

**A Preliminary Revision of *Pseudorhyssa* Merrill Occurring
in Japan, with Description of a New Species
(Hymenoptera: Ichneumonidae)**

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Received for Publication September 7, 1983

Introduction

The genus *Pseudorhyssa* Merrill belonging to the tribe Theroniini in the subfamily Ephialtinae has been represented by only the two species, *Pseudorhyssa alpestris* (Holmgren) from Europe and *P. maculicoxis* (Kriechbaumer) from Europe and North America. So far as I am aware, no species of the genus *Pseudorhyssa* has been known to occur in Japan. In the course of the present investigation I have found three species in Japan, of which one is new to science and the rest are new to Japan. On this occasion I will give a revision on the Japanese species herein after. According to Townes (1969), the members of this genus are the secondary parasites of Rhyssini that parasitize wood-boring sawflies, ovipositing through the same oviposition tunnel as the one used by the rhyssinne. No host record is, however, given in the Japanese species. The holotype of the new species is deposited in the collection of the Entomological Institute, Hokkaido University, Sapporo.

Genus *Pseudorhyssa* Merrill

Pseudorhyssa Merrill, Ann. Ent. Soc. America 41: 150, 1915. [Type-species: *Pseudorhyssa sternata* Merrill (= *Rhyssa approximator* var. *maculicoxis* Kriechbaumer)].

This genus is characterized by the following aspects: —

Clypeus with a median apical tubercle. Mesoscutum covered with close, sharp transverse wrinkles. Propodeal carina strong to weak. Forewing 7–19 mm. in length; areolet present (Figs. 8–10); nervellus intercepted above the middle (Figs. 11–13). Tarsal claws not enlarged, without an enlarged bristle having a spatulate tip. First tergite usually with a sharp lateral longitudinal carina from its spiracle to its apex. Abdomen rugulose or strongly mat, with rather dense hairs; last tergite of female elongate but without an apical horn or boss (Figs. 6 and 7); ovipositor strongly compressed, slender, the apex being not sinuate; ovipositor sheath 1.7–2.0 times as long as front wing.

The Japanese species can be distinguished by the following key: —

Key to the Japanese species of *Pseudorhyssa*

1. Pronotum with a acute tooth on postdorsal margin (Fig. 5). Occiput with a strong protuberance on dorsoventral area. Pleural carina of propodeum obsolete. Median longitudinal carina of propodeum strong and complete. Wings hyaline.*acutidentata*, sp. nov.
- Pronotum without a tooth on posterodorsal margin (Fig. 4). Occiput with a weak protuberance

- on dorsoventral area. Pleural carina of propodeum distinct. Median longitudinal carina of propodeum weak and incomplete. Wings yellowish subhyaline.2
2. Antennae short and stout, with 41 segments; 2nd flagellar segments 2.1 times as long as wide at apex and about 1.4 times as long as 3rd flagellar one. Propodeum finely and transversely striate; propodeal spiracle subcircular, about 1.4 times as long as wide. Apical teeth of mandible approximately equal in length (Fig. 2). Front and middle coxae yellowish brown; hind coxa dark brown, darker basally.*alpestris* (Holmgren)
- Antennae long and slender, with 57 segments; 2nd flagellar segment 3.4 times as long as wide at apex and 1.1 times as long as 3rd flagellar one. Propodeum smooth and impunctate; propodeal spiracle elliptic, 2.1 times as long as wide. Lower apical tooth of mandible a little longer than the upper one (Fig. 3). All coxae almost entirely black.*maculicoxis* (Kriechbaumer)

Pseudorhyssa alpestris (Holmgren) (Figs. 1, 2, 10 & 13)

Rhyssa alpestris Holmgren, Öfvers. Svenska. Vet. Akad. Förh. 16: 122, 1859.

Rhyssa alpestris: Holmgren, Svensk Vet. Akad. Handl. III, 2: 9, 1860.

Rhyssa alpestris: Thomson, Opusc. entom. 8: 737, 1887.

Rhyssa approximator var. *ruficoxis* Kriechbaumer, Ent. Nachr. 13: 250, 1887.

Rhyssa approximator var. *ruficoxis*: Kriechbaumer, Ent. Nachr. 15: 318, 1889.

Rhyssa approximator var. *alpestris*: Kriechbaumer, Entom. Nachr. 15: 318, 1889.

Pseudorhyssa alpestris: Kerrich, Entomologist 99: 45, 1966.

Rhyssa approximator var. *ruficoxis*: Kerrich, Entomologist 99: 44, 1966.

Pseudorhyssa alpestris: Townes, Mem. Amer. Ent. Inst. 11: 128, 1966.

This species is new to Japan. On the basis of the present single female a redescription will be given below: —

♀. Face about 1.3 times as wide as high, almost flat, strongly and densely punctate, with rather dense whitish hairs, and short and shallow grooves on the lateroventral side of each antennal socket; clypeus weakly swollen, small, almost flat, about 1.2 times as wide as high, with large and scattered punctures along the upper margin, and setiferous punctures on apico-lateral corner, the apical margin being almost truncate; malar space very narrow, 1/5 as long as the basal width of mandible; mandible short and stout, with large and scattered punctures, and very fine longitudinal striae on about basal 1/2, the apical teeth being equal in length (Fig. 2); temple rather strongly swollen, about 1.2 times as long as the eye in lateral view, sparsely and weakly punctate, the punctures being sparser anteriorly, and bare on about anterior 1/2; frons weakly concave, polished, smooth, with fine punctures along dorsal margin; vertex weakly and sparsely punctate; distance between lateral ocelli and eyes 2.0 times as long as the diameter of an ocellus; occipital carina weak but distinct, complete, and weakly arched downward on the mid-dorsal part, the lower end joining oral carina far above the base of mandible; occiput with a dull protuberance on median ventral area, the protuberance divided by a shallow vertical groove. Antennae a little stouter than those in the other two species, filiform, with 41 segments; 2nd flagellar segment stout, about 2.1 times as long as wide at apex, 7/9 as long as 2nd flagellar segment and about 1.4 times as long as the 3rd one. Pronotum polished, smooth medially, weakly and rather sparsely punctate dorsally, the punctures being denser dorsally and more widely distributed than those in *acutidentata*; collar finely rugoso-punctate with rather long whitish hairs; epomia short and weak; posterodorsal margin of pronotum not specialized, without a tooth; mesoscutum covered with coarse, strong and transverse striae, shallowly and densely punctate on the anterior part of median and lateral lobes; lateral lobes of

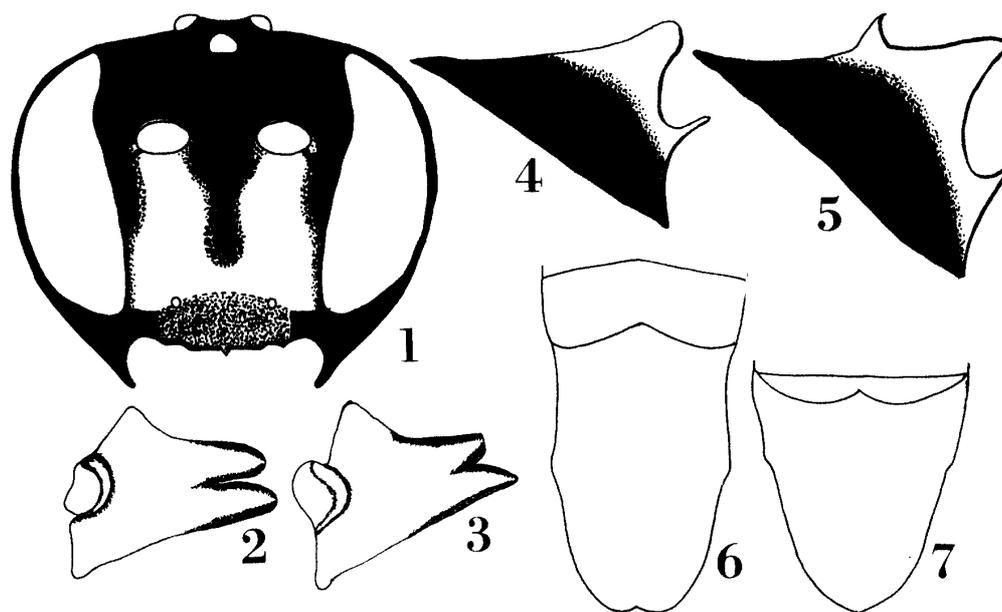


Fig. 1. Colour pattern of head in frontal view, female, *Pseudorhyssa alpestris* (Holmgren).

Figs. 2 and 3. Mandibles, females; 2. *P. alpestris* (Holmgren); 3. *P. maculicoxis* (Kriechbaumer).

Figs. 4 and 5. Hind dorsal parts of pronotum, colour patterns and dorsal teeth, females: 4. *P. maculicoxis* (Kriechbaumer); 5. *P. acutidentata*, sp. nov.

Figs. 6 and 7. Apical segments of abdomen in dorsal view, females: 6. *P. acutidentata*, sp. nov.; 7. *P. maculicoxis* (Kriechbaumer).

mesoscutum with a narrow, median longitudinal punctate area; notauli short and strong basally; scutellum moderately convex, transversely rugulose, without lateral carinae; mesopleurum polished, weakly and densely punctate, the punctures becoming a little sparser posteriorly, and impunctate posteriorly; prepectal carina distinct, present on lower 3/8 of mesopleurum, the upper end far distant from the anterior margin of mesopleurum; metapleurum weakly and sparsely punctate, the punctures becoming sparser centrally. Propodeum trans-rugose medially; median longitudinal carinae obsolete; apical transverse carina weak but complete; lateral and pleural areas weakly and densely punctate; petiolar area polished and smooth; propodeal spiracle subcircular, about 1.4 times as long as wide; pleural carina weak but complete. Wings as in Figs. 10 and 13; metacarpella with 11 or 12 hamuli. Hind femur 5.4 times as long as wide in lateral view; 2nd segment of hind tarsus 1/2 as long as the basitarsus and about 1.7 times as long as the 3rd one; 2nd segment of middle tarsus about 1/2 as long as the basitarsus and about 1.6 times as long as the 3rd one. Abdomen with 1st tergite almost entirely loosely rugulose, 1.8 times as long as wide at apex; dorsal longitudinal carina of 1st tergite present on about basal 1/3; dorsolateral carina distinct on apical 1/3, continuing as blunt ridge to the base; spiracle of 1st tergite situated at basal 3/8; 1st sternite ending at 4/9 the distance between base and apex of tergite, and its apex a little behind spiracle; 2nd to 5th tergites loosely rugulose, the apical part of each tergite strongly mat; 5th and the following tergites rather weakly mat; 2nd tergite about 1.3 times as long as wide at apex and about 1.0 times as long as the 3rd one; last tergite elongate, without apical median notch. Ovipositor sheath about 1.7 times as long as forewing.

Black. Face yellow, with three vertical blackish stripes (Fig. 1); clypeus dark reddish brown (Fig. 1); malar space slightly tinged with dark brown; mandible blackish, with a yellow basal spot;

scape black, yellow on ventral margin; pedicel blackish, dark brown on apicoventral margin; flagellum infusate. Tegula and posterodorsal corner of pronotum yellow. Anteroventral margin of pronotum weakly tinged with yellowish brown. Front leg with coxa and trochanter pale-yellow; femur, tibia and tarsus light yellowish brown. Middle leg with coxa pale-yellow to yellowish brown, a little darker basally; trochanter pale-yellow; femur and tibia light yellowish brown; tarsus yellowish brown to dark brown, paler basally. Hind leg with coxa yellowish brown to dark brown, darker basally and paler apically; trochanter pale-yellow; femur light yellowish brown; tibia dark brown, a little darker apically and a little paler basally; tarsus light dark brown. Abdomen black; 1st to 3rd tergites with a yellowish brown mark, apically; extreme apex of 1st to 6th tergites pale-yellow to yellowish brown; epipleurae pale-yellow. Ovipositor light yellowish brown. Wings yellowish subhyaline.

Length: Body 21.8 mm., forewing 14.5 mm.

♂. Unknown.

Specimen examined: 1♀, Okukinu, Tochigi-ken, Honshu, 23-vii-1969, H. Takizawa leg.

Host: *Xiphydra camelus* Linné and *X. prolongata* Geoffroy (Xiphydriidae, Hym.) (after Aubert, 1969, in Europe).

Distribution: Japan (Honshu); Europe.

Judging from the Kerrich's redescription of the species on the European form, the Japanese form is different from the European in the following points: —

(1) Hind coxa yellowish brown to dark brown, darker basally and paler apically. (2) Face yellow, with three dark brown vertical stripes.

***Pseudorhyssa maculicoxis* (Kriechbaumer) (Figs. 3, 4, 7, 9 & 12)**

Rhyssa approximator var. *maculicoxis* Kriechbaumer, Entom. Nachr. 15: 318, 1889.

Rhyssa approximator: Szépligeti, In Horvath: Zoologische Ergebnisse der dritten asiatischen Forschungsreise des Grafen Eugen Zichy 2: 127, 142. 1901. Misdetermination of *approximator*.

Rhyssa approximator var. *ruficoxis*: Morley, Revision of the Ichneumonidae...in the British Museum...2: 13, 1913. Misdetermination of *ruficoxis* Kriechbaumer.

Pseudorhyssa sternata Merrill, Trans. Amer. Ent. Soc. 61: 150, 1915.

Pseudorhyssa ruficoxis: Townes, U. S. Nat. Mus. Bull. 216: 373, 1960. Misdetermination of *ruficoxis* Kriechbaumer.

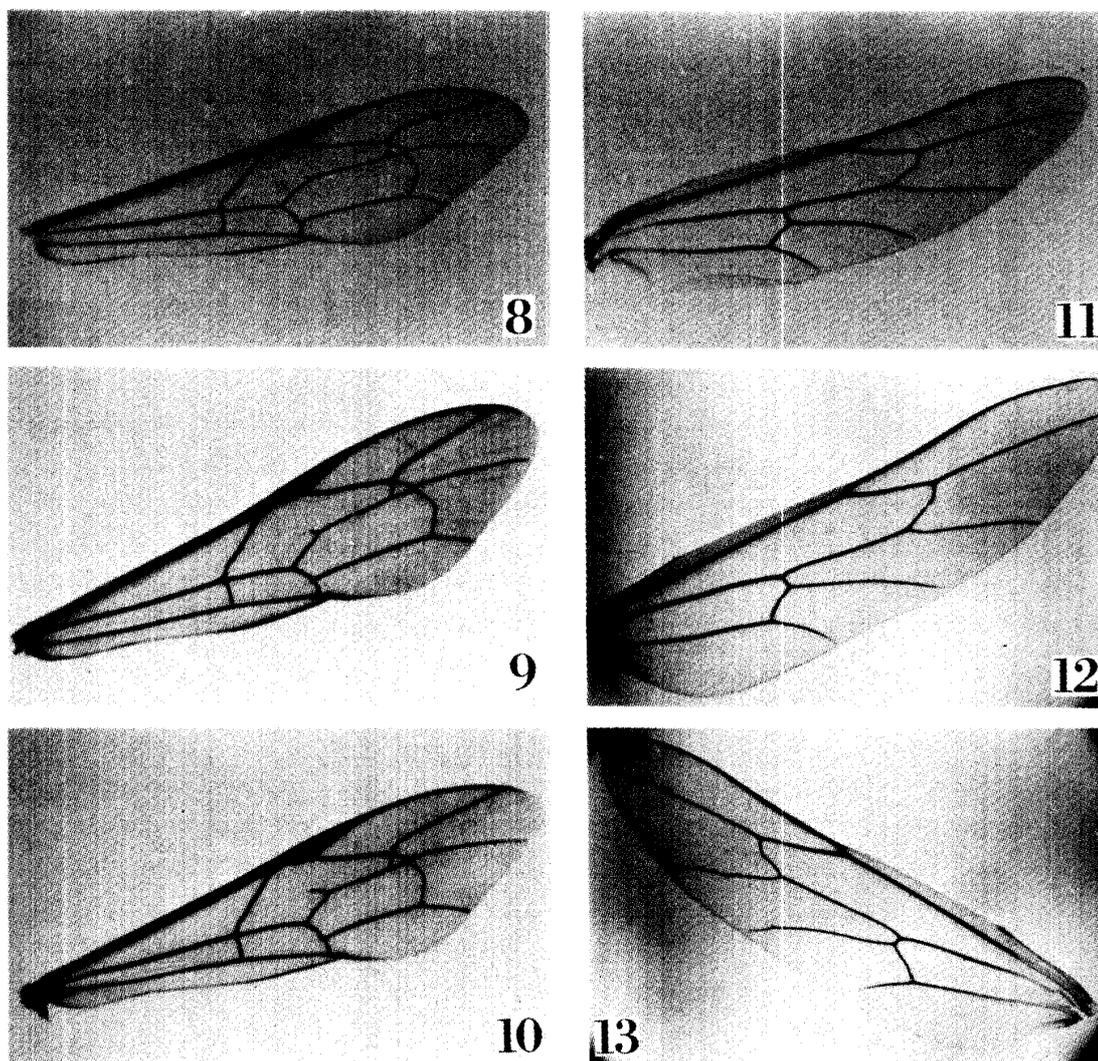
Pseudorhyssa sternata: Kerrich, Entomologist 99: 45, 1966.

Pseudorhyssa maculicoxis: Townes, Mem. Amer. Ent. Inst. 11: 128, 1969.

Pseudorhyssa maculicoxis: Calson, Catal. Hym. Amer. North of Mexico 1: 346, 1979.

This species is new to Japan. On the basis of the present single female a redescription will be given below: —

♀. Face about 1.3 times as wide as high, almost flat, finely and rather sparsely punctate, with rather sparse whitish hairs, and short and shallow grooves on the lateroventral side of each antennal socket; clypeus flat, almost smooth, with setiferous punctures on the lower lateral corner and a row of large punctures along the upper margin, the apical margin being weakly convex medially; malar space very narrow, 2/9 as long as the basal width of mandible; mandible short and stout, very sparsely punctate on about basal 1/2, the lower tooth a little longer than the upper one (Fig. 3); temple rather strongly swollen, about 1.2 times as long as eye in lateral view, with sparse and weak punctures, the punctures being sparser anteriorly, and bare on about anterior 1/2; frons weakly concave, smooth and bare, with very fine and sparse punctures along the dorsal margin; vertex



Figs. 8–10. Right forewings, females: 8. *Pseudorhyssa acutidentata*, sp. nov.; 9. *P. maculicoxis* (Kriechbaumer); 10. *P. alpestris* (Holmgren).

Figs. 11 and 12. Right hind wings, females: 11. *P. acutidentata*, sp. nov.; 12. *P. maculicoxis* (Kriechbaumer).

Fig. 13. Left hind wings, female, *P. alpestris* (Holmgren).

with sparse and distinct punctures; distance between lateral ocelli and eyes 1.8 times as long as the diameter of an ocellus; occipital carina distinct and complete, weakly arched downward dorsally, the lower end joining oral carina far above the base of mandible; occiput with a dull protuberance on ventrodorsal area, the protuberance divided by a narrow, deep groove. Antennae long, slender, filiform, with 57 segments; 2nd flagellar segment about 3.4 times as long as wide at apex, $5/6$ as long as 1st flagellar segment and about 1.1 times as long as the 3rd. Pronotum polished, smooth medially, weakly and rather sparsely punctate dorsally as in *alpestris*; collar finely punctate, with long greyish hairs; epomia short and weak; posterodorsal margin of pronotum without a tooth; mesoscutum closely, strongly and transversely wrinkled and trans-rugulose laterally, the anterior part of median lobe being densely and finely punctate; notauli short and strong basally; scutellum moderately convex, transversely rugulose, without lateral carinae; metapleurum shallowly and rather sparsely punctate, with a wide impunctate area along the posterior margin; prepectal carina weak but distinct, the upper end far distant from anterior margin of mesopleurum; metapleurum very

finely and sparsely punctate. Propodeum polished and bare on median 2/3, strongly and rather sparsely punctate on lateral 1/3, the petiolar area polished and bare; median longitudinal carina weak on basal 1/2, obsolete on apical 1/2; apical transverse carina of propodeum weak but complete; pleural area of propodeum sparsely granulate; pleural carina weak but complete; propodeal spiracle elliptic, about 2.1 times as long as wide. Wings as in Figs. 9 and 12; metacarpella with 10 or 11 hamuli. Hind femur about 4.9 times as long as wide in lateral view; 2nd tarsal segment of hind leg 4/7 as long as the basitarsus and about 1.6 times as long as the 3rd one; 2nd tarsal segment of middle leg 5/9 as long as the basitarsus and about 1.5 times as long as the 3rd one. Abdomen with 1st tergite finely and loosely rugulose except for smooth median basal 1/3, about 2.1 times as long as wide at apex; dorsal longitudinal carina of 1st tergite distinct on basal 2/5, continuing as blunt ridge to near the basal 4/5; dorsolateral carina of 1st tergite obtuse before spiracle and strong behind the spiracle; spiracle of 1st tergite situated at basal 3/8; 1st sternite ending at 2/5 the distance between base and apex of tergite and its apex opposite spiracle; 2nd to 5th tergites finely and loosely rugulose, the apical portion of each tergite moderately strongly mat; 6th and the following tergites weakly mat; 2nd tergite about 1.2 times as long as wide at apex and about 1.1 times as long as the 3rd one; last tergite elongate, without an apical median notch (Fig. 7). Ovipositor sheath 1.9 times as long as forewing.

Black. Face yellow, with three dark brown vertical stripes; clypeus tinged with dark brown; mandible blackish, with a basal yellowish brown spot on basal portion; malar space and lower part of temple slightly tinged with dark brown. Scape and pedicel dark brown to blackish, yellowish brown on the ventral side; flagellum fuscous brown to dark fulvous, a little paler apically. Tegula and postdorsal corner of pronotum yellow. Anteroventral margin of pronotum slightly tinged with dark brown. Front leg with coxa dark brown to blackish, paler apically; trochanter, femur, tibia and tarsus light yellowish brown to yellowish brown. Middle leg with coxa blackish except for yellowish brown extreme apex; trochanter, femur, tibia and tarsus yellowish brown. Hind leg with coxa blackish, a little paler at extreme apex; trochanter yellowish brown; femur fuscous brown, a little darker apically; tibia and tarsus fuscous brown. Abdomen black; apical margin of each tergite tinged with yellowish brown; epipleurae dirty yellowish brown. Ovipositor reddish brown dorsally, yellowish brown ventrally. Wings yellowish subhyaline.

Length: Body ca. 22.0 mm., forewing 15.3 mm.

♂. Unknown.

Specimen examined: 1♀, Momiki-Kaimochi, Gokanoshô, Kumamoto-ken, Kyushu, 21-vii-1966, R. Ooishi leg.

Host: *Sirex* (= *Paurus*) *juvencus* Linné and *S. noctilio* Fabricius (Siricidae, Hym.) (after Aubert 1969, in Europe). The North American form has been associated with *Rhyssa howdenorum* Townes and *R. persuasoria* (Linné) and is presumably cleptoparasitic on them (after Calson, 1979).

Distribution: Japan (Kyushu); Russia; Europe; North America.

Judging from the Townes' and Kerrich's redescriptions on the Nearctic and European forms, respectively, the Japanese form is different from the former two in the following points: —

(1) Face yellow, with three short and vertical blackish stripes. (2) Middle and hind coxae black except at extreme apex. (3) Hind femur fuscous brown. (4) Wings yellowish subhyaline.

***Pseudorhyssa acutidentata*, sp. nov. (Figs. 5, 6, 8 & 11)**

♀. Face about 1.4 times as wide as high, weakly convex, strongly and rather densely punctate, with rather dense whitish hairs, and short and shallow groove on the lateroventral side of each

antennal socket; clypeus small, almost flat, about 2.0 times as wide as high, with a row of large, sparse punctures along the upper margin, and a dense hair band along the apical margin, the apical margin being truncate; malar space narrow, about $2/7$ as long as the basal width of mandible; mandible short and stout, sparsely haired on about basal $1/2$, the apical teeth being stout, and approximately equal in length; temple rather strongly swollen, about 1.3 time as long as eye in lateral view, sparsely haired posteriorly, bare anteriorly; frons weakly concave, polished and smooth, finely punctate on the upper part; vertex finely and sparsely punctate; distance between lateral ocelli and eyes about 1.6 times as long as the diameter of an ocellus; occipital carina strong and complete, with a distinct dorsal notch, the lower end joining oral carina far above the base of mandible; occiput with a strong protuberance on dorsoventral area, the protuberance divided by a deep vertical groove. Antennae long, filiform, with 64 segments; 2nd flagellar segment about 3.3 times as long as wide at apex, $6/7$ as long as 1st flagellar segment and 1.1 times as long as 3rd flagellar one. Pronotum polished and smooth medially, finely and densely punctate dorsally, with a small acute tooth on posterodorsal margin (Fig. 5); collar very finely punctate, with long, rather dense whitish hairs, the hairs being weakly greyish dorsally; epomia short and weak; mesoscutum covered with close, fine and transverse wrinkles, the wrinkles being finer than those in *maculicoxis*, strongly and densely punctate on about anterior $1/5$ and sublateral area; notauli strong basally; scutellum weakly convex, moderately strongly punctate, with trans-rugulae medially, without lateral carinae; mesopleurum polished, weakly and densely punctate, impunctate posteriorly; prepectal carina strong, present on lower $4/9$ of mesopleurum, the upper end far distant from anterior margin of mesopleurum; metapleurum polished, weakly and sparsely punctate. Propodeum with strong and complete median longitudinal carinae; median basal area confluent with areola and petiolar areas, polished and smooth; lateral and pleural areas densely and distinctly punctate; pleural carina obtuse before spiracle, obsolete behind the spiracle; propodeal spiracle large, elliptic, about 2.1 times as long as wide. Wings as in Figs. 8 and 11; metacarpella with 12–14 hamuli. Hind femur 5.3 times as long as wide in lateral view; 2nd segment of hind leg $3/5$ as long as the basitarsus and about 1.7 times as long as the 3rd one; 2nd segment of middle tarsus $4/9$ as long as the basitarsus and 1.2 times as long as the 3rd one. Abdomen with 1st tergite generally with dense transverse or oblique rugulae, smooth and bare on median basal $3/7$, about 2.1 times as long as wide at apex; dorsolateral carina more or less complete; dorsal longitudinal carina of 1st tergite distinct on basal $1/2$, continuing as blunt ridge to near the basal $7/9$; spiracle of 1st tergite situated at basal $3/8$; 1st sternite ending at about $1/3$ the distance between base and apex of tergite, and its apex a very little in front of spiracle; 2nd to 5th tergites loosely rugulose, the apical part of each tergite strongly mat; 6th and the following tergites mat; 2nd tergite about 1.3 times as long as wide at apex and about 1.1 times as long as the 3rd one; last tergite elongate, with a small apical median notch (Fig. 6). Ovipositor sheath about 2.0 times as long as forewing.

Black. Face yellow, with three short vertical dark brown stripes; clypeus fuscous brown to yellowish brown; mandible blackish, yellowish brown to pale-yellow basally; malar space and lower part of temple tinged with fuscous brown; palpi pale-yellow to yellowish brown, the labial palpus a little darker; scape and pedicel blackish, yellowish brown ventrally; flagellum infusate. Hind corner of pronotum and tegula yellow. Front leg yellow to yellowish brown; coxa dark brown, yellow to yellowish brown on apicolateral $1/3$ and at base. Middle leg yellow to yellowish brown; coxa dark brown, yellowish brown on dorsolateral $1/2$ and at apex. Hind leg with coxa dark brown to blackish, paler apically; trochanter and femur yellowish brown to light reddish brown; tibia and tarsus yellowish brown to dark brown, darker apically. Abdomen black; apex of 1st

to 7th tergites tinged with yellow to yellowish brown; epipleurae yellowish brown. Ovipositor light yellowish brown. Wings hyaline.

Length: Body 31.3 mm., forewing ca. 21 mm.

♂. Unknown.

Holotype (♀): Meguro, Tokyo-to, Honshu, 9-v-1963, reared from *Abies* sp. (no further data).

Host: Unknown.

Distribution: Japan (Honshu).

This species may be readily distinguished from any other congeneric species by the pronotum with an acute postdorsal tooth, by the occiput with a pair of strong protuberances and by the incomplete pleural carina of propodeum.

Summary

Three species of the genus *Pseudorhyssa* are described: *P. acutidentata*, sp. nov. from Tokyo; *P. alpestris* (Holmgren); and *P. maculicoxis* (Kriechbaumer). This is the first record of the genus from Japan. A key to the species is given.

Acknowledgements

The writer is greatly indebted to Prof. A. Nagatomi of the Kagoshima University for his kindness in reading through the manuscript and for his constant encouragement. Thanks are also due to Messrs. H. Takizawa and R. Ooishi, for their kindness in offering valuable material.

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