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A New Species and Two New Records of the Limnephilidae (Insecta, Trichoptera) in Korea

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ABSTRACT

A new limnephilid caddisfly, *Nothopsyche bilobata* n. sp., is described. The female adult of *Apatania martima* Ivanov and Levanidova and the larva of *Ecclisomyia kamtshatica* (Martynov) is newly recorded from Korea. Three undetermined species, *Nemotaulius* sp. A, *Nemotaulius* sp. B, and *Nothopsyche* sp. A, are additionally described.

Key words: *Nothopsyche bilobata* n. sp., Limnephilidae, Trichoptera, taxonomy, Korea

INTRODUCTION

The Limnephilidae is one of the largest families in Trichoptera containing more than 1,000 species in the world and occurring mostly in the Holarctic region (Wiggins, 1982). The larvae occupy a wide range of habitats such as rivers, streams, lakes, ponds, marshes, and temporary pools (Wiggins, 1998).

The Korean limnephilid fauna was investigated by Doi (1932), Schmid (1965), Botosaneanu (1970), Olah (1985), Kobayashi (1989), Mey (1989), Kumanski (1991), Malicky (1993), Park and Bae (1998a), and Choe *et al.* (1999). As results of the above studies, the adult stages of 23 species and 11 genera in the family were known from Korea (Park and Bae, 1998b; Choe *et al.*, 1999). Kim (1974) and Yoon and Kim (1988) treated larval limnephilids, but only two species of them, *Hydatophylax nigrovittatus* (McLachlan) and *Nemotaulius admorsus* (McLachlan), were determined.

The purpose of this study is to describe and record the species of Limnephilidae from Korea.

MATERIALS AND METHODS

Adult and larval specimens of the Limnephilidae collected from South Korea and deposited at Seoul Women's University (SWU) were used for this study. Part of the larvae were reared in the laboratory to associate the larval and adult relationships. Reference specimens from Far East Russia and Japan were also examined for comparisons. Descriptions and diagnoses were provided with line-drawings of key characters. The abbreviations used in taxomomic account are as in Park and Bae (1998b).

TAXONOMIC ACCOUNT

Family Limnephilidae Kolenati 우묵날도래과

Genus *Apatania* Ulmer 애우묵날도래속

Apatania martima Ivanov and Levanidova 큰애우묵날도래 (신칭) **(Fig. 1: 1-2)**

Apatania martima Ivanov and Levanidova, 1993, p.15.

Material examined. 1F: GW, Inje, Bangtaecheon, Beombawi, 16 May 1996, Y.J. Bae.

Diagnosis. *Female adult*: Female adults of *A. martima* can be distinguished from other female adults of *Apatania* by partially separated abdominal segment IX and X (Fig. 1: 1) and less broadly developed abdominal segment IX (Kononenko, 1997) (Fig. 1: 2).

Genus *Ecclisomyia* Banks 깃우묵날도래속 (신칭)

Ecclisomyia kamtshatica (Martynov) 캄차카우묵날도래 **(Fig. 1: 3)**

Praecosmoecus kamtshaticus Martynov, 1914 (for full citation and synonymy see Fischer, 1973).

Ecclisomyia kamtshatica: Levanidova *et al.*, 1995: 9; Mey, 1989: 303; Kumanski, 1991: 18; Park and Bae, 1998a: 364 (M, F; JB).

Material examined. 1M with larval exuvium (reared from pupa in lab): GG, Gapyeong, Seungcheonsa, 12 May 1999 (emerged 17 May 1999), S.J. Park; 2M with larval exuviae (reared from pupae in lab): GG, Gapyeong, Seungcheonsa, 12 May 1999 (emerged 19 May 1999), S.J. Park.

Diagnosis. *Larva*: Head is dark and possesses distinct markings. Frontoclypeal apotome and coronal suture are slightly paler. Pronotum and mesonotum are brown and their median areas are light. Posterior margin of pronotum is strongly constricted.

Remarks. Larvae of *E. kamtshatica* from Kamchatka, Russia (collected and determined by R.B. Kuranishi) were examined for a comparison. The above larval diagnosis is based on the examination of the larval exuviae. The head markings of larval exuviae are darker than those of fresh materials from Kamchatka. This may caused by the absence of inner tissue in the larval exuviae (Kuranishi, pers. comm). The larval case is slender, slightly tapered, and bearing somewhat long pieces of plant materials (Kuranishi *et al.*, 1998; Wiggins, 1998). The pupal case is not slender and constructed by coarse rock fragments.

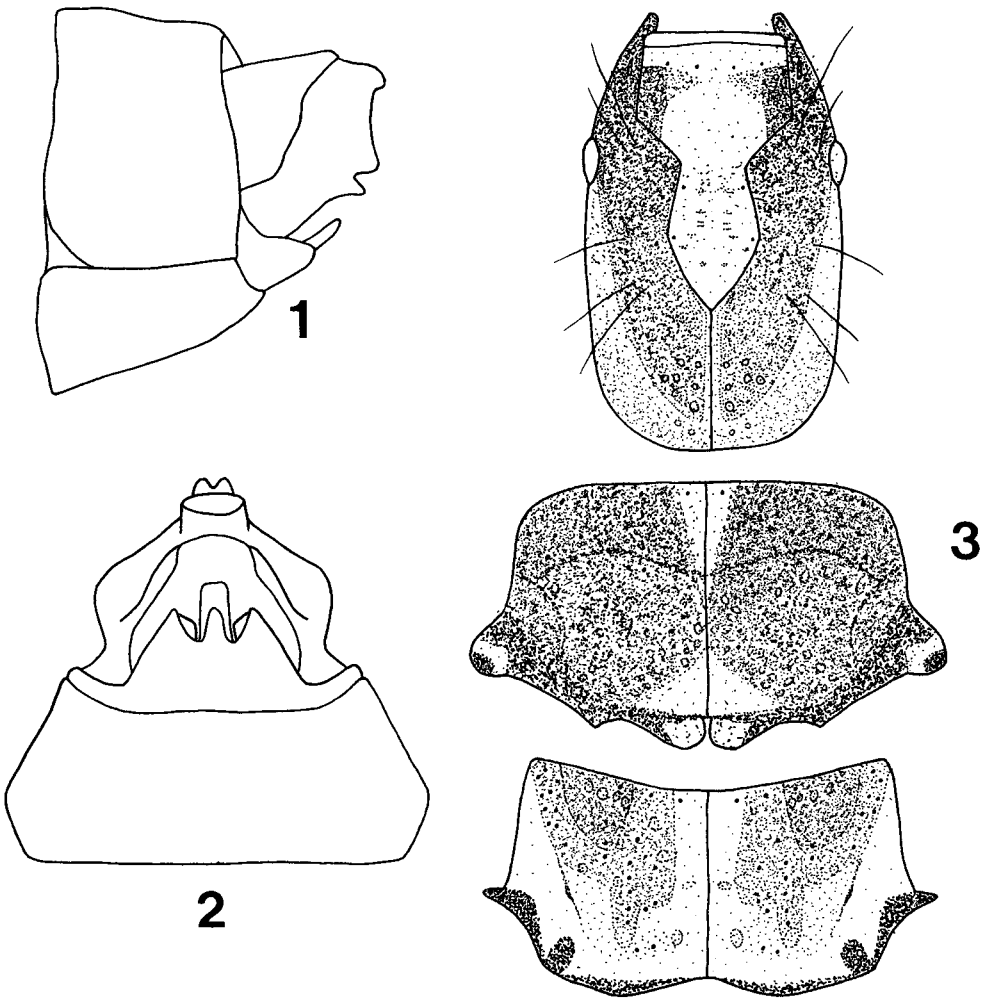

Fig. 1. Female genitalia of *Apatania martima*: 1, lateral; 2, ventral; 3. Larval head and thorax of *Ecclisomyia kamtshatica*.

Genus *Nemotaulius* Banks 띠우묵날도래속(신칭)

***Nemotaulius* sp. A (Fig. 2: 1)**

Material examined. 2L: GG, Yongin, 15 October 1998, T.H. Ro, D.H. Won.

Diagnosis. ***Larva.*** Body of *Nemotaulius* sp. A is yellow. Head possesses a dark U-shaped marking. Pronotum lacks dark band in the anterior part; anterior margin of pronotum is dark. Anal claws possess a accessory hook. Larval case is consist of large leaf pieces in dorsal and ventral series.

***Nemotaulius* sp. B (Fig. 2: 2)**

Material examined. 3L: GN, Jinan-gun, Maryeong-myeon, Deogcheon-ri, Daedonggyo, 17 November 1998, J.Y. Cha; 2L: JB, Jangsu-gun, Jangsu-eub, Noha-ri, Nohagyo, 24 November

1998, J.Y. Cha.

Diagnosis. *Larva.* Body of *Nemotaulius* sp. B is brown. Pronotum possesses a dark band in the anterior part and two pairs of black spots in the middle part; anterior margin of pronotum is dark. Anal claws possess two accessory hooks. Larval case is consist of grains and stalks and attached with larger leaf peaces at the entrance.

Genus *Nothopsyche* Banks 갈색우묵날도래속

***Nothopsyche bilobata* n. sp.** 두잎우묵날도래(신칭) **(Fig. 3: 1-3)**

Material examined. *Holotype*: 1M: GN, Geochang, Yongchugyegog, 24 October 1998, S.J. Park, Y.J. Bae, Y.H. Jin, at light, SWU. *Paratype*: 1M: GW, Inje, Bangtaecheon, Beombawi, 1 October 1995, YJ. Bae, at light, SWU.

Description. *Male adult*: Body length 10.0 mm; forewing length 13.5 mm; hindwing length 11.7 mm. Body light brown. *Head*: Head light brown, with two pairs of anterior setal warts and two pairs of posterior setal warts. Antennae dark brown; scape 4x length of pedicel. Compound eyes black. Ocelli three. Maxillary palpi 3-segmented; segment II and III each 7x length of segment I. Labial palpi 3-segmented. Thorax: *Thorax* yellowish brown. Pronotum with two pairs of setal warts; mesoscutum and mesoscutellum with a pair of confined setal warts. Wings light brown. Legs

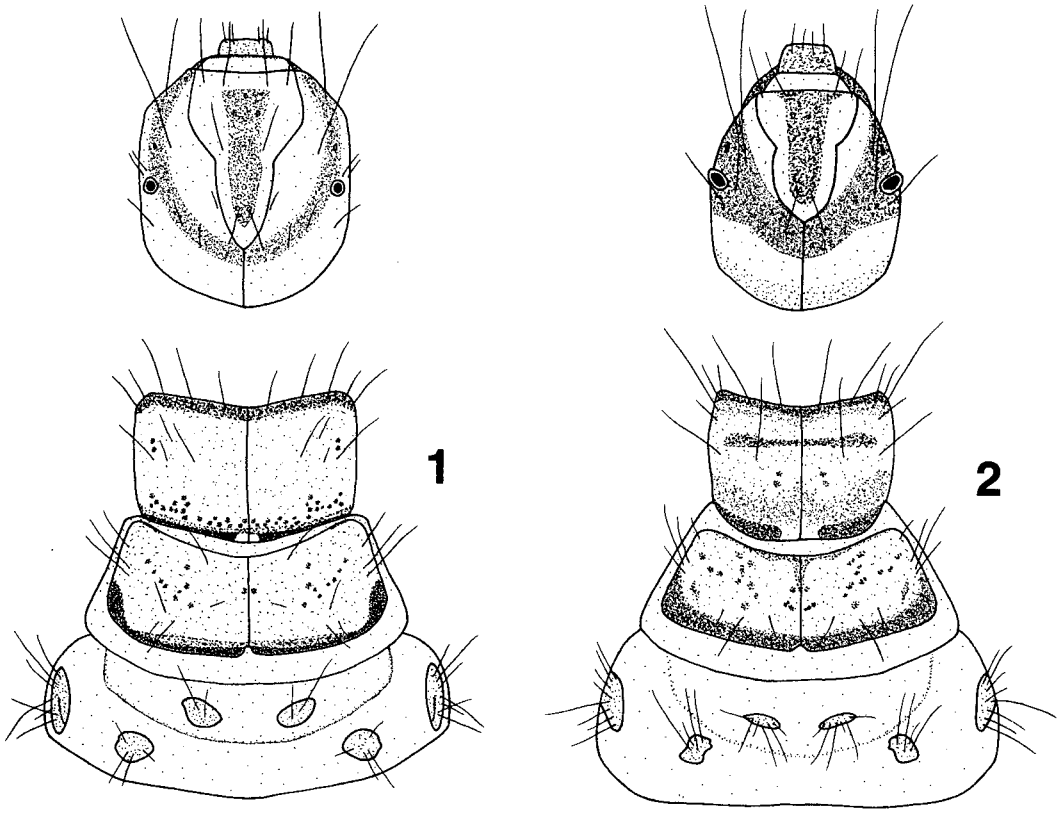

Fig. 2. Larval head and thorax of *Nemotaulius* spp.: 1, *Nemotaulius* sp. A; 2. *Nemotaulius* sp. B.

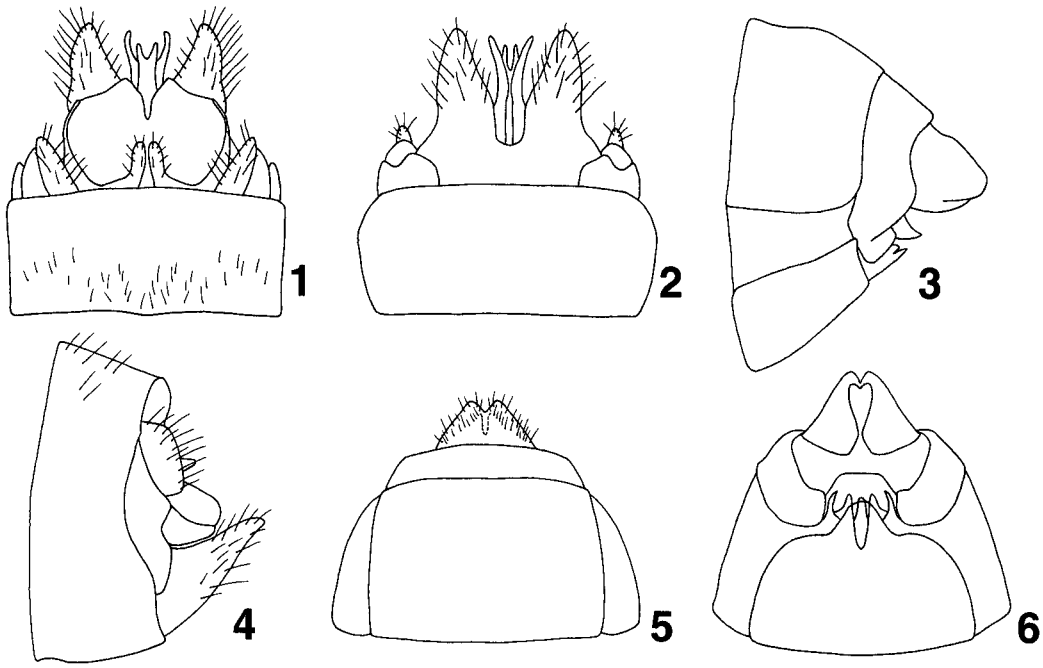

Fig. 3. 1-3, Male genitalia of *Nothopsyche bilobata*, 1, dorsal; 2, lateral; 3, ventral; 4-6, Female genitalia of *Nothopsyche* sp., A, 4, dorsal; 5, lateral; 6, ventral.

yellowish brown, with two apical spurs and rows of black and short spines. *Abdomen.* Abdomen brown. Inferior appendages weakly pointed (Fig. 3: 1-3). Segment X external branches broad and rectangular; internal branches short, blunt, and thick. Parameres slender, weakly acute; aedeagus bifurcated, weakly pointed (Fig. 3: 1, 3).

Diagnosis. *Male adult.* Male adult of *Nothopsyche bilobata* is similar to that of *N. pallipes* Banks (see Nozaki, 1994), but can be distinguished by the blunt internal branches of abdominal segment X (Fig. 3: 1, 2), weakly pointed inferior appendages (Fig. 3: 1-3), and shape of phallus (Fig. 3: 1, 3).

Etymology. The trivial name "bilobata" is a Latin alluding to the two-lobed branches of the abdominal segment X.

***Nothopsyche* sp. A** (Fig. 3: 4-6)

Material examined. 2F: JB, Jangsu, Beonam-myeon, Nodan-ri at Jangsu Hotel, 15 October 1997, S.J. Park, Y.J. Bae, J.H. Hwang, T.H. Ro.

Diagnosis. *Female adult*: Female adult of *Nothopsyche* sp. A can be easily distinguished from that of *N. ulmeri* Schmid (see Nozaki, 1994) by the configurations of setae on setal warts of head and thorax, transparent setal color (those of *N. ulmeri* is black), lamella of the abdominal segment IX (Figs. 3: 10, 11), and marginally located setae on the abdominal segment X (Fig. 3: 9).

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REFERENCES

Botosaneanu, L., 1970. Trichoptéres de la Rèpublique Démocratique - Populaire de la Corée. Annales Zoologici, **27**: 275-359.

Choe, H.J., K. Kumanski and K.S. Woo, 1999. Taxonomic notes on Limnephilidae and Goeridae (Trichoptera: Limnephiloidea) of Korea. Korean J. Syst. Zool., **15**: 27-49.

Doi, H., 1932. Konchuzakki (2). J. Chosen Nat. Hist. Soc., **14**: 64-78 (in Japanese).

Fischer, F.C.J., 1973. Trichopterorum catalogus. Nederlandse Entomologische Vereniging, Amsterdam.

Ivanov, V. and I.M. Levanidova, 1993. A new species of Apatanidae from the Russian Far East. Braueria, **20**: 15-16.

Kim, J.W., 1974. On the larvae of Trichoptera from Korea. Korean J. Limnol., **7**: 1-42 (in Korean).

Kobayashi, M., 1989. A taxonomic study on the Trichoptera of South Korea, with description of four new species (Insecta). Bull. Kanagawa Pref. Mus., **18**: 1-9.

Kononenko, V.S., 1997. Trichoptera and Lepidoptera. *In*: Key to the insects of Russian Far East. Vol. V. Pt 1. pp. 1-206. Dal¢nauka, Vladivostok.

Kumanski, K., 1991. Studies on Trichoptera (Insecta) of Korea V. Superfamily Limnephiloidea, except Lepidostomatidae and Leptoceridae. Insecta Koreana, **8**: 15-29.

Kuranishi, R.B., T. Nozaki and N. Kuhara, 1998. A new record of *Ecclisomyia kamtshatica* (Trichoptera: Limnephilidae) from Japan, with descriptions of immature stages. J. Nat. Hist. Mus. Inst., Chiba, **5**: 47-50.

Levanidova, I.M., T.I. Arefina and I.A. Zasypkina, 1995. A tabular check-list of caddisflies (Insecta: Trichoptera) of the Russian Far East. Far East Entomol., **16**: 1-9.

Malicky, H., 1993. Some caddisflies from Korea. Braueria, **20**: 14.

Mey, W., 1989. Taxonomische und faunistische Notizen zu einigen köcherfliegen (Trichoptera) aus Korea. Acta Entomol. Bohemoslov, **86**: 295-305.

Nozaki, T., 1994. Notes on two *Nothopsyche* species (Trichoptera, Limnephilidae), *N. pallipes* Banks and *N. ulmeri* Schmid, from Japan. Japanese. J. Entomol., **62**: 433-444.

Olah, J., 1985. Three new Trichoptera from Korea. Fol. Entomol. Hung. **66**: 137-142.

Park, S.J. and Y.J. Bae, 1998a. New records of the Limnephiloidea (Insecta: Trichoptera) from Korea. Korean J. Syst. Zool., **14**: 361-370.

Park, S.J. and Y.J. Bae, 1998b. Checklist of the Limnephiloidea (Trichoptera) of Korea. Entomol. Res. Bull. (KEI), Seoul, **24**: 33-42.

Schmid, P.F., 1965. Quelques Trichoptéres Asiatiques II. Entomol. Ts. Arg., **86**. H. 1-2.

Wiggins, G.B., 1982. Order Trichoptera. *In*: Synopsis and classification of living organisms. (Ed., S. P. Parker).

pp. 599-612. McGraw-Hill, New York.

Wiggins, G.B., 1998. Family Limnephilidae. *In*: Larvae of the North American caddisfly genera (Trichoptera) (2nd Ed.). pp. 268-351. Univ. Toronto Press, Toronto.

Yoon, I.B. and K.H. Kim, 1988. VI. Order Trichoptera. *In*: Illustrated encyclopedia of fauna and flora of Korea, Vol. 30, Aquatic insects. pp. 430-551. Ministry of Education of Korea, Seoul (in Korean).

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한국산 우묵날도래과(곤충강, 날도래목)의 1신종 및 2미기록종

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(서울여자대학교 생물학과)

요 약

우묵날도래과의 *Nothopsyche bilobata* n. sp.를 신종으로 기재하였고, *Apatania martima* Ivanov and Levanidova의 암컷 성충과 *Ecclisomyia kamtshatica* (Martynov)의 유충을 한국에서 처음으로 기록하였다. 또한 3종의 미결정종 (*Nemotaulius* sp. A, *Nemotaulius* sp. B, *Nothopsyche* sp. A)을 기록하였다.