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Dachtylembia, a new genus in the family Teratembliidae (Embioptera) from Thailand

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Abstract

Dachtylembia gen. nov. (Embioptera: Teratembliidae), is described and illustrated based on specimens of a new species (*D. siamensis*) collected from Thailand. The geographical distribution of this species in Thailand is mapped.

Key words: *Dachtylembia siamensis*, new species, taxonomy

Introduction

The family Teratembliidae, a relatively small group of Embioptera, was established by Krauss (1911). Four genera in this family are currently listed (Szumik 1994; Miller 2009): *Diradius* Friederichs, 1934, *Oligembia* Davis, 1939, *Paroligembia* Ross, 1952 and *Teratembia* Krauss, 1911. Teratembliidae is considered a sister group of Oligotomidae (Szumik 1994; Szumik *et al.* 1996, 2008; Miller *et al.* 2012). This family is well represented in Nearctic, Neotropical and Afrotropical regions (Ross 1984, Miller 2009). Teratembliids can be recognized by several characteristics: the forked anterior media (AM) in the wing; hind leg with only one basitarsal papilla; hemitergites of the tenth segment (10L and 10R) fused to an extremely large medial sclerite (MS); epiproct (EP) and right tergal process of tenth segment (10 RP) completely separated from the right 10R; left cercus-basipodite (LCB) fused to the base of left cercus and bearing one or more small mesal lobes; first segment of left cercus (LC₁) not echinulate.

Dachtylembia gen. nov., found in the west, north and northeast of Thailand, is erected to include a single species (*Dachtylembia siamensis* sp. nov.). This new genus is closely allied to *Oligembia* Davis, 1939. In *Dachtylembia* the process of the left hemitergite (10LP) is simply apically tapered while *Oligembia* has a forked 10LP with inner and outer processes subequal. *Dachtylembia* also can be distinguished from *Oligembia* by the process of the left cercus-basipodite (LCBP), which has a slender, talon-like appearance without an outer hook; in *Oligembia* the process of the LCB has only a single inner process terminated by a minute bifurcation.

The purpose of this paper is to describe *Dachtylembia siamensis* n. gen., n. sp. and discuss its known distribution.

Material and methods

Specimens were obtained from the bark of trees or lichens in various habitat types of nine provinces in the west, north and northeast of Thailand (Fig. 1). Digital images in the field were generated with a Nikon DSLR camera. Specimens were preserved in 95% ethyl alcohol and examined in the laboratory under an Olympus stereoscopic light microscope with an ocular micrometer. Specimens are deposited in the collection of the Chulalongkorn University Museum of Natural History (CUMNH), Bangkok and Thailand Natural History Museum (TNHM), Pathum Thani, Thailand.

The symbols and explanations used in the identification are as follows; 8 (T8, S8) = eighth abdominal tergite/

sternite; 9 (T9, S9) = ninth abdominal tergite/stergite; 10L and 10R = hemitergites of the tenth segment; 10LP and 10RP = left and right tergal processes; EP = epiproct (segment 11); H = hypandrium (sternite 9); HP = hypandrium process; LPPT = left paraproct; LC₁ and LC₂ = first and second segments of left cercus; left cercus basipodite (LCB); left cercus-basipodite process (LCBP); AM = anterior media; RC₁ and RC₂ = first and second segments of right cercus; SMT = submentum.

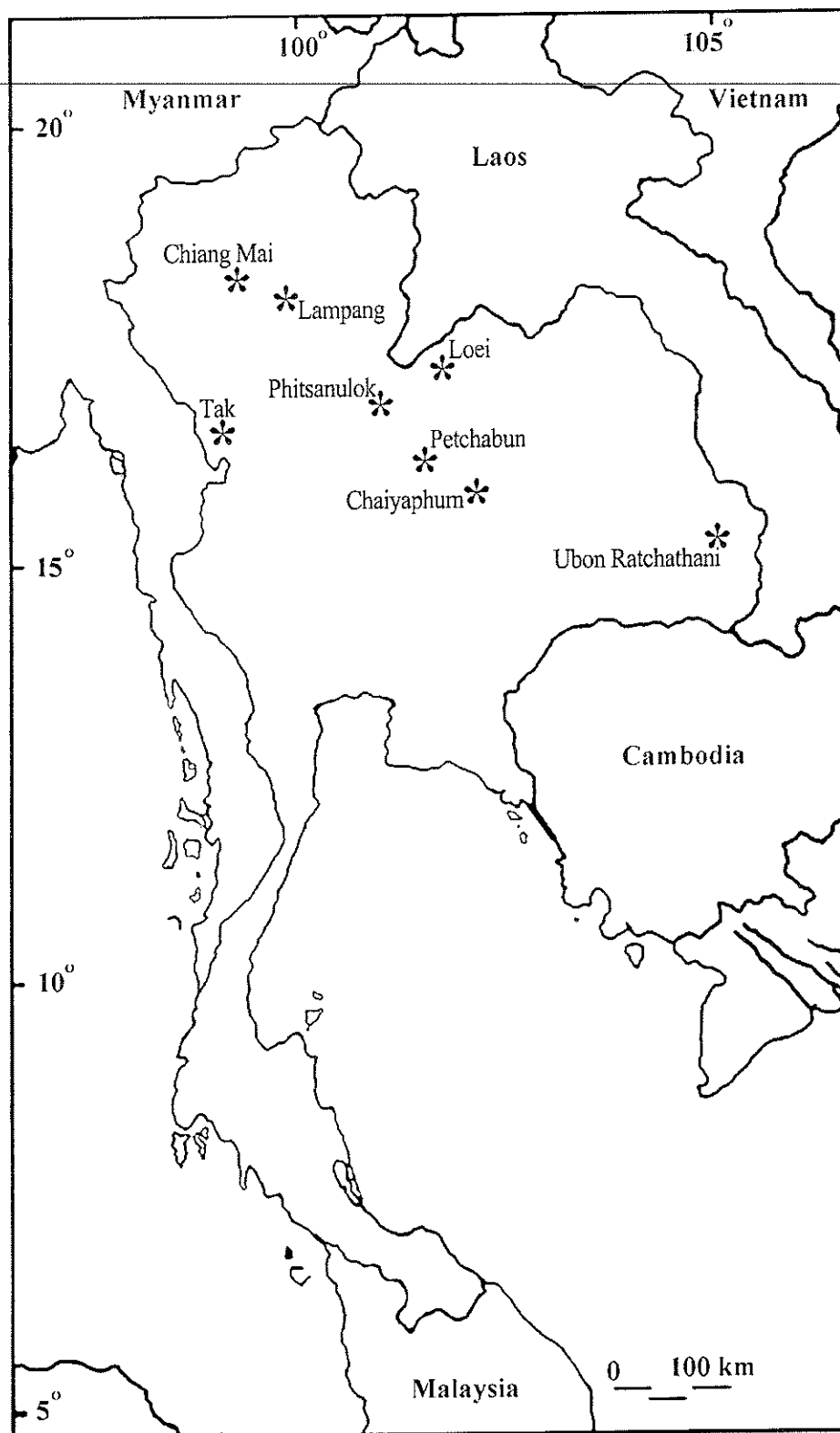


FIGURE 1. Known distribution of *Dactylembia siamensis* n. gen., n. sp. in Thailand.

Systematics

Order: Embioptera, Shipley 1904

Family: Teratembliidae Krauss, 1911

Genus: *Dachtylembia* Poolprasert, gen. nov.

Type species: *Dachtylembia siamensis* Poolprasert sp. nov. by present designation (monotypic).

Diagnosis. Alate male: 10L and 10R fused to an exceptionally large MS. EP and 10RP completely separated from the right 10R. LPPT large, fused to the side of HP, and extended caudally. LCB completely fused to LC₁ with a single finger-like process extending from LCB (LCBP). Apterous female: No distinct characteristics.

Etymology. Dachtyl- (from the Greek *dychtyl* = finger-like), in reference to its process of left cercus-basipodite (LCBP) protruding like a finger.

Dachtylembia siamensis Poolprasert, sp. nov.

(Figs. 2–4)

Diagnosis. Males of *Dachtylembia* are distinguished by the following characteristics of the abdominal terminalia: lines of fusion of 10L, 10R, and MS still evident as shallow, weak grooves, 10R with outer side short, tapered laterally; 10LP elongated, slightly constricted medially then evenly tapered with small outer hook at the apex; LCB with only a single inner process protruding like a finger; inner side of RC₁ relatively simple. Females without significant characters.

Material examined. Holotype male, 8 paratype males, 5 paratype females (CUMNH), Thailand, Tak province, Mae Sod district, hill evergreen forest, 16°45.838'N, 098°54.543'E, elev. 943 m, 26.VI.2009; 1 male (CUMNH), Chaiphaphum province, Thep Sathit district, deciduous dipterocarp forest, 15°37.683'N, 101°23.323'E, elev. 681 m, 07. IX. 2008; 1 male, 1 female (CUMNH), Chiang Mai province, Sanpatong district, hill evergreen forest, 18°32.217'N, 098°31.377'E, elev. 1258 m, 03. III. 2008; 1 male (CUMNH), Lampang province, Ngao district, mixed deciduous forest, 18°46.361'N 99°58.123'E, elev. 412 m, 12.XII.2008; 1 male (CUMNH), Loei province, Phu Ruea district, hill evergreen forest, 17°29.907'N 101°20.483'E, elev. 1196 m, 21. II. 2008; 1 male (CUMNH), Petchabun province, Nam Nao district, mixed deciduous forest, 16°44.963'N 101°27.833'E, elev. 711 m, 12.II.2008; 1 male, 2 females (TNHM), Khao Kho district, hill evergreen forest, 17°00.276'N 100°59.672'E, elev. 1153 m, 05. IX. 2009; 1 male (CUMNH), Phitsanulok province, Nakhon Thai district, hill evergreen forest, 16°52.466'N, 100°49.672'E, elev. 1133 m, 11.XII.2012; 1 male (TNHM), Ubon Ratchathani province, Khong Chiam district, deciduous dipterocarp forest, 17°12.839'N, 102°08.176'E, elev. 230 m, 24. II. 2008. All specimens collected by P. Poolprasert.

Distribution. This species is only known in western, northern and northeastern Thailand

Etymology. The specific epithet refers to the region of first discovery: Siam, former name of the Kingdom of Thailand.

Description. Alate male (n = 9, mean (range) ± SD): Head width × length 0.7 (0.6–0.8) ± 1.13 × 0.9 (0.8–1.0) ± 0.45 mm, body length 6.2 (6.0–6.4) ± 1.05 mm, width 0.7 (0.6–0.8) ± 0.53 mm, forewing length 3.8 (3.7–5.9) ± 0.41 mm, hindwing length 3.3 (3.2–3.4) ± 0.19 mm.

Head capsule elongate-oval, dark. Eyes dark lavender. Submentum trapezoidal with shallow medial concave anterior margin. Mandible dark and slender. Antennae short, brownish throughout, 16-segmented. Thorax brownish throughout. Wings light brown with AM not forked. All legs entirely brownish. Hind leg with only one basitarsal papilla. Abdomen light brown with terminalia paler. Terminalia with forward projection of MS extending one-third length of ninth tergite (9), apex rounded. 10LP slender, straight-sided and parallel-sided then constricted medially and slightly narrowed caudally with apex dorsally furrowed. Inner lobe of LCB finger-like, tapered distally leftward. LPPT sclerotized, without outer hook. 10LP broad basally then tapered terminally with small outer hook at apex. 10RP long, broad, gradually narrowing caudally, with mostly membranous inner margin. LC₁ very broad basally then slightly constricted to distal tip.

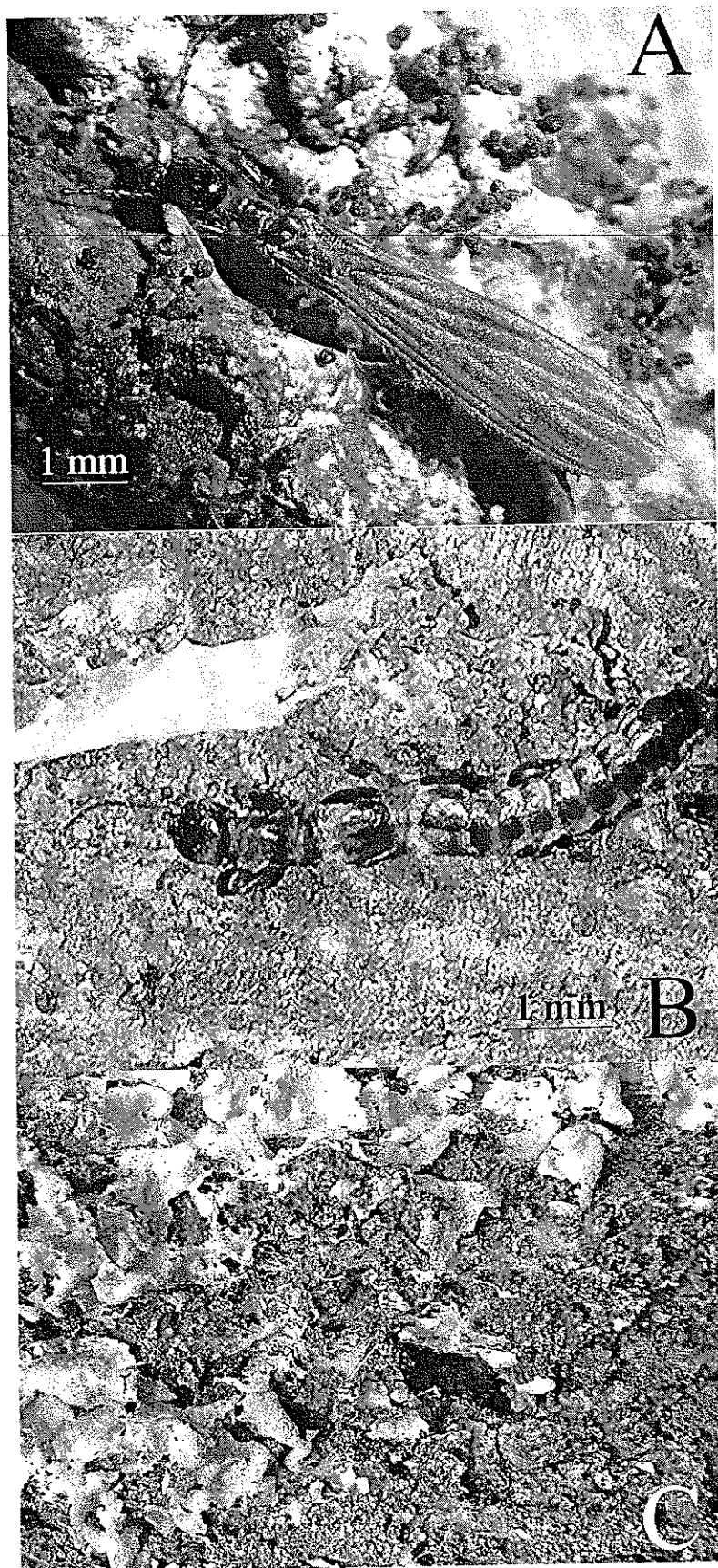


FIGURE 2. *Dactylembia siamensis* n. gen., n. sp. (A) Male. (B) Female. (C) Silk gallery.

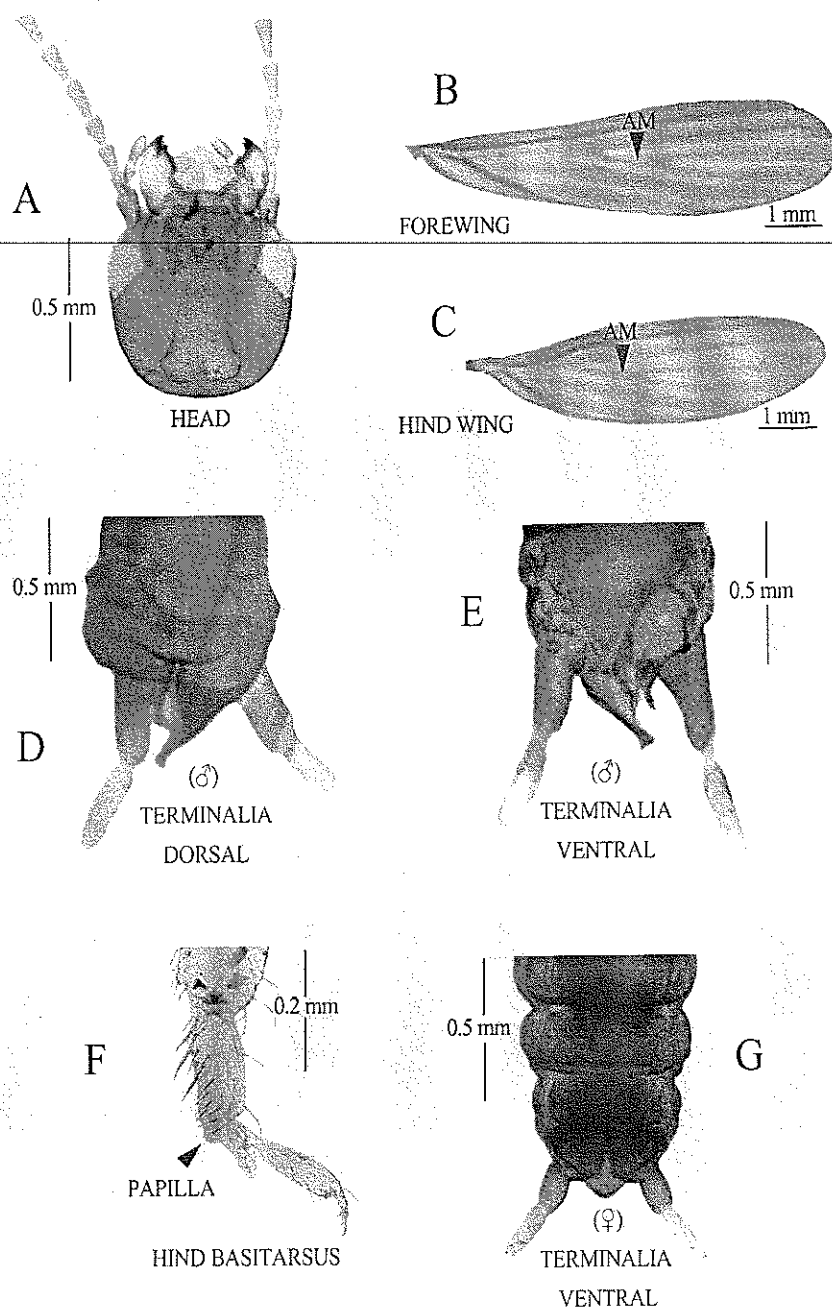


FIGURE 3. Images of *Dactylembia siamensis* n. gen., n. sp. (A) Head of male. (B) Forewing of male. (C) Hind wing of male. (D) Terminalia (dorsal) of male. (E) Terminalia (ventral) of male. (F) Hind tarsus of male. (G) Sternites of female. AM = anterior media.

Apterous female ($n = 5$, mean (range) $\pm$ SD): Head width $\times$ length $0.7 (0.6\text{--}0.8) \pm 0.27 \times 1.0 (0.9\text{--}1.1) \pm 0.35$ mm, body length $6.4 (6.3\text{--}6.5) \pm 0.17$ mm, width $0.7 (0.6\text{--}0.8) \pm 0.29$ mm.

Head capsule dark, longer than wide. Eyes smaller and less reniform than in male. Antennae brown throughout, 14-segmented. Thorax brownish throughout. All legs same color as thorax. Hind leg with only one basitarsal papilla. Abdomen cylindrical, brown throughout. Tenth sternite symmetrically divided longitudinally into two lateral plates. Cerci entirely medium brown.

Remarks. This new species is very difficult to see in nature because its gallery is small, concealed beneath pulverized bark particles and fecal pellets. Most of the nests were also found under foliose lichens (Fig. 2C). Females tend to be solitary in their galleries with their young.

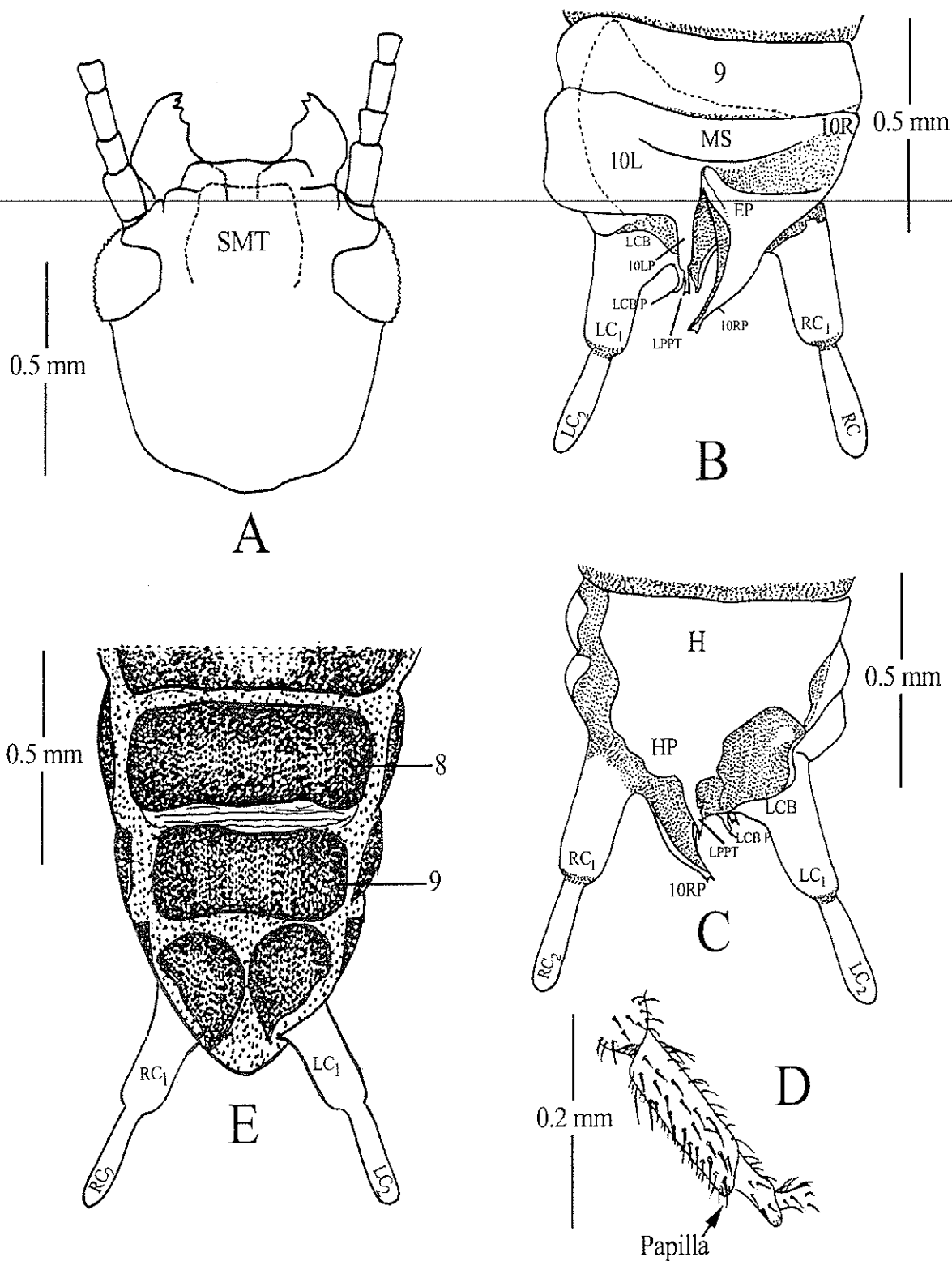


FIGURE 4. Illustrations of *Dactylembia siamensis* n. gen., n. sp. (A) Head of male. (B) Terminalia (dorsal) of male. (C) Terminalia (ventral) of male. (D) Hind basitarsus of male. (E) Sternites of female. Abbreviations: 8 (T8, S8) = eighth abdominal tergite/sternite; 9 (T9, S9) = ninth abdominal tergite/sternite; 10L and 10R = hemitergites of the tenth segment; 10LP and 10RP = left and right tergal processes; EP = epiproct (segment 11); H = hypandrium (sternite 9); HP = hypandrium process; LPPT = left paraproct; LC₁ and LC₂ = first and second segments of left cercus; left cercus basipodite (LCB); left cercus-basipodite process (LCBP); RC₁ and RC₂ = first and second segments of right cercus; SMT = submentum.

Discussion. According to Ross (2007), diversity of Embioptera in southeastern Asia is high, particularly so in Thailand. Teratembidae was also included in a dichotomous key to the families and subsequently, teratembids were reported as an oriental group. However, no species of this family was listed for this geographic area; therefore, *Dachtylembia* **gen. nov.** is considered the first known teratembid in Thailand. Morphological characteristics of the new genus place it in Teratembidae; however, the cladistic analysis has demonstrated that some species in Teratembidae (e.g., *Teratembia geniculata* Krauss, 1911) and Oligotomidae (*Haploembia solieri* (Rambur, 1842), *Aposthonia glauerti* (Tillyard, 1932), *A. gurneyi* (Froggatt, 1904) and *Oligotoma saundersii* (Westwood, 1837)) are closely related (Szumik, 1994). The phylogenetic relationship of these two families including this new species should be reconstructed for further study.

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References

- Davis, C. (1939) Taxonomic notes on the order Embioptera. II. A new Neotropical genus of Embioptera. *Proceedings of the Linnean Society of New South Wales*, 64, 217–222.
- Friederichs, K. (1934) Das Gemeinschaftsleben der Embiiden und Näheres zur Kenntnis der Arten. *Archiv für Naturgeschichte*, 3, 405–444.
- Krauss, H.A. (1911) Monographie der Embien. *Zoologica (Stuttgart)*, 23, 1–78.
- Miller, K.B. (2009) Genus- and family-group names in the order Embioptera (Insecta). *Zootaxa*, 2055, 1–34.
- Miller, K.B., Hayashi, C., Whiting, M.F., Svenson, G.J. & Edgerly, J.S. (2012) The phylogeny and classification of Embioptera (Insecta). *Systematic Entomology*, 37, 550–570.
<http://dx.doi.org/10.1111/j.1365-3113.2012.00628.x>
- Ross, E.S. (1952) The Embioptera of Angola. *Publicacoes Culturais Companhia de Diamantes de Angola*, 14, 41–54.
- Ross, E.S. (1984) A classification of the Embioidina of Mexico with descriptions of new taxa. *Occasional Papers of the California Academy of Sciences*, 140, 1–50.
- Ross, E.S. (2007) The Embioidina of Eastern Asia, Part I. *Proceedings of the California Academy of Sciences*, 58, 575–600.
- Szumik, C.A. (1994) *Oligembia vetusta*, a new fossil Teratembidae (Embioptera) from Dominican Amber. *Journal of the New York Entomological Society*, 102, 67–73.
- Szumik, C.A. (1996) The higher classification of the order Embioptera: A cladistic analysis. *Cladistics*, 12, 41–64.
<http://dx.doi.org/10.1111/j.1096-0031.1996.tb00192.x>
- Szumik, C., Edgerly, J.S. & Hayashi, C.Y. (2008) Phylogeny of embiopterans (Insecta). *Cladistics*, 24, 993–1005.
<http://dx.doi.org/10.1111/j.1096-0031.2008.00228.x>