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Review Article

Checklist of South Korean Metopiinae Förster, 1869 (Hymenoptera, Ichneumonidae) with new South Korean species and a note on *Seticornuta koreana*

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ABSTRACT

The subfamily Metopiinae (Hymenoptera: Ichneumonidae) was represented in South Korea as 96 species belonging to 13 genera. In this study, six additional species belonging to the genus *Triclistus* are recorded for the first time from South Korea. A checklist of South Korean Metopiinae and a note on *Seticornuta koreana* are provided.

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Introduction

The subfamily Metopiinae is one of the large subfamilies within the family Ichneumonidae, consisting of approximately 900 species within 26 genera.

The South Korean species of Metopiinae have been studied in recent years mainly by Korean taxonomists (Choi et al 2015a, 2015b, 2016a, 2016b, 2016c; Kang et al 2016). Based on an ongoing taxonomic study on South Korean Metopiinae, we report here six unrecorded species of *Triclistus* for the first time from South Korea.

Triclistus Förster, 1869 is a cosmopolitan genus comprising 82 described species, and is mainly known from the Palearctic, Oriental, and Nearctic regions (Yu et al 2012). In the Eastern Palearctic region, 26 species are known with just five species occurring in South Korea (Lee and Cha 2000). This genus attacks the larvae of microlepidopteran species such as Tortricidae (Gauld et al 2002).

In this paper, we provide the first records of six species of *Triclistus* for the South Korean Metopiinae fauna and a note that is species valid on *Seticornuta koreana*.

Materials and methods

Materials used in this study were collected by sweeping and Malaise trapping, after which they were deposited in the animal systematic laboratory of Yeungnam University (YNU; Gyeongsan, South Korea). Morphological terminology follows mostly that of Gauld et al (2002). Specimens were examined using an AxioCam MRc5 camera attached to a stereo microscope (Zeiss SterEO Discovery, V20; Carl Zeiss, Göttingen, Germany), processed using AxioVision SE64 software (Carl Zeiss), and optimized with a Delta imaging system (i-solution; IMT i-Solution Inc., Vancouver, BC, Canada). Distributional data mainly follow that of Yu et al (2012). Diagnoses of newly recorded species are based on South Korean specimens.

Abbreviations used in this paper are as follows: CB, Chungcheongbuk-do; CN, Chungcheongnam-do; GB, Gyeongsangbuk-do; GN, Gyeongsangnam-do; GG, Gyeonggi-do; GW, Gangwon-do; JB, Jeollabuk-do; JN, Jeollanam-do; JJ, Jeju-do.

AEI: American Entomological Institute, Gainesville, FL, USA
ANSP: Academy of Natural Sciences of Philadelphia, USA
BBM: Bernice P. Bishop Museum, Department of Entomology, Honolulu, Hawaii, USA
DEI: Deutsches Entomologisches Institut, Germany

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ETH: Entomologisches Institut, Eidgenössische Technische Hochschule
 HOPE: Entomological Collection, University Museum, Oxford, England, United Kingdom
 HU: Hokkaido University, Faculty of Agriculture, Entomological Institute, Sapporo, Japan
 IZB: Institut za zastitu bilja, Fakultete poljoprivrednih znanosti, Croatia
 IZU: Instytut Zoologiczny Uniwersytetu, Sienkiewicza, Wrocław, Poland
 KU: Kyushu University, Entomological Laboratory, Fukuoka, Kyushu, Japan
 MACN: Museo Argentino de Ciencias Naturales, Avenida Angel Gallardo, Argentina
 MHN: Muséum d'Histoire Naturelle, Route de Malagnou, Genève, Switzerland
 MNHN: Muséum National d'Histoire Naturelle, Entomologie, Paris, France
 MOMOI: Kobe University, Faculty of Agriculture, Entomological Laboratory, Kobe, Japan
 MZ: Musée Zoologique, Place Riponne, Lausanne, Switzerland
 NCM: Norwich Castle Museum, Norwich, United Kingdom
 NHM: The Natural History Museum, Department of Entomology, London, England, United Kingdom
 NM: Naturhistorisches Museum, Burgring, Wien, Austria
 NMI: National Museum of Ireland, Kildare Street, Dublin, Ireland
 NNM: Nationaal Natuurhistorisch Museum, the Netherlands
 NR: Naturhistoriska Riksmuseet, Sektionen för Entomologi, Stockholm, Sweden
 SIZ: Schmalhausen Institute of Zoology, Bogdan Khmelitsky Street, Ukraine
 TMA: Termesztudományi Múzeum Allattara, Barossa-Utea, Budapest, Hungary
 USNM: U.S. National Museum of Natural History, Smithsonian Institute, Washington, DC, USA
 ZI: Zoologiska Institutionen, Sweden
 ZIN: Zoological Institute, Academy of Sciences, St. Petersburg, Russia
 ZMHU: Zoologisches Museum, Humboldt Universität, Invalidenstrasse, Berlin, Germany

Taxonomy

Family Ichneumonidae Latreille, 1802

Subfamily Metopiinae Förster, 1869

Diagnosis. Members of this subfamily have the following morphological characters: size of species from small to large (forewing 2.2–16 mm). Clypeus not separated from face by groove; face evenly convex except in *Metopius* (*Metopius* has a flat or concave shield shaped). Sternaulus of mesopleuron absent or short. First tergite with glymma and with spiracle before middle of tergite. Ovipositor short, usually not extending beyond metasomal apex.

Checklist of South Korean Metopiinae

Genus *Acerataspis* Uchida, 1934

Acerataspis Uchida, 1934a: 23. Type species: *Cerataspis clavata* Uchida.

1. *Acerataspis clavata* (Uchida, 1934) 곤봉뿔목매시벌

Cerataspis clavata Uchida, 1934b: 275–277. Type: male; type depository: KU.

Material examined. South Korea: 1♂, GW, Wonju-si, Heungeup-myeon, Yeonse Univ., 29 vi–15 vii 2011 (JW Lee); 15♂♂, GG, Suwon-

si, Jangan-gu, Sanggwanggyo-dong, Mt. Gwanggyosan, 15–25 vii 2008 (JO Lim); 1♂, GB, Cheongdo-gun, Unmun-myeon, Mt. Unmunsan, 3–20 vii 2009 (JW Lee); 1♀, GB, Gyeonsan-si, Yeungnam Univ., 20 v 1990 (JS Lee); 1♀, GB, Gyeonsan-si, Yeungnam Univ., 9 vi 1987 (JY Cha); 1♂, GN, Jinju-si, Ibanseong-myeon, Daechon-ri, Gyeongsangnamdo Arb., 15 vii–1 viii 2011 (JW Lee).

Distribution. South Korea, China, Russia.

Genus *Chorinaeus* Holmgren, 1858

Chorinaeus Holmgren, 1858: 305–394. Type species: *Exochus funebris* Holmgren.

Polyrhaddus Walsh, 1873: 65–166. Type species: *Polyrhaddus cariniger* Walsh.

2. *Chorinaeus eniwanus* Kusigemati, 1967 빛뿔목매시벌

Chorinaeus eniwanus Kusigemati, 1967a: 17–27. Type: female; type depository: HU.

Material examined. South Korea: 1♀, GW, Donghae-si, Samhwa-dong, Mureunggyegok, 37°27'45"N 126°01'17"E, 31 v–15 vi 2005 (JW Lee).

Distribution. South Korea, Japan, Russia.

3. *Chorinaeus flavipes* Bridgman, 1881 연노랑다리뿔목매시벌

Chorinaeus flavipes Bridgman, 1881: 143–168. Type: female; type depository: NCM.

Material examined. South Korea: 1♀, CB, Danyang-gun, Cheongdong-ri, Sobaeksan National Park, 31 vii 1988 (HG Kim).

Distribution. South Korea, Czech Republic, Finland, France, Germany, Ireland, Japan, Latvia, Lithuania, Moldova, Norway, Poland, Russia, Tuvinskaya Respublika, Sweden, Turkey, Ukraine, United Kingdom.

4. *Chorinaeus mandibulatus* Choi and Lee, 2016 큰턱뿔목매시벌

Chorinaeus mandibulatus Choi and Lee, in Choi et al (2016, in press). Type: female; type depository: YNU.

Material examined. South Korea: Incheon-si, Seo-gu, Gajwa-dong, 1990; 1♀, CB, Jincheon-gun, 11 viii 1991 (JW Lee); 1♀, CN, Onyang-si, 19 vi 1983 (JW Lee); 1♀, GN, Jinju-si, Gajwa-dong, 24–30 vi 1989; 1♀, JB, Jeongeup-si, Naejang-dong, Naejangsan National Park Geumseonggyegok, 16–27 vii 2008 (JW Lee); 1♀, Seoul-si, Songpa-gu, Oryun-dong, 1 x 1992 (YH Kim)

Distribution. South Korea.

5. *Chorinaeus parvus* Kusigemati, 1967 꼬마뿔목매시벌

Chorinaeus parvus Kusigemati, 1967a: 17–27. Type: female; Type depository: HU.

Material examined. South Korea: 1♀, GG, Gwangju-si, Docheong-myeon, Taehwasan, 26 vi–7 vii 2007 (JO Lim); 2♀♀, Anyang-si, Manan-gu, Gwanaksan, 5–19 vii 2007 (JO Lim); 1♀, Anyang-si, M.T. 3, 26 vi–4 vii 2007 (JO Lim); 1♀, GW, Donghae-si, Samhwa-dong, Mureung valley, 31 v–15 vi 2005 (JW Lee); 1♀, Inje-gun, Girin-myeon, Jindong-ri, Jeombongsan, 26 vi–28 vii 2012 (JY Park); 1♂, Hongcheon-gun, Bukbang-myeon, Gwangwon Prov. Environment Research Park, 15–30 v 2012 (SJ Jang); 1♀, JB, Namwon-si, Sannae-myeon, Jeonnyeongchi, 2 ix–15 x 2001 (JW Lee).

Distribution. South Korea, Japan.

6. *Chorinaeus pectinatus* Kusigemati, 1967 빛살뿔목매시벌

Chorinaeus pectinatus Kusigemati, 1967a: 17–27. Type: female; type depository: HU.

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