

New Records of the Two Species of Parasitoid Wasps (Hymenoptera: Encyrtidae) from South Korea

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한국산 미기록 기생벌 2종(벌목: 깡충좀벌과)에 대한 보고

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ABSTRACT: Two species of Encyrtidae, *Neastymachus japonicus* (Tachikawa, 1970) and *Boucekiella depressa* Hoffer, 1954, are reported for the first time from South Korea. Description, distribution, and illustration are provided.

Key words: Chalcidoidea, Natural enemy, Scale, Unrecorded species

초 록: 깡충좀벌과에 속하는 *Neastymachus japonicus* (Tachikawa, 1970)와 *Boucekiella depressa* Hoffer, 1954 2종을 한국에서 처음으로 보고한다. 본 종의 기술, 분포, 삽화를 수록한다.

검색어: 좀벌상과, 천적, 각지벌레, 미기록종

The family Encyrtidae is one of the largest groups in the world, containing 4,058 species in 460 genera (Simutnik, 2014), and is divided into two subfamilies, Encyrtinae and Tetracninae. Encyrtidae is a diverse group of insect taxa (Lepidoptera, Coleoptera, Neuroptera, Diptera, Homoptera, Hemiptera, and Hymenoptera) parasitize eggs, pupae, and larvae (Myartseva, 1994). Therefore, it is very important in biocontrol (Japoshvili et al., 2016).

The genus *Neastymachus* 1915 is a small group with only 14 species recorded worldwide (Singh and Srinivasa, 2012). Most of the species belonging to *Neastymachus* have been recorded from India (Singh et al., 1991). *Neastymachus* is morphologically characterized by dark brown to black cross-band on the occiput reaching laterally to eyes (Hayat et al., 2014). As this

genus is not yet well known, more research is needed worldwide (Prinsloo, 1996). *Neastymachus japonicus*, found in *Nipponaclerda biwakoensis*, will be important information in the control of scale natural enemies (Cortez Jr et al., 2022). This species was collected from *Phragmites communis* in Gunsan, South Korea. The genus *Boucekiella* Hoffer, 1954 is a very small group with only one species recorded worldwide. *Boucekiella* is characterized by dorsal-ventrally flattened body (Xi et al., 2010). This genus has a worldwide distribution (Eastern Palaearctic, Europe, Neotropical, Palaearctic, Western Palaearctic)(Yu et al., 2016) and is the major parasitic wasp of *Nipponaclerda biwakoensis* (Xi et al., 2010). *Boucekiella depressa* is a gregarious endoparasitoid and uses the entire host body (Kaneko, 2005). This species was collected from *Phragmites communis* in Gunsan, South Korea.

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Materials and Methods

Materials of the Encyrtids were collected from *Phragmites communis*, which were preserved in 90% ethyl alcohol for DNA and in 75% ethyl alcohol for dried specimens. The species studied are deposited in Kunsan National University (KSNU). For observation and photography, LEICA DMC2900 digital camera and LEICA M205 C microscope (Leica Geosystems AG) were used. Images were stacked by using Helicon software (Helicon Soft).

Systematic Accounts

Family Encyrtidae Walker, 1837 **깁충좀벌과**

Subfamily Encyrtinae Walker, 1837

Genus *Neastymachus* Girault, 1915

Neastymachus Girault, 1915 4:1-184.

Nikolskiella Trjapitzin, 1962 41(4):560-570.

Pseudmicroterys Shafee, Alam & Agarwal, 1975 10:3-125.

Neastymachus japonicus (Tachikawa, 1970) 붉은가슴깁충좀벌(신칭) (Fig. 1A-F)

Neastymachus japonicus (Tachikawa, 1970) 10(3/4):100-106.

Redescription

Morphology. Length of body 1.35-1.42 mm, length of forewing 0.79-0.82 mm. (Fig. 1A). Head with ocellus distinct; ocellular line short, length of ocellular line 0.14 times length of eye; brow smooth; face and clypeus smooth; occipital carina absent (Fig. 1D). Antenna with scape 3.8x as long as broad; funicular 6-segmented and claval three-segmented; F2-F3 each longer than broad (Fig. 1B). Mesosoma gloss; green; mesosoma smooth with setae, length of mesosoma 0.66 times length of forewing; tegula well developed shape triangle; scutellum red and shape shield; notaulus absent; propodeal areola absent (Fig. 1E). Wing covered with setae; stigma narrowly; 1M weakly present; length of forewing 8.10 times pterostigma;

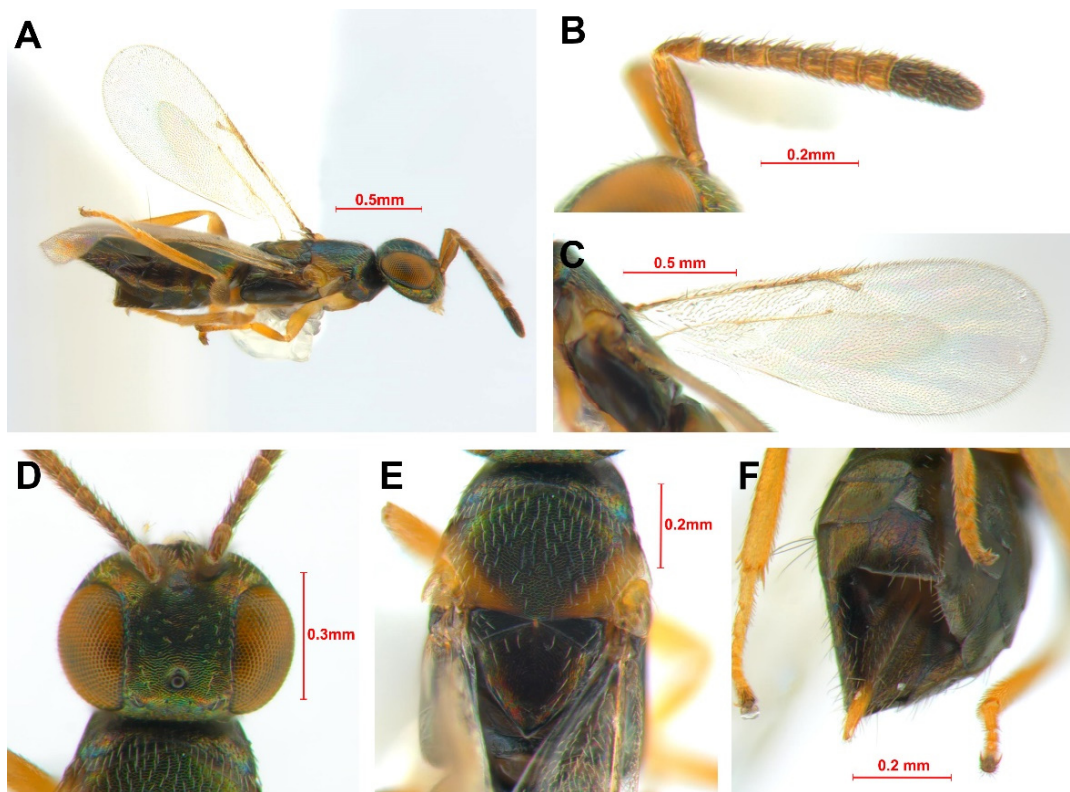


Fig. 1. Habitus of *Neastymachus japonicus* (Tachikawa, 1970): A, whole body in lateral view; B, antenna; C, forewing; D, head; E, mesosoma in dorsal view; F, ovipositor.

marginal vein distinct; stimal vein longer than postmarginal vein (Fig. 1C). Hind leg; brownish; length of hind leg femur 3.05 times length of hind leg coxa. Metasoma Green; metasomal 1.05 times length of mesosoma. Glossy; Ovipositor yellow; short (Fig. 1F).

Distribution. South Korea (new), Japan.

Biology. This species is parasitic to *Nipponaclerda bivakoensis* of Hemiptera (Cortez Jr et al., 2022).

Specimens examined. South Korea, 20 ♀ (KSNU): Bokgyo-ri, Daeya-myeon, Gunsan, Jeonbuk, 13. IX. 2022, Hyojoong Kim.

Family Encyrtidae Walker, 1837 꺾충좀벌과

Subfamily Encyrtinae Walker, 1837

Genus *Boucekiella* Hoffer, 1954

Boucekiella Hoffer, 1954 9(6):169-173.

Urotyndarichus Ferrière, 1955 60:8-15.

Boucekiella depressa Hoffer, 1954 얼룩날개남작좀벌 (신칭) (Fig. 2A–F)

Boucekiella depressa Hoffer, 1954 9(6):169-173.

Urotyndarichus antoninae Ferrière, 1955 60:8-15.

Redescription

Morphology. Length of body 1.65-1.8 mm, length of forewing 1.05-1.10 mm, body distinctly dorsoventrally flattened (Fig. 2A). Head yellowish green; brow carina nearly absent; length of ocello-ocular line 0.35 times length of eye; scapal basin concave; mandible yellow with three teeth (Fig. 2D). Antenna with scape more than 2.2x as long as broad; pedicel slightly longer than F1-F3 combined; funicle segments all shorter than broad and 6-segmented clave 1.83x as long as broad; covered with whitish setae (Fig. 2B). Mesosoma yellowish green; length of mesosoma 0.57 times length of forewing; mesonotum and scutellum median convex with glossy;

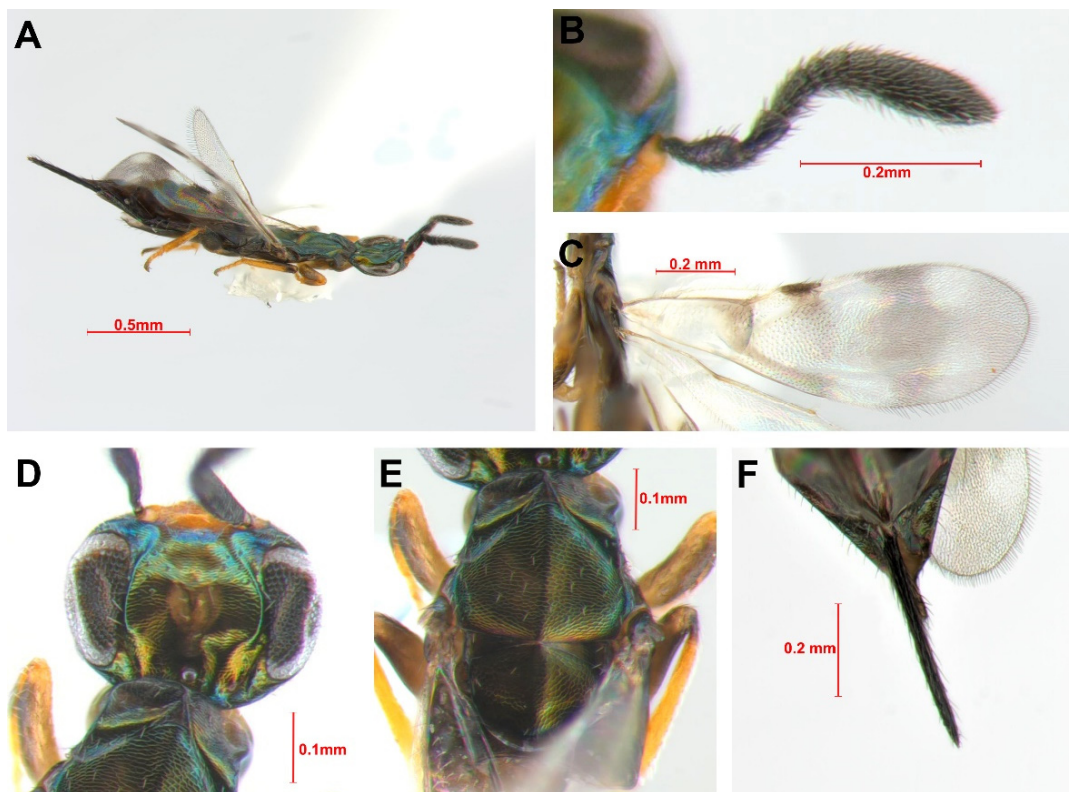


Fig. 2. Habitus of *Boucekiella depressa* Hoffer, 1954: A, whole body in lateral view; B, antenna; C, forewing; D, head; E, mesosoma in dorsal view; F, ovipositor.

tegula nearly absent (Fig. 2E). Wing darkish pattern; overall covered with setae; vein ME indistinct (Fig. 2C). Hind leg yellowish; femur darkish; length of hind leg femur 1.75 times length of hind leg coxa. Metasoma yellowish green; petiole absent; length of metasoma 0.75 times length of forewing; ovipositor darkish; hard with setae (Fig. 2F).

Distribution. South Korea (new), Afghanistan, Armenia, Azerbaijan, Bulgaria, Czech Republic, Czechoslovakia, France, Georgia, Hungary, Japan, Mexico, Moldova, Slovakia, Ukraine, Uzbekistan, Yugoslavia (former)

Biology. This species is parasitic to *Nipponaclerda biwakoensis* of Hemiptera and hyperparasitoid (Cortez Jr et al., 2022)

Specimens examined. South Korea, 20 ♀ (KSNU): Bokgyo-ri, Daeya-myeon, Gunsan, Jeonbuk, 13 .IX. 2022, Hyojoong Kim.

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Statements for Authorship Position & Contribution

Yu, Y.: Kunsan National University, Student in Ph.D;
Designed the research, wrote the manuscript and conducted the experiments.

Kim, H.: Kunsan National University, Professor, Ph.D;
Examined specimens and designed the research

All authors read and approved the manuscript.

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