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ON SOME AMPULICIDAE FROM FORMOSA  
(HYMENOPTERA)

BY K. TSUNEKI

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ON SOME AMPULICIDAE FROM FORMOSA  
(HYMENOPTERA)\*

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The Ampulicidae of Formosa are comparatively well studied through the effort of E. Strand (1913) and K. Yasumatsu (1936) and ten species have been known to occur on the Island, namely *Ampulex amoena* Stål, *A. seitzii* Kohl, *A. difficilis* Strand, *A. kurarensis* Yasumatsu, *A. esakii* Yasumatsu, *A. sonani* Yasumatsu, *Trirhogma caerulea* Westwood, *Dolichurus abbreviatus* Strand and *D. leioceps* Strand.

During the two months of my stay in Formosa, from July to September, 1966, I could collect 8 species of Ampulicidae. Further, I could find 4 species of this family, including 2 species common to those of my collection, among the specimens sent to me for study from the Kyushu University. Of the 10 species above mentioned 2 species of *Ampulex* and 4 species of *Dolichurus* are considered new to science and one species of *Dolichurus* is new to the fauna of Formosa. In the present paper descriptions and records of the species mentioned are dealt with.

1. *Ampulex amoena* Stål, 1857

*Ampulex (Rhinopsis) amoena*: Strand, Arch. Naturg., Abt. A, 1913 (7): 152, 1913.

*Ampulex novaruae*: Sonan, Trans. Nat. Hist. Soc. Formosa, 14 (74): 81, 1924.

*Ampulex (Rhinopsis) amoena*: Sonan, Ibid., 17 (89): 136, 1927.

*Ampulex amoena*: Yasumatsu, Tenthredo, 1 (2): 170, 1936. (With literature)

*Specimens examined*: 5 ♀♀ 44 ♂♂, Taipei Pref. (Wulai), 4, 6. VII. 1966; 3 ♀♀ 13 ♂♂, Taoyuan Pref. (Yangmei), 6. VII. 1966; 2 ♀♀, 33 ♂♂, Ilan Pref. (Tsukeng), 20. VIII. 1966; 1 ♀ 5 ♂♂, Nantou Pref. (1 ♀ 1 ♂, Puli, 8. VII; 4 ♂♂, Lihyuehtan, 24. VIII.), 1966.

*Remarks*. As seen from the list of the specimens above given we can find this species only in the northern half of the Island. Whether this represents the true feature of the present distribution of the species, or merely a seasonal peculiarity we can not say. But the fact that among the specimens hitherto recorded there is only one male captured in the southern half of the Island (Kao-Hsiung, by Sauter), all others being from the region lying middle to north of the Island, seems to support the first assumption. Further detailed study will be needed.

2. *Ampulex denticollis* sp. nov.

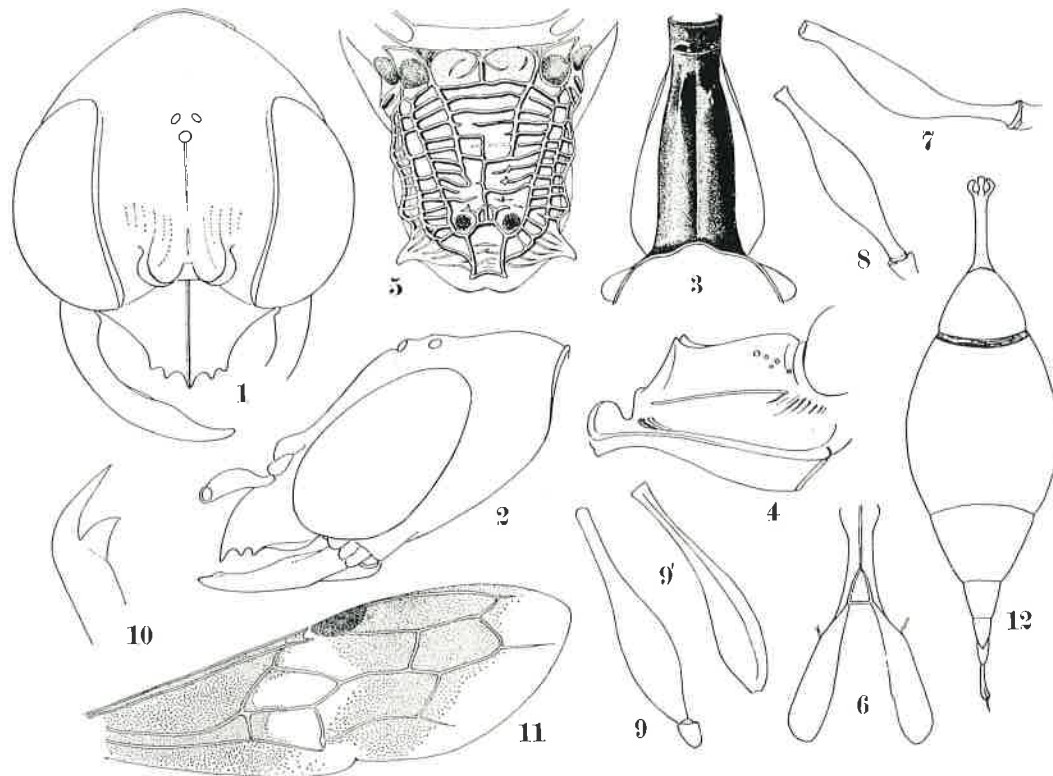
This species (♀) resembles European *A. fasciatus* in being black in colour, in possessing the finely granulated head and thorax, similar general characters of the head, fasciated fore wings etc., but can easily be separated from it by the bidentate collar of the pronotum and the duplicately punctured frons and thorax.

♀. Length about 12 mm. Black, mandibles (basal half externally somewhat dark), apical portion of clypeus broadly, basal 7 joints of antennae beneath (above brown to dark brown), apices of coxae, trochanters nearly wholly, base and apex of femora, tibiae externally and their spurs and tarsi beneath ferruginous; supra-coxal expansions of meso- and metapleurons, apical enlarged portion of metasternal plate, apical portion of abdomen and base of front femora ambur-yellow; palpi, humeral angles in part, wing tegulae and tarsi above brown to dark brown; wings darkened, with middle and apical portions only hyaline, thus forming a fasciated maculation.

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Pubescence white, very fine and short, observable in certain light only; but on lower frons on both sides of antennal base, supra-coxal expansions of meso- and metapleurons and caudal area of propodeum dense and appressed, silverily glittering; on hind tibiae internally similar, but golden in colour and with a sharply outlined longitudinal, nearly glabrous stripe within. Head and thorax opaque, propodeum half polished with aeneous shine, abdomen smooth and shining.

Head in front: Fig. 1, ocelli in a somewhat high triangle, distance among them apparently equal, OOD : POD nearly 12 : 4, IOD at anterior ocellus greater than at base of clypeus (ratio 32 : 25) and equal to antennal joint 3 (relatively 31), joint 3 about 7 times as long as broad at apex and less than twice as long as joint 4 (relatively 18), subsequent joints progressively slightly



Figs. 1-12. *Ampulex denticollis* sp. nov., ♀.

1, Head in front, 2, Head in profile. 3, Pronotum from above, 4, Pronotum in profile. 5, Sculpture of propodeum, 6, Metasternal plate. 7, 8 and 9, Front, mid and hind femora; 9' from behind 10, Claw of legs, 11, Fore wing, 12, Abdomen.

reducing in length up to penultimate joint. Frontal median carina present, fine, partly obsolete, inner orbital carina well defined only along the emarginated area, supra-antennal expansions strongly keeled above, the keel shorter than in *A. amoena*, clypeus strongly raised toward the median line and carinated on top, anterior margin 5-dentate, mandibles slender, horizontally slightly undulate, with 2 strong carinae along the inner margin, the anterior one confined to the apical half (Fig. 1). Head in profile: Fig. 2. pronotum from above: Fig. 3, anterior transverse carina on nape region distinct, accompanied with a deep furrow in front, lying more distantly apart from anterior margin than in *A. amoena*, median impressed line on collar also distinct, with a strong tooth on each side of anterior portion, the segment in profile: Fig. 4; mesonotum approximately as long as the distance between the pronotal teeth and its posterior margin,

median lobe slightly broadened anteriorly, median scutal suture in two short glittering lines, postero-lateral corners raised high, nearly rectangular, enclosing a large deep pit within, scutellum and postscutellum combined distinctly shorter than mesonotum, scutellum slightly wider than long, medianly bluntly carinated and with a wide coarsely crenate furrow in front, postscutellum with a median carina more distinct; propodeum with dorsal aspect slightly less than as long as the combined length of mesonotum, scutellum and postscutellum (ratio 50 : 45), but distinctly longer than mesonotum, with sculpture as given in Fig. 5, postero-lateral teeth strongly produced, medio-apical transverse carina also shortly toothed on each side; posterior aspect without distinct lateral carinae; on mesopleuron scrobal suture in a short weak furrow, defined only on posterior portion, precoxal furrow distinct, deep, thorough, crenate, reaching epicnemial furrow and further extended anteriorly, metasternal plate: Fig. 6, with apical expanded lobes oblique, attaching tightly to the under base of hind coxae as in most of the congeners, the lobes much wider than in *amoena*; front, mid and hind femora: Figs. 7, 8 and 9 respectively (all posterior view, 9' dorsal view of hind femur), each metatarsus longer than the following tarsal joints united, claws similar in all legs: Fig. 10. Fore wing: Fig. 11, radial vein with sections 1 and 2 equal in length, cubital cell 2 with inner transverse vein distinctly longer than section 1 of the lower vein. Abdomen (Fig. 12) with petiole as long as tergite 1, tergite 2 approximately as long in middle as wide across middle (ratio 43 : 46), but apparently longer than wide, since lateral margins much longer (Fig. 12), apical portion laterally more strongly compressed than in *amoena* and basal furrow of sternite 2 slightly weaker than in this species.

Head and thorax very minutely and densely punctured, rather granulate, frons further scattered sparsely with medium-sized rounded shallow punctures, the punctures only a few on vertex, clypeus minutely coriaceous, collar of pronotum with lateral longitudinal grooves not crenate, with a few strong punctures on its sides posteriorly, the area below the groove obliquely weakly striate (Fig. 4): mesonotum and scutellum duplipunctate as on frons, the punctures slightly larger, on mesopleuron the punctures much larger, partly confluent, metapleuron and sides of propodeum postero-laterally smooth and polished, the latter dorso-posteriorly transversely coarsely striate, the area enclosed below by an oblique carina branched off from before middle of the outermost carina of the dorsal aspect of the propodeum, the sculpture of the area: Fig. 5, posterior aspect coarsely irregularly reticulate, on its lower portion transversely closely striate. Abdominal tergites finely very sparsely punctured, on sternites punctures somewhat close, mixing much finer points.

♂. unknown.

Holotype: ♀, Chiayi Pref. (Fenchihu), 25. VII. 1966, K. Tsuneki leg.

### 3. *Ampulex alisanus* sp. nov.

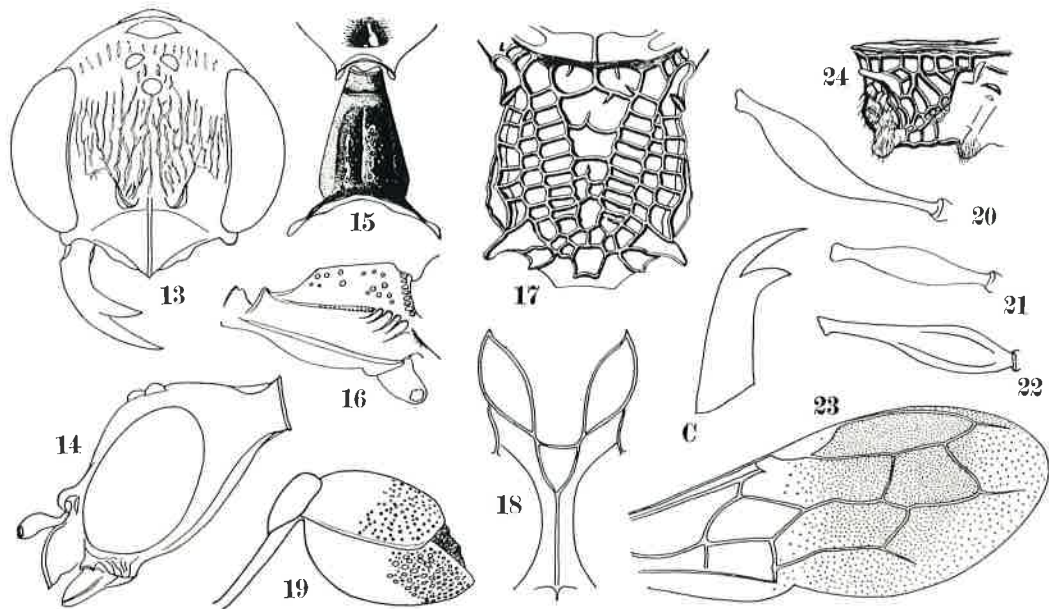
Easily separable from the known species by the combination of the following characters:

Black in colour, a remarkable pit on occiput, short antennal segments, strongly bidentate mandibles, coarsely reticulated mesothorax, coarsely punctured abdomen. Structurally this species somewhat resembles the preceding *denticollis*, but is easily distinguished from it by the general punctuation of the body and non-dentate collar of pronotum.

♂. Length about 8 mm. Black, mandibles with apical third and articulations of legs ferruginous to pale brown; antennae in part beneath, wing tegulae, tibial spurs, tarsi apically dark brown. Wings hyaline, fore wing with a broad pale-brownish fascia at about third from apex. Pubescence on body and legs comparatively long and sparse, silvery in colour, on dorsal aspect slightly darkened, on lower frons, posterior margin of humeral angles, dorso-posterior corners of mesopleura, supra-coxal expansions of meso- and metapleurons and coxae above dense and glitter-

ing.

Head in front: Fig. 13, minimum interocular distance on vertex and at base of clypeus relatively 29 and 26, width of occiput under the same scale 18, occiput with a large deep impression medianly in front of posterior margin, OOD : POD = 11 : 4, frontal medial carina among other frontal striae, supra-antennal lobes with oblique carina strong and high, clypeus convex, with anterior margin triangular, disc medianly strongly carinated, the carina produced at the anterior margin into a tooth, mandible (Fig. 13) with a large tooth on inner margin. Head in profile: Fig. 14. Antenna with scape slightly deformed, length ratio of joints 3, 4 and 5 approximately 16, 12 and 10, joint 3 nearly 3.5 times as long as wide at apex. Pronotum from above: Fig. 15, on nape area with a deep transverse furrow, accompanied posteriorly with a strong carina, more distantly apart from anterior margin than in *amoena*; the segment in profile: Fig. 16, without



Figs. 13-24. *Ampulex alisanus* sp. nov., ♂.

13, Head in front. 14, Head in profile. 15, Pronotum from above. 16, Pronotum in profile. 17, Sculpture of propodeum. 18, Metasternal plate. 19, Abdomen in profile. 20, 21, 22, Front, mid and hind femora. 23, Fore wing. 24, Propodeum in profile (right side). C, Claw of legs.

teeth on dorsal aspect, mesonotal furrows and mesopleural precoxal furrow both considerably obscured by the very coarse reticulated sculpture, postero-lateral pits on mesonotum large and deep, with external ridges markedly raised; propodeum slightly less than as long as the combined length of mesonotum, scutellum and postscutellum (38 : 45), the structure (Fig. 17) similar to that of the preceding species; metasternal plate (Fig. 18) also similar, but with apical large lobes much shorter and the triangular space at their base much broader than in *denticollis*. Abdomen with petiole longer than tergite 1, posteriorly slightly widened, tergite 2 somewhat wider than long (39 : 35), tergite 3 only gently convex (approximately flattened), with outer margin semicircular and enclosed by the highly raised ridge of the apical margin of sternite 2 which is large and strikingly roundly convex (Fig. 19, lateral view), with a deep intersegmental furrow in front. Front, mid and hind femora (posterior view): Figs. 20, 21 and 22 respectively, all metatarsi slightly but distinctly longer than the following tarsal joints united. Claw: Fig. C. Fore wing



venation: Fig. 23, abscissae of radial vein with length relation:  $1 > 2 > 3$ .

Clypeus minutely and closely punctured, punctures in part transversely rugosely confluent, frons longitudinally coarsely striate, the striae more or less irregularly undulate and with a few short branches reaching the next striae, also with a few large shallow, rather indistinct punctures scattered among them, the striae extended further upwards, with the exception of the smoothed oculocellar areas, to vertex where mixed with more distinct punctures; occiput finely closely, in part transversely rugosely punctured, temples below transversely coarsely striate, punctuation of pronotum as given in Figs. 15 and 16, strong and coarse, but not numerous and close, mesonotum, scutellum and mesopleuron very coarsely strongly irregularly reticulate, postscutellum medianly somewhat coarsely, longitudinally rugoso-striate; sculpture on dorsal aspect of propodeum: Fig. 17, on the side (right): Fig. 24, posterior aspect coarsely reticulate. Abdomen with petiole smooth and polished, tergite 1 sparsely scattered with medium-sized, deep, distinct punctures, sometimes mixed with a few larger ones, intervals shining, tergite 2 similarly punctured, but the punctures generally larger, stronger and with more or less smaller ones, tergite 3 very coarsely irregularly reticulate, with intervals minutely wrinkled, sternite 2 more closely, strongly punctured, punctures larger, partly confluent and interspaces scattered with minute points.

♀. Unknown.

Holotype: ♂, Chiayi Pref. (Shitzulu), 27. VII. 1966, K. Tsuneki leg.

Paratype: 1 ♂, the same as above, T. Tano leg.

#### 4. *Trirhogma caerulea* Westwood, 1840

*Trirhogma caerulea*: Strand, Arch. Naturg., Abt. A, 1913, 7: 156, 1913.

*Trirhogma caerulea*: Yasumatsu, Tenthredo, 1 (2): 215, 1936 (with literature).

*Specimens examined*: 1 ♂, Chiayi Pref. (Chuchi), 12. IV. 1965, Y. Hirashima leg.; 4 ♂♂, Chiayi Pref. (Chuchi), 20, 21. VII. 1966, K. Tsuneki leg.; 1 ♂, Nantou Pref. (Puli), 25. VIII. 1966, K. Tsuneki leg.

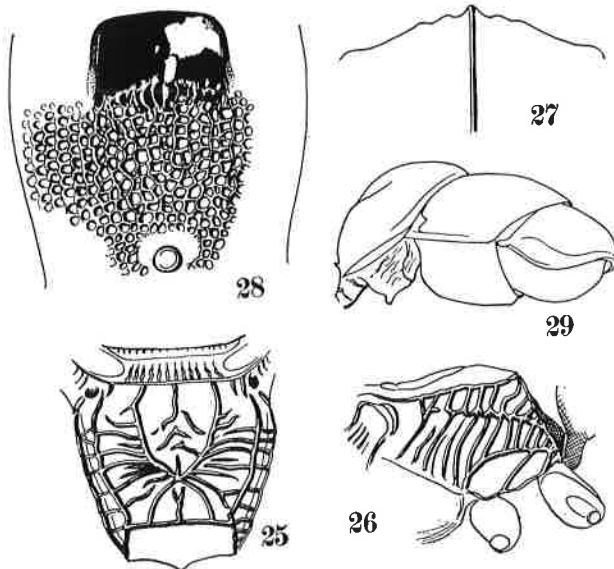
#### 5. *Dolichurus abbreviatus* Strand, 1913

*Dolichurus abbreviatus* Strand, Arch. Naturg., Abt. A, 1913, 7: 154, 155, 1913 (♂, ♀).

*Dolichurus abbreviatus*: Yasumatsu, Tenthredo, 1 (2): 221, 1936.

*Specimens examined*: 1 ♂, Taipei Pref. (Yangmingshan), 28. III. 1965, Y. Hirashima leg.; 1 ♀, Nantou Pref. (Penpuchi), 28. VIII. 1966, K. Tsuneki; 1 ♀, Chiayi Pref. (Fenchihu), 26. VII. 1966, K. Tsuneki leg.

*Remarks*. According to the original description (♂): "... Mesonotum und Scutellum spärlich und seicht punktiert". In the male specimen examined punctures on the segment are medium-sized, slightly longitudinally elongate and fairly strong. (2) "Mittelsegment oben matt", but here the areaglistening. (3) "Das subtrianguläre Mittelfeld von querverlauf



Figs. 25-29. *Dolichurus abbreviatus* Strand, ♂. 25, Propodeum from above. 26, Propodeum in profile. 27, Clypeus. 28, Frontal lemella and sculpture on frons. 29, Abdomen in profile.

ende gebogene, mehr oder weniger unterbrochene Rippen einschliessend". This well agrees with the sculpture of the specimen (Fig. 25). However, the sculpture differs from the interpretation and the figure given by Yasumatsu (1963). In other place Yasumatsu says "clypeus without a median carina (Strand: Clypeus... so dicht behaart, dass die Struktur nicht leicht erkennbar ist.>"). In the present specimen, however, the median carina quite distinct and the anterior margin, different from the figure of Yasumatsu, not simply rounded (Fig. 27). The undulated structure is based on the fact that the anterior margin strongly incrassate and, seen from beneath, constitutes a horizontal face and longitudinally thickly striate, the end of each stria forming a blunt tooth at the anterior margin.

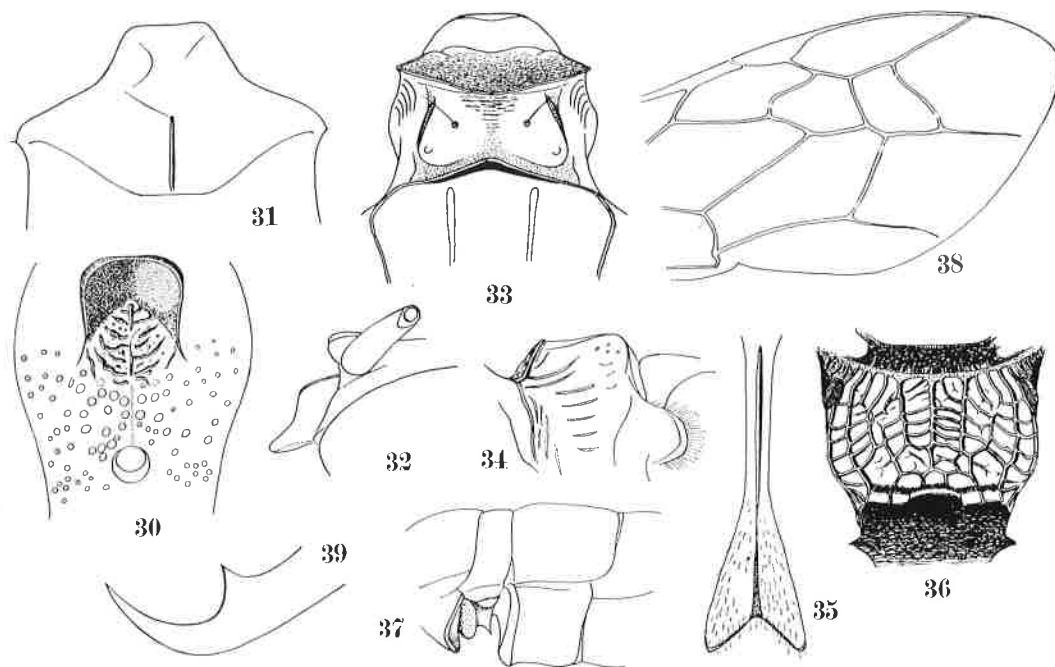
Frontal lamella and the sculpture on the area above this: Fig. 28 (in the females similar). Sculpture on the side of propodeum: Fig. 26. Structure of abdomen in the lateral view: Fig. 29 (notice the process at the apical margin of sternite 1). Wing venation as given by Yasumatsu except that the first transverse cubital vein with a short branch toward the first cubital cell at its bending point, a third from base.

#### 6. *Dolichurus formosanus* sp. nov.

♀. Somewhat resembling *D. leioceps* Strand, but differing from it in having the clypeus medianly distinctly carinate and more highly raised at the base, frons sparsely but rather grossly punctured, pronotum shorter and latero-posteriorly distinctly tuberculate and mesopleuron not granulate, but irregularly distinctly rugoso-reticulate. This species is more closely allied to *D. amamiensis* Tsuneki et Iida, but the clypeus at base more highly raised, frontal lamella with lateral margins subparallel and pronotum much shorter and broader. This species is considered to resemble also *D. taprobanae* Smith, but from the descriptions hitherto given relating to this species we can not have confidence to identify both the species. At least, however, the present species differs from *taprobanae* in that the face is not longitudinally rugulose.

Length 8.0 (paratype 6.5) mm. Black, mandibles apically and articulations of legs reddish brown. Wings hyaline, very faintly fuscous. Head seen in front, in profile and from above similar to that of *D. amamiensis* (Tsuneki, 1964, Figs. 1, 3 and 4), except the form of the lamella and the convexity of the clypeus. IOD on vertex slightly less than as great as at base of clypeus (ration 26 : 33), structure of ocelli as in *amamiensis*, lens not occupying whole the convexed area of each ocellus, OOD : POD (as lens taken ocellus) = 8 : 6, lamella in vertical view: Fig. 30, clypeus in frontal and lateral view: Figs. 31 and 32, with basal 2/3 highly convex and medianly distinctly carinate, temple in profile about 2/5 the width of eye, relative length of antennal joints 3, 4, 5 and 8 about 23, 19, 19 and 13, ratio of length to width at apex of joints 3, 4 and 8 approximately 5.3, 4.4 and 3.2. Pronotum from above: Fig. 33, in profile: Fig. 34, anterior aspect flattened, with a weakly swollen area near each side and distinctly carinated at the posterior margin bordering on the dorsal aspect, this latter anteriorly gently inclined toward median furrow, posteriorly lunately depressed, the depression forming the posterior outline of the large postero-lateral tubercles (Fig. 33). Median lobe of mesonotum with lateral furrows slightly divergent anteriorly, scutellum not raised in middle; metasternal plate: Fig. 35, medianly from base to about middle strongly carinate, the areas on both sides of the carina markedly depressed. Propodeum: Fig. 36, posterior aspect with lateral teeth strong and situated about 2/3 from apex. Abdominal sternites 1 and 2: Fig. 37. Venation of fore wing: Fig. 38. Claw of legs: Fig. 39.

Distribution of long stiff hairs (such as with a large puncture at base) on mandibles, clypeus, frons, pronotum and scutellum as in *amamiensis*. Clypeus practically impunctate, polished, lower frons on each side of antennal sockets finely closely punctured with hair-bearing points, lamella



Figs. 30-39. *Dolichurus formosanus* sp. nov., ♀.  
 30, Frontal lamella and sculpture on frons. 31, Clypeus. 32, Head (anterior portion) in profile. 33, Pronotum from above. 34, Pronotum in profile. 35, Metasternal plate. 36, Propodeum from above. 37, Abdomen (in part) in profile. 38, Fore wing. 39, Claw of the legs.

apically impunctate, with feebly raised area on each side of medial depressed line, posteriorly feebly carinate in middle, the carina partly interrupted, the surface on both sides of the carina uneven, with a few oblique irregular rugae, mixing coarse rounded punctures upwards; frons with a feeble median impressed line in front of anterior ocellus, on each side up to inner orbits sparsely scattered with large punctures, more or less different in size, on vertex punctures slightly finer and sparser, temples practically impunctate. Pronotum on anterior aspect transversely finely closely rugulose, on dorsal aspect medianly in part transversely indistinctly rugulose and covered sparsely with very minute and very weak hair-bearing points, but the surface shining, on lateral aspect longitudinally sparsely striate in middle (Fig. 34). Mesonotum with sparse fine weak punctures as on pronotum, scutellum except the medial area more distinctly, fairly closely punctured, postscutellum very minutely irregularly rugulose, mat, with a few strong longitudinal rugae on posterior margin; on mesopleuron epimeral area smooth, only very finely weakly punctured, episternum coarsely irregularly rugoso-reticulate, main trend of rugae longitudinal; propodeum as given in Fig. 36, its posterior aspect on upper portion longitudinally, then obliquely striate, remaining area mainly transversely, irregularly rugulose, apparently rugulose-reticulate, with interspaces very minutely wrinkled, sides of the segment longitudinally fairly closely rugoso-striate. Abdomen smooth and polished, with tergites laterally finely punctured, punctures on sternites slightly larger, sparser, sternite 2 posteriorly with a row of large shallow, longitudinally lengthened, not well outlined punctures or impressions.

♂. Unknown.

Holotype: ♀, Chiayi Pref. (Mt. Ali, about 2300 m), 9. IV. 1965, T. Shirozu leg. (Coll. Kyushu Univ.).



Paratype: 1 ♀, the same place and date, T. Shirzu leg.

*Remarks.* The paratype is slightly different from the holotype in that the dorsal aspect of the pronotum is only very feebly impressed medio-anteriorly and that the general sculpture of the segment is very much weaker.

#### 7. *Dolichurus shirozui* sp. nov.

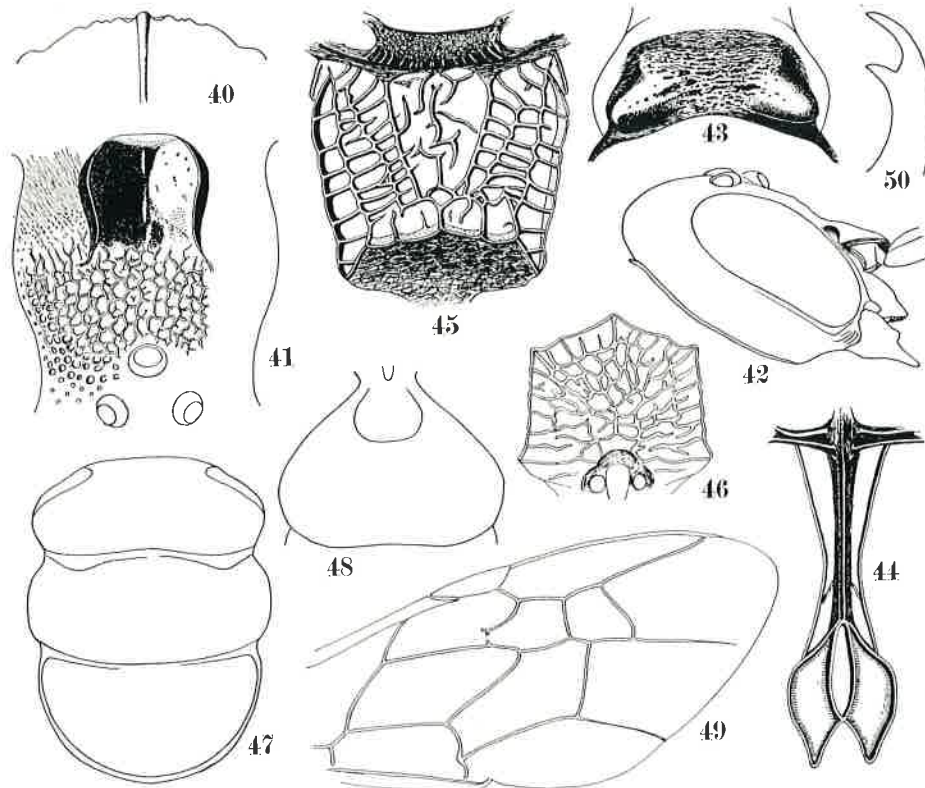
♂. Apparently similar in many characters to *D. abbreviatus* Strand, but is much larger, legs wholly black, with frontal lamella longer and fringed with white, punctures on mesonotum finer, less strong, sculpture on dorsal aspect of propodeum and the venation of fore wing otherwise and the medio-apical process of sternite 1 not so strong.

Length about 8 mm. Black, mandibles with a brownish fleck near apex, palpi, tibial spurs and wing veins partly brown to dark brown; wings hyaline, veins largely black. Pubescence on clypeus, base externally of mandibles, lower frons on both sides of frontal lamella, posterior margin of humeral angles long, close and white; similar but somewhat sparser pubescence on temples below, sides of thorax and propodeum, all coxae and front and mid femora; hairs on vertex and dorsal side of thorax slightly brownish grey.

Head in front with inner orbits roundly emarginate as usual, minimum IOD below and above relatively 42 and 38; clypeus (Fig. 40) strongly raised toward median line, with a stout carina on top, which is produced as a central tooth among others on anterior margin, all these are the end-points of the longitudinal carinae beneath the incrassate anterior margin. Pronotal lamella (Fig. 41) with the surface inclined toward the medial line, with the lateral margins approximately as great in length as the distance between their upper ends and the anterior ocellus, its width at base more than as great as the distance from its base to inner orbit; ocelli with lens not filling whole the convexed area, in a slightly low isosceles triangle, OOD : POD (measured upon the lens) nearly equal (10 : 9), vertex on latero-posterior areas of postocelli markedly impressed and ocelli markedly inclined externally, temples seen from above more roundly swollen out than in *abbreviatus*, seen in profile (Fig. 42) about 2/3 the width of eye, antennal joints 3, 4 and 5 with relative length 22, 25 and 25, joint 3 approximately 3.3 times as long as wide at apex, each joint slightly bent. Pronotum (Fig. 43) somewhat similar in structure to *abbreviatus*, comparatively short and broad, with tubercles strongly produced, anterior aspect not separated from the dorsal aspect by a bordering carinated ridge, antero-lateral vertical ridges with medial protuberance much less developed, not produced in a tooth seen from above; mesonotum with scutal furrows parallel, scutellum similar in form to that of *abbreviatus*, but the transverse furrow at base slightly narrower than in this, mesopleuron with epimeral area swollen, scrobal suture in a broadly impressed line, indistinctly outlined, anterior oblique furrow distinct, broad, coarsely crenate, precoxal furrow feeble (in *abbreviatus* deep and distinct), metasternum: Fig. 44. Propodeum with dorsal aspect as long as combined length of scutellum and postscutellum (in *abbrev.* slightly longer), median carina interrupted and apparently without it, others on one side 4 in number (Fig. 45), posterior aspect clearly margined on sides and upper margin by 4 straight carinae (Fig. 46), with a weak tooth at the lower end of each lateral carina. Abdomen 3-segmented (Fig. 47), tergite 1 antero-laterally slightly depressed and at base flattened (Fig. 48), sternite 3 with marginal area forming a distinct rounded angle with the convexed disc, on apical region broad, first flatly extended and then roundly reflected at apex. but without any bordering furrow or fold between the disc and marginal area. Fore wing venation: Fig. 49, claws of legs: Fig. 50.

Frons coarsely rugoso-reticulate (Fig. 41), on sides of lamella finely closely punctured, lamella smooth and polished, vertex and occiput sparsely, rather finely punctured. Pronotum on anterior,

aspect transversely finely closely striate, intervals scattered with small punctures, dorsal aspect medianly transversely rather coarsely punctate-striate, tubercles smooth and polished, with a few scattered punctures on anterior portion (Fig. 43); mesonotum and scutellum finely and sparsely punctured, postscutellum longitudinally rugulose, mesopleuron on subalar epimeral area finely punctured, punctures somewhat closer than on mesonotum, on other area anteriorly finely, posteriorly and ventrally closely and more coarsely punctured, partly confluent, metapleuron upwards with a few strong longitudinal carinae. Sculpture on dorsal aspect of propodeum: Fig. 45, posterior aspect (Fig. 46) medianly rugoso-reticulate, the rugose striae radiating towards marginal carinae,



Figs. 40-50, *Dolichurus shirozui* sp. nov., ♂.

40, Clypeus, 41, Frontal lamella and sculpture on frons, 42, Head in profile, 43, Pronotum from above, 44, Metasternal plate, 45, Propodeum from above, 46, Posterior aspect of propodeum, 47, Abdomen from above, 48, First tergite seen in front, 49, Fore wing, 50, Claw of legs.

with intervals minutely weakly wrinkled (the sculpture not well visible owing to the close hairs), sides of the segment very coarsely strongly obliquely striate. All the surface of propodeum shining. Abdominal tergites rather closely punctured with medium-sized rounded well outlined punctures, punctures on each segment basally close and apically sparse, sternite 2 much more closely punctured with somewhat larger punctures, sternite 3 on medio-basal area longitudinally and moderately closely, on the remaining area transversely somewhat arcuately, finely, very closely rugoso-punctate (in *abbrev.* simply closely punctured, only on periferal narrow area more coarsely rugoso-punctate).

♀. Unknown.

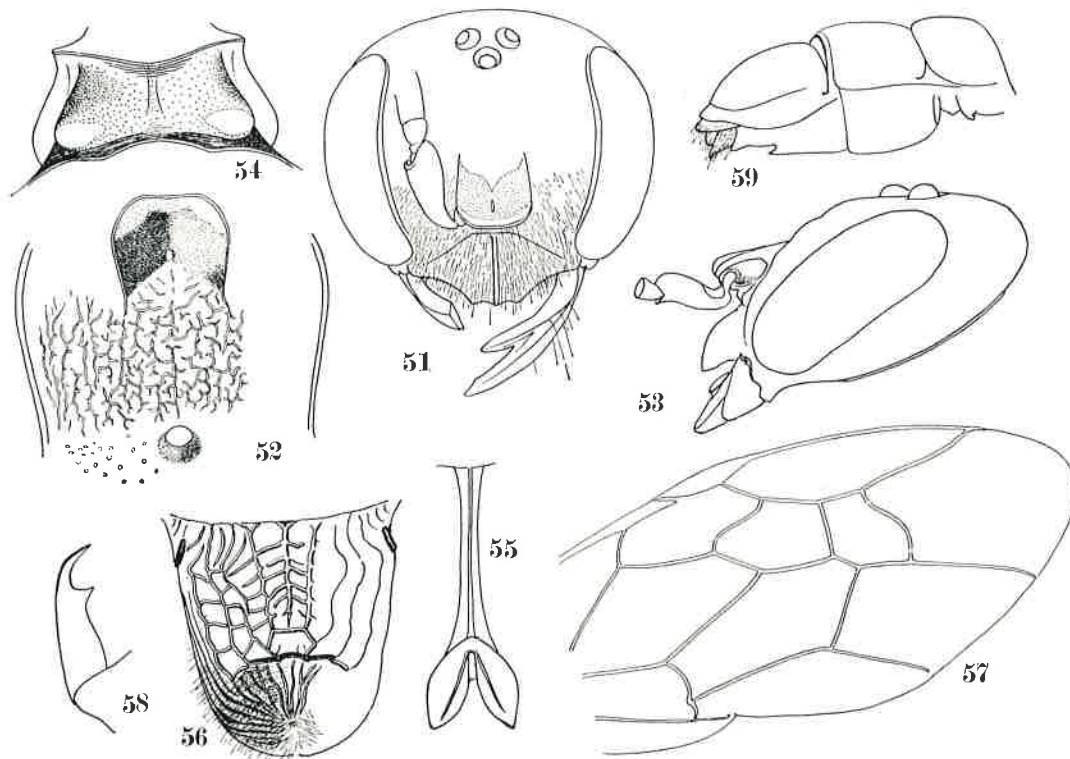
Holotype: ♂, Nantou Pref. (Penpuchi), 26. V. 1965. T. Shirozu leg. (Coll. Kyushu Univ.).

8. *Dolichurus puliensis* sp. nov.

♂. Closely allied to *D. shirozui*, but is much smaller, with clypeus somewhat different in form, lamella less thick and more open, inner orbits as a whole divergent upward, hence proportion of IOD to antennal joint 3 and of OOD to POD much larger, pronotum having a tooth on each antero-lateral corner half way down the side, propodeum different in sculpture, sternite 3 with a very distinct transverse fold before apex. Further, this species is characteristic in having a milky-white patch on the top of tubercles of pronotum and wholly white tibial spurs, together with white fringe of frontal lamella.

Length 5.5 mm. Black, anterior margin of frontal lamella, all tibial spurs white, a patch on top of each tubercle of pronotum semitransparent white; mandibles on apical half ferruginous, palpi apically, tegulae of wings, articulations of legs brown. Antennal flagella, palpi basally dark brown, tarsi of legs more or less brownish. Wings hyaline, apical margin narrowly and weakly clouded. Hairs with general distribution normal, somewhat closer and each hair thicker than usual, in some area (e. g. propodeum) concealing surface sculpture; on head, thorax and legs comparatively long, fairly abundant, hoary white; on vertex, pronotum and mesonotum in part brownish, on lower frons at the sides of lamella and clypeus dense and appressed.

Head in front: Fig. 51, IOD on vertex greater than at clypeus (ratio 29 : 24, approximately 6 : 5) and more than as great in length as antennal joints 3+4, OOD : POD (lens as base) = 10 : 5, lamella in vertical view: Fig. 52, with surface gently inclined toward medial line, clypeus:



Figs. 51-59. *Dolichurus puliensis* sp. nov., ♂.  
51, Head in front. 52, Frontal lamella and sculpture of frons. 53, Head in profile.  
54, Pronotum from above. 55, Metasternal plate. 56, Propodeum from above. 57,  
Fore wing. 58, Claw of legs. 59, Abdomen in profile.

Fig. 51, fairly strongly convex on median lobe, with a distinct carina on top, mandible as given in Fig. 51; head in profile: Fig. 53, temple above about 2/3 the width of eye, antennal joints 3, 4 and 5 similar in length to each other, with relative length 13, joint 3 3.2-times as long as wide at apex. Pronotum: Fig. 54, medial impression weak, postero-lateral tubercles quite marked, with a distinct bordering carina between anterior and dorsal aspects, the carina running down along antero-lateral corners and swollen out half way, appearing like a blunt tooth in the dorsal view; mesonotum with scutal furrows parallel, on mesopleuron epimeral area convex, with a bordering carina against the lower episternal area, metasternum: Fig. 55. Propodeum (Fig. 56) with dorsal aspect as long as mesonotum or scutellum and postscutellum united, with medial 3 carinae distinct as the area glabrous, while outer 3 not well visible owing to weakness of the carinae and comparatively long appressed hairs, posterior aspect with upper carina transverse and medianly broadly depressed, with lateral carinae very weak, almost lacking, the lateral teeth weak, defined only as a particular swelling of one of the carinae. Wing venation: Fig. 57, tarsal claw: Fig. 58. Abdomen with tergite 3 provided with broad impunctate marginal area, on apical region flattened, forming a distinct angle with the convexed disc, sternite 1 with medio-apical triangular process, half-raised, apex narrowly truncate, sternite 2 basally furrowed as usual (Fig. 59), sternite 3 also convex, with apical margin lunately flattened, the border distinctly folded over (Fig. 59).

Frons above the lamella irregularly rugoso-reticulate (Fig. 52), main rugose-striae run longitudinal, especially marked on the sides; lamella basally roughly but not strongly wrinkled, apically minutely uneven, but well shining, vertex minutely, very shallowly, rather indistinctly punctured, punctures in part fairly close, but the surface highly polished, temples practically impunctate. Pronotum on anterior aspect transversely feebly rugulose, the rugose area extended upward to anterior portion of dorsal aspect, sides of pronotum with about 6 strong longitudinal striae on posterior portion; punctures on mesonotum irregular in size, a few larger ones considerably strong, the minute, more or less close ones very weak, rather indistinct, mesopleuron with epimeral area smooth and polished, remaining area irregularly rugoso-reticulate, main trend of rugae oblique or rather transverse, metapleuron above with about 4 longitudinal striae, below 2-3 of the similar striae. Sculpture on dorsal aspect of propodeum: Fig. 56, posterior aspect with the striae radiating, from middle below transverse, strong and continued to the longitudinal striae of the sides of the segment. Abdominal tergites strongly closely punctured, punctures deep and progressively slightly closer toward apex, on 1 intervals slightly larger than width of punctures, on 3 slightly smaller, and further, transversely in rows, mixing very fine transverse striae between. Punctures on sternite 2 as on tergite 2, on sternite 3 apically mixing finer arcuate striae, marginal area finely closely rugoso-striate, the striae medianly weak.

♀. Unknown.

Holotype: ♂, Nantou Pref. (Puli), 8. VII. 1966, K. Tsuneki leg.

Paratype: 2 ♂♂, the same place, 11. VII. 1966, T. Tano leg.

#### 9. *Dolichurus maculicollis* sp. nov.

♂. Resembling the preceding species in that the frons above the lamella reticulate, clypeus medianly thoroughly carinate, IOD less great at clypeus than on vertex, pronotum white maculated on top of tubercles, sternite 3 folded near apex etc., but differs from it in having clypeus incrassate on anterior margin, lamella semicircular, mesopleuron almost smooth and polished, pronotum otherwise sculptured, cubital cells 2 and 3 of fore wing subequal in size and tibial spurs pale brown.

Length about 6.2 mm. Black, anterior and lateral margin of clypeus except base ivory

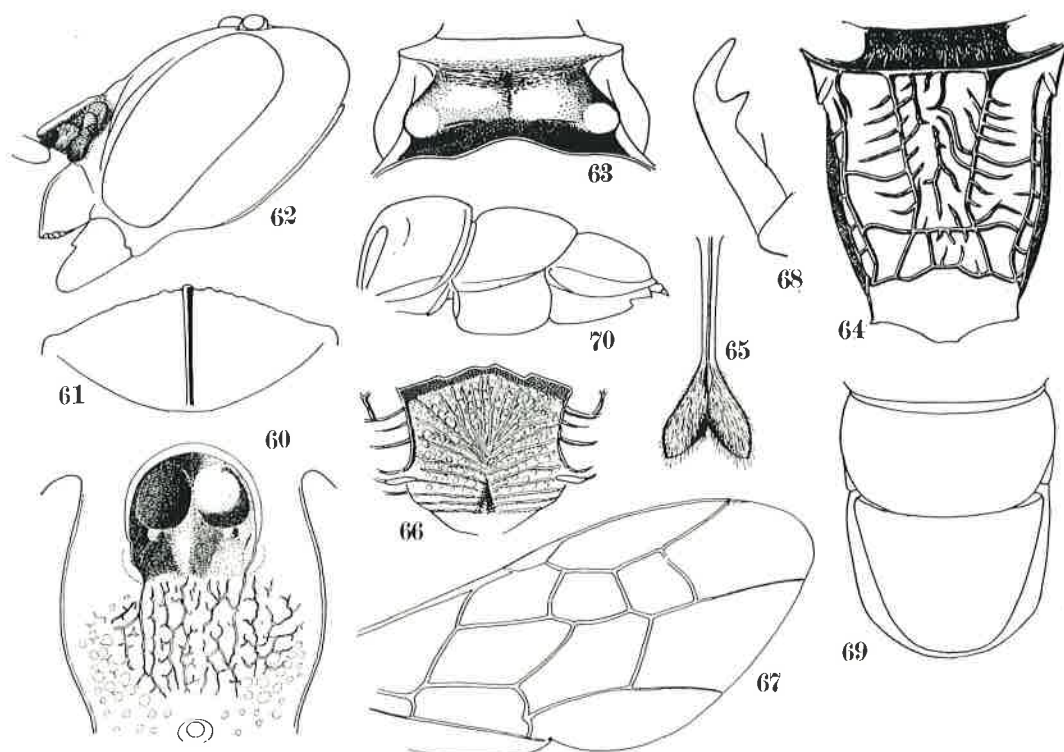


white, top of tubercles of pronotal collar white; mandibles apically, palpi, front tibiae on inside, front tarsi largely, ferruginous; tibial spurs pale, articulations of legs deeper- and antennal flagella beneath dark-brown. Wings hyaline, apically slightly darkened, stigma and veins dark brown, posteriorly and apically paler. Pilosity normal, but less abundant than in *puliensis*, on lower frons and clypeus close and abundant.

Inner orbits gently emarginate as usual, IOD on vertex subequal to at base of clypeus (relative length 29 : 27), and about as long as antennal joints 3+4, OOD : POD (lens as base) = 9 : 6.5, ocellar region raised, each ocellus markedly inclined externally, lamella in the vertical view: Fig. 60; clypeus: Fig. 61, disc highly convex, medianly distinctly carinate from base to apex, apex produced into a tooth, anterior margin seen from beneath, forming a distinct plate and longitudinally coarsely carinate, the ends of the carinae constitute the serrate structure of the anterior margin; mandibles somewhat more robust than in *puliensis*. Antennal joint 3 slightly shorter than 4, relative length between joints 3, 4, 5 and 8 about 14, 16, 16 and 12, joint 3 approximately 3.3 times as long as wide at apex, from joint 6 apically each joint distinctly bent. Head in profile: Fig. 62, with temple more developed than in *puliensis*, not so strongly tapering downward as in this, about 3/5 the width of eye. Pronotum: Fig. 63, with the bordering carina between anterior and dorsal aspects indistinct, median impressed line weak but distinct, posterior area depressed as usual; mesonotum with scutal furrows deep and parallel, median raised area of scutellum quadrate, mesopleuron with epimeral area markedly incrassate and raised high above the level of episternum, its lower edge longitudinally bluntly carinate, epicnemial carina high, the furrow deep and coarsely crenate, precoxal furrow fairly deep, weakly crenate, reaching anteriorly the epicnemial carina; metasternum: Fig. 65. Propodeum (Fig. 64) as long as mesonotum, dorsal aspect slightly concave, with 6 longitudinal (without the medial) and 2 apical transverse carinae, outermost of the former located on the side above of the segment, running from behind stigmata directly to the lateral tooth on the posterior aspect of the segment, posterior aspect: Fig. 66, with surface flattened and lateral teeth indistinct, represented by the incrassation of one of the transverse striae at the turning point to the side. Wing venation: Fig. 67, radial vein with section 1 half as long as section 2, sections 2 and 3 subequal and united as long as section 4. Tarsal claw: Fig. 68. Abdominal tergite 3 with disc convex, with marginal area laterally broad and apically narrow (Fig. 69), not horizontally extended, but obliquely inclined at apex (Fig. 70), sternite 2 deeply furrowed at base, disc behind the furrow subconically convex, with a feeble median carina on top, sternite 3 with marginal area distinct and on apical region separated from the convexed disc by a transverse fold (Fig. 70).

Punctures on lower frons and clypeus close, very minute, practically impunctate, lamella smooth and polished, frons above lamella longitudinally rugoso-striate, intervals shallowly punctured, in some light appearing reticulated, its lateral areas rather coarsely but not strongly reticulate; vertex finely sparsely and very shallowly punctured, with surface smooth and shining. Pronotum with anterior aspect of collar transversely weakly rugulose, the rugulose area extended upward to anterior portion of the dorsal aspect, remaining area of the collar very finely sparsely punctured, nearly impunctate; mesonotum and scutellum finely sparsely and feebly punctured, scutellum with a few gross punctures mixed, postscutellum longitudinally coarsely rugose, with intervals minutely, very closely punctured, opaque. Sculpture on dorsal aspect of propodeum: Fig. 64, on posterior aspect: Fig. 66. Abdominal tergites punctured with medium-sized deep punctures, with averaged interspaces nearly as large as punctures, marginal area of tergite 3 laterally with sparse fine points, medianly at apex close fine transverse rugulae, sternite 2 more grossly punctured, punctures partly longitudinally confluent and laterally finer, on 3 arcuately confluent, apically forming rugulae, marginal area of the sternite rugulose, on apical area much weakly so.





Figs. 60-70, *Dolichurus maculicollis* sp. nov., ♂.

60, Frontal lamella and sculpture of frons. 61, Clypeus. 62, Head in profile. 63, Pronotum from above. 64, Propodeum from above. 65, Metasternal plate. 66, Posterior aspect of propodeum. 67, Fore wing. 68, Claw of legs. 69, Second and third tergites from above. 70, Abdomen in profile.

♀. Unknown.

Holotype: ♂, Chiayi Pref. (Chuchi), 20. VII. 1966, K. Tsuneki leg.

#### 10. *Dolichurus amamiensis* Tsuneki et Iida, 1964

*Dolichurus amamiensis* Tsuneki et Iida, Akitu (Kyoto), 11: 41, 1964 (♀).

*Specimens examined*: 2 ♀♀, Nantou Pref. (Puli) 8, 11. VII. 1966, K. Tsuneki et T. Tano leg.; 1 ♀, Chiayi Pref. (Chuchi), 20. VII. 1964, K. Tsuneki leg.

*Remarks*. This species has been known only from the Island of Amami-Ohshima and is new to the fauna of Formosa.

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