

# ***Brachystoma* Meigen (Diptera: Empidoidea: Brachystomatidae) New to the Oriental (Indo Malayan) Realm: A New Species from Thailand**

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**ABSTRACT.**— *Brachystoma muankai* n. sp. (Diptera: Empidoidea: Brachystomatidae) is described from the mountain Doi Inthanon, Chiang Mai Province, northern Thailand. This is the first occurrence of *Brachystoma* Meigen and the subfamily Brachystomatinae in the Oriental (Indo Malayan) Realm.

**KEY WORDS:** *Brachystoma*, new species, Brachystomatidae, Thailand

## **INTRODUCTION**

The former subfamily Brachystomatinae of the Empididae (sensu Melander, 1908) was elevated to family rank by Sinclair and Cumming (2006) and expanded to include the Ceratomerinae and Trichopezinae on the basis of several synapomorphies including in males, a plate-like ejaculatory apodeme narrowly fused to the base of a wide tubular phallus, and in females, tergite 7 with a dense fringe of setae along the posterior margin. Acanthophorites are present on the female terminalia (a condition found elsewhere in Empidoidea only in Microphoridae and Dolichopodidae), but uniquely for acanthophorite-bearing empidoids, in Brachystomatidae the female cercus is also strongly arched dorsally (more horizontally positioned in other Empidoidea). Of the three brachystomatid subfamilies currently recognized, Ceratomerinae contains three genera confined to the Southern Hemisphere. Trichopezinae has 12 genera represented in Thailand only by *Trichopeza* Rondani (Plant, 2009a) while Brachystomatinae containing *Brachystoma* Meigen, *Anomalempis* Melander and *Xanthodromia*

Saigusa were hitherto unknown from the Oriental Realm. Yang et al. (2007) listed four species of *Brachystoma* from North America, two species from the western Palaearctic and three more are known from the eastern Palaearctic in Japan (Saigusa, 1963). Smith (1969) and Wagner and Andersen (1995) enumerated species of *Brachystoma* from Africa but these were removed to *Rubistella* Garrett Jones by Sinclair (1995) and although at least one undescribed species of true *Brachystoma* is known from Chile (B. J. Sinclair, pers. com.) *Brachystoma* is thus largely confined to the Northern Hemisphere. The present work describes a new species of *Brachystoma* collected in northern Thailand and represents the first record of the genus and subfamily in the Oriental (Indo Malayan) Realm.

## **MATERIALS AND METHODS**

Material used in this study was collected during 2006 and 2007 as part of a three year project (TIGER – Thailand Insect Group for Entomological Research) sampling terrestrial invertebrates in 10 national parks



FIGURE 1. *Brachystoma muankai* n. sp. Female habitus. Scale bar = 1.0 mm.

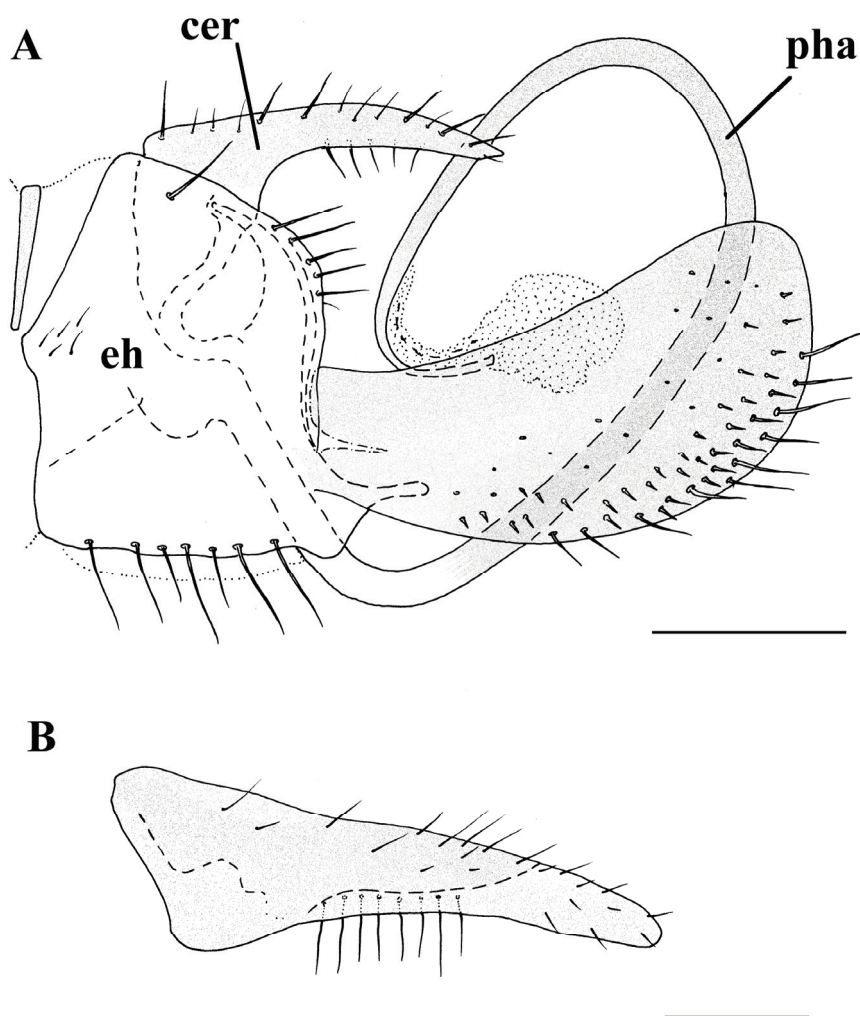
across Thailand. General morphological terms conform with McAlpine (1981) and antennal morphology with Stuckenberg (1999). Interpretation of genitalic homology follows Cumming et al. (1995) and Sinclair (2000). Repository institutions for material were:– NMWC, National Museum of Wales, Cardiff, UK; QSBG, Queen Sirikit Botanical Garden, Chiang Mai, Thailand. In addition to full locality / date / collector data, labels for material collected by the TIGER Project have a unique data code (prefixed ‘T’) which is quoted on the label

and used administratively within the TIGER Project.

#### SYSTEMATICS

##### *Brachystoma* Meigen, 1822

**Diagnosis.**– A characteristic genus of the Brachystomatidae subfamily Brachystomatinae distinguished from *Xanthodromia* by having cell cup obviously longer than cell bm and produced posteroapically and separated from *Anomalempis* by having the



**FIGURE 2.** *Brachystoma muankai* n. sp. **A.** Male genitalia, right lateral view. **B.** Male cercus, dorsal view. Abbreviations: cer, cercus; eh, fused epandrium and hypandrium; pha, phallus. Scale bars: A = 0.1 mm; B = 0.05 mm.

antennal stylus slender and palpi only sparsely setate.

***Brachystoma muankai* n. sp.**

**Figures 1-3**

**Types.**— **HOLOTYPE.**— male, THAILAND, Chiang Mai Province, Doi Inthanon

National Park, Summit Marsh, 18° 35.361' N 98° 29.157' E, 2,500 m, 25–26/ii/2007, pan trap, Y. Areeluck, T1764 (QSBG). **PARATYPES.**— 1 male, 2 females, same data as holotype, Checkpoint 2, 18° 31.554' N 98° 29.940' E, 1,700 m, 23/ii–2/iii/2007, Malaise trap, Y. Areeluck, T1775 (NMWC); 2 females, 5/i–12/i/2007, T1913 (QSBG); 2

females, 2/ii–9/ii/2007, T1793 (NMWC); 1 male, 2 females, 16/ii–23/ii/2007, T1805 (QSBG).

**Additional material.**— One specimen missing its abdomen, same data as holotype (NMWC).

**Etymology.**— The specific epithet derives from the Thai ‘muan’ meaning same as or similar to and ‘kai’ meaning egg, in reference to the swollen egg-shaped apex of the female abdomen.

**Diagnosis.**— A distinctive species with thorax shining yellow and strongly marked black median stripe on scutum. Female abdomen with tergite 7 remarkably enlarged, globose, enclosing terminal abdominal segments.

**Description.**— MALE.— Length 3.5 – 4.0 mm. Head spherical, shining black, frons dusted greyish; eyes almost touching on face; occiput sparsely covered with short fine pale setulae, longest on lower occiput behind mouth; ocellar setae very small, fine. Antenna with scape and pedicel yellow, distal segments brown; pedicel with apical circlet and dorsal patch of minute brownish setulae; postpedicel pointed lanceolate about 3X long as wide, stylus rather longer, not conspicuously broadened. Mouthparts yellow; palp small, pointed ovate with fine apical setulae; proboscis sharply pointed, slightly recurved apically.

Thorax rather shining yellow, slightly paler on pleura, scutellum yellowish brown; scutum with broad black median stripe extending from anterior margin almost to posterior margin, confined within line of acrostichal setulae. One strong black notopleural seta with much smaller seta in front, a weak postalar and 4 – 6 weak apical

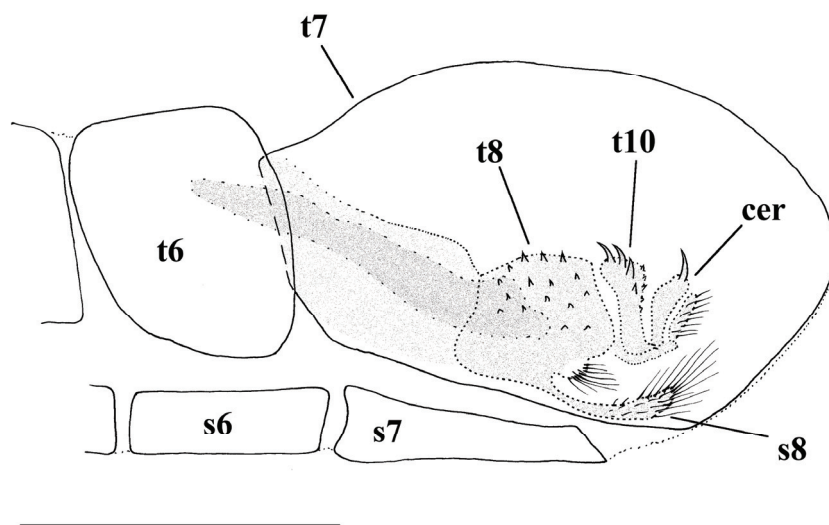
setae on scutellum, acrostichal setulae minute, becoming slightly longer behind; otherwise with only minute setulae between and above postpronotal lobe.

Legs slender but tibiae slightly swollen apically, conspicuously so on posterior tibia; yellowish with tibiae and tarsi brown. All legs sparsely short setate with only a few stronger setae, particularly on femora ventrally becoming somewhat stronger basally (especially on mid femur), anterior preapical on front femur and a dorsobasal on hind tibia stronger; front metatarsus ventrally and posteriorly and all tibia apically with dense white microscopic pile, especially evident on hind tibia.

Abdomen with basal segments whitish yellow, tergites 2 – 4 rather weakly sclerotized with brownish lateral margins, apical tergites brown. Ventrally with distal sternites brownish. Genitalia (Fig. 2) with fused hypandrium and epandrium yellowish bearing pronounced blackish posterior lobe rather densely covered with short setae ventrally; cercus black, rather narrowly pointed apically in lateral view, broadened basally; phallus black, paler basally, long, describing ovate curve.

Wings membrane brownish, faint stigma darker, veins brown. Radial fork rather short and open, angle between  $R_4$  and  $R_5$  about  $70^\circ$ ;  $R_4$  almost linear, hardly curved basally. Cell cup obviously longer than  $bm$ , postero-apically produced with vein  $A_1+CuA_2$  distinct for a short distance beyond apex.

**FEMALE.**— Similar to male (Fig. 1) but abdomen uniformly brown dorsally, yellowish white ventrally. Genitalia (Fig. 3) with tergite 7 remarkably enlarged, globose, yellow, enclosing terminal abdominal segments; tergite 8 black bearing short spine-like setae dorsally and small posteroventral protuberance bearing file pale apical setae; tergite 10 black bearing



**FIGURE 3.** *Brachystoma muankai* n. sp. Female genitalia, left lateral view. Abbreviations: cer, cercus; s6, sternite 6; s7, sternite 7; s8, sternite 8; t6, tergite 6; t7, tergite 7; t8, tergite 8, t10, tergite 10. Scale bar = 0.5 mm.

acanthophorites with single row of spine-like setae; cercus with single apical spine and immediately posterior to it a smaller fleshy lobe with fine setulae posteriorly; sternite 8 with apical lobe bearing fine long setae.

### DISCUSSION

*Brachystoma muankai* n. sp. is clearly distinguished from other Asian species of *Brachystoma* by having the scutum clear yellow with a black median stripe.

*Brachystoma muankai* n. sp. is known only from the mountain Doi Inthanon (Chiang Mai Province) in hill evergreen forest biotopes at elevations from 1,700–2,500 m with capture dates from early January to early March at the end of the cool dry season. The mountain is becoming known at a ‘hotspot’ of empidoid dipteran diversity (Plant, 2009b) and interestingly is the only known locality for *Trichopeza*, the

only other brachystomatid genus present in Thailand.

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### LITERATURE CITED

- Cumming, J. M., Sinclair, B. J and Wood, D. M. 1995. Homology and phylogenetic implications of male genitalia in Diptera-Eremoneura. *Entomologica Scandinavica*, 26: 121–151.
- McAlpine, J. F. 1981. Morphology and terminology – Adults Chapter 2. In: McAlpine, J. F., Peterson, B. V., Shewell, G. E., Teskey, H. J., Vockeroth, J. R. and Wood, D. M. (Coords.), *Manual of Nearctic*

- Diptera, 1. Agriculture Canada Monograph, 27: 9–63.
- Melander, A. L. 1908. Family Empididae. In Williston, S. W. (Ed.), Manual of North American Diptera, 3<sup>rd</sup> Edition. J. J. Hathaway, New Haven, pp, 218–227.
- Plant, A. R. 2009a. Two new species of *Trichopeza* Rondani (Diptera: Empidoidea: Brachystomatidae) from northern Thailand with a revised key to world species. *Studia dipterologica*, 15: 175–184.
- Plant, A. R. 2009b. Diversity of *Chelipoda* Macquart, 1823 (Diptera: Empididae: Hemerodromiinae) in northern Thailand with discussion of a biodiversity ‘hot spot’ at Doi Inthanon. *The Raffles Bulletin of Zoology*, 57: 255–277.
- Saigusa, T. 1963. A revision of the Japanese species of the genus *Brachystoma* (Diptera, Empididae). *Sieboldia*, 3: 167–173.
- Sinclair, B. J. 1995. Generic revision of the Clinocerinae (Empididae), and description and phylogenetic relationships of the Trichopezinae, new status (Diptera: Empidoidea). *The Canadian Entomologist*, 127: 655–752.
- Sinclair, B. J. 2000. 1.2. Morphology and terminology of Diptera male terminalia. In Papp, L. & Darvas, B. (Eds), *Contributions to a Manual of Palaearctic Diptera*, Volume 1. General and Applied Dipterology. Science Herald, Budapest, pp, 53–74.
- Sinclair, B. J. and Cumming, J. M. 2006. The morphology and higher-level phylogeny and classification of the Empidoidea (Diptera). *Zootaxa*, 1180: 1–172.
- Smith, K. G. V. 1969. The Empididae of Southern Africa. *Annals of the Natal Museum*, 19: 1–342.
- Stuckenberg, B. R., 1999. Antennal evolution in the Brachycera (Diptera), with a reassessment of terminology relating to the flagellum. *Studia Dipterologica*, 6: 33–48.
- Wagner, R. and Andersen, T. 1995. New Empididae (Diptera) from the West Usambara Mts, NE Tanzania. *Aquatic Insects*, 17: 25–35.
- Yang, D., Zhang, K., Yao, G. and Zhang, J. 2007. *World Catalogue of Empididae* (Insecta: Diptera). China Agricultural University Press, Beijing, 599 pp.
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