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First Record of *Paracymus atomus* Orchymont (Coleoptera, Hydrophilidae) from Japan, with Key to the Japanese Species of *Paracymus*

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Abstract *Paracymus atomus* Orchymont, 1925 is first recorded from Japan (Amami-Ôshima, Ishigaki-jima, and Iriomote-jima Islands of the Nansei-shotô Islands). This species is similar to *P. orientalis* Orchymont, 1925, but can be distinguished from the latter by the elytral punctures, mesofemoral pubescence, and aedeagus. A revised key to the Japanese species of *Paracymus* is provided.
Key words: Water scavenger beetle, Hydrophilinae, Laccobiini, *Paracymus* group.

Introduction

Paracymus atomus Orchymont, 1925 is a tiny hydrophilid beetle that is widely distributed in Southeast Asia and China (e.g., Wooldridge, 1977; Hansen, 1999; Fikáček *et al*., 2015). It is similar to other Oriental and Palaearctic species of the genus; however, it is distinguishable by the pubescence of the mesofemur, elytral punctures, and the morphology of the aedeagus (Wooldridge, 1977).

Two species of the genus *Paracymus* Thomson, 1867 were recorded from Japan: *Paracymus aeneus* (Germar, 1824) from Honshu and Kyushu Islands and *P. orientalis* Orchymont, 1925 from Honshu to the Nansei-shotô Islands (Minoshima, 2014; Miyake & Okamoto, 2015). In the course of the study on aquatic beetles, the second author realized that a sample of specimens of *P. orientalis* from the Nansei-shotô Islands contained smaller individuals that turned out to belong to *P. atomus*, which represents the third species of *Paracymus* from Japan.

Material and Methods

Protocols of morphological observation were almost identical with those described by Minoshima *et al*. (2015). Observations were performed using Leica MZ16 and Olympus BX50 microscopes. Illustrations were prepared with the aid of drawing tubes attached to the microscopes; line drawings were prepared using the software Paint Tool SAI (Systemax Inc., Tokyo). Photographs were taken with an Olympus OM-D E-M1 Mark II digital camera equipped with an Olympus M.Zuiko Digital ED 60 mm F2.8 macro lens and Kenko DG extension tubes (10 mm and 16 mm) and the digital camera was attached to the MZ16 using a MeCan NY-1S digital SLR microscope adapter. Composite images were created with Helicon Focus software (Helicon Soft Ltd., Kharkov); photographs were subsequently edited in Adobe Photoshop Lightroom Classic and Photoshop CC as needed. Material is deposited in the following collections: Kitakyushu Museum of Natural History and Human History, Kitakyushu, Japan (Y. Minoshima) (KMNH) and Noriaki Inahata collection, Kyoto, Japan (NIC).

Morphological terminology follows Archangelsky *et al*. (2016) for general morphology and Wooldridge (1977) for the shape of punctures.

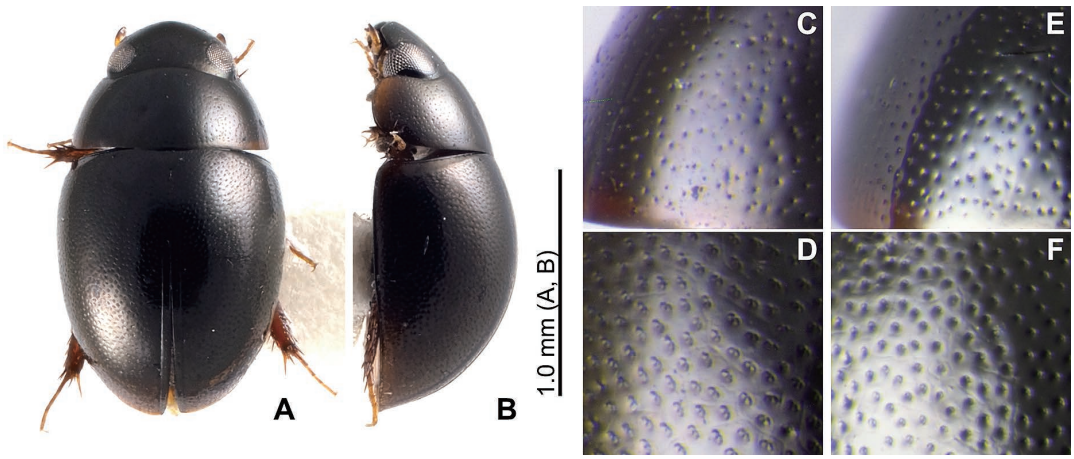

Fig. 1. *Paracymus atomus* (A–D) and *P. orientalis* (E, F). —— A, Dorsal habitus; B, lateral habitus; C, E, detail of pronotal punctures; D, F, detail of elytral punctures.

Paracymus atomus Orchymont, 1925

(Figs. 1–2)

Paracymus punctillatus-atomus Orchymont, 1925: 202. [Type locality: "Montalban" (Philippines)]; Orchymont, 1926: 202 [as "Paracymus punctillatus atomus var nov."].

Paracymus atomus Orchymont: Wooldridge, 1977: 127; Hansen, 1999: 109; Fikáček *et al*., 2015: 47.

Paracymus orientalis (nec. Orchymont, 1925): Minoshima, 2014: 145 [part, misidentification].

See Hansen (1999) for detail synonymy.

Material examined. Japan: 1 ♂ (NIC), Kagoshima Pref., Amami-Ôshima Is., Tatsugô- chô, Akina, 10.IV.2017, N. Inahata leg.; 1 ♀ (KMNH), Okinawa Pref., Iriomote-jima Is., Urauchi, 24°24'N, 123°46'E, 31.XII.2005, Y. Minoshima leg.; 1 ♂ (KMNH), Okinawa Pref., Iriomote-jima Is., Hoshidate, Minapishi, rice paddy, at light, 24°23'N, 123°46'E, 1–2.IV.2015, N. Inahata leg.; 1 ex. (NIC), Okinawa Pref., Ishigaki-jima Is., Shiraho, Todoroki R., under aquatic plants, 24°22'N, 124°14'E, 24.II.2014, N. Inahata leg.

Diagnosis. Very small species, body length 1.7–1.9 mm. Ground punctures on pronotum very fine (Fig. 1 C), rather sparsely distributed, finer than elytral punctures. Elytra bearing fine, geminate, ground punctures (Fig. 1 D). Mesoventral projection present; longitudinal lamina connecting mesoventral projection and area between mesocoxae weakly carinate. Mesofemoral pubescence present on approximately basal three-fourths at anterior part (Fig. 2 C). Parameres (Fig. 2 A, B) slender with inflated and rounded apex and widened base. Median lobe (Fig. 2 A, B) stout, as long as parameres, mostly membranous in apical half; corona in apical position; basal apophyses stout, moderately long.

Differential diagnosis. Within the Japanese species, *P. atomus* is similar to *P. orientalis*. The body size of *P. atomus* is smaller, the pronotal ground punctures (Fig. 1 C) are finer than those of *P. orientalis* (Fig. 1 E). *Paracymus atomus* bears geminate ground punctures on the elytra (Fig. 1 D), in contrast to *P. orientalis* with simple ground punctures (Fig. 1 F). The mesofemoral pubescence is present on approximately basal three-fourths at the anterior part in *P. atomus* (Fig. 2 D), as opposed to approximately basal half in *P. orientalis* (Fig. 2 D, E). Characteristics of their aedeagi well separate in these species: the parameres of *P. atomus* is slenderer (Fig. 2 A); the apex of paramere is inflated and rounded in *P. atomus*, whereas simply rounded in *P. orientalis*; the corona is located at apex in *P. ato-*

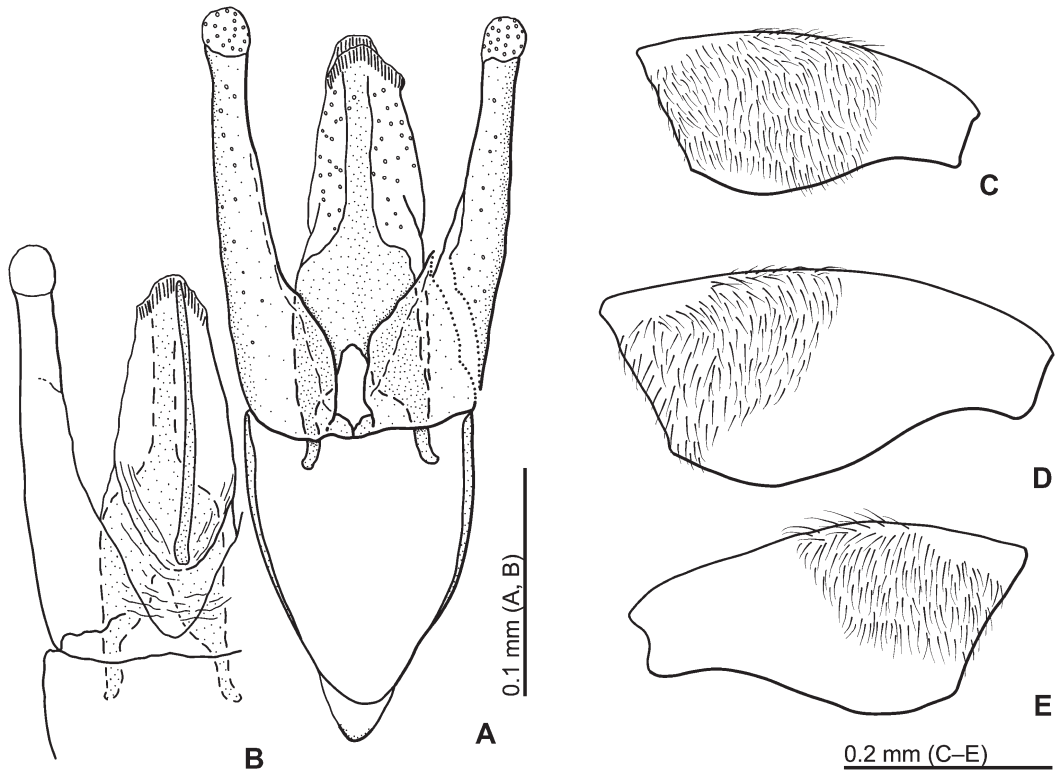

Fig. 2. *Paracymus atomus* (A–C) and *P. orientalis* (D, E). —— A–B, Aedeagus, dorsal (A), ventral (B) view; C–E, mesofemur, ventral view; C, specimen from Iriomote-jima Is., Okinawa Pref., Nansei-shotô Isls.; D, Minami-daitô-jima Is., Okinawa Pref., Nansei-shotô Isls., E, Shimanto-shi, Kochi Pref., Shikoku.

mus, whereas at anterior third in *P. orientalis*.

Habitat. Aquatic species; collected from standing water.

Distribution. Japan (Nansei-shotô Islands: Amami-Ôshima Is., Iriomote-jima Is., and Ishigaki-jima Is.); Southeast Asia and China (e.g., Wooldridge, 1977; Hansen, 1999; Fikáček *et al*., 2015).

Remarks. Minoshima (2014) reviewed the Japanese species of *Paracymus*; we reexamined most of the specimens from that study; one individual of *P. atomus* was contained in the series. *Paracymus atomus* and *P. orientalis* may cohabit in the Nansei-shotô Islands; information on both habitat preference and the rarity of *P. atomus* remain insufficient.

Key to the Species of *Paracymus* from Japan

(Modified from Minoshima, 2014)

1. Ground punctation of pronotum and elytra coarse (fig. 1 A in Minoshima, 2014). Longitudinal lamina connecting mesoventral projection and between mesocoxae (fig. 1 C–D, arrow in Minoshima, 2014) strongly carinate, ridge of the carina nearly straight, curving upwards at apex of the projection, thus reaching to apex of the projection (fig. 1 D in Minoshima, 2014). Parameres pointed apically. ····· *P. aeneus* (Germar, 1824)

— Ground punctation of pronotum and elytra fine (Fig. 1 C, E). Longitudinal lamina connecting mesoventral projection and between mesocoxae (fig. 1 E–F, arrow in Minoshima, 2014) weakly carinate, ridge of the carina only partly present, thus not reaching to apex of the projection (fig. 1 F in Minoshima, 2014). Parameres rounded apically. ····· 2

2. Body small, more than 2 mm. Ground puncture on elytra composed of fine punctures (Fig. 1 F). Mesofemoral pubescence present on approximately basal half at anterior part (Fig. 2 D, E). Each apex of parameres simply rounded; corona located at apical third of median lobe (fig. 2 B in Minoshima, 2014). ····· *P. orientalis* Orchymont, 1925

— Body very small, less than 2 mm. Ground punctures on elytra composed of fine, geminate punctures (Fig. 1 D). Mesofemoral pubescence present on approximately basal three-fourths at anterior part (Fig. 2 C). Each apex of parameres inflated and rounded; corona located at apex of median lobe (Fig. 2 A). ····· *P. atomus* Orchymont, 1925

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要　　約

養島悠介・稲畑憲昭：ミナミチビマルガムシ *Paracymus atomus* Orchymont の日本からの初記録と日本産チビマルガムシ属の検索表（鞘翅目ガムシ科）．———— ミナミチビマルガムシ（和名新称）*Paracymus atomus* Orchymont, 1925 を日本（奄美大島，石垣島，西表島）から初めて記録した．本種はチビマルガムシ *P. orientalis* Orchymont, 1925 に酷似するが，より小型であることや，上翅の点刻が異なること，中脚腿節の軟毛が基部から 4 分の 3 まで密生すること，雄交尾器の形から区別が可能である．

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