Revision of the Genus *Pyracmon* (Insecta: Hymenoptera: Ichneumonidae) from Japan, with Description of a New Species

Kyohei Watanabe

Kanagawa Prefectural Museum of Natural History, Iryuda 499, Odawara, Kanagawa 250-0031, Japan
E-mail: watanabe-k@nh.kanagawa-museum.jp
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Japanese species of the genus *Pyracmon* Holmgren, 1859 are reviewed. A new species, *P. monticola* sp. nov. is described. *Pyracmon sepiellus* (Holmgren, 1860) is newly recorded based on a specimen collected from Hokkaido. *Pyracmon nigrifemur* Barron and Walley, 1983 is also recorded from Kyushu for the first time. A key to Japanese species of this genus is provided.

Key Words: Campopleginae, distribution, Eastern Palearctic region, parasitoid wasp, taxonomy.

Introduction

The genus *Pyracmon* Holmgren, 1859 is a small sized taxon of the subfamily Campopleginae Förster, 1869 and contains six species from the Holarctic region (Yu et al. 2016). In Eastern Palearctic region, Barron and Walley (1983) recorded a single species, *P. nigrifemur* Barron and Walley, 1983 from Honshu, Japan, while no additional record was known in this region.

In 2016, I visited Zoologische Staatssammlung München, Germany (ZSM), and examined its campoplegine specimens, especially Horstmann’s collection. Then I started to the identification of some Japanese campoplegine specimens of Kanagawa Prefectural Museum of Natural History, Odawara (KPM-NK) and National Institute of Agro-Environmental Sciences, Tsukuba (NIAES). By the result, some additional species have been found from Japan. In this paper, the Japanese species of *Pyracmon* are reported.

Materials and Methods

Materials used were from KPMNH, NIAES and ZSM. For the comparison, I also examined the holotype of *Pyracmon nigrifemur* deposited in American Entomological Institute, Logan, Utah, USA (AEIC) and the specimens determined by K. Horstmann deposited in ZSM: *P. fumipennis* (Zetterstedt, 1838) and *P. truncicola* Thomson, 1887. A stereomicroscope (Nikon SMZ800) was used for observations. Photographs were taken by Olympus TG-4 digital camera joined with the stereo microscope. Digital images were edited using Adobe Photoshop® CS6. Morphological terminology follows that established by Gauld (1991) except for wing venation follows that established by Townes (1969). The following abbreviations are used in descriptions: flagellomere (FL), holotype (HT), ocellus diameter (OD), ocello-ocular line (OOL), postocellar line (POL), metasomal tergites (T), tarsal segment (TS) and metasomal sternites (S).

Results and Discussion

I recognize three species of *Pyracmon* from Japan. Two of them are known described species, *P. nigrifemur* and *P. sepiellus*, the latter is newly found from Eastern Palearctic region. The remainder is identified as a new species.

Taxonomy

Genus *Pyracmon* Holmgren, 1859

*Pyracmon* Holmgren, 1859: 326. Type: *Porizon fumipennis* Zetterstedt, 1838. Original designation.

**Diagnosis.** This genus is the one of easily recognizable group of Campopleginae. According to Townes (1970) and Barron and Walley (1983), this genus can be distinguished from other genera of Campopleginae by the following combination of character states: apical margin of clypeus with (Fig 15) or without (Figs 21, 25) a weak median convexity; lower tooth of mandible not longer than upper tooth (Figs 14, 20); posterior transverse carina of mesosternum complete; propodeal spiracle circular to elliptic (Figs 16, 22, 26); areolet receiving second recurrent vein at (Fig. 4) or little distad of the middle; nervulus opposite basal vein (Fig. 4), or distad of it by less than 0.3 its length; nervellus distinctly intercepted (Figs 5, 7); discoidella often pigmented (Fig. 7); glymma present, large and rather deep (Figs 17, 23, 27); thyridium separated from basal margin of T2 by more than its
own length (Figs 17, 23, 27); ovipositor sheath usually about as long as hind tibia; ovipositor rather stout and distinctly compressed.

All Japanese species have the following combination of character states: fore wing with an acute angle of postero-distal corner of second discoidal cell; ovipositor distinctly upcurved.

**Distribution.** Holarctic region.

**Bionomics.** Three families, Tortricidae (Lepidoptera), Arctiopodidae and Elateridae (Coleoptera) (Graham 1965; Barron and Walley 1983), have been recorded as the host while no record is known in Japan.

**Remarks.** Japanese species of *Pyracmon* can be distinguished by the following key.

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**Key to Japanese species of the genus *Pyracmon* (♀)**

1. Hind tibia completely black (Fig. 6). Tegula black (Fig. 7). Palpi blackish brown (Fig. 6). Propodeal carinae strongly developed (Figs 8, 22). Fore wing with postero-distal corner of second discoidal cell in form an acute angle (80°). T I in profile dorsally with an obtuse angulation (Fig. 23). .......... .......... *P. nigrifemur*

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1. Hind tibia with a conspicuous yellowish brown or reddish brown area (Figs 1, 9). Palpi and tegula yellow to yellowish brown (Figs 1, 2, 9, 10). Propodeal carinae strongly developed (Figs 11, 26) or partly obscured (Figs 3, 16). Fore wing with postero-distal corner of second discoidal cell in form an acute to right angle.
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**Revision of the genus *Pyracmon* from Japan** (85°–90°) (Fig. 4). T I in profile dorsally of T I without an obtuse angulation (Figs 17, 27).

2. Apical margin of clypeus with a pair of lateral margined area and a median weak, smooth convexity (Fig. 15). Propodeal carinae partly obscured (Figs 3, 16). Tegula light yellow (Fig. 2). Ovipositor sheath distinctly longer than (1.4× as long as) hind tibia. ..............

— Apical margin of clypeus simply arched, without a pair of lateral margined area and a median weak, smooth production (Fig. 25). Propodeal carinae strongly developed (Figs 11, 26). Tegula dark yellow to brown (Fig. 10). Ovipositor sheath almost as long as hind tibia. ....

**Pyracmon monticola** sp. nov.

[New standard Japanese name: Miyama-chibi-amebachi]

**(Figs 1–5, 12–18)**

**Type series. Holotype:** KPM-NK 74578, female, JAPAN, Nagano Pref., Outaki Vil., Mt. Ontakesan, Hakkaisan, 6. VIII. 2010, K. Watanabe leg. **Paratypes: JAPAN:** KPM-NK 74582, 1 female, Hokkaido, Sapporo City, Mt. Maruyama, 29. VII. 2009, K. Watanabe leg.; KPM-NK 74580, 74581, 2 females, Hokkaido, Sapporo City, Nopporo forest park, 9. VII. 2012, M. Ito leg.; KPM-NK 74579, 1 female, same locality of holotype, 18–20. VIII. 2014, S. Shimizu leg. (Malaise trap); KPM-NK 74583, 1 female, Kanagawa Pref., Hadano City, Mt. Koubouyama, 5. IV. 2007, K. Watanabe leg.

**Description. Female** (n=6). Body length 6.5–7.5 (HT: 7.5) mm, slender, mat and impunctate, covered with silver setae.

Head 0.6× as long as wide. Area combined clypeus with face narrow (Fig. 12), 1.0 as long as wide, slightly convex in lateral view. Apical margin of clypeus blunt, with a pair of lateral margined area and a median weak, smooth convexity (Fig. 15). Gena broadly rounded in dorsal view, distinctly receding (Fig. 13). Malar space 0.8× as long as basal mandibular width. Lower part of occipital carina joined with hypostomal carina. Mandible narrow, slightly tapering distally, lower margin with narrow lamella (Fig. 14). POL 1.2–1.4 (HT: 1.4)× as long as OD. OOL 1.2–1.4 (HT: 1.4)× as long as OD. Antenna with 33–34 (HT: 34) flagellomerites. Length of FL I 4.5× as long as maximum depth. FL I:II:III=2.0:1.4:1.3.

Mesosoma. Pronotum covered with longitudinal striae on ventral 0.6 (Fig. 2). Epomia present. Notauli absent. Epinemial carina complete, its dorsal end joined with anterior margin of mesopleuron. Mesopleuron without smooth
area, speculum reticulate coriaceous. Propodeal carinae as in Figs 3, 16. Lateral longitudinal carina partly obscured (Fig. 16). Lateromedian longitudinal carina partly absent. Area petiolaris with some transverse rugae (Figs 3, 16). Fore wing length 5.5–6.1 (HT: 6.1) mm. Wing venation as in Figs 4, 5. Postero-distal corner of second discoidal cell in form an acute to right angle (85–90°). Areolet sessile or shortly stalked, receiving second recurrent vein at the middle (Fig. 4). Hind wing with unpigmented discoidella (Fig. 5), clearly recognizable by light reflection. Hind femur 5.1–5.4 (HT: 5.4)×as long as maximum depth in lateral view. Hind tibia covered with minute (normal) setae, its dorsal surface with some short bristles. Longest spur of hind tibia about half length of first tarsomere. TS I without a continuous, straight, median ventral row if very closely spaced small setae. TS 1:II:III:VI = 4.5–4.8 (HT: 4.8):2.0:1.3–1.5 (HT: 1.5):0.7–0.8 (HT: 0.8):1.0.

Metasoma. T I 2.7–3.0 (HT: 2.9)×as long as maximum width, its base smooth. T I in profile dorsally without an obtuse angulation (Fig. 17). Subapical part of lower valve of ovipositor weakly widened (Fig. 18). Ovipositor sheath 1.4×as long as hind tibia.

Coloration (Figs 1–5). Body (excluding wings and legs) black to blackish brown, except for: mandible except apex, palpi and tegula yellow; membranous part of metasomal sternites and posterior margin of metasomal tergites (usually T IV to T VII but very narrow) yellowish brown; ovipositor reddish brown. Wings hyaline. Veins and pterostigma blackish brown to brown except for yellowish brown to yellowish black in lower wing base. Fore and mid legs reddish brown to yellowish brown except for: coxae largely black; trochanters and trochantelli yellow. Hind leg blackish brown to black except for: trochantellus yellow; base and apex of femur narrowly tinged with yellowish brown; median part of tibia and tibial spurs yellowish brown.

**Male.** Unknown.

**Distribution.** Japan (Hokkaido and Honshu).

**Bionomics.** Unknown.

**Etymology.** The specific name is from Latin “monticola”. The holotype of this species collected in mountain (ca. 1720–1820 m alt.) in Honshu.

**Remarks.** This species resembles *P. sepiellus* in the front wing with postero-distal corner of second discoidal cell in form an acute angle (ca. 85–90°) and the coloration of hind tibia but can be easily distinguished from *P. sepiellus* by the apical margin of clypeus with a pair of lateral margined areas and a median weak, smooth convexity (simply arched in *P. sepiellus*) and the propodeal carinae partly obscured (complete and strong in *P. sepiellus*).

**Pyracmon nigrifemur** Barron and Walley, 1983

[Standard Japanese name: Ashiguro-chibi-amebachi] (Figs 6–8, 19–23)

**Pyracmon nigrifemur** Barron and Walley, 1983: 232.

**Description.** **Female** (n=6). Body 7.0–8.5 mm, slender, mat and impunctate, covered with silver setae. Head 0.55–0.6×as long as wide. Area combined clypeus with face wide (Fig. 19), 0.8 as long as wide, slightly convex in lateral view. Apical margin of clypeus blunt, simply arched, without margined areas and a median smooth convexity (Fig. 21). Gena broadly rounded in dorsal view, slightly receding. Malar space 0.75–0.8×as long as basal mandibular width. Lower part of occipital carina joined with hypostomal carina. Mandible relatively broad, short, tapering distally, lower margin with narrow lamella (Fig. 20). POL 1.4–1.5×as long as OD. OOL 1.4–1.6×as long as OD. Antenna with 26–29 flagellomeres. Length of FL I 4.5×as long as maximum depth. FL I:II:III = 2.0:1.45–1.6:1.3–1.45.

Metasoma. Pronotum covered with longitudinal striae on ventral 0.2 (Fig. 7). Epomia present but short. Notauli slightly present anteriorly. Epicnemial carina complete, its dorsal end joined with anterior margin of mesopleuron. Mesopleuron with a large smooth area on speculum and usually with a longitudinal rugulose area between epicnemial carina and speculum (Fig. 7). Propodeal carinae strong and complete, as in Figs 8, 22. Lateromedian longitudinal carina and lateral longitudinal carinae complete. Area petiolaris without (Figs 8, 22) or with a few transverse rugae, sometimes covered with irregular rugae laterally. Fore wing length 5.4–6.7 mm. Fore wing with angle of postero-distal corner of second discoidal cell acute (ca. 80°). Areolet sessile, receiving second recurrent vein at or little distad of the middle. Hind wing with slightly pigmented discoidella (Fig. 7). Hind femur 4.5–5.0×as long as maximum depth in lateral view. Hind tibia covered with minute (normal) setae, its dorsal surface with some short bristles. Longest spur of hind tibia shorter than half length of first tarsomere. TS I without a continuous, straight, median ventral row if very closely spaced small setae. TS 1:II:III:VI = 4.7–4.8:2.0:1.2–1.3:0.8–0.9:1.0–1.2.

Metasoma. T I 2.8×as long as maximum width, its base smooth. T I in profile dorsally with an obtuse angulation (Fig. 23). Subapical part of lower valve of ovipositor not distinctly widened. Ovipositor sheath 0.95–1.0×as long as hind tibia.

Coloration (Figs 6–8). Body and legs (excluding wings) black to blackish brown; fore femur, tibia and tarsus, tibial spurs of all legs, membranous part of metasomal sternites and ovipositor dark brown; apex of ovipositor sheath yellowish brown. Wings hyaline. Veins and pterostigma blackish brown to brown except for yellowish brown wing base.
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Bionomics. Unknown.

Remarks. This is the first record of this species from Kyushu.

Pyracmon sepiellus (Holmgren, 1860) [New standard Japanese name: Kita-chibi-amebachi]

(Figs 9–11, 24–27)

Limneria sepiella Holmgren, 1860: 63.

Description based on Japanese specimen. Female (n=1). Body 6.3 mm, slender, mat and inpunctate, covered with silver setae.

Head 0.6× as long as wide. Area combined clypeus with face wide (Fig. 24), 0.8× as long as wide, slightly convex in lateral view. Apical margin of clypeus blunt, simply arched, without margined areas and a median smooth convexity (Fig. 25). Gena broadly rounded in dorsal view, distinctly receding. Malar space 0.75×as long as basal mandibular width. Lower part of occipital carina joined with hypostomal carina. Mandible narrow, slightly tapering distally, lower margin with narrow lamella. POL 1.4×as long as OD. OOL 1.5×as long as OD. Antenna with 27 (29 in Barron and Walley 1983) flagellomeres. Length of FL I 4.5×as long as maximum depth. FL I:II:III=2.0:1.55:1.5.

Mesosoma. Pronotum covered with longitudinal striae on ventral 0.6 (Fig. 10). Epomia absent. Notauli absent. Epinemial carina complete, its dorsal end joined with anterior margin of mesopleuron. Mesopleuron with a large smooth area on scapulum and with a longitudinal rugulose area between epicnemial carina and scapulum. Propodeal carinae strong and complete, as in Figs 11, 26. Lateromedian longitudinal carina and lateral longitudinal carina complete. Area petiolaris with some transverse rugae (Figs 11, 26). Fore wing length 5.0 mm (4.7 mm in Barron and Walley, 1983). Hind wing with recurrent vein little distad of the middle. Hind wing with discoidella, slightly pigmented basally, clearly recognizable by light reflection. Hind femur 5.1× as long as maximum depth in lateral view. Hind tibia with minute tubercles (normal) setae, its dorsal surface with some short bristles. Longest spur of hind tibia shorter than half length of first tarsomere. TS I without a continuous, straight, median ventral row if very closely spaced small setae. TS I:II:III:VI:V=4.4:2.0:1.3:0.8:1.1.

Metasoma. T I 2.6×as long as maximum width, its base smooth. T I in profile dorsally without an obtuse angulation (Fig. 27). Subapical part of lower valve of ovipositor slightly widened. Ovipositor sheath 1.0×as long as hind tibia.

Coloration (Figs 9–11). Body (excluding wings and legs) black to blackish brown, except for: mandible except apex, palpi and membranous part of metasomal sternites yellow; tegula, posterior margins of metasomal tergites and ovipositor yellowish brown. Wings hyaline. Veins and pterostigma blackish brown to brown except for yellowish brown wing base. Fore and mid legs reddish brown to yellowish brown except for largely black coxae. Hind leg blackish brown to black except for: trochantellus reddish brown; base and apex of femur narrowly tinged with reddish brown; tibia except for black apical part and tibial spurs reddish brown (base of tibia slightly and narrowly darkened); base of each tarsal segment more or less tinged with yellowish brown.

Male. No additional specimen collected from Japan is available.

Specimens examined. JAPAN: NIAES, 1 female, Hokkaido, Mt. Tarumaesan, 21–26. VII. 1998, K. Konishi leg. (Malaise Trap). SWEDEN: ZSM, 1 female (homotype of Limneria sepiella by Horstmann), Kiruna, 19. VII. 1964, R. Hinz leg. GERMANY: ZSM, 1 female (det. by Horstmann), Ober-Bayern, Bad Heilbrunn, 5. VIII. 1936, E. Bauer leg.

Distribution. Japan (Hokkaido), widely distributed in Holarctic region.

Bionomics. Larvae of Microtogramus piceus (Coleoptera: Dascilidae) has been recorded as host (Barron and Walley, 1983).

Remarks. This is the first record of this species from Japan. The coloration of hind femur with intraspecific variation (Barron and Walley, 1983), i.e., specimens of northern distribution mostly dark, of southern mostly pale. The Japanese materials collected in the northern area of Japan, Hokkaido, and well accord with this pattern.

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References

Barron, J. R. and Walley, G. S. 1983. Revision of the Holarctic genus Pyracmon (Hymenoptera: Ichneumonidae). Canadian Entomologist 115: 227–241.

Gauld, I. D. 1991. The Ichneumonidae of Costa Rica, 1. Memoirs of the American Entomological Institute 47: 1–589.

Graham, A. R. 1965. A preliminary list of natural enemies of Canadian agricultural pests. Canada Department of Agriculture, Research Institute, Belleville, Information Bulletin 4: 1–179.

Holmgren, A. E. 1859. Conspectus generum Ophionidum Sueciae. Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar 15: 321–330.

Holmgren, A. E. 1869. Conspectus generum Ophionidum Sueciae. Öfversigt af Konliga Vetenskaps-Akademiens Förhandlingar 32: 1–58.

Townes, H. 1969. The genera of Ichneumonidae, part 1. Memoirs of the American Entomological Institute 11: 1–300.

Townes, H. 1970. The genera of Ichneumonidae, Part 3. Memoirs of the American Entomological Institute 13: 1–307.

Yu, D. S., van Achterberg K., and Horstmann, K. 2016. World Ichneumonoidea 2015. Taxonomy, biology, morphology and distribution. [Flash drive], Taxapad®, Vancouver.