

Taxonomic study of the genus *Brachynervus* Uchida (Hymenoptera: Ichneumonidae: Anomaloninae) from South Korea

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Two unrecorded species, *Brachynervus beijingensis* and *B. confusus* are described from South Korea for the first time. A taxonomic study of the South Korean *Brachynervus* was initiated by Uchida (1955). Until now only one species, *B. tsunekii*, has been recorded from South Korea. In the study, we provide the diagnoses and photos of two unrecorded species of *Brachynervus*.

Keywords: *Brachynervus*, Gravenhorstiini, parasitoids, taxonomy

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INTRODUCTION

Anomaloninae is cosmopolitan subfamily more than 740 described species in 46 extant genera (Yu *et al.*, 2016). The genus *Brachynervus* Uchida (1955) is one of the small groups of ichneumonid wasps into the subfamily Anomaloninae. This genus has only nine species recorded from China, India, and Korea. Among the nine species, only one species, *Brachynervus tsunekii* Uchida (1955), has been recorded in Korea. Recently, we discovered two unrecorded species of *Brachynervus* recently.

The tribe Gravenhorstiini Enderlein, 1912, which includes this genus *Brachynervus*, is known as a solitary koinobiont endoparasitoid that attacks larval Lepidoptera and then emerges from the pupa of the host. Little is known about anomalonine biology, but their up-and-down flight pattern is unique. Also, they are easily distinguished from other subfamilies by their bright hind tarsi that hang down during flight (Broad *et al.*, 2018). The genus *Brachynervus* is easily distinguished from other genera of anomalonine by their fore wing vein, 2rs-m (intercubitus) far basad of 2m-cu (second recurrent vein), frons with a high median compressed horn strongly, and postpectal carina absent.

In the present study, I provide diagnoses and photos of two previously unrecorded species of *Brachynervus* in Korea.

MATERIALS AND METHODS

The material used in this study was collected by sweeping and was deposited in the Insect Inquiry · Education Institute, Daegu National University of Education (DNUE-IIEI, Daegu, South Korea) and Nakdonggang National Institute of Biological Resources (NNIBR, Sangju, Korea). Morphological terminology follows Broad *et al.* (2018), and distributional data follows Yu *et al.* (2016). The specimens were examined using a Leica MC190 HD Camera attached to a Leica M125 Microscope (Leica Microsystems, Germany), with the images processed using LEICA LAS X software (Leica). Abbreviations are as follows: **ASIZ**, Academia Sinica, Institute of Zoology, 19 Zhongguancun Lu, Haidian, Beijing, China; **NHM**, The Natural History Museum, Department of Entomology, Cromwell Road, London, England, SW7 5BD, United Kingdom.

SYSTEMATIC ACCOUNTS

Family Ichneumonidae Latreille, 1802 맵시벌과
Subfamily Anomaloninae Viereck, 1918
그물등자루맵시벌아과
Tribe Gravenhorstiini Enderlein, 1912

Genus *Brachynervus* Uchida, 1955

오랑케자루맵시벌속

Brachynervus Uchida, 1955: 122. Type species: *Brachynervus tsunekii*.

Diagnosis. *Brachynervus* is easily distinguished from other genera of the subfamily Anomaloninae by the following characteristics: vein 2rs-m of fore wing far basad of 2m-cu, frons with a strongly and distinctly median compressed horn, and mesosoma without postpectal carina.

Key to species of the genus *Brachynervus* from South Korea

1. Clypeal apical margin round, without notch (Fig. 2A & 2B). Mesoscutum entirely black in dorsal view (Fig. 2D) *B. beijingensis*
- Clypeal apical margin with a median notch (Fig. 3B). Mesoscutum with yellow stripes or apots in dorsal view (Fig. 3D)..... 2
2. Mesoscutum with yellow spots on lateral lobes (Fig. 3D). Second discal cell irregularly pentagonal (Fig. 3H) *B. confusus*
- Mesoscutum with four longitudinal yellow stripes and entirely apically. Second discal cell regularly pentagonal *B. tsunekii*

***Brachynervus beijingensis* Wang, 1983 (Figs. 1 & 2)**

중국짧은그물등자루맵시벌 (신칭)

Brachynervus beijingensis Wang, 1983: 196-197. Type: female. Type depository: ASIZ.

Diagnosis. Male. Color. Generally black and reddish brown (Fig. 1). Face, anterior half of temple and malar space yellow (Fig. 2A), mandible yellow except apical

part black, basal area of mandible dark brown; frons black, with yellow triangular spots on behind eyes. Antennal scape yellow, flagellomeres yellow to brown. Mesosoma black, with yellow spot on the sternaulus area (Fig. 2C). Tegular and scutellum reddish brown (Fig. 2D). Fore and mid legs yellow; hind leg brown, tarsus yellow. Metasoma brown to reddish brown.

Head: Face reticulated; inner orbits of eyes convergent toward below; frons with median longitudinal horn; distance of between lateral ocelli 0.79 times as long as the distance of between lateral ocellus and eye; diameter of lateral ocellus 1.57 times as long as the distance of between lateral ocelli; clypeus separated from face by a distinct deep groove (Fig. 2A). Mandible bidentate and twisted, lower tooth slightly shorter than upper tooth. Malar space long, 1.38 times as long as basal mandibular width. Occipital carina incomplete, occiput polished, middle of occiput with transverse carinae.

Mesosoma: Pronotum reticulate, with transverse striae on the ventral area. Mesoscutum reticulate, with weak notaulus line, median lob of between notauli with transverse striae. Propodeum reticulate, short and thick (Fig. 2D), without pleural carina and postpectal carina (Fig. 2F). Hind tarsomeres 30 : 16 : 9 : 5 : 7; tarsal claws simple and strongly curved. M&Rs (basal vein) opposite to 1Cu-a (nervulus); vein 2rs-m of fore wing far (approximately 6.0 times as long as 2rs-m) basad of 2m-cu; areolet absent (Fig. 2E).

Metasoma: Metasomal tergites compressed.



Fig. 1. Habitus in lateral view of *Brachynervus beijingensis* Wang, 1983. Scale bar: 2 mm.

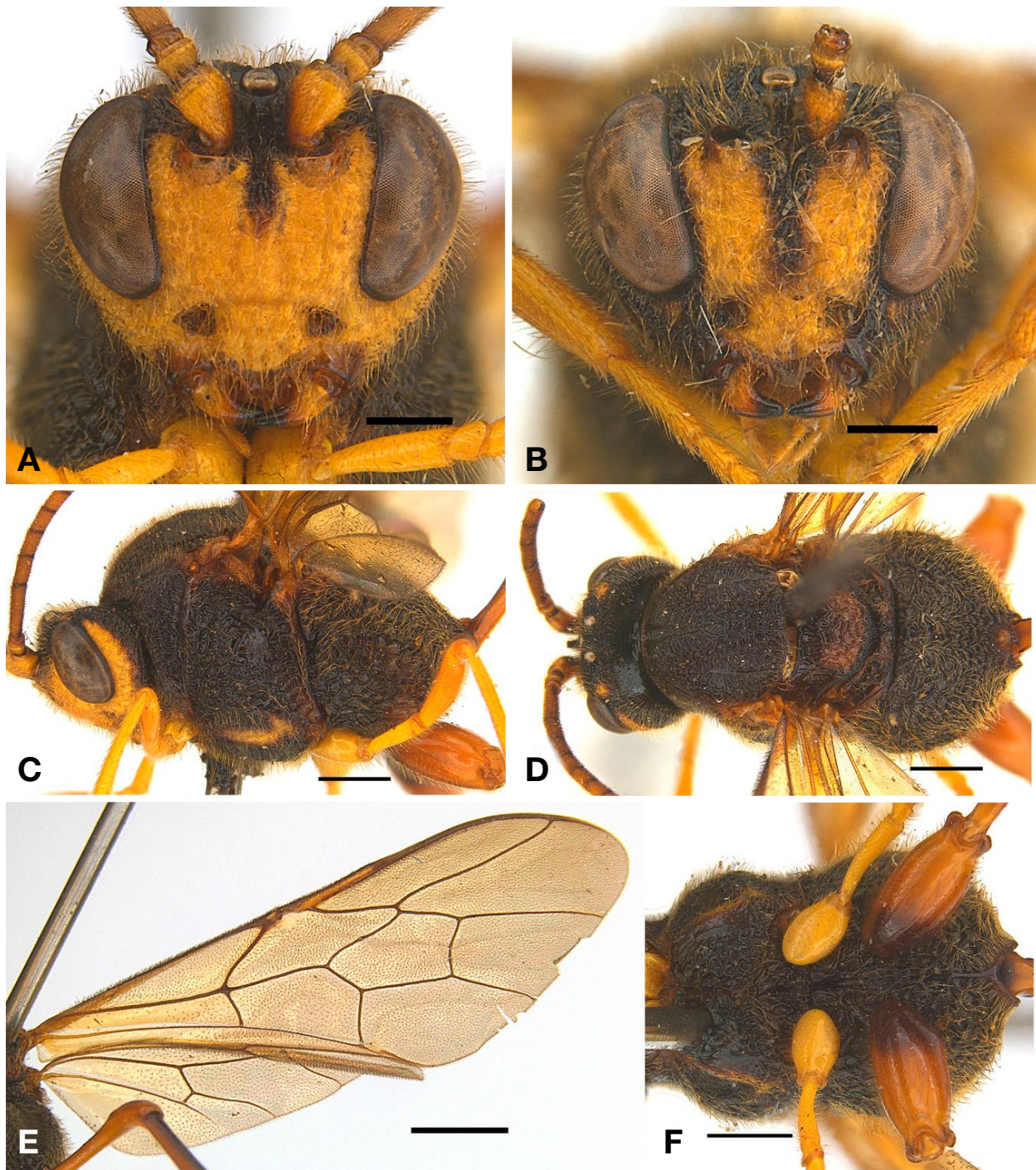


Fig. 2. *Brachynervus beijingensis* Wang, 1983. A. Head in frontal view (male); B. Head in frontal view (female); C. Head and mesosoma in lateral view; D. Head and mesosoma in dorsal view; E. Wings; F. Mesosoma in ventral view. Scale bars: A, B, 0.5 mm; C, D, F, 1 mm; E, 2 mm.

Material examined. [South Korea] 1♀, Gyeonggi-do, Namyangju-si, Wabu-eup, Dogok-ro, Korea Univ., Deokso Farm, 15-27.viii.2011, J.W. Lee (DNUE_IIED); 1♂, Gyeongsangnam-do, Hapcheon-gun, Gahye-ri, 17.viii.1986, J.Y. Cha (DNUE_IIED); 1♀, Gyeongsangbuk-

do, Pohang-si, Jukjang-ri, Haok valley, Malaise trap, 2.ix.2004, M.G. Baek (NNIBR).

Distribution. South Korea (new record), China.

Region. Eastern Palaearctic.

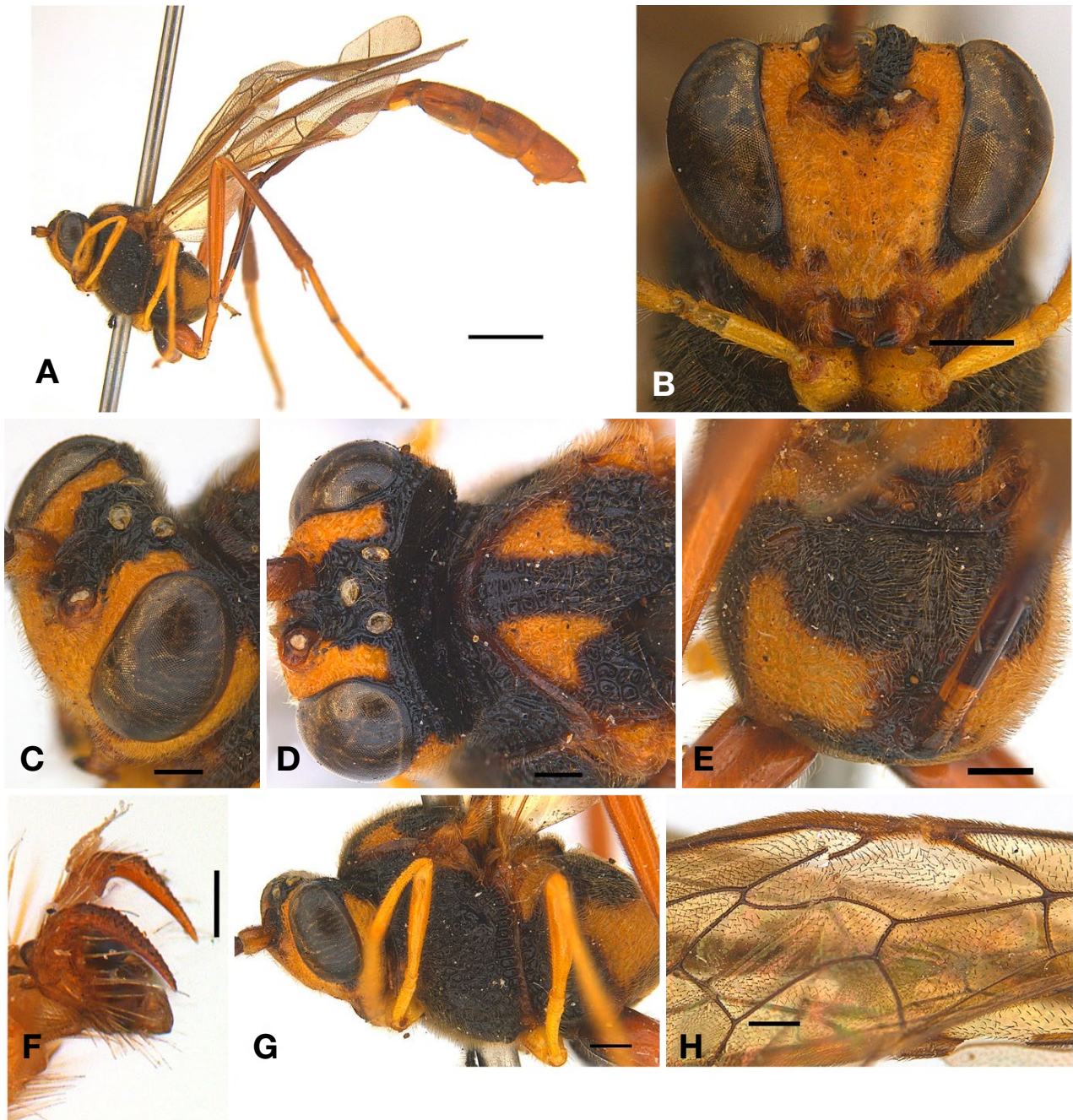


Fig. 3. *Brachynervus confusus* Gauld, 1976. A. Habitus in lateral view; B. Head in frontal view; C. Frons median horn; D. Head and mesoscutum in dorsal view; E. Propodeum; F. Hind tarsal claw; G. Head and mesosoma in lateral view; H. Fore wing. Scale bars: A, 2 mm; B-E, G, H, 0.5 mm; F, 0.1 mm.

***Brachynervus confusus* Gauld, 1976 (Fig. 3)**

짧은그물등자루맵시벌 (신칭)

Brachynervus confusus Gauld, 1976: 1-135. Type: female. Type depository: NHM.

Male. *Color.* Generally black and reddish brown (Fig. 3A). Face, temple and malar space yellow (Fig. 3B),

mandible yellow except apical part black, frons black, without yellow triangular spots on behind eyes (Fig. 3C). Antennal scape yellow, flagellomeres yellow to brown. Mesosoma black (Fig. 3G), with yellow spot on the anterior parts of lateral lobes of mesoscutum (Fig. 3D). Tegular and scutellum yellow. Fore and mid legs yellow; hind leg brown, trochanter, trochantellus, and

tarsus yellowish brown. Propodeum black with yellow spots on anterior and posterior areas (Fig. 3E). Metasoma brown to reddish brown.

Head: Face reticulated; inner orbits of eyes convergent toward below; frons with median longitudinal horn; distance of between lateral ocelli as long as the distance of between lateral ocellus and eye; diameter of lateral ocellus 1.71 times as long as the distance of between lateral ocelli; clypeus separated from face by a distinct deep groove. Mandible bidentate and twisted, lower tooth slightly shorter than upper tooth. Malar space 1.25 times as long as basal mandibular width. Occipital carina incomplete, occiput polished.

Mesosoma: Pronotum reticulate, with transverse striae on the ventral area. Mesoscutum reticulate, with weak notaulus line, median lob of between notauli with transverse striae. Propodeum reticulate, short and thick, without pleural carina and postpectal carina. Hind tarsomeres 20 : 12.3 : 9 : 3.3 : 6.3; tarsal claws simple and strongly curved (Fig. 3F). M&Rs (basal vein) opposite to 1Cu-a (nervulus); vein 2rs-m of fore wing far (approximately 8.3 times as long as 2rs-m) basad of 2m-cu; areolet absent (Fig. 3H).

Metasoma: Metasomal tergites compressed.

Material examined. [South Korea] 1♂, Chungcheongnam-do, Seosan-si, Haemi-myeon, Daegok-ri, Hanseo Univ., 20.vii-24.viii.2011, J.K. Choi (NNIBR-NNIBRIN 194912); 1♂, Gyeonggi-do, Namyangju-si, Mt. Bulam, 25.viii.1993, N.R. Kim (DNUE_IIIEI).

Distribution. South Korea (new record), China, India.

Region. Eastern Palaearctic, Oriental region.

CONFLICTS OF INTEREST

The author of this paper has no affiliation with any interests and is solely responsible for the paper.

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