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New species of *Damalis* Fabricius (Diptera: Asilidae) from Thailand and China

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Abstract: *Damalis bigoti*, **new species**, from Thailand, and *D. candonensis*, **new species**, from China, are described, illustrated, and compared with known species from these regions.

Key words: Asilidae, *Damalis*, new species, Thailand, China.

Introduction

Damalis Fabricius 1805 is a widely distributed asilid genus in the Afrotropical and Oriental regions (Oldroyd 1975). It currently contains 109 species of which most are from Africa and India (Oldroyd 1975, Londt 1989; Joseph and Parui 1984a, 1984b, 1985, 1987, 1990; Geller-Grimm 1997). Sparse collecting in the more eastern continental areas of Asia has yielded only 22 species, *i.e.* eleven from China (Shi 1995) and eleven from Southeast Asia (Scarbrough 2005). Recently collected materials received from IRSNB (Institut Royal des Sciences Naturelles de Belgique, Brussels) contained two undescribed species, one from China and the other from Thailand. These species are described here and the right wing, hind leg, and terminalia illustrated, increasing the number of species to 24 from these countries.

Morphological terminology follows McAlpine (1981). Measurements were made using an ocular micrometer in a Meiji dissecting microscope and follow the techniques of Londt (1989). Terminalia were prepared for study and illustrated following Scarbrough (2005). Male terminalia are illustrated in their usual rotated (180°) position. Thus, the hypandrium and epandria are in dorsal and ventral positions, respectively. Terminalia are illustrated in different positions [lateral, dorsal and ventral views], all at the same scale. Data are recorded as they appear on labels with each line denoted by a forward slash [/]. Months are recorded as Roman numerals. The types of the new species are deposited in IRSNB. Acronyms of institutions follow Arnett *et al.* (1993).

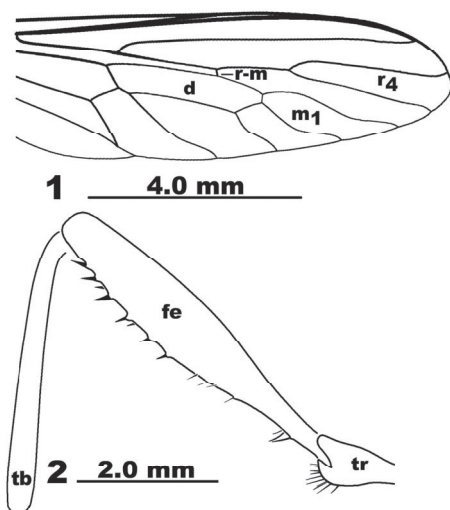
Taxa

Damalis bigoti Scarbrough

new species

(Figs. 1-2, 5-7)

Male. Body and legs largely yellow. Measurements, body 12.5-13.0 mm, wings 11.3-11.5 mm. *Head:* Blackish. Face and frons dark brownish-yellow tomentose; mystax with five black bristles and sparse, short, black setae. Palpus brown apically, brownish-yellow basally, yellowish setose. Proboscis thick basally, black with base and venter narrowly brownish-yellow; yellow setose ventrally, black apically. Antenna blackish, black setose, scape with one black seta longer than three antennal segments combined. Occiput dark brownish-yellow tomentose, yellow setose. *Thorax:* Mostly yellow to brownish-yellow. Mesoscutum with wide median and narrow lateral black stripes and brownish tomentum, tomentum otherwise brownish-yellow or yellow; lateral setae yellowish, acrostichal setae brown. Scutellum yellow, yellow tomentose and setose; preapical groove present. Mediotergite blackish, darkest laterally, anatergite yellow, yellow tomentose. Pleura and metacoxa, mostly yellow, yellow tomentose, with sparse yellow vestiture, anepisternum, katapisternum, and meron blackish; haltere yellow. *Wing* (Fig. 1): Surface mostly hyaline with sparse pale microtrichia; apical 1/4 and narrow anterior margin brownish, color extending posteriorly to base of Rs and R₂₊₃. Crossvein r-m beyond apical 2/3, about as long as base of cell m₁. Cell m₁ constricted preapically, base narrow, much wider before constriction. *Legs:* Yellow with black vestiture, narrow apices of femora and tibiae, and apical tarsomere brown. Coxae yellow, hind



Figures 1-2. Wing and hind leg of *Damalis bigoti*, n. sp.
Abbreviations, r-m=radial-medial crossvein, r₄, m₁, d=radial, medial, discal cells; tr=trochanter, fe=femur, tb=tibia.

coxa brownish-yellow tomentose, yellow setose. Hind trochanter (Fig. 2) and all femora with black bristles ventrally, sparse thin bristles below fore and middle femora, shorter, thicker, and abundant below hind trochanter, sparser below hind femur. Hind femur (Fig. 2) club-shaped, basal 1/3 narrow, much wider beyond with greatest diameter of club 3.2 times greater than base; apical 1/2 with two rows of stout bristles, long setae absent ventrally. Tibiae with sparse bristles, setae longer, most abundant apically. Hind tibia (Fig. 2) slender, about as long as hind femur, apex twice as wide as base. Tarsi with abundant black setae, especially ventrally; pulvillus yellow, brownish-yellow basally; claws yellow basally, black apically.

Abdomen: Slender, segment 5 only slightly wider than segment 2. Tergites mostly sooty brownish-yellow to yellow with narrow apex black, tergite 1 black; black setose. Sternites yellow, yellow tomentose, with sparse, yellow setae; sternite 1 brownish-yellow; sternites 2-7 without tomentum medially. **Terminalia** (Figs. 5-7): Brownish-yellow with abundant long black setae. Epandrium short, apex wide and truncate; notch between epandria narrow. Cercus and ventral lamella rounded apically. Gonostylus flat, hooked in ventral view, apex curved inward, producing thicker, spine-like appearance in lateral view. Gonocoxal process longer than epandrium. Aedeagus tubular apically, with flat

process ventrally. Hypandrium produced medially, notched laterally.

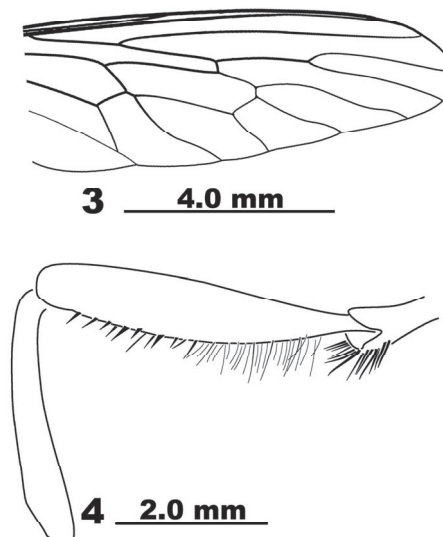
Female. Unknown.

Types. **THAILAND**, holotype M, I. R.Sc.N.B.~ Thailand Loei-Na / Haeo [Province] Khiring Tok / 19.v.2003 (23041) / Leg. P. Grootaert. Paratype, 1 M, Thailand, Proc. Loei / Na Haeo, Chang Tok / waterfall, day catch / 18.v.2003 / Leg. K. Smets.

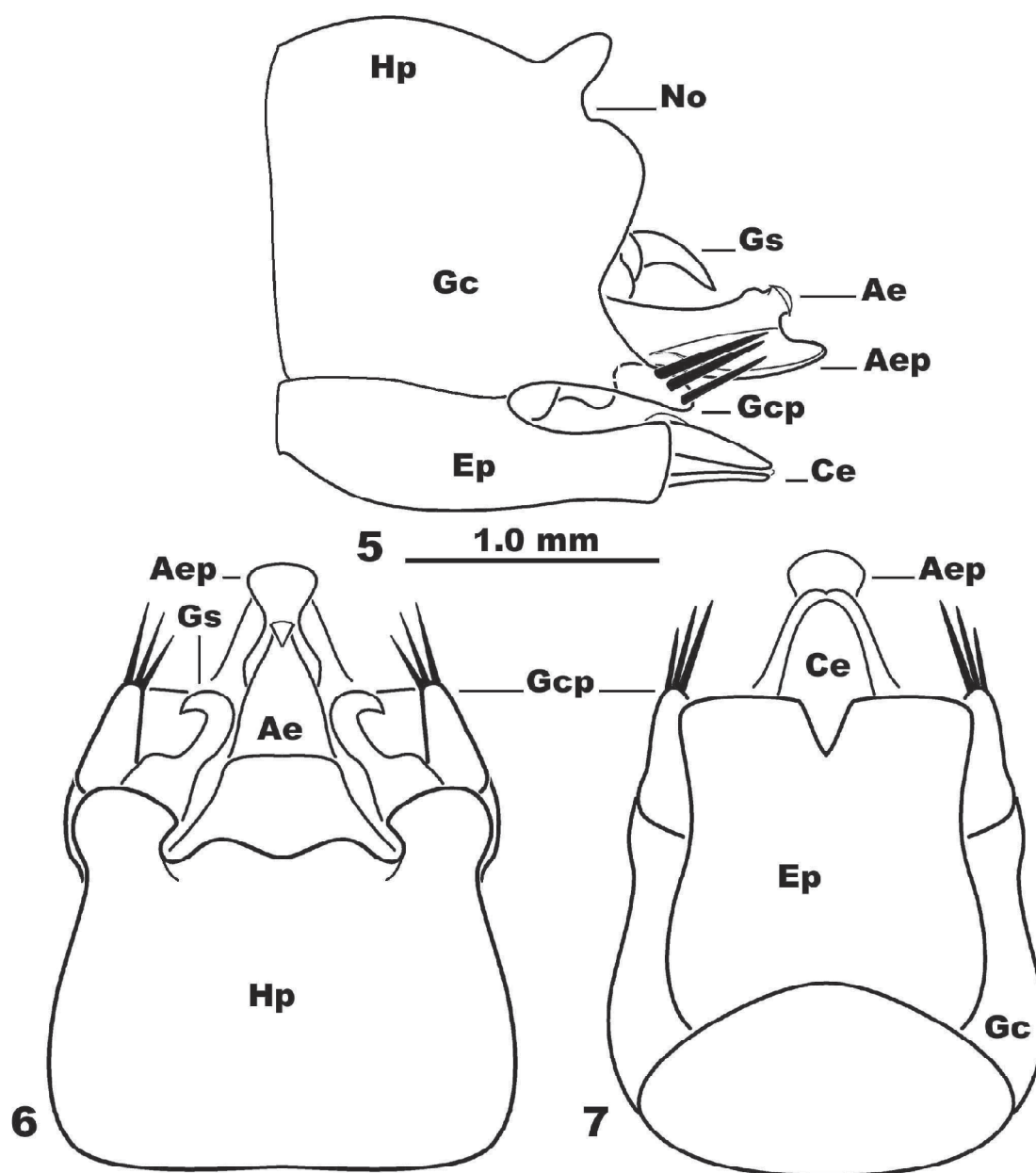
Etymology. The name is in honor of Jacques M. F. Bigot for significant contributions to dipterology and the first to describe a species in the genus *Damalis*.

Remarks. *Damalis bigoti* keys to *D. flaventis* Scarbrough (2005) in the most recent treatment of the genus from SE Asia. The insert of the following couplet will modify the key (couplet 7) for separating the two species:

7. Metacoxa yellow; hind trochanter yellow or brownish-yellow 7a
— Metacoxa dark, brown or black 8
- 7a. Mesopleuron mostly yellow, anepisternum, katepisternum, and meron brownish; hind femur yellow, narrow apex blackish, stout bristles present on apical 1/2 ventrally; hind tibia slender, straight, about as long as hind femur; abdomen mostly yellow, tergite 1 blackish; wing



Figures 3-4. Wing and hind leg of *D. candonensis*, n. sp.



Figures 5-7. Lateral, dorsal, and ventral views of the terminalia of *Damalis bigoti*, n. sp. Abbreviations, Ae=aedeagus, Aep=aedeagal process, Ce=cercus, Ep=epandrium, Gc=gonocoxite, Gcp=gonocoxal process, Gs=Gonostylus, Hp=hypandrium, No=notch, Vi=ventral lamella.

surface mostly hyaline, narrow anterior and apical 1/4 brownish, with sparse pale microtrichia *bigoti*, n. sp.

- Mesopleuron black; hind femur with wide brown band medially, stout bristles well before apical 1/2; hind tibia swollen, slightly curved, shorter than hind femur; tergites 4-7 mostly to entirely blackish; wing surface yellowish with abundant dense yellow microtrichia *flaventis* Scarbrough.

Damalis bigoti is further recognized from *D. flaventis* (Scarbrough 2005) and other regional congeners by the combined characters of the terminalia (Figs. 5-7), especially the abundant long setae, flat, apically hooked gonostylus, the flat aedeagal process below the distiphallus, the narrow, shallow notch between the wide, apically truncate epandria, and the elongated ventral corner of the gonocoxite. The characters listed for *D. bigoti* in the

modified couplet also separate it from *Damalis londti* (Scarbrough 2005), another yellowish species from Thailand. The latter species is further distinguished from *D. bigoti* by its mostly blackish pleura, dark metacoxa, coxae and hind trochanter, mostly black hind femur, and entirely hyaline wing.

***Damalis candonensis* Scarbrough**

new species

(Figs. 3-4, 8-10)

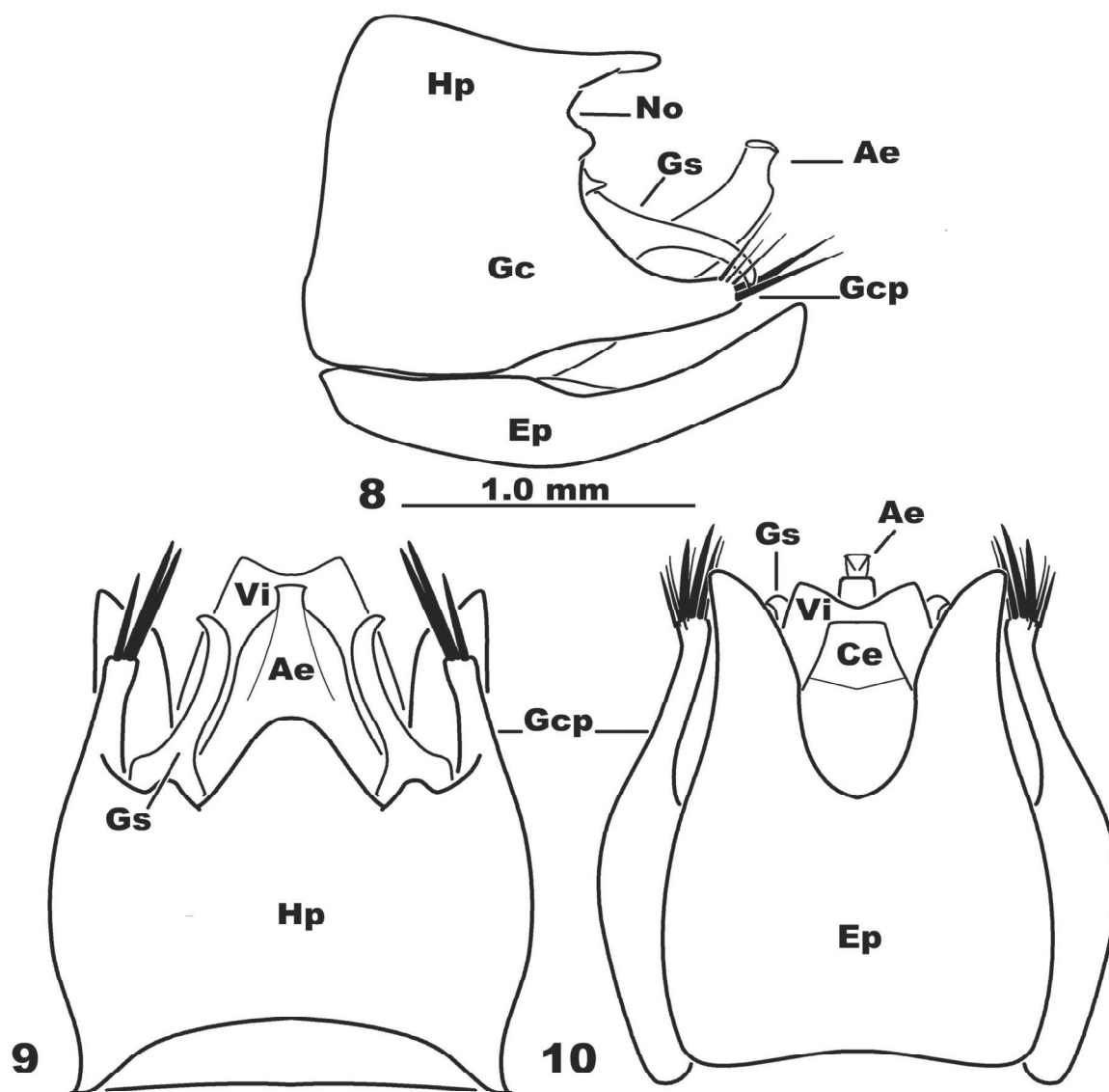
Male. Body and legs largely black. Measurements, body 15.0 mm, wings 11.3 mm. *Head:* Black with brownish-black to black tomentum. Face with sparse, mostly short, black setae, longest just above bristles, 1/3-1/2 as long as mystax bristles; mystax with four black bristles. Palpus, proboscis, antenna, and ocellar tubercle black, black setose; proboscis unusually narrow in lateral view; scape with thin black setae, none extending beyond base of flagellum. Occiput with mostly sparse pale setae; two or three black setae ventrally. *Thorax:* Entirely black. Mesoscutum with wide middle and lateral stripes black tomentose, postpronotal spot, narrow sides, and prescutellum brownish-yellow; setae sparse, dorsal setae black, lateral and prescutellar setae pale. Scutellum brownish-yellow tomentose with pale scattered setae and preapical groove; apical margin polished black. Pleura mostly brownish-yellow tomentose, anepisternum blackish; vestiture yellow; haltere yellow. *Wing* (Fig. 3): Surface brownish, darkest anteriorly, extending posteriorly to r-m crossvein, with abundant blackish microtrichia, microtrichia sparse posteriorly. Crossvein r-m at apical 1/4 of discal cell, about as long as base of cell m_1 . Cell m_1 constricted preapically, base narrow, much wider before constriction. Cell r_4 unusually narrow. *Legs.* Coxae, trochanters, and tarsi entirely black; femora and tibiae black apically, color extending to or near base anteriorly on fore and middle femora and fore and hind tibiae; hind femur with wide black band medially; color brownish-yellow elsewhere. Coxae and fore and middle trochanters pale setose; hind trochanter (Fig. 4) black setose, abundant stout setae ventrally. Femora, tibiae and tarsi with black vestiture, often long and thin ventrally; ventral 1/2 of hind femur with two rows of setigerous bristles. Hind femur (Fig. 4) gradually wider from base to widest diameter, greatest diameter of club only slightly greater than basal 1/3; apical 1/2 with two rows of short bristles ventrally, basal 1/2 with abundant long setae. Hind tibia (Fig. 4) gradually swollen from base to apical

1/5, abruptly narrowed dorsally to apex, greatest diameter slightly less than twice that of base; shorter than length of hind femur. Tarsi with pulvillus yellow; claws black, hooked apically, yellow basally. *Abdomen:* Spatulate, diameter of segment 5 twice as wide as segment 2. Yellow, brownish-yellow dorsally, somewhat sooty glabrous, without noticeable tomentum; tergites 1 and 7 mostly blackish, narrow apices of tergites 5 and 6 blackish; setae black. Sternites yellow, yellow tomentose, with sparse yellow setae; sternite 1 dark, blackish tomentose. *Terminalia* (Figs. 8-10): Brownish-yellow, apically black; setae blackish. Cercus black, truncate apically. Ventral lamella V-shaped. Epanthrium long, apically pointed, epanthrial notch wide and deep. Gonocoxal process subequal to epanthrium. Gonostylus narrow, slightly hooked apically. Distiphallus narrow, tubular apically, apex slightly turned dorsally, wider and abruptly narrowed ventrally before apex. Hypandrium strongly produced medially, shorter than gonocoxite in lateral view, with abundant setae.

Female. Measurements, body 14.0 mm, wings 12.5 mm. *Head:* Dorsal and ventral occipital setae blackish. *Legs:* Fore femur entirely black anteriorly, brownish-yellow posteriorly. Anterior 1/3 of middle femur posteriorly, narrow preapical band; narrow base of hind femur brownish-yellow. Hind femur with two rows of setigerous bristles on apical 2/3. Tibiae black except fore and middle tibiae posteriorly and basal 1/2 of hind tibia. *Abdomen:* Strongly spatulate. Entirely black with bluish reflections dorsally and black setae, pale brownish-yellow tomentose ventrally with sparse yellow setae, each sternite with one to three small polished spots, often triangular-shaped, medially; sternite 1 blackish tomentose.

Types. **CHINA**, holotype M.R.ISc.N.B.~ China, Nanling [National Nature Reserve] / Manshan Goangdong [Province] / forest 1500 meters / 8.v.2004 (24009) / Leg. P. Grootaert. Paratype, 1 F, R.ISc.N.B.~ China, Nanling [National Nature Reserve] / Ruyuan / Goangdong [Province] forest / forest near entrance / park / 8.v.2004 (24008) / Leg. P. Grootaert.

Etymology. The name, *candonensis*, is a combination of Candon, an obsolete French transliteration of the 'Guangdong' province, and the Latin *ensis*, referring to the type locality.



Figures 8-10. Lateral, dorsal, and ventral views of the terminalia of *Damalis candonensis*, n. sp. Abbreviations, Ae=aedeagus, Aep=aedeagal process, Ce=cercus, Ep=epandrium, Gc=gonocoxite, Gcp=gonocoxal process, Gs=Gonostylus, Hp= hypandrium, No=notch, Vi=ventral lamella.

Remarks. *Damalis candonensis* differs from known Chinese congeners by the clavate abdomen, wing dark brown anteriorly with abundant blackish microtrichia, and combined characters of the male terminalia (Figs. 8-10), especially the produced hypandrium, epandrium longer than the gonocoxal process, the truncate cercus, and V-shaped ventral lamella. The female is distinguished further by the polished black abdominal tergites with blue reflections.

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