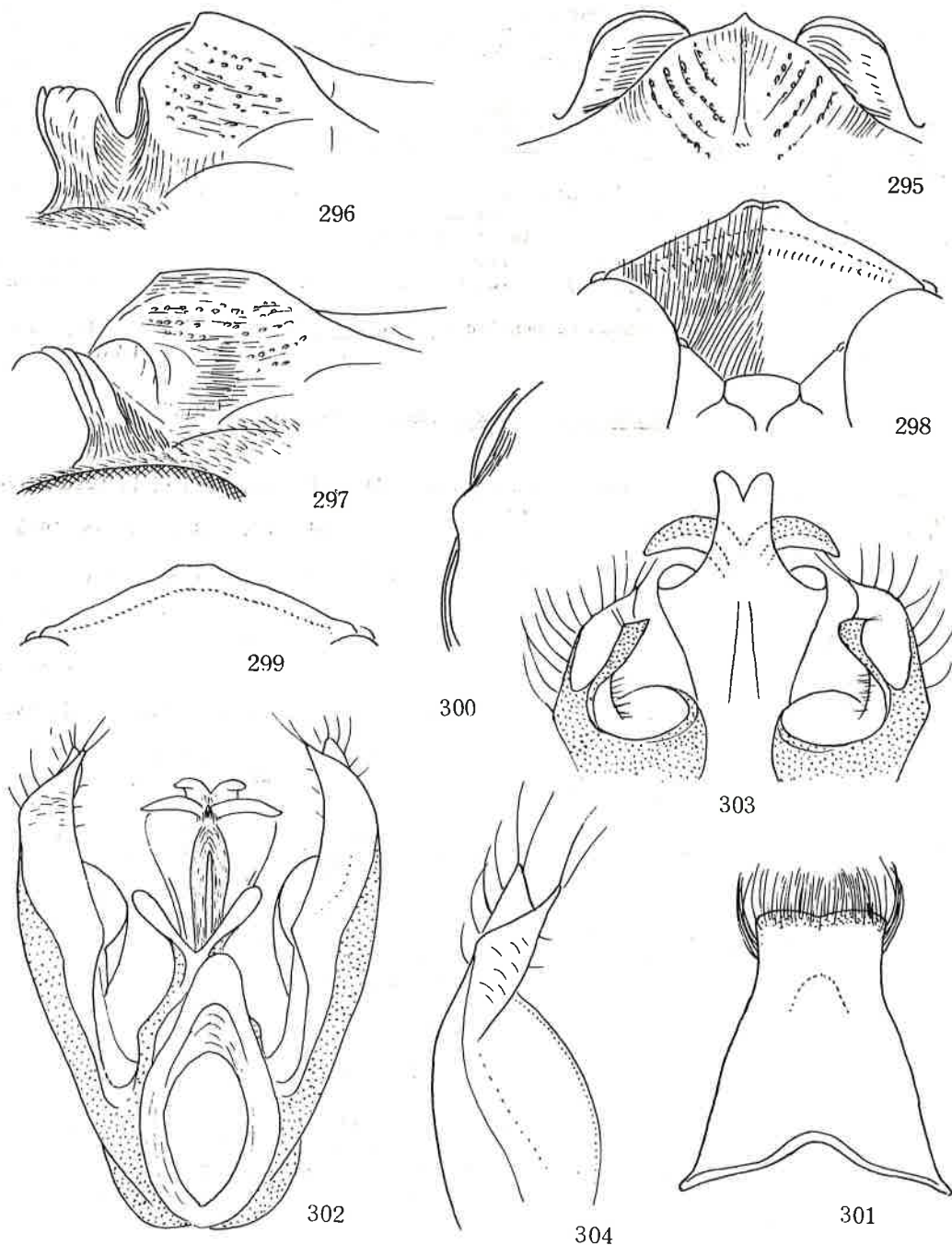
T. malaisei Gussakovskij was originally described with 3 ♀ from the Ussuri Region and was redescribed by me with specimens from Japan including the first description of ♂ (genitalia illustrated). Recently the species was recorded by me from NE province of Burma.

According to my reexamination of one of the syntype females of this species the Japanese specimens are completely consistent in characters with the Ussuri specimen. The case is also true with the Burmese specimen in general, but here some structural differences are present and it was treated as a different race: T. m. arakanum m.

Some supplements to my 1956 description

Head in frontal view markedly wider than long, W:L=100:82 (♀), 100:80 (♂), with sides rounded and slightly convergent towards clypeus, vertex slightly depressed, tops of hind ocelli level with tops of eyes, each ocellus in a hollow, hind ones shallow,

fore one comparatively deeper, eye incision in ♀ comparatively narrow (but somewhat wider than in nipponicum) and deep, subparallel-sided, with dorsal margin horizontal, in ♂ broader, shallower, more strongly narrowed towards sinus, with dorsal margin slightly inclined outwards, frons gently raised and broadly inclined towards medial line, SAT-ASR: Figs. 295 (dorsal view), 296 (dorso-lateral), 297 (lateral); clypeus: Figs. 298 (♀), 299 (♂), occipital carina complete, but lowered and depressed behind



Figs. 295-304. Trypoxylon malaisei Gussakovskij. 298, ♀; 299, 301-304, ♂.

buccal cavity. Measurements of ♀ (♂ within parentheses):

HW,HL,IODv,A3,Al3,P=100,46,26,25,--,160 (100,48,33,15,22,124). IODs=10:8 (10:7.5). OOD,Od,POD=3,4,4 (8,6,7). A3=AWx5 (AWx2). A3,4,5=10,6.5,6 (10,8,7). (Al3=BWx2.4 and ≈Al0-12). P,Ma,Mi,2(Ma),3(Ma)=100,17,5,30(20),30(27) (100,21,9,40(29),42(42)). RC=M, Rl short, CV1=CV2x7 (in other ♀ 7, 7.5, 7.5, 8, always over 7), TCV:CV2=5:3 - 2:1, TCV gently sinuate, angle about 110° (RC=M, Rl short, CV1=CV2x4.6 (in other ♂ 4.6, 4.6, 7.0, 5.2, 6.3, variable), TCV:CV2=1:1 - 5:3, angle about 120° (in other ♂ 120°, 120°, 110°, 110°).

Collar comparatively thick, anterior part medianly minutely tuberculate, posterior part incompletely discoloured, with posterior half alone discoloured, brown, lamina on side: Fig. 300, subalar area of mesopleuron at postero-lateral area margined with carina, carina posteriorly connected with mesopleural flange. Propodeum with distinct lateral carinae, accompanied inside with a series of striae that are extended inwards in front of area apicalis to form a zone of arcuate carinae, area dorsalis enclosed distinctly with furrow, area apicalis completely margined with carina, with surface smooth and polished, without medial keel, GSR roundly and highly raised, apex broadly discoloured and reflected.

In ♂ sternite 8: Fig. 301; genitalia in ventral view: Fig. 302, apical half in dorso-vertical view: Fig. 303, left paramere in lateral view: Fig. 304, paramere shallowly bifurcate at apex into lamellate lobes, penis with well developed shoulder and sickle-shaped appendages.

Vertex strongly microcoriaceous and closely superimposed with medium-sized punctures, punctures on top areas of elevations sparser, on inclination to median line finer and closer; mesoscutum on antero-lateral area distinctly punctured, punctures on median area and on posterior portion finer and sparser, generally punctures are comparatively larger and stronger in ♂ than in ♀, area dorsalis distinctly, fairly closely punctured, medial bottom line of medial furrow closely crenate, outsides of area and posterior inclination broadly smooth and shining, with sparse fine piliferous punctures scattered.

Remarks. In the Japanese female specimens gaster is mostly from apical area of G1 to base of G3 red, usually carrying a brown mark on posterior part of G2 above; in the typical specimens G2 and 3 almost completely red. In ♂ gaster is completely black. Legs black, rarely bases of tibiae obscurely brownish.

27. TRYPOXYLON KYOTOENSE TSUNEKI, 1966

Trypoxylon kyotoense Tsuneki, Bull. Osaka Mus. Nat. Hist., 19: 22, 1966 (1 ♀, Kyoto: Kibune, with figures of head seen in front and apical margin of clypeus).
Trypoxylon kyotoense: Tsuneki, Life Study (Fukui), 17 (1-2): 33, 1973 (keyed).

Specimen:

1 ♀ (holotype), Kyoto (Kibune), 5. IX. 1966, K. M. (Coll. Ohsaka Mus. Nat. Hist.).

Redescription

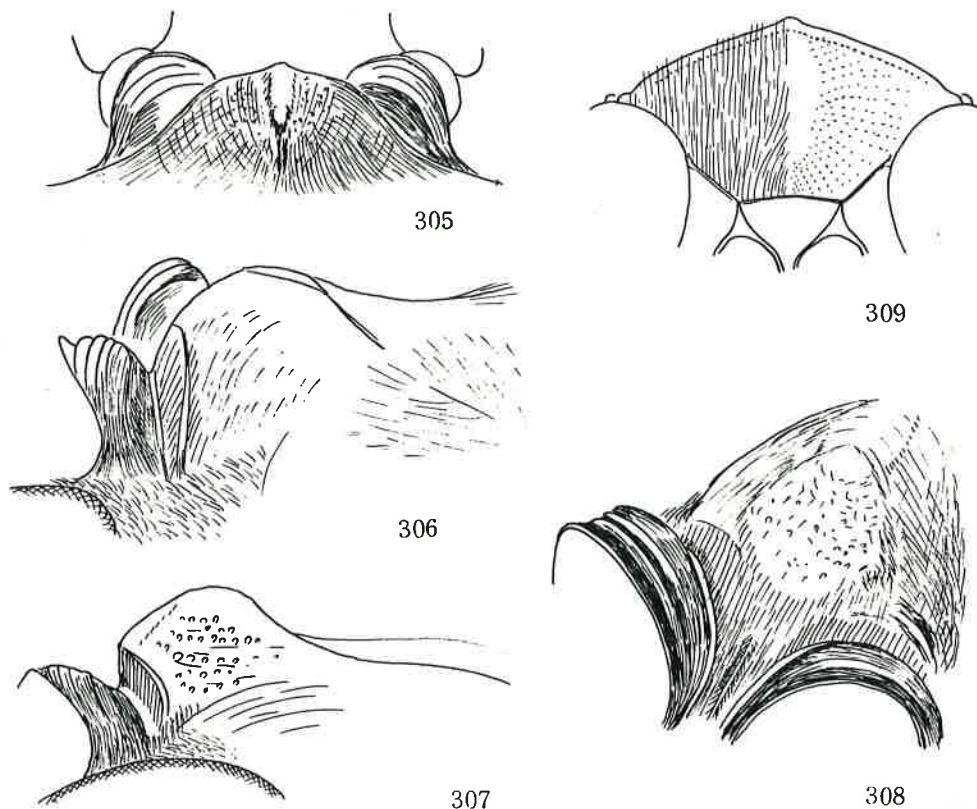
♀. Presumably 15-16 mm. Black, mandible on outer margin near apex adorned with a large, indistinctly outlined white mark, palpi opaque pale brown, tegula translucent brown, tubercle posteriorly slightly brownish, gaster at apical swelling of G1 (with a black mark above), G2 except posterior area above and G3 on basal sides and apical margin yellowish red. Tibial spurs and claws of all legs pale brown. Hair silvery, on clypeus parallel, at base only somewhat convergent towards medial line.

Head in frontal view markedly wider than long, HW:HL=100:72, with lateral margins roundly convergent towards clypeus, vertex slightly depressed, tops of hind ocelli level with tops of eyes, eye incision moderately broad and narrowed towards sinus, sinus comparatively broadly rounded, dorsal margin somewhat inclined outwards, frons gently raised and broadly inclined towards medial line which is smooth and shining, surface anteriorly, behind SAT, broadly roundly and weakly concave, elevation on both sides of medial furrow comparatively small and gently rounded, SAT tuberiform, median top with a short, thick and shining carina, not acutely pointed in cross section, but broadly rounded, anterior inclination of SAT broad, without median carina within the range of SAT, but with a fine raised line or carina in middle of IAA (Fig. 308), PAF deep, flat-bottomed and at both ends shortly curved down, ASR highly elevated, apical carina distinct, dorsum transversely striated with 3-4 weak carinae. SAT-ASR in dorsal view: Fig. 305, in dorso-lateral view to see through PAF: Fig. 306, in lateral view:

Fig. 307, in antero-lateral view; Fig. 308. Clypeus: Fig. 309, disc at base roundly raised and from top anteriorly gently roundly tectate. Occipital carina high and broad and narrowed downwards, but complete, behind buccal cavity triangularly depressed.

Measurements: HW,HL,IODv,A3,P=100,48 (including length of occipital carina about 2),27,24,156 (IODi=81). IODs=10:8. OOD,Od,POD=2,3,2. A3=AWx4.5. A3,4,5=10,7.5,6. P,Ma,Mi,2(Ma),3(Ma)=100,17,6(behind basal condyle),36(20),40(29). RC=M, very close to wing apex, Rl very short, CV1=CV2x7.0, TCV:CV2=2:1, TCV gently sinuate, angle at base about 110° and at apex about 120°.

Collar of pronotum thick, anterior part as long in middle as posterior part, and roundly incrassate towards sides, anterior inclination carrying a broad, round, gentle



Figs. 305-309. Trypoxylon kyotoense Tsuneki, ♀

excavation in middle, parapsidal suture on mesoscutum a weak raised line, scutellum flat, subalar area of mesopleuron normal; propodeum with distinct lateral carinae, but carina not reaching lateral carina of area apicalis, area dorsalis distinctly enclosed with comparatively broad and crenate furrow, basal elevation about half the length of postscutellum, obliquely inclined posteriorly and transversely finely bicarinate, median furrow of area dorsalis broad and comparatively deep, with bottom line finely crenate, medial furrow of posterior inclination very deep at base, wedge-shaped, area apicalis completely margined with carina, surface flat, shining, without median longitudinal keel, GSR triangularly (apex rounded) highly elevated, apical area slightly reflected, translucent pale castaneous brown, intercoxal carina gently upcurved, nearly straight; hind coxal organ minute, but toothed.

Frons strongly, distinctly microcoriaceous and superimposed with comparatively large irregular punctures, PIS on top areas of elevations and thence upwards somewhat sparse, = or PD, on lower concave area punctures slightly smaller, but PIS=PD (punctures relatively more numerous). Thorax-complex smooth and polished and punctured, punctures on mesoscutum very fine and sparse, but laterally somewhat larger, with PIS

narrower, on mesopleuron fine, but distinct and sparse; propodeum with distinct lateral series of close striae, just inside lateral carinae, striae longer posteriorly, covering completely the surface in front of area apicalis; area dorsalis with basal furrow coarsely foveolate, disc distinctly, closely punctured with medium-sized and posteriorly shallowed punctures, sides anteriorly somewhat sparsely and moderately largely punctured, except smooth femoral sinus, punctures posteriorly finer and sparser, but on posteriormost depressed area transversely coarsely rugoso-striate.

Remarks. This species is closely allied to T. malaisei, but is easily distinguished therefrom by the form of apical margin of clypeus and by the strange whitish mark on mandible.

28,A. TRYPOXYLON REGIUM GUSSAKOVSKIJ, 1933

Trypoxylon regium Gussakovskij, Ark. f. Zool., 24 A (10): 11, 1933 (1 ♀, Ussuri).

Trypoxylon regium: Gussakovskij, Trav. Inst. Akad. Sci. USSR, 3: 652, 1936 (keyed and redescri.).

Trypoxylon regium: Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci., 6 (1): 16, 1956.

Trypoxylon responsum regium: Tsuneki, Etizenia (Fukui), 22: 6, 1967

Trypoxylon regium: Tsuneki, SPJHA, 15: 48, 1981.

I could not examine holotype specimen of this species which was not in the collection of Natural History Museum of Stockholm. Judging from the original description of this species, however, there is no doubt that the following Japanese taxon falls within the category of this species.

28,B. TRYPOXYLON REGIUM HATOGAYUUM TSUNEKI, 1956

Trypoxylon regium hatogayuum Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., Ser. II, Nat. Sci., 6 (1): 17 (♀), 40 (♂), 1956 (with figs. of propodeum, head in frontal view (♀), clypeus, mandible, antenna and genitalia (♂), Fukui).

Trypoxylon responsum hatogayuum: Tsuneki, Etizenia (Fukui), 22: 7, 1967.

Trypoxylon responsum hatogayuum: Tsuneki, Life Study (Fukui), 17 (1-2): 33, 36, 1973 (keyed).

Trypoxylon responsum hatogayuum: Tsuneki and Japanese authors, 1967-80.

Trypoxylon responsum hatogayuum: Tsuneki, Etizenia, 45: 9-11, 1970 (biology).

Trypoxylon responsum hatogayuum: Nambu, Life Study, 15 (1-2): 1-7, 1971 (biology).

Trypoxylon responsum hatogayuum: Suda, Hym. Comm., 8: 3, 1978 (8 ♀ 2 ♂, Yamanashi).

Trypoxylon regium hatogayuum: Tsuneki, SPJHA, 15: 47, 48, 1981

Specimens in my collection:

40 ♀ 13 ♂, from Prefs. Iwate, Ishikawa, Fukui, Saitama and Mie (1 ♀, Ise-Geguh), of which 6 ♀ 2 ♂ are emerged from the cocoon of reared larvae in Fukui Prefecture.

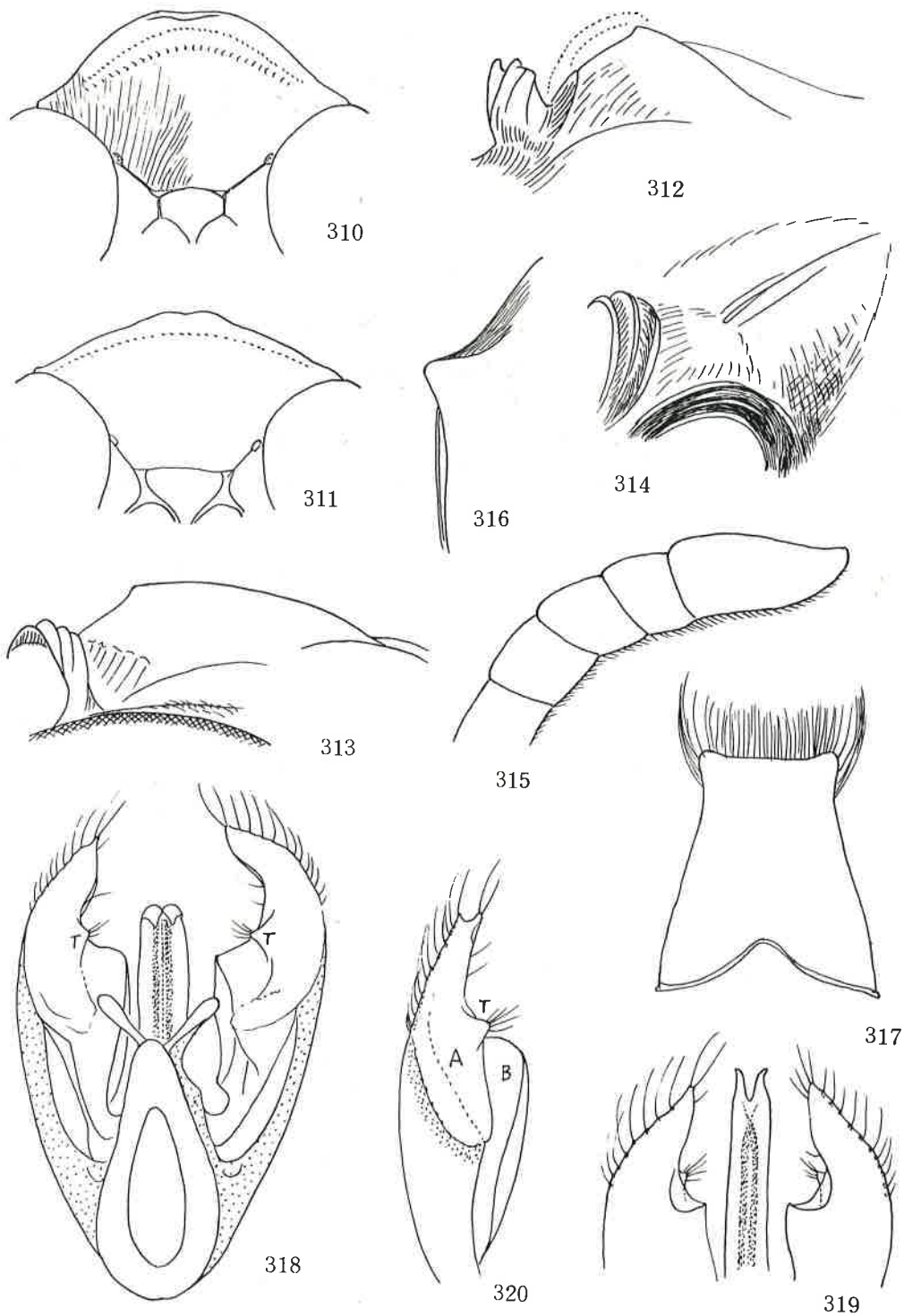
Other recorded localities: Prefs. Akita, Miyagi and Yamanashi.

Comparison.

The Japanese race of this species differs from the typical one in that the legs are not completely black, but partly brightly maculated: ♀ (in regium s. str. ♂ is unknown), fore tibia at base ferruginous, the colour slightly extended on to front side, fore tarsus from apex of T1 to end pale castaneous, fore and mid tibial spurs pale yellow, hind ones pale brown, frequently mid and hind tibiae at base brown, but sometimes without brown ring (in Japanese race ♂ similar).

In external characters the present species is very similar to T. malaisei, main differences from this lie in that apical margin of clypeus is without medial prominence, but simply rounded and in fresh specimens slightly emarginate in middle (Figs. 310 (♀), 311 (♂)), RC of fore wing is not M-type, but C-type and lamina on side of pronotum more acutely toothed (Fig. 316). Strictly, furthermore, eye incision somewhat broader and more distinctly narrowed towards sinus, SAT-ASR similar in pattern of structure, but much lower (Figs. 312, dorso-lateral; 313, lateral and 314, antero-lateral) and Al3 in ♂ relatively somewhat shorter (Fig. 315).

In the structure of the male genital organs, however, the present species is remarkably different from malaisei; Fig. 318 (ventral view), paramere not bifid at apex,



Figs. 310-320. Trypoxylon regium hatogayuum Tsuneki. 310: ♀

with a piliferous prominence or tubercle on inner margin at base of apical part (Fig. 318, T), penis valve simple at apical area, without shoulder and sickle-shaped appendages. Apical part of genitalia in dorso-vertical view: Fig. 319, paramere simple at apex, but sometimes appears as given with Fig. 320 (ventro-lateral view), A is an inward expansion from outer margin and B is an usual rolled expansion of inner margin, T is a tubercle crowned with a tuft of hair (A takes various forms when the lamella desiccates, the figure shows most natural condition). Sternite 8: Fig. 317.

Measurements of 2 ♀ from Fukui (one of them allotype) (♂ within parentheses):

HW:HL in frontal view 100:88; 100:87 (100:84). HW,HL,IODv,A3,A13,P=100,52,30,26,--,126; 100,52,30,24,--,124 (100,52,31,24,18,128). IODs=10:7.5; 10:7.5 (10:7.5). OOD,Od,POD=4,4,5; 4,5,5 (4,5,5). A3=AW×4.3; AW×4.0 (AW×1.7). A3,4,5=10,6.5,6; 10,7,6.5 (10,8,9). (A13= BW×1.8 and ≠A10-12). P, Ma, Mi, 2(Ma), 3(Ma)=100,28,8,40(34),46(42); 100,21,7,36(28),40(40) (100,21,7,36(28),40(40)). RC=C; RC=C (RC=C), R1 short, short (short). CV1=CV2×9; CV2×7.5 (CV2×8.0). TCV:CV2=5:2, 2:1 (2:1). TCV straight, gently incyrved (gently incurved). Angle about 95°, about 100° (about 95°).

Table 6. Measurements of G1, G2 and G3

Pref.	Loco	Sex	Ma	Mi	2(Ma)	3(Ma)
Morioka		♀	24	8	40(30)	38(40)
Saitama	Hodosan	♀	16	6	32(20)	30(27)
Mie	Ise	♀	26	9	40(30)	40(38)
Fukui	Koike	♀	22	8	40(28)	44(40)
"	"	♀	16	6	35(20)	32(26)
"	"	♀	19	7	34(20)	40(33)
"	"	♀	17	6	30(22)	32(30)
"	"	♀	17	6	32(20)	36(27)
"	"	♀	18	6	32(22)	36(32)
"	"	♀	22	8	38(26)	42(38)
"	"	♀	21	7	36(28)	40(40)
"	"	♀	18	6	30(22)	32(30)
"	"	♀	16	6	34(20)	40(29)
"	Arashi	♀	28	8	40(34)	46(47)
"	"	♀	27	8	38(34)	44(47)
"	"	♀	17	6	30(18)	30(30)
"	"	♀	15	6	30(20)	30(26)
"	"	♀	28	8	36(30)	40(42)
"	"	♀	17	5	32(20)	34(26)
"	"*	♀	24	7	36(30)	36(40)
"	"*	♀	24	8	32(32)	42(42)
"	"*	♀	25	8	34(30)	38(40)
"	"*	♀	24	8	34(27)	38(38)
"	"*	♀	24	7	38(30)	39(38)
"	"*	♀	26	8	34(32)	40(40)
"	Utinami	♀	18	7	32(22)	36(32)
"	Iwaya	♀	16	6	30(18)	38(24)
"	"	♀	18	7	38(22)	40(32)
"	Hossaka	♀	22	7	36(24)	42(36)
Morioka		♂	27	9	40(38)	37(48)
Isikawa	Mt.Haku	♂	18	7	36(28)	32(36)
Fukui	Koike	♂	18	7	36(25)	36(38)
"	Arashi	♂	32	10	46(46)	46(58)
"	"	♂	24	8	38(34)	38(42)
"	"	♂	24	8	40(32)	42(40)
"	"	♂	26	9	40(36)	44(50)
"	"	♂	26	9	42(32)	40(40)
"	"*	♂	31	11	40(48)	36(58)
"	"*	♂	30	11	40(46)	38(63)
"	"*	♂	31	12	46(46)	46(58)
"	"*	♂	31	10	44(42)	42(54)

Remarks. *... Emerged from the same nest.

case in T. errans Saussure (ref. T. saitamaense m.).

Remarks. In general, apical swelling of G1 is considerably variable among specimens of the same species from the same locality. But the variation in this species is especially marked, very much stronger than in the case of nipponicum mentioned earlier in this paper. Table 6 shows the variations of Ma, Mi, 2(Ma), 3(Ma) with their relative length when P is 100. According to the result when apical incrustation is very strong G1 (= P) comes to be only thrice as long as its maximum width, but when it is weakest it is nearly 7 times as long as Ma.

Difference in the developmental degrees of apical swelling of G1 is not always irregular, but seems to be connected usually with the locality and when the difference is observed among specimens from the same locality they are collected in different years or different height. The fact suggests that some meteorological factor or factors may exert influence. This seems to be supported by the fact that the specimens collected in the same season of the same year from the same locality have similarly developed G1. Especially suggestive is the case of the ♀♂ specimens that are reared and emerged from the same nest collected at Arashi, Fukui Prefecture, about 600 m above sea level (with * in the left Table).

This seems to indicate that some hereditary factor or factors may play a role in the developmental procedure of the gastral petiole. If so the variation in G1 has connection with speciation and seems to be worthy of notice.

At the same time, however, it must be taken into consideration that the extension of G1 is controlled mechanically by the condition at the time of emergence from the cocoon. If inhibited by some condition it can not fully develop and an aberrant short G1 is brought about. This is frequently the

28. TRYPOXYLON RYUKYUENSE TSUNEKI, 1966 (STAT. REALTERED)

- Trypoxylon amamiense Tsuneki, Etizenia, 6: 2, 1964 (♀ partim, montanic form, nec T. formosicola amamiense Tsuneki).
Trypoxylon ryukyuense Tsuneki, Ibid., 13: 9, 1966 (3 ♀, Amami-Ohshima; 1 ♀, Rokuno-shima).
Trypoxylon responsum ryukyuense: Tsuneki, Ibid., 22: 7, 1967.
Trypoxylon responsum ryukyuense: Murota, Life Study (Fukui), 17 (3-4): 101, 1973 (1 ♀, Amami-Ohshima).
Trypoxylon regium ryukyuense: Tsuneki, SPJHA, 15: 49, 1981.

In the last of the references listed above I again combined ryukyuense with the Ussuri species, regium Gussakovskij, as a local race, although I made it with a query, because the localities of ryukyuense were different in Zoogeographical Region from regium (Oriental as against Palaearctic) and, moreover, in ryukyuense the male still remained unknown and the combination of two different forms at the species level without knowledge about the male was, at least in the present genus, a rather venture.

Since the publication of No. 15 of the present Publication I have continuously considered the problem about the allocation of ryukyuense, feeling resistance in the above listed combination and finally it has been determined that at least at the present state of knowledge ryukyuense should be separated from regium-group at the specific rank.

The chief reasons for this are the two facts above mentioned. Apart from these, however, there are considerable differences shown by ryukyuense from regium-group in some external characters that are rather more significant than in the case of taiwanum which was separated from regium-group in SPJHA, No. 15.

The differences (from ssp. hatogayuum) are:

- (1) IODv as against HW is distinctly smaller (Table 7).
- (2) A3 is relatively distinctly longer (do.).
- (3) Head in frontal view with lateral margins roundly convergent towards clypeus (in regium-group not).
- (4) Eye incision much narrower and deeper.
- (5) Apical margin of clypeus more broadly and more strongly reflected and marginal form is slightly different in fresh specimens (Fig. 322, cf. Fig. 310).
- (6) Disc of clypeus more distinctly roundly raised at base, as a result the hair much more strongly and distinctly convergent towards medial line (Fig. 322, cf. Fig. 310).
- (7) Disc of area dorsalis transversely weakly rugoso-striate (in regium-group sparsely punctured).
- (8) Gaster completely black (in regium-group medianly distinctly red).

Colouration of legs is as in hatogayuum (differs from regium). SAT-ASR similar (Fig. 321, forso-lateral view), pronotal lamina in 3 specimens: Figs. 323, 324, 325.

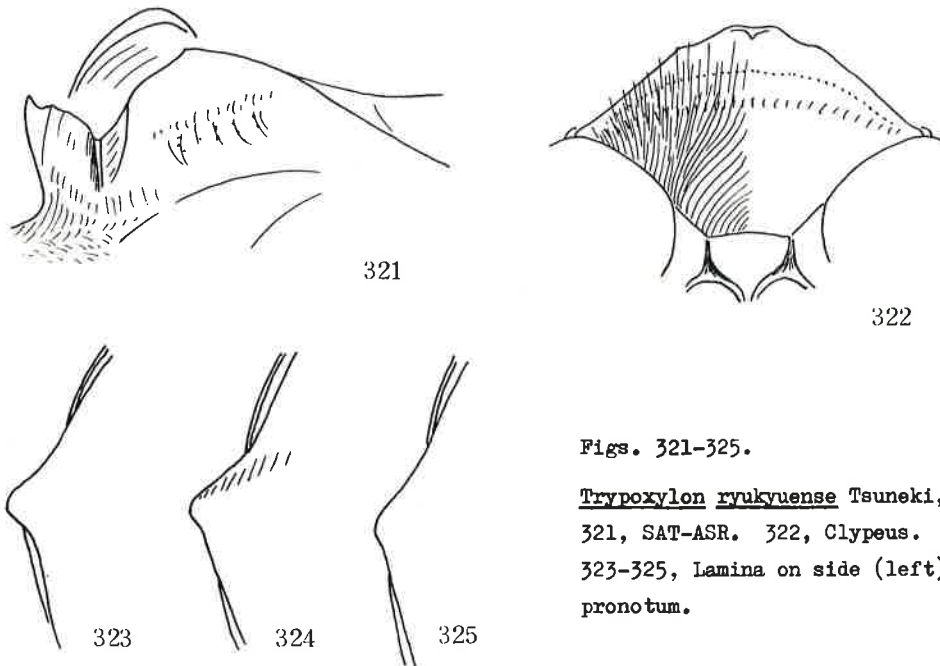
Table 7. Measurements of T. ryukyuense and T. regium hatogayuum

Loco	S	HL	IODv	A3(L/W)	P	IODs	ODodPD	A4	A5	MaMi	2(Ma)	3(Ma)	CV1	T:C	Angle
Amami I. ♀	46	25	25(4.3)	156	8.0	2	4	3	6.5	6.0	19	7	30(24)	36(32)	7.8 2:1 90° 110°
Amami I. ♀	48	25	26(4.5)	144	8.0	2	6	3	6.5	6.0	20	7	31(24)	40(34)	6.6 5:3 90 110
Amami I. ♀	46	25	26(4.5)	144	8.0	3	5	4	6.5	6.0	18	6	32(24)	34(32)	7.8 2:1 90 110
Fukui H. ♀	50	29	24(4.0)	140	7.5	6	9	7	6.5	6.0	21	7	38(26)	42(38)	8.0 2:1 90 95
Fukui H. ♀	50	29	24(4.0)	150	7.5	4	7	6	6.5	6.0	21	6	34(24)	40(36)	8.0 2:1 90 100
Fukui A. ♀	52	30	25(4.0)	126	7.5	4	5	5	6.5	6.0	28	8	40(34)	46(42)	8.7 7:3 100 90
Fukui I. ♀	50	30	25(4.2)	162	7.6	4	6	5	6.5	6.0	18	7	38(22)	40(32)	7.3 2:1 95 110
Fukui I. ♀	50	29	24(4.0)	152	7.5	4	5	5	7.0	6.5	16	6	30(18)	38(24)	7.2 2:1 90 100
Fukui K. ♂	50	34	16(2.2)	136	7.4	4	4	4	7.5	7.5	18	7	36(25)	36(38)	7.0 2:1 90 110
Fukui H. ♂	52	32	14(1.8)	128	8.0	4	5	5	8.0	8.0	18	7	36(28)	32(36)	7.2 2:1 90 100
Fukui A. ♂	50	33	16(2.0)	116	7.5	4	4	4	8.0	7.0	24	8	38(34)	38(42)	8.5 2:1 95 110
Fukui A. ♂	51	36	15(1.8)	116	7.0	4	4	4	8.0	8.0	32	9	46(46)	46(58)	7.0 2:1 95 95
Fukui A. ♂	52	35	15(2.0)	126	7.5	4	4	3	7.0	8.0	24	8	40(32)	42(40)	6.3 7:4 105 105

Remarks. Abbreviation as in Table 1. Angle... at base and at apex.

Amami I., Is. Amami-Ohshima. Fukui: H., Hatogayu. A., Arashi. I., Iwaya. K., Koike.

In the male HW:HL in frontal view is from the top of Table 7 respectively: 100:83, 100:80, 100:83, 100:84, 100:83. Al3 with relative length (ditto): 18, 18, 20, 20, 19. Al3 with length ratio to BW (ditto): BW 2.1, BW 2.0, BW 2.0, BW 2.1, BW 2.0. In all of them Al3 is as long as Al0-12. State of TCV: bent in, sinuate, incurved, sinuate, straight.



Figs. 321-325.

Trypoxylon ryukyuense Tsuneki, ♀.
321, SAT-ASR. 322, Clypeus.
323-325, Lamina on side (left) of pronotum.

It seems possible to me that when the male is discovered in future it will prove the correctness of the present determination on the taxonomic status of the present species by the different structure of the genital organs, as done by taiwanum.

30.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 (♀, status discussed).

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

Trypoxylon inornatum: Tsuneki, Ibid., 13: 7, 1966 (♀ ♂ from Okinawa, nec from Amami-Oshima).

Trypoxylon formosicola inornatum: Tsuneki, Etizenia, 22: 5, 1967 (♀ ♂, actual comparison of two forms).

Trypoxylon formosicola inornatum: Tsuneki, SPJHA, 15: 34, 1981 (observation of holotype ♀).

Trypoxylon formosicola inornatum: Tsuneki, Ibid., 16: 81, 1981 (♀, Hongkong).

Distribution. Okinawa and Hongkong.

Remarks. As to the detailed explanation with illustrations on T. formosicola and the present subspecies see SPJHA, No. 15, pp. 32-35, 1981.

30.B. TRYPOXYLON FORMOSICOLA AMAMIENSE TSUNEKI, 1964

Trypoxylon amamiense Tsuneki, Etizenia, 6: 2, 1964 (♀ ♂, Amami-Oshima, figs.).

Trypoxylon inornatum: Tsuneki, Etizenia, 13: 7, 1966 (synonymized).

Trypoxylon formosicola amamiense: Tsuneki, SPJHA, 15: 35, 1981.

Remarks. As to the general characters of this subspecies refer to my 1966 paper and as to SAT-ASR and the measurements see my 1981 paper.

31. TRYPOXYLON TAKASAGO KUMASO TSUNEKI, 1966

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

Trypoxylon takasago kumaso: Tsuneki, SPJHA, 15: 37, 1981 (♂ ♀, Okinawa, 8 figs.).

Remarks. As to the procedure of investigation and the characters of this subspecies see the above cited literature.

A different subspecies of T. takasago m. is known to occur on the island of Hongkong: T. t. hongkongense Tsuneki, 1981. The nominate species occurs in Formosa.

32. TRYPOXYLON CHICHIDZIMAENSE TSUNEKI, 1973

Trypoxylon chichidzimaense Tsuneki, Etizenia, 65: 12, 1973 (♀, Ogasawaras or Bonin Is.).

Trypoxylon chichidzimaense: Tsuneki, SPJHA, 14: 52, 1981 (♀, redescri. figs.).

Diagnosis. ♀, about 11 mm. Gl flask-shaped, mesoscutum under 30 magnification distinctly microcoriaceous, propodeum with lateral carinae, area dorsalis with lateral furrows, pronotal lamina toothed, subalar area acutely edged on outer margin, but not expanded, gaster, antenna, legs except fore tibial spurs and tarsus black, SAT tuberiform, with medial carina, PAF down-curved in cross section, clypeus with apical margin incised in middle, RC=M-C, angle about 110°.

Black, mesoscutum without plumbeous shine, clypeus at apical margin brown, mandible bright ferruginous, at extreme base black and dark brown at apex, palpi pale yellow, with one or two basal joints black striped on outer side, posterior part of pronotal collar discoloured, tegula transparent amber yellow, fore tibia often at base narrowly brown, fore tibial spurs and fore tarsus ferruginous, but tarsus brownish on outer side. Hair silvery, on clypeus appressed, mixed sparsely with long erect hairs and at base distinctly convergent towards medial line.

Head in frontal view with sides rounded and slightly convergent towards clypeus, W:L=100:87, vertex not depressed, eye incision comparatively broad and narrowed towards bottom, dorsal margin horizontal, frontal elevations gentle, median furrow wide and shallow, anteriorly surface nearly flat, SAT roundly, not strongly raised, median carina broad and short, ASR obliquely broadly expanded, greater part smooth, polished and outer half semitransparent brown, PAF broad and shallow. SAT-ASR in oblique dorso-lateral view: Fig. 327, dorso-lateral view to see through PAF: Fig. 326, lateral view: Fig. 328, scapal hollow near antennal socket markedly deep, clypeus: Fig. 329, mandible on inner margin minutely incised near middle (Fig. 329), clypeus at base gently roundly elevated, apical marginal area broadly (about a quarter of the length) glabrous, smooth and polished and the area reflected, occipital carina shortly interrupted behind buccal cavity where surface depressed.

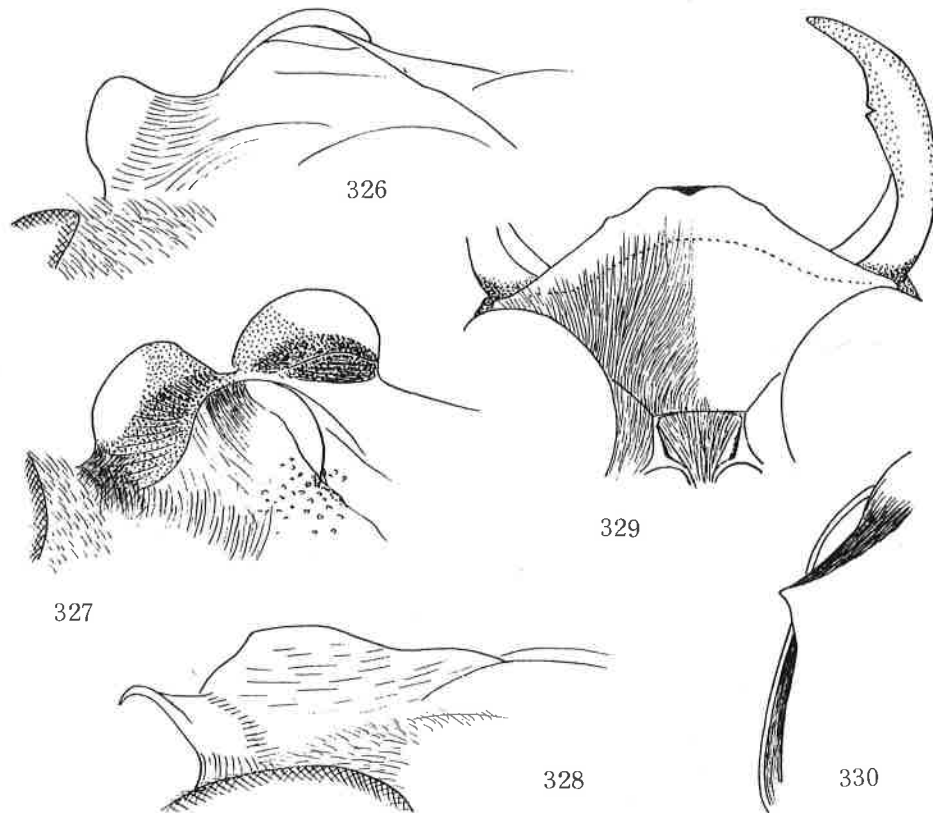
Measurements on two specimens (first ... holotype):

HW, HL, IODv, A3, P=100, 50, 24, 24, 148. 100, 54, 26, 25, 140. IODs=10:9. 10:9. A3=AW×4. AW×4. A3:IODc=10:9. 10:9.3. A3, 4, 5=10, 7.5, 6.5. 10, 7, 6.5. P, Ma, Mi, 2(Ma), 3(Ma)=100, 20, 7, 34(25), 34(32). 100, 18, 7, 32(22), 36(31).

Collar transverse, anterior part narrow in middle and gently enlarged towards sides, in frontal view dorsal margin broad triangularly elevated and weakly tuberculate in middle, posterior part discoloured, lamina on side: Fig. 330. Parapsidal sutures in fine impressed lines, subalar area on outer margin acutely edged and slightly produced, but not expanded into pent-roof structure. Lateral carinae of propodeum not strong, originating slightly behind spiracle and not reaching apex of the segment posterior part disturbed by transverse striae, area dorsalis enclosed with distinct furrow, the furrow narrowed anteriorly, medial furrow moderately deep, enlarged toward apex, basal elevation in a transverse ridge-like, less than half the length of post-scutellum, area apicalis complete, margined above with one or two strong carinae, GSR not elevated at apical margin.

In fore wing $RC=C$, but very close to M , R_1 short, yet reaching close to wing apex, $CV_1 \neq CV_2 \times 5$ (in paratype $= CV_2 \times 6$), $TCV:CV_2 \neq 3:2$, TCV gently sinuate, CV_2 downcurved near apex, angle about 110° .

Hind coxal organ well developed, cone-shaped, with top roundly hollowed like a crater and acutely edged at its margin.



Figs. 326-330. Trypoxylon chichidzimaense Tsuneki, ♀

Frons distinctly microcoriaceous and superimposed with medium-sized flat-bottomed punctures, PIS 1-2 times PD, punctures anteriorly finer and closer, mesoscutum under 20 magnification microsculpture can be seen only with difficulty, but under 30 magnification it is distinct, punctures comparatively large, nearly as large as those on frons and similarly sparse, sparser on median area, mesopleuron with somewhat weaker microsculpture and more uniformly, somewhat more closely superimposed with similar but slightly elongate piliferous punctures. Propodeum with lateral series of striae only on sides of posterior inclination, area dorsalis at base obliquely coarsely and shortly striate, disc finely sparsely punctured, median and lateral furrows weakly transversely striate, outsides of the area and posterior inclination finely sparsely punctured, posterior portion, in front of area apicalis transversely, arcuately striate, sides except anterior femoral sinus fairly closely covered with comparatively large hair-bearing punctures, on posterior narrow area transversely striate.

Remarks. The present species somewhat resembles T. kinabalum known from North Borneo, but is different from this in the colour of legs (slightly of antenna and of mandible also), in the form of SAT, pronotal lamina and GSR, in the state of lateral furrows of area dorsalis and markedly in the relative length of gastral petiole.

Specimens: 2 ♀, Ogasawara Is. (Chichidzima I.), 16. VIII. 1972, Y. Haneda.

ON SOME EUROPEAN SPECIES

The European species of Trypoxylon are, as in other insect groups, well studied and have repeatedly been described by many authors, because of the early development of the scientific investigation of the area. The descriptions are certainly sufficient enough to separate the species of Europe from each other, because the number of them is only a few. However, when the members of the genus of other regions where very many closely allied species occur are compared with the European representatives, most of the descriptions hitherto made of them are of little use, because they are too simple, without the study of the male genital organs and without the study of variations in characters, except the study on figulus by de Beaumont and his followers. The fact was keenly felt of T. scutatatum when I studied the shield-bearing group of southern regions of Asia. Thus I was compelled to do the detailed study of this species, as far as my collection allowed me to do so, in connection with its close relative from Pakistan (SPJHA, 7: 63-66, 1978). The same is also the case in regard to figulus Linné and clavicerum Lepelletier et Serville from Eastern Asia dealt with in the present paper. As to fronticorne Gussakovskij I studied in detail the East and South Asiatic specimens only. Regarding the European form of this species, together with albipes Smith, I must expect the study by some European investigator.

In the following T. attenuatum Smith will be described again with my new method to enable it to compare with the allied species of other regions, together with the supplemental measurements of T. clavicerum as far as possible to me.

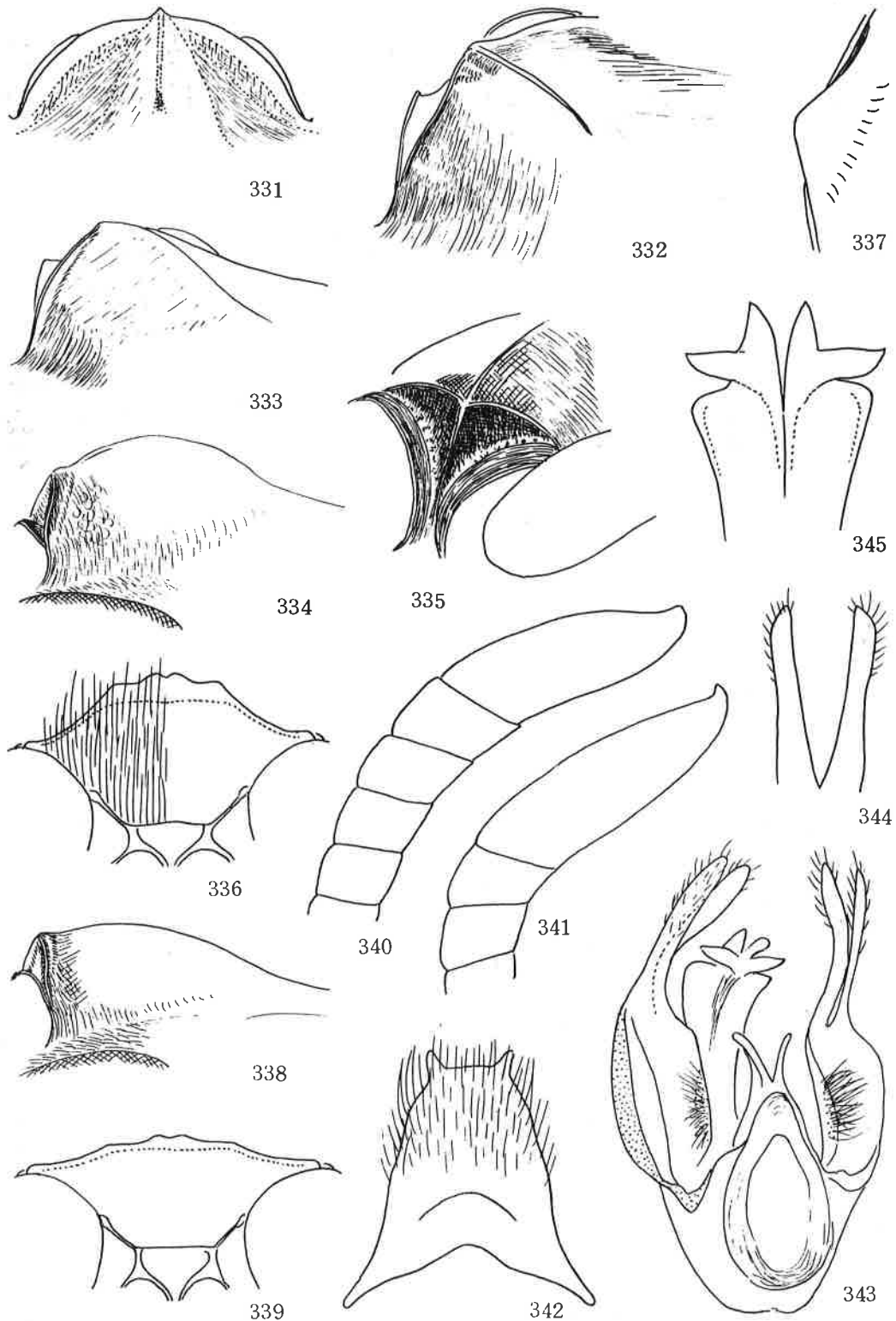
On TRYPOXYLON ATTENUATUM SMITH, 1851

Trypoxylon attenuatum Smith, List. Brit. Anim. Brit. Mus., Pt. 6, Acul., 1851, p. 120
(♀)

♀. 8-10 mm. Head seen in front with sides rounded, very slightly narrowed towards clypeus, vertex not depressed, but rather roundly raised, with top slightly above level of tops of eyes, tops of hind ocelli of course far above top level of eyes, eye incision moderate in width, distinctly narrowed towards bottom, bottom minutely rounded, dorsal margin slightly inclined outwards; frons gently raised, median furrow narrow and weak, surface nearly flat, SAT moderately high, broad nasiform, carinated in middle and on anterior margin, seen from dorsal side: Fig. 331, SAT-ASR seen obliquely from above: Fig. 332, apical transverse carina of SAT reached outer lateral part of ASR and behind the carina surface depressed along it, the structure in dorso-lateral view: Fig. 333, in lateral view: Fig. 334, in ventro-lateral view: Fig. 335, median carina of SAT extended anteriorly beyond transverse carina to IAA and highly keeled; clypeus: Fig. 336, disc broadly roundly elevated, with hairs comparatively thick, long but sparse, not convergent towards medial line even at base; occipital carina broadly expanded and behind buccal cavity curved backwards and depressed in middle. Measurements in Table 8. RC=C, sometimes somewhat close to B. Pronotum transverse, posterior part not discoloured, completely black, lamina on side: Fig. 337 (left side). Subalar area of mesopleuron normal; lateral carinae of propodeum weak, not reaching apex of segment, area dorsalis without lateral furrow, area apicalis complete, surface shining, without medial ke 1, GSR roundly raised, apical area brownish, not reflected. G1 clavate, but subflask-shaped.

Black, mandible except basal third ferruginous, palpi dark brown, apically paler, tibial spurs brownish white; hair on clypeus silvery.

♂. 6.5-8.5 mm. Similar in general to ♀. Clypeus: Fig. 339, hairs parallel, short, more abundant than in ♀ and mixed sparsely with long ones, Al3 seems to be somewhat different locally in relative length to basal width, in one specimen from Lisbon: Fig. 340, in two from Holland and from Austria: Fig. 341, but the material studied is too scanty, at any rate, in the former Al3=A9-12, while in the latter >A9-12, but <A8-12. Median furrow of frons somewhat deeper and broader than in ♀, but with bottom line shining, eye incision also broader, but here shallower than in ♀, sinus more broadly rounded and dorsal margin somewhat more strongly inclined outwards. SAT appears relatively somewhat longer than in ♀ (Fig. 338, lateral view, cf. Fig. 334). Occipital carina not so broadly expanded as in ♀ and not so curved backwards behind buccal cavity, but broadly disappeared there. Measurements: Table 8. Lamina on side of pronotum similar, but sometimes with apex more minutely rounded. Sternite 8: Fig. 342.



Figs. 331-345. *Trypoxylon attenuatum* Smith. 331-337, ♀; rest, ♂.

Table 8. Measurements of Trypoxylon attenuatum Smith

Loco	S	BL	HL	IODvA3(L/W)	A13(L/W)	P	IODs	ODOdPD	A4	A5	Ma	Mi	2(Ma)	3(Ma)	CVL	T:C	A.			
Port.	♂	7.0	56	38	11(1.3)	30(3.0)	100	7.0	4	4	5	10	12	25	15	48(33)	46(41)	4.0	5:4	105
Holl.	♂	6.5	54	37	11(1.5)	38(3.4)	98	7.0	3	4	5	10	10	28	17	55(38)	52(50)	4.0	5:4	100
Aust.	♂	7.0	58	39	11(1.2)	40(3.3)	100	7.0	2	2	3	10	10	28	16	52(36)	52(50)	4.0	5:4	110
Fr.	♀	9.7	56	34	17(2.5)	--(---)	100	8.5	3	4	5	9	8	30	14	52(40)	54(56)	4.5	5:4	100
Fr.	♀	8.3	56	35	17(2.6)	--(---)	100	7.5	3	4	5	9	8	28	14	52(38)	52(50)	4.2	5:4	110

Remarks. Abbreviation as in Table 1.

Loco: Port., Portugal. Holl., Holland. Aust., Austria. Fr., France.

HW:HL in frontal view in ♂ from top, 100:80, 100:82, 100:82; in ♀ 100:90 and 100:88.

RC from top... B-C, B, B-C; C-B and C-B.

apical sides provided with a short tooth, amber yellow in colour, fringe of hair not confined to apical margin and apical sides, but broadly on lateral margins. Genitalia in ventro-lateral view: Fig. 343, paramere deeply bifid at apex intonearly symmetric lobes, inner marginal area of main body expanded, lamellate, but expansion not marked, the margin near its base incrassate into an elongate swelling from which a tuft of very long hairs arising, volsella in ventral view: Fig. 344, apical part of penis valve in ventral view: Fig. 345, bearing well developed sickle-shaped appendages and distinct shoulder, but the shoulder is not roundly raised apically.

On TRYPOXYLON CLAVICERUM LEPELETIER et SERVILLE, 1828

Trypoxylon clavicerum Lepeletier et Serville, Encycl. Meth. Ins., X, p. 750, No. 1, 1828 (1825).

In connection with the East Asiatic races, T. c. exiguum and T. c. gussakovskiji I tried earlier in this paper (pp. 40-43) comparatively the explanation of the characters the European typical race of this species in fair detail. In the following will be given supplementally the illustrations of SAT-ASR and clypeus, and to show some of the variations in characters the measurements (Table 9) of the specimens in my collection.

Table 9. Measurements of Trypoxylon clavicerum Lep. et Serv.

Loco	S	BL	HL	IODvA3(L/W)	A13(L/W)	P	IODs	ODOdPD	A4A5	Ma	Mi	2(Ma)	3(Ma)	CVL	T:C	A.				
Pol.	♀	6.0	62	35	17(2.4)	--(---)	90	5.0	2	6	7	7	6	38	23	62(52)	56(69)	2.8	5:5	115
Pol.	♀	7.0	60	33	16(2.5)	--(---)	86	5.5	2	6	7	7	6	36	21	63(47)	62(64)	4.0	3:2	110
Pol.	♀	7.0	56	34	17(2.5)	--(---)	88	5.0	2	5	5	7	6	37	20	60(46)	64(62)	4.4	3:2	110
Pol.	♀	5.8	58	36	18(3.0)	--(---)	86	5.0	2	5	6	7	6	38	22	62(48)	56(64)	3.2	5:5	110
Holl.	♀	7.0	58	36	17(2.7)	--(---)	86	5.0	2	5	6	7	6	41	22	58(52)	53(66)	3.6	5:4	110
Holl.	♀	6.7	59	36	18(3.0)	--(---)	90	5.0	2	5	6	7	7	37	21	62(48)	62(68)	3.4	5:5	110
Pol.	♂	5.0	60	37	12(1.6)	24(2.0)	80	7.0	3	4	5	6	6	40	24	54(60)	51(75)	3.3	5:4	120
Pol.	♂	5.5	60	39	13(1.6)	25(1.9)	82	6.5	3	4	6	7	6	40	25	42(48)	40(69)	3.0	5:4	110
Holl.	♂	6.2	58	37	13(1.7)	25(1.8)	80	7.0	3	4	4	6	6	44	26	56(61)	50(72)	4.3	5:4	120
Holl.	♂	6.0	60	37	13(1.7)	24(1.8)	78	7.0	3	4	5	7	6	44	25	62(60)	58(74)	4.0	5:4	120
Belg.	♂	6.0	58	36	14(1.7)	24(1.8)	74	7.0	4	5	6	7	6	44	23	62(60)	60(78)	4.0	5:4	120
Pol.	♂	5.0	62	40	13(1.7)	25(1.8)	76	6.5	3	4	5	7	6	52	24	60(60)	63(72)	3.0	5:5	120

Remarks. Abbreviation same. Loco: Pol., Poland. Holl., Holland. Belg., Bergium.

HW:HL in frontal view in ♀ from top, 100:94, 90, 90, 92, 94, 94; in ♂, 100:86, 84, 84, 84, 86, 88.

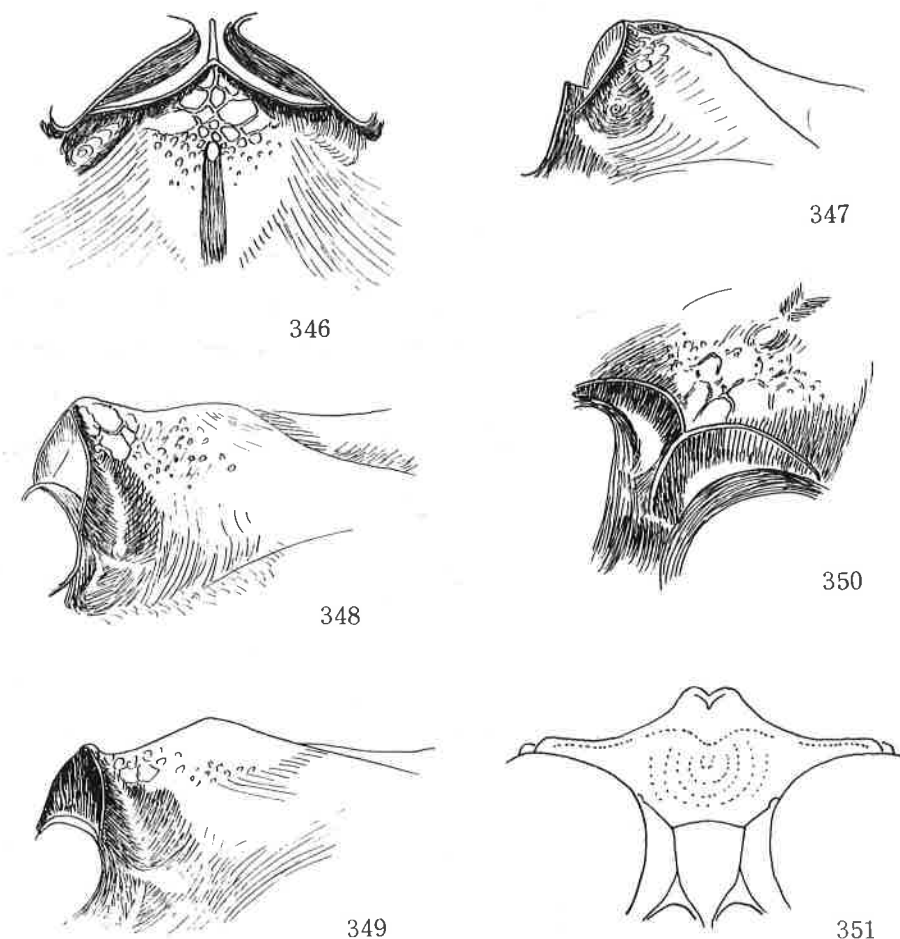
RC=C in all ♀ and ♂. Angle all at apex.

As to the values given in the above Table compare with those of the Asiatic subspecies (p. 42 and 43).

As to the figures shown in the following page compare with those of ssp. exiguum

given on p. 41.

SAT-ASR in vertical view with apex forward: Fig. 346, in oblique dorso-lateral view: Fig. 347, in dorso-lateral view: Fig. 348, in lateral view: Fig. 349 and in ventro-lateral view: Fig. 350. SAT with top area broadly flattened, without distinct and acute medial carina, apical margin transversely carinated and IAA medianly strongly keeled. Clypeus: Fig. 351.



Figs. 346-351. *Trypoxylon clavicerum* Lep. et Ser.

ON SOME OTHER SPECIES

T. scutatum Chevrier. See SPJHA, No. 7, pp. 63-66, 1978.

T. figulus (Linneus) and *T. medium* Beaumont. See pp. 15-20 of the present paper.

T. fronticorne Gussakovskij. Refer to pp. 18-20 of the present paper.

REFERENCES

- Ashmead, W. H. 1904. A new genus and some new species of Hymenoptera from the Philippine Islands. *Can. Entom.*, 36 (10): 281-285.
- Beaumont, J. de. 1945. Notes sur les Sphecidae de la Suisse. Première Série. *Mitt. Schweiz. Ent. Ges.*, 19: 467-481 (no fig.).
- Beaumont, J. de. 1963. Notes sur les Sphecidae (Hym.) de la Suisse. Deuxième Série. *Ibid.*, 36 (4): 289-302.
- Beaumont, J. de. 1964. Hymenoptera: Sphecidae. *Insecta Helvetica Fauna*, 3, ref. pp. 82-85.
- Blüthgen, P. 1951. Neues oder Wissenswertes über mitteleuropäischen Aculeaten und Goldwespen. II. *Bonner Zool. Beitr.*, 2: 229-234.
- Bohart, R. M. and A. S. Menke. 1976. Sphecoid Wasps of the World. A Generic Revision. Univ. Calif. Press, 695 pp.
- Gussakovskij, V. 1933. Verzeichnis der von Herrn Dr. R. Malaise im Ussuri und Kamtschatka gesammelten aculeaten Hymenopteren. *Ark. f. Zool.*, 24 A (10): 1-66.
- Gussakovskij, V. 1936. Les espèces paléarctiques du genre Trypoxylon Latr. (Hymenoptera, Sphecidae). *Trav. Inst. Zool. Akad. Sci. URSS*, 3: 639-667.
- Haneda, Y. 1960. A new locality of Trypoxylon pulawskii Tsuneki in Japan. *Life Study (Fukui)*, 4 (1): 13 (in Jap.).
- Haneda, Y. 1969. Sphecidae collected in the western montanic district of Yamanashi Prefecture. *Ibid.*, 13 (3-4): 68-70 (do.).
- Haneda, Y. 1970. Sphecidae collected in the northwestern district of Akita Prefecture. *Ibid.*, 14 (1): 12-13 (do.).
- Haneda, Y. 1971. Sphecidae collected in Formosa in 1970. *Ibid.*, 15 (1-2): 29-33 (do.).
- Haneda, Y. 1972. Sphecidae collected in Formosa in 1971. *Ibid.*, 15 (1-2): 1-7 (do.).
- Iida, T. 1968. Contribution from my cabinets to the knowledge of Japanese Hymenoptera. *Ibid.*, 12 (1-2): 3. (do.).
- Itami, H. 1968. Some Sphecidae collected at the foot of Mt. Iide, Yamagata Prefecture (Hym.). (do.). *Life Study*, 12 (1-2): 15-17.
- Itami, H. 1969. Sphecidae of Niigata Prefecture, Japan. *Ibid.*, 13 (3-4): 44-53 (do.).
- Itami, H. 1975. Hymenoptera and Orthoptera of Niigata Prefecture. *Rep. Env. Res. Lakes Fukushima and Hyoko* (do.).
- Kurokawa, H. and T. Murota. 1980. Contribution to the distribution knowledge of Sphecidae in Fukui Prefecture. *Hym. Comm.*, 12: 22-24 (do.).
- Masuda, H. 1931. Biology of Trypoxylon obsonator Smith. *Zool. Mag. (Tokyo)*, 43 (8): 517- (do.).
- Ma u da, H. 1943. Biology of Trypoxylon pygmaeum Gussakovskij. *Mushi (Fukuoka)*, 15: 1-15 (do.).
- Matsumura, S. 1911. *Thous. Ins. Jap., Suppl.*, 3 (do., with English descriptions).
- Matsumura, S. 1930. *Ill. Thous. Ins. Jap., Rev. Ed. (Tokyo)* (do.).
- Matsumura, S. and T. Uchida. 1926. Die Hymenopteren-Fauna von den Riukiu-Inseln. *Ins. Matsumurana (Sapporo)*, 1 (1): 32-52.
- Murota, T. 1973. Some aculeate Hymenoptera collected in the Amami-Group of the Ryukyus. *Life Study*, 17 (3-4): 100-102 (in Jap.).
- Murota, T. 1977. On Sphecidae and Chrysididae of Fukui Prefecture. *Hym. Comm.*, 5: 5-7 (do.).
- Murota, T. 1980. Some remarkable Sphecidae of Mt. Akausagi (or Akato), Fukui Prefecture. *Ibid.*, 12: 11-15 (do.).
- Nakamura, M. 1979. New localities of three species of Sphecidae. *Ibid.*, 9: 9 (do.).
- Nambu, T. 1966-67. Studies on the biology of eight species of Trypoxylon (Hym., Sphecidae) occurring in Japan, with some notes on their parasites. *Life Study (Fukui)*, 10 (1-4): 25-34, 1966; 11(1-2): 6-16, 1967 (in Jap. with Eng. summary).
- Nambu, T. 1968. Contribution from my cabinets to the knowledge of the Japanese Hymenoptera. *Life Study*, 12: 22 (in Jap.).
- Nambu, T. 1969. Trypoxylon species of Saitama Prefecture. *Saitama Seibutsu*, 9: 17-18 (do.).
- Nambu, T. 1971. Biology of Trypoxylon responsum hatogayuum Tsuneki in Saitama Prefecture, Japan (Hymenoptera, Sphecidae). *Life Study (Fukui)*, 15 (1-2): 1-7 (in Jap. w. Eng. summ.).
- Nambu, T. 1972. Biological observation on Trypoxylon nambui Tsuneki (Hym., Sphecidae) in Saitama Prefecture, Japan. *Ibid.*, 16 (1-2): 9-14 (do.).
- Nambu, T. 1972. The prey of Trypoxylon pacificum Guss. and T. varipes Pérez in Sai-

- tama Prefecture. *Atypus* (Ohsaka), 59: 6-8).
- Nambu, T. 1974. Result of the collecting trips made during the summer vacation of this year. *Hym. Comm.* (Mishima), 1: 1-2 (in Jap.).
- Nambu, T. 1978. Hymenoptera in Saitama Dōbutsu-shi. Board of Educ. Saitama Pref.
- Nambu, T. 1979. Memoranda on the biology of some hunting wasps (including *Trypoxylon* *figulus* *yezo*, *imayoshii* and *koikense*). *Memezū*, 3: 56-62 (mimeographic private publication).
- Pérez, J. 1905. Hyménoptères recueillis dans le Japon central, par M. Harmand, ministre plenipotentiaire de France à Tokio. *Bull. Mus. Paris*, 11: 23-39, 79-87, 148-158.
- Saussure, H. de. 1867. Hymenoptera. Familien der Vespiden, Sphegiden, Pompiliden, Crabroniden und Heterogynen. In "Reise der Oesterreichischen Fregatte Novara um die Erde, Novara-Expedition". *Zool. Teil. Bd. 2*: 1-156, 4 pls.
- Sickmann, 1894. Beiträge zur Kenntnis der Hemenopteren Fauna des nördlichen China. *Zool. Jahrb., Abt. Syst.*, 8 (2): 209-236.
- Smith, F. 1856. Catalogue of hymenopterous insects in the collection of the British Museum. Part IV. Sphecidae, Larridae, and Crabronidae. London, 497 pp. 6 pls.
- Smith, F. 1873. Descriptions of aculeate Hymenoptera of Japan, collected by Mr. George Lewis at Nagasaki and Hiogo. *Trans. Ent. Soc. London*, 1873: 181-206.
- Strand, E. 1922. H. Sauter's Formosa Ausbeute: Crabronidae und Scoliidae IV. (Die Gattungen *Trypoxylon*, *Bombus* und *Oxybelus*). *Intern. Ent. Zeits.*, 16 (18): 147-151, (19): 156-157, (20): 163-164, (21): 171-173, (23): 188-189.
- Suda, H. 1973. Sphecidae of Yamanashi Prefecture, Japan (I). *Life Study* (Fukui), 17 (3-4): 121-124 (in Jap.).
- Suda, H. 1978. *Idem* (II). *Hym. Comm.* (Mishima), 8: 1-15 (in Jap.).
- Tano, T. 1968. Contribution from my cabinet to the knowledge of the Sphecidae in Japan. *Life Study*, 12 (1-2): 32-36 (do.).
- Tano, T. 1973. A nest of *Trypoxylon nipponicum* Tsuneki. *Ibid.*, 17 (3-4): 77-78 (do.).
- Tsuneki, K. 1956. Die Trypoxylonen der nordöstrichen Gebiete Asiens (Hymenoptera, Sphecidae, Trypoxylinae). *Mem. Fac. Lib. Arts, Fukui Univ., Ser. II. Nat. Sci.* 6 (1): 1-42, 25 textfigs. 4 pls.
- Tsuneki, K. 1958. Eine neue Art von *Trypoxylon* aus Japan (Hymenoptera, Sphecidae). *Akitu*, 7 (1): 7-8.
- Tsuneki, K. 1958. Das Männchen von *Trypoxylon shimoyamai* Tsuneki (Hymenoptera, Sphecidae). *Akitu* (Kyoto), 7 (3): 53-54.
- Tsuneki, K. 1958. On some remarkable Sphecidae collected in City Toyama. *Ibid.*, 7 (3): 54 (in Jap.).
- Tsuneki, K. 1964. On some aculeate Hymenoptera of Japan. *Etizenia* (Fukui), 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. 1966. New species of the genus *Trypoxylon* and *Oxybelus* in Japan, with some biological notes (Hym., Sphecidae). *Ibid.*, 16: 1-8.
- Tsuneki, K. 1966. Notes on some Chrysididae and Sphecidae in the collection of the Osaka Museum of Natural History, with description of three new species (Hymenoptera). *Bull. Osaka Mus. Nat. Hist.*, 19: 19-28.
- Tsuneki, K. 1967. Studies on the Formosan Sphecidae. II. The subfamily Trypoxylinae (Hymenoptera). *Etizenia* (Fukui), 22: 1-21.
- Tsuneki, K. 1967. Some Sphecidae from Mt. Hyōnosen, Western Japan. *Life Study*, 11 (3-4): 44 (in Jap.).
- Tsuneki, K. 1968. Descriptions and records of some fossorial wasps in Japan (Hymenoptera, Sphecidae). *Etizenia* (Fukui), 27: 1-8.
- Tsuneki, K. 1968. Some Hymenoptera from Quelpart Island, South Korea. *Life Study*, 12 (3-4): 49-54.
- Tsuneki, K. 1969. Chrysididae and Sphecidae in the collection of the Osaka Museum of Natural History. *Ibid.*, 13 (1-2): 23-28.
- Tsuneki, K. 1969. The Taichodzi Temple - An ecological reliot in the City of Fukui. *Ibid.*, 13 (3-4): 58-62 (in Jap.).
- Tsuneki, K. 1970. Some fossorial wasps of Central Japan sent by Dr. J. Minamikawa. *Ibid.*, 14 (1): 9-11.
- Tsuneki, K. 1970. Sphecidae in the valley of Arashi, Fukui Prefecture. *Life Study*, 14 (2): 40 (in Jap.).
- Tsuneki, K. 1970. Cocoon spinning behaviour of *Trypoxylon malaisei* Gussakovskij. *Ibid.*, 14 (3-4): 64 (do.).
- Tsuneki, K. 1970. Gleaning on the bionomics of the East Asiatic non-social wasps

- (Hymenoptera). VI. Some species of Trypoxyloninae. *Etizenia* (Fukui), 45: 1-20.
- Tsuneki, K. 1971. Eine neue Art von *Trypoxylon* aus Kinkadzan, Japan. *Life Study* (Fukui), 15 (1-2): 16-18.
- Tsuneki, K. 1973. A guide to the study of the Japanese Hymenoptera (31). The genus *Trypoxylon* Latreille. *Ibid.*, 17 (1-2): 31-38 (keyed, in Jap.).
- Tsuneki, K. 1973. *Trypoxylon gracilescens* F. Smith, an addition to the Japanese Fauna. *Ibid.*, 17 (3-4): 54 (in Jap.).
- Tsuneki, K. 1973. *Trypoxylon sapporoense* Tsuneki, ♀, found in Fukui Prefecture. *Ibid.*, 17 (3-4): 113 (do.).
- Tsuneki, K. 1973. Prey of *Trypoxylon malaisei*, *nipponicum*, *frigidum cornutum*, *clavicerum exiguum* and *koikense*. *Ibid.*, 17 (3-4): 150 (do.).
- Tsuneki, K. 1974. Sphecidae (Hymenoptera) from Korea. *Ann. Hist.-Nat. Mus. Natn. Hung.*, 66: 359-387.
- Tsuneki, K. 1976. A fourth contribution to the knowledge of Sphecidae (Hymenoptera) of Manchuria, with remarks on some species of the adjacent regions. *Kontyu* (Tokyo), 44 (3): 288-310.
- Tsuneki, K. 1978. Studies on the genus *Trypoxylon* Latreille of the Oriental and Australian Regions (Hymenoptera, Sphecidae). I. Group of *Trypoxylon scutatum* Chevrier, 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 South-East 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.*, 11: 1-68.
- Tsuneki, K. 1979. Sphecidae and Chrysididae collected by K. Baba in the northern part of Japan Proper and Hokkaido, with description of two new species. *Insect of Niigata Prefecture*, special publication of Essa Konchū Dōkōkai, 50: 9-14.
- Tsuneki, K. 1980. Studies on the genus *Trypoxylon* Latreille of the Oriental and Australian Regions (Hymenoptera, Sphecidae). VI. Species from Borneo, Celebes and Moluccas. *Ibid.*, 12: 1-118.
- Tsuneki, K. *Idem*. VII. Species from the Philippines. *Ibid.*, 13: 1-130.
- Tsuneki, K. *Idem*. VIII. Species from New Guinea and South Pacific Islands. *Ibid.*, 14: 1-98.
- Tsuneki, K. *Idem*. IX. Species from Australia. *Ibid.*, 14: 99-106.
- Tsuneki, K. *Idem*. X. Revision of the Formosan species. *Ibid.*, 15: 1-56 (including the species from the Ryukyus).
- Tsuneki, K. *Idem*. XI. Additional species from various parts of the Regions, with an appendix on some species from other Regions. *Ibid.*, 16: 1-90.
- Valkeila, E. 1961. Beiträge zur Kenntnis der nordeuropäischen Raubwespen (Hym., Sphecidae). *Ann. Ent. Fenn.*, 27: 141-146.
- Wolf, H. 1959. Ueber einige westdeutsche Bienen und Grabwespen (Hym., Sphecoidea). *Mitt. Deuts. Ent. Ges.*, 18 (1): 11-16.
- Yano, M. 1932. Hymenoptera in *Iconographia Insectorum Japonicorum*, Ed. I. Tokyo.
- Yasumatsu, K. 1929. Observation on the habits of *Trypoxylon obsonator* Smith. *Kontyu*, 3: 107-120 (in Jap.).
- Yasumatsu, K. 1938. Two species of the genus *Trypoxylon* new to Japan. *Zool. Mag.* (Tokyo), 50: 451-455 (in Jap.).
- Yasumatsu, K. 1939. Hymenoptera in *Iconographia Insectorum Japonicorum Illustratio Iconographica* etc. Tokyo.
- Yasumatsu, K. 1950. Hymenoptera in *Iconographia Insectorum Japonicorum*, Ed. II. Tokyo.

Addendum:

- Ishikawa, R. 1965. Sphecidae in *Iconographia Insectorum Japonicorum Colori Naturali* Edita. III. Tokyo.

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. 8)
AW ... Apical width or Width at apex (always maximum width, in case of A3 very frequently in lateral view.
BW ... Basal width or Width at base (always maximum width near base).
CV1, CV2 ... Abscissa 1 of cubital vein, Abscissa 2 of cubital vein ... (see p. 8)
G1, G2 ... Gastral segment 1, Gastral segment 2 ...
GSR ... Gastral socket rim, really the dorsal rim of socket of lifting muscle of gastrer (sometimes simple and not raised, but frequently highly, roundly or subtriangularly raised).
HL ... Head length at inner orbit in dorsal view (not in middle where particularly longer due to SAT).
HW ... Head width in dorsal view (always maximum width).
IAA ... Interantennal area.
IAF ... Interantennal furrow.
IOD ... Interocular distance or distance between eyes.
IODE ... Minimum IOD at about base of clypeus (frontal view).
IODv ... Minimum IOD at vertex (dorsal view).
IODs ... Ratio of IODv to IODE, usually shown by IODv as 10.
L/W ... Ratio of length to width.
Ma ... Maximum width (in case of gastral petiole dorsal view).
Mi ... Minimum width (ditto, usually just behind basal condyle, but sometimes in front of apical swelling).
2(Ma), 3(Ma) ... Length of G2 (Maximum width of G2), ditto of G3.
OOD (or OD) ... Ocellular distance, namely the distance between inner margin of compound eye and outer margin of hind ocellus.
Od ... Ocellar diameter (transversely measured).
P ... Petiole = G1
PAF ... Post antennal furrow, transverse or oblique furrow between ASR and SAT. (see p. 8)
PD ... Puncture diameter.
PIS ... Puncture interspace.
POD ... Postocellar distance, distance between inner margins of hind ocelli.
RC ... Radial cell of fore wing (see p. 89).
RI ... Apical produced part of R1 beyond the meeting point with Rs, often very long.
SAT ... Supraantennal tubercle, nasiform or tuberiform, characteristic to species.
TCV ... Transverse cubital vein (see p. 89).
T1, T2 ... Tarsal joint 1, tarsal joint 2 ...
W:L ... Ratio of Width to Length.

FORMULAE

Formulae always show the relative length.

- HW, HL, IODv, A3, 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.

I N D E X

<u>amamiense</u> Tsuneki (ssp.).....	81	<u>nasutum</u> Tsuneki (ssp.)	70 38
<u>ambiguum</u> Tsuneki	56	<u>nipponicum</u> Tsuneki	73 70
<u>attenuatum</u> Smith	84	<u>nipponicum puliense</u> Tsuneki	38 73
<u>chichidzimaense</u> Tsuneki	82	<u>obsonator</u> Smith (syn.)	63
<u>chongar</u> Tsuneki (ssp.)	22	<u>okinawanum</u> Tsuneki	38
<u>clavicerum</u> Lep. et Serv.	86	<u>pacificum</u> Gussakovskij	45
<u>clavicerum exiguum</u> Tsuneki	40	<u>pappi</u> Tsuneki (syn.)	9
<u>clavicerum gussakovskiji</u> Tsuneki .	42	<u>petiolatum</u> Smith	63
<u>cornutum</u> Gussakovskij (ssp.)	22	<u>petiolatum obsonator</u> Smith (syn.) ...	63
<u>dubiosum</u> Tsuneki (ssp.)	9	<u>petioloides isigakiense</u> Tsuneki	70
<u>errans</u> Saussure	59	<u>pulawskii</u> Tsuneki (syn.)	59
<u>exiguum</u> Tsuneki (ssp.)	40	<u>puliense</u> Tsuneki (ssp.)	70
<u>figulus</u> Linneus	15, 19	<u>regium</u> Gussakovskij	77
<u>figulus koma</u> Tsuneki	20	<u>regium ryukyuense</u> Tsuneki (non ssp.).	80
<u>figulus yezo</u> Tsuneki	21	<u>regium hatogayuum</u> Tsuneki	77
<u>formosicola amamiense</u> Tsuneki	81	<u>responsum</u> Nurse (syn.)	77, 80
<u>formosicola inornatum</u> M. et U. ..	81	<u>ryukyuense</u> Tsuneki	80
<u>frigidum chongar</u> Tsuneki (syn.) ..	22	<u>saitamaense</u> Tsuneki (aberratio)	73
<u>frigidum cornutum</u> Gussakovskij ...	22	<u>sapporoense</u> Tsuneki	9
<u>fronticorne japonense</u> Tsuneki	28	<u>schmiedeknechti</u> Kohl	9
<u>fronticorne seulense</u> ssp. nov. ..	30	<u>scutatum</u> Chevrier	87
<u>gussakovskiji</u> Tsuneki (ssp.)	42	<u>seulense</u> Tsuneki (ssp.)	30
<u>hatogayuum</u> Tsuneki (ssp.)	77	<u>subpileatum</u> Strand (syn.)	9
<u>imayoshii</u> Yasumatsu	53	<u>takasago kumaso</u> Tsuneki	82
<u>inornatum</u> M. et U. (ssp.)	81	<u>thaianum dubiosum</u> Tsuneki	9
<u>iriomotense</u> Tsuneki	9	<u>tricolor</u> Sickmann (syn.)	63
<u>isigakiense</u> Tsuneki (ssp.)	70	<u>trochanteratum</u> Cameron	50
<u>japonense</u> Tsuneki (ssp.)	28	<u>varipes</u> Pérez	36
<u>kinkadzanense</u> Tsuneki (syn.)	32	<u>varipes nasutum</u> Tsuneki	38
<u>kodamanum</u> Tsuneki	34	<u>yamatonis</u> Tsuneki ssp. nov.	23
<u>koikense</u> Tsuneki	43	<u>yezo</u> Tsuneki (ssp.)	20
<u>koma</u> Tsuneki (ssp.)	20		
<u>konosuense</u> Tsuneki	61	<u>ehosense</u>	13
<u>koreanum</u> Tsuneki	38	<u>shimoyamense</u>	30
<u>kumaso</u> Tsuneki (ssp.)	82		
<u>kyotoense</u> Tsuneki	75		
<u>malaisei</u> Gussakovskij	73		
<u>malaisei arakanum</u> Tsuneki	73		
<u>medium</u> Beaumont (non ssp.)	19		
<u>monticola</u> Tsuneki	51		
<u>murotai</u> Tsuneki (syn.)	70		
<u>nambui</u> Tsuneki	32		

ERRATA to SPJHA, No. 17.

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

- p. 1 To be added to Synopsis:
T. figulus f. medium Beaumont → T. medium Beaumont
- p. 2, l. 5 f.b. conclusion → conclusion
- p. 17, l. 6 it is A10-12 and A9-12 → >A10-12 and <A9-12
- p. 18 bottom line 33-44 → 43-44
- p. 19, l. 32 broaght → brought
- p. 21, l. 13 A13 A10-12, but A9-12 → A13 > A10-12, but < A9-12
- p. 43, l. 21 f.b. sha ed → shaped
- p. 46, l. 3 f.b. A3=AW 3 → A3=AW × 3
- p. 47, Figs. 194-195 ... 194, ♀; 195, ♂ →
→ Figs. 193-194 ... 193, ♀; 194, ♂
- p. 48, l. 2 CV1=CV2 4.0-4.5 → CV1=CV2 × 4.0-4.5
- p. 51, l. 24 dorsal lobe much broader → dorsal lobe not much broader
- p. 53, l. 20 virable → variable
- p. 59, l. 3 f.b. AW 2.5 → AW × 2.5
- p. 80, l. 1 28 → 29
- p. 84, l. 11 f.b. ke l → keel
- l. 18 cly eus → clypeus
- p. 92 To be added to the list:
chosenense 13
shimoyamai 30

0 32
3 70
8 73
3
8
5
9
3
3
0
9
0
7
0
7
0
0
3
9
9
7
0
9
2
9
3
6
8
3
0
3

SPECIAL PUBLICATIONS OF
THE JAPAN HYMENOPTERISTS ASSOCIATION

NO. 17

Published on August 20, 1981

Price Y. 2800. 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.