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Armigeres (*Armigeres*) *laoensis* sp. nov. (Diptera: Culicidae) from Khammouane Province, Lao PDR

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Abstract: In the course of epidemiological studies on mosquito-borne diseases in Lao PDR in 2000, an undescribed species of genus *Armigeres* was collected from bamboo internodes with a bamboo hole in Khammouane Province. This species has special morphological characteristics in the male genitalia with an expanded gonostylus having 20 strong teeth, of which the anterior half was longer than the rest. Careful comparisons with related species show that the newly collected material belongs to a new species. It is named as *Armigeres* (*Armigeres*) *laoensis* sp. nov. after the country Lao PDR.

Key words: *Armigeres* (*Armigeres*) *laoensis*, *Armigeres*, mosquito, new species, Lao PDR

This study is based on materials collected by the authors in the year 2000 under a scientific research grant from the Japanese government for cooperative research with the Center of Malarology, Parasitology and Entomology in Vientiane, Lao PDR entitled "Epidemiological studies on mosquito borne diseases in Lao PDR". In the course of careful examination, an undescribed species of genus *Armigeres* was found in materials collected from bamboo internodes with a hole in Khammouane Province, Lao PDR and here described as a new species *Armigeres* (*Armigeres*) *laoensis*. The pupa and larva of the new species did not certificate because they were not rearing individually. Comparisons with descriptions and illustrations of *Armigeres* species from Malaysia, Indonesia, Papua New Guinea, Philippines and China (Edwards, 1914; Borel, 1930; Bonne-Wepster and Brug, 1937; Baisas, 1935; Bohart and Farner, 1944; Thurman, 1959; Delfinad, 1966; Steffan, 1968; Dong et. al., 1995a, b; Zhu et al., 1997) indicate that the new species is closely related to *Armigeres manalangi* found in the Philippines, with definite morphological differences in male genitalia.

Armigeres (*Armigeres*) *laoensis*
Toma et Miyagi, sp. nov.
(Fig. 1, A–I)

Male. Wing 4.0 mm. Proboscis 2.9 mm. Forefemur 3.5 mm. Abdomen 5.3 mm.

Head: Vertex covered with dark flat scales, some white scales on mid vertex, dark erect scales with bluish luster at certain angles of posterior margin of vertex. Narrow band of white scales along ocular line, broadening ventrally in postgenal area. Ocular and frontal setae present. Clypeal integument dark. Proboscis long, slightly curved, compressed in apical 0.35, covered by dark scales. Antenna 2.3 mm. Pedicel and flagellomere 1 with white scales on inner and lower sides, and small black scales on inner and upper sides.

Thorax: Integument dark brown. Scutum densely covered with narrow, curved dark brown scales; dingy brownish scales at dorso-

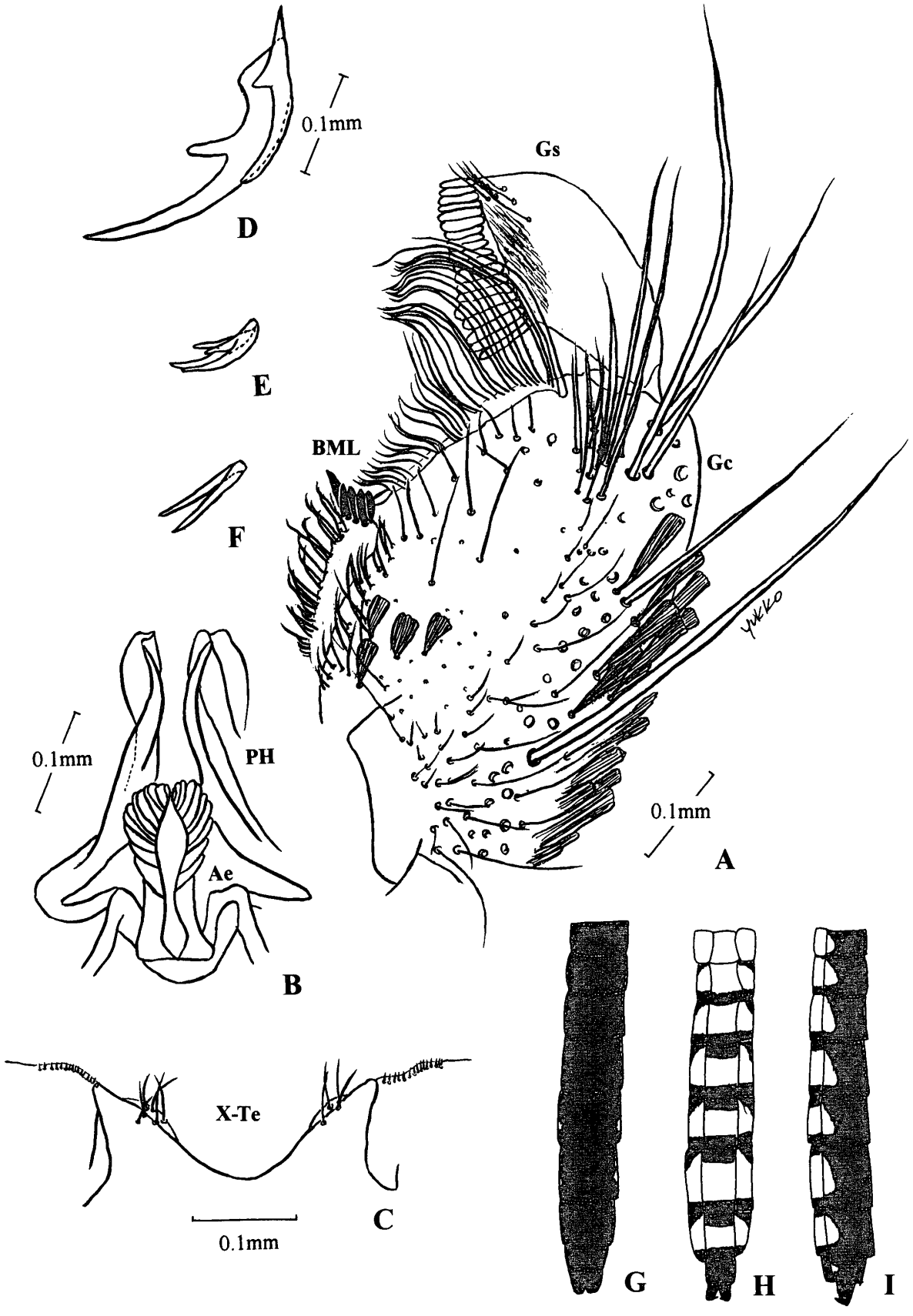

Fig. 1. *Armigeres* (*Armigeres*) *laoensis* sp. nov.

A, Dorsal aspect of male genitalia (BML: basal mesal lobe, Gs: gonostylus, Gc: gonocoxite); B, Dorsal aspect of phallosome (Ae: aedegus, PH: phallosome); C, Tergum X; D, Foreunguis; E, Midunguis; F, Hindunguis; G, Dorsal aspect of abdomen; H, Ventral aspect of abdomen; I, Lateral aspect of abdomen.

central area. Paratergite with white scales. Acrostical, dorsocentral, and scutal fossal setae absent. Several strong antealar and supraalar setae present. Prescutellar setae absent. Scutellum covered with flat grayish brown scales with several strong marginal setae. Mesopostnotum bare, integument brown. Antepronotum with flat white scales and 11–15 black setae on front and sides; upper dorsal and posterior margin mostly with dark scales. Proepisternum covered with large patch of white scales, with more than 10 pale setae. Upper part of postpronotum covered with narrow brown scales, lower part with broad white scales and partially narrow white scales, about 6–7 brown setae along posterior border. Subspiracular bare. Prespiracular seta absent. Postspiracular area with patch of white scales, and 4–5 setae. Mesokatepisternum with 2 large patches of white scales, 3–4 upper and 14–15 lower mesokatepisternal setae on posterior border; patch of several brown setae on prealar area. Mesanepimeron with a large patch of white scales and 1 brown seta. Upper mesanepimeron with a dense patch of pale setae. Mesomeron and metameron bare.

Legs: Forecoxa covered with white scales, with dark scales in center; mid- and hindcoxae with white scales on posterior sides. Fore- and midfemora with white scales on posteroventral surface extending to apex; hindfemur extensively white-scaled, reaching nearly to apex. All tibiae subequal in length.

Ungues: Foreunguis (Fig. 1D) much larger than mid- and hindungues, unequal in size, larger one about twice size of smaller one, both with submedian tooth. Midunguis (Fig. 1E) subequal with submedian tooth. Hindunguis (Fig. 1F) small and simple.

Wing: Dark-scaled. Cell R_2 about 0.6 of R_{2+3}. Alula with row of small scales. Capitellum with dark scales and some brown scales, pedicel and scabellum light in color.

Abdomen: Terga (Fig. 1G, I) I–VIII dark-scaled with small patches of white scales laterally. Sterna (Fig. 1H) II–VII white-scaled with apical dark band; IV–VII with dark basal band. Sternum VIII dark-scaled with indistinct pale scales.

Genitalia (Fig. 1A–C): Sternum IX with fine setae in center. Tergum IX (Fig. 1C) with apical margin slightly sclerotized, and with depression in center, 4–6 fine setae on each lobe. Gonocoxite (Fig. 1A) broad, about twice as long as its breadth at center, dorsal surface of gonocoxite with numerous long brush-like setae on apical half; many long, strong sinuous setae arising ventroapically on gonocoxite. Basal mesal lobe with 5 stout setae, each seta with pointed apex; apical seta longer than the rest. Gonostylus short, much expanded apically, bearing 20 strong teeth, basal half of teeth on gonostylus longer than those of apical half; numerous tiny setae and 6 fine setae on apical sides. Aedegus (Fig. 1B) heart-like shape, with about 11 teeth on each side.

Female, larval and pupal stages. As yet unknown.

Type Material. Holotype male (000830-7 with genitalia on a slide G-55), and 1 male paratype (000830-7) from Thapachon, Khammouane Province, Lao PDR, collected as larvae from a bamboo hole by T. Toma in August 30, 2000, and allowed all to emerge. The holotype will be deposited in the National Museum of Natural History, Smithsonian Institution, Washington, DC, U.S.A. after completion of our revisional study of the genus.

Taxonomic Discussion. Armigeres laoensis sp. nov. belongs to the subgenus *Armigeres* Theobald as definded by Thurmam (1959) and Delfinad (1966). This species is closely related to *Ar. aureolineatus* Leicester, *Ar. manalangi* Baisas and *Ar. apoensis* Bohart in that all four have expanded gonostylus (broadened trianguloid gonostylus). With reference to the descriptions and illustrations by Baisas (1935), Bohart and Farner (1944), Thurman (1959) and Delfinad (1966), *Ar. laoensis* sp. nov. can be easily distinguished by morphological differences as follows: (1) basal half of teeth on gonostylus longer than those of apical half (basal half of teeth shorter than those of apical half in *Ar. aureolineatus*, *Ar. manalangi* and *Ar. apoensis*); (2) five stout setae on basal mesal lobe (three in *Ar. aureolineatus*, *Ar. manalangi* and *Ar. apoensis*); (3) tergite IX with 4–6 setae on each lobe (9 in *Ar. manalangi*); and (4) heart-like shape of aedegus (separated in *Ar. aureolineatus*, narrowed apically in *Ar. man-*

alangi and rounded in *apoensis*).

Bionomics. Immatures of *Ar. laoensis* sp. nov. were found in bamboo internodes with a hole. The feeding behavior and medical importance of this species are not known.

Distribution. Known only from Khammouane Province, Lao PDR.

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