SPECIAL PUBLICATIONS

OF THE

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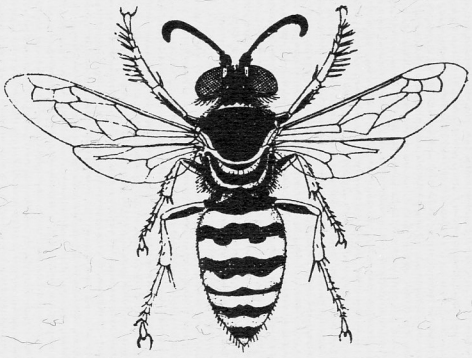
NO. 23



MISHIMA

JULY 31, 1982

SPHECIDAE OF THE SAUTER'S FORMOSA COLLECTION PRESERVED IN THE UBERSEE-MUSEUM AT BREMEN, WITH TAXONOMIC NOTES ON SOME SPECIES (HYMENOPTERA)

By K. TSUNEKI

This is a report of the result of my observations on a short series of the Sphecidae collected by H. Sauter in 1907-08 in Formosa which was turned to me from British Museum (Natural History) to help me with material in connection with my study on the genus Trypoxylon Latreille of East Asia. The specimens belonged mostly to common species, but included a new subspecies of Oxybelus agilis Smith. In relation to Chalybion japonicum (Gribodo) and Sceliphron madraspatanum (Fabricius)that were included in the material I gave some taxonomic notes on these two species occurring in Formosa based upon the rich material of my own collection.

1. Sphex (Sphex) sericeus lineolus Lepeletier, 1845

Sphex (Sphex) sericeus lineolus: Tsuneki, Etizenia, 26: 3, 1967; Ibid., 53: 2, 1971.

Specimens examined: 3 ♀, Taihanroku, 15. VI. 1908; 1 ♀, same place, 27. VII. 1908; 8 ♂, same place, 20. V. 1908; 1 ♂, Koroton, 15. IX. 1907.

Remarks. As to the present name of the localities see Tsuneki, 1977 (Ann. Hist. Nat. Mus. Nat. Hung., 69: 262). This species is common in Formosa.

2. Sphex (Sphex) diabolicus flammitricus Strand, 1913

Sphex (Sphex) flammitricus: Tsuneki, Etizenia, 26: 1, 1967; Ibid., 53: 1, 1971.
Sphex (Sphex) diabolicus flammitricus: Bohart & Menke, World Sphecid., p. 114, 1976.

Specimen examined: 1 ♀, Taihanroku, 15. VI. 1908.

Remarks. This species is also common in Formosa.

3. Sphex (Sphex) argentatus argentatus Fabricius, 1787

Sphex (Sphex) argentatus: Tsuneki, Etizenia, 26: 2, 1967; Ibid., 53: 1, 1971.

Specimens examined: 4 ♀, Takao, 15, 20. IX. 1907, 26. XI. 1907.

Remarks. Also common in Formosa.

4. Isodontia nigella (Smith, 1856)

Sphex (Isodontia) nigellus: Tsuneki, Etizenia, 26: 4, 1967; Ibid., 53: 2, 1971.

Specimens examined: 2 ♂, Koroton, 15. IX. 1907; 1 ♀, Kansirei, 5. VI. 1908; 1 ♂, Kansirei, 14. VI. 1908.

Remarks. Also common.

5. Chalybion (Chalybion) japonicum (Gribodo, 1883)

Pelopoeus japonicus Gribodo, Ann. Mus. Civ. Stor. Nat. Genova, 18: 264, 1883 (♀ ♂, Japan).
Chalybion curvatum Ritsema (nec Smith, 1870), Notes Leyden Mus., 2: 226, 1880 (Japan).
Pelopoeus (Chalybion) punctatus Kohl, Verh. zool bot. Ges. Wien, 38: 155, 1888 (♀, Is. Zanzibar, length 20 mm).
Sceliphron (Chalybion) inflexum Sickmann, Zool. Jahrb. f.Syst., 8: 220, 1894 (1 ♀ 5 ♂, N. China).

Sceliphron ritsemae Dalla Torre, Cat. Hym., 8: 389, 1897.
Chalybion japonicum Pérez, (nec Gribodo), Bull. Mus. Hist. Nat. Paris, 3: 152, 1905 (Japan).
Sceliphron (Chalybion) punctatum: Kohl, Ann. k. k. Nat.-Hofmus. Wien, 32: 61, 1918.
Sceliphron (Chalybion) inflexum: Kohl, Ibid., p. 62, 1918.
Sceliphron (Chalybion) inflexum: Tsuneki, Etizenia, 26: 7, 1967 (♀ ♂, Formosa); Ibid., 53: 7, 1971 (ditto).
Chalybion japonicum punctatum: Bohart & Menke, World Sphecid., p. 103, 1976.

Specimens examined: 2 ♂, Koroton, 15. IX. 1907; 2 ♀, Taihanroku, 15. VI. 1908.

Remarks. As to the relationships of Chalybion japonicum Gribodo and Chalybion inflexum Sickmann I gave a comment in my 1967 paper (see references) and it was confirmed by examination of the types of japonicum Gribodo by J. van der Vecht, and Bohart and Menke (1976) adopted this determination.

However, as to the separation of the Japanese population from those of other regions at the subspecies rank there is a problem. According to my observation there is no morphological difference between them. Degrees of cloudness of the wings are also practically identical. Only a tendency towards larger size is seen in the Japanese population as against the populations of the Ryukyus and Formosa. But here the difference is very slight and admittable only by statistics (Table 1). It is never similar to the case of Ammophila atripes formosana and A. a. japonica. Moreover, if separated, the North-Chinese and the Korean populations must be within the range of japonicum and separated from the southern populations, namely japonicum = inflexum.

Table 1. Body length distribution of East-Asiatic populations of Chalybion japonicum (Gribodo)

Sex	L (mm) / Loco	10	11	12	13	14	15	16	17	18	19	20	21
♂	Formosa	1	-	2	6	17	11	3	4	2	-		
	Ryukyus			-	1	3	-	-	3	1	-		
	Japan				1	-	-	1	1	3	-		
	Korea						1						
	N.China									1			
♀	Formosa							4	5	19	9	1	-
	Ryukyus								-	1	1	-	
	Japan	-	1	-	-	1	1	1	-	1	6	4	
	Korea					-	1	-	-	2	-		

On the other hand, Pelopoeus (Chalybion) punctatum Kohl, 1888 was described with a female specimen from Zanzibar, an island of East Africa. According to the original description it is very similar to Chalybion japonicum, not only in morphological and colorific characters, but also in body length —— 20 mm, the largest size of japonicum Gribodo (see Table 1). Certainly Kohl says in his 1918 monograph of Sceliphron s. l. that S. punctatum dem inflexum fast vollkommen gleicht ....Heute will es mir fast scheinen, als of ein Irrtum bei der Fundortsbezettelung obwalte order eine Nestverschleppung des inflexum stattgefunden hatte.

As to inflexum Sickmann Kohl says that the length in ♀ is 16-20 mm and in ♂ 14-18 mm. While, according to Sickmann (1894) the types of inflexum are 16 mm (♀) and 12-15 mm (♂). But the material observed by him is too scanty, only 1 ♀ and 5 ♂ from Tientsin and its suburbs. I have one female and one male specimens of this species captured by myself in Peking on July 29 and August 1, 1938 which are 20 mm and 18 mm respectively in length (compare with Table 1), showing that the values given by Sickmann are not always the case (the dried specimens of Chalybion spp. are frequently with the gaster not straightly extended, but curved- or bent down, if measured in this state the value of the length becomes much shorter than true).

Chalybion curvatum Ritsema (nec Smith and = ritsemae Dalla Torre) is a complete synonym of japonicum Gribodo, since both are described with the Japanese specimens and

in Japan only a single species of this genus occurs.

The names given to this species thus far are all to the specimens of the Palaearctic Region and not to those of the Oriental. Therefore, if the populations having the averaged smaller body size of the Ryukyus, Formosa and Southern Pacific or Asiatic Regions must be called with a subspecific name a new name is necessary. For such persons I propose the name, taiwanum, but to me it seems that such is utterly unnecessary, since the difference between the Oriental and Palaearctic populations is here not so marked as in other instances. At any rate the application of the subspecies name of punctatum Kohl to the Oriental population is incrrect.

Sickmann pointed out that inflexum can be distinguished from curvatum by the "schmächtigere Gestalt und heller flügel", but these are not always the case. This is proved by the fact that the Japanese hymenopterists since Yasumatsu have called the Japanese specimens of the Chalybion with "inflexum Sickmann".

On Chalybion bengalense of Formosa

Sceliphron (Chalybion) bengalense: Kohl, Ann. k. k. Naturh. Hofmus. Wien, 32: 54, 1918.
Sceliphron (Chalybion) bengalense: Vecht, Zool. Verh. (Leiden), 48: 41, 1961.
Sceliphron (Chalybion) bengalense: Tsuneki, Etizenia, 26: 8, 1967 (Formosa 28 ♀ 64 ♂).
Sceliphron (Chalybion) bengalense: Tsuneki, Ibid., 53: 7, 1971 (Formosa, 17 ♀ 38 ♂).

In Formosa the other species of Chalybion also occurs commonly which is considered to belong to the South Oriental representative, Ch. bengalense (Dahlbom, 1845). The two species are distinctly fifferent from each other as expalined in detail by Kohl (1918) and in my 1967 paper above cited. But the occurrence of bengalense in Formosa is ignored in the Bohart and Menke, 1976.

The Formosan specimens of Ch. bengalense generally well agree in characters with the redescription by Kohl (1918), but in the measurements of IODv:A2:A3 slightly different from his, but well agree with the measurements of the holotype by van der Vecht (1961):

Table 2. Measurements of interocular distance and antennal joints of Chalybion bengalense and Ch. japonicum (♀).

Species & Reporter	HW : IODv		IODv : IODc		IODv : A3 : A4 : A5			
bengalense (Tsun.)	69	25	25	25	25	16	18	17
japonicum (Tsun.)	72	25	25	29	25	16	19	18
bengalense (Kohl)	--	25	25	25	27	16	18	--
bengalense (Vecht)	--	25	25	25	25	16	18	17
bengalense (Kohl)	Dorsal area of propodeum = mesoscutum + postscutellum							
Formosan bengal.	" slightly > " (ratio: 30 : 27-28).							

Formosan specimens of Chalybion bengalense generally well agree in characters with the redescription by Kohl (1918), but in the measurements of IODv:A2:A3 slightly different from his, but well agree with those of the lectotype of this species by J. van der Vecht (1961) (see Table 2).

This species differs from japonicum in the structure of gastral petiole (not so strongly curved), pronotum (median notch weaker), clypeus (elevation slightly weaker), IODs (=IODv:IODc, see Table 2), HW:IODv (see Table 2), tomentosa on mesopleuron and propodeum (more marked) and slightly smaller body size. Further it is much more greenish and less bluish in colour.

6. Sceliphron madraspatanum formosanus Van der Vecht, 1968

Sceliphron (Sceliphron) madraspatanum: Tsuneki, Etizenia, 26: 5, 1967.
Sceliphron madraspatanum formosanum Van der Vecht, Tijds. Ent., 111 (6): 204, 1968.
Sceliphron (Sceliphron) madraspatanum formosanum: Tsuneki, Etizenia, 53: 6, 1971; Tano, Life Study (Fukui), 16 (1-2): 23, 1972; Murota et Tano, Hymen. Comm. (Mishima), 5: 31, 1977.
Specimens examined: 2 ♀ 1 ♂, Koroton, 15. IX. 1907; 1 ♂, 3 ♀ 5 ♂, 1 ♀ 2 ♂,

Takao, 14. IV., 15. IX. and 11. X. 1907.

Remarks. In the Formosan specimens (ssp. formosanum) sometimes the mark on the scutellum is separated in two and rarely very small, but almost all bear the mark on the scutellum (Table 3) and the band on the postscutellum constantly present.

Table 3. Mark on scutellum in the Formosan specimens.

Sex	Large	Small	Lacking	Total
♂	90	7	2	99
♀	89	11	2	102

While, in the Japanese specimens (ssp. kohli) this mark is almost always lacking.

On the other hand, in the Formosan specimens the marks on the propodeum are considerably variable, but in the greater part the segment is without mark, while in the Philippine specimens (ssp. conspicillatum) the marks are well developed. In Figure 5 the variation in maculation of propodeum is presented and in Table 4 their frequency in the specimens from Formosa (main island) and Lan Hsu (Is. of Botel Tobaco) is given.

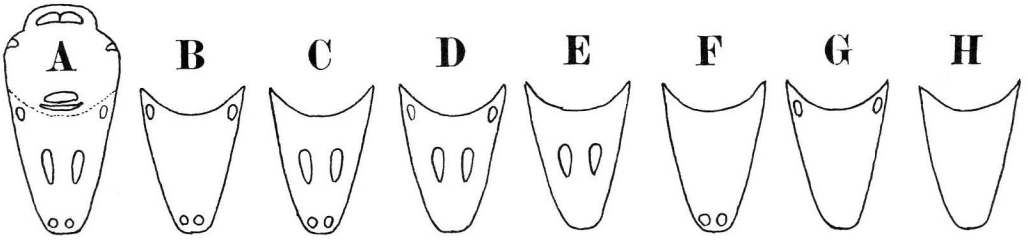


Fig. 5. Variation in maculation of propodeum in the Formosan specimens.

Table 4. Frequency of each type of maculation in the Formosan and Lan Hsu specimens.

Sex	Loco	D.S. \ Type	A	B	C	D	E	F	G	H	Total
♂	Formosa	Bremen M.	-	-	-	-	-	3	-	6	9
		T.M.-T.T.	1	15	1	1	1	8	2	34	63
		Tsuneki	3	8	1	-	1	7	2	24	46
	Lan Hsu	T.M.-T.T	3	7	1	-	1	2	5	27	46
♀	Formosa	Bremen M.	2	-	-	1	-	-	-	3	6
		T.M.-T.T.	5	2	1	-	3	8	5	32	56
		Tsuneki	3	4	2	-	1	4	5	26	45
	Lan Hsu	T.M.-T.T.	6	4	1	-	1	3	1	16	26
♂	Formosa	Sum	7	30	3	1	3	20	9	91	164
♀		Sum	16	10	4	1	5	15	11	77	133
		Total	23	40	7	2	8	35	20	168	297

Remarks. Abbreviation: D.S. Derivation of the specimens. M. Museum. T.M.-T.T. Murota, T. and T. Tano, 1977 (see references).

The insect fauna of Is. of Lan-Hsu or Botel Tobaco is believed by the Japanese entomologists to be close to that of the Philippines. So I particularly inserted the result of the study of Murota and Tano (1977). But in this species the tendency of variation is almost similar to that of the Formosa, not strong at A, but at H as in the population of the main island.

7. Ammophila atripes formosana Strand, 1913

Ammophila basalis: Matsumura (nec Smith), Thous. Ins. Jap., Suppl. 3: 119, 1911.
Ammophila atripes var. formosana Strand, Arch. Naturg., Abt. A, 1913 (3): 85, 1913.
Ammophila clavus: Sonan, Trans. Nat. Hist. Soc. Formosa, 17 (89): 132, 1927 (biol.)
Ammophila clavus: Yasumatsu, Icon. Ins. Jap., Ed. 2: 1473, 1950.
Ammophila atripes: Van der Vecht, Zool. Abh., 48: 39, 1961 (comparison with clavus)
Ammophila clavus taiwana: Tsuneki, Etizenia, 26: 15, 1967 (discussion on relationships between clavus and atripes)
Ammophila clavus formosana: Tsuneki, Ibid., 53: 4, 1971; Tsuneki et IIda, Ibid., 37: 17, 1969 (biol.); Haneda, Life Study, 16 (1-2): 5, 1972; Murota, Ibid., 17 3-4): 116, 1973.
Ammophila atripes formosana: Bohart and Menke, World Sphecid., p. 151, 1976; Murota et Tano, Hym. Comm., 5: 19, 1977; Sabi et al., Ibid., 5: 38, 1977.

Specimens examined: 3 ♀, Koroton, 15. IX. 1907; 1 ♀, Takao, 11. X. 1907.

Remarks. I followed here the determination of Bohart and Menke (1976). But I still have a doubt about the separation of clavus and atripes at the species rank, as I discussed in detail in my 1967 paper. This concept was further strengthened by my study of Trypoxylon schmiedeknechti of the Oriental Region and T. schmiede nechti of the Australian Region, the latter has been considered up to my study as distinct from the former. The reason pointed out by Vecht in his 1961 paper seems to me too weak to separate the species. To me it seems that atripes and clavus are conspecific, only different at the subspecific rank.

8. Pison punctifrons Shuckard, 1837

Pison fabricator: Strand, Arch. Naturg., 79 (7): 164, 1913 (Formosa).
Pison suspiciosus: Sonan, Zool. Mag. (Tokyo), 37 (440): 238, 1925 (do.).
Pison fabricator: Sonan, Trans. Nat. Hist. Soc. Formosa, 17 (89): 136, 1927.
Pison punctifrons: Yasumatsu, Ann. Zool. Jap., 15 (2): 236, 1935; J. Fac. Agr. Kyushu Univ., 10 (2): 145, 1953.
Pison punctifrons: Tsuneki, Etizenia, 22: 20, 1967; Ibid., 54: 19, 1971; Haneda, Life Study (Fukui), 15 (1-2): 31, 1971; Ibid., 16 (1-2): 5, 1972; Murota, Ibid., 17 (3-4): 117, 1973; Hym. Comm. (Mishima), 5: 20, 1977 (all regarding Formosa).

Specimens examined: 2 ♀ 1 ♂, Koroton, 15. IX. 1907.

Remarks. This species is not rare in Formosa.

9. Trypoxylon schmiedeknechti Kohl, 1906

Trypoxylon schmiedeknechti: Tsuneki, SPJHA (Spec. Publ. Jap. Hymts. Ass.), 15: 12, 1981 (list of ref. up to this time, except below).
Trypoxylon subpileatum: Murota, Hymts. Comm., 5: 19, 1971; Sabi et al., Ibid., 5: 39, 1977.
Trypoxylon subpileatum huntnensis: Murota et Tano, Ibid., 5: 32, 1977 (Is. Lan Hsu).
Trypoxylon schmiedeknechti: Tsuneki, SPJHA, 17: 9 (Formosa with the Ryukyus: Is. of Iriomote).

Specimens examined: 5 ♀ 3 ♂, Takao: 2 ♀ 3 ♂, 15. IX. 1907; 3 ♀, 11. X. 1907.

Remarks. This species is very common in Formosa.

10. Trypoxylon formosicola Strand, 1922

Trypoxylon formosicola: Tsuneki, SPJHA, 15: 32, 1981 (list of ref. up to this time except the following:).
Trypoxylon formosicola: Sabi et al., Hymts. Comm., 5: 39, 1977; Tsuneki, SPJHA, 17: 81, 1981 (sspp.); Ibid., 18: 81, 1981 (ssp.); Ibid., 19: 60, 1981.

Specimen examined: 1 ♀, Takao, 11. X. 1907.

Remarks. This species is also common in Formosa.

11. Trypoxylon petiolatum Smith, 1957

Trypoxylon petiolatum: Tsuneki, SPJHA, 15: 30, 1981 (ditto relating to Formosa).

Specimens examined: 5 ♀ 7 ♂, Takao: 4 ♀ 4 ♂, 15. IX. 1907; 1 ♀ 2 ♂, 10. X. 1907; 1 ♂, date unknown.

Remarks. This species has long been recorded under the name, either bicolor or obsonator (see SPHJA, No. 8). It is widely spread over the Oriental Region and eastern parts of Asiatic Continent and Pacific Islands and everywhere common.

12. Dasyproctus agilis (Smith, 1858)

Synonyms after Leclercq, 1972:

Dasyproctus ceylonicus Saussure, 1867; Crabro orientalis Cameron, 1890; Dasyproctus indicus Saussure, 1892; Crabro (Dasyproctus) infuntulus Kohl, 1894; Crabro revelatus Cameron, 1898; Crabro impetuosus Cameron, 1901; Dasyproctus philippinensis Ashmead; Dasyproctus funestus Turner, 1917;

Main references relating to Formosa:

Dasyproctus ceylonicus impetuosus: Tsuneki, Etizenia, 30: 18, 1968 (w. ref.); Tsuneki, Ibid., 51: 24, 1971; Tsuneki, Ann. Hist.-Nat. Mus. Nat. Hung., 69: 298, 1977; Haneda, Life Study, Life Study (Fukui), 15 (1-2): 33, 1971; Ibid., 16 (1-2): 6, 1972; Murota, Ibid., 17 (3-4): 118, 1973; Murota, Hymts. Comm., 5: 21, 1977.

Dasyproctus agilis: Bohart and Menke, World Sphecid., p. 420, 1976; Murota et Tano, Hymts. Comm., 5: 32, 1977; Sabi et al., Ibid., 5: 41, 1977.

Specimens examined: 4 ♀ 3 ♂, Takao: 1 ♂, 15. VIII. 1907; 1 ♀, 15. IX. 1907; 2 ♀, 10. X. 1907; 2 ♂, 15. X. 1907; 1 ♀, date undescribed; Other 1 ♀ 1 ♂ are kept by J. Leclercq.

Remarks. This species is common and abundant in Formosa. The specimens were once examined by Prof. J. Leclercq and each bears the identification label put by him: Dasyproctus agilis orientalis Cam.

13. Oxybelus agilis taiwanus ssp. nov.

Oxybelus agilis Smith, Cat. Hym. Brit. Mus., Pt. 4: 387, 1856 (India).
Oxybelus agilis: Sonan, Trans. Nat. Hist. Soc. Formosa, 30 (196): 21, 1940 (with redescription in Japanese).
Oxybelus agilis: Tsuneki, Ann. Hist.-Nat. Mus. Natn. Mus., 69: 292, 1977 (w. ref., 8 ♀ 8 ♂, Formosa, leg. Sauter, w. suppl. description, figs.).

Specimens 3 ♀ 3 ♂, Takao, 1907.

Remarks. Formosan specimens are considered to form a subspecies and it will be redescribed below in some detail, because the original description is too simple. The present subspecies differs from the nominate species mainly in the colour of legs, antennae, postscutellum and gastral tergite 5.

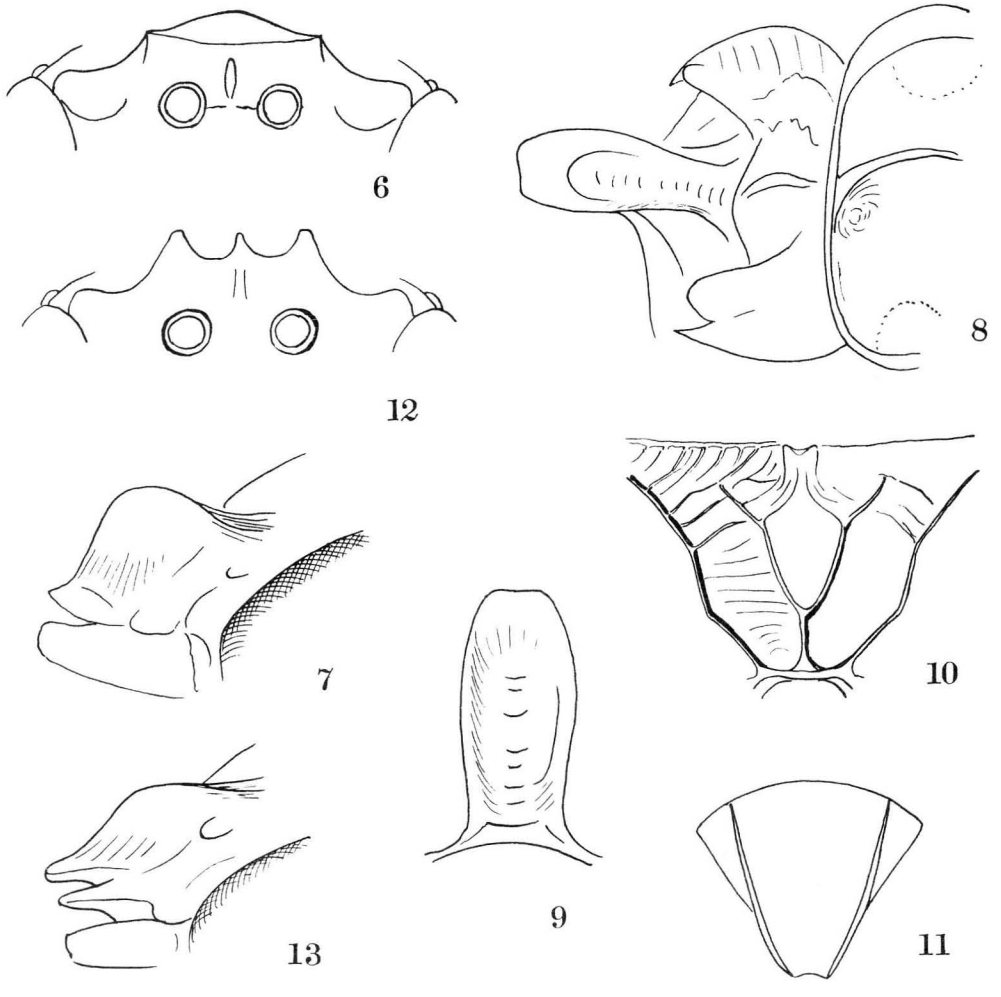
Colour of legs. ♀. Fore tibia except dark brown folded side and sometimes fore tarsus above and always apical joints of all legs yellowish ferruginous (fore and mid femora on apical half beneath and hind tibia at extreme base yellow. ♂. Fore and mid femora on apical 2/3 beneath (broader apically), fore and mid tibiae externally broadly and hind tibia externally on basal half yellow.

Scutellum with lateral yellow marks usually, but sometimes without (♀ ♂), postscutellum always yellow (♀ ♂), gastral tergite 5 usually without lateral marks (♀ ♂), but sometimes with marks in ♂.

In the colour of legs the male of the present subspecies is similar to the Bornean species, O. suluense Pate, but differs from this in the colour of scutellum and especially in the presence of lateral gastral spines; in ♀ markedly differs in the colour of legs and scutellum and in the form of apical margin of the clypeus.

♀. 6-7 mm. Mandible yellow, apical 2/5 dark red, antenna apically reddish ferruginous, more broadly so beneath (but not completely ferruginous as understood from the original description). Other yellow: Collar of pronotum (sometimes interrupted in middle or intermittent), humeral tubercle, a spot on tegula, lateral marks on scutellum (sometimes lacking, according to Sonan), postscutellum, latero-apical margins scutellum and postscutellum, squamae (laterally broadly translucent), large lateral marks on tergites 1-4 (posteriorly gradually smaller).

IOD at vertex across middle of hind ocelli : IOD at middle of frons (minimum) : at lateral ends of clypeus = 30:28:39. Apical margin of clypeus: Fig. 6, median rostrate carina in lateral view: Fig. 7, temporal carina extended upwards above middle of temple, occipital carina graduaaly lowered below and disappears behind mouth. Pronotal collar till tubercles distinctly and acutely edged and carinate, weakly incised in middle, at end of tubercle shortly toothed, but with apex rounded, mesoscutum medianly carinate on anterior 2/5, on posterior margin longitudinally, shortly and very coarsely carinate, the median stronger and longer, scutellum and postscutellum distinctly carinate in middle, the former shortly reflected at lateral and posterior margins (lateral reflected area always translucent yellow), squamae at apex bifid, outer apex horizontal and pointed, inner apex obliquely raised and broadly rounded (Fig. 8), mucro:



Figs. 6-13. Oxybelus agilis taiwans ssp. nov.

6 (♀), 12 (♂): Clypeus. 7 (♀), 13 (♂): Clypeal elevation (lateral). 8: Scutellum - propodeum seen obliquely from above. 9: Mucro. 10: Sculpture of propodeum. 11: Pygidial area (♀).

Fig. 9, medianly deeply furrowed, lateral raised areas translucent pale brown, medial furrow apically broadened, brownish in colour and apical 1/4 translucent. Propodeum in posterior view consists of inner triangular and outer subtriangular areas, the form: Fig. 10, apex of inner triangle broadly roundly concave and smooth, polished and connected at apical middle with a highly raised carina, on both sides of which surface deeply hollowed. On mesopleuron epicnemial carina or omaulus strong and connected below with acetabular carina which is complete and medianly weakly incised, episternal sulcus coarsely foveolate (not marked due to strong whitish hair), state of junction with hyposternal sulcus as usual, scrobal sulcus indistinct, ante-coxal carina gently sinuate, rising till near middle of pleuron, side of propodeum margined below with intercoxal carina which is raised anteriorly and encircling upper base of mesocoxa. Gastral tergites depressed at each apical margin, pygidial area: Fig. 11, apex retuse. Fore tarsal comb consisted of 9 spines, on T1 6, on T1-4 each 1, slightly greater in length than width of T1.

Vertex and frons finely reticulate-punctate, mesoscutum similar but punctures larger, on scutellum much larger, with distinct interspaces, on mesopleuron irregular, mixed with numerous transverse rugosed carinae. Propodeum on dorsal aspect where carinae of inner triangle obsolete, obliquely, somewhat irregularly striate or rugoso-striate with carinae, on posterior aspect below mucro somewhat finely and irregularly reticulate, on other areas transversely, rather closely striate, interspaces minutely, irregular striolate, not polished. Gaster fairly closely and uniformly punctured with medium-sized punctures, setiferous punctures on pygidial area larger, closer, longitudinally elongate and gradually smaller apically, sternite 1 finely, closely, somewhat weakly punctured except apical triangular area where and the following sternites are smooth and polished and scattered sparsely with medium-sized punctures.

♂, about 5 mm. IOD at vertex, in middle of frons and at lateral ends of clypeus= 30,24,46, length from anterior margin of fore ocellus to apex of median tooth of clypeus relatively 41, apical margin of clypeus stoutly tridentate (Fig. 12), medial tooth pointed at apex, in vertical view slightly shorter than lateral, not reaching the line connecting the apices of lateral teeth, seen in profile: Fig. 13. Lateral teeth of gastral tergites 3-6 comparatively strong and pointed, pygidial area slightly wider than long, trapeziformed, with apex roundly emarginate. Punctuation similar to ♀.

Holotype: ♀, Takao, 1907.
Paratypes: 2 ♀ 3 ♂, same.

14. Oxybelus lamellatus bicolorisquama Strand, 1923

Oxybelus lamellatus bicolorisquama: Tsuneki, Etizenia, 30: 27, 1968; Ibid., 51: 28, 1971; Murota, Hymts. Comm., 5: 22, 1977; Sabi et al. Ibid., 5: 41, 1977.
Oxybelus bicolorisquama Strand, Internat. Ent. Zeits., 16 (21): 172, 1923 (Taiwan: Koshun); Sonan, Trans. Nat. Hist. Soc. Formosa, 30 (196): 21, 1940.

Specimen examined: 1 ♀, Takao, 1907.

Key to the Formosan species of Oxybelus

1 Mucro broad, lobiform or pandurate, translucent brown ..... lamellatus bicolorisquama Strand
- Mucro different 2
2 Mucro and squamae not developed (lateral margins of scutellum more strongly expanded than usual, translucent yellow, a small tubercle on baso-medial carina present instead of mucro) ..... lewisi Cameron
- Mucro and squamae well developed, the former elongate, gutterwise excavated, the latter yellow, at apex bifid and twisted 3
3 Pygidial area black or brownish black ..... agilis taiwanus ssp. nov.
- Pygidial area reddish brown or ferruginous ..... nipponicus formosus Tsuneki

15. Bembix formosana Bischoff, 1913

Bembix formosana Bischoff, Deut. Ent. Zeits., 1913 (6): 714, 1913; Tsuneki, Etizenis, 31: 6, 1968 (34 ♀ 50 ♂, Formosa, with ref.); Ibid., 56: 5, 1971 (8 ♀, Formosa); Ibid., 65: 3, 1973 (1 ♀, Ryukyus); Ann. Hist.-Nat. Mus. Natn. Hung., 69: 265,

1977 (3 ♀ 1 ♂, Formosa).

Specimens examined: 20 ♀ 4 ♂, Takao: 3 ♀, 20. VIII., 6 ♀, 20. VIII., 6 ♀, 15. IX., 3 ♀ 3 ♂, 1. X., 1 ♀, 15. X., 1 ♀ 1 ♂, 7. XII. 1907.

Remarks. This species is found on the sandy shore and gregarious in their habitat, but is never "everywhere common".

16. Bembecinus hungaricus formosanus (Sonan, 1928)

Stizus formosanus Sonan, Trans. Nat. Hist. Soc. Formosa, 18 (97): 262, 1928.
Stizus formosanus var. quadrimaculatus: Iwata, Ibid., 29 (189): 171, 1930 (biol.).
Bembecinus hungaricus formosanus: Tsuneki, Etizenia, 31: 6, 1968 (many ♀ ♂, list of ref., main characters and their variation); Tsuneki, Ibid., 56: 5, 1971 (w. additional refs.); Haneda, Life Study (Fukui), 15: 32, 1971; Ibid., 16: 5, 1972; Murota, Ibid., 17: 117, 1973; Tsuneki, SPJHA, 2: 3, 1977 (Botel Tobaco Is.); Ann. Hist.-Nat. Mus. Natn. Hung., 69: 265, 1977 (8 ♀ 5 ♂, Takao, Sauter leg.); Murota et Tano, Hymts. Comm., 5: 32, 1977 (Is. Botel Tobaco); Sabi et al., Ibid., 5: 38, 1977.

Specimens examined: 11 ♀ 4 ♂, Takao: 1 ♀ 2 ♂, 15. VI., 2 ♀ 1 ♂, 15. IX., 1 ♀ 1 ♂, 3. X., 1 ♀, 10. X., 2 ♀, 11. X. 1907. 1 ♀, Koroton, 15. IX. 1907.

17. Bembecinus quadratus Tsuneki, 1976

Bembecinus pacificus Tsuneki, Etizenia, 31: 17, 1968 (nec Turner); Ibid., 56: 6, 1971. Haneda, Life Study, 15: 32, 1971; 16: 5, 1972; Tsuneki, Ann. Hist.-Nat. Mus. Nat. Hung., 69: 265, 1977.
Bembecinus quadratus Tsuneki, Kontyu (Tokyo), 44 (4): 434, 1976 (nom. nov.). Murota, Hymts. Comm., 5: 24, 1977; Sabi et al. Ibid., 5: 38, 1977; Tsuneki, SPJHA, 2: 5, 1977 (variation).

Specimen examined: 1 ♀, Taihanroku, 25. V. 1908.

Remarks. The specimen belongs to the common typical form.

18. Cerceris pictiventris formosicola Strand, 1913

Cerceris novarae var. formosicola Strand, Arch. Naturg., Abt. A, 75 (7): 161, 1913.
Cerceris (Apiratryx) formosicola: Giner Mari, Arb. morphol. taxon. nt. Berlin-Dahlem, 10 (2-3): 170, 1943 (♀ ♂, Formosa).
Cerceris pictiventris formosicola: Van der Vecht, Zool. Medd., 39: 354, 1964.
Cerceris pictiventris formosicola: Tsuneki, Etizenia, 29: 6 (China), 21 (Formosa), 1 1968; Ibid., 44: 6, 1970; Haneda, Life Study, 15: 32, 1971; Ibid., 16: 6, 1972; Tsuneki, Ann. Hist.-Nat. Mus. Natn. Hung., 69: 263, 1977 (♀ ♂, Sauter coll.); Murota, Hymts. Comm., 5: 25, 1977; Murota et Tano, Ibid., 5: 32, 1977; Sabi et al., Ibid., 5: 38, 1977.

Specimens examined: 3 ♀ 2 ♂, Takao: 1 ♀, 15. VIII., 2 ♀, 15. IX., 2 ♂, 15. X. 1907.

Remarks. This species is everywhere common in Formosa.
