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Descriptions of genus *Downsiomyia* Vargas (Diptera: Culicidae: Aedini) and its type species *Do. nivea* (Ludlow)

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Abstract

Genus *Downsiomyia* and its type species, *Do. nivea* (Ludlow), are described in detail. The 30 species included in the genus are listed. An extensive list of previous literature pertaining to the genus is provided.

Key words: *Aedes*, *Downsiomyia*, *Finlaya*, Albonivea Group, Nivea Group, *Do. nivea*, mosquitoes

Introduction

Recently, Reinert *et al.* (2004), as a result of cladistic analysis of the tribe Aedini, reinstated *Downsiomyia* Vargas to generic rank for species previously placed in the Niveus Group of *Finlaya* Theobald. These authors proposed extensive changes to the generic classification of Aedini based on the analyses of morphological data from eggs, fourth-instar larvae, pupae, and adults of all previously recognized genera, subgenera, and major groups of the tribe. The very brief original description (in Spanish) of *Downsiomyia* by Vargas (1950) is inadequate for distinguishing generic-level taxa of Culicidae, therefore the genus and its type species, *Do. nivea* (Ludlow), are described in detail below. The genus includes 30 species (listed herein). In accordance with provisions of the *International Code of Zoological Nomenclature* (International Commission on Zoological Nomenclature 1999), the terminations of some species names were changed to agree in gender with *Downsiomyia*.

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Morphological terminology used in the descriptions follows Harbach & Knight (1980, 1982) and Reinert (1990, 1999b, 2000b). The recommended two-letter abbreviation for *Downsiomyia* is *Do*. A "previous usage" section is provided for tracking the published generic-level history of species included in *Downsiomyia*.

Genus *Downsiomyia* Vargas, 1950

Type species: *Stegomyia nivea* Ludlow, 1903

Previous usage

Stegomyia Theobald, of Ludlow (1903), in part of Theobald (1903, 1905a, 1907, 1908, 1910), Blanchard (1905), Ludlow (1905), Leicester (1908), Stone (1957b).

Scutomyia Theobald of Ludlow (1911), in part of Theobald (1905b, 1907, 1910), Banks (1906), Brunetti (1907, 1912).

Ochlerotatus Lynch Arribalzaga, of Shriram *et al.* (2005), in part of Edwards (1913), Moulton (1914), Brunetti (1920), Senior-White (1923).

Aedes (*Ochlerotatus*) Group *Finlaya*, in part of Edwards (1917).

Finlaya Theobald, in part of Barraud (1923, 1924), Senior-White (1927).

Armigeres of Edwards (1926).

Aedes (*Finlaya*) of Knight & Chamberlain (1948), Peters & Dewar (1956), Stone (1957a), Knight (1978a), Luh & Li (1980), Huang & Rueda (1998), in part of Dyar (1920), Edwards (1921, 1922a, 1922b, 1928, 1929), Brug & Haga (1923), Haga (1924), Dyar & Shannon (1925), Brug (1926, 1931, 1934, 1939), Borel (1930), Brug & Edwards (1931), Barraud (1934), Li & Wu (1935), Bonne-Wepster & Brug (1937, 1939), Causey (1937), Hu (1937), Feng (1938a, 1938b, 1958), Wu (1940), Bohart (1945, 1946), Hsiao (1945), Bohart & Ingram (1946), Brug & Bonne-Wepster (1947), LaCasse (1948), LaCasse & Yamaguti (1948, 1950), Sasa (1948), Chow (1949a, 1949b, 1950), Carter (1950), Knight & Hull (1951), Monchadskii (1951), Bonne-Wepster (1954a, b), Chow *et al.* (1954), Horsfall (1955), Stone & Knight (1956), Hsieh & Liao (1956), Hara (1957), Macdonald (1957), Chu (1957), Wattal *et al.* (1958), Thurman (1959, 1963), Stone *et al.* (1959), Stone (1961, 1963, 1967, 1970), Omori (1962), Lien (1962, 1968), Kurihara (1963, 1978, 1981, 1999), Delfinado *et al.* (1963), Loy & Rowland (1963), Rozeboom & Cabrera (1964), Mackie (1964), Joshi *et al.* (1965), Macdonald *et al.* (1965), Army Mosquito Project (1965), Scanlon & Esah (1965), Scanlon & Peyton (1965), Stone *et al.* (1966), Gould *et al.* (1968), Ramachandran *et al.* (1970), Aslamkhan (1971), Tanaka (1971, 2002), Basio (1971), Grothaus *et al.* (1971), Qutubuddin (1972), Rahman *et al.* (1973), Stone & Delfinado (1973), Ramalingam & Pillai (1973), Ramalingam (1974), Matsuo *et al.* (1974), Gutsevich *et al.* (1974), Baisas (1974), Lien *et al.* (1975), Bhat (1975), Tanaka *et al.* (1975), Sasa *et al.* (1977), Lien *et al.* (1977), Knight & Stone (1977), Knight (1978b), Lee *et al.* (1980, 1982), Gutsevich & Dubitsky (1981), Jayasekera & Chelliah (1981),

O'Connor & Sopa (1981), Ma (1982), Chau (1982), Lu & Li (1982), Gould *et al.* (1982), Cai (1984), Ward (1984, 1992), Miyagi *et al.* (1985), Tsukamoto & Horio (1985), Lee & Egan (1985), Toma & Miyagi (1986), Apiwathnasorn (1986), Rudnick *et al.* (1986), Malhotra *et al.* (1987), Nagpal & Sharma (1987), Lee (1987), Tsukamoto *et al.* (1987), Lee & Zorka (1987), Lu & Su (1987), Ahmed (1988), Lu *et al.* (1988), Debenham & Hicks (1989), Evenhuis & Gon (1989), Townsend *et al.* (1990), Darsie & Pradhan (1990), Harrison *et al.* (1991), Darsie *et al.* (1992, 1993), Malhotra & Mahanta (1994), Stojanovich & Scott (1995, 1996a, 1996b), Reinert (1999a), Peyton *et al.* (1999), Tanaka (2003), Kaur (2003), Kurihara *et al.* (2004), Rajavel *et al.* (2005b).

Aedes (*Ochlerotatus*) Globus *Finlaya*, in part of Martini (1931).

Aedes (*Finlaya*) Group H, in part of Edwards (1932), Bohart (1957).

Aedes Meigen, in part of Riley (1932), Yamada (1932), Hsiao & Bohart (1946), Sasa *et al.* (1947), Barnett & Toshioka (1951), Osima (1952), Ori & Shimogama (1953), Chu (1957), Barnett (1962), Cabrera & Rozeboom (1964), Sakakibara (1965), Stojanovich & Scott (1965, 1966), Lee & Lien (1970), Basio *et al.* (1973), Ree *et al.* (1973), Harinasuta *et al.* (1974), Wada *et al.* (1976), Pae *et al.* (1976), Sarkar *et al.* (1981), Malhotra *et al.* (1982), Gandahusada *et al.* (1984), Lee *et al.* (1984), Xu (1984), Khamboonruang *et al.* (1987), Hawley (1988), Darsie *et al.* (1991), Service (1993), Gerberg *et al.* (1994), Mogi (1996), Strickman *et al.* (2000), Ruang-Areerate *et al.* (2003).

Aedes (*Finlaya*) *niveus* complex of Traub & Macdonald (1963).

Aedes (*Finlaya*) Group H (Geniculatus-Group), Subgroup I, Niveus of Knight & Marks (1952), Colless (1958, 1959), Macdonald & Traub (1960).

Aedes (*Finlaya*) *niveus* group of Wharton (1962), Traub & Macdonald (1963), Rao & Rajagopalan (1957), Colless (1957), Harinasuta *et al.* (1970), White (1979), Lu (1981), Rajput & Singh (1987).

Aedes (*Finlaya*) *niveus* subgroup of Sasa & Kakahashi (1952), Knight (1946, 1969), Nakato & Matuo (1960), van Peenen *et al.* (1975), Furumizo & Rudnick (1979), Amerasinghe (1982), Knight & Harrison (1988), Kulasekera *et al.* (1990), Rattanarithikul & Panthusiri (1994), Tewari & Hiriyan (1995), Rueda (2004).

Aedes (*Finlaya*) *Nipponicus* group of Tanaka *et al.* (1979).

Aedes (*Finlaya*) *niveus* group, *niveus* subgroup of Lu & Ji (1997).

Ochlerotatus (*Finlaya*), in part of Reinert (2000a), Zagaria & Savioli (2002), Rajavel *et al.* (2005a), Rattanarithikul *et al.* (2005).

Ochlerotatus (*Finlaya*) Niveus Assemblage, of Reinert (2002).

Downsiomyia Vargas, of Reinert *et al.* (2004).

Description

FEMALES. *Head:* Vertex with broad, decumbent scales; occiput with numerous erect, forked scales; ocular line narrow, with pale scales; eyes above antennal pedicels contiguous or separated by 1 eye facet or less; interocular space small, with few pale

scales, normally 2 dark, interocular setae; antennal pedicel with few small scales and short, dark setae mesally; maxillary palpus and proboscis dark-scaled. *Thorax:* Scutum with dark integument, covered with narrow, dark scales except bare, median prescutellar space; narrow pale (normally silvery or white) scales on anterior promontory, antedorsocentral area, scutal fossa (normally entire area, rarely pale scales extending posteriorly onto antealar and anterior margin of supraalar area, e.g. *Do. nipponica* (LaCasse & Yamaguti)), anterior 0.30–0.70 of acrostichal and dorsocentral areas (some species, e.g. *Do. harinasutai* (Knight), *Do. litorea* (Colless), *Do. nipponica* and *Do. nivea* (Ludlow)); prescutellar space mesal to setae rarely with pale scales (e.g. *Do. mohani* (Knight), *Do. nipponica, Do. saperoi* (Knight) and *Do. watteni* (Lien)), and normally antealar area, other areas dark-scaled; acrostichal (anterior and posterior) and dorsocentral (anterior and posterior) areas without setae; scutellum with broad scales (normally dark) and several setae on all lobes; mesopostnotum bare; paratergite wide, bare; antepronota widely separated, with broad, pale scales, several setae; postpronotum with few broad scales normally restricted to posterodorsal area, few posterior setae; prespiracular setae absent; postspiracular area without scales, with several setae; hypostigmal and subspiracular areas bare; upper proepisternum with broad scales, several setae; lower proepisternum bare; mesokatepisternum with upper and lower posterior patches of broad, pale scales, few upper and posterior setae; prealar area with patch of broad, pale scales on lower area extending dorsally onto lower part of upper area (except absent in few species, e.g. *Do. ganapathi* (Knight), *Do. pseudonivea* (Theobald), *Do. pexa* (Colless) and *Do. vana* (Colless)); mesepimeron with 1 moderately large patch on upper area and extending onto middle, several upper setae, lower setae absent; metameron bare. *Wing:* Entirely dark-scaled; remigium with 1–3 setae distally on dorsal surface; upper calypter with several setae on margin; alula with row of narrow scales on margin; vein R_2 longer than R_{2+3}; anal vein terminating distal to juncture of CuA and mcu. *Legs:* Hindfemur dark-scaled distally, with broad, pale-scaled areas on proximal parts of anterior and posterior surfaces; tibiae and tarsi dark-scaled; fore- and midungues each with 1 tooth, hindungues simple. *Abdomen:* Terga with basolateral, pale-scaled patches; segments VII and VIII laterally compressed.

Female genitalia. *Tergum VIII:* Proximal 0.20–0.40 retracted into segment VII; moderately to heavily pigmented, base broad and moderately concave; apex broadly rounded; numerous broad scales covering distal 0.70–0.85; apical margin with number of long, stout setae; several short setae on distal 0.35–0.69; VIII-Te index 0.50–0.76 (0.84 in *Do. nipponica*); length 0.26–0.36 mm; width 0.38–0.56 mm. *Sternum VIII:* Moderately to heavily pigmented; base straight; apex with minute (0.01–0.06 of VIII-S length), median emargination separating pair of broad, flattened lobes or with pair of broad, flattened lobes with apicolateral areas angled posterolaterally; broad scales forming moderately large patches on median, lateral areas on distal 0.76–0.92; numerous short setae on distal 0.84–0.97; apical margin with numerous short, lanceolate setae with apices curved; seta

2–S inserted posterior to 1-S; intersegmental membrane between segments VII and VIII short; VIII-S index 0.81–0.93 (0.74 in *Do. inermis* (Colless)); length 0.32–0.46 mm; width 0.38–0.50 mm. *Tergum IX:* Heavily pigmented; comprised of 2 narrow, finger-like, lateral lobes connected by very narrow, basal strip; 1–5 (usually 2–4) moderately long, stout setae apically on each lobe; IX-Te index 0.60–1.07; length 0.09–0.14 mm; width 0.10–0.16 mm. *Insula:* Covered with short spicules; lightly to moderately pigmented; short; wide; liplike; with 3–8 moderately long setae. *Lower vaginal lip:* Moderately pigmented; narrow, lower vaginal sclerite absent. *Upper vaginal lip:* Heavily pigmented; narrow; median caudal area flattened; upper vaginal sclerite very small, comprised of narrow, heavily pigmented strip along basolateral area of lip. *Spermathecal eminence:* Membranous; comprised of few wrinkled, circular folds. *Postgenital lobe:* Spicules along lateral margins longer, stout and many with basal denticles; short; moderately broad; apex flattened or broadly rounded but usually with minute (0.02–0.08 of dorsal length), median emargination; 12–39 total setae; ventral PGL index 1.42–2.00; ventral length 0.11–0.15 mm (0.17 mm in *Do. pexa*). *Cercus:* Short; broad; apical margin broad and oblique with 5–7 (usually 6) stout setae, setae long on mesal area and tapering in length to moderately long on lateral area, several short, lanceolate setae with apices curved; dorsal surface with scales absent, 2,3 long and few short setae on distal 0.37–0.65; cercus index 1.45–1.89; length 0.14–0.18 mm; width 0.08–0.11 mm. *Spermathecal capsules:* Nivea Group with one large capsule, Albonivea Group with one large and 2 medium capsules; numerous small spermathecal capsule pores near orifice.

MALES. *Head:* Antenna about 0.75 length of proboscis, flagellar whorls with numerous long setae directed dorsally and ventrally, distal 2 flagellomeres elongate; maxillary palpus dark-scaled, slightly shorter to approximately equal to proboscis length, palpomere 1 small, palpomere 2 long, narrow, palpomere 3 long, narrow, slightly upturned, with few to several long setae apically on ventral surface, palpomere 4 short, thin, with several to numerous moderately long setae on ventrolateral margins, setae projecting anteroventrally, few moderately long setae dorsoapically, palpomere 5 short, with several short to moderately long setae mainly on ventral and apical areas, palpomeres 4,5 normally slightly down-turned; proboscis longer than forefemur. *Thorax:* Anterior area of scutum with silvery scales more extensive than in female. *Legs:* Fore- and midtarsi with ungues unequal, each with 1 tooth, hindtarsus with ungues equal, both simple.

Male genitalia. *Tergum IX:* Relatively short, bearing 2 small lobes caudally, each with few to several stout setae. *Gonocoxite:* Somewhat triangular in outline, proximal part relatively broad, distal part narrow, ventral surface with several to numerous long, broad, fusiform scales on mesal area (except *Do. mikrokopion* (Knight & Harrison)); dorsal surface with numerous short, slender setae on mesal area, and with narrow, thumblike lobe on basomesal area projecting caudoventrally and bearing few to several short setae; dorsal and lateral surfaces with numerous relatively long, dark, broad, spatulate scales.

Gonostylus: Narrow, relatively short, with long, narrow gonostylar claw attached apically. *Proctiger:* Paraproct heavily pigmented and terminating in short, curved, beaklike point; few short, cercal setae. *Phallosome:* Aedeagus simple, scooplike, apex concave (except *Do. axitiosa* (Kulasekera, Knight & Harbach), see Kulasekera *et al.* 1990) with one or usually 2 or more small teeth on each side laterally; paramere narrow, shorter than aedeagus; basal piece short and broad. *Claspette:* With moderately long columnar stem bearing 1–3 short, thin setae, with narrow, basolateral extension connected to ventral area of basomesal, thumblike lobe of gonocoxite; claspette filament long, somewhat leaflike, longitudinally striated, expanded on middle part and narrow distally. *Sternum IX:* With few, normally moderately long setae caudomesally.

PUPAE. *Cephalothorax:* Seta 1-CT long, moderately stout to stout, normally single (occasionally 2-branched); 2,3-CT short, slender; 5-CT longer than 4-CT, 5-CT often long, moderately stout to stout, single; 11-CT stout, single (distal part rarely forked). *Trumpet:* With basal tracheoid area weakly developed. *Abdomen:* Seta 3-I long, single, longer than 6,7-I; 6-I single (rarely 2-branched), longer than 7-I; 7-I normally 2-4 branched (rarely single); 9-III-VI short; 6-VII short, slender, with 2–7 branches, inserted posterior and slightly mesal to 9-VII; 9-VII moderately long, stout, aciculate, normally with 2,3 branches (rarely single on 1 side); 9-VIII long, stout, multiple-branched, aciculate, inserted on posterolateral corner of segment. *Paddle:* Without fringe of long spicules; midrib well developed, reaching or nearly reaching apex; seta 1-Pa often single (with 2,3 branches in some species, e.g. *Do. novonivea*).

FOURTH-INSTAR LARVAE. *Head:* Seta 1-C single, distal part attenuate (*Do. axitiosa* split distally, see Kulasekera *et al.* 1990); 4-7-C well developed, multiple-branched, aciculate; 4-C slightly shorter than 5-7-C, inserted mesal to 6-C; 5-7-C approximately equal in length; 5-C inserted posterior to 4,6,7-C; 13-C single (single or 2-branched in *Do. mikrokopion*, see Knight & Harrison 1987), long, inserted lateral to 12-C; 18-C present; 19-C absent; antenna with spicules, 1-A multiple-branched, aciculate; 6-Mx branched; labiogula width greater than length; ventromedian cervical sclerite present. *Thorax:* Setae 1-3-P normally inserted on common setal support plate; 8-P branched, shorter than 4-P; 5-M longer than 7-M; 6-T single. *Abdomen:* Seta 12-I present; 6-I-VI long, 6-II,III branched, 6-II shorter than 6-III; 7-I long, stout, single or 2-branched; 7-II short, multiple-branched; 8-II branched; 2-VI at same level or mesal to 1-VI (2-VI slightly lateral to 1-VI in *Do. litorea*); 1-VII long; 2-VII inserted near 1-VII; 3-VII branched; 4,10,12-VII, 2,4-VIII single; comb scales in single row (except small patch in *Do. axitiosa*); segment X with saddle incomplete ventrally, normally with several moderately long to long, stout spicules on posterior margin dorsal to insertion of 1-X, acus absent, 1-X inserted on saddle, 2-X normally with few branches, much shorter than 3-X, 3-X long, single, ventral brush with several setae, posterior setae normally with several long

branches arising from short stem, inserted on grid normally with transverse and lateral bars (lateral bar weekly developed or absent in some species, e.g. *Do. harinasutai* and *Do. mohani*), 2,3 shorter precratal setae. *Siphon:* Pecten comprised of numerous, evenly spaced spines, inserted on approximately proximal 0.50 of siphon, acus present, seta 1-S branched, aciculate, inserted distal to pecten, 6,8-S short, 9-S short, slightly curved.

EGGS. Matsuo *et al.* (1974) provided photographs and the following description of the egg of *Do. albolateralis* (Theobald). *Size:* Length 470–510 μ (495 ± 2 μ); width 120–170 μ (151 ± 3 μ). *Outer chorion:* Reticulation composed of pattern of quadrilateral, pentagonal, or sometimes hexagonal cells (at 200x magnification), ridge of reticulation high, hence cells appearing concave, many small papillae in each cell, irregular in shape, occasionally confluent with each other and ridge (at 1,000x magnification).

Species included in Downsiomyia

Specimens examined in parenthesis, F = female, Fg = female genitalia, M = male, Mg = male genitalia, P = pupa, and L = fourth-instar larva. Nivea Group: *Do. albolateralis* (F, Fg, M, Mg, P, L), *Do. axitiosa, Do. dorseyi* (Knight) (F, Fg, M, Mg, L), *Do. ganapathi* (F, Fg, M, Mg, P, L), *Do. harinasuti* (F, Fg, M, Mg, P, L), *Do. idjenensis* (Brug), *Do. inermis* (F, Fg, M, Mg, P, L), *Do. lactea* (Knight) (F, L), *Do. laoagensis* (Knight) (F, Fg, M, P, L), *Do. leonis* (Colless) (F, Fg, M, Mg, P, L), *Do. litorea* (F, Fg, M, Mg, P, L), *Do. mikrokopion* (F, Fg, M), *Do. mjoebergi* (Edwards) (F, Fg), *Do. mohani* (F, Fg, M, P, L), *Do. nipponica* (F, Fg, M, Mg, P, L), *Do. nippononivea* (Sasa & Nakahashi) (F, M), *Do. nishikawai* (Tanaka, Mizusawa & Saugstad) (F, M, P, L), *Do. niveoides* (Barraud) (F, Fg, M, Mg, P, L), *Do. nivea* (F, Fg, M, Mg, P, L), *Do. novonivea* (Barraud) (F, Fg, M, Mg, P, L), *Do. omorii* (Lien) (F, M, Mg, P, L), *Do. pexa* (F, Fg, M, Mg, P, L), *Do. pseudonivea* (F, Fg, M, Mg, P, L), *Do. shehzadae* (Qutubuddin), *Do. sinensis* (Chow) (M, Mg), *Do. subnivea* (Edwards) (F, Fg, M, Mg, P, L), *Do. vana* (F, Fg, M, Mg, P, L), *Do. watteni* (F, M, Mg, P, L), and Albonivea Group: *Do. albonivea* (Barraud) (F, Fg, M, Mg) and *Do. saperoi* (F, Fg, M, Mg, P, L).

Bionomics

Immatures of *Downsiomyia* species normally inhabit water in treeholes but have been collected occasionally from bamboo stumps, fallen bamboo and bamboo internodes (Mcdonald & Traub 1960). Macdonald (1957) reported *Fl. albolateralis* biting humans in the forest canopy (75 feet high) and less commonly at ground level in Malaysia. *Finlaya niveoides* and *Fl. vana* were collected biting humans in a swamp-forest in Malaysia (Wharton 1962) and Macdonald *et al.* (1965) reported small numbers of *Fl. nivea*-subgroup species biting humans by day and early evening in Malaysia. Shriram *et al.* (2005) found 96 of 3,625 *Fl. nivea* (identification ?, see discussion below under *Fl. nivea*) naturally infected with *Wuchereria bancrofti* filarial parasites in the Andaman and Nicobar Islands of India.

Distribution

Species of the genus occur in the Oriental Region and adjoining areas of the Australasian and Palaearctic Regions.

Discussion

Downsiomyia is diagnosed and distinguished from other generic-level taxa of Aedini by the following combinations of characters: females by (1) vertex with only broad, decumbent scales whereas erect, forked scales restricted to occiput, (2) antennal pedicel with few small scales and short setae mesally, (3) eyes contiguous or separated by one eye facet or less, (4) maxillary palpus and proboscis dark-scaled, (5) acrostichal and dorsocentral areas without setae, (6) scutal fossa entirely covered (or rarely nearly covered) with narrow, curved, pale scales, (7) supraalar area dark-scaled (rarely pale scales extending to anterior margin of supraalar area, e.g. *Do. nipponica*), (8) scutellum with broad scales on all lobes, (9) paratergite, postspiracular area, subspiracular area and metameron without scales, (10) wing entirely dark-scaled, and (11) hindtibia, hindtarsus and distal part of hindfemur dark-scaled; female genitalia by (1) both tergum VIII and sternum VIII with numerous broad scales, (2) tergum IX comprised of two narrow, lateral lobes connected by narrow, basal strip and each lobe with 1–5 setae apically, (3) insula liplike with few long setae in lateral patches, (4) upper vaginal sclerite small, (5) cercus short, broad, with lateral part of distal margin oblique and bearing 5–7 stout setae that decrease in length laterally, and (6) only single large spermathecal capsule (Nivea Group) or one large and two smaller spermathecal capsules (Albonivea Group); males by (1) flagellar whorls of antenna with numerous long setae directed dorsally and ventrally and distal two flagellomeres elongate, (2) maxillary palpus slender, dark-scaled and slightly shorter to approximately equal to length of proboscis, (3) fore- and midtarsi with unequal ungues, each with one tooth, whereas hind ungues are equal, simple; male genitalia by (1) gonocoxite somewhat triangular in outline, proximal part relatively broad, distal part narrow and bearing several to numerous long, broad, fusiform scales (except *Do. mikrokopion*) on mesal area of ventral surface, and basomesal area of dorsal surface with narrow, thumblike lobe bearing several short setae, (2) gonostylus relatively narrow, short and with long, narrow gonostylar claw apically, (3) aedeagus simple, scooplike and with one or usually two or more small teeth apically on each side, and (4) claspette developed as moderately long column bearing one long, somewhat leaf-like, longitudinally striated, claspette filament apically; pupae by (1) seta 1-CT long, moderately stout to stout and normally single whereas setae 2,3-CT are short and slender, (2) seta 5-CT noticeably longer than seta 4-CT and often long and single, (3) seta 11-CT long, stout and single, (4) seta 3-I long and stout, longer than seta 6-I, (5) seta 6-VII short, with few slender branches, inserted posterior to seta 9-VII which is moderately long, stout and normally with 2 or 3 aciculate branches, (6) seta 9-VIII long, stout, multiple-branched, aciculate and inserted on posterior lateral corner of segment, and (7) paddle without hairlike spicules on

margin and midrib well developed; and fourth-instar larvae by (1) seta 1-C single with distal part attenuate, (2) setae 4-7-C well developed, multiple-branched and aciculate, (3) antenna with spicules and seta 1-A with multiple aciculate branches, (4) seta 12-I present, (5) seta 7-I long, stout, single or 2-branched whereas seta 7-II is short and multiple-branched, (6) seta 6-II shorter than seta 6-III, (7) setae 2-VIII and 4-VIII both single, (8) segment X with saddle incomplete ventrally and seta 1-X attached, and (9) pecten on siphon with numerous, evenly spaced spines and seta 1-S branched, aciculate and inserted distal to pecten.

Illustrations and descriptions of *Downsiomyia* species are found in articles listed above in the "previous usage" section.

Downsiomyia females have large, pale-scaled patches covering the scutal fossae, which also occur in females of the Gubernatoris Group of "*Ochlerotatus*" ("*Finlaya*"). However, the latter group is easily distinguished by the presence of an elongate, transverse patch of pale scales anterior to the wing base that extends mesally. In contrast, the supraalar area is dark-scaled in *Downsiomyia*. The pale-scaled scutal fossa of *Downsiomyia* is also superficially similar to some *Stegomyia*, as evidenced by the type species, *Do. nivea*, which was originally assigned to that genus. *Stegomyia* are readily distinguished by possessing white-scaled areas on the supraalar area of the scutum, apex of the maxillary palpus and the hindtarsomeres, as well as numerous differences in the other life stages. The simple aedeagus bearing small teeth apically in *Downsiomyia* males is somewhat similar to some species of *Ochlerotatus* Lynch Arribalzaga, e.g. *Oc. cantans* (Meigen) and *Oc. excrucians* (Walker), but these species differ in numerous other characters.

We conducted an extensive search of the literature on Culicidae, but were unable to find the formal synonymy of *Downsiomyia* with *Finlaya*. This synonymy was listed, without explanation in *A Synoptic Catalog of the Mosquitoes of the World* by Stone *et al.* (1959), and again in Knight & Stone (1977). *Downsiomyia*, as the Niveus Subgroup, was last reviewed by Colless (1958, 1959), who treated 19 species. Knight (1946) previously reviewed nine species, including *Do. nivea*. Reinert (2002) indicated that the female genitalia could be easily separated into two assemblages of species that are similar but distinguished as follows: "Niveus Assemblage" with a single, large, spermathecal capsule, and tergum IX usually with three or four setae on each lateral lobe apically (at least on one lateral lobe); and the "Alboniveus Assemblage" with one large and two medium-sized spermathecal capsules, and tergum IX with only one or two setae apically on each lateral lobe. These two "Assemblages" of species are treated herein as Species Groups. Reinert (2002) separated species treated here from other groups of *Finlaya* based on features of the female genitalia. Reinert (1981, 2000c) noted that groups of species in *Paraedes* Edwards also possess different numbers of spermathecal capsules.

Rozeboom & Cabrera (1964) incriminated *Do. nivea* as a vector of nocturnally periodic *Wuchereria bancrofti* (Cobbold) in the Philippine Islands and Gould *et al.* (1982)

indicated that *Do. harinasutai* was the primary vector of subperiodic *Wuchereria bancrofti* in Thailand. Zagaria & Savioli (2002) also list these two species as vectors of filariasis. Rudnick *et al.* (1986) reported that species of *Downsiomyia* (as "Niveus Subgroup") were canopy vectors of dengue virus in Malaysia.

Description of type species, *Downsiomyia nivea* (Ludlow), 1903

FEMALE. *Head:* Maxillary palpus dark brown-scaled, 0.18 length of proboscis; proboscis dark brown-scaled, 1.13–1.20 length of forefemur; clypeus brown, bare; antenna brown, 0.80 length of proboscis, pedicel brown with few small, dark brown scales and short brown setae mesally; eyes contiguous above antennal pedicels; ocular line narrow, covered with overlapping, broad, silvery scales; ocular setae numerous; vertex covered with overlapping, broad, dark brown, decumbent scales; occiput with numerous blackish-brown, erect, forked scales; postgena covered with overlapping, broad, silvery scales. *Thorax:* Scutum covered with narrow scales except narrow, bare, median area of prescutellar space, anterior 0.65–0.70 covered with silvery scales extending to anterior and lateral margins, remainder of scutum with dark brown scales, setae as follow: few short on anterior promontory, several on antedorsocentral area, few along lateral margin of scutal fossa, few on antealar area, numerous dark ones on supraalar area with those anterior to wing base shorter, 3–5 laterally on each side of prescutellar area, and 1,2 on parascutellar area; scutellum with overlapping, broad, dark brown scales on each lobe, median lobe with 4,5 long and 6,7 short setae, lateral lobe with 2,3 long and 5,6 short setae; mesopostnotum bare; antepronotum with numerous setae on dorsal and lateral surfaces, patch of overlapping, broad, silvery scales posterior to setae; pleural areas with all scales overlapping, broad, silvery except postpronotum; proepisternum with 7–10 setae and patch of scales on upper area, lower area bare; postpronotum with 4,5 posterior setae, narrow band of several moderately broad to broad, brown scales on dorsal margin; prespiracular area, subspiracular area, paratergite, mesomeron, metameron and metepisternum bare; postspiracular area with 7–13 setae; mesokatepisternum with 4,5 setae in row on upper margin and 11–15 along posterior margin, one near middle very long, large upper and small lower posterior patches of scales; prealar area with 10–13 setae on upper area and patch of scales on lower area; mesepimeron with 13–17 short, upper posterior setae, large triangular patch of scales extending from near upper part to near lower part of anterior margin caudal to area in front of setae; metameron with upper margin well above base of hindcoxa. *Legs:* Ante- and postprocoxal membranes bare; fore-, mid- and hindcoxa with large patch of overlapping, broad, silvery scales on anterior surface, forecoxa with patch extending over lateral surface, midcoxa also with several broad, brown scales ventral to silvery scales; fore- and midfemur with anterior surface dark brown-scaled, forefemur with broad, white-scaled patch extending from near base to near midlength of posterior surface, midfemur with short, white-scaled stripe near base

ventrally on posterior surface, hindfemur with distal part dark brown-scaled, anterior surface with proximal 0.78 white-scaled except few brown scales on basal margin, posterior surface similar to anterior surface but proximal white-scaled area slightly shorter; fore-, mid- and hindtibiae and fore-, mid- and hindtarsi dark brown-scaled; fore- and midungues each with 1 tooth; hindungues simple. *Wing:* Dark brown-scaled; vein R_2 longer than R_{2+3}; remigium with 2 short, dark, posterior setae mainly obscured by scales; alula with row of brown scales on posterior margin; upper calypter with row of numerous setae on margin; halter with stem pale, knob dark brown-scaled. *Abdomen:* Terga I-VIII with several setae on lateral and posterior margins, dark brown-scaled, I-VII each with large, basolateral patch of overlapping, silvery scales, IV with band incomplete, VIII with median, dorsobasal patch of silvery scales; sterna II-VII with broad, brown scales, basolateral areas with patches of broad, silvery scales that connect to form narrow, basal bands on posterior 3,4 sterna; segments VI,VII laterally compressed.

Female genitalia. *Tergum VIII:* Proximal 0.20–0.35 retracted into segment VII; numerous broad, spatulate scales covering distal 0.73–0.79, both dark and pale scales present; setae on distal 0.51–0.65; VIII-Te index 0.53–0.59; length 0.28–0.31 mm; width 0.51–0.56 mm. *Sternum VIII:* Apex with minute (0.02–0.04 of VIII-S length), median emargination separating broad, flattened lobe with lateral portion slightly angled posterolaterally on each side; broad, spatulate scales on distal 0.76–0.81; setae on distal 0.94–0.97; VIII-S index 0.88–0.91; length 0.39–0.42 mm; width 0.44–0.47 mm. *Tergum IX:* With 3–5 setae on each lateral lobe apically, 6–9 total setae; length 0.10–0.12 mm; width 0.11–0.14 mm. *Insula:* With 5–8 setae. *Postgenital lobe:* Apex broadly rounded or flat; 10–17 setae on each side of midline, 21–32 total setae; ventral PGL/cercus index 0.78–0.87; dorsal PGL index 1.00–1.16; ventral PGL index 1.50–1.71; ventral length 0.13–0.14 mm. *Cercus:* Oblique, apical margin with 6 stout setae; dorsal surface with setae on distal 0.47–0.52; cercus index 1.45–1.68; cercus/dorsal PGL index 1.59–1.91; length 0.16–0.17 mm; width 0.09–0.11 mm. *Spermathecal capsule:* One large capsule.

MALE. *Head:* Antenna brown, 0.74–0.75 length of proboscis; maxillary palpus dark brown-scaled, 0.96 length of proboscis, palpomere 3 long, narrow, slightly upturned and bearing few long, brown setae ventroapically, palpomeres 4,5 slightly down-turned; proboscis 1.26 length of forefemur; vertex with broad scales creamy-brown. *Thorax:* Scutum with anterior, silvery-scaled area more extensive, extending posteriorly nearly to prescutellar area and covering most of supraalar area, median posterior margin nearly straight or with small, blunt extension; postpronotum with only few broad, brown scales on upper posterior area. *Legs:* Fore- and midungues unequal, each with 1 tooth, hindungues equal, both simple. *Abdomen:* Sterna VI,VII with several semierect, brown scales.

Male genitalia. *Tergum IX:* Heavily pigmented; length relatively short; pair of narrow, short, pointed lobes on posterior margin each bearing 3–5 long, stout, slightly curved

setae, with longitudinal fold on lateral side of each lobe; anterior margin concave mesally. *Gonocoxite:* Heavily pigmented but with mesal surface lightly pigmented and membranous; moderately long; proximal part of dorsal surface moderately wide with narrow, thumblike lobe on basomesal margin, lobe with several short, relatively slender setae extending from base to apex, elongate patch of numerous short, slender setae on most of mesal area, patch of several long, narrow, fusiform scales on basolateral area, several relatively long, broad, dark spatulate scales on lateral area distal to these scales; lateral surface with numerous broad scales similar to those of dorsal surface and extending over entire ventral surface except on small basomesal area, several long, stout setae on distal portion of lateral and few on apical area of ventral surface; ventral surface with proximal part wide and distal part narrow presenting triangular outline, with double row of long, broad, fusiform scales on distal 0.54 of mesal margin, few moderately long setae on mesal margin proximal to fusiform scales, 5,6 short, slender setae on basomesal area. *Gonostylus:* Short, 0.39 length of gonocoxite; narrow throughout length but distal part slightly narrower, curved mesally and bearing one short, fine seta subapically on mesal surface; gonostylar claw attached apically to gonostylus, narrow, long, 0.53 length of gonostylus, distal part slightly curved, apex truncate. *Proctiger:* Paraproct heavily pigmented, narrow, terminating in short, curved, beaklike point, basal area curved and without sternal arm; 1,2 short, thin, cercal setae. *Tergum X:* Heavily pigmented, narrow; extending from base of paraproct tergomesally, apex attached to ventral surface of tergum IX lobe. *Phallosome:* Aedeagus moderately long, simple, scooplike, lateral margins gently convex with distal portion narrower, apex concave with 2 or 3 small teeth on each side laterally; paramere heavily pigmented, narrow, 0.89 length of aedeagus; basal piece heavily pigmented, short, moderately broad to broad. *Claspette:* With moderately long, narrow, spiculate, columnar stem bearing 2 short, slender setae at about midlength, basal area with narrow lateral extension connected to ventral area of basomesal, thumblike lobe of gonocoxite, mesal area connected to its mate by spiculate, troughlike aedeagal guide; claspette filament attached apically to stem, long, somewhat leaf-like, longitudinally striated, expanded on middle part and narrowing to point distally. *Sternum IX:* Moderately to heavily pigmented, 2,3 moderately long, moderately stout setae on posteromesal area.

PUPA. *Cephalothorax:* Lightly pigmented with some moderately pigmented areas; seta 1-CT very long, stout, with 2 branches; 2-CT relatively short, slender, single; 3-CT short, slender, with 2 branches; 4-CT short, slender, with 4,5 branches; 5-CT very long, stout, single; 6-CT short, slender, single; 7-CT moderately long, moderately stout, with 2-5 branches; 8-CT moderately long, slender, with 2,3 branches; 9-CT moderately long, slender, single; 10-CT moderately long, slender, single to 4-branched; 11-CT long, stout, single; 12-CT long, slender, with 3–5 branches; 11-CT > 12-CT > 10-CT length. *Trumpet:* Moderately long with apex relatively broad; moderately pigmented; tracheoid weakly developed at base; index 2.91–3.10; pinna 0.37–0.39 of trumpet length. *Abdomen:* Terga

and sterna covered with numerous minute spicules in short rows; punctures present on terga III–V, located posterior to seta 4; sterna II–VII each with transverse, curved ridge near base; seta 1-I moderately long, stout, fanlike, with multiple, brush-tipped branches; 2-I short, slender, single or 2-branched; 3,6-I long, stout, single; 4-I short, slender, with 3–6 branches; 5-I short, slender, with 4–7 branches; 7-I moderately long, slender, with 2,3 branches; 9-I short, slender, single; 10-I short, slender, single or 2-branched; 0-II minute, single; 1-II moderately long, slender, with 4–9 branches; 2-II short, moderately stout, single, inserted anterior and lateral to 1,3-II; 3-II long, stout, single, inserted lateral to 1-II; 4-II short, slender, with 5,6 branches; 5-II short, slender, with 2,3 branches, inserted posterior and slightly lateral to 4-II; 6-II relatively long, slender, single to 3-branched; 7-II moderately long, slender, with 2 branches; 9-II short, slender, single; 0,14-III minute, single; 1-III moderately long, slender, with 3–6 branches; 2-III short, moderately stout, single, inserted anterior and approximately in line with 3-III; 3-III long, stout, single, inserted anterior and slightly mesal to 1-III; 4-III short, slender, with 2–4 branches; 5,7-III short, slender, with 2,3 branches; 6-III moderately long, slender, single; 8-III short, slender, with 3–5 branches; 9,11-III short, slender, single; 10-III moderately long, slender, with 2 branches; 0,14-IV minute, single; 1-IV short, slender, with 2–4 branches; 2-IV short, moderately stout, single, inserted anterior and mesal to 1-IV; 3-IV short, slender, with 3–5 branches; 4,9,11-IV short, slender, single; 5-IV very long, greater than 1.5 times length of tergum IV, stout, single; 6-IV moderately long, slender, single; 7-IV short, slender, with 2–4 branches; 8-IV short, slender, with 3,4 branches; 10-IV moderately long, slender, single to 3-branched; 0,14-V minute, single; 1-V short, slender, single or 2-branched; 2-V short, moderately stout, single, inserted anterior and mesal to 1,3-V; 3-V moderately long, slender, single or 2-branched, inserted anterior and very slightly mesal to 1-V; 4-V short, slender, with 3 branches; 5-V very long, greater than 1.5 times length of tergum V, stout, single; 6-V moderately long, slender, single or 2-branched; 7-V moderately long, slender, single to 6-branched; 8-V short, slender, with 3,4 branches; 9,11-V short, slender, single; 10-V moderately long, slender, single; 0,14-VI minute, single; 1-VI short, slender, single or 2-branched; 2-VI short, moderately stout, single, inserted anterior and very slightly mesal to 1-VI; 3,9,11-VI short, slender, single; 4-VI short, slender, with 3 branches; 5-VI long, approximately equal to length of tergum VII, stout, single; 6-VI moderately long, slender, with 2 branches; 7,10-VI moderately long, slender, single; 8-VI short, slender, with 3 branches; 0,14-VII minute, single; 1,4-VII short, slender, with 2 branches; 2-VII short, moderately stout, single, inserted anterior and mesal to 1-VII; 3-VII short, slender, single or 2-branched; 5-VII moderately long, moderately stout, single; 6-VII short, slender, with 5,6 branches, inserted posterior and slightly mesal to 9-VII; 7,10-VII moderately long, slender, single; 8-VII short, slender, with 4,5 branches; 9-VII moderately long, stout, with 5-7 aciculate branches; 11-VII short, slender, single; 0-VIII minute, single; 4-VIII moderately long, slender, single; 9-VIII moderately long, stout, with 8–10 aciculate branches, inserted near posterolateral corner; 14-VIII

short, slender, single. *Paddle:* Broadly ovoid; short, stout spicules on outer margin except basal area and proximal 0.35; index 1.27–1.36; midrib extending to apex; seta 1-Pa short, moderately stout, with 2,3 branches.

FOURTH-INSTAR LARVA. *Head:* Seta 1-C relatively slender, distal part attenuate, single; 2-C absent; 3-C short, single; 4-C moderately long, fanlike, with 7–11 aciculate branches; 5-C long, with 6–12 aciculate branches; 6-C long, fanlike, with 8–10 aciculate branches; 7-C long, fanlike, with 9–12 aciculate branches; 4-C < 5-C < 6-C < 7-C length, but 5,6-C approximately equal length, and 7-C slightly longer; 4-7-C noticeably posterior to anterior margin of cranium; 4-C mesal and slightly posterior to 6-C; 5-C posterior to 4,6-C, lateral to 4-C, slightly mesal to 6-C; 7-C mesal and slightly posterior to antennal base, lateral to 4-6-C, slightly anterior to 4-C, anterior to 5-C, approximately in line with 6-C; 8-C short, slender, with 2,3 branches; 9-C short, slender, with 4,5 branches; 10-C short, slender, with 2 branches; 11-C moderately long, fanlike, with 15–21 lightly aciculate branches; 12-C short, slender, with 3,4 branches, mesal to 13-C; 13-C moderately long, slender, single (2-forked on 1 side of 1 specimen); 14-C short, stellate, with 4–10 branches; 15-C short, moderately stout, with 2–4 branches, inserted on anterior 0.20 of labiogula; 18-C short, single. *Antenna:* Moderately long; lightly pigmented with approximately distal 0.50 slightly darker; several scattered spicules, more numerous on proximal 0.50; seta 1-A moderately long, extending beyond apex of antennal shaft, with 6–10 lightly aciculate branches, inserted 0.54 from apex. *Mouthparts:* Lateral palatal brush with mesal filaments comb-tipped, simple filaments laterally; seta 1-Mx short, stellate, with 4–9 branches; dorsomentum with 15–17 teeth. *Thorax:* Seta 0-P short, slender, with 9,10 branches; 1-P moderately long, with 5,6 aciculate branches; 2-P moderately long, lightly aciculate, single; 3-P short, stellate, with 7–14 branches; 1-3-P inserted on moderately pigmented, common setal support plate; 1-P > 2-P > 3-P length; 4-P moderately long, slender, single or 2-branched; 5-P moderately long, moderately stout, with 3,4 aciculate branches; 6-P moderately long, moderately stout, aciculate, single; 6-P greater than 5-P length; 7-P moderately long, moderately stout, with 4,5 aciculate branches; 5-7-P each inserted on separate, moderately pigmented, small, setal support plate; 8-P short, stellate, with 6,7 branches; 9-P moderately long, with 4,5 branches; 10-P moderately long, single; 10-P less than 12-P length; 12-P moderately long, single (rarely 2-branched); 11-P short, with 2,3 branches; 9-12-P on moderately pigmented, common tubercle; 14-P short, slender, with 2–4 branches; 1-M short, stellate, with 6–9 branches, 1,2-M approximately equal length; 2,3-M short, single; 4-M short, slender, with 2 branches; 5,7-M long, moderately stout, aciculate, 5-M inserted on moderately pigmented, small tubercle, 5-M > 7-M length; 6-M long, moderately stout, fanlike, with 5–7 aciculate branches, 6,7-M inserted on moderately pigmented, common tubercle; 8-M long, moderately stout, fanlike, with 7,8 aciculate branches, inserted on moderately pigmented tubercle; 9-M long, moderately stout, with 7–9 aciculate branches; 10,12-M single,

aciculate, 10-M stout, long, longer than 9,12-M; 11-M very short, slender, with 3,4 branches; 9-11-M inserted on moderately pigmented, common tubercle with well developed lateral spine; 13-M short, slender, with 10–13 branches; 14-M short, stellate, with 8–13 branches; 1-T short, stellate, with 7–11 branches; 2-T moderately long, slender, single; 3-T short, stellate, with 9–14 branches; 4-T short, slender, with 4,5 branches; 5-T short, single or with 2 stiff branches; 6-T moderately long, slender, single; 7-T long, stout, fanlike, with 10–14 aciculate branches, inserted on moderately pigmented tubercle; 8-T short, slender, with 7–12 branches; 9-T long, stout, with 5–7 aciculate branches; 10-T very long, stout, aciculate, single; 10-T greater than 9,12-T length; 11-T short, slender, with 3,4 branches; 12-T short, slender, single; 9-12-T inserted on moderately pigmented, common tubercle with short lateral spine; 14-T short, stellate, with 5–11 branches. *Abdomen:* Setae 0,14-II-VIII minute, single, except 14-V,VI single or 2-branched, 14-VII with 2,3 branches; 1-I-VI, 2-I-VII, 4-I,II, 5-II-VI, 7-IV, 9-I,III,IV, 11-I, 13-I-VI stellate, 2-I-VI with stouter branches, 9-II,V,VI with stiff branches; 6-I-VI, 7-I long, stout, aciculate, each attached to small, moderately pigmented, tubercle; 1-I with 6–16 branches; 2-I with 6–8 branches; 3-I moderately long, slender, with 2 branches; 4-I with 8–11 branches; 5-I short, slender, with 5–11 branches; 6-I with 4–7 branches; 7-I single; 9-I with 3,4 branches; 10-I moderately long, slender, single; 11-I with 5,6 branches; 12-I short, slender, single; 13-I with 5–7 branches; 1-II with 5–8 branches; 2-II with 4–6 branches; 3-II moderately long, with 2 branches; 4-II with 5–9 branches; 5-II with 4,5 branches; 6-II with 4,5 branches; 7-II with 4–6 branches; 8-II short, slender, with 2–4 branches; 9-II with 2–4 branches; 10,12-II moderately long, slender, single; 11-II short, slender, with 2 branches; 13-II with 7–10 branches; 1-III with 5–9 branches; 2-III with 5–8 branches; 3-III moderately long, slender, with 2 branches (rarely single); 4-III short, slender, with 3–5 branches; 6-III with 2 branches; 7-III short, slender, with 8–10 branches; 8-III short, slender, single; 9-III with 3-5 branches; 10-III moderately long, slender, single; 11,12-III short, slender, with 2,3 branches; 13-III with 5–9 branches; 1-IV with 3,4 branches; 2-IV with 6,7 branches; 3-IV moderately long, slender, with 2 branches; 4-IV short, slender, with 2–4 branches; 5-IV moderately long, with 4–6 branches; 6-IV with 2 branches; 7-IV with 6–8 branches; 8-IV short, slender, single; 9-IV with 3–6 branches; 10-IV moderately long, slender, single; 11,12-IV short, slender, with 2,3 branches; 1-V with 3–5 branches; 2-V with 4–8 branches; 3-V moderately long, slender, single (rarely 2-branched); 4-V short, slender, with 3–6 branches; 5-V moderately long, with 3–6 branches; 6-V with 2 branches; 7-V short, slender, with 7–10 branches; 8-V short, slender, single; 9-V with 2–5 branches; 10-V moderately long, slender, single; 11-V short, slender, with 2,3 branches; 12-V short, slender, with 2 branches; 13-V with 4–6 branches; 1-VI with 3,4 branches; 2-VI with 5–7 branches; 3-VI moderately long, single or 2-branched; 4-VI moderately long, slender, with 2 branches; 5-VI moderately long, with 3,4 branches; 6-VI with 2 branches; 7-VI short, slender with 3–5 branches; 8-VI short, slender, with 3–6 branches; 9-VI with 2–4 branches; 10-VI moderately long, slender, single; 11-VI short, slender with 2 branches;

12-VI moderately long, slender, single to 3-branched; 13-VI with 6–12 branches; 1-VII long, moderately stout, with 3,4 branches; 2-VII with 2,3 branches; 3-VII short, slender, with 3,4 branches; 4-VII moderately long, slender, single; 5-VII moderately long, slender, with 3,4 branches; 6-VII short, slender, with 6–10 branches; 7-VII short, slender, with 3,4 branches; 8-VII short, slender, with 8–16 branches; 9-VII short, slender, with 3–5 branches; 10,12-VII moderately long, slender, single; 11-VII very short, slender, single or 2-branched; 13-VII moderately long, with 4,5 branches; 1-VIII moderately long, moderately stout, with 4,5 branches; 2,4-VIII moderately long, slender, single; 3-VIII moderately long, moderately stout, inserted on moderately pigmented tubercle, with 3–6 aciculate branches; 5-VIII moderately long, moderately stout, with 7–9 aciculate branches; comb with 14–16 scales in curved row, scales comprised of long, heavily pigmented, pointed spine with minute spicules along much of lateral margins extending to subapical area; segment X with dorsal saddle heavily pigmented, anterior margin darker, moderate size, incomplete ventrally, acus absent, with numerous, moderately long, stout spicules on posterior margin between setae 1-X and 3-X, numerous rows of minute spicules scattered over remainder of surface, dorsal siphon/dorsal saddle index 2.12–2.20, seta 1-X relatively long (longer than dorsal saddle length), moderately stout, with 2 aciculate branches, 2-X long, moderately stout, with 8,9 branches, 3-X very long, stout, single, ventral brush with 10,11 setae, fanlike with short stems and 7–11 branches, anterior 2 setae precratal, remainder with transverse grid bar, and posterior 5 or 6 setae with well developed, lateral grid bars, 4 anal papillae relatively short, broad, with apices pointed. *Siphon:* Heavily pigmented; acus small, detached; index 2.00–2.06 (dorsal length/width at midlength); pecten on proximal 0.52–0.57 of siphon, with 16–21 evenly spaced spines, each with tooth moderately long, relatively stout, with stout subbasal tooth and usually with 2–4 minute spicules proximally, and apex pointed, proximal 2,3 spines shorter; seta 1-S moderately long, moderately stout, with 7–10 aciculate branches, inserted distal and ventral to last pecten spine; 2-S relatively long, single; 6-S short, single; 8-S short, slender, with 2,3 branches; 9-S very short, single; spiracular apodeme relatively short, ventral arm narrow, with moderately narrow, uniformly wide lobe extending proximally, apex bluntly rounded.

Bionomics

The larval specimens examined by us were collected from treeholes and cut bamboo in the Philippine Islands.

Discussion

The above description of *Do. nivea* is based on our examination of the lectotype female, one paralectotype female, two females, two males, nine pupal exuviae, and nine larval exuviae collected in the Philippine Islands. These specimens were identified as *Ae.* (*Fin.*) *nivea* by the late Kenneth L. Knight and their identity confirmed by us. Huang & Rueda (1998) discussed the type series of this species.

Published illustrations of *Do. nivea* include the adult female (Huang & Rueda 1998: Fig. 1), the female genitalia (Reinert 2002: Fig. 8), the male genitalia (Knight 1946: Figs. 5 and 9), the pupa (Knight & Chamberlain 1948: Fig. 33; Baisas 1974: Fig. 9e,g), and the larva (Knight 1946: Fig. 16; Knight & Hull 1951: Fig. 12; Baisas 1974: Fig. 9a–d,f).

We agree with Knight (1946) who stated "Because of the number of closely related species, literature records of *nivea* must be considered with caution, unless careful descriptions are appended." This was further emphasized by Huang & Rueda (1998) who considered that the species described and illustrated by Tewari & Hiriyan (1995, as *Ae. niveus*) from the Andaman and Nicobar Islands of India is not conspecific with the type specimens from the Philippine Islands. We agree with Huang & Rueda. This is obvious from our descriptions of the larva and pupa of *Do. nivea* from the Philippine Islands, which differ considerably from the illustrations of Tewari & Hiriyan.

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