

New Record of the Family Artematopodidae Lacordaire, 1857 (Coleoptera, Elateroidea) in Korea

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한국 미기록, 옛방아벌레과(딱정벌레목, 방아벌레상과)의 보고

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ABSTRACT: The family Artematopodidae Lacordaire is reported based on a species, *Macropogon sibiricus* Motschulsky, for the first time in Korea. We provide taxonomic information for the family, the genus and species with morphological diagnostic characters and photos.

Key words: Elateroidea, Artematopodidae, *Macropogon sibiricus*, Taxonomy, Korea

초록: 한국에서 *Macropogon sibiricus* Motschulsky 옛방아벌레(신칭)를 근거로 하여 옛방아벌레과(Artematopodidae) (신칭)가 분포함을 보고한다. 이 과 및 속, 종에 대한 진단형질과 사진을 포함하여 분류학적 정보를 제공한다.

검색어: 방아벌레상과, 옛방아벌레과, 옛방아벌레, 분류, 한국

The family Artematopodidae Lacordaire, 1857 is called as soft-bodies plant beetle and currently recognized as a basal group in the superfamily Elateroidea (Lawrence, 1988; Lawrence and Newton, 1995; Lawrence et al., 2011; Kundrata et al., 2013, 2014; McKenna et al., 2015; Zhang et al., 2017). This family is consisting of 78 extant species placed in eight genera of three subfamilies (Hörschemeyer, 1998; Kundrata et al., 2013; Arriaga-Varela and Escobar, 2014; Gimmel and Bocakova, 2015) including eight fossil species belonging to three genera, *Electribius* Crowson, 1973, *Proartematopus* Crowson, 1973, and *Sinobrevipogon* Cai et al., 2015 from the middle Eocene Baltic amber and the middle Jurassic Daohugou beds, respectively (Crowson, 1973; Lawrence, 1995;

Hörschemeyer, 1998; Cai et al., 2015). Of which 58 extant species are distributing in Nearctic region, 11 species in eastern Asia, and only one species in southern Europe.

In eastern Asia, although three species of *Macropogon* Motschulsky, 1845 were known from Siberia and Far East Russia and eight species of *Eurypogon* Motschulsky, 1860 were described from Japan, Taiwan and China, any species of Artematopodidae has not been documented in Korea. In 2015, we collected a species, *Macropogon sibiricus* Motschulsky, 1845, in South Korea. Therefore, we report the family Artematopodidae for the first time in Korea based on the *Macropogon* species.

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Received May 3 2018; Revised November 27 2018

Accepted November 29 2018

Materials and Methods

We collected three specimens of *Macropogon sibiricus* at Hongcheon, Gangwon province, South Korea in 2015. The specimens were observed under a stereo-microscope (MZ 16A and MZ6; Leica, Solms, Germany) for species identification. All of the examined specimens are preserved in the insect collection at the National Institute of Agricultural Science [NIAS], Jeonju, Korea.

Results

Systematic Accounts

Order Coleoptera Linnaeus

Series Elateriformia Crowson

Superfamily Elateroidea Leach

Family Armatopodidae Lacordaire, 1857 옛방아벌레과(신칭)

Diagnosis. Body ovate to elongate, 2.5-10 mm in length, densely clothed pubescence. Head deflexed, strongly inserted in prothorax; eyes well developed; frontal clypeal suture absent; mandible unidentate. Antennae 11-segmented, filiform or serrate, rarely pectinate. Prothorax with weakly developed interlocking mechanism. Tarsomeres 2 to 4 or 3 to 4 with ventral lobes. Elytra wider than pronotum, with ventrally interlocking tongue-like processes at posterior. Abdomen with five ventrites, sometimes obscured mesally (in *Electribius*). (adapted from Lawrence, 2010)

Distribution. Holarctic, Oriental and Neotropical regions (Gimmel and Bocakova, 2015), new to Korea.

Biology. There are little knowledge on the ecological features in five species belonging to three genera, *Macropogon*, *Eurypogon* Motschulsky and *Armatopus* Perty. The members of *Macropogon* and *Eurypogon* are probably associated with feed on mosses growing on boulders. Species of *Armatopus* are found on bushes in adult stage and the superficial layer of soil, covered by litter (Lawrence, 2010).

Remarks. This family can be easily characterized by synapomorphies from other elateroid families, including tarsomere 3 and 4 with ventral lobes and a ventral tongue-like process at the posterior apex of the elytron (Crowson, 1973).

Genus *Macropogon* Motschulsky, 1845 옛방아벌레속(신칭)

Macropogon Motschulsky, 1845: 38. Type species: *Macropogon sibiricum* Motschulsky, 1845: 38 (Dauria).

Diagnosis. Head without setose cavity under antennal insertion, sometimes small cavity present. Anterior margin of frontoclypeus truncate or weakly convex. Mandible with subapical tooth. Antennomere 5 more than 2.5 times longer than 4; 4 subequal to 3; antennomeres 4-11 densely clothed with erect hairs in male. Pronotum without transverse groove or paired cavities. Prosternum with paired longitudinal ridges continuous with lateral margin of prosternal process; anterior ends of paired longitudinal ridges without deep pits. Elytral striae gradually shallowed at apex. Abdomen ventral sutures 3-5 complete and distinct; ventries 2-4 without glandular hairs in male; ventrite 5 partly covered with glandular hairs. Basal pro- and mesotarsomeres with ctenidium in most males (not in *M. sequoiae* Hopping).

Distribution. Holarctic (Lawrence, 2005), new to Korea.

Remark. *Macropogon* can be easily distinguished from the sister genus *Eurypogon* by the different length ratio of antennomere 4 and 5 and the presence of ctenidium at the basal pro- and mesotarsomeres. Five species of *Macromogon* are distributed in Holarctic region. Four species (*M. piceus* LeConte, *M. rufipes* Horn, *M. sequoiae* Hopping and *M. testaceipennis* Motschulsky) were known from North America including USA and Canada (Hopping 1936). A species, *M. sibiricus* Motschulsky were recorded in eastern Asia including eastern Siberia (Dauria) and Far East Russia.

Macropogon sibiricus Motschulsky, 1845 옛방아벌레(신칭) (Figs. 1, 2)

Macropogon sibiricum Motschulsky, 1845: 38 (Dauria).

Macropogon pubescens Motschulsky, 1860: 362 (Kamtschatka), synonymized by Gusakov, 2009: 138.

Specimens examined. 2 males (nos. 3699 and 3700), 1 female (no. 3701), Myeonggae-ri, Nae-myeon, Hongchoen-gun, Gangwon-do, Korea. 7. VI. 2015. S. S. Kim [NIAS].

Diagnosis. Male (no. 3700). Body 5.9 mm long, 2.1 mm wide, widest at posterior of elytra (Fig. 1A); color entirely black, shiny, but tarsomeres 2-4 each with ventral emarginate

pale yellow, lamella, tarsomere 5 and claw reddish brown (Fig. 1F); pubescence golden-yellow, wholly and densely covered, erected or subrecumbent at dorsal, entirely recumbent at ventral. Head clearly deflexed from between antennal sockets to clypeus (Fig. 1D); punctures sub-ocellate, circular to oval,

sparse at front, dense at vertex; clypeal margin convex; eyes (Fig. 1C) protuberant, interocular distance 3.0 times eye diameter (ca., 11: 33). Antennae (Fig. 1A) 11-segmented, long and slender, reaching to second third of elytra, covered by subrecumbent hairs from antennomere 1 to 4 and erect hairs

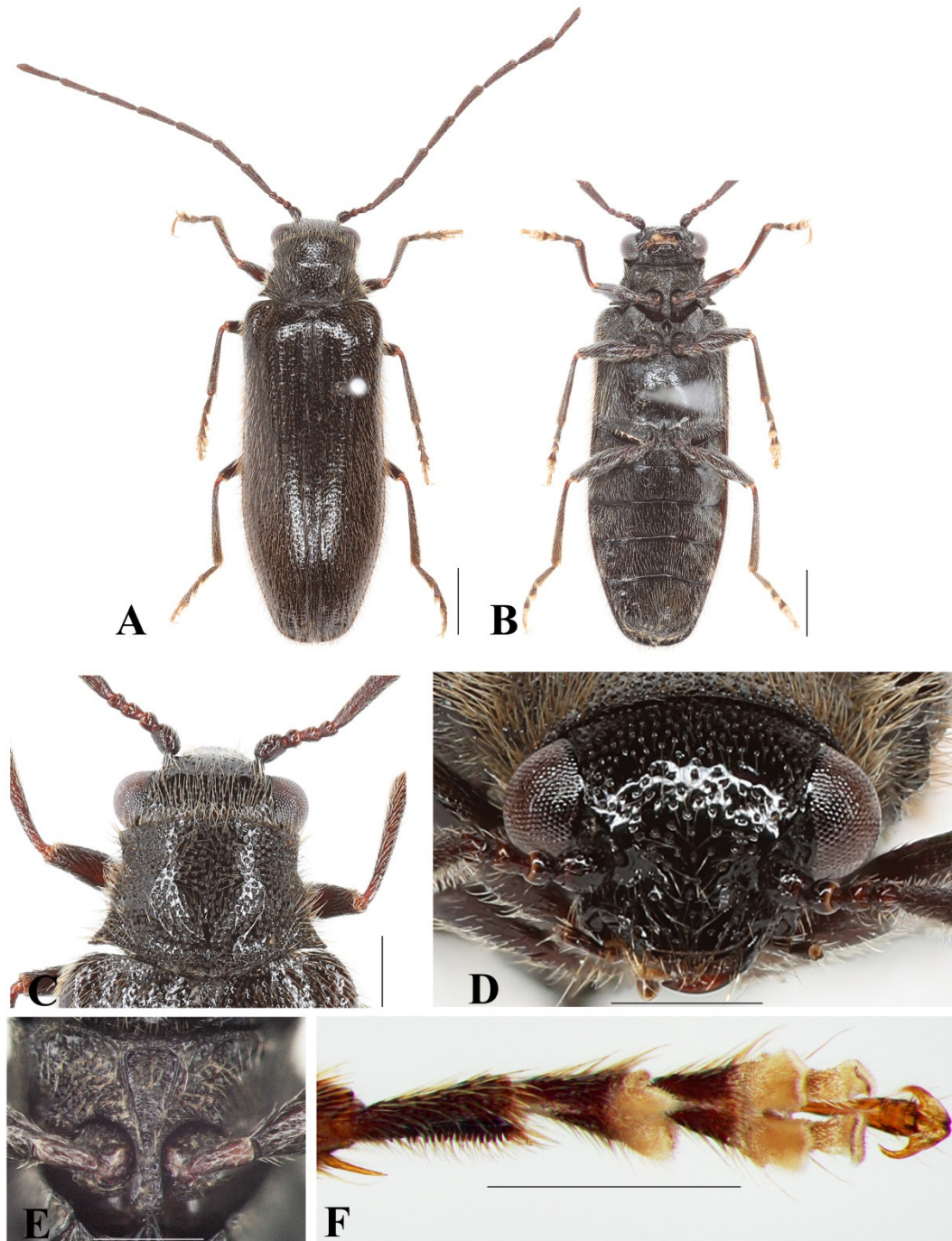


Fig. 1. A male of *Macropogon sibiricus* Motschulsky from Korea. A, dorsal view; B, ventral view; C, head and pronotum in dorsal view; D, head in anterior view; E, Prosternum in ventral view; F, mesotarsomeres in ventral view. Scale bars: A-B (1.0 mm), C-F (0.5 mm).

from 5 to 11; antennomere 1 1.3 times longer than width, 1.8 times longer than 2, 3 and 4; antennomere 2 and 3 obconic, sub-equal; antennomere 4 obconic, smallest, slightly shorter than 2 and 3; antennomere 5 elongate, sub-triangular, 5.75 times longer than 4, 1.65 times longer than combined length of three antennomeres 2 to 4; antennomere 6 to 10 similar in shape and length, gradually slender; antennomere 11 longest, simple. Pronotum (Fig. 1C) pentagonal, convex medially, widest at posterior; anterior margin straight; lateral margins arched at middle, obscure from middle to anterior; posterior margin roundly arched; disc smooth at median, gradually



Fig. 2. Aedeagus of *Macropogon sibiricus* Motschulsky from Korea. Scale bar (0.25 mm).

coarse to outsides, with a sub-circular carina; punctures sub-ocellate, larger than head, sparse at median, denser and larger toward outsides; pronotal hind angles short, broad at base. Prosternum (Fig. 1E) transverse, with well ridged anterior margin, with paired longitudinal carinae in front of procoxae, continuing as sides of prosternal process; surface coarse; prosternal process slightly bent inwardly, widest to posterior, round at apex. Scutellum sub-oval, convex. Elytra weakly sinuate behind humeri, widest at third fourth; strinae formed by fine and deep punctures, shallow to apex. Legs slender; tibiae with two spurs at apex; pro- and mesotarsomere 1 with ctenidium; tarsomere 2-4 each with ventral emarginate pale yellow lamella (Fig. 1F); claw with a small tooth at middle. Abdomen with fine and deep punctures; ventrite 1 shortest. Aedeagus 2.9 times as long as wide, paramere sub-cylindrical, simple at apex, median lobe slightly narrowing toward apex, longer than paramere (Fig. 2).

Female. Similar to male, but differs from several characteristics: head with small and smooth two elevations at insides of eyes; antennomere 2 to 4 reddish brown; antennomere 4 slightly longer than 3 (shorter in male); antennomere 5 to 11 with rather sparse elect hairs; pro- and mesotarsomere 1 without ctenidium.

Distribution. Russia (East Siberia and Far East) and new to Korea.

Remarks. Motschulsky (1845: 38) established a new genus *Macropogon* based on *M. sibiricus* from Dauria, the eastern Siberia. And then, he (1860) additionally described *M. pubescens* from Kamchatka. Gusakov (2009) synonymized *M. pubescens* to *M. sibiricus* in recent.

Acknowledgements

This paper was supported by Sunchon National University Research Fund III in 2018.

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