Topomyia houghtoni Feng, A New Record in Malaysia and a Redescription of the Adult and Immature Stages[1]

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ABSTRACT. *Topomyia (Suayamyia) houghtoni* Feng, known previously only from China, has now been collected from Peninsular Malaysia, which constitutes a new record. The original description of this species, made in Chinese, is not readily available. A redescription is made of the adult female and male, pupa and larva and full illustrations are provided of the male genitalia, the pupal and the larval stages. *Topomyia houghtoni* occurs in rain forests in mountains and foothills and breeds in the leaf axils of *Alocasia* and *Colocasia*.

INTRODUCTION

Topomyia (Suaymyia) houghtoni was described by Feng in 1941, from 3 adults (2 males, 1 female) and a few larvae collected from Western Yunnan, China. The original description was in Chinese and was published in the Bull. Fan. Inst. Biol. 10:244-254. 1941. The original description in Chinese was republished in 1958, by the Peking Science Press, in a book titled "Compilations of descriptions of Chinese mosquitoes." An English translation of the original description by Dr. C. Y. Chow, was made available to the author, per kindness of Dr. Peter Mattingly. Previously, this species was known only from China. Two collections of *houghtoni* were obtained recently in secondary rain forest from the central mountain range of Peninsular Malaysia. The collections included several adults, larvae and associated skins. As the original description, especially that of the immature stages, is inadequate and as the original illustrations are scanty, the stages are being redescribed and illustrated.

The terminology used for the adults follows Harbach and Knight (1980), and for the chaetotaxy of the pupa and larva, that of Belkin (1962). The following system is used to enumerate seta branching: If only one numeral is given in parentheses following the seta number, it represents the only number of branches encountered in the sample; if two sets of figures are given, the first represents the mean number of branches and the second, the range encountered in the sample.

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Topomyia (Suaymyia) houghtoni Feng

(Figs. 1 and 2)

Topomyia houghtoni Feng 1941, Bull. Fan. Inst. Biol., Peking (Zool.), 10:244. No mention of type-specimens or where deposited; Type-locality: Peng Lung Chai near Chefang, Western Yunnan, China. Altitude, 915 M.

Topomyia (Suaymyia) houghtoni of Thurman (1959); Knight and Stone (1977).

FEMALE. Wing, 3.88 mm, Proboscis, 2.48 mm, Fore-femur, 2.83 mm, Abdomen, 2.91 mm. Median in size.

Head: Conspicuous, triangular patch of flat silvery scales on vertex, immediately above eyes; similar silvery patches on side of head below eyes; occiput covered with broad, decumbent dark brown scales with metallic green luster at certain angles, erect scales absent. Inner margins of eyes touching above antenna. Interocular and ocular setae present. Clypeus longer than broad, integument brown, no scales. Maxillary palpus small, about 0.13 of proboscis, composed of three segments. Proboscis covered with small dark scales, except for small pale ventral patch at base; often with narrow pale line extending from base to about 0.5 of proboscis on venter. Pedicel with dark integument, with silvery sheen at certain angles; antenna flagellum pilose, approximately 1.92 mm long.

Thorax: Integument of scutum brown. Scutum densely covered with narrow, curved brown scales, with few broad, brown scales in the prescutellar area. Median silvery line extending caudally approximately to wing roots, consisting of 2 rows of flat, rounded, silvery scales. Scutal, dorsocentral, supra-alar and prescutellar setae present. Middle and lateral lobes of scutellum covered with dark brown scales, few narrow, hairlike scales on outer margin of lateral lobes. Mesopostnotum bare, integument dark brown, except area around wing base and three coxae, which are creamy white. Antepronotal lobes with narrow dark scales on anterior aspect, with broad, flattened silvery scales on the dorsum, row of prominent bristles on anterior side. Postpronotum covered with flat broad scales, the lower half silvery, upper half with mostly dark brown scales with green sheen, along with few silvery scales; single prominent seta present near middle of the posterior border. Two to 3 fairly prominent prespiracular setae. Postspiracular setae absent. Propleuron covered with patch of flat, silver scales. Paratergite bare. Major part of pleuron with post- and subspiracular areas, most of sternopleuron, mesepimeron and middle of metapisternum, covered by patch of flat, round, silvery scales. Setae present on propleuron, prealar and upper part of mesepimeron. Base of mesomeron slightly higher than base of hind coxae.

Leg: Three coxae and trochanters covered with same type of silvery scales as on pleuron. Remainder legs uniformly covered with small dark brown scales, except for line of pale scales extending along ventral side of femur to tibia; this line narrower on first two legs and broader on hind leg. Claws of all legs simple, equal; hind legs with smaller claws.

Wing: Brown-scaled. Squame scales densely covering veins; plume scales narrow. Cell R_2 about 2.5 times length of stem. A vein ending just beyond fork of Cu. Alula with row of narrow, hair-like scales; upper calypter bare.

Haltere: Upper part of pedicel and capitellum covered with dark brown scales.

Abdomen: Terga of segments I-VIII densely covered with flat, dark brown scales with green sheen at certain angles. Lateral side of each tergum with narrow strip of pale gold scales, upper border of this pale strip appears as straight line from terga I-VII. Sterna II-VII entirely covered by flat, pale gold scales. Sternum VIII covered with dark brown scales.

MALE. Wing, 3.65 mm, Proboscis, 2.45 mm, Palpi, 0.28 mm, Forefemur, 2.61 mm. Resembles female except for following characters: patch of pale scales on ventral aspect of base of proboscis larger and more conspicuous. Midleg with first and fifth tarsomeres dark, second tarsomere dark at base with rest of segment covered by white scales; third tarsomere may be entirely white or white with dark scales at base; fourth tarsomere usually dark scaled, may be ochreous. Head: maxillary palpus and antenna about same length as on female; antenna pilose.

MALE GENITALIA. (Fig. 1). Tergum IX with lobes separated by narrow sclerotized bridge; prominent setiform, broad at base and gradually tapering to point, present on each lobe; setae absent on bridge of IX-T. Sternum IX broad with sclerotized basal and lateral borders, slightly notched at apex, scattered scales and setae present. Gonocoxite length about 3.5 times breath, broader at base; outer 0.5 of gonocoxite with dense patch of setae extending entire length; patch of 10-14 slender recurved setae present in inner subapical area; below this patch on inner side, are few sparcely scattered small straight setae; scales present on ventral aspect. Claspette not bearing dorsal lobe; ventral lobe broad and setaceous, bearing 3-6 prominent setae and several smaller ones; ventral lobes joined by narrow band. Gonostylus with broad flap-like lobe and group of 4-6 fine setae at base; denser group of smaller setae on outer margin about middle of gonostylus; prominent curved setiform present at apex. Apex of gonostylus with flat, rectangular flap bearing fine setae along border and 4 finger-like lobes on tubercles, each with very fine subapical setae at right angle to lobe. Paraproct elongated with arms sclerotized; parameres well developed. Phallosome long, prominent.

PUPA. (Fig. 1). Abdomen, 4.27 mm, Trumpet, 0.46 mm, Paddle, 0.8 mm. Integument of cephalothorax and abdomen dark yellow, with narrow light brown patch on anterior area of abdominal terga II-VI. Chaetotaxy as figured; conspicuous setae marked with an asterisk (*).

Cephalothorax: Trumpet: Pale yellow, with distinct sculpturing. Index 2.7-4.5; pinna 0.04-0.1 of trumpet length. Seta 1 long, conspicuous, 2 branched from base, 2(2, 1-2), 3(2, 1-2), 4(2, 1-3), 5(2, 1-3), 6(2, 1-2), 7(2, 1-3), 8(1, 1-3), 9(2, 1-2), 10(1, 1-2), 11(1), 12(2, 1-4).

Abdomen: Microtrichia present on abdominal segments II-VIII. Segment I: Seta 1 light, 4-8 main branches, subsequent branching very fine 2(1), 3*(1, 1-2), 4(4, 2-5), 5(1, 1-2), 6(1, 1-3), 7(2, 1-3), 9(1, 1-2). Segment II: 1(3, 2-4), 2(1), 3*(1), 4(3, 2-5), 5(1, 1-3), 6*(1, 1-2), 7(2, 1-4), 9(1), 11(2, 1-2). Segment III: Seta 1(4, 3-5), 2(1), 3*(1, 1-2), 4(2, 1-3), 5(2, 1-2), 6(2, 2-4), 7(3, 2-4), 8(1, 1-2), 9(1), 10(2, 1-2), 11(1, 1-2). Segment IV: Seta 1(3, 2-5), 2(1), 3(3, 2-5), 4(3, 1-6), 5*(1), 6(1, 1-2), 7(2, 2-3), 8(2, 1-2), 9(1), 10(2, 1-3), 11(1, 1-2). Segment V: Seta 1(2, 1-3), 2(1), 3(2, 1-4), 4(2, 2-3), 5*(1), 6(2, 1-3), 7(3, 2-4), 8(2, 1-3), 9(1), 10(2, 1-3), 11(1, 1-2). Segment VI: Seta 1(2, 2-3), 2(1), 3(1, 1-2), 4(2, 2-3), 5*(1), 6(1), 7(1, 1-2), 8(2, 1-2), 9(1), 10(2, 1-3), 11(2, 1-2). Segment VII: Seta 1(1, 1-2), 2(1), 3(1), 4(1, 1-2), 5(1), 6(1, 1-2), 7(1, 1-2), 8(3, 2-3), 9*(16, 14-18) barbed, 10(2, 1-3), 11(2, 1-2). Segment VIII: 4(1, 1-2), 9*(18, 15-20) barbed. Paddle: Lightly pigmented, covered with microtrichia; midrib distinct, reaching tip; margin serrated, without fringe. Male genital lobe large, extending to 0.7 of paddle, female genital lobe extending to 0.33 of paddle.

LARVA. (Fig. 2). Head: 1-05 mm. Siphon: 0.9 mm. Anal saddle: 0.31 mm. Chaetotaxy as figured, setae lightly to moderately pigmented. Stellate setae present; spicules present on head. Prominent setae marked with asterisk (*).

Head: Width about 1.17 length. Ocular bulge inconspicuous. Collar narrow, darkly pigmented at outer angles. Pigmentation of head yellow to light brown. Integument with spicules unevenly distributed on head. Mental plate with strong median tooth, about 8 smaller and even teeth on either side. Maxilla with well-developed horn reaching beyond front of head. Mouth brushes short and dense. Seta 1(1, slender and pointed forwards), 4(1), 5(1, 1-2), 6(1), 7(3, 2-5), 8(4, 2-5), 9(5, 3-7), 10(3, 2-4), 11(1), 12(3, 3-5), 13(4, 3-4), 14(1, 1-2), 15(3, 3-4). Antenna: Length about 0.28 of head. Shaft with inner surface slightly swollen at lower third. Integument light yellow with few scattered, small spicules. All setae single. Seta 1 reaching tip of antenna, its base about 0.76 from base of antenna.

Thorax: All long and prominent setae with barbs. Prothorax: Seta 0 (11, 10-14), 1(3, 2-3), 2(2, 1-3), 3(2, 2-3), 4*(6, 4-8), stellate), 5*(12, 11-14), 6*(1, 1-2), 7*(8, 7-10), 8*(9, 7-11), 9*(3, 3-4), 10*(3, 1-4), 11(3, 2-4), 12*(3, 2-4), 14(3, 2-3). Mesothorax: Seta 1(3, 2-4), 2(2), 3(1, 1-2), 4(2, 2-3), 5*(1), 6*(1, 1-2), 7*(1, 1-3), 8*(3, 3-4), 9*(2, 1-2), 10*(1), 12*(1), 13(11, 8-14), 14(9, 7-10). Metathorax: Seta 1(1), 2(2, 1-3), 3(5, 4-7), 4(3, 2-3), 5*(7, 5-10), stellate), 6(2, 2-3), 7*(8, 5-10), 8(5, 4-6), 9*(8, 5-10), 10*(1), 12(1), 13(13, 10-18).

Abdomen: Segment I: Seta 1*(6, 5-10, stellate), 2(2), 3(3, 3-4), 4(5, 3-7), 5(2, 2-3), 6*(5, 4-7), 7*(4, 2-5), 9(3, 2-4), 10(3, 2-4), 11*(6, 4-11, stellate), 13(2, 2-4). Segment II: Seta 1(1, 1-3), 2(2, 1-3), 3(4, 2-6), 4(1), 5(3, 3-4), 6*(4, 3-5), 7*(3, 2-4), 8(1), 9(3, 2-3), 10(3), 11(2, 1-5), 12(8, 6-11), 13(1, 1-2). Segment III: Seta 1*(14, 11-16, stellate), 2(1), 3(1, 1-2), 4*(1), 5(5, 3-6), 6*(2, 2-3), 7(4, 4-5), 8(2, 2-3), 9(2, 2-3), 10(2), 11(3, 2-3), 12(2, 2-3), 12(2). Segment IV: Seta 1*(11, 9-14, stellate), 2(1), 3(2), 4*(1, 1-2), 5(5, 5-7), 6*(2, 1-2), 7(5, 5-6), 8(2, 2-3), 9(3), 10(2), 11(3), 12(2, 2-3), 13(3, 3-4). Segment V: Seta 1*(17, 15-20, stellate),

2(1, 1-2), 3*(1), 4(3), 5(5, 4-6), 6*(1, 1-2), 7(4, 4-5), 8(2, 2-3), 9(2, 1-3), 10(3), 11(2), 12(2, 2-3), 13(3, 2-4). Segment VI: Seta 1*(18, 15-20, stellate), 2(1, 1-2), 3(2), 4(2), 5(4, 3-6), 6*(1), 7(1, 1-2), 8(5, 4-6), 9(1, 1-2), 10(4, 3-5), 11(2), 12*(5, 3-5), 13(6, 5-8). Segment VII: Seta 1*(3, 1-4), 2(1, 1-2), 3*(1, 1-2), 4*(1), 5(4, 3-5), 6(8, 4-11), 7(1), 8(9, 9-10), 9(4), 10(4, 3-5), 11(2, 2-3), 12*(2), 13*(9, 7-13). Segment VIII: Seta 1(6, 5-7), 2*(1), 3(4, 3-5), 4*(1), 5*(3, 3-4). Comb scales 17(11-23) in 2 irregular rows; individual sclae large, with prominent central spine, fringed at base. Siphon: fairly long, broad at base and tapering; index 5.7 (4.9-6.1); lightly pigmented; pecten teeth 39 (31-48), extending from base to near tip of siphon, in 2 or 3 irregular rows; pecten teeth at base of siphon with fringe usually on one side only, those towards apex without fringe. Seta 1(5, 3-7), ventral tufts about 5 pairs, each with 3 to 4 branches; dorsal tuft about 4 pairs, each tuft 3-6 branched. Anal segment: Saddle: incomplete, only dorsal plate present, lightly pigmented, with small spines along distal margin. Gills fairly long, pointed, length 1.16 mm, (0.99-1.6 mm), averaging 6.1 times length of saddle. Seta 1*3, 2-4, arising from saddle), 2*(1, 1-2), 3*(3, 2-3), 4*(2, 1-5), ventral fan consisting of single tuft).

SPECIMENS EXAMINED. Total 20: 3 males, 4 females, 2 larvae, 8 associated skins and 3 male genitalia slide preparations.

DISTRIBUTION. Previously known only from China. Now collected from two localities in Peninsular Malaysia: at Genting Heights, Pahang State (elevation 1,260 M) and at Ulu Gombak, Selangor State (elevation 200 M), both sites approxiamtely 19 km apart. This constitutes a NEW RECORD of *houghtoni* in Peninsular Malaysia.

TAXONOMIC DISCUSSION. The specimens of *Topomyia houghtoni* collected in Malaysia, very closely resemble in all stages, the original description of this species from China. There are, however, some minor variations between these two populations, in the larval stages, e.g., in the number of branches of the setae and in the number of the comb and pecten teeth, the latter being more numerous in the Malaysian specimens. The Malaysian and Chinese populations share the same type of habitat (leaf axils of *Colocasia/Alocasia*) and the same general environment (forests at higher elevations).

Topomyia houghtoni clearly belongs to the subgenus *Suaymyia*, as the claspettes of the male genitalia consists only of the setaceous ventral lobe, without the elongated dorsal lobe and the IX tergum having elongated lobes that are widely separated by a narrow bridge. These are the main characters used by Thurman(1959) to distinguish the subgenus *Suaymyia* from the type subgenus. *Topomyia houghtoni* can be separated from all the other species in this subgenus. In the adults of *houghtoni*, the lateral aspects of the abdominal terga are covered with golden scales, forming a light band with a fairly straight dorsal line from terga I-VII. This character is shared with *auriceps* Brug, *leucotarsis* Thurman and *pseudoleucotarsis* Thurman. In the other species belonging to this subgenus, the abdominal terga may be either entirely dark, as in *cristata* Thurman or only some of the abdominal terga may be entirely dark, as in *argentoventralis* Leicester or the pale patches on the sides may be

broader at the ventral side and narrowing towards the dorsal side, as in *decorabilis* Leicester, *imitator* Baisas and *papuensis* Marks. The male genitalia of *Topomyia auriceps* are distinct from those of *houghtoni*, especially the gonocoxite and gonostylus. *Topomyia houghtoni* bears a close resemblance to both *leucotarsis* and *pseudoleucotarsis*. However, from the original description and illustrations of the last two species, there appears to be some minor differences between *houghtoni* and these species in the apical lobe of the gonostylus and the setae of the claspette.

BIOLOGY. In Malaysia, *houghtoni* occurs on mountains and foothills, at elevations ranging from 200 M to 1,260 M. In China they were collected at approximately 900 M. The breeding site in China was the leaf axil of *Colocasia*, whereas in Malaysia both collections came from leaf axils of *Alocasia*, in secondary rain forests. The large maxilla indicates the the larvae are predaceous, and this was observed in China, where the larvae were seen to "catch, crush and swallow" other larvae. Nothing is known of the biology of the adults.

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Fig. 1

Topomyia (Sua) houghtoni

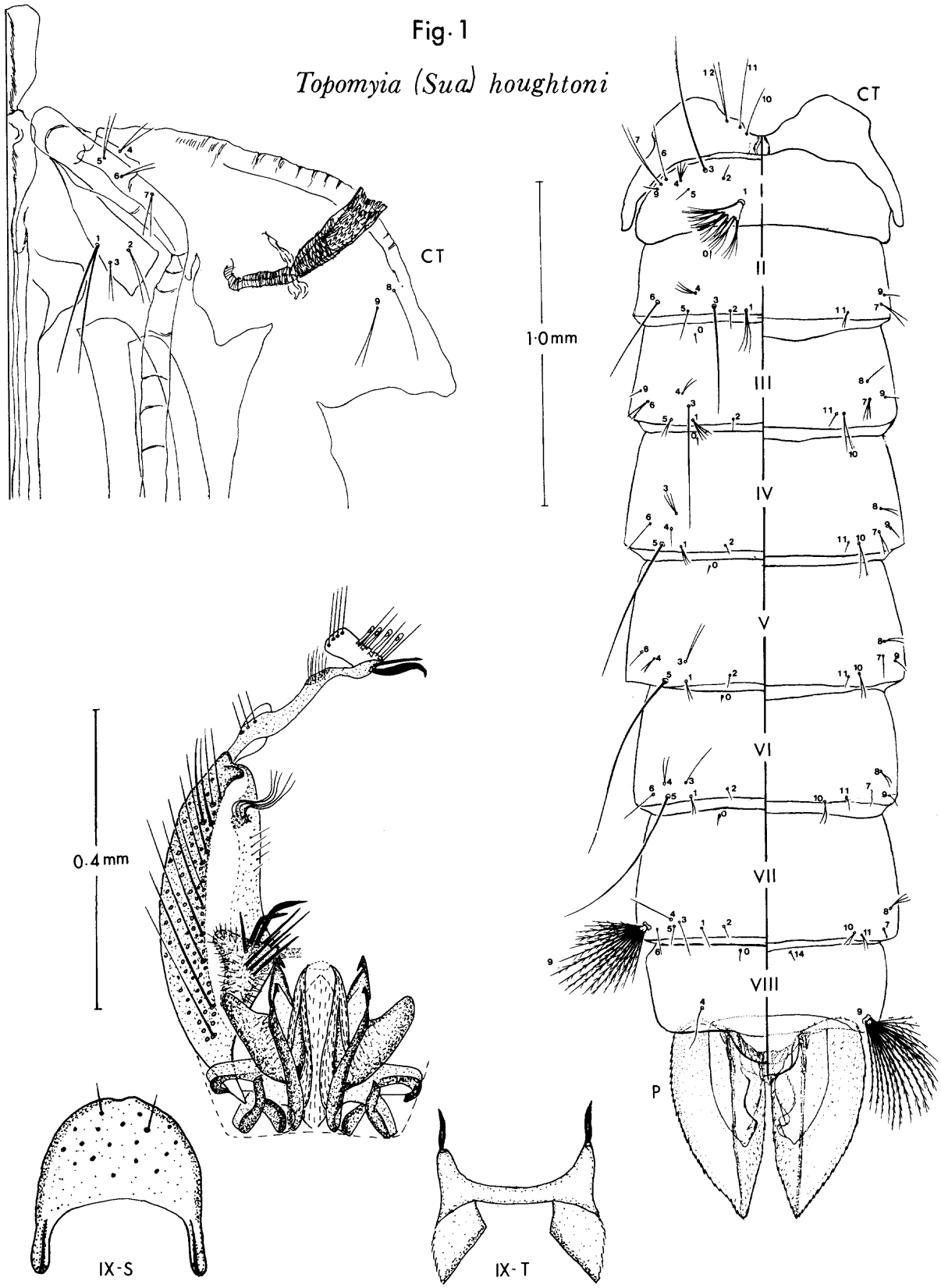

Fig. 2

Topomyia (Sua.) houghtoni