

First Record of the Family Curtonotidae (Diptera: Ephydroidea) from Korea with One Unrecorded Species

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ABSTRACT

The family Curtonotidae, known as the Hunchbacked or Quasimodo fly, is a small group of acalyptrate flies belonging to the superfamily Ephydroidea. Until now, a total of 103 species under four genera have been recorded worldwide, mainly distributed in tropical and subtropical areas. Among them, only five species of the genus *Curtonotum* Macquart, 1843 have been recorded in the Palaearctic region, mainly in the Russian Far East, but there are still no previous reports in the Korean fauna. In this study, we firstly report the family Curtonotidae Duda, 1934 from Korea with *Curtonotum maritimum* Ozerov, 2007. Additionally, we provide taxonomic information and a key for the Palaearctic *Curtonotum* species.

Keywords: Curtonotidae, *Curtonotum maritimum*, Diptera, first record, Korea

INTRODUCTION

The family Curtonotidae known as the Hunchbacked or Quasimodo fly, is a small group of acalyptrate flies comprising 103 recorded species in four genera, *Axinota* van der Wulp, 1886, *Cyrtona* Seguy, 1938, *Curtonotum* Macquart, 1843 and *Tigrisomyia* Kirk-Spriggs, 2010, and is mainly distributed in tropical and subtropical areas such as Afrotropical and Neotropical regions. Among them, only five species, *Curtonotum amurensis* Ozerov 2007, *C. anus* (Meigen, 1830), *C. maritimum* Ozerov 2007, *C. shatalkini* Ozerov, 2007 and *C. simile* Tsacas, 1977, have been recorded in the Palaearctic region. This family is superficially resembled the family Drosophilidae and was previously treated as a lower taxon of the families Drosophilidae or Diastatidae (Hendel, 1917; Duda, 1924). Duda (1934) treated it as a separate family, Curtonotidae which was widely accepted in later studies (Hackman, 1960; Hennig, 1973; Kirk-Spriggs, 2021).

The biology of species of this family is poorly known. Adults of *Curtonotum anus* were collected from sandy areas in Hungary, suggesting that their habits are likely those of

locust parasitoids or egg predators (Papp, 1998). Adults of several *Curtonotum* species have been collected or found on various kinds of dung, and some African species have been found in the burrows of warthogs and porcupines (Papp, 1998; Kirk-Spriggs and Freidburg, 2007; Klymko and Marshall, 2011; Kirk-Spriggs, 2021). Also, some Nearctic species are found on dung baits and in association with tree falls (Mello and Pereira-Colavite, 2018).

This family can be diagnosed as the following combination of characters: small to medium sized (2.2–12.0 mm) with hunchbacked appearance; coloration from pale beige to dark brown; postocellar setae strong and convergent; anepisternal setae present; wing hyaline, darkened over crossveins, infuscated or distinctly patterned, with basal medial and discal median cell; arista plumose, with long dorsal and ventral rays; costal vein with humeral and subcostal breaks; subcostal vein complete, ending in costa; aedeagus large and C-shaped with anteroventrally directed distiphallus; two spermathecae present (Kirk-Spriggs and Freidberg, 2007; Klymko and Marshall, 2011; Kirk-Spriggs, 2021).

There have been no records of this family in Korea yet,

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and we recently discovered *Curtonotum maritimum* Ozerov, 2007 for the first time in the Korean fauna. Therefore, in this paper, family Curtonotidae Duda, 1934 is recorded for the first time in Korea.

MATERIALS AND METHODS

Examined specimens were collected with sweeping and light trap. Morphological characteristics of adults and genitals were observed under a stereoscopic microscope (Olympus SZX 16, Japan) or a compound microscope (Olympus BX50). Photographs of the specimens were taken using the Michrome 16 CMOS camera (Tucsen, Fujian, China). All voucher specimens examined in the present study are deposited in the collection of Department of Plant Medicine at Kyungpook National University (KNU), Daegu, Korea. Terminology follows Kirk-Spriggs (2021).

SYSTEMATIC ACCOUNTS

Order Diptera Linnaeus, 1758

Superfamily Ephydroidea

¹*Family Curtonotidae Duda, 1934

Curtonotidae Duda, 1934: 1. Type-genus *Curtonotum* Macquart, 1843.

Cyrtotoninae Enderlein, 1914: 326 (Nomen nudum).

²*Genus *Curtonotum* Macquart, 1843

Curtonotum Macquart, 1843: 350 (type species: *Musca gibba* Fabricius, 1805 = *Curtonotum taeniatum* Hendel 1913).

Cyrtotonotum Agassiz, 1846: 108 (unjustified emendation of *Curtonotum* Macquart).

Diplocentra Loew, 1862: 13 (unjustified/unnecessary new replacement name for *Curtonotum* Macquart).

Seliacantha Bezzi, 1895: 66 (nomen nudum).

Selidacantha Bezzi, 1895: 66 (nomen nudum: emendation of *Seliacantha* Bezzi, 1895 nomen nudum).

Parapsinota Duda, 1924: 177 (type species: *Drosophila angustipennis* de Meijere, 1911).

Diagnosis. Head dichoptic in both sexes; one strong reclinate, one slightly weaker proclinate and one very small reclinate fronto-orbital setae between these two setae; two dorsocentral and one prescutellar acrostichal setae; scutellum entirely covered with setulae, with 2–3 strong marginal setae; anepisternum with 3–5 moderate to long posterior setae and some short setae on posterior half; fore femur with well-defined

ctenidial comb anteroventrally in apical half; all tibiae with preapical dorsal setae; wing greyish to greybrown infusate, crossvein dm-cu usually markedly infusate; costal vein with humeral and subcostal breaks, and with a variable number of prominent costal spines; aedeagus large and C-shaped, basiphallus and distiphallus fused and asymmetrical (Kirk-Spriggs and Freidberg, 2007; Klymko and Marshall, 2011; Ozerov and Krivosheina, 2013).

³**Curtonotum maritimum* Ozerov, 2007 (Fig. 1)

Curtonotum maritimum Ozerov, 2007: 2 (type locality: Primorskyi Kray, Russia).

Material examined. Korea: Gangwon-do: 1♀, Jeongseong-gun, Sindong-eup, Mt. Jirunsan, 37.208544N, 128.703986E, 23 Jul 2018, SJ Suh Coll. (KNU); 1♀, Yeongwol-gun, Buk-myeon, Mt. Sirusan, 37.231252N, 128.452035E, 31 Aug 2018, Suh SJ Coll. (KNU); 1♀, Samcheok-si, Dogye-eup, Mt. Yukbaeksan, 37.207916N, 129.095941E, 29 Sep 2018, Suh SJ Coll. (KNU); 1♂, Hongcheon-gun, Duchon-myeon, Mt. Garisan, 37.835578N, 127.992476E, 2 Jul 2021, Suh SJ Coll. (KNU); Seoul: 1♂, Gangnam-gu, Segok-dong, 37.463483N, 127.119358E, 9 Aug 2023, Kim JH (KNU); Gyeongsangbuk-do: 1♂1♀, Chilgok-gun, Dongmyeong-myeon, Mt. Palgongsan, Hantiseongji, 36.015313N, 128.625613E, 1 Sep 2020, Suh SJ Coll. (KNU); 3♂2♀, Gyeongju-si, Yangnam-myeon, Mt. Bunggeum-san, 35.717011N, 129.435189E, 13 Sep 2022, Suh SJ Coll. (KNU); Jeollanam-do: 1♀, Boseong-gun, Mundeok-myeon, Mt. Cheonbongsan, 34.956931N, 127.126992E, 13 Jul 2017, Suh SJ Coll. (KNU); 1♀, Hwasun-gun, Cheongpung-myeon, Mt. Guksabong, 34.849150N, 126.910730E, 22 Jul 2017, Suh SJ Coll. (KNU); 1♀, Hwasun-gun, Cheongpung-myeon, Mt. Guksabong, 34.849150N, 126.910730E, 8 Sep 2017, Suh SJ Coll. (KNU); 2♀, Jangheung-gun, Yuchi-myeon, Mt. Ongnyeobong, 34.770412N, 126.832542E, 10 Sep 2017, Suh SJ Coll. (KNU).

Description. Body length: male 7.5–7.9 mm, female 7.6–8.3 mm. Head yellow to beige in ground color; ocellar triangle with creamy pollen; frons orange-beige with bulge ventrally, narrow lateral frontal vitta extending from occipital sclerite nearly to ventral margin of frons with creamy pollen, lateral margin covered with narrowly creamy pollen, broad as half of head width in both sexes; one long reclinate, one slightly weaker proclinate and one very fine reclinate fronto-orbital setae between these two setae; antennal base with yellowish short setulae irregularly; antenna orange-beige with lightly creamy pollen, apical margin of postpedicel rounded; arisal rays long plumose, the longest one slightly longer than

Korean name: ¹*곶등파리과 (신칭), ²*곶등파리속 (신칭), ³*곶등파리 (신칭)

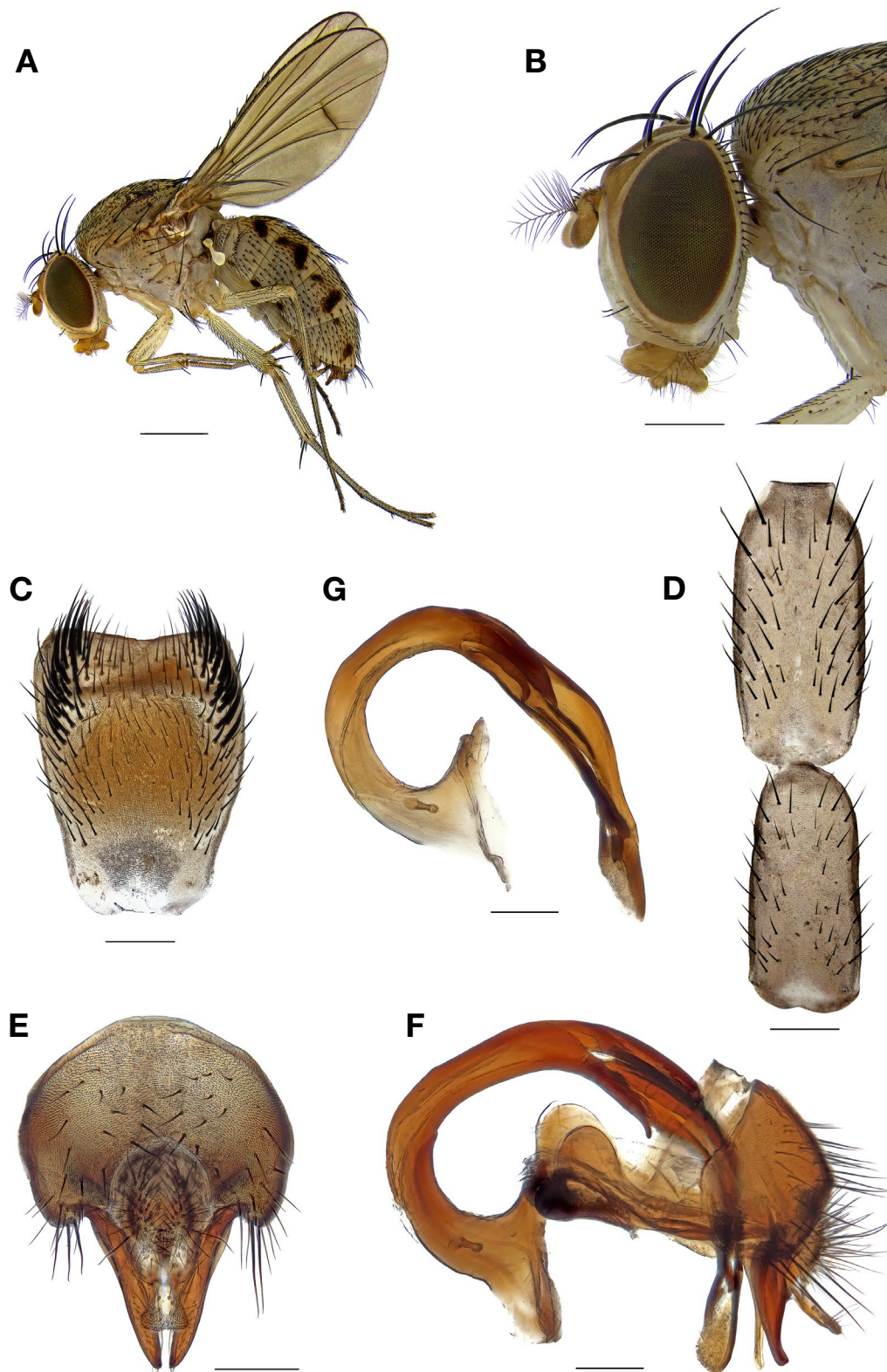


Fig. 1. *Curtonotum maritimum* Ozerov, 2007, male. A, Habitus, lateral view; B, Head, lateral view; C, Fifth sternite, dorsal view; D, Third and fourth sternites, dorsal view; E, Terminalia, dorsal view; F, Terminalia, lateral view; G, Aedeagus, lateral view. Scale bars: A=1 mm, B-D=0.5 mm, E-G=0.2 mm.

postpedicel; vibrissal seta slightly longer than twice of subvibrissal setae, but not over three times; subvibrissal setae from vibrissal seta to facial ridge almost 9–10, sometimes 8; face and gena with creamy pollen; palpus and proboscis yellow to beige (Fig. 1A, B). Thorax yellow to beige in ground color with creamy pollen; scutum dark with white pollen, lateral brown vittae extended to scutoscutellar suture; acrostichal seta 0 + 1; dorsocentral setae 0 + 2; scutellum dark with short lied setulae densely and pollen on dorsal surface, two lateral scutellar setae; two postpronotal setae; two notopleural setae; one proepisternal seta; anepimeron with two strong setae along posterior margin and some short setae on posterior part; one strong katepisternal seta. Wing lightly brown infusate, crossvein dm-cu markedly infusate; costa with 6–9 spines, gradually shortened towards apex; halter beige. Legs yellow to beige with creamy pollen; fore femur with four posterodorsal setae, and 13–20 anteroventral ctenidial spine in apical half; fore tibia with one preapical dorsal seta; mid femur with a row of anterior setae and 5 subapical posteroventral setae, the apical one strong; hind femur with one preapical anterodorsal seta. Abdomen conical form, yellow to beige with lightly creamy pollen; tergite 3–5 with acute isosceles triangle-like black medial vitta; tergites 2–5 with incomplete black lateral vittae, and a dark spot on each anterior margin; sternite 4 slender, slightly more than twice as wide as long; sternite 5 slightly concave medially with numerous robust setae in two groups laterally (Fig. 1C, D); aedeagus large and C-shaped, basiphallus and distiphallus fused and asymmetrical (Fig. 1E–G).

Distribution. Korea (new record), China (Gongzhuling), Russia (Primorskyi Krai).

Key to the Palaearctic species of the family Curtonotidae

1. Male sternite 5 with apical conical extension medially..... *C. anus* (Meigen)
 - Male sternite 5 without apical conical extension medially 2
2. Male sternites 5 without numerous robust setae 3
 - Male sternites 5 with numerous robust setae in two groups 4
3. Male sternite 4 about as wide as sternite 5 *C. simile* Tsacas
 - Male sternite 4 much narrower than sternite 5 *C. shaltalkini* Ozerov
4. Male sternite 4 less than 1.5 times as wide as long; rows of setae on male sternite 5 close to each other in the middle of sternite..... *C. amurensis* Ozerov
 - Male sternite 4 slightly more than twice as wide as long; rows of setae on male sternite 5 distant *C. maritimum* Ozerov

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CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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