

Six Species of the Tribe Ichneumonini (Hymenoptera: Ichneumonidae) New to Korea

Jong-Chul Jeong¹, Jin-Yeol Cha², Jin-Kyung Choi³ and Jong-Wook Lee^{3,*}

¹National Park Research Institute, Korea National Park Service, Namwon, Korea

²Park Resource Conservation Team, Korea National Park Service, Seoul, Korea

³Department of Biology, Yeungnam University, Gyeongsan 712-749, Korea

ABSTRACT

Six Ichneumonini species, *Barichneumon constrictus* (Uchida, 1956), *Ctenichneumon albomaculatus* (Uchida, 1956), *Diphyus salicatorius* (Gravenhorst, 1820), *Ichneumon ohtaniensis* Uchida, 1926, *Ichneumon kuroi-shiensis* (Uchida, 1929) and *Stenichneumon odaiensis* Uchida, 1932, are reported for the first time in Korea. Photographs and redescrptions are provided.

Key words: *Barichneumon*, *Ctenichneumon*, *Diphyus*, *Ichneumon*, *Stenichneumon*, newly recorded species

INTRODUCTION

The Ichneumonini latreille, 1802 (=Joppini of Townes et al. (1961, 1965)) is the largest tribe of subfamily Ichneumoninae, and contains 2,710 species in 214 genera worldwide (Yu et al., 2005). The species of the tribe Ichneumonini are all internal parasitoids of Lepidoptera, Coleoptera, and Hymenoptera.

This tribe is similar to the tribe Heresiarchini and the tribe Trogini, but distinguished by forms of propodeum: The Ichneumonini have distinct dorsoposterior faces in propodeum, the Heresiarchini (=Protichneumonini of Heinrich) have the abbreviated and evenly convex propodeum, and the Trogini (=Callajoppini of Heinrich) have the steeply sloping propodeum (Heinrich, 1934).

The taxonomic study of the Korean Ichneumonini was initiated by Uchida (1926) who reported eight Korean species. Thereafter, two authors, Uchida (1929, 1930, 1935, 1939, 1955) and Townes et al. (1965) added 47 species of Korean Ichneumonini. Kim (1955) and Kusigemati (1988) newly included three species in Korean fauna. Most recently, Yu et al. (2005) listed 61 species of the tribe Ichneumonini from Korea, and Jeong and his coworker (2007, 2008a, b) added seven species. Therefore, we confirmed 65 Korean species under 28 genera.

In this study, we report six species of the tribe Ichneumonini new to Korea. We also provide photographs and redescrptions.

MATERIALS AND METHODS

Morphological terminology used in this study follows modified Townes's system (1969), except as followings: The subalar prominence is used instead of subtegular ridge, the epicnemial carina instead of prepectal carina, prepectus for epicnemium, gena for the temple, hypopygium for female subgenital plate, malar space for cheek (Gauld, 1984), pronotal flange for collar, supra-antennal area for frons, and supra-clypeal area for face (Sime and Wahl, 2002). Also, the terminology for wing vein follows the system of Comstock and Needham (Eady, 1974).

Specimens were examined with the stereo microscope (Zeiss Stemi SV 11 Apo) and key characteristics are taken in photographs produced with Zeiss AxioCam MRc5 digital camera system.

Materials used in this work have been collected by malaise trap (MT) and sweeping, and deposited in Animal systematics laboratory of the Yeungnam University (YNUE, Gyeongsan, Korea). All the voucher specimens used in this study were loaned from the Systematic Entomology Laboratory, Hokkaido University, Japan.

Abbreviations for museums and institutions this paper as follows: BFIC, Muséum National d'Histoire Naturelle Brunoy, France; BMNH, The Natural History Museum, Department of Entomology, Cromwell Road, London, England; IRSNB, Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium; ISZP, Institute of Systematic Zoology, Polish Academy of Sciences, Krakow, Poland; SEHU, Entomological Institute, Faculty of Agriculture, Hokkaido University, Sapporo, Japan; YNUE, Animal Systematics Laboratory, Department of Biology, Yeungnam University, Gyeongsan, Korea.

*To whom correspondence should be addressed

Tel: 82-53-810-2376, Fax: 82-53-811-2376

E-mail: jwlee1@yumail.ac.kr

TAXONOMIC ACCOUNTS

Family Ichneumonidae Latreille, 1802
Subfamily Ichneumoninae Latreille, 1802
Tribe Ichneumonini Latreille, 1802

Genus *Barichneumon* Thomson, 1893

Barichneumon Thomson, 1893: 1959. Type Species: *Ichneumon anator* Fabricius, 1793.

¹**Barichneumon constrictus* (Uchida, 1956) (Fig. 1)

Melanichneumon (*Melanichneumon*) *constrictus* Uchida, 1956: 64. Type: female; Type Locality: Sasayama, Japan; Type Depository: SEHU.

Melanichneumon constrictus: Iwata, 1958: 70; 1960: 136.

Barichneumon constrictus: Townes, Momoi & Townes, 1965: 435; Yu and Horstmann, 1997: 543.

Material examined. [YNUE] KOREA: Gyonggi-do, Gapyeong-gun, Hwaaksan, 05 Sep. 1998 (Y.T. Quan), 1 ♀; Gyeongsangbuk-do, Pohang-si, Cheongha, Yugye, 12 Jun. 2004 (M.G. Baek), 1 ♀; Gyeongju-si, Sannaemyeon, Danseoksan, Sinseon temple in Gyeongju National Park, 28 Aug. 2008 (J.C. Jeong), 1 ♀; [SEHU] JAPAN: Sasayama, 05 Sep. 1954 (K. Iwata), 1 ♀ (Holotype of *Melanichneumon* (*Melanichneumon*) *constrictus* Uchida, 1956).

Remarks. This species is distinguished from the other species of this genus by yellow lateral area of scutellum and apicolateral marks of tergites 1-2.

Redescription. *Female*. Body length 11 mm. Forewing length 7 mm.

Color. Body ground plan color black. Flagella with a median white band. Following characters light yellow: inner margin of eye, maxillary and labial palp, labrum, pronotal flange, dorsal margin of pronotum, subalar prominence, lateral area of scutellum, postscutellum, apicolateral marks of tergites 1-2, apicomedian marks of tergites 6-7 and median area of sternites 2-4. Fore and mid legs dark brown except ventral area of fore and mid femora; fore tibiae and tarsus light brown.

Flagella. Flagella with 41 segments, lanceolate; third flagellomere about 2.5X as long as wide, central flagellomeres quadrate.

Head (Fig. 1C). Vertex with posterior section steeply declivous behind ocelli, as long as ocellar area. Genae convex, evenly receding behind eye in dorsal view, 0.5X as wide as eye in lateral view. Juncture of hypostomal and occipital carina separated from mandibular base by about 0.2X basal

mandibular width. Occipital carina more or less complete, and dorsal and ventral regions with same height; occipital notch absent. Distance between median and lateral ocellus 0.6X as long as diameter of median ocellus, area between lateral ocellus and eye sparsely punctated. Ocellar area weakly convex, supra-antennal area simple. Distance between eye and antennal socket narrower than distance between antennal sockets. Eye large, inner margin weakly concave opposite antennal socket, surface glabrous. Supra-clypeal area weakly convex, with a weak median swelling. Clypeus flat, entire, transverse, uniformly thick, about 2.5X as wide as long, with evenly distributed punctures. Apical margin of clypeus simple, without a median apical tubercle, apicolateral margin forming an angle of approximately 40°. Malar space with subocular sulcus, 0.6X as long as basal mandibular width. Mandible slender and very strongly tapered so apex is needle-like; dorsal tooth conspicuously longer and broader than ventral tooth; axis of mandible twisted about 90°, so the ventral tooth is not visible when mandibles closed. Maxillary palp with five segments, and labial palp with four segments.

Mesosoma. Pronotum in profile moderately long, 0.8X as long as high; pronotal flange low; epomia complete, forming a weak ridge shaped. Mesoscutum coarsely and closely punctate, centrally glabrous; notauli distinct. Scutellum moderately convex; lateral longitudinal carinae more or less complete to center. Mesopleura simple; epicnemial carinae complete, turned anteriorly to touch anterior mesopleural margin; mesopleural sulcus more or less straight. Postscutellum evenly convex, axillary trough of metanotum with low or reduced longitudinal ridge. Propodeum elongated, without apophyses; propodeal spiracles elongate elliptical, more than 4.0X as long as wide (Fig. 1E). Areola wider apically than basally, well-defined by carinae (Fig. 1D). All propodeal carinae complete. First lateral area of propodeum with uniformly distributed punctures. Metapleura with confluent punctures, rugae absent; pleural and juxtacoxal carinae complete.

Legs. Fore femora with weak longitudinal concavity; fore tibiae simple; fore tarsomere 2 elongate and slender, 3.5X as long as broad; fore tarsomere 3 elongate and slender, 2.5X as long as broad; fore tarsomere 4 short, subquadrate to transverse, 1.2X as long as broad; fore tarsomere 5 slender, of similar thickness to other tarsomeres. Hind coxae elongate and slender, 1.5X as long as high, without scopa; hind tibial spurs long and slender, normal dimensions, pointed apically; apex of tarsal claw simply pointed.

Wing. 2 m-cu of fore wing with two bullae separated by an abscissa of the vein that is longer than either bulla; Cell

¹*네점무늬맵시벌

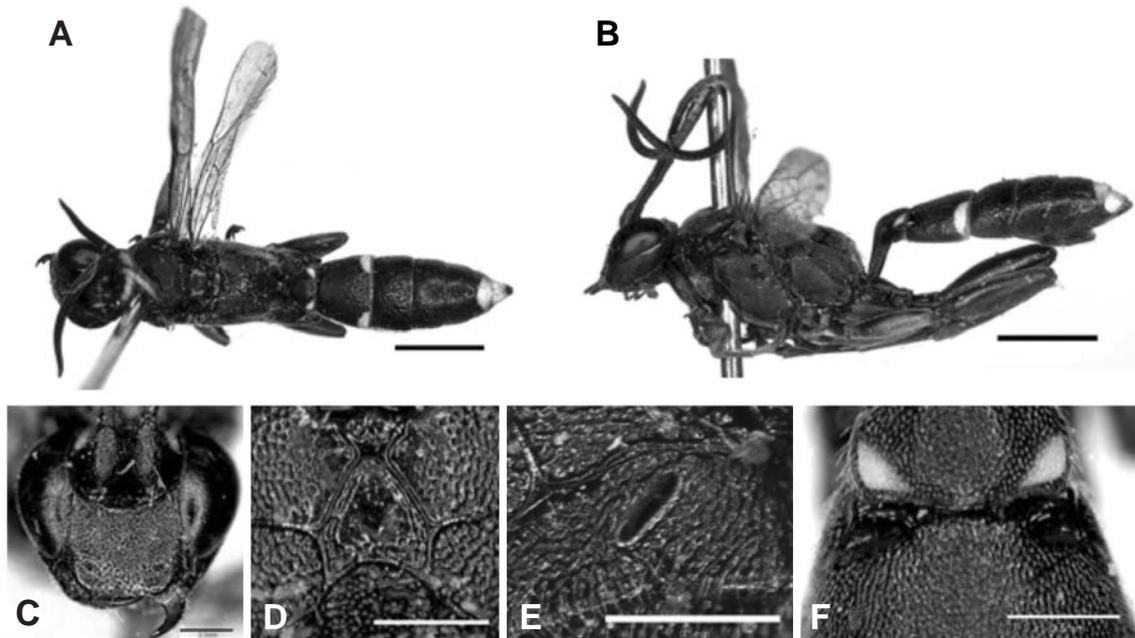


Fig. 1. *Barichneumon constrictus* (Uchida, 1956). A, Body in dorsal view; B, Body in lateral view; C, Head in frontal view; D, Areola; E, Spiracle of propodeum; F, Gastrocoeli. Scale bars=2.0mm (A, B), 0.5 mm (C-F).

1+2Rs (areolet) anteriorly truncate, vein 2Rs as long as vein 3r-m, vein 2m-cu interception at midpoint of posterior margin. Hind wing with M+Cu only curved proximally, distal abscissa of Cu tubular, vein 2-CU 3.5X as long as vein CU-a.

Metasoma. Postpetiole without distinct median field, with fine and dense punctures, no trace of rugae. Gastrocoeli 0.7X as broad as distance between them, and with distinctly impressed thyridium (Fig. 1F). Second tergite as long as width of its apex, third tergite nearly 0.6X as long as width of its apex. Tergites 2-4 without longitudinal rugae, with coarsely punctate. Sternites 2-5 divided. Hypopygium short, exposing most of ovipositor (oxypygous). Ovipositor sheath centrally with short hairs, the longest hairs being shorter than the breadth of the ovipositor sheath.

Male. Unknown.

Distribution. Korea, Japan.

Genus *Ctenichneumon* Thomson, 1894

Ctenichneumon Thomson, 1894: 2082. Type Species: *Ichneumon funereus* Geoffroy, 1785.

¹**Ctenichneumon albomaculatus* (Uchida, 1956)

(Fig. 2)

Naenaria (*Neonaenaria*) *albomaculata* Uchida, 1956: 59.

Type: female; Type Locality: Hyogo, Japan; Type Depo-

sitory: SEHU.

Naenaria (*Neonaenaria*) *albomaculata*: Iwata, 1958: 71.

Naenaria albomaculata: Iwata, 1960: 140.

Ctenichneumon albomaculatus: Townes, Momi and Townes, 1965: 505; Yu and Horstmann, 1997: 561.

Material examined. [YNUE] KOREA: Chungcheongbuk-do, Weolaksan, 21-23 Jul. 2000 (S. Cho & H.Y. Kim) 1♂; Gyeongsangnam-do, Miryang-si, Cheonhwangsan, Sajapyeong, 25 Jun. 1997 (J.W. Lee), 1♂; GN, Jirisan, Baemsagol, 11 Jun.-08 Jul. 2001 (J.W. Lee), 1♂; Jeollanam-do, Jangseong-gun, Bukha-myeon, Sajabong, 21 Jun. 2005 (J.W. Lee), 1♂; 20 Jul. 2005 (J.W. Lee), 1♂; Jeongeup-si, Naejangsan, Geumseong, 21 Jul. 2005 (J.W. Lee), 2♂♂; Jirisan, Jangdangol, Bakkatjangdang, 12 Jun.-11 Jul. 2001 (J.W. Lee), 1♂; Gurye-gun, Sandong-myeon, Jwasa-ri, Banyabong, 13 Jul. 2002 (T.H. An), 1♀; [SEHU] JAPAN: Honshu, Tamba, Sasayama, 14 Jun. 1955 (K. Iwata), 1♀ (Holotype of *Naenaria* (*Neonaenaria*) *albomaculata* Uchida, 1956).

Diagnosis. This species is distinguished from the other species of this genus by long and slender body, metallic blue body color, many marks and long gastrocoeli.

Redescription. Female. Body length 22 mm. Forewing length 13 mm.

Color. Body ground plan color metallic blue. Flagella

¹*육점배무늬납색맵시벌

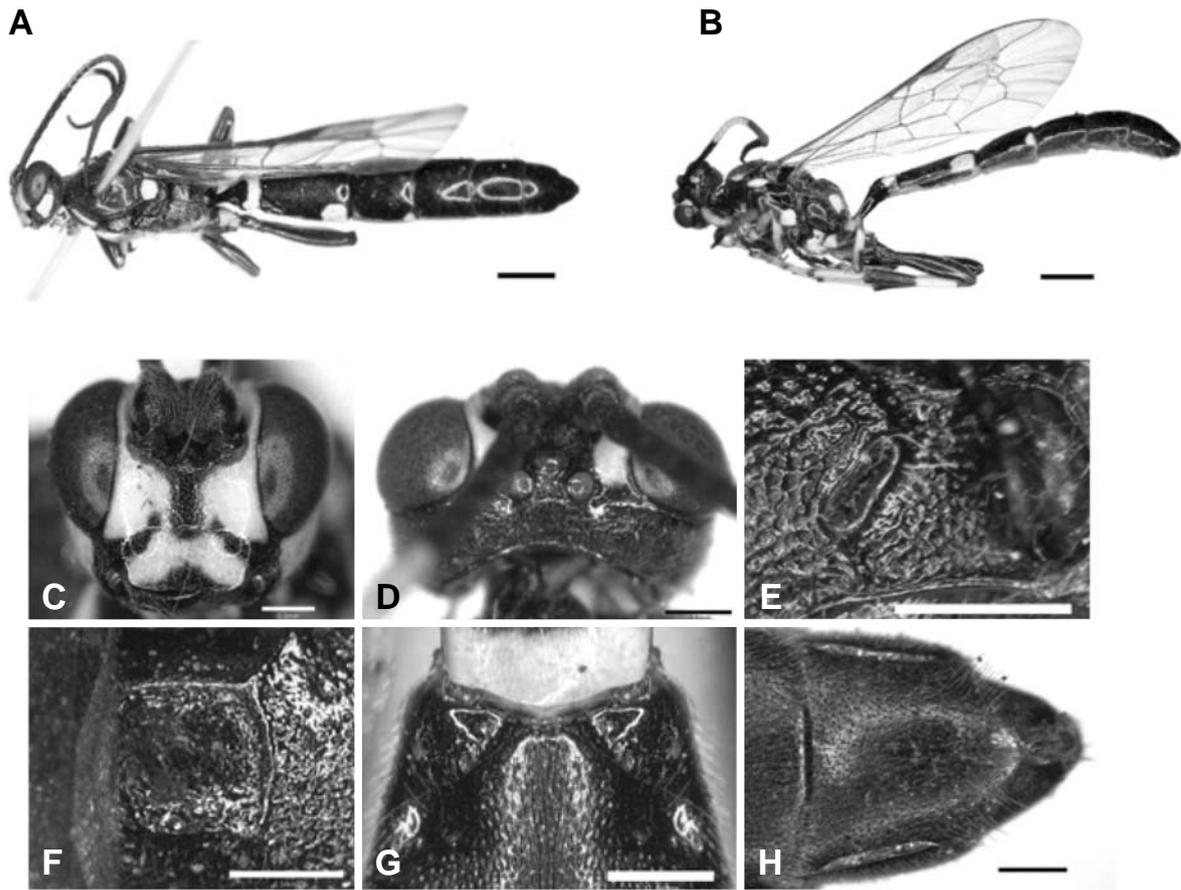


Fig. 2. *Ctenichneumon albomaculatus* (Uchida, 1956). A, Body in dorsal view; B, Body in lateral view; C, D, Head : C, in frontal view; D, in dorsal view; E, Spiracle of propodeum; F, Areola; G, Gastrocoeli; H, Hypopygium. Scale bars=2.0 mm (A, B), 0.5 mm (C-H).

black, with a median white band. Following characters yellow: supra-antennal orbit, supra-clypeal area and lateral parts of clypeus, ventral area of genae, maxillary and labial palp, pronotal flange, dorsal margin of pronotum, subalar prominence, scutellum, apicoventral marks of mesopleura, apicolateral marks of propodeum, fore coxae, trochanters, ventral surface of femora and tibiae, subbasal band of tibiae, tarsus, dorsal marks of hind coxae, basal area of tibiae, tarsus except black apex, apical margin of postpetiol, apicolateral marks of tergites 2-3 and apical margin of sternites 3-6. Median part of clypeus metallic blue. Apex of mandible and stigma dark brown. Wing light brown.

Flagella. Flagella with 44 segments, lanceolate; third flagellomere about 2.5X as long as wide; central flagellomeres transverse, wider than its length.

Head (Fig. 2C, D). Vertex with posterior section steeply declivous behind ocelli, as long as ocellar area. Genae convex, evenly receding behind eye in dorsal view, 0.8X as wide as eye in lateral view. Juncture of hypostomal and occipital

carinae separated from mandibular base by 0.8X basal mandibular width. Occipital carina complete, dorsal and ventral regions with same height. Distance between median and lateral ocellus 0.5X as long as diameter of median ocellus, area between lateral ocellus and eye sparsely punctate. Ocellar area weakly convex, supra-antennal area medially simple. Distance between eye and antennal socket narrower than distance between antennal sockets. Eye moderately large; inner margin weakly concave opposite antennal socket; surface glabrous. Supra-clypeal area simply convex, with a weak median swelling. Clypeus flat, entire, simply transverse, uniformly thick, about 2.0X as wide as long, with evenly distributed punctures; apical margin simple, without a median apical tubercle, apicolateral margin forming an angle of approximately 90°. Malar space with subocular sulcus, moderately long, 0.8X basal mandibular width. Mandible moderately large, weakly and evenly tapered; dorsal tooth conspicuously the longer, the ventral tooth small, conspicuously broader than the ventral tooth; axis of

mandible weakly twisted 40°. Maxillary palp with five segments, and labial palp with four segments.

Mesosoma. Pronotum in profile moderately long, 0.8X as long as deep; pronotal flange low; epomia complete, forming a weak ridge shaped. Mesoscutum finely punctate, centrally evenly pubescent, notauli distinct basally. Scutellum weakly convex; lateral longitudinal carinae absent. Mesopleura simple; epicnemial carinae complete, turned anteriorly to touch anterior mesopleural margin; mesopleural sulcus more or less straight. Postscutellum evenly convex, axillary trough of metanotum with low or reduced longitudinal ridges. Propodeum elongated, without apophyses; propodeal spiracles elongate oval, 2.5X as long as wide (Fig. 2E); anterior margin of propodeum steeply and abruptly sloping downward from areola; areola quadrate, well-defined by carinae (Fig. 2F). All propodeal carinae complete; first lateral area with uniformly distributed punctures. Metapleura with small and contiguous punctures, rugae absent; pleural and juxtacoxal carinae complete.

Legs. Fore femora with a weak longitudinal concavity; fore tibiae simple; fore tarsomere 2 short, 1.5X as long as broad; fore tarsomere 3 short, subquadrate to transverse, 1.2X as long as broad; fore tarsomere 4 short, subquadrate to transverse, as long as broad; fore tarsomere 5 slender, of similar thickness to other tarsomeres. Hind coxae slightly longer than deep, without scopae; hind femora ventrally simple; apex of tarsal claw simply pointed.

Wing. 2m-cu of fore wing with two bullae separated by an abscissa of the vein that is longer than either bulla; Cell 1+2Rs (areolet) anteriorly truncate, vein 3r-m 1.2X as long as vein 2Rs, vein 2m-cu interception apicad midpoint of posterior margin. Hind wing with M+Cu only curved proximally, distal abscissa of Cu tubular, vein 2-CU 3.0X as long as vein CU-a.

Metasoma. Postpetiole without distinct median field, striated. Gastrocoeli 0.7X as broad as distance between them, and without thyridium (Fig. 2G). Second tergite 1.8X as long as width of its apex, third tergite nearly 1.2X as long as width of its apex. Second tergites with weak longitudinal rugae. Tergites 2-4 with finely punctate. Second sternites divided, sternite 3-5 entire. Hypopygium elongate, exposing only apex of ovipositor (amblypygous) (Fig. 2H). Ovipositor sheath centrally with short hairs, the longest hairs being shorter than the breadth of the ovipositor sheath.

Male. as in female except following characters:

Flagella. Flagella with 43 segments, with tyloids at segments 7-15. Third flagellomere about 2.0X as long as wide, central flagellomeres quadrate with median transverse ridge.

Wing. Cell 1+2Rs (areolet) anteriorly truncate, vein 3RS

shorter than vein 3RS of female. Vein 2-CU of hindwing 3.0X as long as vein CU-a.

Metasoma. Apex of aedeagus subcylindrical. Subgenital plate medially rounded, without a long lobe. Genital clasper large, ventral apical corner more pointed than dorsal apical corner.

Distribution. Korea, Japan.

Genus *Diphyus* Kriechbaumer, 1890

Diphyus Kriechbaumer, 1890: 184. Type species: *Diphyus tricolor* Kriechbaumer, 1890.

¹*Diphyus salicatorius* (Gravenhorst, 1820) (Fig. 3)

Ichneumon salicatorius Gravenhorst, 1820: 295. Lectotype: female; Type Locality: Poland; Type Depository: IZUP.

Ichneumon cinctorius Stephens, 1835. Homonym of *Ichneumon cinctorius* Fabricius, 1775.

Amblyteles indocilis Wesmael, 1845: 126. Lectotype: female; Type Locality: Belgium; Type Depository: IRSNB. Synonymized by Horstmann (1998).

Spilichneumon unipunctatus Uchida, 1926: 131. Lectotype: female; Type Locality: Sapporo, Japan; Type Depository: SEHU. Synonymized by Townes et al. (1965).

Amblyteles inaciculatus Pic, 1927: 2. Lectotype: male; Type Locality: France; Type Depository: BFIC. Synonymized by Hilpert et al. (1993).

Amblyteles inaciculatus var. *nigrobinotatus* Pic, 1927: 58. Type: male; Type Locality: France; Type Depository: BFIC. Synonymized by Hilpert et al. (1993).

Amblyteles indocilis: Meyer, 1933: 340.

Spilichneumon indocilis f. *unipunctatus*: Uchida, 1936: 141.

Diphyus indocilis: Townes, Momoi & Townes, 1965: 490; Yu and Horstmann, 1997: 570.

Diphyus salicatorius: Horstmann, 1998: 6.

Material examined. [YNUE] KOREA: Seoul, Dobongsan, 06 Nov. 1982 (M.O. Ju), 1 ♀; Gangwon-do, Taebaeksan, 18 Jun. 1983 (S.M. Lee), 1 ♀; Gyeongsangbuk-do, Gyeongsan, Yeungnam Univ., 19 Mar. 1990 (B.S. Jeong), 1 ♀; FINLAND: Fennia, Espoo, 16 Oct. 1977 (O. Ranin), 1 ♀.

Diagnosis. The female of this species is distinguished from the other species of this genus by amblypygous abdomen, weak gastrocoeli and a mark of last tergite.

Redescription. Female. Body length 17 mm. Forewing length 13 mm.

Color. Body ground plan color black. Flagella with a median white band, lanceolar area brown. Following characters yellow: Supra-antennal orbit, pronotal flange, dorso-apical margin of pronotum, scutellum, subalar prominence

¹*단무늬검정맷시벌

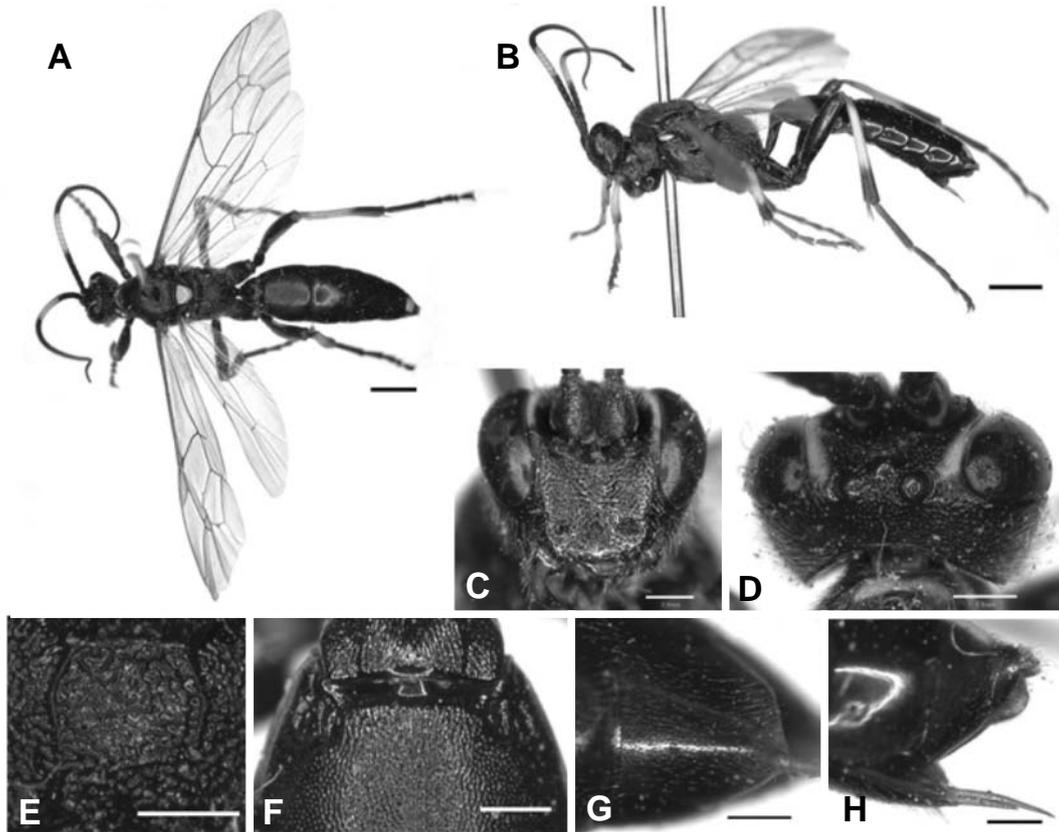


Fig. 3. *Diphys salicatorius* (Gravenhorst, 1820). A, Body in dorsal view; B, Body in lateral view; C, D, Head : C, in frontal view; D, in dorsal view; E, Areola; F, Gastrocoeli; G, Hypopygium; H, Ovipositor. Scale bars=2.0 mm (A, B), 0.5 mm (C-H).

and all tibiae with black apex. Tarsus brown. Wings light brown, stigma brown. Last tergite with apicomedian mark. Sternite 2 brown.

Flagella. Flagella with 46 segments, lanceolate. Third flagellomere about 2.0X as long as wide, central flagellomeres quadrate.

Head (Fig. 3C, D). Vertex with posterior section steeply declivous behind ocelli, surface with transverse rugae, 1.2X as long as ocellar area. Genae convex, evenly receding behind eye in dorsal view, 1.5X as wide as eye in lateral view. Juncture of hypostomal and occipital carinae separated from mandibular base by about 0.5X basal mandibular width. Distance between median and lateral ocellus 0.5X as long as diameter of median ocellus, area between lateral ocellus and eye sparsely punctate. Ocellar area weakly convex. Supra-antennal area with transverse rugae, without denticle or ridge. Distance between eye and antennal socket narrower than distance between antennal sockets. Eye moderately large; inner margin weakly concave opposite antennal socket. Supra-clypeal area simply convex, with a weak median swelling. Clypeus flat, entire, simply transverse, uniformly

thick, about 2.0X as wide as long; punctures sparsely and irregularly distributed; apical margin simple, without a median apical tubercle, apicolateral margin forming an angle of approximately 40°. Malar space with subocular sulcus, moderately long, as long as basal mandibular width. Mandible moderately large, weakly and evenly tapered; dorsal tooth conspicuously the longer, conspicuously broader than the ventral tooth; axis of mandible weakly twisted 20°. Maxillary palp with five segments, and labial palp with four segments.

Mesosoma. Pronotum in profile moderately long, 0.8X as long as deep; pronotal flange low; epomia complete, forming a weak ridge shaped. Mesoscutum with more or less contiguous punctures, centrally evenly pubescent; notauli only basally distinct. Scutellum flat; lateral longitudinal carinae only discernible on extreme anterior end. Mesopleura simple. Epicnemial carinae complete, turned anteriorly to touch anterior mesopleural margin; mesopleural sulcus more or less straight. Postscutellum sharply rounded and strongly declivous posteriorly, axillary trough of metanotum with low or reduced longitudinal ridge. Propodeum

elongated, without apophyses, propodeal spiracles elongately elliptical more than 4.0X as long as wide; anterior margin of propodeum steeply and abruptly sloping downward from areola. Areola subquadrate, well-defined by carinae (Fig. 3E). All propodeal carinae complete. First lateral area with uniformly distributed punctures. Metapleura rugosopunctate; pleural and juxtacoxal carinae complete.

Legs. Legs simple. Fore tarsomere 2 elongate and slender, 2.5X as long as broad; fore tarsomere 3 elongate and slender, 2.5X as long as broad; fore tarsomere 4 elongate, 1.5X as long as broad; fore tarsomere 5 slender, of similar thickness to other tarsomeres. Hind coxae without scopa. Hind femora ventrally simple. Apex of tarsal claw simply pointed.

Wing. 2m-cu of fore wing with two bullae separated by an abscissa of the vein that is longer than either bulla; Cell 1+2Rs (areolet) anteriorly truncate, vein 2Rs as long as vein 3r-m, vein 2m-cu interception at midpoint of posterior margin. Hind wing with M+Cu only curved proximally, distal abscissa of Cu tubular, vein 2-CU 4.0X as long as vein CU-a.

Metasoma. Median longitudinal carinae of tergite 1 complete and extending to apex. Postpetiole with distinct median field, longitudinal striate. Gastrocoeli 0.5X as broad as distance between them, and with weakly impressed thyridium (Fig. 3F). Second tergite as long as width of its apex, with longitudinal rugae restricted to basal 0.5. Third tergite nearly 0.6X as long as width of its apex. Second sternites divided, sternite 3-5 entire. Hypopygium elongate, exposing only apex of ovipositor (amblypygous) (Fig. 3G). Ovipositor sheath centrally with short hairs, the longest hairs being shorter than the breadth of the ovipositor sheath (Fig. 3H).

Male. I cited diagnosis of Meyer (1933) for characters of Male, because I cannot find male specimen of this species: Antennae black; ventral side of basal flagellomeres yellow. Supra-clypeal area and clypeus yellow with black median stripe. Tegula and scutellum yellow. Legs as in female. Abdomen black; tergites 2-3 brown (Meyer, 1933).

Host records. [Lepidoptera] Noctuidae: *Cerapteryx graminis* (Linnaeus); Arctiidae: *Phragmatobia fuliginosa* (Linnaeus).

Distribution. Korea, Austria, Azerbaijan, Belarus, Belgium, Czechoslovakia, England, Finland, France, Germany, Japan, Latvia, Mongolia, Netherlands, Norway, Poland, Russia, Spain, Sweden.

Genus *Ichneumon* Linnaeus, 1758

Ichneumon Linnaeus, 1758: 560. Type Species: *Ichneumon extensorius* Linnaeus, 1758.

¹*Ichneumon kuroishiensis* (Uchida, 1929) (Fig. 4)

Amblyteles kuroishiensis Uchida, 1929: 174. Lectotype: female; Type Locality: Kuroishi, Japan; Type Depository: SEHU.

Pterocormus kuroishiensis: Townes, Momoi and Townes, 1965: 470.

Ichneumon kuroishiensis: Yu and Horstmann, 1997: 604.

Material examined. [YNUE] KOREA: Gangwon-do, Seolaksan, Socheongbong, 19 Aug. 1987 (J.W. Lee), 2♂; Gyeongsangbuk-do, Sobaeksan, Huibangsa, 24 Jul. 1974 (C.H. Kim), 1♂; Sobaeksan, Huibangsa-Birobong, 30 Jul. 1987 (H.G. Kim), 1♂; Sobaeksan, 23 Jun. 1971 (S.M. Lee), 1♂; Jeju-do, Hanrasan, Baerokdam, 31 Jul. 1972 (J.I. Kim), 1♀; [SEHU] JAPAN: Honshu, Kuroishi, 05 Aug. 1927 (T. Uchida), 1♂.

Diagnosis. This species is distinguished from the other species of this genus by orange fore- and mid legs, yellowish dorsal area of hind coxae, quadrate areola and yellow postpetiole.

Redescription. Female. Body length 17 mm. Forewing length 12 mm.

Color. Body ground plan color black. Flagella without a median white band, basal segments (1-13) yellowish brown. Margin of eye, median area of supra-clypeal area, clypeus, mandible except black apex, malar space, and maxillary and labial palp brown. Pronotal flange, dorsal margin of pronotum, scutellum, and postscutellum yellow. Legs yellowish brown; ventral area of fore trochanters and all femora black; ventral area of mid and hind coxae black. Wings and stigma yellowish brown. Apicolateral area of tergites 1-3 yellow; tergites 6-7 with yellowish apical margin.

Flagella. Flagella lanceolate, third flagellomere about 1.5X as long as wide; central flagellomeres quadrate;

Head (Fig. 4C, D). Vertex with posterior section weakly and evenly rounded down to occipital carina, 1.8X as long as ocellar area. Genae swollen, bulging out behind eye in dorsal view, 1.8X as wide as eye in lateral view. Juncture of hypostomal and occipital carinae separated from mandibular base by 0.7X basal mandibular width. Occipital carina more or less complete. Distance between median and lateral ocellus as long as diameter of median ocellus, area between lateral ocellus and eye coarsely punctate. Ocellar area weakly convex, supra-antennal area simple. Distance between eye and antennal socket as long as distance between antennal sockets. Eye small; inner margin of eye weakly concave opposite antennal socket. Supra-clypeal area simply convex, with a weak median swelling. Clypeus flat, entire, simply transverse, uniformly thick, about 2.5X as wide as long,

¹*쿠로이시진맷시벌

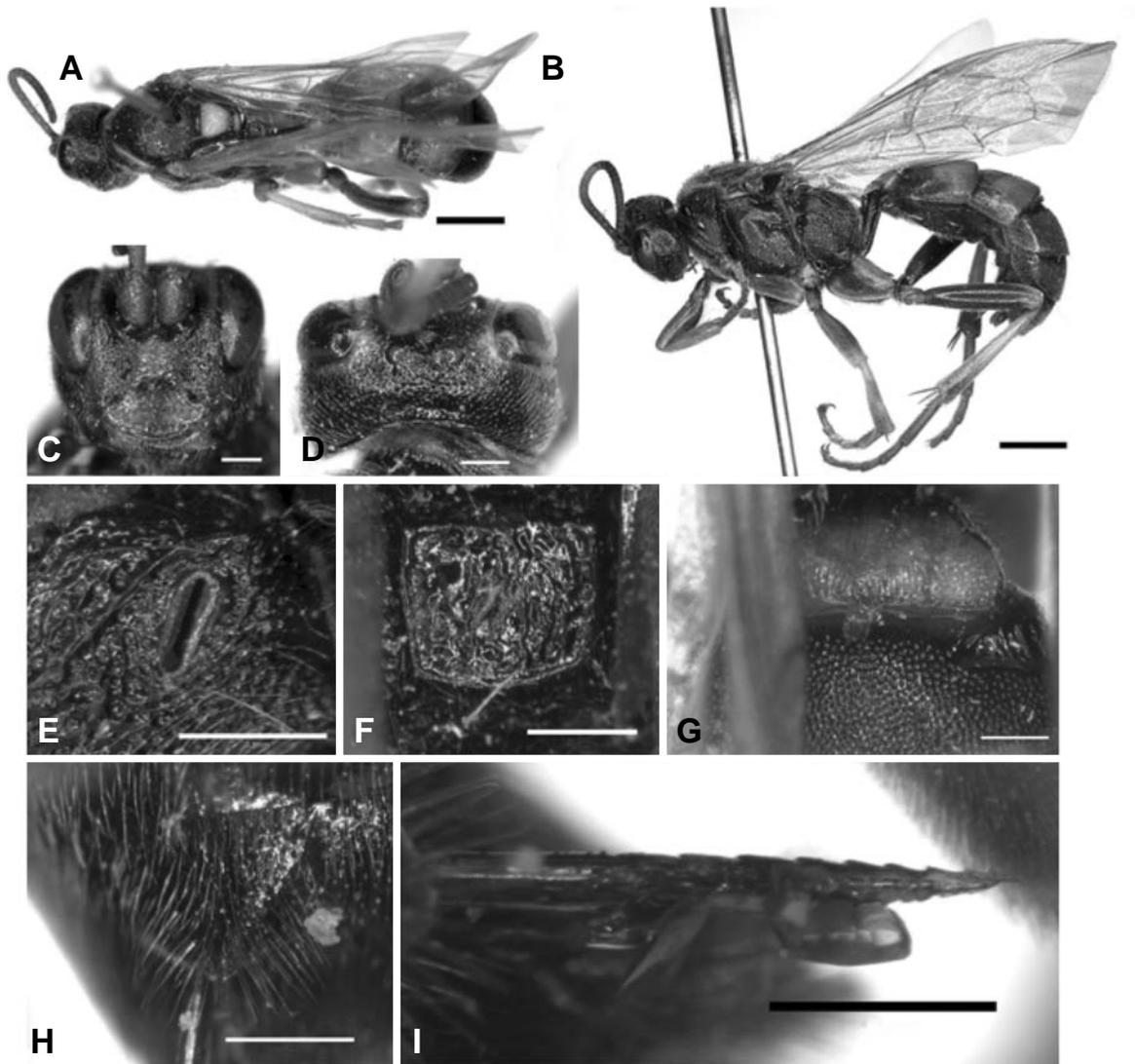


Fig. 4. *Ichneumon kuroishiensis* (Uchida, 1929). A, Body in dorsal view; B, Body in lateral view; C, D, Head : C, in frontal view; D, in dorsal view; E, Spiracle of propodeum; F, Areola; G, Gastrocoeli; H, Hypopygium; I, Ovipositor. Scale bars=2.0 mm (A, B), 0.5 mm (C-I).

with sparse and irregular punctures; apical margin simple, median area weakly convex, apicolateral margin forming an angle of approximately 40°. Malar space with subocular sulcus, moderately long, 0.8X basal mandibular width. Mandible moderately large, weakly and evenly tapered; dorsal tooth conspicuously longer and broader than the ventral tooth; axis of mandible weakly twisted 40°. Maxillary palp with five segments, and labial palp with four segments.

Mesosoma. Pronotum in profile moderately long, 0.8X as long as deep; pronotal flange high and with posterior face concave; epomia complete, forming a weak ridge shaped. Mesoscutum with more or less contiguous punctures, centrally evenly pubescent; notauli distinct. Scutellum weakly

convex; lateral longitudinal carinae absent. Mesopleura simple. Epicnemial carinae complete, turned anteriorly to touch anterior mesopleural margin. Postscutellum evenly convex, axillary trough of metanotum with low or reduced longitudinal ridge. Propodeum short, without apophyses, propodeal spiracles elongately elliptical more than 3.5X as long as wide (Fig. 4E); anterior margin of propodeum steeply and abruptly sloping downward from areola. Areola large, subquadrate, well-defined by carinae (Fig. 4F). Anterior transverse carina at least medially complete, costula obsolete; posterior transverse carina complete; lateral longitudinal carinae complete. First lateral area scattered and coarsed punctures; metapleura rugosopunctate; pleural and juxtaco-

xal carinae complete.

Legs. Fore femur with a weak longitudinal concavity; fore tibiae simple, with scattered long fine spines; fore tarsomere 2 elongate and slender, 2.0X as long as broad; fore tarsomere 3 short, subquadrate to transverse, 1.2X as long as broad; fore tarsomere 4 short, subquadrate to transverse, as long as broad; fore tarsomere 5 slender, of similar thickness to other tarsomeres. Hind coxa without scopa. Apex of tarsal claw simply pointed.

Wing. 2m-cu of fore wing with two bullae separated by an abscissa of the vein that is longer than either bulla; Cell 1+2Rs (areolet) anteriorly truncate, vein 2Rs 0.8X as long as vein 3r-m, vein 2m-cu interception apicad midpoint of posterior margin. Hind wing with M+Cu only curved proximally, distal abscissa of Cu spectral, vein 2-CU 3.0X as long as vein CU-a.

Metasoma. Median longitudinal carinae of tergite 1 complete and extending to apex. Postpetiole with distinct median field, with longitudinal rugae. Gastrocoeli 0.8X as broad as distance between them, and with distinctly impressed thyridium (Fig. 4G). Second tergite 0.6X as long as width of its apex, third tergite 0.5X as long as width of its apex. Tergites 2-4 with finely punctate. Sternites 2-5 divided. Hypopygium short, exposing most of ovipositor (oxypygous) (Fig. 4H). Ovipositor sheath centrally with short hairs, the longest hairs being shorter than the breadth of the ovipositor sheath. Ovipositor short and saw-like (Fig. 4I).

Male. as in female except following characters:

Color. Flagella without a median white band, segments 1-2 yellow. Inner margin of eye yellow. Postscutellum black. Postpetiol yellow. Apicolateral marks of tergite 2-4 yellow; tergite 5-7 completely dark brown.

Flagella. Flagella with 43 segments, with tyloids at segments 6-22; third flagellomere about 1.2X as long as wide; central flagellomeres quadrate.

Head. Clypeus about 1.8X as wide as long.

Mesosoma. Areola quadrate.

Wing. Distal abscissa of Cu tubular, vein 2-CU 3.0X as long as vein CU-a.

Metasoma. Apex of aedeagus subcylindrical. Subgenital plate medially rounded, without a long lobe. Genital clasper large, ventral apical corner more pointed than dorsal apical corner.

Distribution. Korea, Japan.

¹**Ichneumon ohtaniensis* Uchida, 1926 (Fig. 5)

Ichneumon ohtaniensis Uchida, 1926: 81. Lectotype: female; Type Locality: Sakhalin, Russia; Type Depository: SEHU.

Pterocormus ohtaniensis: Townes, Momoi and Townes, 1965: 475.

Ichneumon ohtaniensis: Yu and Horstmann, 1997: 611.

Material examined. [YNUE] KOREA: Gangwon-do, Yanggu-gun, Daeamsan, 13 Jun. 1990 (J.I. Kim), 1 ♀.

Diagnosis. This species is distinguished from the other species of this genus by wide scutellum and dark brown apical half of 1-2 tergites.

Redescription. Female. Body length 12 mm. Forewing length 8 mm.

Color. Body ground plan color black. Flagella with a median white band, ventral area of lanceolar segments brown. Supra-antennal orbit yellow. Labrum dark brown. Mandible brown except black base and apex. Pronotal flange, and scutellum yellow. All tibiae and tarsus brown; hind tibiae with dark apex. Wings and stigma light brown. Basal margin of tergite 2 and apical half of tergite 2-3 dark brown; tergites 6-7 with apicomedian marks.

Flagella. Flagella with 36 segments, lanceolate. Third flagellomere about 1.5X as long as wide; central flagellomeres subquadrate.

Head (Fig. 5C, D). Vertex with posterior section steeply declivous behind ocelli, 1.5X as long as ocellar area. Genae convex, evenly receding behind eye in dorsal view, 1.5X as wide as eye in lateral view. Juncture of hypostomal and occipital carinae separated from mandibular base by 0.7X basal mandibular width. Occipital carina more or less complete. Distance between median and lateral ocellus as long as diameter of median ocellus; area between lateral ocellus and eye sparsely punctate. Ocellar area weakly convex. Supra-antennal area simple, with dense punctures. Distance between eye and antennal socket narrower than distance between antennal sockets. Eye moderately small; inner margin of eye weakly concave opposite antennal socket. Supra-clypeal area simply convex, with a weak median swelling. Clypeus about 3.0X as wide as long, with sparsely and irregularly distributed punctures; apical margin simple, without a median apical tubercle; apicolateral margin forming an angle of approximately 40°. Malar space with subocular sulcus, moderately long, as long as basal mandibular width. Mandible moderately large, evenly tapered; dorsal tooth conspicuously longer and broader than the ventral tooth; axis of mandible weakly twisted. Maxillary palp with five segments, and labial palp with four segments.

Mesosoma. Pronotum in profile moderately long, as long as deep; pronotal flange low; epomia complete, forming a weak ridge shaped. Mesoscutum with punctures separated inter space by about their own diameter; notauli only basal-

¹*검정띠진맷시벌

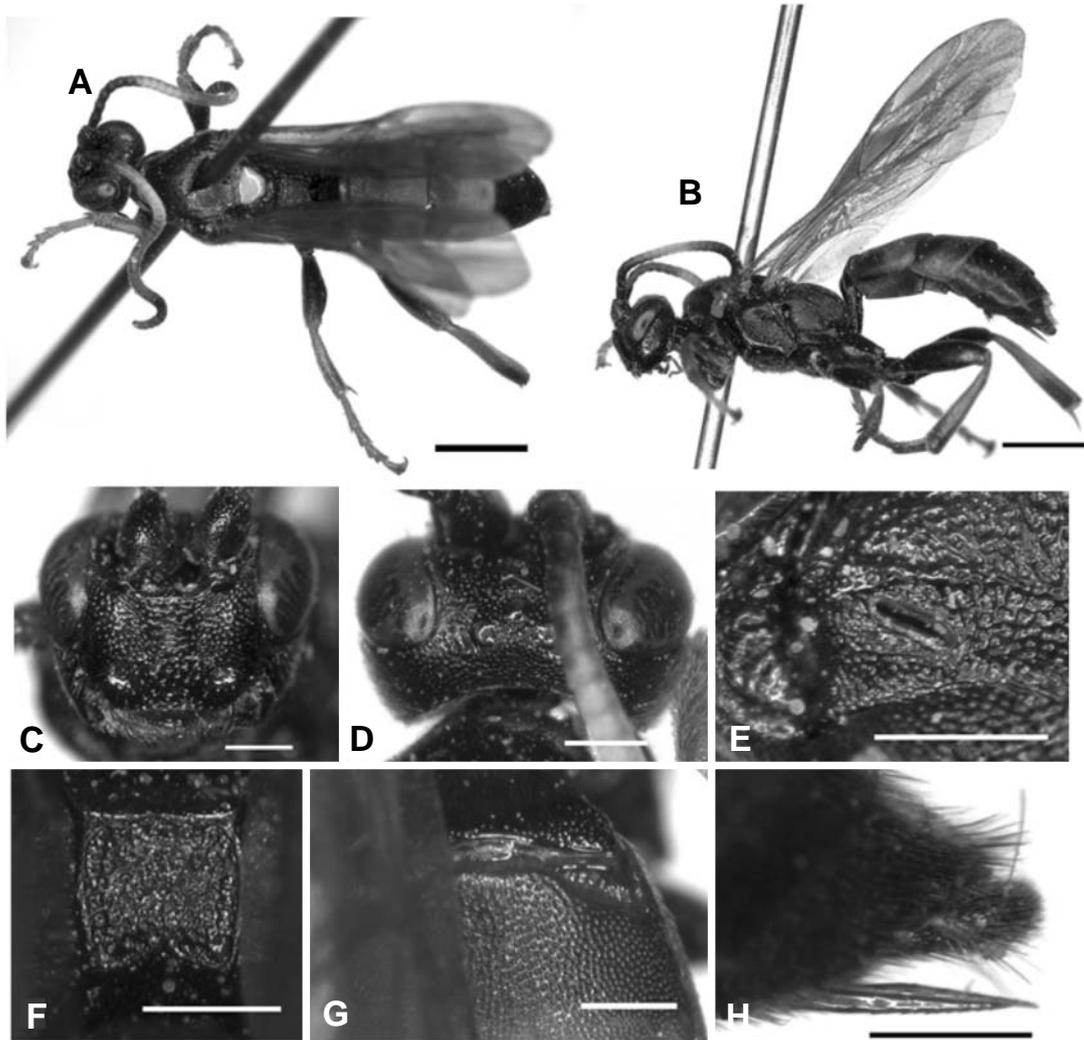


Fig. 5. *Ichneumon ohtaniensis* Uchida, 1926. A, Body in dorsal view; B, Body in lateral view; C, D, Head : C, in frontal view; D, in dorsal view; E, Spiracle of propodeum; F, Areola; G, Gastrocoeli; H, Ovipositor. Scale bars=2.0 mm (A, B), 0.5 mm (C-H).

ly distinct. Scutellum flat; lateral longitudinal carinae absent. Mesopleura simple; epicnemial carinae complete, turned anteriorly to touch anterior mesopleural margin. Postscutellum sharply rounded and strongly declivous posteriorly, axillary trough of metanotum with low or reduced longitudinal ridges. Propodeum elongated, without apophyses, propodeal spiracles elongately elliptical more than 3.5X as long as wide (Fig. 5E); anterior margin of propodeum steeply and abruptly sloping downward from areola. Areola large and quadrate, well-defined by carinae (Fig. 5F). Anterior transverse carina at least medially complete, costula obsolete; posterior transverse carina complete; lateral longitudinal carinae complete; median longitudinal carinae present anteriorly, anterior transverse carina, present posteriorly, anterior transverse carina. First lateral area with uniformly

distributed punctures. Metapleura rugosopunctate; pleural and juxtacoxal carinae complete.

Legs. Fore femur with a weak longitudinal concavity; fore tibiae simple, with stout and short conical spines; fore tarsomere 2 elongate and slender, 2.0X as long as broad; fore tarsomere 3 1.2X as long as broad; fore tarsomere 4 as long as broad; fore tarsomere 5 slender, of similar thickness to other tarsomeres. Hind coxa without scopa. Apex of tarsal claw simply pointed.

Wing. 2m-cu of fore wing with two bullae separated by an abscissa of the vein that is longer than either bulla; Cell 1+2Rs (areolet) anteriorly truncate, vein 2Rs as long as 3r-m, vein 2m-cu interception apicad midpoint of posterior margin. Hind wing with M+Cu only curved proximally, distal abscissa of Cu tubular, vein 2-CU 3.0X as long as

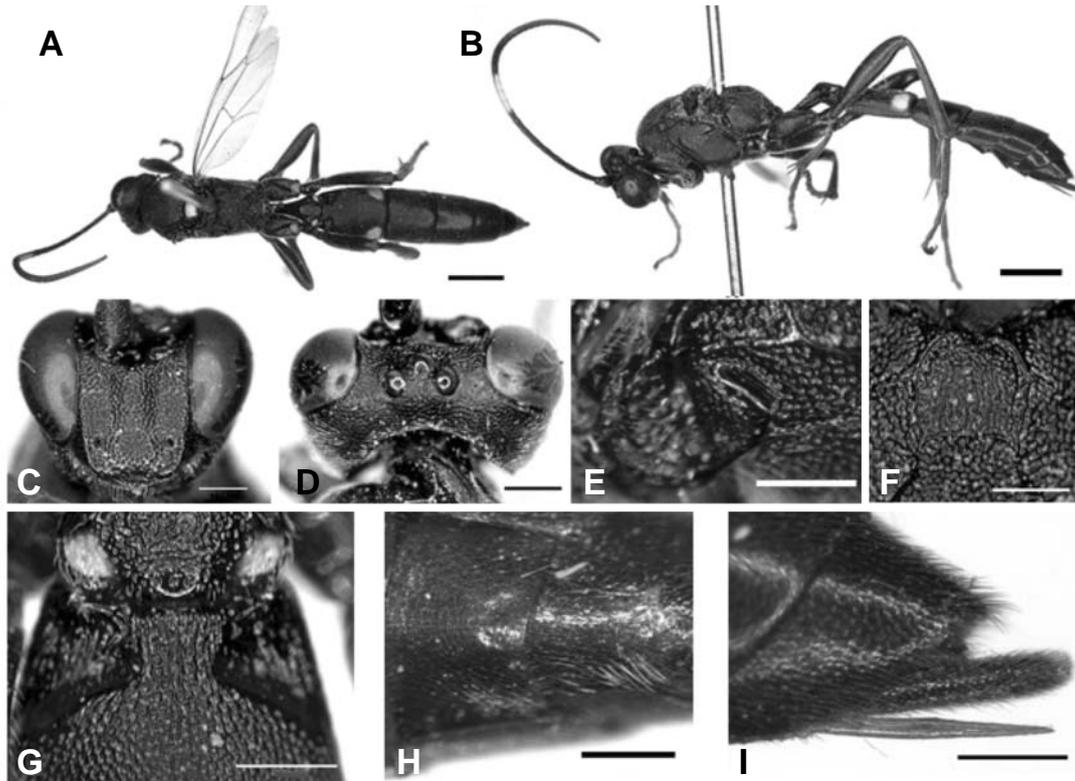


Fig. 6. *Stenichneumon odaiensis* Uchida, 1932. A, Body in dorsal view; B, Body in lateral view; C, D, Head : C, in frontal view; D, in dorsal view; E, Spiracle of propodeum; F, Areola; G, Gastrocoeli; H, Hypopygium; I, Ovipositor. Scale bars=2.0 mm (A, B), 0.5 mm (C-I).

vein CU-a.

Metasoma. Median longitudinal carinae of tergite 1 complete and extending to apex. Postpetiole with distinct median field and longitudinal striate. Gastrocoeli as broad as distance between them, with distinctly impressed thyridium (Fig. 5G). Second tergite as long as width of its apex, third tergite 0.6X as long as width of its apex. Tergites 2-4 with densely punctate. Sternites 2-4 divided, sternite 5 entire. Hypopygium short, exposing most of ovipositor (oxyptygous). Ovipositor sheath centrally with short hairs, the longest hairs being shorter than the breadth of the ovipositor sheath (Fig. 5H).

Male. Unknown.

Distribution. Korea, Russia.

Genus *Stenichneumon* Thomson, 1893

Stenichneumon Thomson, 1893: 1964. TS: *Ichneumon pistorius* Gravengorst, 1829 (= *Stenichneumon militarius* Thunberg, 1824).

¹**Stenichneumon odaiensis* Uchida, 1932 (Fig. 6)

Stenichneumon (*Stenichneumon*) *odaiensis* Uchida, 1932:

29. Type: female; Type Locality: Odaigahara, Japan; Type Depository: SEHU.

Material examined. [YNUE] KOREA: Seoul, Ahasan, 12 Jul. 1996 (H.J. Jang), 1 ♂; Gyeonggi-do, Gwangreung, 10 Jun. 1973 (Y.J. Yeom), 1 ♀; Pocheon, Jugeumsan, 28 Jun. 1998 (J.D. Yeo), 1 ♀; [SEHU] JAPAN: Nara, Odaigahara, 05 Jul. 1932 (C. Teranishi), 1 ♀.

Diagnosis. This species is distinguished from other *Stenichneumon* species by only black tergites 4-7.

Redescription. Female. Body length 16 mm. Forewing length 10.5 mm.

Color. Body ground plan color black. Flagella dark brown, with a median white band. Maxillary and labial palp brown. Pronotal flange, scutellum, and apicolateral marks of tergite 1-3 yellow. All tibiae and tarsus with brown ventral area and dark brown dorsal area. Wing clear and stigma brown. Sternites 2-3 brown.

Flagella. Flagella with 36 segments, lanceolate from 13 segment. Third flagellomere about 3.1X as long as wide; central flagellomeres elongate.

¹*어리가시맷시벌

Head (Fig. 6C, D). Vertex with posterior section steeply declivous behind ocelli but surface flat. Genae convex, evenly receding behind eye in dorsal view, 0.9X as wide as eye in lateral view. Juncture of hypostomal and occipital carinae separated from mandibular base by about 0.5X basal mandibular width. Occipital carina more or less complete. Distance between median and lateral ocellus 0.4X as long as diameter of median ocellus; area between lateral ocellus and eye sparsely punctate. Ocellar area weakly convex. Supra-antennal area medially with transverse rugae, no ridge. Distance between eye and antennal socket narrower than distance between antennal sockets. Eye moderately large; Inner margin of eye weakly concave opposite antennal socket. Supra-clypeal area simply convex, with a weak median swelling and coarse punctures. Clypeus about 2.0X as wide as long, punctures evenly distributed, apical margin simple, without a median apical tubercle; apicolateral margin forming an angle of approximately 40°. Malar space with subocular sulcus 0.7X basal mandibular width. Mandible moderately large and simple; axis of mandible weakly twisted about 40°; Maxillary palp with five segments, and labial palp with four segments.

Mesosoma. Pronotum in profile short and deep, less than 0.6X as long as deep; pronotal flange low; epomia complete, forming a weak ridge shaped. Mesoscutum with more or less contiguous punctures; notauli distinct. Scutellum strongly convex; lateral longitudinal carinae complete to posterior margin. Mesopleura simple; epicnemial carinae complete, turned anteriorly to touch anterior mesopleural margin. Postscutellum evenly convex, axillary trough of metanotum with low or reduced longitudinal ridges. Propodeum elongated, without apophyses; propodeal spiracles elongately elliptical more than 4.0X as long as wide (Fig. 6E). Areola quadrate, round anteriorly, large, well-defined by carinae (Fig. 6F). All propodeal carinae complete; first lateral area with uniformly distributed punctures. Metapleura with small and contiguous or confluent punctures, rugae absent; pleural and juxtacoxal carinae complete.

Legs. Fore tibiae simple; fore tarsomere 2 elongate and slender, 3.5X as long as broad; fore tarsomere 3 elongate and slender, 2.5X as long as broad; fore tarsomere 4 elongate, 1.5X as long as broad; fore tarsomere 5 slender, of similar thickness to other tarsomeres. Hind coxa without scopula. Apex of tarsal claw simply pointed.

Wing. 2m-cu of fore wing with two bullae separated by an abscissa of the vein that is longer than either bulla; Cell 1+2Rs (areolet) anteriorly truncate, vein 2Rs longer than vein 3r-m, vein 2m-cu interception at midpoint of posterior margin. Hind wing with M+Cu only curved proximally, distal abscissa of Cu tubular, vein 2-CU 3.0X as long as vein CU-a.

Metasoma. Median longitudinal carinae of tergite 1 apically incomplete. Postpetiole with distinct median field, rugosopunctate. Gastrocoeli 2.0X as broad as distance between them, with distinctly impressed thyridium (Fig. 6G). Second tergite 1.8X as long as width of its apex, third tergite as long as width of its apex. Tergites 2-4 with restricted longitudinal rugae at base of only tergite 2. Sternites 2-4 divided, sternite 5 entire. Hypopygium short, exposing most of ovipositor (oxygygous) (Fig. 6H). Ovipositor sheath centrally with short hairs, the longest hairs being shorter than the breadth of the ovipositor sheath (Fig. 6I).

Male. as in female except following characters:

Color. Body ground plan color black. Following characters yellow: orbit, maxillary palp, ventral area of genae, pronotal flange, posterolateral margin of pronotum, outer side of tegula, scutellum, postscutellum, two marks of propodeum, inner surface of fore leg, inner surface of mid tibia, two marks of dorsal hind coxae, part of hind trochanter, posterior margin of postscutellum and apicolateral marks of tergites 2-3. Sternites 2-3 brown.

Flagella. bristle shaped; third flagellomere about 1.7X as long as wide; central flagellomeres quadrate; flagellomeres with small tyloids.

Head. Genae 1.2X as wide as eye in lateral view. Malar space short, 0.5X basal mandibular width.

Mesosoma. Pronotum in profile moderately long, 0.8X as long as deep. Wing: Cell 1+2Rs (areolet) anteriorly truncate, but vein 3RS very short.

Metasoma. Second tergite 1.3X as long as width of its apex, third tergite nearly as long as width of its apex. Apex of aedeagus subcylindrical. Subgenital plate medially rounded, without a long lobe. Genital clasper not enlarge, dorsal and ventral apical corners approximately equal shape.

Distribution. Korea, Japan.

ACKNOWLEDGEMENTS

This work had financial support from the Korean Ministry of Environment as “The Eco-technopia Project”.

REFERENCES

- Eady, R.D., 1974. The present state of nomenclature of wing venation in the Braconidae (Hymenoptera); its origins and comparison with related groups. *J. Ent. B*, 43(1): 63-72.
- Gauld, I.D., 1984. An introduction to the Ichneumonidae of Australia. British Museum (Natural History), London, No. 895. pp. 1-413.
- Gupta, V.K., 1987. The Ichneumonidae of the Indo-Australian area (Hymenoptera). *Mem. Amer. Entomol. Ins.*, 41: 598-1210.

- Heinrich, G.H., 1934. Die Ichneumoninae von Celebes. Mitt. Zool. Mus. Berlin, 20: 1-263.
- Hilpert, H., R. Hinz and K. Horstmann, 1993. Typenrevision der von Maurice Pic beschriebenen Ichneumoninae (ohne Phaeogenini) (Hymenoptera, Ichneumonidae). Spixiana, 16(2): 173-187.
- Iwata, K., 1958. Ovarian eggs of 233 species of the Japanese Ichneumonidae (Hymenoptera). Acta Hymenopterologica, 1: 63-74.
- Iwata, K., 1960. The comparative anatomy of the ovary in Hymenoptera, Part V. Ichneumonidae. Acta Hymenopterologica, 1: 115-169.
- Jeong, J.C. and J.W. Lee, 2008a. Taxonomic Review of the Genus *Hymenura* Townes (Hymenoptera: Ichneumonidae: Ichneumoninae) in Korea. J. Asia-Pacific Entomol., 11(1): 17-20.
- Jeong, J.C., J.K. Choi and J.W. Lee, 2008b. First record of the genus *Probolus* (Hymenoptera: Ichneumonidae: Ichneumoninae) from Korea, based on one New Species and one Newly Recorded species. Korean J. Syst. Zool., 24(1): 99-105.
- Jeong, J.C., S.M. Lee and J.W. Lee, 2007. Redescriptions of Four Ichneumonine Genera and Species (Hym.: Ichneumonidae: Ichneumoninae) New to Korea. Korean J. Syst. Zool., 23(2): 189-197.
- Kim, C.W., 1955. A study on the Ichneumon-flies in Korea (in Korean with German summary). Commemoration These 15th Anniv. Korea Univ., 423-498.
- Kusigemati, K., 1988. New host records of Ichneumonidae (Hymenoptera), with description of a new species and notes on some known species from Japan and Korea (VII). South Pacific Study, 9: 21-27.
- Matsumura, S., 1912. Thousand insects of Japan. Supplement IV. Keiseisha, Tokyo, pp. 1-247.
- Meyer, N.F., 1933. Keys to parasitic Hymenoptera (family Ichneumonidae) of the USSR and adjacent countries. Vol. 1. Introduction and Ichneumoninae. Zoological Institute of the Academy of Sciences of the USSR, 9(1): 1-458.
- Sime, K.R. and D.B. Wahl, 2002. The cladistics and biology of the *Callajoppa* genus-group (Hymenoptera: Ichneumonidae, Ichneumoninae). Zool. J. Linn. Soc., 134(1): 1-56.
- Takahashi, H., 1995. Ichneumonoidea from Hachijo-jima Island, Izu Islands. Gensei, 67: 6-8.
- Townes, H.K., 1969. The genera of Ichneumonidae, Part 1. Mem. Amer. Entomol. Ins., 11: 1-300.
- Townes, H.K., M. Townes and V.K. Gupta, 1961. A catalogue and reclassification of the Indo-Australian Ichneumonidae. Mem. Amer. Entomol. Ins., 5: 1-522.
- Townes, H.K., S. Momoi and M. Townes, 1965. A catalogue and reclassification of the eastern Palearctic Ichneumonidae. Mem. Amer. Entomol. Ins., 5: 1-661.
- Uchida, T., 1925. Das systematische Studium über die Tribus Joppini der Unterfamilie Ichneumoninae von Japan (in Japanese with German summary). Dobutsugaku Zasshi. Zoological Magazine, 1925: 443-457.
- Uchida, T., 1926. Erster Beitrag zur Ichneumoniden-Fauna Japans. J. Fac. Agric. Hokkaido Imp. Univ., 18: 43-173.
- Uchida, T., 1927. Einige neue Ichneumoniden-Arten und Varietaeten von Japan, Formosa und Korea. Trans. Sapporo Nat. Hist. Soc., 9: 193-216.
- Uchida, T., 1929. Über einige Ichneumoniden-Arten aus Japan, Formosa, Korea und Suedmandschurei. Insecta Matsumurana, 4: 71-77.
- Uchida, T., 1930. Beitrag zur Ichneumoniden-Fauna Japans. J. Facul. Agr. Hokkaido Univ., 25: 349-376.
- Uchida, T., 1932. H. Sauter's Formosa-Ausbeute. Ichneumonidae (Hym.). J. Facul. Agr. Hokkaido Univ., 33: 133-222.
- Uchida, T., 1935. Zur Ichneumonidenfauna von Tosa (I.) Subfam. Ichneumoninae. Insecta Matsumurana, 10: 6-33.
- Uchida, T., 1936. Erster Nachtrag zur Ichneumonidenfauna der Kurilen. Insecta Matsumurana, 10: 135-146.
- Uchida, T., 1939. Die smithschen Typen der japanischen Ichneumoniden. Insecta Matsumurana, 14: 27-36.
- Uchida, T., 1955. Die von Dr. K. Tsuneki in Korea gesammelten Ichneumoniden. J. Facul. Agr. Hokkaido Univ., 50: 95-133.
- Uchida, T., 1956. Neue oder bisher unbekannte Ichneumoniden aus Japan und seinen Umgegenden (I). Insecta Matsumurana, 20: 57-76.
- Yu, D.S. and K. Horstmann, 1997. A catalogue of world Ichneumonidae (Hymenoptera). Mem. Amer. Entomol. Ins., 58: 1-1558.
- Yu, D.S., K. van Achterberg and K. Horstmann, 2005. World ICHNEUMONOIDEA 2004. Taxonomy, biology, morphology and distribution. Taxapad CD. Vancouver, Canada.

Received February 11, 2009

Accepted March 13, 2009