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New Record of *Sphaeridium lunatum* (Coleoptera, Hydrophilidae) from Hokkaido, Northern Japan

Alyssa Lee Suzumura

Systematic Entomology, Graduate School of Agriculture Hokkaido University, Sapporo 060–8589 Japan
E-mail: asuzu5@gmail.com

Abstract The terrestrial hydrophilid beetle, *Sphaeridium lunatum* is recorded from Japan for the first time from the northern Japanese island of Hokkaido. In addition to misidentified specimens collected from Tsukisamu, Sapporo from the Systematic Entomology Collection, Hokkaido University, specimens were collected from Ebetsu, Ishikari near Sapporo. A differential diagnosis to the species is provided along with habitus photos and illustrations of male genitalia and protarsi for *S. lunatum* as well as *S. scarabaeoides* for comparison.
Key Words: Coprophilous beetle, Sphaeridiinae, Sphaeridiini, terrestrial hydrophilid

Sphaeridium Fabricius, 1775 is a widespread terrestrial beetle hydrophilid genus constituting 41 species that inhabit fresh cow dung, 24 of which are from the Afrotropical Region and 14 from the Palearctic and Oriental Regions (Hansen, 1999). Many of the palearctic and oriental species have wide distributions and often live together in the same dung pats with other species of the same genus. Due to the overlapping distributions of many species and the outdated state of the literature on the genus in Asia, misidentification is also widespread.

While sorting and identifying hydrophilid beetles in the Systematic Entomology Collection, Hokkaido University, Sapporo, Japan (SEHU), I found several specimens of *Sphaeridium lunatum* Fabricius, 1792 from Tsukisamu, Sapporo that were incorrectly labeled as "*Sphaeridium scarabaeoides*". Subsequent collecting from cow pats in the neighboring city of Ebetsu confirmed the presence of this species in Hokkaido. Previously, only three species of *Sphaeridium* were known from Japan, two of which, *S. discolor* d'Orchymont, 1933, and *S. quinquemaculatum* Fabricius, 1798 are distributed only in the southern Ryukyu archipelago (Jia & Ôhara, 2004). As *S. scarabaeoides* Linné, 1758 was the only species known from northern Japan, and due to its similarity to *S. lunatum* in appearance and the tendency for both species to inhabit the same dung pats (Otronen & Hanski, 1983), it is understandable that the two would be mistaken.

Identifications were based on keys and descriptions from Berlov and Shatrovskiy (1989) and Berge Henegouwen and Foster (2019).

Sphaeridium lunatum Fabricius, 1792

[Japanese name: Kita-emma-hababiro-gamushi]

(Figs. 1 A, 2 A & B, 3 & 4; Table 1)

Sphaeridium lunatum Fabricius, 1792: 78 [Germany – "Germania"].
Dermestes lunatus: Marsham, 1802: 66.
Sphaeridium bimaculatum Ragusa, 1891: 136.

Diagnosis. Large size, 4.5–8.0 mm long. Head and labrum black, pronotum completely black or barely lightened along anterior half of lateral margin, elytra black, with or without indistinct reddish humeral spots, with yellow apical spot covering about 1/5–1/4 length of elytra (Fig. 1 Aa), often not

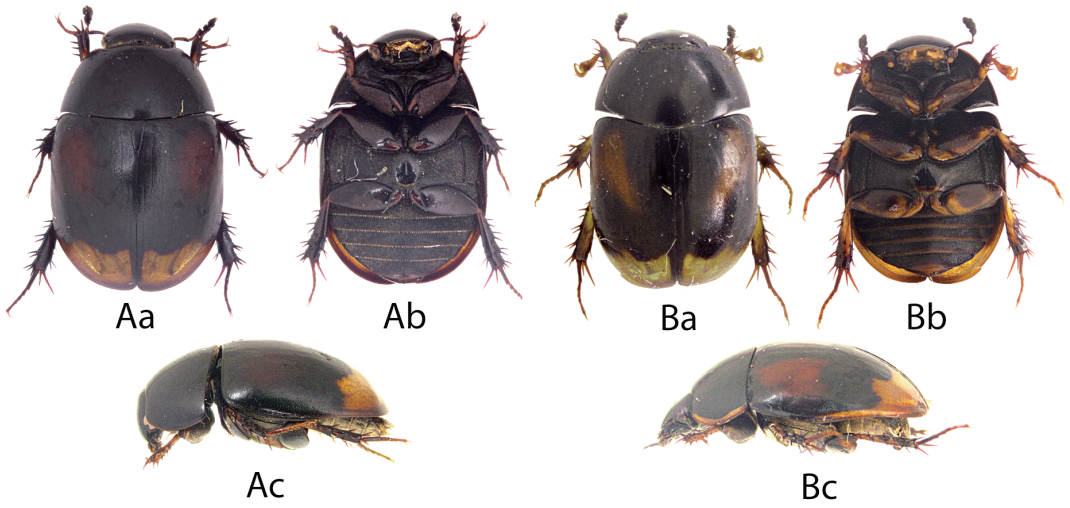

Fig. 1. Habitus. —— A, *Sphaeridium lunatum*; B, *S. scarabaeoides*. —— a, Dorsal view; b, ventral view; c, lateral view.

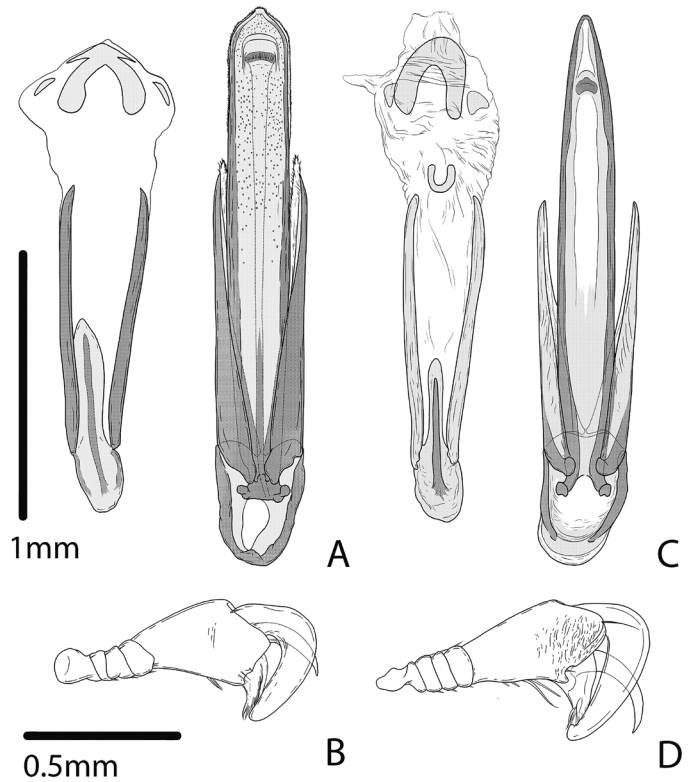

Fig. 2. Male genitalia and protarsus. —— A & B, *Sphaeridium lunatum*; C & D, *S. scarabaeoides*. —— A & C, Aedaegus (right) and genital segment (left), dorsal view; B & D, left protarsus, lateral view.

Fig. 3. World distribution of *Sphaeridium lunatum* including data from my collecting, Hansen (1990) and Przewoźny (2018).

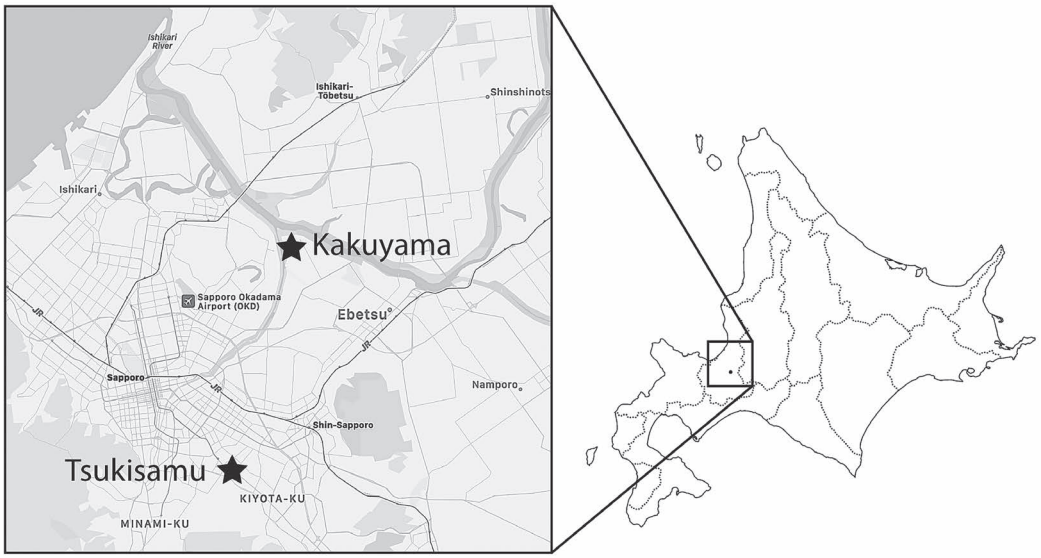

Fig. 4. Collecting locales of *Sphaeridium lunatum* in Hokkaido, Japan.

reaching elytral margins and never extended along lateral margin (Fig. 1 Ac). Ventrally dark brown, legs dark, sometimes reddish at apices (Fig. 1 Ab). Pronotum with lateral margins rounded, without row of short spines, posterior angles obtuse. Elytra lacking apparent striation (if present, represented only by indistinct superficial grooves), covered in even, dense punctures and microrugae. Sutural interval raised slightly, flat, marginal bead distinct around entire margin of elytra. Proventrite convex, with four to five strong spines emerging from ventral surface. Mesoventral protuberance elongate, fusiform, strongly convex. Metaventrite strongly convex, metaventral field about as long as wide, with a strong median longitudinal groove, weak transverse groove, and strong even punctation anterior to transverse groove, entirely covered in microsculpture. Middle and hind legs with two strong ventral

Table 1. Differential characters of *Sphaeridium lunatum* and *S. scarabaeoides*.

	S. lunatum	***S. scarabaeoides***
Elytral apical spot	Not extending anteriorly along lateral margins (Fig. 1 Ac)	Extended anteriorly along lateral margins (Fig. 1 Bc) though not distinctly in many specimens
Legs	Dark, sometimes reddish at apices (Fig. 1 Ab)	Yellow with a black spot at center of each femora (Fig. 1 Bb), or at least lightened at base and apex
Median lobe	Parallel until near apex, tip forming an oblique angle (Fig. 2 A)	Gradually tapered to apex, sides gently curved, tip acute (Fig. 2 C)

spines. Male protarsus as in Fig. 2 B, widened, apical margin angled, with apicoventral angle produced into a blunt protrusion. Male genitalia as in Fig. 2 A, median lobe parallel sided except at apex which is abruptly narrowed to obliquely angled tip with truncate protrusion at apex. Median lobe parallel-sided until near apex, tip forming an oblique angle, apex with shallow truncate protuberance.

Distribution. Europe, Middle East, North America (introduced), Russia (West Siberia, Far East), Asia (Mongolia) (HANSEN, 1990; PRZEWOŹNY, 2018); Japan (Hokkaido) —— new record (Fig. 3).

Note. Because coloration is variable in *Sphaeridium scarabaeoides*, dissection of the male may be necessary for reliable identification in some populations. Additionally, *S. lunatum* may be newly introduced to Japan since the specimens examined were collected relatively recently despite being quite common in the Sapporo area based on my own collecting experience.

Specimens examined. Japan: Hokkaido. 3 exs., Tsukisamu, Sapporo, Ishikari, 6.VIII.1990, A. TANAKA leg.; 4 exs., same locality and collector but different date, 15.VIII.1990; 17 exs., Kakuyama (YONEMURA farm), Ebetsu, Ishikari, 2.VIII.2020, cow dung, A. SUZUMURA & H. YAMAMOTO leg.

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要　　約

鈴村 有紗 李：北海道で発見された日本初記録の陸生ガムシ *Sphaeridium lunatum*（鞘翅目ガムシ科）．——— これまで未記録であったキタエンマハバビロガムシ（和名新称）*Sphaeridium lunatum* FABRICIUS, 1792 を，北海道大学昆虫体系学研究室のコレクションに含まれていた札幌市月寒産の標本の再同定と，近隣の江別市で新たに採集された標本に基づいて日本初記録種として報告した．また，本種の特徴をその全形およびオスの交尾器と前脛節を図示し明記した．また，比較のため近似種であるエンマハバビロガムシ *Sphaeridium scarabaeoides* LINNAEUS, 1758 についても図示した．

References

Berge Henegouwen, A. van, & G. N. Foster, 2019. A new illustrated key to the British species of *Sphaeridium*, with the possibility of *S. substriatum* Faldermann, 1839 as a British species (Hydrophilidae: Sphaeridiinae). *The Coleopterist*, *England*, **28**: 1–12.

Berlov, E., & A. G. Shatrovskiy, 1989. Hydraenidae, Hydrophilidae. Pp. 260–293. *In* Ler, P. A. (ed.), *Opredelitel* '*nasekomykh Dal'nego Vostoka SSSR v shesti tomakh*, **3**. Zhestkokrylye, ili zhuki (part 1). 572 pp. Nauka, Leningrad.

Fabricius, J. C., 1792. Entomologia Systematica Emendata et Aucta. Secundum Classes, Ordines, Genera, Species Ajectis Synonimis, Locis, Observationibus, Descriptionibus. Tomus 1. Pars 1. xx + 330 pp. C. G. Proft, Copenhagen.

Hansen, M., 1999. World Catalogue of Insects, 2. Hydrophiloidea (Coleoptera). 416 pp. Apollo Books, Stenstrup.

Jia, F. L., & M. Ôhara, 2004. *Sphaeridium discolor* d'Orchymont (Coleoptera, Hydrophilidae) newly recorded from Japan and Indonesia. *Elytra*, *Tokyo*, **32**: 51–56.

Marsham, T., 1802. Entomologia Britannica, Sistens Insecta Britanniae Indigena, Secundum Methodum Linnaeanam Disposita, 1. Coleoptera. 547 pp. Wilks & Taylor, London.

Otronen, M., & I. Hanski, 1983. Movement patterns in *Sphaeridium*: differences between species, sexes, and feeding and breeding individuals. *Journal of Animal Ecology*, *Oxford*, **52**: 663–680.

Przewoźny, M., 2018. Catalogue of Palearctic Hydrophiloidea (Coleoptera). Internet version 2018-01-01 [online]. Available from: http://waterbeetles.eu/documents/PAL_CAT_Hydrophiloidea_2018.pdf (accessed on 24 January 2020).

Ragusa, E., 1891. Catalogo ragionato dei coleotteri di Sicilia. *Il Naturalista Siciliano*, *Palermo*, **10**: 133–148; 149–166; 213–231; 237–255.

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