

Distributional Records of Scarabaeid Beetles (Coleoptera, Scarabaeidae) from Tonaki-jima Is., the Okinawa Isls., Southwestern Japan

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Abstract Twelve scarabaeid beetles collected from Tonaki-jima Is. belonging to the Okinawa Isls. in the Ryukyus, Japan are reported. Among them, the following ten species are newly recorded from the island: 1) *Psammodius kobayashii* NOMURA, 1973, 2) *Rakovicius coreanus* (KIM, 1980), 3) *Anomala albopilosa yashiroi* SAWADA, 1950, 4) *Exomala okiwaensis* (OHAUS, 1925), 5) *Oryctes rhinoceros* (LINNAEUS, 1758), 6) *Polyphylla schoenfeldti* BRENSKE, 1890, 7) *Nigrotrichia loochooana okinawana* (NOMURA, 1964), 8) *Protaetia pryeri pryeri* (JANSON, 1888), 9) *P. orientalis sakaii* KOBAYASHI, 1994, and 10) *Gametis forticula forticula* (JANSON, 1881). Additional records of *Onthophagus murasakianus carnarius* (NOMURA, 1976) and *Maladera oshimana* NOMURA, 1962 are also provided. Consequently, 13 scarabaeid beetles are known to occur on Tonaki-jima Is.

Tonaki-jima Is. is one of the smallest inhabited islets (area: about 3.58 km²) in the Okinawa Isls. and located in about 60 km northwest of Okinawa-jima Is., the Ryukyus, Japan. The scarabaeid beetle fauna of Tonaki-jima Is. has been reported sporadically, and merely a total of three species, *Maladera oshimana* NOMURA, 1962, *Onthophagus murasakianus carnarius* (NOMURA, 1976) and *Tricholontha pagena* NOMURA, 1952, has been known from the island, despite being investigated on such surrounding islands as Kume-jima Is., Aguni-jima Is., and the Kerama Isls. (FUJIOKA, 2001; SASAKI *et al.*, 2002; OKAJIMA & ARAYA, 2012; INOUE, 2013; KANEKO & NAGANO, 2017). The authors conducted faunistic surveys of scarabaeid beetles of this island in spring of 2017 and summer of 2018. In this paper, we report ten scarabaeid beetles new to Tonaki-jima Is., with new collecting records of two previously known species from the island.

All the examined specimens are preserved in the Laboratory of Entomology, Tokyo University of Agriculture, Atsugi, Kanagawa, Japan. The following abbreviations are used for collector's names in the text: NK — Naoki KANEKO, HS — Hiroaki SHIGETOH, KO — Kazuyuki ÔSHIMA, and HY — Hira-ku YOSHITAKE. Scientific names follow the recent catalogue of BEZDĚK *et al.* (2016), but partially follow MATSUMOTO (2016).

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Family **Scarabaeidae** LATREILLE, 1802

Subfamily **Aphodiinae** LEACH, 1815

1. *Psammodius kobayashii* NOMURA, 1973

(Fig. 1)

Specimens examined. 46 exs., near Teidahiroba, 18.VII.2018, NK.

Distribution. Japan: the Ryukyus (Amami-Ôshima, Tokunoshima, Yoron-jima, Okinawa-jima,

Izena-jima, Sesoko-jima, Senaga-jima, Kume-jima, Ishigaki-jima, and Iriomote-jima Iss.; Tonaki-jima Is. — new record); Taiwan (FUJIOKA, 2001; SASAKI *et al.*, 2002; OKAJIMA & ARAYA, 2012; MATSUMURA *et al.*, 2018).

Notes. New to Tonaki-jima Is. This species was collected near the root of *Calystegia soldanella* (Convolvulaceae; Hamahirugao in Japanese) on a beach.

2. *Rakovicius coreanus* (KIM, 1980)

(Fig. 2)

Specimens examined. 10 exs., near Teidahiroba, 18.VII.2018, NK.

Distribution. Japan: Tsushima Is. and the Ryukyus (Amami-Ōshima, Tokunoshima, Okinawa-jima, Sesoko-jima, and Senaga-jima Iss.; Tonaki-jima Is. — new record); Taiwan, Korean Peninsula and, Thailand (FUJIOKA, 2001; SASAKI *et al.*, 2002; OKAJIMA & ARAYA, 2012; KAKIZOE, 2013).

Notes. New to Tonaki-jima Is. This species was collected near the root of *Calystegia soldanella* on a beach together with *Psammodyus kobayashii* NOMURA, 1973.

Subfamily **Scarabaeinae** LATREILLE, 1802

3. *Onthophagus murasakianus carnarius* (NOMURA, 1976)

(Fig. 3)

Specimen examined. 1 ex., Ūnda, 19.VII.2018, NK (bait trap: dung).

Distribution. Japan: the Ryukyus (Nakanoshima, Akuseki-jima, Kodakara-jima, Amami-Ōshima, Okinawa-jima, Iheya-jima, Zamami-jima, Tonaki-jima, Kume-jima, Miyako-jima, Ishigaki-jima, Iriomote-jima, and Taketomi-jima Iss.) (FUJIOKA, 2001; SASAKI *et al.*, 2002; OKAJIMA & ARAYA, 2012; HOSOYA *et al.*, 2016).

Note. The examined specimen was attracted to human feces.

Subfamily **Rutelinae** MACLEAY, 1819

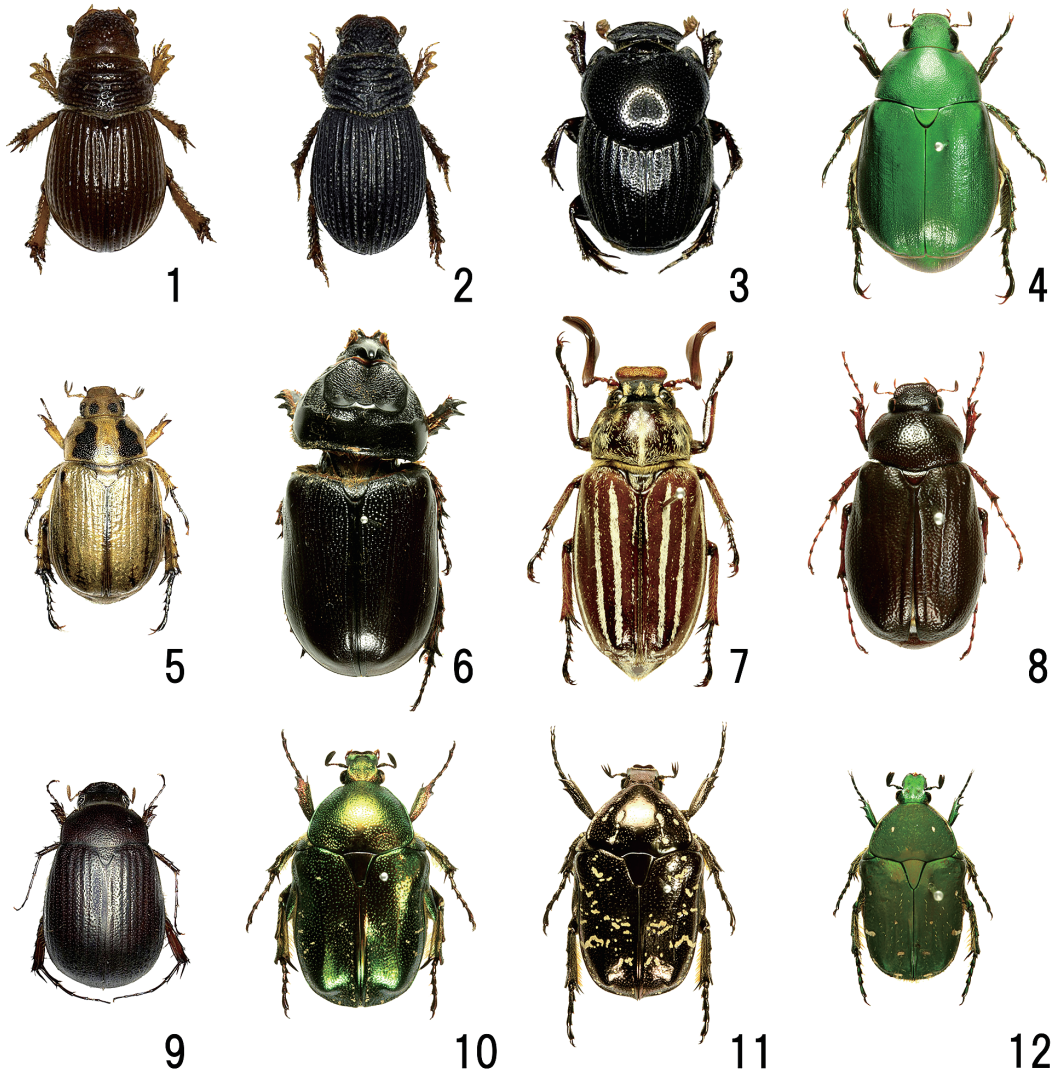
4. *Anomala albopilosa yashiroi* SAWADA, 1950

(Fig. 4)

Specimens examined. 1 ex., Ūnda, 18.VII.2018, NK; 20 exs., near Mt. Gichūzan, 18.VII.2018, NK (light trap); 1 ex., Minshuku-Muranaka, 17.VIII.2018, HS (lamplight); 1 ex., Ūnda, 1.IX.2018, HS.

Distribution. Japan: the Ryukyus (Okinoerabu-jima, Yoron-jima, Okinawa-jima, Ie-jima, Iheya-jima, Izena-jima, Kouri-jima, Kume-jima, Aguni-jima, Akashima, and Kerama-jima Iss.; Tonaki-jima Is. — new record) (FUJIOKA, 2001; SASAKI *et al.*, 2002; OKAJIMA & ARAYA, 2012).

Notes. New to Tonaki-jima Is. This is one of the most common chafers in Japan. Most of the examined specimens were attracted to light.



Figs. 1–12. Dorsal habitus of Scarabaeidae spp. from Tonaki-jima Is., southwestern Japan. — 1, *Psammodyus kobayashii*; 2, *Rakovicius coreanus*; 3, *Onthophagus murasakianus carnarius*; 4, *Anomala albopilosa yashiroi*; 5, *Exomala okiwaensis*; 6, *Oryctes rhinoceros*; 7, *Polyphylla schoenfeldti*; 8, *Nigrotrichia loochooana okinawana*; 9, *Maladera oshimana*; 10, *Protaetia pryeri pryeri*; 11, *P. orientalis sakaii*; 12, *Gametis forticula forticula*.

5. *Exomala okiwaensis* (OHAUS, 1925)

(Fig. 5)

Specimen examined. 1 ex., Tonaki Port, 20.IV.2017, HS (light trap).

Distribution. Japan: the Ryukyus (Okinawa-jima, Ie-jima, Sesoko-jima, Hamahiga-jima, Tokasaki-jima, Zamami-jima, and Kume-jima Iss.; Tonaki-jima — new record) (FUJIOKA, 2001; SASAKI *et al.*, 2002; OKAJIMA & ARAYA, 2012; KANEKO & NAGANO, 2017; KUSUI, 2017 a).

Note. New to Tonaki-jima Is.

Subfamily **Dynastinae** MACLEAY, 18196. *Oryctes rhinoceros* (LINNAEUS, 1758)

(Fig. 6)

Specimen examined. 1 ex. (corpse), Shidonosaki, 20.IV.2017, HS.*Distribution.* Japan: the Ryukyus (Takara-jima, Kikai-jima, Amami-Ôshima, Tokunoshima, Okinoerabu-jima, Yoron-jima, Okinawa-jima, Iheya-jima, Aguni-jima, Ie-jima, Kouri-jima, Minna-jima, Ôgami-jima, Ishigaki-jima, Iriomote-jima, Yonaguni-jima, Minamidaitô-jima, Kitadaitô-jima, and Uotsurishima Iss.; Tonaki-jima Is. — new record); Taiwan, Lanyu Is., China, Korean Peninsula, Thailand, Myanmar, India, Philippines, Malaysia, Sumatra, Java, Sulawesi, Seram, Ambon, New Guinea, and Fiji (FUJIOKA, 2001; SASAKI *et al.*, 2002; SATO & IREI, 2003; HOSOYA, 2011; KUSUI, 2017 b).*Note.* New to Tonaki-jima Is.Subfamily **Melolonthinae** LEACH, 18197. *Polyphylla schoenfeldti* BRENSKE, 1890

(Fig. 7)

Specimens examined. 2 exs., Mt. Ufutaki, 19.IV.2017, HS; 5 exs., Tonaki Port, 20.IV.2017, HS (light trap); 5 exs., near Mt. Gichûzan, 18.VII.2018, NK (light trap).*Distribution.* Japan: the Ryukyus (Suwanose-jima, Takara-jima, Amami-Ôshima, Tokunoshima, Okinoerabu-jima, Yoron-jima, Okinawa-jima, Iheya-jima, Izena-jima, Kerama-jima, Aka-shima, Aguni-jima, Zamami-jima, and Kume-jima Iss.; Tonaki-jima Is. — new record) (FUJIOKA, 2001; SASAKI *et al.*, 2002; OKAJIMA & ARAYA, 2012).*Note.* New to Tonaki-jima Is.8. *Nigrotrichia loochooana okinawana* (NOMURA, 1964)

(Fig. 8)

Specimens examined. 1 ex., Ūnda, 18.VII.2018, NK; 4 exs., near Mt. Gichûzan, 18.VII.2018, KO (light trap).*Distribution.* Japan: the Ryukyus (Okinawa-jima, Iheya-jima, Tokashiki-jima, Akashima, and Kume-jima Iss.; Tonaki-jima Is. — new record) (FUJIOKA, 2001; SASAKI *et al.*, 2002; OKAJIMA & ARAYA, 2012; KANEKO & NAGANO, 2017).*Note.* New to Tonaki-jima Is.9. *Maladera oshimana* NOMURA, 1962

(Fig. 9)

Specimens examined. 2 exs., Ūnda, 18.VII.2018, NK; 2 exs., near Mt. Gichûzan, 18.VII.2018, NK & KO (light trap); 2 exs., Minshuku-Muranaka, 17.VIII.2018, HS (lamp light); 1 ex, Tonaki Shûraku, 1.IX.2018, HS.*Distribution.* Japan: the Ryukyus (Nakanoshima, Taira-jima, Kodakara-jima, Takara-jima, Ama-

mi-Ôshima, Tokunoshima, Okinoerabu-jima, Okinawa-jima, Iheya-jima, Izena-jima, Tokashiki-jima, Tonaki-jima, Kume-jima, Ôgami-jima, Miyako-jima, Ikema-jima, Kurima-jima, Irabu-jima, Tarama-jima, Ishigaki-jima, Minna-jima, Kuroshima, Iriomote-jima, and Yonaguni-jima Iss.) (FUJIOKA, 2001; SASAKI *et al.*, 2002; OKAJIMA & ARAYA, 2012; HOSOYA *et al.*, 2016; KUSUI, 2016 a, 2017 b).

Notes. Since FUJIOKA (2001) recorded this species from Tonaki-jima Is., the record has been neglected. However, the occurrence of this species was reconfirmed in this survey.

Subfamily **Cetoniinae** LEACH, 1815

10. *Protaetia pryeri pryeri* (JANSON, 1888)

(Fig. 10)

Specimens examined. 25 exs., Ūnda, 18.VII.2018, NK; 1 ex., Ūnda, 17.VIII.2018, HS; 2 exs, Tonaki-son Shûraku, 1.IX.2018, HS; 1 ex., near Iehnshiji, 1–2.IX.2018, HY (bait trap: pineapple).

Distribution. Japan: Kyushu and the Ryukyus (Okinoerabu-jima, Yoron-jima, Okinawa-jima, Ie-jima, Kouri-jima, Minna-jima, Iheya-jima, Izena-jima, Gushigawa-jima, Ikei-jima, Tokashiki-jima, Kume-jima, Aguni-jima, Ishigaki-jima and Taketomi-jima Iss.; Tonaki-jima Is. — new record); Guam Is. and Midway Atoll Is. (FUJIOKA, 2001; SASAKI *et al.*, 2002; OKAJIMA & ARAYA, 2012).

Note. New to Tonaki-jima Is.

11. *Protaetia orientalis sakaii* KOBAYASHI, 1994

(Fig. 11)

Specimens examined. 2 exs., Mt. Ufutaki, 19.IV.2017, HS.

Distribution. Japan: the Ryukyus (Yoron-jima, Okinawa-jima, Iheya-jima, Izena-jima, Kouri-jima, Tokasiki-jima, Tonaki-jima, Miyako-jima, Irabu-jima, Ishigaki-jima and Iriomote-jima Iss., and Daitô and Senkaku Isls.); Taiwan, Guam Is., and Saipan Is. (FUJIOKA, 2001; SASAKI *et al.*, 2002; OKAJIMA & ARAYA, 2012).

Note. New to Tonaki-jima Is.

12. *Gametis forticula forticula* (JANSON, 1881)

(Fig. 12)

Specimens examined. 1 ex., Mt. Ufutaki, 19.IV.2017, HS; 2 exs., Shidonosaki, 20.IV.2017, HS; 1 ex., Ūnda, 17.VIII.2018, HS; 1 ex., Ūnda, 1.IX.2018, HS.

Distribution. Japan: Honshu, Shikoku, Kyushu, Tsushima Is., Koshikishima Isls., Ôsumi Isls. (Kuroshima, Mageshima, Kuchinoerabu-jima and Yakushima Iss.), and the Ryukyus (Kuchinoshima, Gaja-jima, Nakanoshima, Akuseki-jima, Kodakara-jima, Takara-jima, Amami-Ôshima, Kikai-jima, Tokunoshima, Okinoerabu-jima, Okinawa-jima, Iheya-jima, Izena-jima, Fukajishima, Ie-jima, Kouri-jima, Kudaka-jima, Minna-jima, and Kume-jima Iss.; Tonaki-jima Is. — new record) (FUJIOKA, 2001; SASAKI *et al.*, 2002; OKAJIMA & ARAYA, 2012; HOSOYA *et al.*, 2013; HOSOYA *et al.*, 2016; KUSUI, 2016 b).

Note. New to Tonaki-jima Is.

要 約

金子直樹・重藤裕彬：渡名喜島におけるコガネムシ科甲虫(鞘翅目)の分布記録。——渡名喜島は、沖縄諸島に属する島嶼の中でもきわめて小さな有人島の一つであり(面積：3.58 km²)、沖縄本島の北西約60 kmの海上に位置している。これまでに久米島、粟国島、慶良間諸島など、渡名喜島の周辺諸島におけるコガネムシ類の分布調査は行われているものの、渡名喜島からはわずか3種(ムラサキエンマコガネ奄美・沖縄亜種、リュウキュウビロウドコガネ、ケブカコフキコガネ)の記録が知られるのみであり、調査の余地が多く残されていた。本論文では、2017年春と2018年夏の調査によって得られた渡名喜島産コガネムシ科甲虫6亜科12種の採集例を報告した。このうち、以下の10種は同島初記録である：1) サキシマケシマグソコガネ、2) タイケシマグソコガネ、3) アオドウガネ沖縄亜種、4) オキナワセマグラコガネ、5) サイカブト、6) オキナワシロスジコガネ、7) リュウキュウクロコガネ沖縄亜種、8) リュウキュウツヤハナムグリ名義タイプ亜種、9) シロテンハナムグリ台湾亜種、10) アオヒメハナムグリ名義タイプ亜種。これにより、渡名喜島から記録されたコガネムシ科甲虫の種数は13種となった。

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