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First Record of the Genus *Brachydeutera* Loew (Diptera: Ephydriidae) from Korea

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한국 미기록속 *Brachydeutera* Loew의 보고

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ABSTRACT: The genus *Brachydeutera* Loew, 1862 comprises a small group of Acalyptratae flies belonging to the subfamily Ephydrinae of the family Ephydriidae. So far, 16 described species have been recorded worldwide, and although the genus occurs in all fauna regions, it is most diverse in the subtropics and tropics, particularly in Africa and Asia. This genus has been recorded for the first time in the Korean fauna based on the discovery of a nominated species, *B. meridionalis* (Rondani, 1856). This paper provides the diagnosis, the morphological features, and an ecological photograph of the first recorded species.

Key words: *Brachydeutera meridionalis*, Ephydriidae, New record, Korea

조 록: *Brachydeutera* Loew, 1862(코주부물가파리속, 신칭)는 물가파리과, 물가파리아과에 속하는 작은 분류군이다. 지금까지 이 속에는 전 세계적으로 16종이 기록되어 있으며, 모든 동물구계에서 발견되지만 아열대 및 열대 지방, 특히 아프리카와 아시아에서 종 다양성이 풍부하다. 본 연구를 통해 *Brachydeutera*속을 국내 미기록종 *B. meridionalis* (Rondani, 1856)(코주부물가파리, 신칭)과 함께 처음으로 보고하며, 이 종에 대한 진단 형질, 형태학적 사진 및 생태사진을 제공하였다.

검색어: 코주부물가파리(신칭), 물가파리과, 미기록, 한국

The genus *Brachydeutera* Loew, 1862 belongs to the subfamily Ephydrinae of the family Ephydriidae, and 16 species have been recorded worldwide. This genus is observed in all fauna regions, but it is most diverse in the subtropics and tropics, particularly in Africa and Asia (Mathis and Zatwarnicki, 1995; Mathis and Winkler, 2003; Mathis et al., 2021). The species of this genus occur in most lentic habitats that are small and quiet, such as ponds and puddles, but are abundant in relatively stable sites and places with permanent water sources,

significant pollution, and aquatic weeds. Adult flies feed on fine particles, particularly decomposing organic matter, and skim them from the water surface using their labella (Fig. 1). Most larvae are epipelagic swimmers preferring shallow water and feeding primarily on decaying microscopic plants or animal materials (Mathis and Ghorpadé, 1985; Mathis and Steiner, 1986; Mathis and Winkler, 2003; Keiper, 2009). Some species are also found in coastal marine habitats, including mangrove swamps (Foote, 1995). *B. hebes* (Cresson, 1926) has been reported as a parasite of the liver fluke snail (*Lymanaea ollula* Gould) from Hawaii (Mathis and Zatwarnicki, 1995).

This genus was discovered for the first time in Korean

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Fig. 1. Adult of *Brachydeutera meridionalis* (Rondani) feeding on water.

fauna, with a nominated species, *B. meridionalis* (Rondani, 1856). This paper provides the diagnoses and illustrates the external features and male genitalia of this species.

Materials and Methods

All voucher specimens examined in this study were deposited in the collection of the School of Applied Biosciences at Kyungpook National University, Daegu, Korea. Morphological characteristics of the adults and their genitalia were observed under a stereoscopic microscope (Olympus SZX 16) or compound microscope (Olympus BX50). Pictures were obtained using a Michrome 16 CMOS camera (Tucsen, Fujian, China).

The following abbreviations for the provinces were used: GW (Gangwon-do), CB (Chungcheongbuk-do), DG (Daegu-si), GB (Gyeongsangbuk-do), GN (Gyeongsangnam-do), and JB (Jeollabuk-do).

Results

Systematic accounts

Order Diptera Linnaeus, 1758
Superfamily Ephydroidea Hendel, 1922
Family Ephyridae Zetterstedt, 1837
Subfamily Ephydrinae Zetterstedt, 1837
Tribe Dagini Mathis, 1982

Genus *Brachydeutera* Loew, 1862 **코주부물가파리속 (신칭)**

Brachydeutera Loew, 1862: 162.

Type species: *Brachydeutera dimidiata* Loew (= *Notiphila argentata* Walker).

Diagnosis. Frons much wider than long, microtomentose; 2-3 laterocline fronto-orbital setae; 1 pair of cruciate interfrontal setae; face generally bare except for 3-12 lateral setulae, with prominent mediovertical carina; clypeus conspicuous; pedicel without prominent dorsoapical seta; arista conspicuously pectinate, longest rays subequal to length of postpedicel. Thorax often essentially two-toned with brown mesonotum and whitish gray to gray pleural areas. Costal vein reaching to R_{4+5} ; R_{2+3} not extended beyond level of crossvein dm-m; M beyond crossvein dm-m evanescent (Mathis and Ghorpadé, 1985; Mathis and Winkler, 2003).

Brachydeutera meridionalis (Rondani, 1856) **코주부 물가파리(산칭)** (Fig. 2)

Pegophila meridionalis Rondani, 1856: 129 [type locality: not given (? Italy)].

Notiphila meridionalis: Cogan, 1984: 147 (generic combination).

Brachydeutera meridionalis: Stuke, 2012: 194 (generic combination).

Brachydeutera ibari Ninomyia, 1929: 190 (type locality: Japan, Honshu: Ogahanto).

Diagnosis. Head generally olivaceous to bluish brown; occiput, frons, ridge of facial carina and antenna concolorous, and others silvery white; 3 laterocline fronto-orbital setae present; 1 cruciate interfrontal seta present, as long as ocellar seta; facial carina acutely pointed ventrally, extended from ptilinal fissure to epistoma; epistomal margin of face broadly emarginate medially; palpus slender, yellow; clypeus and labellum conspicuous, yellow to dark brown; prementum stout, gray; pedicel without prominent dorsoapical seta; arista conspicuously pectinate with 9-11 rays, longest one subequal to the length of postpedicel (Fig. 2A-C). Thorax with olivaceous to bluish brown dorsum, with darker narrow vittae on acrostichal and dorsocentral tracks; brownish coloration of scutum continued ventrally to dorsal one-fifth of anepisternum, thereafter abruptly delimited from grayish to silvery white coloration of ventral portion of pleural areas; anterior notopleural seta weaker than posterior seta; 1 strong anepisternal and 1 katepisternal setae present. Legs mostly yellow to brown; all coxae grayish

to silvery white; tibiae becoming gradually darker toward apex; tarsomeres dark brown. Wing hyaline; costal vein reaching to R_{4+5} ; R_{2+3} not extended beyond the level of crossvein dm-m; M beyond crossvein dm-m evanescent; calypter whitish yellow; halter yellow to brown. Abdomen with brown to dark brown tergites, each posterior margin slightly gray; sternites grayish to silvery white; epandrium + surstyli tongue-like, apex bluntly rounded; gonite slender club-shaped with base subrectangular; distiphallus tongue-like in dorsal view (Fig. 2D-G).

Body length: 3.4-4.4 mm.

Materials examined. 7♂9♀, Haseo-myeon, Buan-gun, JB, Korea, 35.695656°N 126.571010°E, 23.V.2006; 14♀, Mt.Bonghwabong, Byeonsan-myeon, Buan-gun, JB, Korea, 35.614327°N 126.469659°E, 23.V.2006; 4♂15♀, Sangnok Beach, Byeonsan-myeon, Buan-gun, JB, Korea, 35.599722°N 126.482222°E, 23.V.2006; 2♀, Mt.Ugeumsan, Sangseo-myeon, Buan-gun, JB, Korea, 35.695708°N 126.669194°E, 24.V.2006; 2♂3♀, Mt.Cheontaesan, Deokcheon-myeon, Jeongeup-si, JB, Korea, 35.642873°N 126.802668°E, 25.V.2006; 1♂2♀, Mt.Poamsan, Mungyeong-eup, Mungyeong-si, GB, Korea, 36.799413°N 128.180032°E, 04.VI.2006; 1♀, Mt.Balchibong, Salmi-myeon, Chungju-si, CB, Korea, 36.928322°N 127.961201°E, 06.VI.2006; 16♂17♀, Angolpo, Jinhae-si, GN, Korea, 35.093465°N 128.793826°E, 17.VI.2006; 11♂14♀, Ungcheon-dong, Jinhae-si, GN, Korea, 35.083363°N 128.766672°E, 17.VI.2006; 1♂, Mt.Obongsan, Goesan-eup, Goesan-gun, CB, Korea, 36.796892°N 127.813734°E, 21.VIII.2006; 4♀, Angolpo, Jinhae-si, GN, Korea, 35.093465°N 128.793826°E, 26.VIII.2006; 1♂4♀, Sangnok Beach, Byeonsan-myeon, Buan-gun, JB, Korea, 35.599722°N 126.482222°E, 03.IX.2006; 17♂13♀, Bangyul-ri, Giseong-myeon, Uljin-gun, GB, Korea, 36.809182°N 129.393653°E, 07.VI.2007; 3♂2♀, Cheongcheon-ri, Hayang-eup, Gyeongsan-si, GB, Korea, 35.875277°N 128.772222°E, 16.IX.2007, 1♂1♀, Chungdo Reservoir, Soi-myeon, Eumseong-gun, CB, Korea, 36.905555°N 127.731666°E, 04.X.2007; 5♂5♀, Mt.Giusan, Jeongseon-eup, Jeongseon-gun, GW, Korea, 37.212504°N 128.385863°E, 10.VI.2016; 4♂5♀, Mt.Giusan, Jeongseon-eup, Jeongseon-gun, GW, Korea, 37.215725°N 128.410301°E, 02.X.2016; 2♀, Bakgye-ri, Haksan-myeon, Yeongdong-gun, CB, Korea, 36.116275°N 127.670986°E, 23.V.2019; 1♀, Mt.Cheongnyongsan, Daegok-dong, Dalseo-

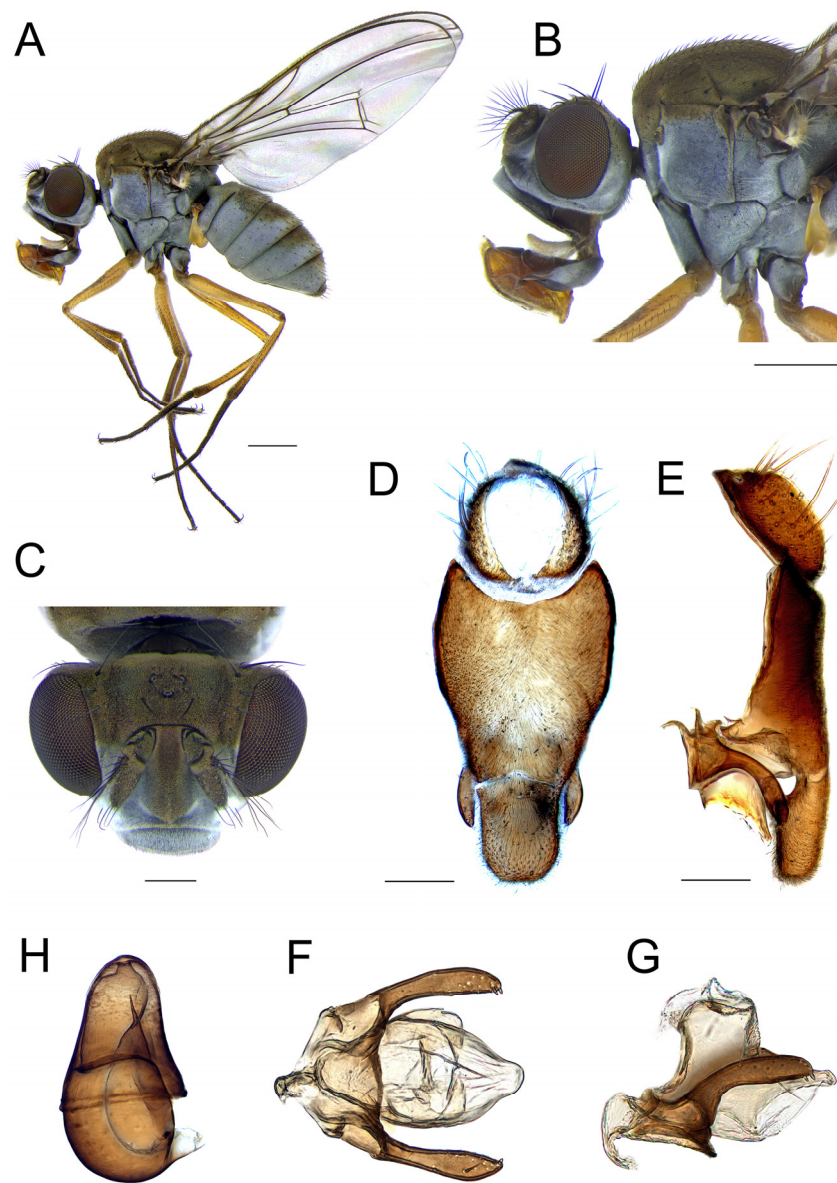


Fig. 2. *Brachydeutera meridionalis* (Rondani, 1856) (A–G: male, H: female). A. habitus, lateral view; B. head, lateral view; C. head, front view; D. terminalia, dorsal view; E. terminalia, lateral view; F. aedeagus, dorsal view; G. aedeagus, lateral view; H. spermatheca, lateral view. Scale bars: A–B = 0.5 mm; C = 0.2 mm; D–H = 0.1 mm.

gu, Daegu, Korea, 35.789260°N 128.535671°E, 28.VII.2019; 1 ♀, Mt.Soyosan, Buan-myeon, Gochang-gun, JB, Korea, 35.516490°N 126.612608°E, 12.V.2020; 3♂ 10 ♀, Is.Munyeodo, Okdo-myeon, Gunsan-si, JB, Korea, 35.803408°N 126.422065°E, 04.IX.2020; 1 ♀, Baekgu Park, Bakgu-myeon, Gimje-si, JB, Korea, 35.908005°N 126.952005°E, 15.X.2020; 6♂ 11 ♀, Is. Seonyudo, Okdo-myeon, Gunsan-si, JB, Korea, 35.821121°N 126.413183°E, 22.IV.2023.

Distribution. Palearctic: Korea (new record), Japan (Honshu), Russia (Far East), Egypt, Israel, Madeira Islands, United Arab Emirates; Australasian/Oceanian: Hawaii; Oriental: China, Bonin Islands, Taiwan (Mathis and Zatwarnicki, 1995; Mathis and Winkler, 2003).

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Statements for Authorship Position & Contribution

Kim, D.: Kyungpook National University, Student in Ph.D;
Designed the research, wrote the manuscript and examined specimens

Kim, J.: Kyungpook National University, Student in Ph.D;
data arrangement

Suh, S.J.: Kyungpook National University, Professor, Ph.D;
Examined specimens and designed the research

All authors read and approved the manuscript.

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