

A Description of Scutomya, a Subgenus Resurrected for the
Albolineatus Group of the Genus Aedes
(Diptera: Culicidae)

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ABSTRACT. Scutomya Theobald is resurrected as a subgenus of the genus Aedes Meigen and the nine species previously assigned to the Albolineatus Group of the subgenus Stegomyia Theobald are included. The subgenus is described, discussed and compared to other subgenera. Its distribution and bionomics are given. Two species groups are proposed for Scutomya. A table provides current status of descriptions and illustrations for all included species.

INTRODUCTION

Scutomya Theobald (1904) is herein resurrected from the synonymy of Stegomyia Theobald as a subgenus of Aedes Meigen. The nine species [Ae. albolineatus (Theobald), Ae. arboricola Knight and Rozeboom, Ae. bambusicola Knight and Rozeboom, Ae. boharti Knight and Rozeboom, Ae. hoogstraali Knight and Rozeboom, Ae. impatibilis (Walker), Ae. laffooni Knight and Rozeboom, Ae. platylepidus Knight and Hull, and Ae. pseudalbolineatus Brug] previously assigned to the Albolineatus Group of subgenus Stegomyia are included in Scutomya. The status of descriptions and illustrations of all included species is listed in Table 1. All stages possess features which distinguish them from those of the other subgenera of Aedes and are covered in the following description and discussion. The range of variation for features within the subgenus description may increase with the collection of additional specimens. Nomenclature used for the stages and structures of Culicidae follow Harbach and Knight [1980, 1981(1982)]. The suggested abbreviation for the subgenus Scutomya is Scu.

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GENUS Aedes MEIGENSUBGENUS Scutomyia THEOBALD

Type-species: Scutomyia albolineata Theobald¹

Scutomyia Theobald 1904:77; of Leicester 1908:105.

Scutomyia in part of Theobald 1905:19, 1907:196, 1910:199; in part of Brunetti 1907:336, 1912:452.

Stegomyia Theobald in part of Brunetti 1914:71, 1920:125; in part of Senior-White 1923:60; Barraud 1927:553.

Aedes (Stegomyia) in part of Edwards 1922:464, 1932:160; in part of Barraud 1934:243; in part of Brug 1939:103; in part of Stone, Knight and Starcke 1959:178; in part of Knight and Stone 1977:154.

Aedes (Stegomyia) Albolineatus Group of Knight and Rozeboom 1946:83; Ross 1950:79; Knight and Hull 1952:167; Bohart 1956(1957):32; Belkin 1962:443; Huang 1978a:197, 1978b:351, 1979:7; Reinert and Ramalingam 1983(1984):337.

FEMALE. Head. Antennal pedicel with a patch of broad overlapping white scales on mesal surface; maxillary palpus dark scaled, 4-segmented; proboscis long, slender and dark scaled; clypeus without scales; eyes separated and with narrow white scales on interocular space (except Ae. platylepidus); vertex covered with broad recumbent scales, scales white on at least anterior area, broad white scales along coronal suture and a small diamond-shaped area of narrow curved white scales on anterior median area except Ae. platylepidus which has vertex with broad dark scales and an anterior median patch of broad pale scales (anterior median white scales broad in Ae. bambusicola); occiput with short erect forked dark scales. Thorax. Scutum with a moderately broad to broad longitudinal median stripe of white scales extending from anterior promontory area to at least posterior end of acrostichal area (absent in Ae. platylepidus); scutellum with broad overlapping recumbent scales on all 3 lobes; acrostichal setae absent; dorsocentral setae present or absent; antepronotum with scales and several setae; postpronotum without scales, 2, 3 posterior setae; proepisternum with broad overlapping white scales on both upper and lower areas, 1-6 (usually 3, 4) upper setae; subspiracular area, paratergite, mesomeron, metameron and mesopostnotum bare; postspiracular area without scales, 1-5 setae; mesokatepisternum with a broad band of broad overlapping white scales covering most of upper area, a smaller patch of similar scales

¹Type-species is Scutomyia albolineata Theobald (1904:77) and not Culex albolineatus Giles (1901:609).

on lower area (upper and lower scale patches connected in Ae. platylepidus), one long stout and 2-5 short fine lower setae, upper setae usually absent (occasionally one seta present in some specimens); prealar knob without scales, 5-9 setae; mesepimeron with a large upper patch of broad overlapping white scales, 3-10 upper setae, lower setae absent. Legs. Coxae I-III each with a patch of broad white scales; tarsus III with at least tarsomere 1 with a white scaled basal band, tarsomere 5 dark scaled. Wing. Dorsal and ventral veins with dark scales, occasionally a minute pale scaled spot at base of costa; alula with a single row of narrow scales on margin; remigial setae present. Halter. Capitellum dark scaled. Abdomen. Terga with laterobasal patches of white scales, in some species white scaled patches extend dorsad and form narrow bands; sterna with basal areas white scaled and apical areas dark scaled. Genitalia. Tergum VIII with base gently concave, apex nearly straight to gently convex, numerous broad scales on apical 0.22-0.79 [0.22-0.50 in all species except Ae. boharti (0.79) and Ae. pseudalbolineatus (0.65)], several short setae on apical 0.19-0.40, apex with several short and a few moderately long stouter setae, VIII-Te index 0.45-0.60, VIII-Te/IX-Te index 1.82-2.97; sternum VIII with base moderately concave, apex gently sloping from lateroapical corners to midline which is indented (0.09-0.14 of VIII-S length), a number of broad scales on apical 0.69-0.90, short and a few moderately long setae on apical 0.75-0.89, apical margin with short and a few moderately long stouter setae, apical intersegmental membrane heavily pigmented, VIII-S index 0.61-0.70; tergum IX with apex with a moderately deep median indentation and with 3-8 (usually 3-6) setae apically on each side of midline, 6-16 total setae, base slightly concave, IX-Te index 0.56-0.97 (usually 0.56-0.66); insula tongue-like, 3-9 (usually 6-9) small tuberculi on apical 0.4, each with or without a short spicule; lower vaginal lip narrow, lower vaginal sclerite absent; upper vaginal lip with caudal margin straight, upper vaginal sclerite moderately to heavily pigmented, medium size, fenestrated on caudal and mesal margins; spermathecal eminence membranous, nonpigmented, with a small median longitudinal area of short to very short simple spermathecal eminence spicules near apices of upper vaginal sclerites; postgenital lobe moderately long, moderately wide, apex usually with a small to moderately deep (0.03-0.10 of dorsal length) V-shaped median indentation or rounded, 8-11 setae on each side of midline, 17-22 total setae, ventral PGL/cercus index 0.64-0.77, dorsal PGL index 0.80-1.13, ventral PGL index 1.57-1.92; cercus moderately long, moderately wide, apex rounded, dorsal surface without scales, 4, 5 moderately long and long stout setae on apical margin, several short and 2, 3 moderately long setae on apical 0.42-0.66, cercus index 1.94-2.31, cercus/dorsal PGL index 2.42-2.97; 3 spermathecal capsules, one large and 2 medium size, heavily pigmented, spherical.

MALE. Essentially as in the female. Head. Antenna plumose, shorter than proboscis; maxillary palpus slender and approximately 0.48-0.83 length of proboscis (except Ae. bambusicola which is approximately 0.97), 5-segmented, palpomere 5 with 4-6 short apical setae, palpomeres 3, 4 with 1-3 short apical setae, palpomeres 4, 5 usually slightly upturned. Genitalia. Tergum IX band-like, caudal margin flat or slightly concave mesally and with several moderately long setae; gonocoxite short to moderately long, base wide and apex narrow, setae more numerous on mesal margin; gonostylus attached at apex of gonocoxite, long, narrow, gently tapered and curved to apex, a single long stout gonostylar claw attached

between 0.25-0.75 of length on mesal margin of gonostylus, secondary setae absent; basal mesal lobe small, moderately long, attached along its length to mesal membrane of gonocoxite, several short to moderately long setae on apical area, 3 or more of these stout and spiniform; proctiger long, narrow, paraproct with a subapical short thumb-like lobe, cercal setae absent; phallosome with aedeagus long, a number of short heavily pigmented teeth on lateroapical margins; basal piece short to moderately long and broad.

PUPA. Metanotum. Seta 10-CT single to 5-branched; 11-CT single, longer than 10, 12-CT; 12-CT single to 3 (usually 3) branched. Abdomen. Seta 3-II-III single, long, stout; 5-IV-V very long, stout; 5-VI long; 9-VII single to 8-branched, long, stout, aciculate (*Ae. bambusicola* has 9-VII small, simple and 6-VII well developed like 9-VII on the other species of the subgenus); 4-VIII single or 4-branched; 9-VIII with 4-21 branches, long, stout, aciculate. Paddle. More or less ovoid; a few minute serrations on basal area of outer margin; a few minute spicules on apical portions of outer and inner margins; without fringe of hair-like spicules; midrib extends to apex; seta 1-P with 2-11 (usually 4 or more) branches, long, stout, aciculate.

LARVA. Head. Seta 1-C single, long, stout; 4-C with 8-21 thin branches, moderately long; 5-C with 2-20 (usually 7-12) branches, long, stout, far caudad and slightly laterad of 4-C; 6-C single to 11-branched (usually single), long, stout, laterad and slightly caudad of 4-C; 7-C with 5-25 (usually 7-14) branches, long, caudomesad of antennal base; 13-C single, long; 15-C with 1-8 (usually 4, 5 and rarely 1,2) branches, long, aciculate; 6-Mx with 2-13 branches, well developed. Antenna. Short, with or without small spicules; seta 1-A single to 5-branched, short. Abdomen. Seta 1-I-VII multiple branched, moderately long; 6-I-VI long, aciculate, 6-I with 3-9 branches, 6-II with 3-6 (occasionally 2) branches, 6-III-VI with 2 branches; 13-I-VI multiple branched, moderately long; comb on VIII with 3-16 scales arranged in a single row, each scale thorn-like with a long stout median apical spine and small denticles on laterobasal areas; saddle incompletely rings segment X, acus absent; 1-X single to 4 (usually 3,4) branched, long, stout, aciculate; 2-X with 2-10 branches (usually with 3 or more branches), moderately long; 3-X single, long; 4-X composed of 10 setae attached to the grid, each with 2-12 branches (at least one seta with 4 or more branches, except *Ae. bambusicola*); 4 anal papillae. Siphon. Short; index approximately 2.0-3.1; acus present; pecten on basal one half of siphon, 3-11 (*Ae. arboricola* and *Ae. bambusicola* occasionally with 1,2) spines, evenly spaced; seta 1-S with 2-7 (usually 3,4) branches, moderately long to long, aciculate, distad of pecten.

SPECIES GROUPS. Based on distinctive characters of the adult habitus, male genitalia, pupa and larva, two species groups (Laffooni and Hoogstraali) are proposed for the subgenus Scutomyia as follows.

LAFFOONI GROUP

Adults. Median longitudinal white scaled stripe of scutum does not extend to prescutellar area but usually extends from anterior pronotory area to posterior end of acrostichal area.

Male Genitalia. Gonostylar claw attached distal to or at midpoint of gonostylus; gonostylar claw moderately long; aedeagus with apical area flared.

Pupa. Seta 5-CT very long, stout, aciculate, usually single; seta 5-VI long, stout.

Larva. Integument of thorax and abdomen with or without pilosity of spicules; thorax and abdomen with numerous well developed stellate setae; seta 2-X with 7-10 (rarely 5, 6) branches.

Species Included. The following five species belong to the Laffooni Group: Ae. albolineatus, Ae. arboricola, Ae. boharti, Ae. laffooni and Ae. pseudalbolineatus.

HOOGSTRAALI GROUP

Adults. Median longitudinal white scaled stripe of scutum extends to at least prescutellar area and often extends from anterior promontory area to posterior end of prescutellar area or stripe absent.

Male Genitalia. Gonostylar claw attached proximal to midpoint of gonostylus; gonostylar claw long; aedeagus with apical area not flared.

Pupa. Seta 5-CT short, thin, simple, often branched; seta 5-VI moderately long, thin.

Larva. Integument of thorax and abdomen not pilose; thorax and abdomen at most with only a few stellate setae and these with fewer branches; seta 2-X with 2-6 (usually 4, 5) branches.

Species Included. The following four species belong to the Hoogstraali Group: Ae. bambusicola, Ae. hoogstraali, Ae. impatibilis and Ae. platylepidus.

DISCUSSION. Theobald (1904) described the new genus Scutomya for his new species Scutomya albolineata. Brunetti in 1914 included Scutomya as a synonym of the genus Stegomyia Theobald and later Edwards (1922) reduced Stegomyia to subgeneric rank within the genus Aedes Meigen. As part of the subgenus Stegomyia, Knight and Rozeboom (1946) designated the Albolineatus Group of species (Ae. albolineatus, Ae. arboricola, Ae. bambusicola, Ae. boharti, Ae. hoogstraali, Ae. impatibilis, Ae. laffooni and Ae. pseudalbolineatus). Other authors have followed this group classification, including Belkin (1962), Bohart [1956(1957)], Reinert (1973a), Huang (1978a, 1978b, 1979) (latter article also transferred Ae. platylepidus Knight and Hull to this group), and Reinert and Ramalingam [1983(1984)]. Based on the distinctive features mentioned, the subgenus Scutomya is resurrected for the species previously assigned to the Albolineatus Group.

The following features are the most distinctive for Scutomya and they can be used to separate this subgenus from the other subgenera of Aedes: in the adults by the combination of (1) antennal pedicel with mesal patch of broad pale scales, (2) maxillary palpus and proboscis dark scaled,

(3) scutellum with broad scales on all three lobes, (4) acrostichal setae absent, (5) postpronotum, subspiracular area and paratergite without scales, (6) proepisternum with scales on both upper and lower areas, (7) mesepimeron without lower setae, and (8) tarsus III with at least tarsomere 1 with white scaled basal band and tarsomere 5 dark scaled; in the female genitalia by the combination of (1) tergum VIII shape, (2) insula tongue-like with several tuberculi, and (3) tergum IX shape; in the male genitalia by the combination of (1) tergum IX band-like with setae; (2) gonostylus long, narrow, a single long gonostylar claw attached at a distance from apex, and secondary setae absent, (3) basal mesal lobe with several apical setae, some of which are stout and spiniform, (4) proctiger long and with subapical lobe, (5) aedeagus long and with a number of short lateroapical teeth, and (6) basal piece broad; in the pupa by the combination of (1) seta 3-II-III single, long and stout, (2) seta 5-IV-V usually single, very long and stout, (3) seta 9-VII-VIII long, stout, aciculate, and seta 9-VIII multiple branched, (4) seta 1-P usually with 4-8 (2-11) branches, long and stout, and (5) paddle without fringe of hair-like spicules; and in the larva by the combination of (1) positions of setae 4-7-C, (2) setae 4, 5, 7-C multiple branched, (3) seta 15-C multiple branched and long, (4) seta 1-A single to 5-branched and short, (5) seta 6-I-VI with 2 or more branches and long, (6) comb scales in a single row and thorn-like, (7) seta 2-X multiple branched, (8) seta 4-X with 5 pairs of multiple branched setae attached on the grid, (9) siphon short and with an acus, and (10) pecten with 3-11 (Ae. arboricola and Ae. bambusicola occasionally with 1, 2) evenly spaced spines.

Adult features of Scutomyia show the most similarity to those of subgenera Stegomyia and Diceromyia Theobald. From Stegomyia they differ by: antennal pedicel with a patch of broad scales only on mesal area, maxillary palpus and proboscis both dark scaled, subspiracular area and paratergite both without scales, and tarsus III with tarsomere 5 dark scaled. Edwards (1941) and Huang (1972, 1977, 1979) provide summaries of the features of subgenus Stegomyia. Scutomyia differs from Diceromyia by: antennal pedicel with a patch of broad scales mesally and without short setae, absence of scales on subspiracular area and paratergite, upper mesokatepisternal setae usually absent, male palpus differently developed, and mesepimeron without lower setae. Additional descriptive features of Diceromyia are provided by Reinert (1970, 1973b). Adults of Scutomyia, especially Ae. platylepidus, superficially resemble those of subgenus Mattinglyia Lien of the genus Heizmannia Ludlow. They are easily separated from Mattinglyia by the absence of scales on the paratergite, absence of lower mesepimeral setae, and presence of a patch of broad pale scales on mesal area of the antennal pedicel.

Female genitalia of Scutomyia can be distinguished from other subgenera of Aedes by the shape of tergum VIII and the tongue-like insula with several tuberculi. Tergum VIII is somewhat similar to those of Aztecaedes Zavortink, Chaetocruimyia Theobald, some Finlaya Theobald, Macleaya Theobald, Protomacleaya Theobald and African Diceromyia. From the first five subgenera, Scutomyia is easily separated by the development of the insula, tergum IX, postgenital lobe and cercus. Female genitalia of Scutomyia are most similar to those of African Diceromyia from which they differ in the development of the cercus, tergum IX and postgenital lobe.

The male genitalia of the subgenus are most similar to those of subgenera Stegomyia and Diceromyia but they can be easily separated by the combination of features mentioned above.

Pupae and larvae of Scutomyia are distinguished from other subgenera of Aedes by the characters previously outlined. Exact relationships with other subgenera are not apparent. It is noteworthy that larvae of some species of Scutomyia have two or more forms without any apparent correlated differences in the pupae or adults.

Keys to species included in Scutomyia can be found in Huang (1979), as Albolineatus Group of subgenus Stegomyia, and with an amendment in Reinert and Ramalingam [1983(1984)]. For current illustrations of most stages and structures, the reader is referred to Reinert (1970), Huang (1978a, 1978b, 1979) and Reinert and Ramalingam [1983(1984)].

DISTRIBUTION. The subgenus contains species which have their distribution restricted to the Oriental region with the exception of the widespread species Ae. albolineatus which also has been reported from the Papuan area and the Solomon Islands. All species, with the exception of Ae. pseudalbolineatus, have been reported from the Philippine Islands. Belkin (1962) and Huang (1979) provide recent summaries of the geographical distribution of the subgenus. The latter author lists distribution by species.

BIONOMICS. The usual immature habitats of Scutomyia species are plant containers such as bamboo stumps and tree holes; however, they also have been reported from coconut shells and husks, leaf axils of sago palms and Colocasia, banana stumps, fallen leaves, palm stump, fallen coconut spathe, steps cut in coconut trees, rot holes in trees, depression in a log located in a mangrove area, bamboo stakes, tree stump, rock hole, lagoon, jungle pool, broken bottle, water bucket in woods, a tub, in beached canoes, and a tin can. One or more of these breeding sites were reported by: Leicester (1908); Barraud (1927, 1934); Paine and Edwards (1929); Borel (1930); Bonne-Wepster and Brug (1932); Brug (1939); Knight and Rozeboom (1946); Belkin (1962); Reinert (1970); Huang (1978a, 1978b, 1979); and Reinert and Ramalingam [1983(1984)].

Females apparently seldom bite humans; however, Ae. albolineatus and Ae. boharti have been reported in the literature as feeding on humans. The label of one specimen of Ae. bambusicola examined indicated it was taken feeding on the leg of the collector.

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Table 1. Species of Aedes (Scutomyia)
and status of known stages/structures

SPECIES	F	FG	M	MG	P	L	E
LAFFOONI GROUP							
<u>Ae. albolineatus</u>	X	X*	X*	X*	X*	X*	-
<u>Ae. arboricola</u>	X	-	X	X*	X*	X*	-
<u>Ae. boharti</u>	X	-	X	X*	X*	X*	-
<u>Ae. laffooni</u>	X*	X*	X*	X*	X*	X*	-
<u>Ae. pseudalbolineatus</u>	X*	X*	X*	X*	-	X	-
HOOGSTRAALI GROUP							
<u>Ae. bambusicola</u>	X*	-	X*	X*	X*	X*	-
<u>Ae. hoogstraali</u>	X	X*	X*	X*	X*	X*	-
<u>Ae. impatibilis</u>	X	X*	X*	X*	X*	-	-
<u>Ae. platylepidus</u>	X*	-	X*	X*	X*	X*	-

X = Indicates stage or structure has been described.

X* = Indicates stage or structure has been illustrated.

- = Indicates stage or structure has not been described or illustrated.

F = Female

FG = Female genitalia

M = Male

MG = Male genitalia

P = Pupa

L = Larva

E = Egg