

Re-identification of the Species of *Aphodius* (*Aganocrossus*) (Coleoptera, Scarabaeidae, Aphodinae) in the Tokara Islands and Kami-mishima, Kagoshima Prefecture, Japan

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Abstract Specimens recorded as “*Aphodius urostigma*” in HOSOYA *et al.* (2009, 2011) from the Tokara Islands and in HOSOYA (2010) from Kami-mishima in Kagoshima Prefecture are re-identified. It reveals that *A. urostigma* is distributed in Kuchino-shima, Nakano-shima, Kodakara-jima and Takara-jima Islands of the Tokara Islands, whereas *A. postpilosus* is only in two islands, Nakano-shima and Takara-jima Islands. This result suggests that *A. urostigma* is dominant to *A. postpilosus* in the Tokara Islands. On the other hand, all the specimens collected from Take-shima Island of Kami-mishima are identified as *A. postpilosus*, but not *A. urostigma*. Thus, the record of “*A. urostigma*” from Take-shima Island reported by HOSOYA (2010) is corrected to that of *A. postpilosus*.

Introduction

BORDAT and DELLACASA (1996) reported that *Aphodius* (*Aganocrossus*) *postpilosus* REITTER, 1895, which had been treated as a junior synonym of *A. (A.) urostigma* HAROLD, 1862, was a valid species, and both of them were distributed in Japan. However, Japanese coleopterologists did not follow their treatment and have recognized *A. postpilosus* as a junior synonym of *A. urostigma* (FUJIOKA, 2001; KAWAI *et al.*, 2005). Quite recently, OCHI (2012) considered *A. postpilosus* as a valid species in the illustrated guide to scarabaeoid beetles in Japan. Subsequently, KIUCH (2013) suggested that the species which has been recognized as “*A. urostigma*” in Japan, with long hairs at the margins of thorax and elytra, is not *A. urostigma* but *A. postpilosus*, whereas the true “*A. urostigma*” has at most one or two long hairs at the margin of thorax.

The distributions of these two species overlap in a wide area: *A. postpilosus* is distributed in India, Sikkim, Laos, Vietnam, South Korea, China and Japan, whereas *A. urostigma* in Sri Lanka, India, Sikkim, Laos, Cambodia, Thailand, Vietnam, China, Japan, Indonesia, Java, Sumatra, Celebes and Borneo (BORDAT & DELLACASA, 1996). Their distribution patterns in Japan were revised by OCHI (2012) and KIUCH (2013): *A. urostigma* in Hokkaido, Honshu, Shikoku, Kyushu, the Izu Islands, the Oki Islands, Tsushima Island, the Gotô Islands, the Ôsumi Islands, the Tokara Islands, the Amami Islands, the Okinawa Islands, the Miyako Islands and the Yaeyama Islands, whereas *A. postpilosus* in Hokkaido, Honshu, Kyushu, Yaku-shima Island and Amami-Ôshima Island. Although KIUCH (2013) reported that these two species were collected sympatrically, *A. postpilosus* seems dominant to *A. urostigma* in Japan. Thus, a reexamination on their detailed distributions in Japan is necessary.

Hitherto known records of “*A. urostigma*” are from Kuchino-shima, Nakano-shima, Taira-jima, Suwanose-jima, Akuseki-jima, Kodakara-jima and Takara-jima Islands of the Tokara Islands (HOSOYA, 2011), and from Take-shima Island of Kami-mishima (HOSOYA, 2010). However, *A. urostigma* and *A. postpilosus* were not distinguished from each other in these records.

Thus, in this paper, the author will re-identify the specimens recorded as “*A. urostigma*” in HOSOYA *et al.* (2009, 2011) and HOSOYA (2010), and reevaluate the distribution of these two closely related species, *A. urostigma* and *A. postpilosus*, from the Tokara Islands and Kami-mishima in Kagoshima Prefecture, Japan.

Materials and Methods

Specimens of “*A. urostigma*” recorded as “*A. urostigma*” in HOSOYA *et al.* (2009, 2011) from the Tokara Islands (Toshima Village) and HOSOYA (2010) from Kami-mishima (Mishima Village) were re-identified by using binoculars in the laboratory, Kyushu University.

Results

Aphodius (Aganocrossus) postpilosus REITTER, 1895

Specimens examined. 5 exs., Road to Sannoehana, Take-shima Island, Mishima Village, Kagoshima Pref., Japan, 10–VII–2009, (from one cow dung: collected as larvae, adults emergence in VII to VIII. 2009), T. HOSOYA leg.; 1 ex., Ooga, Nakano-shima Island, the Tokara Islands, Kagoshima Pref., Japan, 29–VII–2009, (Light Trap), T. HOSOYA, T. DOI & M. TANAHASHI leg.; 1 ex., Takarajima primary and junior high school, Takara-jima Island, the Tokara Islands, Kagoshima Pref., Japan, 1–VIII–2009, (Light Trap), T. HOSOYA leg.

Aphodius (Aganocrossus) urostigma HAROLD, 1862

Specimens examined. 3 exs., Seranma hot spring, Kuchino-shima Island, the Tokara Islands, Kagoshima Pref., Japan, 31–VIII–2008, (Light Trap), T. HOSOYA & T. KIYOSHI leg.; 1 ex., 1–VIII–2008, the same collecting place as mentioned above (Light Trap); 5 exs., Takarajima primary and junior high school, Takara-jima Island, the Tokara Islands, Kagoshima Pref., Japan, 10–VIII–2008, (Light Trap), T. HOSOYA, T. KIYOSHI & Y. KAWASHIMO leg.; 1 ex., village, Takara Island, the Tokara Islands, Kagoshima Pref., Japan, 11–VIII–2008, (cow dung), T. HOSOYA leg.; 4 exs., Ookizaki, Nakano-shima Island, the Tokara Islands, Kagoshima Pref., Japan, 28–VII–2009, (Light Trap), T. HOSOYA, T. DOI & M. TANAHASHI leg.; 3 exs., Ooga, Nakano-shima Island, the Tokara Islands, Kagoshima Pref., Japan, 29–VII–2009, (Light Trap), T. HOSOYA, T. DOI & M. TANAHASHI leg.; 1 ex., northern part of Nakano-shima Island, the Tokara Islands, Kagoshima Pref., Japan, 31–VII–2009, (Light Trap), T. HOSOYA, T. DOI & M. TANAHASHI leg.; 6 exs., Takarajima primary and junior high school, Takara-jima Island, the Tokara Islands, Kagoshima Pref., Japan, 1–VIII–2009, (Light Trap), T. HOSOYA leg.; 11 exs., Ooiwaya, Kodakara-jima Island, the Tokara Islands, Kagoshima Pref., Japan, 3–VIII–2009, (Light Trap), T. HOSOYA leg.

Discussion

The result of the re-identification revealed that the two species, *A. urostigma* and *A. postpilosus* were mingled in the records of “*A. urostigma*” reported by HOSOYA *et al.* (2009, 2011) and HOSOYA (2010). In the Tokara Islands, the inhabitancy of true *A. urostigma* was confirmed in all the islands, whereas “*A. urostigma*” in HOSOYA *et al.* (2009, 2011) had been recorded in Kuchino-shima, Nakano-shima, Kodakara-jima and Takara-jima Islands. On the other hand, *A. postpilosus* was newly re-

corded only from two islands, Nakano-shima and Takara-jima Islands. This is the first valid record of these two species from the Tokara Islands. In order to reevaluate of the records of “*A. urostigma*” from other islands of the Tokara Islands, e.g. Taira-jima, Suwanose-jima and Akuseki-jima Islands (HOSOYA, 2011), a re-identification based on the specimens is necessary.

Aphodius urostigma and *A. postpilosus* were collected sympatrically at Ooga in Nakano-shima Island and Takarajima primary and junior high school in Takara-jima Island. KIUCH (2013) already showed that *A. urostigma* and *A. postpilosus* were distributed sympatrically in Kantô and Kyushu districts and Tsushima Island. In the result, *A. urostigma* was recorded from all four islands, and highly abundance to *A. postpilosus*. Thus, *A. urostigma* is considered to be dominant to *A. postpilosus* in the Tokara Islands. This is different from the suggestions in KIUCH (2013) that *A. postpilosus* would be dominant to *A. urostigma* in Japan. However, it is possible that the main collecting method, light trap, affected the results since KIUCH (2013) reported that *A. urostigma* shows stronger phototaxis than *A. postpilosus*. Thus, further researches using various sampling methods other than light trap, such as collecting from the cow dung, are necessary to reveal the interactions between these two closely related species in the Tokara Islands as well as ecological and behavioral features.

On the other hand, all the specimens collected from Take-shima Island of Kami-mishima were identified as *A. postpilosus*, but not *A. urostigma*, and herewith the record of “*A. urostigma*” from Take-shima Island reported by HOSOYA (2010) is corrected to that of *A. postpilosus*.

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要 約

細谷忠嗣：鹿児島県トカラ列島と上三島におけるマグソコガネ属フチケマグソコガネ亜属の再同定（鞘翅目コガネムシ科）。—— BORDAT and DELLACASA (1996) は、これまで *Aphodius* (*Aganocrossus*) *urostigma* のシノニムとして扱われてきた *A. (A.) postpilosus* が独立種であり、日本にも両種が分布することを示した。このため、従来、*A. (A.) urostigma* として記録されてきたものに両種が含まれることから、日本における両種の分布について再検討する必要があるが生じた。そこで、細谷ら (2009, 2011) および細谷 (2010) でトカラ列島 (十島村) と上三島 (三島村) から報告した *A. (A.) urostigma* について再同定を行い、これらの地域における両種の分布について再検討した。その結果、トカラ列島においては、ヒメフチケマグソコガネ *A. (A.) urostigma* はこれまでに記録のある口之島、中之島、小宝島、宝島から確認されたのに対して、フチケマグソコガネ *A. (A.) postpilosus* は中之島と宝島のみで確認された。上三島の竹島においては、フチケマグソコガネのみが確認された。本論文でこれらの記録の訂正・追加を行なった。

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