

Three New Species of the Genus *Oedostethus* (Coleoptera, Elateridae, Negastrinae) in Korea

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ABSTRACT

Three new species belonging to the subfamily Negastrinae, *Oedostethus koreanus* sp. nov., *O. ovalatus* sp. nov. and *O. canicapillus* sp. nov. are described. The genus *Oedostethus* is new to Korea.

Key words: new species, Insecta, Coleoptera, Elateridae, Negastrinae, Korea

INTRODUCTION

The subfamily Negastrinae was established by Nakane and Kishii (1956). However, the nominators did not describe exactly in the column of description or diagnosis, but the characteristics were appeared in the key. Thereafter, his diagnosis and characters were referred by several authors (Stibick, 1971, 1979; Dolin, 1975; Gurjeva, 1974; Kishii, 1987; Ôhira, 1988;). According to these authors, the Negastrinae can be easily distinguished from other subfamilies by following characters: distinctly small body, broad prosterum, medio-outwardly curved prosternal pleural suture (Fig. 2-A), elongate prosternal process (Fig. 1-C), mesocoxal cavity surround by meso- and metasternum (Fig. 2-D), simple claws without seta at base.

On the taxonomic situation of this subfamily, Kishii (1987) also pointed out: "This large cosmopolitan subfamily has not been well studied at the generic and specific levels except some limited faunas. Only the European and Japanese faunas are well known, and about 25 genera and approximately 300 species were described already. Possibly another 300 or more species remained to be discovered." Adults of Negastrinae are found in water-sides (Nakane and Kishii,

1956), shingle beds (Penev and Alekseev, 1996) or sometimes in meadow but the ecology of them are not known clearly.

In Korea, the first record of this subfamily was made by Kim and Park (1991) who reported *Migiwa* (= *Fleutiauxellus*) *quadrillum* (Candèze, 1873) from South Korea. Since then, Kishii (1994) described a new species, *Quasimus pseudovalis* Kishii, 1994 from Gaema plateau in North Korea. Therefore, only two species have been recorded from Korea.

We had collected 160 specimens of three new species belonging to the genus *Oedostethus* from South Korea. The provincial abbreviations used in this paper are as follows: KW; Kangwondo, KB: Kyngsangbukdo, CB: Ch'ungch'öngbukdo, JN: Chöllanamdo.

The types are deposited in Sungshin Women's University, Seoul, Korea.

SYSTEMATICS

Subfamily Negastrinae Nakane et Kishii 애방아벌레아과 (신칭)

Negastrinae Nakane et Kishii, 1956. *Kontyû*, p. 202.

Genus *Oedostethus* Le Conte 강변애방아벌레속 (신칭)

Oedostethus Le Conte, 1853. *Trans. Am. phil. Soc.* p. 489.

Type-species: *O. femoralis* Le Conte, original designation.

Diagnosis. Body feebly convex, 3-5 mm long in general. Head nearly flat; frontal carina

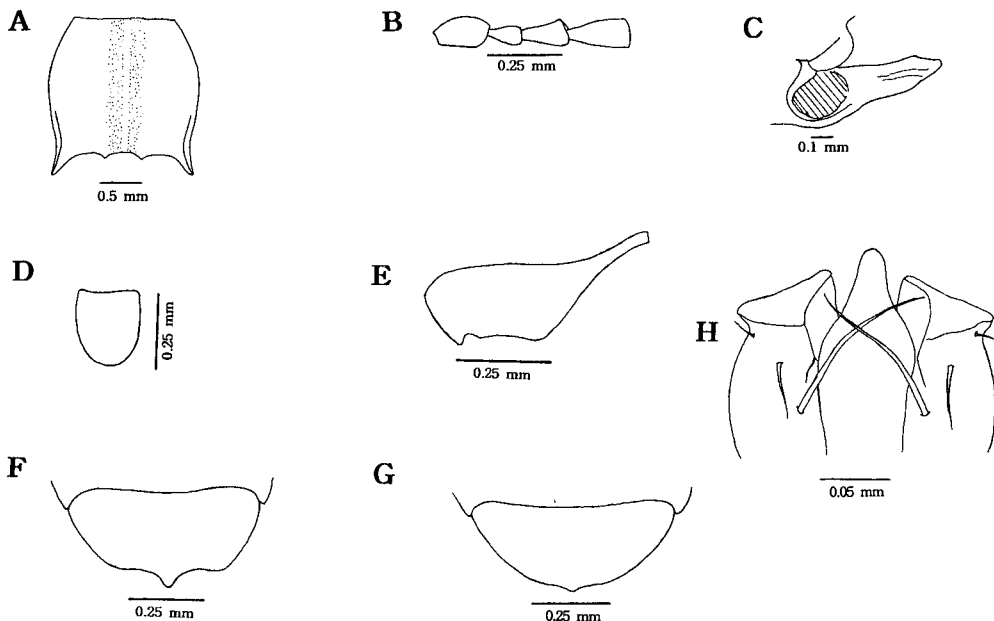


Fig. 1. *Oedostethus koreanus* sp. nov. A. pronotum at dorsal view; B. 1st to 4th antennal segments; C. prosternal process in profile; D. scutellum; E. metacoxal plate; F, G. 7th sternite (F. male, G. female); H. apical part of aedeagus at dorsal view.

developed. Antennae reaching beyond pronotal hind angles; 2nd segment subequal or shorter than the 3rd. Pronotum convex moderately; lateral margins arcuate, sinuate at base of hind angles; hind angle short with one carina (Fig. 1-A); surface without granule. Prosternum broad; prosternal pleural suture feebly arcuate, double-lined (Fig. 2-A). Claws simple or flanged at base. Bursa copulatrix with two sclerotic plates.

Remarks. This genus is newly recorded in Korea.

Distribution. Palearctic region, N. America.

1. *Oedostethus koreanus* sp. nov. 강변애방아벌레 (신칭) (Fig. 1A-H, 3A-C)

Type materials. Holotype: 1 ♂, stream-side of Chogyekol, Mt. Odaesan, Chinbu-myŏn, P'yŏngch'ang-gun, KW, 24. Jun. 1998, Han *et* Kang. Paratypes: 14 ♂♂, 6 ♀♀, same data with holotype; 24 ♂♂, 8 ♀♀, Mt. Wŏraksan, Chech'on-shi, CB, 21-22. May 1998, Han *et* Kang; 34 ♂♂, 17 ♀♀, Hŭibangsa valley, Mt. Sobaeksan, KB, 28. May 1999, T. M. Han; 10 ♂♂, 9 ♀♀, Piagol valley, Mt. Jirisan, JN, 21-22. May 1999, Han *et* Park; 10 ♂♂, 5 ♀♀, Simwon valley, Mt. Jirisan, JN, 23. May 1999, T. M. Han.

Description. Body: 3.4-4.9 mm long and 1.3-1.85 mm wide across the base of elytra; elliptic, subparallel-sided, flattened above elytra. Color black, shining, but one half of 1st and 2nd antennal segment, apex of mandible dark reddish brown or reddish brown, legs yellowish brown; femur dusky brown. Punctures generally dense, fine. Vestiture pale brown, short, moderately dense, more or less recumbent.

Head: flat between eyes; surface weakly scabrous; frontal carina developed, rounded, but sometimes truncated in middle, thickly ridged above antennal sockets, bifurcate at base; frontal groove narrowed in middle. Mandibles bidentate. Labrum semicircular, about 2.2 times as wide as long; anterior margin nearly truncated. Maxillary palpi hatchet shaped; 4th segment subtriangular, 1.2 times as long as wide. Antennae elongate: 11th segment narrowly elliptic, exceeding beyond the pronotal hind angle; 1st segment swelling, large, stout; 2nd cylindrical, small, distinctly shorter than 3rd; 3rd triangular, 1.6 times as long as 2nd (Fig. 1-B); 3th to 10th serrate.

Thorax: Pronotum convex moderately, 1.08 times as wide as long, broadest in middle; disc with median longitudinal line developed without punctures and pubescence, dorso-lateral surface weakly sinuous; lateral margins gently arcuate, sinuate at base of hind angles; hind angle short, divergent lateral backward, with one carina extending to basal one third along lateral margin (Fig. 1-A). Prosternum convex moderately, broadest in middle; anterior margin weakly rounded; posterior process straight, gradually narrowed towards apex (Fig. 1-C); propleural punctures distinct. Scutellum tongue shaped, flat, parallel sided, 1.2 times as long as wide (Fig. 1-D); rim feebly depressed, smooth. Metacoxal plate flat with posterior margin weakly expanded in middle (Fig. 1-E). Legs slender, simple; claws simple, feebly expanded at base.

Elytra: elongate, rather flat in dorso-median part, about 1.6 times as long as wide; lateral sides subparallel in basal half, gradually narrowed backward; humeral mucro distinctly projected; striae distinct; intervals convex anteriorly.

Abdomen: 7th sternite 2.1 times as wide as long; posterior margin truncated, with one triangular projection in middle (Fig. 1-F).

Aedeagus: cylindrical, nib-form in profile. Median lobe nearly cylindrical with median longitudinal

convex part, abruptly narrowed and bluntly pointed, slightly exceeding the apex of parameres. Paramere broad, subparallel-sided (Fig. 3-B); telomere with apical part flat triangular at dorsal view, with three strong setae; longest and thick seta located on inner middle margin; medium and thin one in median part; shortest and thin one near apex of outer margin (Fig. 1-H; 3-C).

Female: Similar to male, but antennae short, not exceeding beyond the pronotal hind angle, 3rd segment subcylindrical and 7th sternite round at posterior margin (Fig. 1-G).

Etymology. The species name of *O. koreanus* was derived from the name of nation, Korea.

Remarks. This species closely resembles *Oedostethus petrenkoi* Dolin of Altai and Maritime Province of Siberia, but can be distinguished by the shorter antennae, subequal relative length and width of pronotum, more cylindrical and subparallel-sided shape of aedeagus. On the hand, the above two species and several Far East Russian species including *O. matisi* Dolin, *O. problematicus* Dolin, *O. nazarenkoi* Dolin exclusively hold the sexual dimorphism in 7th sternite (Fig. 1-F, G).

2. *Oedostethus ovalatus* sp. nov. 둥근강변에방아벌레 (신칭) (Fig. 2A-E, 3D-F)

Types material. Holotype: 1 ♂, stream-side of Chogyekol, Mt. Odaesan, Chinbu-myön, P'yöngch'ang-gun, KW, 24. Jun. 1998, Han et Kang. Paratypes: 4 ♂♂, 2 ♀♀. ditto; 1 ♂, Mt. Söraksan, Sockch'o, KW, 14. Jul. 1984, S. H. Lee.

Description. Body: 3.2-4.0 mm long and 1.2-1.8 mm wide across the before middle of elytra; suboval, well convex. Color black, explicitly shining, but basal three antennal segments, legs except for femur, apex of mandible yellowish brown; rest antennal segments, femur dark brown. Punctures dense, fine. Vestiture reddish brown, short, dense, rather recumbent.

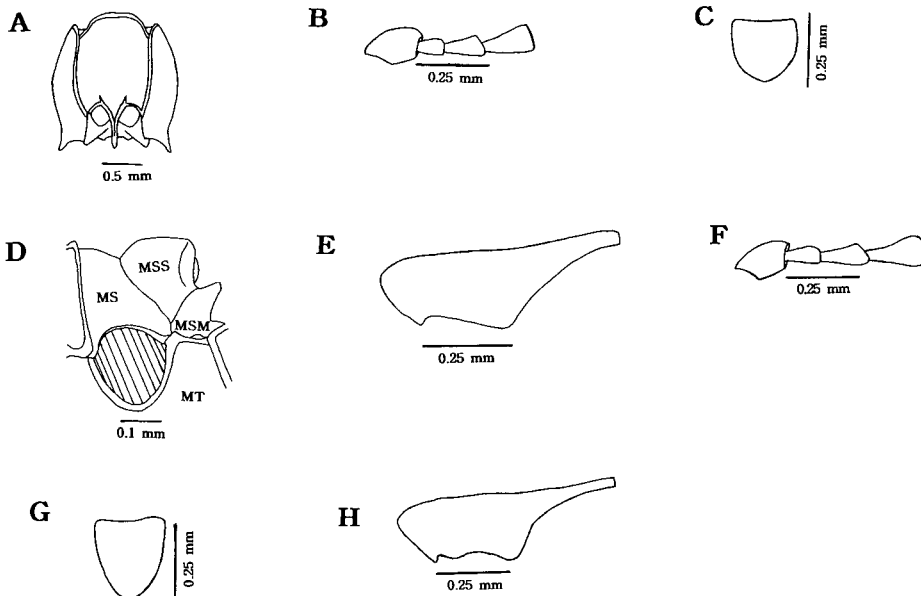


Fig. 2. A-E: *O. ovalatus* sp. nov.; F-H: *O. canicapillus* sp. nov. A, pronotum at ventral view; B, F, 1st to 4th antennal segments; C, G, scutellum; D, mesocoxal cavity at ventral view; (MS; mesosternum, MSM; mesepimeron, MSS; mesepisternum, MT; metasternum); E, H, metacoxal plate.

Head: weakly convex between eyes; frontal carina truncated in middle, thickly ridged above antennal sockets, bifurcate at base; frontal groove narrowed in middle. Mandibles bidentate. Labrum semicircular, about 1.9 times as wide as long; anterior margin rounded, Maxillary palpi hatchet shaped; 4th segment triangular, 1.4 times as long as wide. Antennae slender, elongate, two apical segments exceeding beyond the pronotal hind angle; 1st segment robust, large; 2nd subcylindrical, shorter than 3rd; 3rd subtriangular 1.4 times as long as 2nd (Fig. 2-B); 4th to 10th triangular, serrate; 11th narrowly elliptic.

Thorax: Pronotum well convex, about 1.3 times as wide as long, widest in middle; disc with median longitudinal line developed without punctures and pubescence; lateral margins distinctly arcuate, sinuate at base of hind angles; hind angle short, divergent lateral backward, with one carina extending to basal one third along lateral margin. Prosternum convex moderately, broadest in middle, strongly shining; anterior margin elongate, rounded; posterior process straight, gradually narrowed and roundly pointed towards apex (Fig. 2-A); propleural punctures deep, rather large. Scutellum linguiform, 1.07 times as long as wide (Fig. 2-C); surface with sparse punctures and pubescence, but rim of posterior margin smooth. Metacoxal plate flat; posterior margin distinctly expended backwards in middle (Fig. 2-E). Legs slender, simple; claws feebly expended at base.

Elytra: ovate, well convex, 1.5 times longer than wide, broadest before middle; lateral arcuate; humeral mucro distinctly projected; striae distinct; intervals well convex anteriorly.

Abdomen: 7th sternite rounded at posterior margin, 2.4 times as wide as long.

Aedeagus. Median lobe straight, gradually tapered and roundly pointed apically, exceeding the apex of parameres. Paramere slightly attenuate towards apex; telomere obliquely and obtusely pointed at apex, with five strong setae on antero-lateral margin; basimere feebly arcuate at lateral margin (Fig. 3-E, F).

Female. Similar to male, but antennae short, not reaching to apex of pronotal hind angles and body is more large.

Etymology. The species name of *O. ovalatus* was derived from the oval shape of elytra and distinctly convex pronotum.

Remarks. This species is similar to *Oedostethus apterus* Dolin *et* Bessalitsyna in Magadan of East Siberia, but can be distinguished by more broad pronotum, elytra widest before middle and more short median lobe of aedeagus.

3. *Oedostethus canicapillus* sp. nov. 흰털강변애방아벌레 (신칭) (Fig. 2F-H, 3G-I)

Type examined. Holotype: 1 ♂, Mt. Hambaeksan, Kohan-ŭp, Chŏngsŏn-gun, KW, 14. Aug. 1999, Han *et al.* Paratype: 3 ♂♂, 10 ♀♀, ditto.

Description. Body: 3.0-4.0 mm long and 1.2-1.5 mm wide across the before middle of elytra; suboval, moderately convex. Color black, shining, but basal 3 antennal segments, apex of mandible, and legs reddish brown; rest antennal segments and femur dark brown. Punctures generally dense, minute. Vestiture white, dense, short, recumbent.

Head: flat between eyes; surface not scabrous; frontal carina rounded, thickly ridged above antennal sockets, bifurcate at base; frontal groove narrowed in middle. Mandibles bidentate. Labrum semicircular, about 2.6 times as wide as long. Maxillary palpi hatchet shaped; 4th segment subtriangular, 2.0 times longer than wide. Antennae slender, 11th segment narrowly elliptic,

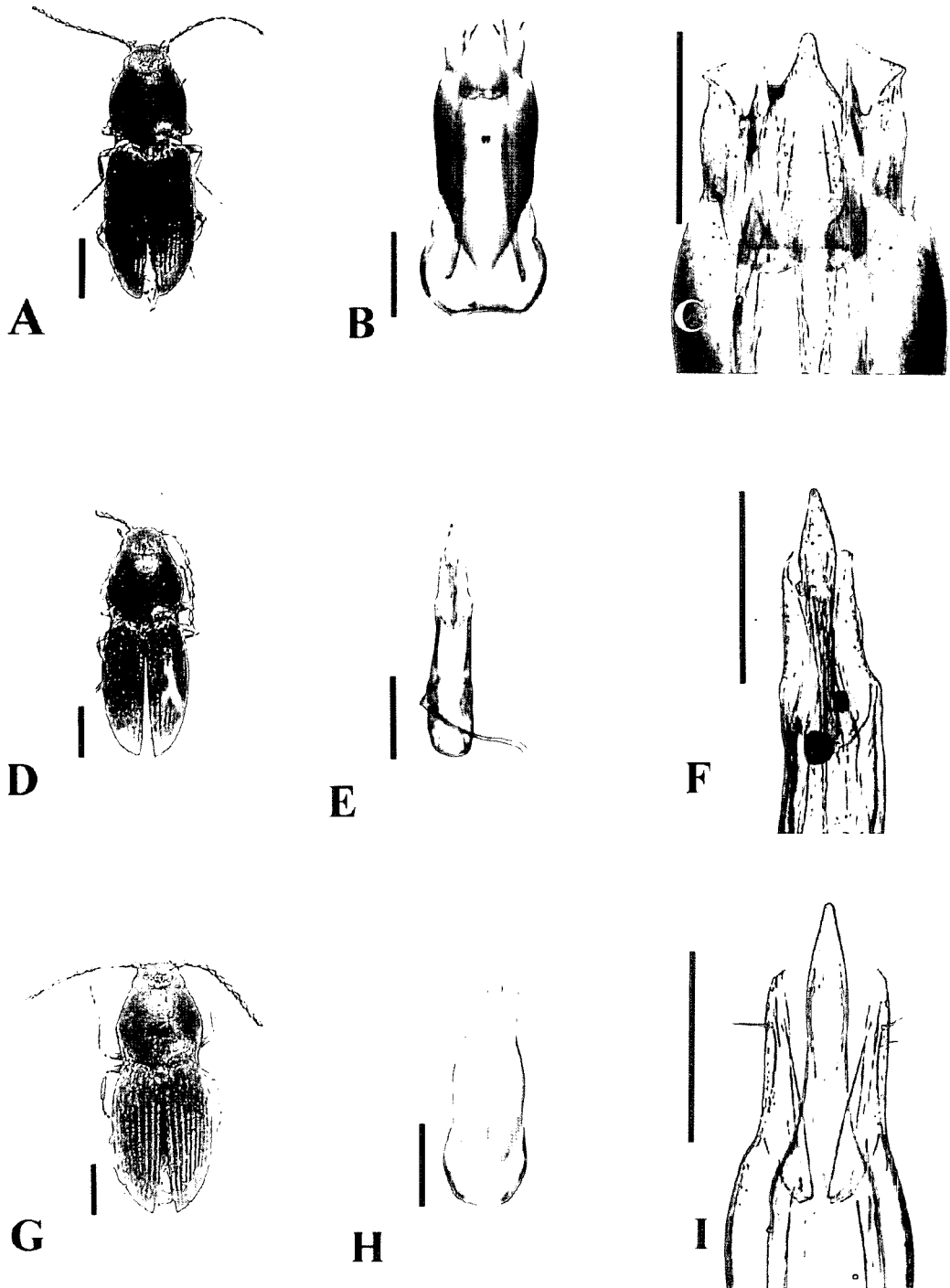


Fig. 3. A-C: *O. koreanus* sp. nov.; D-F: *O. ovalatus* sp. nov.; G-I: *O. canicapillus* sp. nov. A, D, G. male adults (scale bar: 1.0 mm); B, E, H. aedeagus at dorsal view (scale bar: 0.25 mm); C, F, I. apical part of aedeagus at dorsal view (scale bar: 0.25 mm).

exceeding beyond the apex of pronotal hind angle; 1st segment swelling, large, stout, weakly margined at anterior; 2nd cylindrical, small; 3rd subcylindrical, 1.4 times longer than 2nd (Fig. 2-F); 4th to 10th triangular, serrate.

Thorax: Pronotum convex, 1.14 times as wide as long, broadest in middle; disc with median longitudinal line developed without punctures and pubescence; lateral margins arcuate, sinuate at base of hind angles; hind angle short, divergent lateral backward, with short one carina extending to base; surface not wrinkled. Prosternum convex moderately, broadest in middle; anterior margin weakly rounded; posterior process straight, gradually narrowed toward apex; punctures more or less fine. Scutellum tongue shaped, 1.1 times as wide as long; anterior margin feebly concaved posteriorly (Fig. 2-G); surface slightly convex, but posterior rim depressed and smooth. Metacoxal plate flat; posterior margin distinctly expanded in middle (Fig. 2-H). Legs slender, simple; claws feebly expanded at base.

Elytra: ovate, more or less elongate, flat in dorso-median portion, 1.66 times as long as wide, widest before middle; lateral margins arcuate; humeral mucro distinctly projected; striae distinct; intervals convex anteriorly.

Abdomen: 7th sternite semicircular, 1.15 times as wide as long.

Aedeagus. Median lobe slender, digitate, straight, but broadest part weakly bent in profile, gradually tapered apically, roundly pointed. 1.4 times longer than telomere. Parameres bifurcated, feebly attenuate towards apex; telomere sharply pointed at apex, with three strong setae distributed on median lateral margin; basimere feebly arcuate at lateral margin (Fig. 3-H, I).

Female: Similar to male. But can be distinguished by antennae barely reaching to apex of pronotal hind angles and more or less larger body.

Etymology. The species name of *O. canicapillus* was derived from the whitish vestiture.

Remarks. This species was collected in high montane area nearing the top (1575.9 m) of Mt. Hambaeksan and is closely allied to *O. ovalatus*, but differs by the short and whitish vestiture, 1st antennal segment weakly margined anteriorly, more elongate elytra, and more sharpened apex of paramere of aedeagus.

ACKNOWLEDGEMENTS

The authors thank to Dr. Hitoo Ôhira, National Institute for Physiological Sciences, Myodaiji, Okazaki, Japan, for lending us many valuable papers and specimens; also to Dr. Takashi Kishii, Kamihamuro 1-10 Takatsuki, Osaka, Japan, Prof. Wladimir G. Dolin, Schmalhausen Institute for Zoology, Ukraine and Dr. Giuseppe Platia, Via Molino Vecchio, Gatteo, Italia for sending many papers with useful information; finally to Dr. Jung Kyeu Kim, Korean Entomological Institute, Korea Univ. and Mr. Sang Wook Park for reading manuscript and editing photographs.

REFERENCES

Dolin, V. G., 1975. Wing venation of click-beetles (Coleoptera, Elateridae) and its importance for taxonomy of

- the family. Zool. Zh., **54**: 1618-1633 (in Russian).
- Gurjeva, E. L., 1974. Thoracic structure of click beetles (Coleoptera, Elateridae) and the significance of the structural characters for the system of the family. Entomol. Rev. (Wash.), **53**: 67-79.
- Kim, J. I. and H. C. Park, 1991. The survey on the entomofauna at the Mt. Myungji under the resting-year scheme; the first year report. Rep. Surv. Mt. Myungji and Mt. Mugap. Ecosyst. Kyōnggi-do, pp. 167-208 (in Korean).
- Kishii, T., 1987. A taxonomic study of the Japanese Elateridae (Coleoptera), with the keys to the subfamilies, tribes and genera: 1-262, 12 figs. (Kyoto).
- Kishii, T., 1994. Notes on Elateridae from Japan and its adjacent area(13). Bull. Heian high school, Kyoto, **38**: 1-35, 8 pls.
- Le Conte, L., 1853. Revision of the Elateridae of the United States. Trans. Am. phil. Soc., **10**: 408-508.
- Nakane, T. and T. Kishii, 1956. On the subfamilies of Elateridae from Japan (Col. Elateridae). Kontyū, **24**: 201-206, 2 pls.
- Ôhira, H., 1988. On the generic classification of the subfamily Negastrinae in Japan (Coleoptera: Elateridae). Trans. Essa ent. Soc. Niigata, (66) : 3-17 (in Japanese).
- Penev, L. D. and S. K. Alekseev, 1996. The click-beetles of north Ossetia, Caucasus: fauna, habitat distribution, and biogeography (Coleoptera: Elateridae). Stuttgarter Beitr. Naturk. Ser. A, Nr., **548**: 1-19.
- Stibick, J. N. L., 1971. The generic classification of the Negastrinae (Coleoptera: Elateridae). Pacific Ins., **13**(2): 371-390.
- Stibick, J. N. L., 1979. Classification of the Elateridae (Coleoptera). Relationships and classification of the subfamilies and tribes. Pacific Ins., **20**(2/3): 145-186.

RECEIVED: 15 February 2000

ACCEPTED: 28 March 2000

한국산 강변애방아벌레속(딱정벌레목, 방아벌레과, 애방아벌레아과)의 3신종

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요 약

한국산 애방아벌레아과에 속하는 3신종, *Oedostethus koreanus* sp. nov., *O. ovalatus* sp. nov., *O. canicapillus* sp. nov.을 기재하여 보고한다. 강변애방아벌레속은 국내에서 처음으로 기록된다.