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TAXONOMIC NOTES ON *TRYPOXYLON* OF FORMOSA AND THE RYUKYUS WITH DESCRIPTIONS OF NEW SPECIES AND SUBSPECIES (HYMENOPTERA, SPHECIDAE)

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TAXONOMIC NOTES ON *TRYPOXYLON* OF FORMOSA AND THE RYUKYUS WITH DESCRIPTIONS OF NEW SPECIES AND SUBSPECIES (HYMENOPTERA, SPHECIDAE)[1]

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Recently I had an opportunity of studying the specimens of Fossorial wasps of the Ryukyu Islands sent by Bernice P. Bishop Museum, Honolulu[2], and Entomological Laboratory, Kyushu University, Fukuoka[3]. The material of Kyushu University comprised the specimens from Formosa which were collected in the main by Professor T. Shirôzu, the eminent Lepidopterist, during his recent journey to the area. Among the specimens from the two sources were included a considerable number of the wasps belonging to the genus *Trypoxylon* Latreille, some of which were of use to solve some of the questions that I had presented in my previous paper (1964) and some requested to emend the error committed by me on account of the insufficiency of the material. Further, some of the Formosan examples could afford informations concerning the species that were quite incompletely described by E. Strand (1922) based on the well-known Sauter's collection, or could complete his species by adding the other sex that was unknown to him,

As the specimens from the two regions comprise forms that are mutually closely related, sometimes including species distributed in two regions as separate subspecies, it seems more convenient to put them together in one paper than to deal with them separately according to the region or derivation of the specimens. Further, in order to make abundant the material as far as possible I added specimens from my own collection and revised them with the new specimens.

Before proceeding further I express my deepest thanks to the curators of the collections above mentioned for giving me the chance of investingation of these interesting specimens. I also wish to regard with respect the gentlemen who collected the valuable specimens under the severe climatic conditions.

KEY TO THE SPECIES

♀ ♀

1 First abdominal segment long, petiolated, more than 4 times (very rarely 3.7 times) as long as wide at (the widest portion slightly before) apex 2
– First abdominal segment not so long, gradually widening posteriorly, less than 3.5 times as long as wide at apex 11
2 Front with shield-shaped enclosure (body wholly black) 3
– Front without shield-shaped enclosure 5
3 Frontal shield very shallow, on lower portion level with the surrounding areas, only marked off by the carinae (lateral branch-carina directing eye-incision distinctly bent in middle, another carina or elevated line branched off in the opposite direction towards the median line of the shield, not reaching there, OOD:POD=1:2, interocular distance at

1) *Contribution No. 92 from the Biological Laboratory, Fukui University, Japan.*
2) A part of the specimens are based on "Japan-U.S. Co-operative Science Program: Zoogeography and Ecology of Pacific Area Insects.
3) All the specimens are based on the above described Program.

vertex and at clypeus subequal, antennal joint-3 4-times as long as wide at apex, abdominal petiole 2.5-times as long as the following segment, tibial spurs yellow), length 10–11 mm, Formosa. ***T. taiwanense* Strand, 1922**

– Frontal shield deeply impressed and inclined towards the median line 4

4 Abdominal segment-1 2.5-times as long as segment 2, frontal shied : Fig. 1, with lateral angles about middle of its length, length 9–12 mm, Formosa.

***T. subpileatum* Strand, 1922**

– Abdominal segment 1 slightly less than twice as long as segment 2, frontal shield : Fig. 2, with lateral angles distincily below middle of its length, length 8.5–12.3 mm, the Ryukyus. ***T. dubiosum* Tsuneki, 1964**

5 Area cordata on propodeum distinctly marked off by the furrow (body wholly black, radial cell of fore wing reaching near the apical margin, clypeus with a medial protuberance on apical margin, antennal sockets with upper margins connected by a transverse carina, with the orifice directing latero-anteriorly (obliquely downwards)) 6

– Area cordata not or very shallowly indistinctly marked off by the feeble furrow 7

6 Antennal joints comparatively slightly shorter, joint-3 3.7-times, joint-10 1.4-times as long as wide at apex, clypeus longitudinally raised in middle (carina connecting upper margins of antennal sockets extended into an overhang, with a triangular incision in middle), length 13–14 mm, Formosa. ***T. formosicola* Strand 1922**

– Antennal joint-3 4-times, joint-10 1.7 times as long as wide at apex, clypeus basally roundly raised, without madial longitudinal elevation (carina connecting upper margins of antennal sockets not so developed), length 12.5–15.0 mm, the Ryukyus.

***T. inornatum* Matsumura 1926**

7 Abdominal segments from apical portion of petiole to apex yellowish red, front and mid legs largely ferruginous (anterior margin of clypeus broadly, mandibles, palpi, antennae at base and beneath, tegulae, hind legs partly ferruginous or yellow, frontal medial furrow deep, on both its sides the surface markedly roundly raised, supra-antennal elevation nearly nose-form, with a glittering carina on top, OOD:POD=2:3, ratio of interocular distance at vertex and at clypeus approximately 3:2, antennal joint-3 5.5-times as long as wide at apex), length 13.5 mm, India, Celebes and Formosa.

***T. gracilescens* Smith, 186)**

– Abdomen and the anterior four legs not so broadly ferruginous or yellowish red 8

8 Antennae beneath largely and legs in part ferruginous or yellowish (OOD:POD within 1:2～2:3, ratio of interocular distance at vertex and at clypeus approximately 3:2, radial cell of fore wing not reaching near the apical margin, abdomen with a broad reddish yellow band), length 12.0–17.0 mm, from India to Japan. ***T. obsonator* Smith, 1873**
(= *T. hyperorientale* Strand)

– Antennae wholly black 9

9 Petiole of abdomen very slender, almost without the apical swelling, abdomen beneath wholly or partly reddish yellow (OOD less than half as wide as postocellus, abdominal segment 1 as long as 3 following segments united), length 13.0–16.0 mm, Formosa.

***T. melanocorne* Strand 1922**

– Petiole of abdomen distinctly enlarged on apical portion (body wholly black) 10

10 Antennal joints comparatively short, joint 3 only slightly more than thrice as long as wide at apex, carina on top of supra-antennal tubercle short, only 1/3 the length to anterior ocellus, lateral feeble grooves of area cordata almost smooth, not crenate, length 12.5 mm,

Formosa. ***T. takasago* sp. nov.**

– Antennal joints comparatively long, joint 3 about 4.5 times as long as wide at apex, carina on top of supra-antennal tubercle long, about half the distance to anterior ocellus, lateral feeble furrows of area cordata distinctly crenate, length 13.0–16.0 mm, the Ryukyus. ***T. ryukyuense* sp. nov.**

11 Ratio of interocular distance at vertex and at clypeus more than 2:1, legs black, at most partly brownish, supra-antennal elevation nose-form, markedly high (anterior margin of clypeus bluntly quadridentate, area cordata obliquely rugoso-striate, body wholly black), length 7.5 mm, Formosa. ***T. shirozui* sp. nov.**

– Ratio of interocular distance at vertex and at clypeus approximately 3:1, anterior four legs largely yellowish white, length 7–9 mm, ····· ***T. koshunicon* Strand, 1922** ····· 12

12 Head seen in front subquadrate, nearly as long as wide (Fig. 29) (frontal incrassation lower, with punctures smaller and sparser, legs with brownish area slightly more broadly extended than in the following subspecies), length 7.5 mm, Formosa. ***T. koshunicon koshunicon* Strand, 1922**

– Head seen in front rounded, wider than long (Fig. 30) (compared characters otherwise), length 7.5–8.5 mm, the Ryukyus. ***T. koshunicon okinawanum* subsp. nov.**

♂ ♂

(The males of *taiwanense, takasago, ryukyuense, shirozui, koshunicon okinawanum* remain unknown. In the known species also information is quite incomplete.)

1 First abdominal segment long, petiolated, more than 4 times (rarely 3.7 times) as long as wide at apex ····· 2

– First abdominal segment comparatively short, gradually enlarging posteriorly, less than 3.5 times as long as wide at apex ····· None

2 Frontal shield present (the key in ♀♀ can probably be applied to the subsequent division)

– Frontal shield absent ····· 3

3 Area cordata enclosed by distinct furrows ····· 4

– Area cordata very indistinctly or very weakly enclosed by feeble furrows ····· 5

4 Ultimate antennal joint amply as long as two preceding joints united, length 9.0–10.0 mm. ***T. formosicola* Strand, 1922**

– Ultimate antennal joint as long as three preceding joints united, length 10.0 mm. ***T. inornatum* Matsumura, 1926**

5 Abdomen extensively yellowish red, front and mid legs largely ferruginous. ***T. gracilescens* Smith, 1860**

– Abdomen and legs not so broadly reddish yellow ····· 6

6 Front and mid legs partly ferruginous (ultimate antennal joint slightly bent and as long as three preceding joints united) ***T. obsonator* Smith, 1873**
(= *T. hyperorientale* Strand)

– Leys wholly or nearly wholly black ····· 7

7 Abdomen wholly black, front tibiae at base in front very feebly browish, length 9.5 mm, Okinawa. ***T. kumaso* sp. nov.**

– Abdomen with middle portion beneath and laterally reddish, legs wholly black, Formosa. ***T. melanocorne* Strand, 1922**

NOTES AND/OR DESCRIPTION OF EACH SPECIES

1. *Trypoxylon subpileatum* Strand, *1922*

Trypoxylon pileatum subpileatum Strand, Internat. Ent. Zeitschr., 16 (19) : 163, 1922.

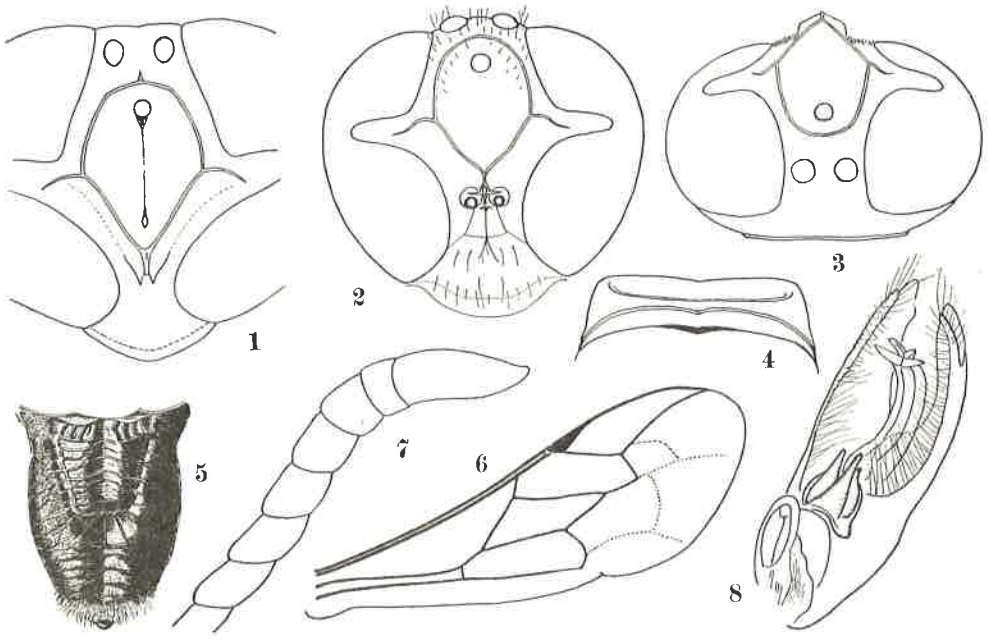
As to *T. pileatum* Smith no detailed explanation (especially with figures) concerning the character of the frontal shield has been made and the character is, from the present day taxonomy, indispensable to distinguish species among the shield-bearing group of the genus. Strand attempted comparison of his specimens with the incomplete descriptions of the previous authors. Therefore, in reality, it is the same as that almost no comparison was made. In other words the number of the species in the shield-bearing group far surpasses his presumation. Hence, the Formosan specimens are considered rather better to be dealt with as a separate species, leaving a query as to the affinity with the Indian species.

It is regretted that in his descriptions, at least in his 1922 paper, he was so ardent to compare the characters of his species with the quite incomplte and superficial descriptions of the previous authors that he very frequently neglected to give his own observations on the more important distinctions. The description of *subpileatum* is also the case. I therefore have some doubt as to whether the specimens before me truly represent this species or not. But the identity of the locality of the specimens and the consistency of some characters alluded to by him led me to identify the speimens as such. In the following the descriptions of the specimens will be given in some detail in order to supply the future investigators the further characters of the species. To me it is regret, however, that the male specimen is lacking in the collection.

♀. Length of the examples before me 10–11 mm (in the original description 9–12 mm). Nearly wholly black, mesonotum with feeble bronzy lustre, not glossy. Mandidibles apically brownish (in one specimen wholly reddish brown except base), mouth parts and palpi largely ferruginous, all tibial spurs pale yellow, all tarsal joints apically brownish (in one specimen rather ferruginous). wing veins black, posteriorly brownish. OOD:POD = 1:3, space between postocelli raised in middle from posterior margin of frontal shield, the shield seen perpendicularly: Fig. 1, deeply hollowed and inclined toward the median line, lateral carina running into the eye incision gently curved upwards or very obtusely bent in middle, its branching point located about middle of the length of the shield, ratio of interocular distance at vertex and at clypeus 15:11 (approximately 3 : 2), clypeus broadly roundly produced anteriorly, the surface without the medial elevation, apical bevel broad; antennal joint 3 slightly less than thrice as long as wide at apex, ultimate joint approximately twice as long as wide at base and slighly less than as long as two preceding joints united. Transverse furrow across middle of pronotum very deep, without elevation nor posterior protuberance in middle of the anterior portion, posterior portion completely discoloured, ambur-like; on mesonotum prescutal suture almost invisible and median scutal lines represented by glittering, posteriorly slightly divergent lines, parapsidal suture also in a glittering line, short, about 1/5 the length of the scutum, postscutellum lunate in form, approximately 1/3 as long as scutellum. On propodeum area dorsalis cordate in form, shorter than the rest (= posterior inclination) of the segment, not marginated by the furrows, but well-defined by the total elevation of the area, the area medially broadly shallowly impressed, stigmatal carinae distinct, without the accompanying furrow, posterior inclination just posterior to area dorsalis deeply roundly excavated, from the excavation a narrow groove runs to the apex of the segment (in one specimen the groove slightly broader). Abdominal segment 1 petiolated, but comparatively short, only 5 times as long as wide at apex and approximately as long as two following segments combined, with stigmata situated slightly before third from base and the segment

gradually enlarging from about middle of its length, Legs normal. In fore wing radial cell ending far before apical margin, vestigial 2nd cubital cell markedly narrowed upwards, with the upper abscissa about 3/5 of the lower and 2nd transverse cubital vein gently curved externally (Fig. 20, F).

Frontal shield microscopically finely coriaceous, with scattered fine hair points, half mat, medial region only shining; vertex half mat, coriaceons sculpture finer than on shield, only observable under 60 times enlargement, with sparse fine hair-bearing punctures along the upper carina of the frontal shield and on the space between postocelli. Mesonotum, scutellum, mesopleuron sparsely scattered with hair-bearing punctures, punctures not large but distinct, intervals generally 2–3 times as large as the width of punctures; propodeum wholly transversely very coarsely and strongly striate, at base obliquely so, intervals of the striae with fine rugae, especially markedly so on posterior inclination, sides of the segment obliquely finely closely striate,



Figs. 1–8. **1**, *T. subpiliatum* Strand, frontal shield. **2–8**, *dubiosum* Tsuneki. 2 and 3, head. 4, pronotum. 5, propodeum. 6, venation of fore wing. 7, male antenna. 8, male genitalia.

striae posteriorly coarse and anteriorly and centrally obsolete, central area with a few very minute hair points. Abdomen covered with very minute hair points.

Silvery hairs on clypeus, sides of front, on other portions of body normal and distinct.

Specimens examined: 1 ♀, Toyen-Hsien (Shinpa), Formosa, 14. VIII. 1965, B. S. Chang leg.; 1 ♀, Pientung-Hsien (Szuchunghsi), Formosa, 4. IV. 1965, Y. Hirashima leg.

Remarks. This species differs from the common Ryukyu species, *T. dubiosum* Tsuneki, not only in the form and structure of the frontal shield, but also in the following points:

(1) Abdominal segment 1 relatively much longer, in *dubiosum* 4 times as long as wide at apex.

(2) Interocular distance at clypeus distinctly narrower than at vertex (ratio 2 : 3), in *dubiosum* subequal (ratio 13:15).

(3) Vestigial 2nd cubital cell of fore wing differently formed, in *dubiosum* upper abscissa is about 1/3 the length of the lower abscissa, in this species the ratio about 2:3; 2nd transverse cubital vein in *dubiosum* gently roundly curved, in this species rather medianly bent, with the angle rounded (Fig. 20, F).

(4) Silvery hairs on clypeus, sides of front apparently thicker, denser and more appressed, always glittering from every direction, in *dubiosum* seen perpendicularly with the clypeal margin toward the light the pilosity loses glittering and the surface comes well visible.

2. *Trypoxylon dubiosum* Tsuneki, 1964

Trypoxylon dubiosum Tsuneki, Etizenia (Occ. publ. Biol. Lab. Fukui Univ.) 6 : 4, 1964.

At the time when this species was described I had some doubt whether this was truly separable from *subpileatum* Str. known from the adjacent region, since the description was quite incomplete. But the direct comparison of the specimens revealed that they belong without doubt to a different species respectively (see remarks to *T. subpileatnm*). Here I only reproduced the figures of some characters of this species (Figs. 2-8).

On the other hand, this species is rather closer to *T. thaianum* Tsuneki, 1961, than to *subpileatum*. Especially in the structure of the frontal shield both species are very similar to each other. However, the two species are strikingly different in the structure of the pronotum and the 1st abdominal segment. In *thaianum* pronotum anteriorly broadly roundly emarginate and the emargination reaches the transverse furrow across middle and the abdominal petiole relatively longer and more suddenly incrassate on the apical portion.

This species is common and abundant on the Island of Amami-Ohshima.

3. *Trypoxylon taiwanense* Strand, 1923

Trypoxylon taiwanense Strand, Internat. Ent. Zeitschr., 16 (23) : 187, 1923.

This species was described with three female specimens collected in Anping and Tainan. It is very characteristic in having the frontal shield not deeply excavated.

Among the specimens investgated here no example of this species could be discovered.

4. *Trypoxylon formosicola* Strand, 1922

Trypoxylon formosicola Strand, Internat. Ent. Zeitschr., 16 (18) : 148, 1922.

This species is very close to the subsequent species and had there not been the description "das Apicalglied der Antenne beim ♂ reichlich so lang wie die beiden vorhergehenden Glider zusammen ist" I should show no hesitation to place them within the category of the same species. But, the difference in the structure of the antenna is considered decisive. In *inornatum* the apical joint of the antenna in the male is as long as three preceding joints taken together.

In the female also the detailed comparison could reveal the following differences between them:

(1) In *formosicola* antennal joints relatively slightly shorter, joini-3 3.7-times, joint-10 1.4-times as long as wide at each apex, in *inornatum* they are respectively 4 times and 1.7 times as long as wide.

(2) The carina connecting upper margins of antennal sockets extended anteriorly into an overhang. with a triangular incision in middle (Fig. 9), in *inornatum* the connecting carina not so strongly extended (Fig. 12).

(3) Clypeus longitudinally bluntly raised in middle, while in *inornatum* basally somewhat roundly raised. not medially longitudinally raised.

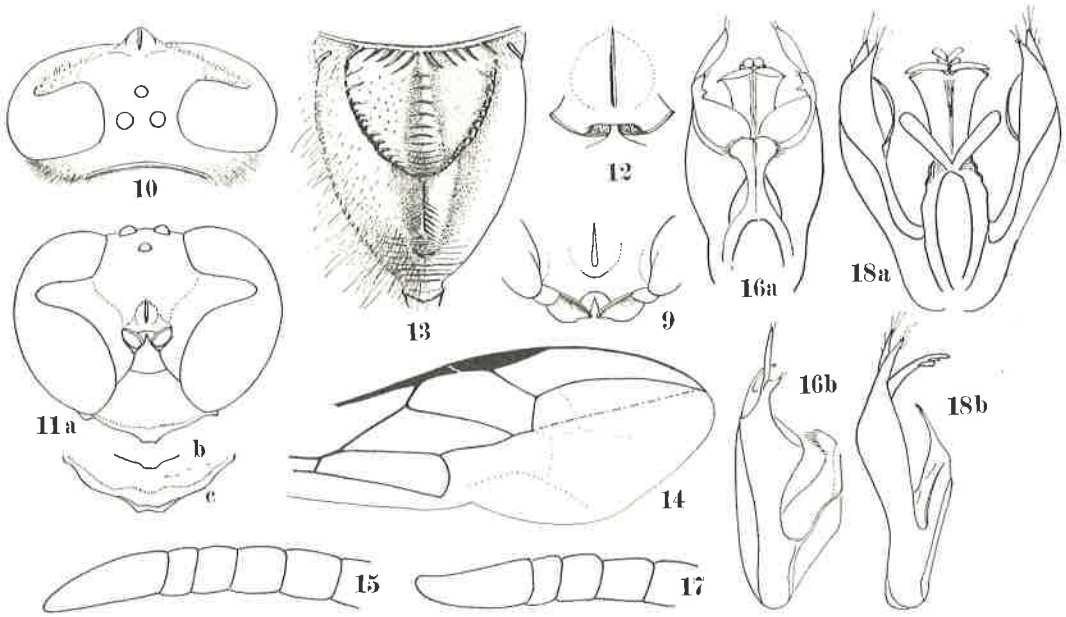
Specimen examined: 1 ♀, Pingtung Hsien (Kenting), 4. IV. 1965, T. Saigusa leg.

5. *Trypoxylon inornatum* Matsumura, 1926

Trypoxylon inornatum Matsumura, Ins. Mats., 1 (1) : 42, 1926 (♀).
Trypoxylon formosicola: Yasumatsu, Trans. Nat. Hist. Soc. Formosa, 28 (183) : 447, 1938 (♀).
Trypoxylon amamiense Tsuneki, Etizenia, 6 : 2, 1964 (♀♂). (SYNONYM NOV.)

The description of *T. inornatum* is also superficial and incomplete. Therefore, when I dealt with the specimens of Amami-Ohshima I could not have conviction to identify them with this species. It led me to describe a new species, *amamiense*, to receive them, leaving the solution of the problem in future. Now, I have found several specimns of *amamiense* among the wasps captured on the Island of Okinawa, the type locality of *inornatum*. The fact seems to allow to accept the identity between *inornatum* and *amamiense*. In the following the characters of *inornatum* basing upon the specimens at hand will be given in some detail:

♀. Length 12.5–15.0 mm. Black, with bronzy reflection on thorax. Mandibles ferruginous to reddish brown, except basal portion and narrow lower margin; mouth parts and palpi ferruginous to dark brown, tibial spurs of front legs pale brown, sometimes basally fairly dark, those of mid and hind legs sometimes apically (in old specimens wholly) brownish. Tegulae externally slightly ferruginous, glossy. Wings hyaline, apically somewhat clouded, veins and stigma black. Pubescent area normal, hairs comparatively long and silvery, on clypeus mixing pale ferruginous



Figs. 9–18. 9, *T. formosicola* ♀, inter- and supra-antennal area.
10–16, *T. inornatum* Matsumura. 10 and 11a, head, 11b and 11c, clypeus, b, variation. 12, inter- and supra-clypeal area. 13, propodeum. 14, wing venation. 15, apical portion of antenna (♂). 16, genitalia (♂).
17–18, *T. malaisei* Gussakovskij. 17, apical portion of antenna. 18, genitalia (♂).

erect ones, on mouth parts, antennal flagella (apically very short) and tarsi of legs more or less ferruginous.

Head seen from above (Fig. 10), with ocelli in an equilateral triangle, usually uniform in size, somelimes the anterior somewhat smaller, location of postocelli more or less variable, but always OOD<POD (3/5 to 3/4), POD slightly less than as great as the width of postocellus,

elevation between postocelli slight; frontal swelling and its medial furrow mediocre, without shield-shaped enclosure. Head seen in front (Fig. 11), with ratio of minimum interocular distance at vertex and at clypeus 21:17 (approximately 7:6), supra-antennal elevation tuberculate, with the short median carina arising at the top of the tubercle and reaching upwards about 2/5 of the distance to anterior ocellus, antennal sockets facing obliquely (externally) downwards and the transverse carina connecting the produced upper margins of sockets more or less varied in development, usually low, sometimes fairly high and slightly produced (Fig. 12), with its margin straight, but not so strongly developed as in *formosicola* (Fig. 9), supra-clypeual area (Fig. 11) comparatively longer than in the compared species; clypeus at base broadly roundly raised, without the medial ridge, apical bevel comparatively broad, with in middle a projection (Fig. 11, c) similar in form to that of *T. malaisei* commonly occurring in northern regions of East Asia; antennal joints comparatively longer than in *formosicola*, joint-3 4-times, joint-10 1.7-times as long as wide at apex (in *formosicola* 3.7 times and 1.4 times respectively). Collar of pronotum laterally rounded and medially narrowed, with a transverse furrow across middle, area behind the furrow half discoloured; mesonotum with median scutal line represented by two fine glittering lines, slightly divergent posteriorly and reaching approximately fourth of the segment, parapsidal sutures in fine glittering impressed lines, in length about third of the scutum, postscutellum comparatively wider than in *malaisei*, ratio of width to length in middle about 3.0 (in *malaisei* nearly 2.5); propodeum with area dorsalis well marked off by crenate furrows (Fig. 13), cordiform, medianly longitudinally shallowly impressed, the impression broader posteriorly; posterior inclination medianly broadly and deeply furrowed, upper border of the furrow formed by a triangular perpendicular bank, lateral margins separated from the sides of the segment by longitudinal carinae (stigmatal carinae), reaching anteriorly near the stigmata of the segment. Abdominal segment 1 petiolated, in form as in *malaisei*, nearly as long as segments 2, 3 and 4 put together and 4.5 times (15 times) as long as wide at apex (in middle), posterior third gradually incrassate posteriorly. Rest of abdomen and legs normal. In fore wings radial cell long, as in *malaisei* or *formosicola*, reaching near the apical margin (Fig. 14) and its apex located on the supposed exention line of lst recurrent nervure (Fig. 14), length ratio of lst and 2nd abscissa of radial nervure approximately 1:3 (exact value 2.9, in *malaisei* 2.9 and in *obsonator* 2.3), 2nd abscissa fairly markedly rounded upwards, vestigial 2nd cubital cell faintly marked off, its upper nervure approximately 3/5 of its lower nervure (Fig. 20, B).

Front very minutely coriaceous, with superimposed medium-sized rounded punctures scattered, intervals in general as long as width of the punctures; pro-, mesonotum, scutellum, postscutellum and mesopleuron sparsely scattered with minute hair-bearing punctures, intervals shining; area dorsalis at base obliquely coarsely striate, lateral furrows strongly crenate, medial impressed area transversely coarsely striate, the striae on posterior portion extended laterally and connected with the crenae of the lateral furrows, disc of the area finely punctured with irregular-shaped points, intervals nearly as large as the points, area along the stigmatal carinae transversely strongly somewhat coarsely striate; on posterior inclination banks of the medial furrow transversely weakly striate, the area below middle wholly transversely striate, remaining area scattered with very minute sparse hair-bearing points; abdomen practically impunctate.

♂. Well agrees in general characters with ♀. Tarsi apically brownish. Clypeus much less produced anteriorly, but with the similar medial protuberance, supra-clypeal area subtriangular, with anterior bordering line more markedly arched than in ♀, minimum interocular distance at vertex and at clypeus 18 and 14 (9:7), ocelli in an isosceles triangle, slightly lower than equilateral one, OOD nearly equal to POD, antennal joint-3 2.3-times as long as wide at apex, ultimate

joint not bent, as long as three preceding joints united (Fig. 15). Genitalia: Fig. 16, a and b.

Specimens examined: 2 ♀♀, Okinawa Is., VI. 1945, G. E. Bohart leg.; 1 ♀, Amami-Ohshima (Simmura), 20. VII. 1955, T. Shirozu leg.; 2 ♀♀ 2 ♂♂, Amami-Ohshima (Yuwan, Kachiura, Akaogi, Asari), 25. VI.—7. VII. 1961, K. Tsuneki leg.; 2 ♀♀, Amami-Ohshima (Yuwan), 16 -29. VII. 1963, Y. Hirashima and C. M. Yoshimoto leg.; 1 ♀, Tokunoshima Is. (Mikyo), 27. VII. 1963, Y. Hirashima leg.

Remarks. Affinity and distinction between this species and *formosicola* Str. was already given in connection with the latter species. Here the differences from the closely resembling *T. malaisei* will be presented:

♀. When *T. malaisei* has the red-banded abdomen the distinction is quite easy; further in this species usually the extreme base of the front tibia is somewhat ferruginous. Structurally the antennal socket affords a good distinguishing clue: In *malaisei* the socket is a simple hole, the circling carina not raised, level with the surface of the face, while in *inornatum* the upper margin of the socket raised, with the orifice somewhat tunnel-shaped, the opening directing externally downward (Fig. 11). ♂. Sometimes the colour at base of front tibiae of use, sometimes of little use (abdomen in both specics wholly black). Ultimate antennal joint not bent in *inornatum*, slightly bent in *malaisei* (Fig. 15, cf. Fig. 17). Genitalia markedly different, especially in the form of squamae and of the basal plates (Fig. 16, cf. Fig. 18).

6. *Trypoxylon ryukyuense* sp. nov.

Tryoxylon amamiense Tsuneki, Etizenia, 6 : 2, 1964 (♀, ex parte). (SYNONYM NOV.)

This species was dealt with in my previous paper (1. c.) as representing a montanic population of *T. amamiense* (= *T. inornatum*). Further material brought to light the fact that the distribution pattern of the two forms was not so clealy segregated as I had supposed. According to such an ecological evidence, the two populations must reasonably be separated at the species level. The differences from *T. inornatum* (the greater part was already pointed out in connection with the description of *T. amamiense*) are as follows:

♀. Generally somewhat larger, 14.0–16.5 mm. Clypeus rounded anteriorly, without medial protuberance (Fig. 19), sometimes the medial region of apical margin slightly incrassate and sometimes further with a small impression. Minimum interocular distance at vertex and at clypeus relatively 4:3, (OOD:POD similarly 2:3). Circling carina of antennal socket not raised above, simple as in *malaisei*, carinae on supra-antennal tubercle longer, reaching about middle of the distance to anterior ocellus, frontal median furrow slightly deeper, area lacking the minute coriaceous sculpture in the frontal furrow and around anterior ocellus distinctly broader. Antennal joints relatively slightly longer, joints 3, 4 and 10 respectively 4.4 times, 2.8 times and 1.8 times as long as wide at apex (in *inornatum* 4.0–, 2.6- and 1.7-times respectively so). Area dorsalis with lateral furrows very shallow, borader and indistinct, (median furrow shallow, broadened posteriorly), basal oblique striae obsolete, the surface transversely finely closely striate with scattering minute points in between, the striae always stronger and well-defined on the lateral and medial furrows, on the disc sometimes as strong and as distinct as on the furrows, but usually feeble and sometimes even indistinct; posterior inclinaion transversely finely and closely striate, the striated area broader than in *inornatum*, occupying almost whole the area of the inclination. In fore wing the vestigial veins formimg the 2nd cubital cell somewhat more distinct than in *inornatum*, the cell distinctly wider than high (Fig. 20, C), the inner and upper veins subequal, in *inornatum* (Fig. 20, B) the upper is markedly shorter than the inner and the cell higher than wide.

♂. Unknown.

Holotype: ♀, Amami-Ohshima (Santaro-toge), 26. VI. 1961, K. Tsuneki leg.

paratypes: 2 ♀♀, the same data as holotype; 1 ♀, the same Is. (Yuwandake), 6. VIII. 1963, T. Okada leg.; 1 ♀, Tokunoshima (Mikyo), 22. VII. 1963, Y. Hirashima leg.

Other specimen: 1 ♀, Amami-Ohshima (Yuwan), 22. VII. 1963, C. M. Yoshimoto leg. (the head is lacking).

Remarks. This species closely resembles *T. geniculatum* Cameron (1902) from India, but differs at least in the pilosity of antennae, in the form of supra-antennal tubercle, in the structure of area cordata and in the colour of abddomen. It is also close to *T. responsum* Nurse (1903), but is separable therefrom at least in the coloration of the abdomen. From the apparent similar species, *T. montanum* Schulz (= *placidum* Cameron, 1904), it can be distinguished at least by the difference in the relative lengh of the ultimate joint of antenna.

7. *Trypoxylon obsonator* Smith, 1873

Trypoxylon obsonator Smith, Trans. Ent. Soc. Lond., p. 194, 1873.
Trypoxylon obsonator: Bingham, Faun. Brit. Ind., Hym., I, p. 226, 1897.
? Trypoxylon elongatum Ashmead, Proc. U.S. Nat. Mus., 38 : 961, 1905 (Philippines).
Trypoxylon hyperorientale Strand, Internat. Ent. Zeitschr., 16 (18) : 156, 1922. (SYNONYM NOV.)
? Trypoxylon bicolor: Matsumura (nec Smith), Ins. Mats., 1 (1) : 41, 1926.
Trypoxylon obsonator: Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., II, 6 (1) : 12, 1956.

Specimens from the Ryukyus: 2 ♀♀ 1 ♂, Okinoerabu (Ooyama), 28-30. VII. 1963, C. M. Yoshimoto leg., 1 ♀, Tokunoshima (Mikyo), 27. VII. 1963, Y. Hirashima leg., 1 ♀, Ishigaki Is., X. 1951, R. M. Bohart leg.; 1 ♀, Okinawa Is., 2. IX. 1945, J. L. Gressitt leg.

Remarks. One of the female specimens (Ooyama, Okinoerabu Is., 28-30. VII. 1963, C. M. Yoshimoto leg.) is markedly different in the colour of the wings. They ara slightly yellowish hyaline, apically somewhat clouded and with the nervures and stigma bright ferruginous. This is very conspicuous against the black or dark brown nervures aud stigma of the usual specimens of this species. However, even the close examination enabled me to find only the following differences:

(1) Apical bevel of the clypeus more strongly reflected than in others and the anterior margin rather truncate in middle.

(2) Lateral crenulate lines on the dorsal and posterior aspects of the propodeum bordering on the sides of the segment which are usually observed in the normal specimens hardly defined in this specimen, only a few short weak crenulae can be observed on posterior portion.

Such differences as above listed, however, can not convince me to separate the specimen as a good species. It may be an aberratio or a mutant of the species. If in future it is confirmed that the specimens having such characters as above mentioned occur abundantly to form a decided population they should be separated as a distinct species, in spite of the fact that the differences in character are very slight. But, it is also probable that the colour change is due to artificial treatment, such as long immersion in alcohol or boiling in water for softening.

8. *Trypoxylon gracilescens* Smith, 1860

Trypoxylon gracilescens Smith, Jour. Proc. Linn. Soc. Lond., Zool., IV, Suppl.: 85, 1860 (Makassal).
Trypoxylon gracilescens: Bingham, Faun. Brit. Ind., Hym., I : 227, 1897 (Tenasserim).
Trypoxylon gracilescens petioloides Strand, Internat. Ent. Zeitschr., 16 (18) : 150, 1922 (Formosa).

Specimen examimed: 1 ♀. Nantou Hsien (Nanchanchi), 30 IV. 1965, T. Shirozu leg.

Remarks. The specimen agrees well in characters with *T. gracilescens petioloides* Strand. But I think *petioloides* must fall within the usual variation of the species. Further, it seems doubt-

ful whether the Indian specimens really lack reddish coloration at the apex of the abdominal petiole, since in the simple description such a detail is apt to be omitted. We can find much more striking difference between the original description and that of Bingham (1897) in the colour of the hind legs. But such a slight difference in colour is considered not important unless the general trend of the population is grasped. In Figure. 21 the apical margin of the clypeus of this species (♂) was exhibited.

9. *Trypoxylon melanocorne* Strand, 1922

Trypoxylon melanocorne Strand, Internat. Ent. Zeitschr., 16 (19) : 157, 1922.

Remarks. This species seems very characteristic in that die apical Erweiterung des Petiolus ist fast unmerklich. No specimen of this species could be found among the materials.

10. *Trypoxylon takasago* sp. nov.

♀. 12.5 mm. Wholly black except mandibles, tegulae and legs in part. Area dorsalis with lateral furrows very weak, median furrow distinct, posteriorly widened, disc polished, 1st abdominal segment potiolated, subequal in length to thorax complex, longer than segments 2+3, but slightly shorter than 2+3+4.

Hairs silvery, normal in distribution, on front not long, appressed, Black, mesonotum and mesopleurons with somewhat bronzy reflection, not glossy. Mandibles ferruginous, apically darkened; palpi, tegulae, apex of all trochanters, front tibiae in front largely, base of mid tibiae, (sometimes base of hind tibiae,) tibial spurs of front and mid legs, (sometimes of hind legs also) ferruginous. Hind tibial spurs, front tarsi wholly, mid and hind tarsi apically brownish. Wings hyaline, apically slightly clouded, veins black, in part faintly brownish. Pronotum posteriorly tends to be discoloured, dark brown.

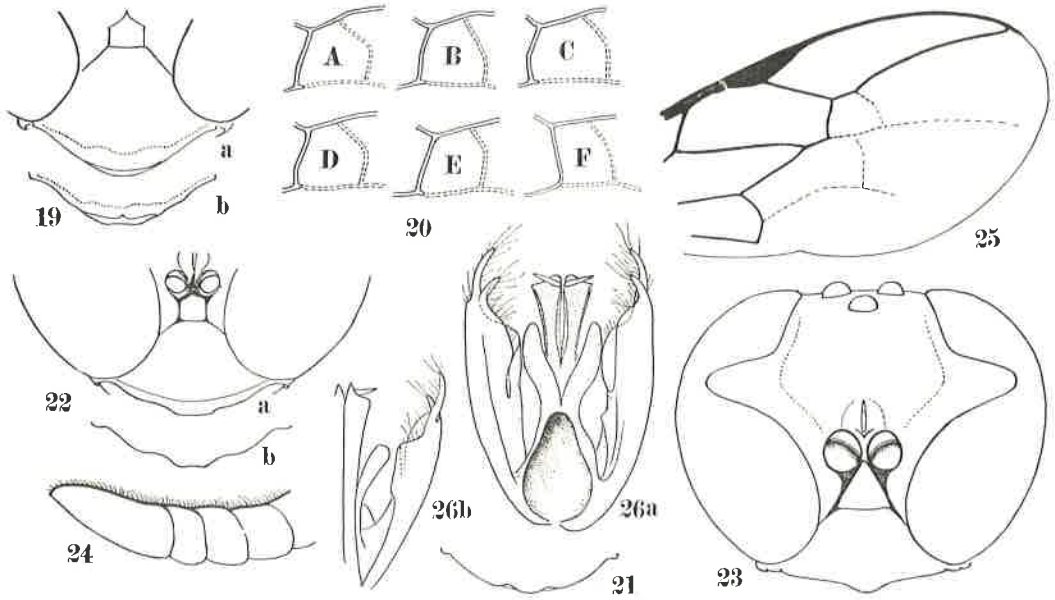
Ocelli in an equilateral triangle, the anterior somewhat smaller. OOD:POD = 1 : 2, POD about 2/3 the width of postocellus, postocellar interval longitudinally subcarinate, frontal elevation not strong, frontal furrow weak, on lower portion the surface flattened and sometimes bordered below by two feeble elevated oblique lines, originating and branching above the supra-antennal carina (this is visible in the oblique light only and corresponding to the lower carinae of the frontal shield in some species), supra-antennal tubercle low, rounded, with a glittering carina on top, reaching upwards a third to the anterior ocellus; antennal sockets with upper margin raised and shortly produced, with the opening directing obliquely downwards. Ratio of minimum interocular distance at vertex and at clypeus 15 : 12 (head width 59); clypeus very slightly raised near base, not subcarinate in middle, apical margin rounded with a feeble medial protuberance which is gently enarginate in middle (Fig, 22); supra-clypeal area slightly wider than high, with sides very weakly divergent below; antennal joint 3 slightly more than thrice as long as wide at apex, ultimate joint twice as long as wide at base, about as long as two preceding joints united. Pronotum normal, mesonotum with median scutal piceous lines markedly divergent posteriorly, interval slightly impressed, the impression reaching third of the segment, prescutal sutures parallel, shorter than medien scutal line, feebly grooved, parapsidal sutures in glittering impressed lines, in length about fourth of the scutum, scutellum slightly wider than long, area cordata on propodeum with lateral furrows very weak, median impression rather deep, posteriorly widened, median excavation of the posterior slope broad and deep, anteriorly slightly convergent and posteriorly narrowed into a furrow, stigmatal furrow and the accompanying carina well defined, but not strong. Abdomimal segment 1 approximately as long as thorax complex, longer than segments 2 and 3 combined (100 : 65), but shorter than 2, 3 and 4 combined (100: 110), legs normal. In fore wing radial cell long, reaching near the apical margin (R_1 of the cell completely attaining to the apex), vestigial 2nd cubital cell higher than wide (Fig. 20, E).

Front and vertex microscopically minutely coriaceous, with fine punctures superimposed, intervals generally as large as the width of the punctures. Mesonotum, scutellum, postscutellum and mesopleurons with microscopically minute hair-bearing points sparsely scattered. Area cordata glossy, especially at the central sparsely crenate furrow, on the disc and on other portions of the segment punctuation as on mesonotum, excavation on posterior slope without striae, stigmatal furrows transversely finely striate, the striae posteriorly longer and reaching the medial furrow; abdomen fairly closely covered with very fine hair-bearing points.

♂. Unknown.

Holotype: ♀, Keeling Shih (Pinglin), 4. IV. 1965, T. Saigusa leg.

Paratype: 1 ♀, the same data.



Figs. 19–25. **19,** *T. ryukyuense*, clypeus. **20,** vestigial 2nd cubital cell of fore wing: A, *T. malaisei*. B, *T. inornatum*. C, *T. ryukyuense*. D, *T. formosicola*. E, *T. takasago*. F, *T. subpileatum*. **21.** *T. gracilescens*, clypeus. **22,** *T. takasago*, clypeus, b, in paratype. **23–26,** *T. kumaso* (♂). 23, head. 24, apical portion of antenna. 25, fore wing. 26, genitalia; a, ventral view (right half).

Remarks. Paratype slightly differs from the holotype in the following points:

(1) Front tarsi largely ferruginous, hind tibiae at base ferruginous.

(2) Undulation on anterior margin of clypeus more marked (Fig. 22, b).

(3) Lateral furrows of area cordata slightly more distinct, well-defined up to the posterior extremity, in the holotype posteriorly completely obsolete.

This species closely resembles *T. malaisei* Gussakovskij, but is easily separable therefrom by the difference in colour of the front legs. Further, in the structure of the propodeum and the relative length of the abdominal petiole and of the antennal joints this species is different from the species compared.

11. *Trypoxylon kumaso* sp. nov.

♂. Length 9.5 mm. Nearly wholly black, abdominal segment 1 petiolated, area cordata with lateral furrows feeble and median impression not reaching verge of the area; ultimate antennal joint approximately

three preceding joints united.

Black, mesonotum, scutellum and postscutellum with bronzy reflection, slightly more glossy than to call half opaque, mesopleuron also with aeneous shimmer, but fairly glossy. Pubescence silvery, on incision of eyes and clypeus not long, on clypeus mixed with scattered longer hairs, on other parts of body mediocre in length, antennae and abdomen comparatively more hairy than usual, hairs not long but abundant, on posterior margin of abdominal segments 1–4 turning into a white band in some light. Mandibles on apical 2/3 reddish brown; tegulae yellowish dark brown; externally paler, front tibiae with an indistinctly outlined elongate brownish macula on inner marin near base, the apical spurs pale brown; front and mid tarsi apically dark brownish. Wings hyaline, apically broadly but slightly darkened, veins and stigma black, veins slightly brownish.

Head from above with relative width to length in middle 53 : 43, OOD: POD relatively 3: 3, width of postocellus 4, front ocellus 3.5. Head seen in front: Fig. 23, wider than long, minimum interocular distance at vertex and at clypeus relatively 17 and 13, frontal swelling marked, but medial impressed line shallow, supra-antennal tubercle low, gently rounded, with a glittering carina on top, reaching upwards third of the distance to anterinr ocellus; sockets of antennae with upper margin raised, shortly overhanged, supra-clypeal area nearly equilateral triangular, clypeus roundly swollen, not medially raised, with apical margin very slightly produced and provided in middle with a rounded protuderance which appears in some light medianly slightly incised. Antennae comparatively markedly, progressively incrassate towards apex, joint 3 nearly twice as long as broad at apex, joints 4, 5 and 6 slightly shorter than 3 and subequal in length to one another, from joint 8 apically somewhat moniliform, ultimate joint not bent, about 2.5 times as long as wide at base and approximately equal to the preceding three joints taken together (Fig. 24). Pronotum with a transverse furrow across middle as usual, its anterior part markedlly narrowed in middle and the lateral portions appear incrassate, posterior part apically tends to be discoloured; on mesonotum prescutal sutures represented by glittering impressed lines, reaching about fifth of the scutum, median scutal lines slightly longer than prescutal sutures, also in the fine glittering lines, but posteriorly feebly carinated, parapsidal sutures distinct as glittering lines, in length slightly less than 1/3 as long as the scutum; scutellum subquadrate (width to length 14: 12), postscutellum half the length of scutellum. On propodeum area cordata as long in middle as wide at base, with lateral furrows shallow and feeble, defined only in certain light, subparallel from base to middle, then posteriorly roundly convergent, median impression fairly deep, but ending at about 2/3 from base, with a fine groove in middle which is sharply bordered on both sides by carinae; posterior inclination with a large medial impression, also medianly grooved, the groove reaching near apex beyond the impression, stigmatal carinae not strong, but well-defined and accompanied with a furrow inside. Abdominal segment 1 petiolated, slightly shorter than thorax complex (80 : 65), but slightly longer than subsequent two segments combined (65 : 55), from 2/3 from base posteriorly gradually broadened. Genitalia: Fig. 26, closely resembles that of *T. malaisei*, squamae bifurcate at apex, but the furcations different in length, digitus elongate lobiform, comparatively larger than in *malaisei*. In fore wing (Fig. 25) radial cell reaching near the apical margin, vestigial 2nd cubital cell slightly wider than high, 2nd transverse cubital vein obsolete on its lower half.

Ground surface of vertex and front microscopically minutely coriaceous, nearly mat, with superimposed fine punctures, the space between generally as large as punctures. Mesonotum practically impunctate, scutellum, postscutellum and mesopleuron with very minute hair-bearing points sparsely scattered, area cordata without well-defined punctures, but the surface not smooth, with irregular medium-sized shallow impressions covering the disc, perceivable in oblique light

only, the surface fairly glossy, the area at base radiately shortly coarsely striate, median impression without striae, central groove very minutely wrinkled, not completely glossy; posterior inclination posteriorly with some oblique striae, intervals finely closely granulate, median impression with indistinct short coarse crenae near bottom groove, stigmatal furrows irregularly crenulate, sides of the segment practically impunctate, only posteriorly microscopically finely coriaceous, but shining. Abdomen with fairly close hair-bearing points.

♀. Unknown.

Holotype: ♂, Okinawa Is. (Nago), 15. III. 1964, T. Takara leg. (Coll. Bernice P. Bishop Museum).

Remarks. Wholly black coloration, character of the wing venation and the comparative body size tempted me to combine this species with *T. ryukyuense* the male of which remained unknown. But the characters of the clypeus and especially of propodeum made me hesitate to do so. Viewed from the structure of the male genital organ, this species is closely allied to *T. malaisei* occurring widely in the eastern part of palaearctic region and rather remote from *T. inornatum*.

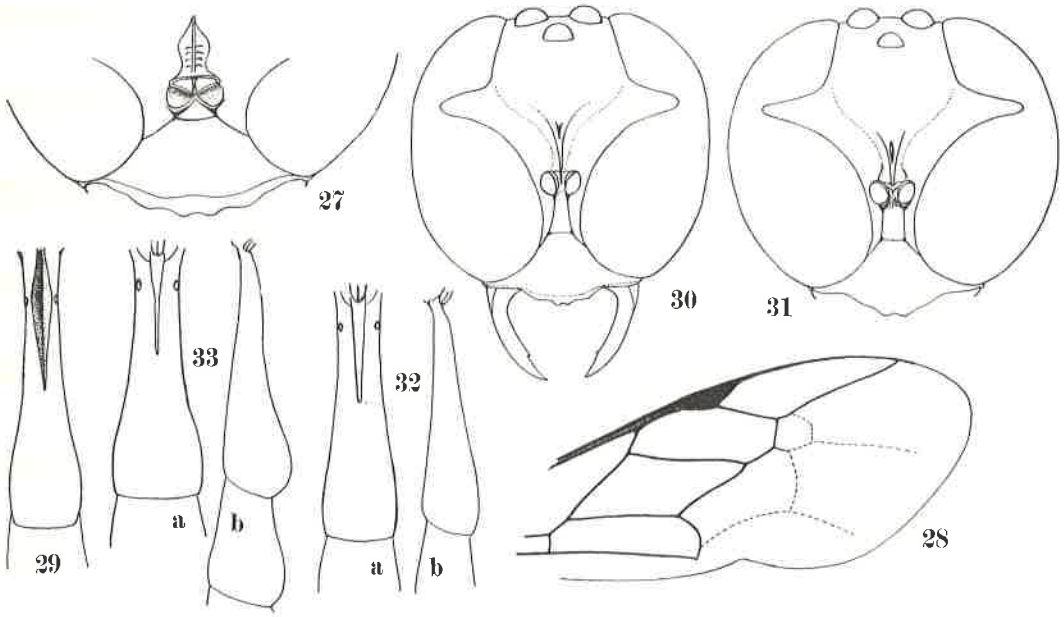
12. *Trypoxylon shirozui* sp. nov.

♀. Length 9.5 mm. Wholly black, supra-antennal elevation nose-form, markedly high and large. Abdomen not petiolated, segment 1 gradually widening posteriorly and slightly shorter than segments 2 and 3 combined, area cordata not marked off laterally, radial cell of fore wing not reaching near the apical margin.

Mandibles apically somewhat reddish brown, wings light fusco-hyaline, basally paler and apically darker, veins and stigma black, posteriorly slightly brownish. Pubescence on front including eye incisions grey, not appressed, the surface well visible, on clypeus silvery, also not completely appressed, seen perpendicularly the surface also well visible, seen from obliquely above silverily glittering, apical margin of abdominal segments 1–4 with a fringe of whitish hairs, hairs on vertex and mesonotum short, yellowish grey, on other portions normal.

Ocelli in an equilateral triangle, the anterior somewhat smaller; OOD : POD=5 : 10 (width of postocellus 7), vertex nearly flattened, ocellar region not raised, only oculocellar area slightly depressed, without carina between postocelli, frons also not raised. only the inner orbital areas up to the bottom of eye incisions slightly depressed, median furrow narrow and feeble, not distinct, supra-antennal elevation nose-shaped (Fig. 27) laterally strongly compressed (especially at the lower portion) and markedly high and large, with 4–5 crenulae near ridge, the ridge carinate, reaching upward about 2/5 of the distance to the median ocellus, under surface of the elevation flattened and polished. marginated by carinae and provided with a median carina; socket of antenna with upper margin raised and carinated, produced in an overhang, the carina on inner upper portion in common with the lower outer carina of the under aspect of the nose-shaped elevation; relative interocular distance at vertex and at clypeus 34 and 28 (= 5 : 4), head width relativly 56, clypeus broadly roundly raised along median line, apical margin slightly roundly produced and sinuate, with four small blunt protuberances, medial two more marked (Fig. 27), supra-antennal area isosceles triangular, much broader than high. Antennae comparatively hairy, hairs pale brownish, those on scapes in some light whitish, each joint comparatively short, joint 3 about 2.6 times as long as wide at apex (under the eye measurement appears much thicker owing to the dense hairs), joint 9 about as long as wide, ultimate joint less tha as long as two preceding joints untied and twice as long as wide at base. Pronotum far depressed below the level of mesonotum, deeply furrowed across middle, anterior part subcarinate and medially shortly triangularly produced posteriorly, posterior part not carinate, not discoloured. Mesonotum

anteriorly suddenly and roundly raised, median scutal lines as long as parapsidal line, slightly less than 1/3 as long as scutum, both in glittering fine carinae and the former slightly divergent posteriorly with interval weakly impressed, prescutal sutures short, finely impressed, scutellum and postscutellum distinctly raised, the furrow between the two deep, somewhat lunate, with bottom crenulate; area dorsalis medianly shallowly impressed, the impression posteriorly slightly wider and without lateral carinae defined, stigmatal carinae distinct, but not strong, accompanying no furrow. Abdominal segment 1 not petiolated, gradually widened posteriorly, in length very slightly more than as long as hind tibia (ratio 17: 16) and 3.4 times as long as wide at apex, with median furrow deep and distinct, reaching middle of the segment (Fig. 29). Legs normal. In fore wing radial cell not particularly long, ending far before the apical margin, vestigial 2nd cubital cell with upper abscissa half as long as the lower, with 2nd transverse cubital vein roundly bent toward middle (Fig. 28).



Figs. 27–33. **27–29,** *T. shirozui* 27, lower portion of head seen in front. 28, fore wing venation. 29, abdominal petiole. **30,** *T. koshunicon*, head. **31–33,** *T. koshunicon okinawanum*. 31. head. 32, abdominal petiole. 33, idem, variation.

Vertex, front, collar anterior to the transverse furrow, mesonotum, scutellum, postscutellum and mesopleuron microscopically finely coriaceous or granulate, with fine rounded shallow punctures scattered, intervals usually 2–3 times as large as the width of punctures, punctures on mesonotum slightly smaller and rather indistinct, posterior margin of mesonotum strongly crenate, metapleuron smooth and polished. Propodeum on dorsal aspect obliquely, at base somewhat strongly coarsely, on posterior portion more finely and closely, on median impression arcuately and much more closely rugoso-striate, intervals except at base with minute rugae or fine wrinkles, but fairly glossy; inside of stigmatal carina, a short distance apart, runs a longitudinal carina arising some distance from base of the segment and extending posteriorly to the indistinct border of the dorsal aspect, between the two carinae the surface transversely finely closely striate. on its anterior portion finely rugoso-subreticulate; propodeum on posterior aspect transversely finely closely rugoso-striate, the striae medio-posteriorly turning somewhat oblique and near the medial furrow weaker, within the furrow the surface largely polished; sides of the segment obliquely,

very finely densely striate. Abdominal segments practically impunctate, with only a microscopically fine hair-points scattered.

♂. Unknown.

Holotype: ♀, Nantou Hsien (Sungkang), 31. V. 1965, T. Shirozu leg. (Coll. Ent. Lab. Kyushu Univ.).

Remarks. This species belongs to the group of *T. pennsylvanicum japonense* and is characteristic in having the supra-antennal nose-formed elevation extraordinarily high and large. Further it is separable from other known congeners by the combinetion of characters of frons, clypeus, antennae, propodeum, abdominal petiole and wing venation.

13. *Trypoxylon koshunicon* Strand, 1922

Trypoxylon koshunicon Strand, Internat. Ent. Zeitschr., 16 (18) : 149, 1922 (♂).

T. koshunicon was described upon a male specimen the front of which was heavily damaged by the noxious insect. The characters described are limited to the coloration, pilosity, structures of antennae, frons (presumed), abdominal segments 1 and 2 (relative length) and hind tibial spinules.

At the present state of knowledge on the Formosan fauna of this genus the lack of description of the characters of the clypeus and propodeum and the convergency of the inner orbital lines makes it rather difficult to identify a certain specimen with this species. However, judging from the coloration, especially of legs, this species is considered to belong to the group of *T. varipes* P.rez occurring in Japan. The fact is of use to presume, to a certain extent, the characters of the species that were not alluded to in the original description. Aided by the description and the fact above mentioned the specimen here treated was identified with this species, although it belonged to the other sex. In the following full description will be attempted:

♀ (hitherto undescribed). Length 7.5 mm. Black with the following portions pale yellow～yellowish white: Mandibles except apical half, palpi, antennal joint 1 beneath broadly, humeral angles, tegulae, front legs except coxae, mid legs except basal half of coxae, hind legs on apex of coxae, trochanters, both ends of femora, bascal ring and apex of tibiae, both ends of tarsal joints 1–3, sides of apical margin of abdominal segmnts 2–5, also basal sides of segment 2. Apical half of mandibles reddish brown, glossy, apically darker. Basal portions of antennae (except scapes), wing veins and stigma, mid and hind tibial spurs, mid tarsal joints 2 and 3 except both ends dark brown. Brown to pale brown: Mouth parts, apical margin of clypeus, apex of antennal joints 2–4, front femora above more or less, front tibial spurs, both femora and tibiae above of mid legs, apical portion of basitarsi of mid legs, apical two joints of mid and hind tarsi. Aloria of all legs always black; wings slightly clouded, apically more or less darker. Darker colour of mid and hind tibial spurs in contrast to the whitish tibial apex, as pointed out by the original author, very conspicuous.

OOD : POD÷1 : 3, width of postocellus slightly less than twice as great as POD (9 : 5), elevation between and behind postocelli very slight, defined only in oblique light; frontal incrassation not strong, the surface somewhat concave and medianly with a sculptureless glossy line, not impressed. Supra-antennal elevation and its connection with the impression above as in *T. varipes* (nose-shaped, top acutely carinated, the carina bifurcate upwards, including between the branches a longitudinal excavation which is connected with the frontal median glossy line — in *varipes* this glossy line mostly absent). Head seen in front (Fig. 30) subquadrate, ratio of interocular distance at vertex and at clypeus 5 : 2, clypeus medianly comparatively broadly but not strongly produced anteriorly, and in middle bluntly bidentate, supra-clypeal area markedly

elongate, approximately twice as long as wide in middle; antennal joint 3 nearly thrice as long as wide at apex (ratio 3.1), joint 8 slightly longer than wide (ratio 1.1), ultimate joint slightly less than as long as two preceding joints taken together. Pronotum transverse, laterally more or less incrassate, without medial elevation nor protuberance, transverse furrow markedly before middle, the anterior portion fairly acutely carinate towards middle, the prsterior portion broad and discoloured; on mesonotum parapsidal sutures represented by slightly impressed lines, slightly less than a third as long as the scutum and slightly divergent anteriorly, impressions of prescutal sutures and median scutal lines feeble, without medio-anterior furrow; scutellum somewhat broader than long, with axillal scrobes (at antero-latral corners) deep, rounded and very marked, area cordata marginated with shallow grooves, posteriorly more or less indistinct, the area medianly broadly furrowed, the furrow posteriorly shallower; on posterior slope median excavation roughly broad lenticular, indistinct in outline, medianly acutely furrowed; stigmatal carinae feeble. Abdominal segment 1 posteriorly gradually widening, on apical portion markedly roundly incrassate (especially upwards), as long as two following segments taken together and approximately thrice as long as wide at apex, relative width of minimum and maximum wtdths of the segment 1 : 2, caudal segment narrowly carinate, with apex acutely pointed. In fore wing radial cell not reach- ing near apical margin and vestigial 2nd cubital cell wider than high, with lst transverse cubital vein subequal to upper abscissa.

Head and thorax above half-mat. Front microscopically finely coriaceous (under 30× defined with some difficulty), with very minute punctures (under 20× easily visible) scattered, punctuation anteriorly close and posteriorly progressively sparser, on central area intervals 2-3 times as large as width of punctures (the puncture under higher enlargement consists of a collection of several fine points), on vertex punctures finer and sparser. Mesonotum, scutellum and postscutellum finely closely but distinctly (under 30×) punctured, with intervals on an average as large as punctures and minutely coriaceous. Mesopleuron covered with appressed silvery pile, but the surface apparently smooth and shining, metapleuron smooth and polished; area cordata at base obliquely coarsely striate, lateral furrows crenulate, remaining area transversely finely closely striate, the striae on medial furrow fairly strong and distinct, but on the disc very feeble, rather faint, in some light invisible; posterior inclination without sculpture, on apical hairy portion granulate, inside of stimatal carinae closely crenulate; sides of the segment smooth and polished, on central region obliquely finely closely but very feebly striate, on posterior portion rather sparsely scattered with medium-sized punctures, on extreme apical portion transversely rugose. Abdomen covered with close fine short-hair-bearing points, not glossy, only on the posterior incrassation of 1st segment more or less shining. Hairs on eye incisions, inner ordits, clypeus, supraclypeal area, temples, sides of pro- and mesonotum, mesopleurons, stigmatal furrows and apical portion of propodeum silvery, appressed, comparatively thick, on abdomen without hair bands, but in some light appears to have bands.

Specimen examined: 1 ♀, Pingtung Hsien (Kenting), 4. IV. 1965, T. Shirozu leg.

Remarks. This species belongs doubtlessly to the group of *T. varipes* having the inner orbits strongly convergent towards the clypeus and the legs extensively maculated with yellowish white. The group is also characteristic in the structure of the clypeus and front, and in the sculpture of the area cordata on the propodeum. Between the members of the group there are more or less differences in some other characters together with those in degrees of the common distinctions. *T. koshunicon* differs from *varipes* mainly in the structure of the ultimate antennal joints in the male (reichlich so lang wie die beiden vorhergehenden Glieder zusammen, while in *varipes* as long as three preceding joints combined) and in the convergency of the inner orbital lines (much

more strongly convergent than in *varipes*) and somewhat in colour.

14. *Trypoxylon koshunicon okinawanum* subsp. nov.

The new subspecies differs from the nominate race in the following points:

(1) Head seen from above relatively less thick, ratio of width to length in middle (from base of supra-antennal tubercle to occipital margin) 46 : 24, in *koshunicon* s. str. 43 : 24.

(2) Head seen in front not so subquadrate, but rounded and distinctly wider than long (Fig. 31, cf. Fig. 30), with eye-incisions shallower (idem) and with supra-clypeal area broader (idem); pattern of the clypeal form also somewhat different.

(3) Frontal incrassation comparatively higher (more distinctly defined at its lower inclination), with punctures larger and closer.

(4) Legs slightly darker: Pale yellowish white. Bases of all coxae black. Front legs: Femora above and beneath, tibiae externally, tarsal joints 1 (apical half only)-4, brown. Mid legs: Femora above and beneath, tibiae externally and tarsi wholly except both ends of each joint slightly darker brown. Hind legs: Coxae except apex, femora, tibiae and all tarsal joints except all both ends narrowly, slightly brownish black, trochanters above pale brown, both ends of the femora and tibiae yellowish white, those of tarsal joints pale brown.

Sculpture of area dorsalis: At base obliquely coarsely striate, on medial furrow transversely finely closely striate, striae posteriorly obsolete; feeble lateral furrows weakly crenate, disc polished.

♂. Unknown.

Holotype: ♀, Ishigaki Is. (Kara-yama), 14-18. III. 1964, C. M. Yoshimoto and J. Harrell leg. (Coll. Bishop Mus.)

Paratypes: 1 ♀, Iriomote Is., 11-12. III. 1964, C. M. Yoshimoto and J. Haralle leg.; 1 ♀, Ishigaki Is., 22. V. 1964, J. L. Gressitt leg. (Coll. Bishop Mus.)

Remarks. Abdominal segment 1 is usually gradually widening posteriorly and the posterior incrassation is not very striking (Fig. 32). But in one example it is comparatively markedly incrassate (Fig. 33). This is especially striking in the lateral view (idem).

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