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Taxonomic Studies on the Pompilidae Occurring in Japan North of the Ryukyus: The Genus *Agenioideus* ASHMEAD (Hymenoptera)

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Abstract Generic characters, phylogenetic relationships and a brief review of the biology of the genus *Agenioideus* are presented. Keys and descriptions are provided for the three species occurring in Japan north of the Ryukyus. One of these species is described as new: *A.* (*Agenioideus*) *takahashii*. *Psammochares philippinensis* BANKS and *Ridestus sibatanii* LELEJ are newly synonymized with *A. lascivus* (CAMERON), whose male is described for the first time.

Key words: Taxonomy; Pompilidae; *Agenioideus*; Japan; new species.

In the subfamily Pompilinae, the genus *Agenioideus* ASHMEAD, 1902, is a good key-taxon to understand the phylogeny of the subfamily to which the genus belongs. This is because the genus has several features shared with most species of the subfamily Pepsinae. Most of these features have been considered primitive. This is quite natural, because the Pepsinae are presumed to constitute the sister group of the Pompilinae (SHIMIZU, 1994).

As ASHMEAD (1902) properly chose the name *Agenioideus* ("Agenia-like"), the members of the genus "suggest in many ways the species of the old genus *Agenia* [tribe Auplopodini (=Ageniellini)] in the Pepsinae" (EVANS, 1950). In fact, EVANS (1950) suggested the possibility that *Agenioideus* is a genus of a fundamental linkage of the two major subfamilies of the Pompilidae, and WAHIS (1957) stated that the genus is almost intermediate between the two subfamilies. However, I consider the morphological similarities between *Agenioideus* and the Ageniellini solely superficial.

Although this genus has many primitive features, its members have several derived characteristics of the "higher Pompilinae" *sensu* SHIMIZU (1994), as mentioned below. Thus, I consider *Agenioideus* belonging to this group which I tentatively name the "tribe Pompilini". However, the phylogenetic position of this genus within the Pompilini has not been clarified as yet. In this paper I propose a hypothesis about the phylogenetic relationships of *Agenioideus*.

In Japan north of the Ryukyus, only one species, *Agenioideus ishikawai* SHIMIZU, has hitherto been known to occur (SHIMIZU, 1989a). Recently another species, *Ridestus sibatanii* LELEJ, was recorded from Okinawa-jima, the Ryukyus (LELEJ and YAMANE, 1992). I consider *R. sibatanii* a synonym of *A.*

lascivus (CAMERON). This species occurs also in Kyushu and Honshu. Moreover, I found another new species occurring in Hachijô-jima (Izu Islands) and Kyushyu. Thus, I provide the keys and descriptions for these three species of *Agenioideus*, of which one belongs to the subgenus *Ridestus* and two to the subgenus *Agenioideus*.

In this paper the subgeneric classification follows WAHIS (1986) and WOLF (1985, 1986, 1990, 1992). The terminology of the wing veins and cells follows DAY (1988). The following abbreviations are used for morphological terms:

LID: lower interocular distance
MID: middle interocular distance
OOL: ocello-ocular line
POL: postocellar line
S: sternum of metasoma
SGP: subgenital plate of male
SMC: submarginal cell of forewing
T: tergum of metasoma
UID: upper interocular distance

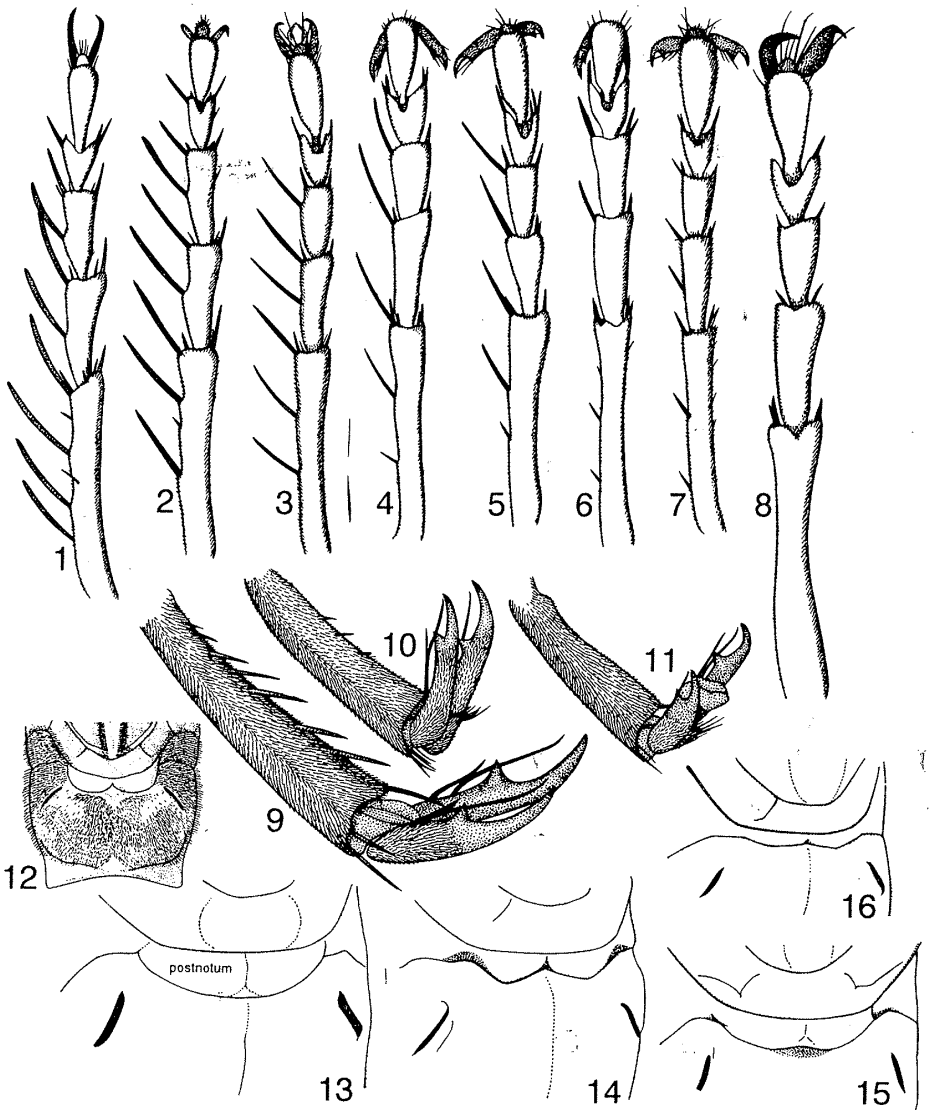
Genus *Agenioideus* ASHMEAD

Agenioideus ASHMEAD, 1902, Canad. Ent., **34**: 85. [Type: *Pompilus humilis* CRESSON, 1867; original designation.]

Aporoideus ASHMEAD, 1902, Canad. Ent., **34**: 86. [Type: *Pompilus sericeus* VANDER LINDEN, 1827; original designation.]

Sericopompilus BANKS, 1912, J. N. Y. Ent. Soc., **19**: 228, 229. [In part.]

Generic characters. In the following features, those apparently considered primitive within the Pompilinae are accompanied by "(*p*)", and those considered derived by "(*d*)": T7 of male with a pale marking; body weakly hairy; T 6 of female with several, suberect fine setae (*p*); eye comparatively broad, at least 0.6× as broad as half MID (*d*); inner orbits more or less convergent above; anterior margin of labrum notched or cleft medially (*d*); clypeus of female wider than LID; antenna of female thin and long, 3rd segment more than 3.2× as long as thick (*d*), antenna of male short and stout (*p*), but 3rd segment 1.5 × or more as long as thick; maxilla with apical 3 segments more or less thin and long, 4th longest (*d*); posterior margin of pronotum usually arcuate anteriorly, or shallowly and weakly angulate at middle (*p*); postnotum usually at least 1/3 length of metanotum (*p*), more or less constricted just in front of spiracle (*d*) (Figs. 13–16); propodeum sloping gradually, without a well-defined declivity (*p*), in female often transversely rugulose (*p*) or with conspicuous, dense, pale pubescence, and in male often with dense, pale, suberect pubescence (*d*); pterostigma usually comparatively large, its height about 1× or more the length



Figs. 1-8. Left fore tarsus of female, dorsal view.——1, *Agenioideus* (*Ridestus*) *rutilus* (KLUG) [tarsal comb type: 4,2,2]; 2, *A.* (*R.*) *excisus* (MORAWITZ) [tarsal comb type: 3,2,2]; 3, *A.* (*Agenioideus*) *ishikawai* SHIMIZU [tarsal comb type: 3, 2, 1m]; 4, *A.* (*A.*) *cinctellus* (SPINOLA) [tarsal comb type: 2, 1a, 1a]; 5, *A.* (*A.*) *nubecula* (COSTA) [tarsal comb type: 2, 1a, 1a]; 6, *A.* (*A.*) *birkmanni* (BANKS) [tarsal comb type: 0,1a,1a]; 7, *A.* (*A.*) *takahashii* n. sp. [tarsal comb type: 0, 0, 0]; 8, *A.* (*A.*) *apicalis* (VANDER LINDEN) [tarsal comb type: 0, 0, 0].

Figs. 9–11. Hind tarsomere 5 of female, ventrolateral view.——9, *Agenioideus* (*Ridestus*) *rutilus* (KLUG); 10, *A.* (*Agenioideus*) *amurensis* (GUSSAKOVSKIJ); 11, *A.* (*A.*) *ishikawai* SHIMIZU.

Figs. 12–16. Postnotum of female (12, dorsal view, others, dorsolateral view).——12, *Batozonellus annulatus* (FABRICIUS); 13, *Agenioideus* (*Agenioideus*) *cinctellus* (SPINOLA); 14, *A.* (*Ridestus*) *excisus* (MORAWITZ); 15, *A.* (*A.*) *ishikawai* SHIMIZU; 16, *A.* (*R.*) *benedictus* (CAMERON). (12 from SHIMIZU, 1994.)

of crossvein 2r-rs (*p*); tarsal comb present (*d*) (Figs. 1–3, 7) or absent (Figs. 4–6, 8); female tarsomere 5 ventrally smooth (Fig. 11) or with a median row of several spines (*d*) (Figs. 9–10); male fore tarsomere 5 parallel-sided, not produced on inner margin (*p*); orbicula very small, much less than 0.5× as wide as tarsomere 5 (*p*); orbicular pecten consisting of about 7 radiating, straight weak setae (*p*); female claws long and slender (*d*) with a tooth, and male inner fore claw usually strongly curved and bifid (*d*) and the others dentate; metasoma fusiform, not parallel-sided (*p*); female S2 usually with a transverse shallow depression (*p*); male genitalia sometimes with aedeagus bearing minute setae along shaft; basal hooklets single or absent.

Phylogenetic relationships. In the above-mentioned characteristics, the comparatively broad eye, thin and long antenna, and the presence of the tarsal comb and a median row of ventral spines on the tarsomere 5 are autapomorphies of the "higher Pompilinae" (tribe Pompilini) (**f** in Fig. 17). Although the last two states are not shared with all the members of *Agenioideus*, this genus apparently belongs to the tribe (SHIMIZU, 1994) (Fig. 17).

Then, the question is where the genus should be put within the Pompilini.

In my previous studies on the phylogeny of the Pompilidae (SHIMIZU, 1994), I established the monophyly of the *Episyron* group, which consists of *Austrochares*, *Parabatozonus*, *Poecilopompilus*, *Batozonellus* and *Episyron*, based on the synapomorphies of the prementum with a pair of subparallel carinate lines on its distal half, the last three segments of the maxillary palpus shorter than the third (in *Episyron* these segments are almost as long as the third), the crenulate male flagellum (in *Episyron* the flagellum is not crenulate), the apical margin of the labrum with a median deep cleft, and the upper margin of the clypeus distinctly sinuate (**h** in Figs. 17–18); moreover, I considered that the *Episyron* group is associated with *Sericopompilus* to form the *Episyron–Sericopompilus* group by the posterior margin of the postnotum arcuately produced on each side of the midline and constricted just in front of the spiracles, hindwing crossvein cu-a originating distad to the fork of vein M+CuA, and the inner margins of the compound eyes strongly convergent above (not strongly convergent in some *Episyron*) (**g** in Figs. 17–18).

In the present study I found that the following derived states of *Agenioideus* are also shared with members of the *Episyron–Sericopompilus* group (**j** in Fig. 18):

1) The anterior margin of the labrum is cleft or notched medially.

2) The postnotum is more or less constricted just in front of the spiracle.

The feature (1) is found not only in the *Episyron–Sericopompilus* group, but also at least in *Tachypompilus* and *Perissopompilus* (SHIMIZU, 1994). Nevertheless, these states seem to associate *Agenioideus* with the *Episyron–Sericopompilus* group as a monophyletic group (Fig. 18).

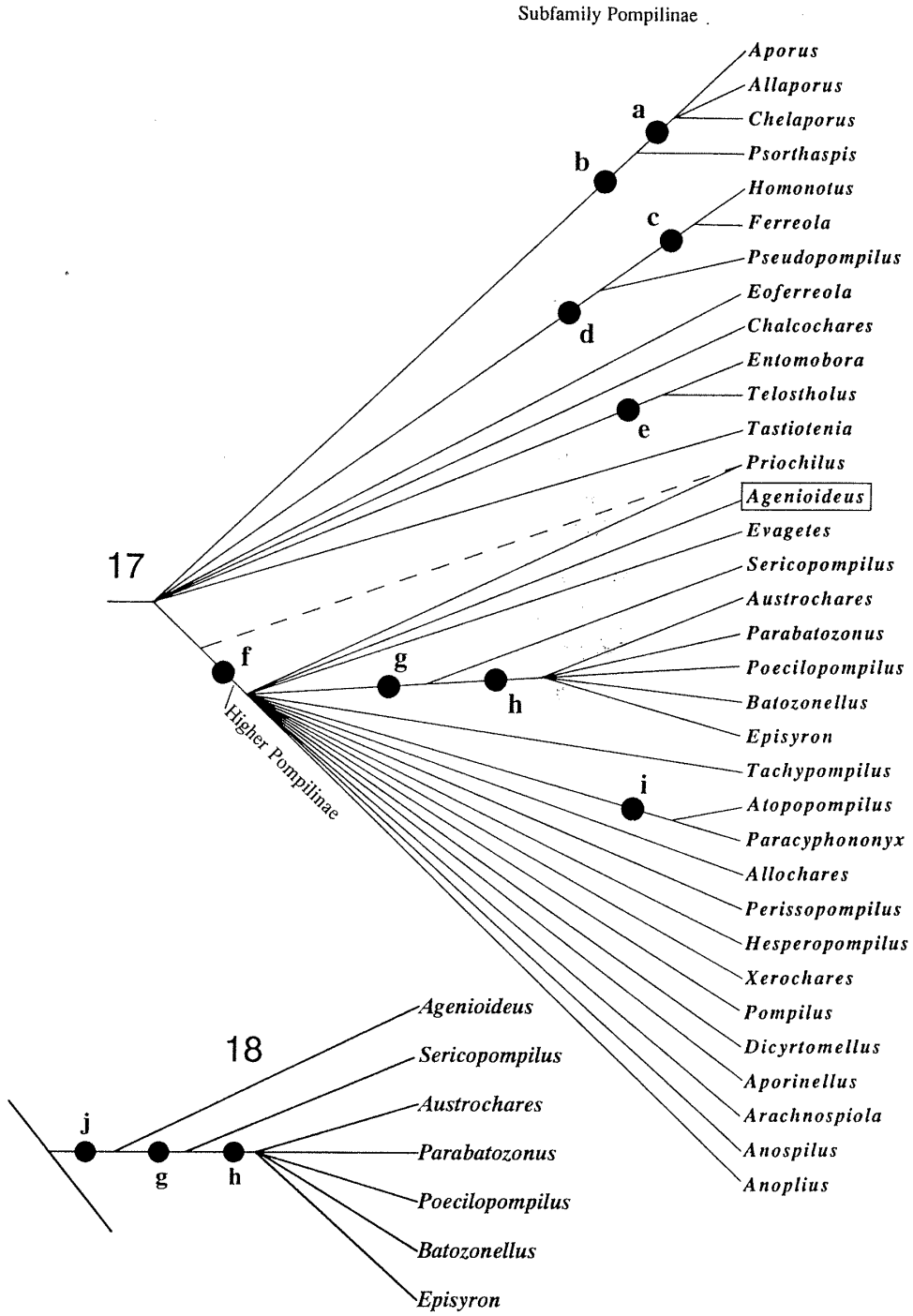


Fig. 17. Cladogram of the subfamily Pompilinae, after SHIMIZU (1994: fig. 376). Roman letters **a**–**i** refer to the synapomorphies (**a**–**e**, **i**: see original literature; **f**–**h**: see the text).

Fig. 18. Cladogram showing phylogenetic relationships between *Agenioideus* and its relatives. Roman letters **g**–**h**, and **j** refer to the synapomorphies discussed in the text.

The following three synapomorphies may support this presumption:

1) The male propodeum has dense, pale, suberect pubescence in most *Agenioideus* and *Batozonellus*.

2) The inner orbits of the female are strongly convergent dorsad in some *Agenioideus* and most *Episyron–Sericopompilus* group.

3) The hindwing crossvein cu-a is strongly curved or recurved near the meeting with vein M+CuA in the subgenus *Ridestus* and the *Episyron-Sericopompilus* group.

In addition, a curious fact can be pointed out on the basis of the prey records of the Pompilinae: spiders of the family Araneidae are utilized as prey by limited genera, i.e., *Parabatozonus*, *Poecilopompilus*, *Batozonellus*, *Episyron*, *Agenioideus* (*Agenioideus*), *Sericopompilus* and *Anoplius* (*Pompilinus*), although the last three genera are by no means specialists on preying on the Araneidae (SHIMIZU, 1994, p. 123). In these genera *Anoplius* is considered to be somewhat isolated from the others. [There is a possibility that *Anoplius* is more closely related to *Pompilus*, *Xerochares*, *Arachnospila*, *Aporinellus*, *Dicyrtomellus* and *Anospilus* (SHIMIZU, 1994, p. 43).] These prey records may also support the close relationship of *Agenioideus* to the *Episyron–Sericopompilus* group.

Biology. Information on some aspects of nesting behavior of 11 species is summarized in Table 1.

In general, the patterns of nesting behavior exhibited by most species of *Agenioideus* are not specialized, and this may be correlated to the fact that the genus has many primitive features in morphological structure.

Most species of *Agenioideus* utilize pre-existing cavities as their nests after hunting, which are afterward closed with bits of earth and debris carried in the mandibles. Some species dig a short burrow in loose earth after hunting, employing their forelegs in the usual manner of fossorial pompilids, lastly fill the nest by scraping in debris with forelegs, and pack it with the dorsal tip of the gaster. It is noteworthy that this genus contains a sole species, *A. coronatus* (NOUVEL et RIBAUT), which does not make nests at all but shows the parasitoid type of life. This behavioral type is the same as the type which is considered the most primitive in the Pompilidae. However, I consider the type of *A. coronatus* to have been acquired secondarily from the burrowing type, based on the following two reasons:

1) This species exhibits the prey carriage behavior immediately after hunting; according to GROS (1983), a female wasp carried her prey backward in some centimeters from the hunting point, grasping it by one of the pedipalpi, and then rode the back of the spider to lay her egg on its abdomen.

2) The species hunts spiders of *Aelurillus*, Salticidae (GROS, 1983) which is one of the most specialized families in the Araneae.

Recently it was found that *A. ishikawai* digs a short burrow both before

Table 1. Tarsal comb type and some aspects of nesting behavior of 11 species of *Agenioideus*.

	Agenioideus (*Ridestus*) *ciliatus* (LEPELETIER)	*A.* (*R.*) *rytiphorus* (KOHL)	*A.* (*Agenioideus*) *apicalis* (VANDER LINDEN)	*A.* (*A.*) *birkmanni* (BANKS)	*A.* (*A.*) *cinctellus* (SPINOLA)
Tarsal comb type	3, 2, 2	3, 2, 1m*	0, 0, 0	0, 1a, 1a	2, 1a, 1a
Behavior sequence	Prey-Transport-Egg-Closure?		Prey-Transport-Egg-Closure		Prey-Transport-Egg-Closure; Prey-Transport-Nest-Egg-Closure
Type of prey	Theridiidae; Amaurobiidae	Theridiidae	Segestriidae	Gnaphosidae	Salticidae; Thomisidae
Transport	Backward, holding legs	Backward	Backward, holding spinnerets		Backward, holding legs, pedipalpi; Forward
Location of egg			Dorsal portion of abdomen		Lateral portion of abdomen
Direction of egg			Longitudinal		Oblique
Point of sting			Between bases of legs?		Between bases of legs; Mouth
Paralysis			Temporary		Temporary
Nest-type	Using pre-existing cavity?		Using pre-existing cavity		Using pre-existing cavity; Dug in soil
Closure					Barrier of soil or debris carried in mandibles
Place of observation	Europe	Europe	Europe	North America	Europe
References	7	6	7	1	2, 3, 7, 9

Table 1. (*Continued*)

	A. (*A.*) *humilis* (CRESSON)	*A.* (*A.*) *ishikawai* SHIMIZU	*A.* (*A.*) *nubecula* (COSTA)
Tarsal comb type	3, 2, 1m	3, 2, 1m	2, 1a, 1a
Behavior sequence	Prey-Transport-Nest-Egg-Closure	Nest-Prey-Transport-Nest-Egg-Closure	Prey-Transport-Egg-Closure; Prey-Transport-Nest-Egg-Closure
Type of prey	Araneidae	Araneidae	Salticidae
Transport	Backward, holding legs	Backward, holding legs	Backward, holding chelicerae, pedipalpi, legs
Location of egg	Ventral portion of abdomen	Ventrolateral portion of abdomen	Lateral portion of abdomen
Direction of egg	Longitudinal	Oblique	Perpendicular
Point of sting		Between bases of legs	Between bases of legs
Paralysis	Permanent	Permanent	Temporary
Nest-type	Dug in soil	Dug in soil	Using pre-existing cavity;Dug in soil
Closure	Filled by scraping with forelegs	Filled by scraping with forelegs	Barrier of soil or debris carried in mandibles
Place of observation	North America	Japan	Europe
References	1	10	3, 4, 5, 7, 11

Table 1. (*Continued*)

	A. (*A.*) *sericeus* (VANDER LINDEN)	*A.* (*A.*) *usurarius* (TOURNIER)	*A.* (*Mimochares*) *coronatus* (NOUVEL *et al.*)
Tarsal comb type	3, 2, 1m	3, 2, 1m	0, 0, 0
Behavior sequence	Prey-Transport-Nest-Egg-Closure	Prey-Transport-Egg-Closure; Prey-Transport-Nest-Egg-Closure	Prey-Transport-Egg
Type of prey	Salticidae; Pisauridae; Thomisidae; Araneidae;Linyphiidae	Agelenidae	Salticidae
Transport	Backward	Backward, holding legs	Backward, holding pedipalpi
Location of egg	Lateral portion of abdomen	Dorsolateral portion of abdomen	Apical portion of abdomen
Direction of egg	Oblique; Perpendicular	Longitudinal; Oblique	Perpendicular
Point of sting	Mouth	Between bases of legs; Mouth	Mouth
Paralysis		Temporary	Temporary
Nest-type	Dug in soil	Using pre-existing cavity; Dug in soil	—
Closure	Filled by scraping with forelegs	Barrier of soil or debris carried in mandibles; Filled by scraping with forelegs	—
Place of observation	Europe	Europe	Europe
References	3, 8, 9, 11	7, 11	7

Blank spaces indicate a lack of knowledge. References: 1, EVANS and YOSHIMOTO, 1962; 2, FERTON, 1891; 3, FERTON, 1897; 4, FERTON, 1901; 5, FERTON, 1905; 6, FERTON, 1910; 7, GROS, 1983; 8, MANEVAL, 1939; 9, RICHARDS and HAMM, 1939; 10, SHIMIZU, 1989b; 11, SOYER, 1950. * From WOLF, 1986: figure 187.

and after hunting; this type of behavior sequence, "Nest–Prey–Transport–Nest –Oviposition–Closure", suggests the transition from the type "Prey→Nest" to the more advanced type "Nest→Prey" (SHIMIZU, 1989b).

The nest of *Agenioideus* is principally unicellular with an exception that *A. nubecula* (COSTA) may dig a nest containing several cells (up to four) (FERTON, 1901, 1905); in this case, the wasp, before hunting, probably prepares the nest-cell, although its nest structure and behavior sequence requires further detailed studies.

The known hosts and prey of *Agenioideus* belong to nine families of the Araneae. The records of orb-weavers (Araneidae) as prey seem to be important for the phylogenetic relationships between *Agenioideus* and its relatives, as was mentioned above.

The prey spider is stung usually between the bases of the legs, sometimes near the mouth. In most cases the spider is paralyzed only temporarily, whose duration varies from 3–4 minutes (in *A. coronatus*) to ca. 7 hours (in *A. nubecula*) (GROS, 1983).

The most common type of prey transport is that the spider is grasped by the base of the legs (or rarely chelicerae, pedipalpi and spinnerets) and dragged over the ground backward.

The wasp's egg is laid on the lateral, dorsal or ventral portion of the abdomen of the spider, and the long axis of the egg is directionally vertical, oblique or longitudinal. It is important where the egg of the parasitoid species (e.g., *A. coronatus*) is laid on the body of the spider, because the egg location should ensure the security of the wasp's egg or larva after spider's recovering from the paralysis; the egg of *A. coronatus* is placed on the anterior portion of the abdomen of the spider, and the long axis of the egg becomes vertical (GROS, 1983).

Relationships between the tarsal comb and nesting behavior. The tarsal comb of the Pompilinae, which contains a long spine near the middle of the tarsomere 2 and sometimes tarsomere 3, is not found in the other subfamilies of the Pompilidae, except for most *Psoropempula* (EVANS, 1974) and some *Hemipepsis* (SHIMIZU, 1994) (Pepsinae).

In *Agenioideus* the tarsal comb varies so greatly in development (Figs. 1–8) that the definition of the comb by BANKS (1939) (tarsal comb present=the tarsomere 2 having a spine at the middle of the segment, which is as long as, or longer than that of the apex) cannot cover such various conditions. Here I propose a simple method of notation, "tarsal comb type"; this consists of the numbers of the spines on the outer side of the tarsomere 1–3 in order, which are longer than the width of each segment. If the tarsomere 2 or 3 has only a spine near the middle, the subscript "m" is added to 1 (1m); if the tarsomere has only a spine at the apex, "a" is added (1a).

It is not possible for this method to express the differences in the length of the comb spines (see Figs. 7–8; the conditions as shown in these two figures are expressed as the same type, 0, 0, 0). Moreover, other problems exist; the length of the spines may vary in individuals and the spines are sometimes broken or worn. However, the method has the advantage of knowing the relationships between the condition of the tarsal comb and nesting behavior. Table 1 shows a close relationship between these. The species which do not nest but behave as a parasitoid (e.g., *A. coronatus*) or utilize ready-made cavities [e.g., *A. apicalis* (VANDER LINDEN)] have no tarsal comb (type 0, 0, 0). By contrast, the typical fossorial species such as *A. humilis* (CRESSON), *A. ishikawai* and *A. sericeus* (VANDER LINDEN) have a well-developed tarsal comb (type 3, 2, 1m), although *A. usurarius* (TOURNIER) [=*Pompilus republicanus* KOHL], which has a tarsal comb of the same type as the above three species, sometimes nests in crevices of stone walls and sometimes does a certain amount of digging to prepare the nest. On the other hand, *A. cinctellus* (SPINOLA) and *A. nubecula*, whose tarsal combs are not well developed (type 2, 1a, 1a), usually nest in pre-existing cavities but rarely or sometimes dig their burrows. It seems strange that *A. ciliatus* (LEPELETIER), which has a remarkably developed tarsal comb (type 3, 2, 2), is not known to prepare the nest-cell by digging. Here, it is emphasized that more records on the nesting behavior of *Agenioideus* must be accumulated to draw valid conclusions about its relationships with the tarsal comb condition.

Distribution. So far as known, the present genus occurs throughout the world except for the Australian region, but "is primarily characteristic of the warmer parts of the Holarctic region", and "a stock of *Agenioideus*" "succeeded in entering South America" and "underwent a small radiation (two species) there" (EVANS, 1965).

Key to the subgenera occurring in Japan north of the Ryukyus

1(2) Forewing vein CuA_1 not attaining wing margin (Fig. 22); hindwing crossvein cu-a strongly curved or recurved near the meeting with vein M+CuA; ♀: tarsomere 5 ventrally with a median row of at least 3 spines (Fig. 9); tarsal comb developed (Figs. 1–2); propodeum transversely rugulose. . . . . *Ridestus* BANKS

2(1) Forewing vein CuA_1 almost attaining wing margin (Figs. 25, 37); hindwing crossvein cu-a gently curved near the meeting with vein M+CuA; ♀: tarsomere 5 ventrally smooth or at most with median, minute 3 spines (Figs. 10–11); tarsal comb developed or absent (Figs. 3–8); propodeum smooth or slightly rugulose . . . . . *Agenioideus* ASHMEAD

Subgenus *Ridestus* BANKS

Ridestus BANKS, 1912, J. N.Y. Ent. Soc., **19**: 223 (as genus). [Type: *Psammochares transversalis* BANKS, 1910 (=*biedermani* BANKS, 1910); original designation.]

Galactopterus ARNOLD, 1937, Ann. Transv. Mus., **19**: 32 (as genus). [Type: *Galactopterus rufipes* ARNOLD, 1937; original designation.]

Eggysomma HAUPT, 1962, Bull. Res. Coun. Israel, **11B**: 42 (as genus). [Type: *Eggysomma oasis* HAUPT, 1962; original designation.]

Agenioideus lascivus (CAMERON, 1891) [Japanese name: Maeaka-bekkô]

(Figs. 19–24)

Pompilus lascivus CAMERON, 1891, Mem. Manchester lit. phil. Soc., (**4**) **4**: 459, 475, pl. 3, fig. 26, ♀.

Psammochares philippinensis BANKS, 1934, Proc. Am. Acad. Arts Sci., **69**: 92, ♀. **N. syn.**

Pompilus philippinensis: TSUNEKI, 1988, SPJHA, **34**: 36, ♀.

Pompilus (*Arachnospila*) *philippinensis*: TSUNEKI, 1989, SPJHA, **35**: 114, ♀.

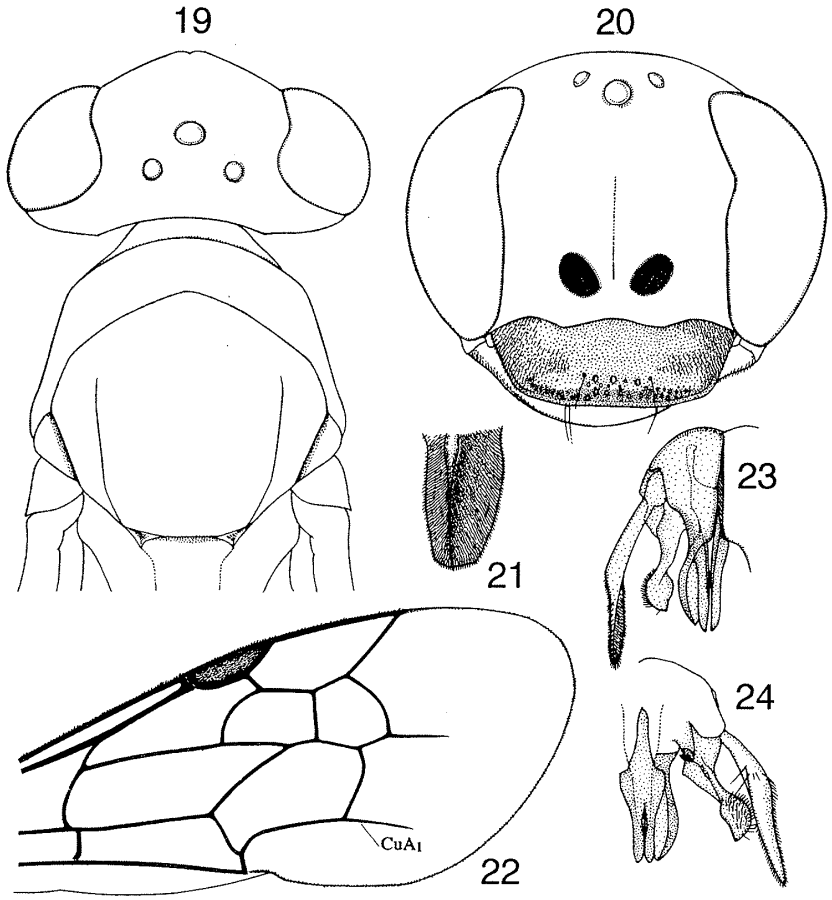
Ridestus sibatanii LELEJI, 1992, Rept. Fac. Sci. Kagoshima Univ. (Earth Sci. Biol.), **25**: 105, ♀. **N. syn.**

This species is easily distinguished from all other species of the Japanese Pompilidae by its ferruginous red coloration on the head (in the female) and the anterior half of the mesosoma (in both sexes). The forewing marginal cell remote from the wing tip by about its own length is also a good diagnostic character for this species.

Description. ♀. Length: Body 6.9–10.1 mm; forewing 5.6–7.7 mm.

Black; the following parts ferruginous red in specimens from Japan: frons and gena except lower portions, vertex, occiput, pronotum, mesoscutum, (scutellum in a specimen from Amami-Oshima, the Ryukyus), tegula, base of wings, dorsal margin of mesopleuron, apex of fore femur, and base and apex of fore tibia; in the holotype and specimens from the Philippines and Taiwan, ferruginous red areas more expanded into the following areas: lower portions of frons and gena, basomedial portion of clypeus, postgena, scutellum, disc of metanotum, prepectus, anterodorsal portion of mesopleuron, posteroventral corner of mesopleuron (Philippine and Taiwanese specimens), or the whole head except mouthparts and apical half of mandible which is dark rufous, scutellum, the whole metanotum, prepectus, and dorsal portion of mesopleuron (holotype). Middle portion of mandible ferruginous red to dark rufous. Apical 1/3 of fore femur (holotype) and the whole fore tibia (holotype and Philippine specimens) ferruginous to brown; fore tibial spur light brown to ferruginous at least basally.

Wings subhyaline; forewing slightly infuscate at apical half, whitish at apex, with a submarginal darker fascia; hindwing weakly fuscous at apical 1/4.



Figs. 19–24. *Agenioideus* (*Ridestus*) *lascivus* (CAMERON). (20, 22, Female, others male.)—— 19, Head, pronotum and mesoscutum, dorsal view; 20, head, anterior view; 21, subgenital plate, ventrolateral view; 22, forewing; 23, genitalia, dorsal view; 24, ditto, ventral view.

Body mat; head and mesosoma minutely granulate, except for clypeus which is densely finely punctate; metasoma micropunctate.

Body covered with silvery white to sericeous pubescence most conspicuous on lower side of frons, ventral portion of mesopleuron, mesosternum, sides of metanotum and postnotum, lateral and posterior portions of propodeum, and coxae. Whitish hairs long and abundant on gena, occiput, anterior portion of pronotum, propleuron and posterior face of fore coxa, short and sparse on vertex, anterior face of fore coxa, side of propodeum, basolateral portion of T1 and base of S1; brownish, long, sparse hairs on apical portion of clypeus, apical margin of labrum, mandible, S4–6 and T6.

Head seen in front (Fig. 20) 1.2× as broad as long, 1.3–1.5× as broad as pronotum. Vertex well convex between tops of eyes. Frons in dorsal view gently convex, with median line obscure on its upper half. MID 0.56–0.60× head width. Inner orbits slightly emarginate a little above the middle, convergent above and slightly divergent below; UID : MID : LID = 8.1–8.3 : 10 : 9.3–

9.6. Ocelli slightly obtuse-angled in front, POL : OOL = 1 : 1.0–1.2. Clypeus a little broader than LID, 2.7–2.9× as broad as long, with a shagreened (or smooth in a specimen from Shizuoka, Honshu) depressed rim which is narrow but complete to anterolateral corner; surface of clypeus moderately convex longitudinally, with preapical setiferous pores dense and large; apical margin of clypeus slightly convex but almost straight at middle, and anterolateral corner broadly rounded. Malar space very short. Gena in dorsal view roundly convergent posteriorly, 0.5× eye width in profile. Mandible unidentate (not counting apical point as a tooth). Antenna with 3rd segment 3.9–4.6× as long as thick; scape ventrally scarcely compressed, without a longitudinal carina.

Pronotum shallowly depressed along posterior margin, lateral margins narrowed behind, and shoulder swollen. Mesoscutum with parapsidal line very fine except for its posterior portion which is distinctly impressed; posterolateral margin slightly reflexed. Disc of scutellum gently convex, a little above the level of mesoscutum. Disc of metanotum overhanging postnotum. Postnotum shorter than metanotum at midline, with many, fine, transverse striae. Propodeum evenly arched above in profile, with numerous transverse rugae.

Longer spur of hind tibia 0.58–0.65× as long as tarsomere 1. Tarsal comb well developed (type 3,2,2); tarsomere 2 and 3 with a spine at middle longer than that at apex of each tarsomere. Tarsomere 5 ventrally with a median row of 3–5 spines.

Forewing (Fig. 22) with marginal cell 1.0–1.1× its own length from wing tip. SMC2 1.0–1.3× as long as SMC3 below, receiving crossvein 1m-cu at apical 0.28–0.40, and narrowed above by 0.5–0.6× its length below. SMC3 receiving crossvein 2m–cu at apical 0.40–0.52, and narrowed above by 0.4–0.5× its length below. Crossvein cu-a originating at or distad to point of separation of vein M+CuA by at most 0.3 of its length. Crossvein 2m–cu meeting vein CuA_1 a little less than half the distance from base of CuA_1 to outer wing margin. Hindwing with crossvein cu-a originating at or a little distad to point of separation of vein M+CuA.

♂. Length: Body 5.8 mm; forewing 4.8 mm.

Similar to female but more slender.

Black; the following parts ferruginous red: pronotum (collar yellowish), mesoscutum, tegula, base of wings, dorsal margin of mesopleuron, apex of fore femur, and streaks along upper portion of inner and outer orbits. Hind tibia dorsally with an ivory yellow spot which extends from its base to middle.

Wings hyaline; forewing slightly infuscate at apical 1/3, whitish at apex, with a submarginal darker fascia; hindwing weakly fuscous at apical 1/4.

Silvery white pubescence more conspicuous than in female, especially on lower side of frons, clypeus, ventral portion of mesopleuron, mesosternum, postnotum, propodeum and coxae. More hairy than female; whitish hairs on

head, mesosoma, basolateral portion of T1 and sterna, especially longer and abundant on vertex, gena, anterior portion of pronotum and propleuron.

Head seen in front 1.2× as broad as long, 1.2× as broad as pronotum. Frons in dorsal view well convex (Fig. 19). MID 0.58× head width. Inner orbits slightly emarginate a little above the middle, weakly convergent above and subparallel below; UID : MID : LID = 8.9 : 10 : 8.5. Ocelli obtuse-angled in front, POL : OOL = 1 : 0.8. Clypeus narrower than in female, 2.4× as broad as long, with a polished, narrow apical rim which is not well depressed; apical margin of clypeus very feebly convex. Gena in dorsal view strongly convergent posteriorly and scarcely convex, 0.23× eye width in profile. Antenna short and stout, 3rd segment 1.7× as long as thick.

Pronotum in dorsal view (Fig. 19) gradually narrowed anteriorly, shoulder not swollen. Postnotum as long as metanotum at midline.

Forewing with marginal cell 0.9× its own length from wing tip.

Legs less spinose than in female. Longer spur of hind tibia 0.76× as long as tarsomere 1. Tarsomere 5 ventrally smooth or at most with a median, indistinct minute spine. Inner tarsal claw of foreleg strongly curved and cleft, with an inner ray rounded apically; the other claws with an acute tooth beyond middle.

SGP (Fig. 21) gradually narrowing apically, its apex almost truncate, and compressed laterally with an elevated median carina; its surface and margin densely clothed with minute setae. Genitalia (Figs. 23–24) with paramere slightly elbowed about midway, rounded apically, with dense, suberect setae on apical half; digitus oval in outline, covered with stiff setae externally; parapenial lobe a little shorter than aedeagus, strongly concave on inner surface, convex on outer one, spoon-shaped apically; aedeagus as a whole arrowhead-shaped, its lateral margins almost parallel subapically, and gradually convergent to end in form of rounded 2 lobes.

Specimens examined. Holotype ♀, "Holotype" "Pompilus lascivus Cam Type" "Agenioideus lascivus Cam ♀, det. M. C. DAY, 1973"; 1♀, Takakusa-yama, Yaizu-shi, Shizuoka Pref., vii-16, 1957; 1♀, near Murozumi Shrine, Murozumi Seashore, Hikari-shi, Yamaguchi Pref., x-6, 1992 (K. MIYOSHI); 1 ♀, Fukuoka, viii-22, 1929 (K. YASUMATSU); 1♀, Aoshima, Miyazaki, Kyushu, viii-12, 1953 (H. NAGASE); 1♀, Shinmura, Amami-Ôshima, vii-29, 1972 (T. NAMBU); 1♀, Tsukeng, Ilan, Formosa, viii-8, 1971 (Y. HANEDA); holotype ♀ of *Psammochares philippinensis* BANKS, "Dapitan, Mindanao, Baker" "Type No. 51216, U.S.N.M." "Psammochares philippinensis Bks, type" "Agenioideus lascivus Cam. ♀, det. M. C. DAY, 1973"; 1♂, Hokuto, Taiwan, 1929 (K. SATO Collection, 1975).

Distribution. Japan [Honshu, Kyushu, Amami-Oshima; Okinawa-jima (LELEJ and YAMANE, 1992)], Taiwan (TSUNEKI, 1989), the Philippines

(BANKS, 1934; TSUNEKI, 1988), India (CAMERON, 1891; BINGHAM, 1897) and Ceylon (BINGHAM, 1897).

Remarks. I examined the holotype of *Psammochares philippinensis* BANKS deposited in the United States National Museum. This specimen has the identification label of *Agenioideus lascivus* CAM. by M. C. DAY. I also examined the holotype of *A. lascivus* in the Hope Entomological Collection of Oxford University Museum, and reconfirmed that *P. philippinensis* is a junior synonym of *A. lascivus.*

Subgenus *Agenioideus* ASHMEAD

Agenioideus ASHMEAD, 1902, Canad. Ent., **34**: 85 (as genus). [Type: *Pompilus humilis* CRESSON, 1867; original designation.]

Aporoideus ASHMEAD, 1902, Canad. Ent., **34**: 86 (as genus). [Type: *Pompilus sericeus* VANDER LINDEN, 1827; original designation.]

Gymnochares BANKS, 1917, Bull. Mus. Comp. Zool., **61**: 107, 108 (as subgenus of *Psammochares*). [Type: *Psammochares birkmanni* BANKS, 1910; designated by PATE, 1946.]

Key to the species occurring in Japan north of the Ryukyus

1(2) Mid and hind tibial spurs blackish; SMC2 longer than SMC3 below (Fig. 25). ♀: tarsal comb well developed, i.e., tarsomere 2 and 3 with a spine at middle, much longer than width of each segment (Fig. 3); clypeus with irregularly spaced, small pores at apical 1/3; mandible bidentate (not counting apical point as a tooth); inner orbits convergent above, somewhat divergent below (Fig. 29). . . . . *A. ishikawai* SHIMIZU

2(1) Mid and hind tibial spurs ivory white; SMC2 shorter than SMC3 below (Fig. 37). ♀: tarsal comb hardly developed, tarsomere 2 with a spine at middle, about as long as that at apex and width of the segment, and tarsomere 3 lacking a spine at middle (Fig. 7); clypeus with dense, very large and strong pores preapically (Fig. 35); mandible unidentate; inner orbits convergent above and below. . . *A. takahashii* n. sp.

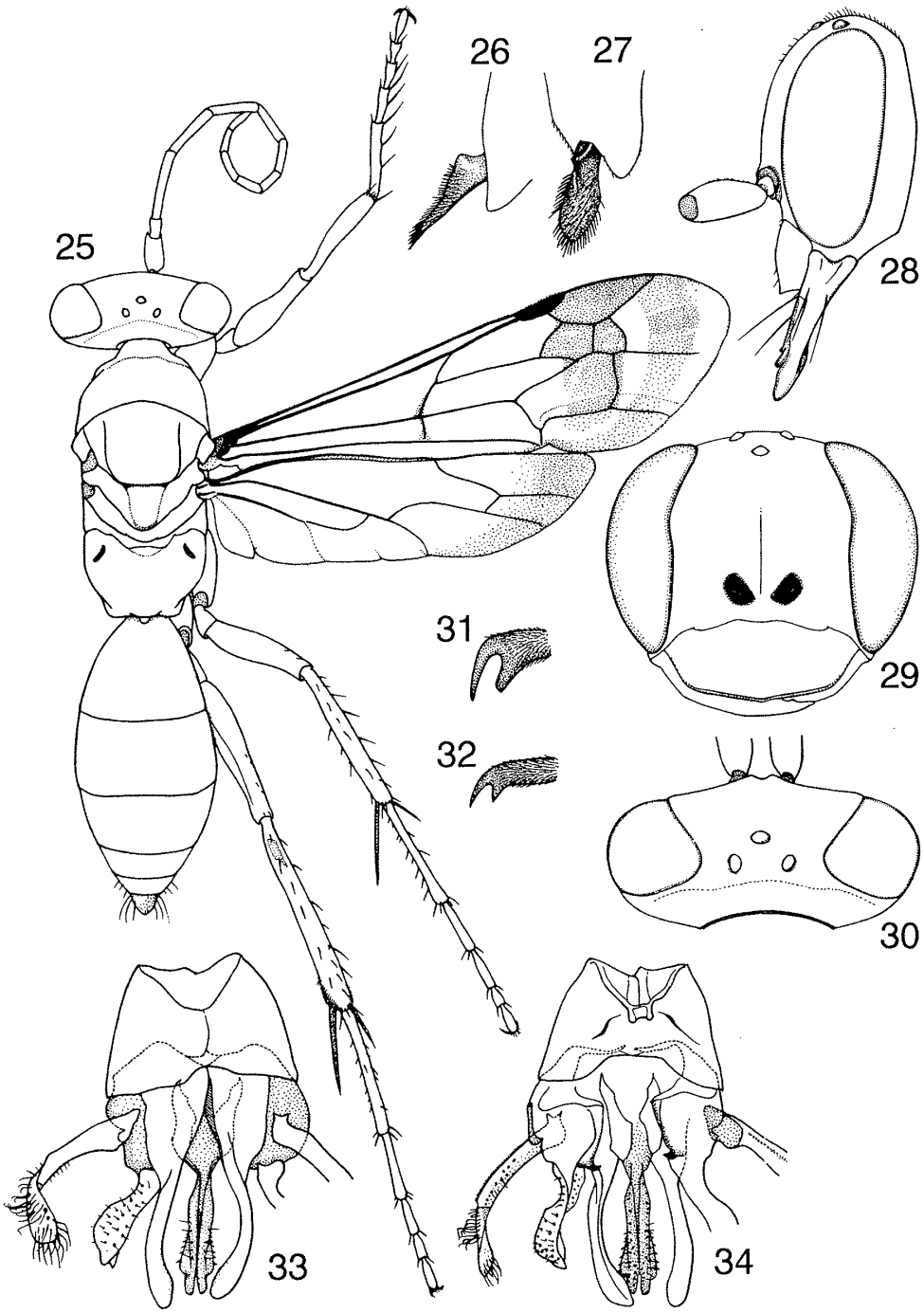
Agenioideus ishikawai SHIMIZU
[Japanese name: Ishikawa-bekkô]

(Figs. 3, 11, 15, 25–34)

Agenioideus ishikawai SHIMIZU, 1989, Jpn. J. Ent., **57**: 136, figs. 1–12, ♀, ♂.

This species is easily distinguished from all the other species of the Japanese Pompilidae by the combination of the bifasciate forewing and basally white spotted hind tibia.

Description. ♀. Length: Body 4.8–9.0 mm; forewing 4.6–7.4 mm.



Figs. 25–34. *Agenioideus* (*Agenioideus*) *ishikawai* SHIMIZU. (25, 28–30, Female, others male.) ——25, Whole body, dorsal view; 26, subgenital plate, lateral view; 27, ditto, ventrolateral view; 28, head, lateral view; 29, ditto, anterior view; 30, ditto, dorsal view; 31, inner claw of fore tarsus; 32, outer claw of fore tarsus; 33, genitalia, dorsal view; 34, ditto, ventral view. (26–27, 30, 33–34 from SHIMIZU, 1989a.)

Black; hind tibia dorsally with an ivory white spot near base; apical half of mandible rufous; fore tibial spur light brown.

Wings (Fig. 25) hyaline; forewing with an indistinct submarginal fuscous fascia and a broader and darker inner fascia occupying marginal cell, SMC2 and 3 and apical half of discoidal cell 2; hindwing slightly fuscous along outer margin.

Body densely micropunctate and scarcely polished.

Body and appendages covered with conspicuous silvery white pubescence, which is densest on posterolateral portion of propodeum and dorsal face of hind coxa. Whitish hairs longer and abundant on vertex, gena, occiput, pronotal collar, propleuron and fore coxa; brownish long hairs sparsely on apical margin of labrum, mandible, T6 and S5–6.

Head seen in front (Fig. 29) 1.1–1.2× as broad as long. Vertex slightly convex between tops of eyes. Frons in dorsal view gently convex (Fig. 30), with median line fine on its lower part, almost evanescent near anterior ocellus. MID 0.56–0.61× head width. Inner orbits slightly emarginate a little above the middle, as a whole convergent above. UID : MID : LID = 6.3–7.1 : 10 : 9.6–9.8. Ocelli almost right-angled in front, POL : OOL = 1 : 0.7–0.9. Clypeus a little broader than LID, 2.4–2.8× as broad as long, without a well defined depressed rim; its surface slightly convex medially (Fig. 28), with irregularly spaced, small pores; apical margin of clypeus slightly, triangularly produced medially. Malar space very short. Gena in dorsal view strongly convergent posteriorly, 0.3–0.4 × eye width in profile. Mandible bidentate. Antenna very thin and long, basal 4 segments in a ratio of 20–26 : 10 : 30–42 : 25–31; third segment 4.8-6.0× as long as thick; scape ventrally not compressed, without a longitudinal carina.

Pronotum sloping anteriorly in even arc, its shoulder scarcely swollen. Mesoscutum with parapsidal lines distinct and nearly parallel, its posterolateral margin scarcely reflexed. Disc of scutellum gently convex, slightly above the level of mesoscutum, triangularly narrowed posteriorly. Disc of metanotum scarcely overhanging postnotum. Postnotum shorter than metanotum at midline, with several faint transverse striae. Propodeum gently arched above in profile, without any trace of transverse rugae.

Legs not strongly spinose. Longer spur of hind tibia 0.59–0.71× as long as tarsomere 1. Tarsal comb well developed (type 3, 2, 1 m) (Fig. 3); apical spine of fore tarsomere 1 0.6–0.8× as long as tarsomere 2; tarsomere 2 and 3 externally with a long spine at middle, which is about as long as that at apex of tarsomere 2 and much longer than width of each tarsomere. Tarsomere 5 without ventral spines (Fig. 11).

Venation as shown in Fig. 25. Forewing with marginal cell 0.5–0.7× its own length from wing tip. SMC2 1.1–1.6× as long as SMC3 below, receiving crossvein 1 m–cu at apical 0.36–0.47, and narrowed above by 0.5–0.8× its

length below. SMC3 receiving crossvein 2m–cu at apical 0.27–0.47, narrowed above by 0.3–0.4× its length below. Crossvein cu-a originating at or barely distad to point of separation of vein M+CuA. Crossvein 2m–cu meeting vein CuA_1 a little more than half the distance from base of CuA_1 to outer wing margin. Hindwing crossvein cu-a originating distinctly basad to point of separation of vein M+CuA.

♂. Length: Body 4.1–7.2 mm; forewing 4.0–6.3 mm.

Similar to female but more slender.

Black, with ivory white markings as follows: an apical spot on T7, a subbasal spot on hind tibia dorsally, and in some specimens a transverse streak just in front of posterior margin of pronotum, which is more or less interrupted medially. Apical portion of mandible rufous. Metasoma without long erect setae. Wing fasciae paler than in female.

Head seen in front 1.1–1.2× as broad as long. Vertex between tops of eyes more convex than in female. MID 0.59–0.64× head width. Inner orbits less convergent above than in female, parallel or slightly convergent below. UID : MID : LID = 7.6–8.3 : 10 : 8.4–9.1. Ocelli right- or obtuse-angled in front, POL : OOL = 1 : 0.7–1.0. Clypeus a little broader than LID, 2.1–2.5× as broad as long, with a scarcely depressed, narrow apical rim; apical margin of clypeus almost straight, not produced medially and its anterolateral corner rounded. Gena in dorsal view almost flattened immediately behind eye, 0.3–0.4× eye width in profile. Mandible unidentate. Antenna comparatively thick and short, very weakly concave on upper side of each segment from 5th, basal 4 segments in a ratio of 17–23 : 10 : 13–19 : 14–18; third segment 1.8–2.4× as long as thick and 0.36–0.48× as long as UID.

Pronotum abruptly sloping, with sides convergent anteriorly.

Tarsal claws except inner fore one with an acute tooth (Fig. 32); the latter strongly curved and bifid, inner ray stout and rounded apically (Fig. 31).

Metasoma slender fusiform. SGP (Figs. 26–27) narrowly spatulate, highly raised into a triangular pyramid subbasally, its surface densely clothed with suberect minute setae and margin fringed with stouter setae.

Genitalia (Figs. 33–34) similar to those of *A.* (*Agenioideus*) *humilis* (CRESSON) according to the description and figure of EVANS (1950); paramere slender, elbowed about mid-way, spatulate at apex, its apical half with numerous long sinuous setae; volsella strongly sinuate at outer margin, digitus clothed with minute setae, spoon-shaped distally, its apical margin slightly emarginate; basal hooklets single; parapenial lobe a little longer than aedeagus, slightly decurved at apical half, and spatulate at apex; aedeagus with several small setae along shaft, broadened preapically, and its apex in form of slender 2 lobes.

Specimens examined. Holotype ♂, Yoyogi, Tokyo, vii-30, 1955 (R. ISHIKAWA). Paratypes: Konoura, Akita Pref., 1♀, vii-28, 1973 (T. NAMBU);

Karuizawa, Kitasaku, Nagano Pref., 1♀, viii-20, 1950 (R. ISHIKAWA); Yoyogi, Tokyo, 1♂, vii-9, 1954; 2♀♀, ix-12, 1954; 1♀, vi-14, 1955; 1♂, vi-29, 1955; 3♂♂2♀♀, vii-9, 1955; 1♂, vii-11, 1955; 1♂1♀, vii-13, 1955; 5♂♂, vii-14, 1955; 3♂♂3♀♀, vii-23, 1955; 4♂♂1♀, vii-30, 1955; 1♀, viii-15, 1955; 1♀, viii-29, 1955; 1♀, viii-30, 1955; 1♂, ix-4, 1955; 1♀, x-5, 1955; 2♀♀, vii-1, 1956 (R. ISHIKAWA); Egota, Tokyo, 1♀, vi-6, 1950; 1♂, vi-20, 1951; 1♀, vi-26, 1951; 1♂, ix-7, 1951; 1♀, ix-28, 1951 (R. ISHIKAWA); Toyotama, Tokyo, 2♀♀, vi-27, 1950 (R. ISHIKAWA); Kobotoke, Mt. Takaosan, Tokyo, 1♀, viii-12, 1952 (R. ISHIKAWA); Mukôgaoka, Kawasaki-shi, Kanagawa Pref., 2♀♀, vii-14, 1955 (R. ISHIKAWA); Honjô-shi, Saitama Pref., 2♀♀, viii-6, 1981 (A. SHIMIZU); Kodama, Saitama Pref., 1♀, ix-5, 1968 (T. NAMBU); Chichibu, Saitama Pref., 1♀, vii-14, 1973 (T. NAMBU); Mt. Kanayama, ca. 240 m alt., Ôta-shi, Gunma Pref., 2♂♂4♀♀, vii-7,9, 1985; 1♂1♀, vii-20, 21, 1985; 2♂♂, vii-25, 1986; 1♂, viii-11, 1987 (A. SHIMIZU); Sasama, Haibara, Shizuoka Pref., 1♀, vii-4, 1959 (R. ISHIKAWA & K. SUGIYAMA); 1♀, viii-4, 1959; 1♀, viii-5, 1959 (K. SUGIYAMA); Omaezaki, Shizuoka Pref., 1♂, viii-9, 1971 (T. NAMBU); Shimogamo, Kyoto, 1♀, vii-24, 1955 (R. ISHIKAWA); Okamachi, Toyonaka, Osaka, 1♀, vii-25, 1954; 1♂, ix-14, 1954; 1♀, ix-26, 1954 (S. UÉNO).

Other specimens: 1♀, Kôbaru, near Sobosan, Bungo, Kyushu, viii-24, 1930 (C. TAKEYA); 1♀, Yokokura, Katsuyama, Fukui Pref., vii-31, 1957 (Y. HANEDA); 1♀, Ôsuka, Shizuoka Pref., viii-9, 1970 (T. NAMBU); 1♀, Mt. Yamabushi, Suzu-shi, ISHIKAWA Pref., viii-9, 1984 (I. TOGASHI); 1♀, Nobuse, Shikine Is., Tokyo, vii-12, 1989 (H. TAKAHASHI).

Distribution. Japan (Kyushu, Honshu and Shikine Is.).

Agenioideus takahashii n. sp.
[Japanese name: TAKAHASHI-bekkô]

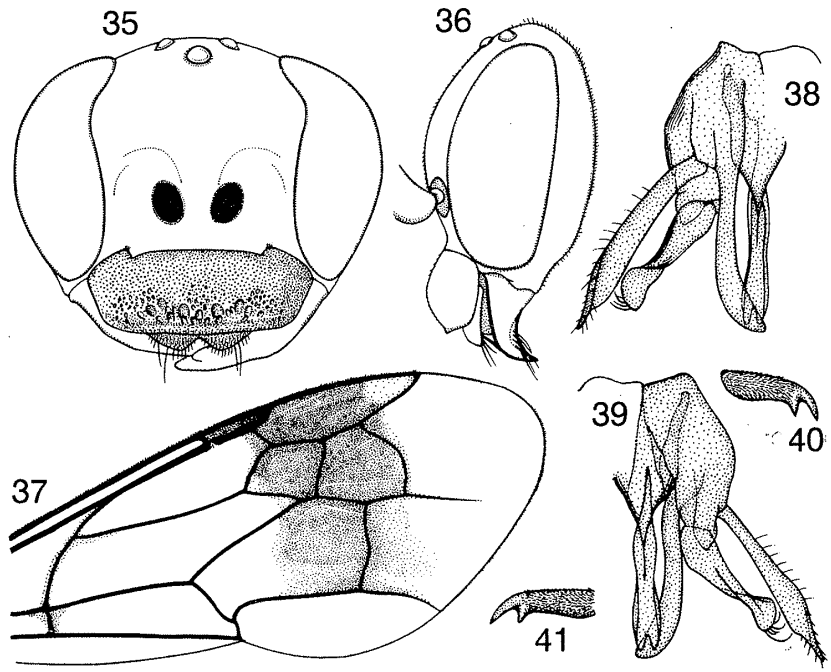
(Figs. 7, 35–41)

This species is similar to the preceding, but easily distinguished from the latter by several features as treated in the above-mentioned key.

Description. ♀. Length: Body 5.8–8.8 mm; forewing 5.4–8.0 mm.

Black; hind tibia dorsally with an elongate ivory white spot near base; fore tibial spur light brown; mid and hind tibial spurs ivory white, except for its dorsal edges, which are dark brown; middle portion of mandible rufous; antennal scape ventrally with a longitudinal yellowish streak; pronotum with an indistinct ferruginous streak just in front of posterior margin; this streak extends to dorsal margin of pronotal lobe, where it is distinct and yellowish.

Wings hyaline; forewing (Fig. 37) with a well defined dark fascia occupying basal 2/3 of marginal cell, SMC 2 and 3, apical half of discoidal cell 2 and



Figs. 35–41. *Agenioideus* (*Agenioideus*) *takahashii* n. sp. (35–37, Female, others male.)——35, Head, anterior view; 36, ditto, lateral view; 37, forewing; 38, genitalia, dorsal view; 39, ditto, ventral view; 40, inner claw of fore tarsus; 41, outer claw of fore tarsus.

basal portion of discoidal 3; both sides of crossvein cu-a indistinctly fuscous; fore- and hindwings feebly infuscate along outer margin.

Head densely finely punctate; mesosoma and metasoma micropunctate, except for postnotum which is almost smooth.

Body and appendages covered with conspicuous silvery white pubescence, which is densest on posteroventral portion of mesopleuron, posterolateral portion of propodeum and dorsal face of hind coxa. Less hairy than *A. ishikawai*; whitish short hairs relatively abundant on apical portion of clypeus, vertex, occiput, pronotal collar, propleuron and posterolateral portion of propodeum; brownish longer hairs sparsely on apical margin of labrum, mandible, T6 and S6.

Head seen in front (Fig. 35) 1.2× as broad as long. Vertex slightly convex between tops of eyes. Frons feebly convex in dorsal view, median line indistinct. MID 0.58–0.61× head width. Inner orbits distinctly emarginate a little above the middle, convergent above and below. UID : MID : LID = 7.5–7.8 : 10 : 8.5–8.9. Ocelli obtuse-angled in front, POL : OOL = 1 : 0.96–1.1. Clypeus much broader than LID, 2.4–2.6× as broad as long, with a shagreened depressed rim; surface of clypeus strongly convex at apical 1/3 (Fig. 36), with numerous, very large and strong, preapical pores; apical margin of clypeus very slightly arcuately convex. Malar space very short. Gena in dorsal view strongly

convergent posteriorly, 0.4–0.5× eye width in profile. Mandible unidentate. Antenna with basal 4 segments in a ratio of 25–32 : 10 : 29–34 : 24–31; third segment 3.8–4.3× as long as thick; scape ventrally somewhat compressed with a longitudinal carina.

Pronotum steeply sloping anteriorly, its shoulder not swollen, without a depressed posterior margin. Mesoscutum with parapsidal line very fine, its posterolateral margin reflexed. Disc of scutellum well convex above the level of mesoscutum, slightly narrowed posteriorly. Disc of metanotum strongly overhanging postnotum. Postnotum shorter than metanotum at midline, with transverse striae at anterior and lateral portions. Propodeum gently arched above in profile; its surface subpolished, without any trace of transverse rugae.

Forelegs less spinose than in *A. ishikawai*; tarsal comb scarcely developed (type 0,0,0) (Fig. 7); tarsomere 1 externally with 3 spines shorter than width of the segment; tarsomere 2 with a spine at middle, which is about as long as that at apex and width of the segment; tarsomere 3 without a spine at middle. Longer spur of hind tibia 0.66–0.77× as long as tarsomere 1. Tarsomere 5 without ventral spines.

Forewing (Fig. 37) with marginal cell 0.65–0.76× its own length from wing tip. SMC2 0.67–0.91× as long as SMC3 below, receiving crossvein 1 m–cu at apical 0.20–0.30, and narrowed above by 0.69–0.75× its length below. SMC3 receiving crossvein 2m–cu at apical 0.38–0.43, and narrowed above by 0.38–0.47× its length below. Crossvein cu-a originating at or barely distad to point of separation of vein M+CuA. Crossvein 2m–cu meeting vein CuA_1 much more than half the distance from base of CuA_1 to outer wing margin. Hindwing crossvein cu-a originating distinctly basad to point of separation of vein M+CuA.

♂. Length: Body 6.2 mm; forewing 5.3 mm.

Black, with ivory yellow markings as follows: an apical spot on T7, a subbasal large spot on hind tibia dorsally, and a transverse streak just in front of posterior margin of pronotum, which is interrupted medially. Mid and hind tibial spurs ivory white. Antennal scape ventrally with a longitudinal yellowish streak. Apical half of mandible rufous. Fore tibial spur light brown. Fore tibia and tarsus somewhat brownish. Wing fascia paler than in female. Metasoma without long erect setae.

Head seen in front 1.2× as broad as long. Vertex between tops of eyes more convex than in female. Frons in dorsal view roundly convex. MID 0.64 × head width. UID : MID : LID = 8.0 : 10 : 8.1. POL : OOL = 1 : 0.91. Clypeus 2.5× as broad as long, apical margin almost straight, but its anterolateral corner rounded, without a well defined apical rim; surface of clypeus slightly convex longitudinally, with preapical pores smaller than in female. Gena in dorsal view flattened immediately behind eye, 0.24× eye width in profile.

Antenna thicker and shorter than in *A. ishikawai*, 3rd segment 1.5× as long as thick; basal 4 segments in a ratio of 28 : 10 : 15 : 18.

Pronotum with sides strongly narrowing anteriorly. Postnotum almost as long as metanotum. All tarsal claws with a strong tooth near apex; inner and outer claws of foreleg almost symmetrical (Figs. 40–41).

Genitalia (Figs. 38–39) with paramere almost straight, wedge-shaped at apex, with fine, sparse short setae externally; volsella stout, twisted subapically, its apical margin rounded with several, long, stout curved setae; basal hooklets absent; parapenial lobe a little longer than aedeagus, slightly decurved and spatulate at apex; aedeagus slender, slightly broadened subapically, its apex bilobed, without setae along shaft.

Holotype: ♀. Mitsune, Hachijô Is., Tokyo, ix-24, 1989 (H. TAKAHASHI). Deposited in the Department of Natural History, Tokyo Metropolitan University, Tkyo.

Paratypes: Mitsune, Hachijô Is., Tokyo, 1 ♀, vii-29, 1987; 1 ♀, ix-12, 1989; 1 ♀, ix-24, 1989; 1 ♀, ix-25, 1989; 1 ♀, ix-14, 1990 (H. TAKAHASHI). 1♂, Sobosan, Bungo, Kyushu, vii-14, 1931 (ESAKI & FUJINO). Deposited in the colletions of Nationnal Institute of Agro-Environmental Sciences.

Distribution. Japan (Kyushu and Hachijô Is.).

This new species is named after Mr. H. TAKAHASHI, who kindly offered me his own materials of this species.

Acknowledgments

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