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A New Species of the Genus *Simplocaria* (Coleoptera, Byrrhidae) from Japan, with Description of the Larva of *S. hispidula*

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Abstract A new species of the genus *Simplocaria*, *Simplocaria* (*Simplocaria*) *yamashitai* sp. nov., is described from Hyôgo Pref., Honshu, Japan. This species is similar to *S.* (*S.*) *hakonensis* Takizawa, 1983, but differs from it by the shapes of parameres and penis. Key to species of the genus is presented. The larva of *Simplocaria* (*Simplocaria*) *hispidula* Fairmaire, 1886 is described for the first time. Key to known genera of byrrhid larvae of Japan is also provided.

Introduction

Up to the present eight species of the genus *Simplocaria* (Byrrhidae, Simplocariini) have been recorded from Japan (Pütz, 2002, 2004; Kitano & Sakai, 2007; Kitano, 2017). Of these seven species are apterous, and their distribution areas of most species are relatively narrow. One macropterous species, *Simplocaria* (*Simplocaria*) *hispidula* Fairmaire, 1886, is common in Japan, and is widely distributed from Japan to China.

In this paper, we describe a new species of the genus from Hyôgo Pref., Japan with a key to Japanese species of the genus. In addition, the larva of *S.* (*S.*) *hispidula* Fairmaire, 1886 is described with a key to Japanese genera of the family.

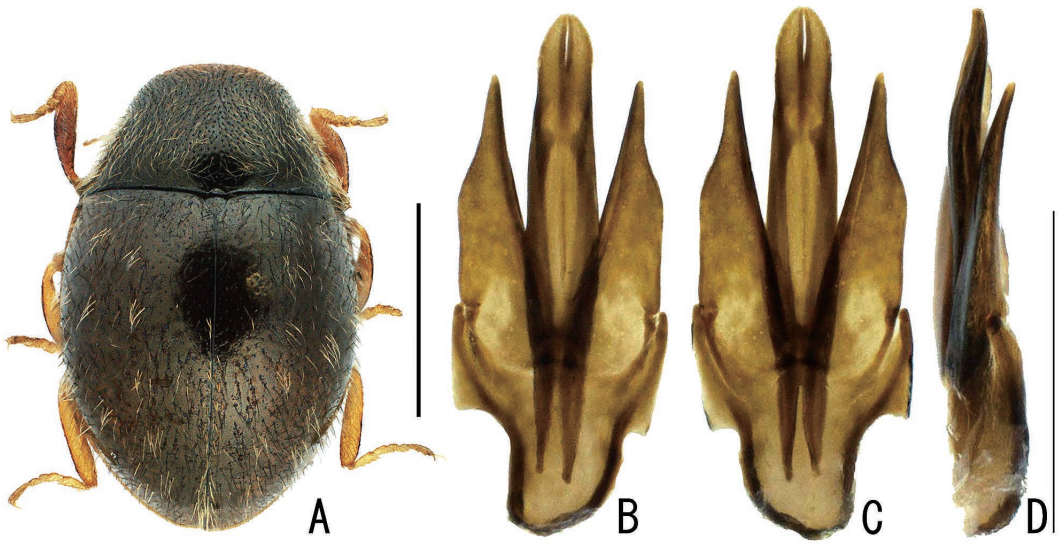

Fig. 1. *Simplocaria* (*Simplocaria*) *yamashitai* sp. nov. —— A, Habitus, holotype, male (Scale = 1.0 mm); B–D, male genitalia, paratype: B, ventral, C, dorsal, D, lateral views (Scale = 0.5 mm).

Material and Methods

The materials examined in this paper are preserved in Ehime University Museum, Matsuyama (EUMJ).

General observations, dissections and microstructures of dissected parts were made under a Leica MZ95. After observation, the dissected parts were mounted on the same card with the specimen. Photographs were taken under a Leica MZ95. Illustrations were drawn under Olympus BH2.

Technical terms refer to LAWRENCE *et al*. (2013) for adults and LESAGE (1983) for larvae.

Morphological abbreviations used in this study are as follows: EL: elytral length from anterior margin to elytral apex; EW: maximum elytral width; PL: pronotal length; PW: maximum width of pronotum; TL: total length (PL + EL). The average is given in parenthesis after the range.

Taxonomy

Simplocaria (***Simplocaria***) ***yamashitai*** sp. nov.

[Japanese name: Kobe-chibi-marutogemushi]

(Figs. 1 & 3A)

M a l e. Body oval, 1.50 times as long as wide, shiny, closely covered with pubescence in dorsal surface. Coloration of body black; antennae and legs brown; mouthparts dark brown. Pubescence whitish yellow sheen under a bright light, scattered, relatively long, growing on dorsal surface and abdominal surface, forming mottled pattern.

Head closely covered with pubescence, irregularly punctuate. Eyes ovoid. Antennae 11-segmented; antennomere 1 large and slender; antennomere 2 small, narrowed apically, oval, about 1/2 as long as antennomere 1; antennomere 3 slender, expanded apically, about 1.60 times as long as antennomere 2; antennomere 4 filiform, shorter than antennomere 3, about 0.54 times as long as antennomere 3; antennomeres 5–7 moniliform; antennomere 7 as long as wide; antennomeres 8–10 transverse; antennomere 11 enlarged, longer than wide, rounded at apex.

Pronotum with metallic luster, density punctuate, about 0.53 times as long as wide, straightly and gently tapered anteriorly; PL/PW 0.54. Scutellum small, triangular. Elytra with metallic luster, conjointly about 1.13 times as long as wide, sparsely punctuate as on pronotum; sides slightly arcuate in basal 1/3, then gently tapering apically; apical margin narrowly rounded; EW/PW 1.10; EL/PL 2.38; EL/EW 1.16. Prosternum punctuate, T-shaped; prosternal process rounded at apex. Mesoventrite wide, finely and sparsely punctuate, with metallic luster. Abdominal ventrites densely punctuate, without any modifications in terminal segment. Legs slender; tibiae subparallel-sided, sparsely punctuate, fore tibiae slightly arcuate outward, widest in middle; tarsi simple, densely pubescent.

Aedeagus trilobed, strongly sclerotized; penis slender, subparallel-sided, gently tapering apically, not dilated in apical part; parameres pointed at apices, relatively wide in basal part, abruptly tapering in apical 1/3; phallobase asymmetrical.

F e m a l e. Similar to male; but TL larger.

Measurements. Male (n = 3). TL 2.28–2.43 (2.31) mm; PW 1.29–1.35 (1.33) mm; PL 0.68–0.72 (0.70) mm; EL 1.57–1.71 (1.63) mm; EW 1.38–1.49 (1.45) mm. Female (n = 2). TL 2.36– 2.42 (2.39) mm; PW 1.31–1.35 (1.33) mm; PL 0.73–0.78 (0.76) mm; EL 1.63–1.64 (1.64) mm; EW 1.55–1.58 (1.57) mm.

Type series. Holotype (EUMJ): ♂, Ohte, Suma-ku, Kôbe-shi, Hyôgo Pref., 27.V.2018, M. YAMASHITA leg. Paratypes (EUMJ): 3 ♀♀, same data as for the holotype; 1 ♀, same locality and collector, 26.I.2008; 1 ♂, 1 ♀, same locality and collector, 5.I.2008; 1 ♂, same locality and collector, 25.I.2015.

Distribution. Japan (Honshu: Hyôgo Pref.).

Etymology. The species name is dedicated to Mr. Masashi YAMASHITA, who is a collector of the type series.

Bionomics. Host moss is Polytrichaceae Gen. et sp.

Remarks. This species is rather similar to *Simplocaria* (*Simplocaria*) *hakonensis* TAKIZAWA, 1983 in the body form (Fig. 3B) and the structure of aedeagus. But this species is easily distinguished form the latter in having the following features: penis subparallel-sided, not dilated in apical part; parameres relatively wide in basal part, abruptly tapering apically in apical 1/3.

Key to Species of Japanese *Simplocaria* (Revised PÜTZ, 2002)

1. Humeral angle and hind wings developed. ····· *S.* (*S.*) *hispidula* FAIRMAIRE (distributed in Hokkaido, Honshu, Shikoku, Kyushu, Hachijô-jima, Shôdo-shima)
– Humeral angle and hind wing not developed. ····· 2
2. Elytra with small yellowish spots. ····· 3
– Elytra without small yellowish spots. ····· 5
3. Penis subparallel-sided, not dilated in apical part. ····· *S.* (*S.*) *yamashitai* sp. nov. (Honshu: Hyôgo Pref.)
– Penis more or less dilated in apical part. ····· 4
4. Pronotum sparsely punctuate. Elytra with very short basal striae; sutural margin with fine yellowish edge. ····· *S.* (*S.*) *hakonensis* TAKIZAWA (Honshu, Shikoku, Kyushu)
– Pronotum more coarsely punctuate. Elytra without basal striae; sutural margin without edge. ···· *S.* (*S.*) *ivanloebli* PÜTZ (Shikoku)
5. Body length less than 3.0 mm; body shape strongly convex in lateral view. Pronotum and elytra weakly or sparsely punctuate. ····· 6
– Body length more than 3.1 mm; body shape weakly convex in lateral view. Pronotum and elytra strongly punctuate. ····· 7
6. Parameres strongly tapered apically, sinuate in lateral margins. ····· *S.* (*S.*) *isensis* KITANO (Honshu: Mie Pref.)
– Parameres evenly tapered apically, almost straight in lateral margins. ····· *S.* (*S.*) *munetoshii* PÜTZ (Kyushu: Miyazaki Pref.)
7. Parameres strongly tapered apically. Apex of penis wide and obtuse. ····· *S.* (*S.*) *naganoensis* PÜTZ (Honshu: Mt. Kiso-komaga-take, Nagano Pref.)
– Parameres evenly tapered apically. ····· 8
8. Apex of penis relatively pointed. ····· *S.* (*S.*) *oharai* PÜTZ (Kyushu: Fukuoka Pref.)
– Apex of penis narrowly rounded. ····· *S.* (*S.*) *basistriata* NAKANE, 1964 (Honshu: Mt. Jônen, Nagano Pref.)

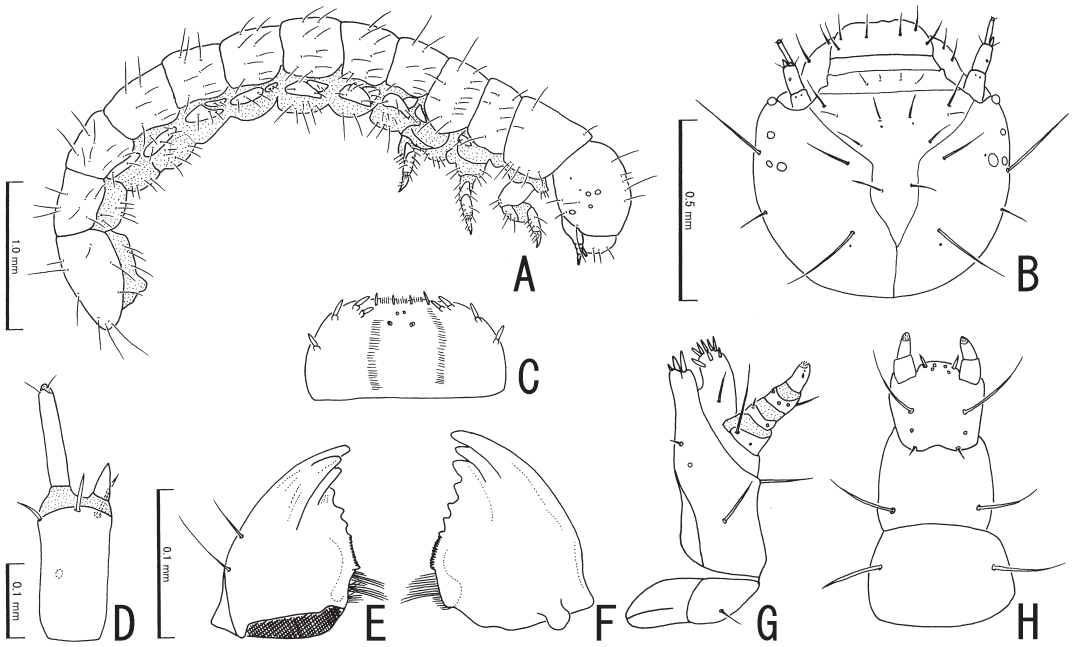

Fig. 2. Larva of *Simplocaria* (*Simplocaria*) *hispidula* FAIRMAIRE, 1886. —— A, Habitus in lateral view; B, head; C, labrum in ventral view; D, left antenna in ventral view; E, left mandible in dorsal view; F, left mandible in ventral view; G, left maxilla; H, labium.

Simplocaria* (*Simplocaria*) *hispidula FAIRMAIRE, 1886

Simplocaria hispidula FAIRMAIRE, 1886: 319.
Simplocaria bicolor PIC, 1935: 3.

Description of larva. About 4.5 mm. Body (Figs. 2A & 3C) elongate cylindrical; dorsum well sclerotized, shiny; venter weakly sclerotized. Coloration of head capsule, mouth parts, legs, and tergum dark brown; venter cream.

Head capsule (Fig. 2B) oval, as long as wide, with short and long setae. Labrum (Fig. 2C) free, transverse, shallowly concave in front margin; epipharynx with two pairs of epipharyngeal sensilla, with four pairs of robust spiniform epipharyngeal setae. Antennae (Fig. 2D) long; sensory appendage conical; 3rd segment long and slender, about 3.5 times as long as sensory appendage. Mandibles (Fig. 2E & F) subtriangular, with three apical teeth. Maxillae (Fig. 2G) with 4-segmented palpi; lacinia with three robust spiniform setae; galea with eight robust spiniform setae. Labium (Fig. 2H) weakly sclerotized; mentum with three pairs of setae and three pairs of sensilla; labial palpi 2-segmented, relatively long.

Pupae (Fig. 3D & E). Coloration of body fully cream, covered with minute setae, with a pair of long and stout spines on anterior margin of pronotum.

Specimens examined. Five mature larvae (one larva rearing to adult) and two pupae, Tarumi, Matsuyama-shi, 10.II.2016, H. YOSHITOMI leg.

Bionomics. This is the most common species in Japan. Overwintering is occurred in the adult and larval stages. Host moss is Polytrichaceae Gen. et sp.

Fig. 3. *Simplocaria* (*Simplocaria*) *yamashitai* sp. nov. (A), *Simplocaria* (*Simplocaria*) *hakonensis* TAKIZAWA, 1983 (B) & *Simplocaria* (*Simplocaria*) *hispidula* FAIRMAIRE, 1886 (C–E). —— A & B, Adults; C, larva in lateral view; D & E, pupa in ventral (D) and dorsal (E) views.

Key to Known Genera of Byrrhid Larvae of Japan

1. Body short campodeiform, densely covered with long hairy setae. ····· ····· *Cytilus* (*C. alternatus* (SAY, 1825) and *C. sericeus* (FORSTER, 1771); after BÖVING & CRAIGHEAD (1931) and LESAGE (1983))
– Body long, cylindrical, bearing long setae. ····· 2
2. Abdominal segment VIII clearly larger than segment VI; apex of mandible simple. ····· ····· *Byrrhus* (after BÖVING & CRAIGHEAD (1931) and EMDEN (1958))
– Abdominal segment VIII as long as segment VI; apex of mandible with three to five teeth. 3
3. Head capsule longer than wide; mandible with three rubust teeth. ····· ····· *Lamprobyrrhus* (*L. hayashii* FIORI, 1967; after HAYASHI (1962))
– Head capsule as long as wide; mandible with pointed three to five teeth. 4
4. Setae on head capsule short; front margin of labrum concave; antennomere III short. ····· ····· *Horiella* (*H. bicornis* KITANO et SAKAI, 2007; KITANO & SAKAI (2007))
– Setae on head capsule long; front margin of labrum shallowly concave; antennomere III long. ·· ····· *Simplocaria* (*S. hispidula* FAIRMAIRE, 1886; after this study)

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要　　約

大塚駿希・吉富博之：日本産チビマルトゲムシ属 *Simplocaria*（鞘翅目マルトゲ ムシ科）の 1 新種およびシラフチビマルトゲムシの幼虫の記載．――――兵庫県神戸市からコウベチビマルトゲムシ *Simplocaria* (*Simplocaria*) *yamashitai* sp. nov. を記載し，本属の日本産種の検索表を示した．本種はハコネチビマルトゲムシ *S.* (*S.*) *hakonensis* TAKIZAWA に外見が類似するが，雄交尾器の特徴により容易に区別できる．また，シラフチビマルトゲムシ *S.* (*S.*) *hispidula* FAIRMAIRE の幼虫を記載し，日本産マルトゲムシ科の幼虫の属の検索表を示した．

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