

DESCRIPTION OF *AEDES (HOWARDINA) ALBONOTATUS* (COQUILLET), A COMMON DOMESTIC MOSQUITO FROM THE BAHAMAS¹

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Aedes albonotatus larvae, closely resembling those of *Aedes aegypti* L. in gross appearance and habitus, were repeatedly collected during the course of an entomological survey of Grand Bahama Island, Bahamas. They were found adjacent to houses in collections of water, in discarded automobile tires, oil drums, paint cans and in similar containers. In addition, they were present in tree holes and in occasional automobile tires not in close proximity to human habitation. A single adult female was found among adult mosquitoes (mostly *A. tortilis* (Theobald)) captured while attempting to feed upon a human host. This specimen, however, did not contain ingested blood. No adults were found among the many specimens of other species taken in light trap collections.

A. albonotatus is widely distributed on Grand Bahama Island, except that it does not appear to breed in the town of Sea Grape, a suburb of Freeport occupied largely by recently immigrated persons. In contrast, the range of *Aedes aegypti* on the island appears to be virtually limited to this one location. Thus, both domestic mosquitoes occupy similar breeding sites but do not occur together. The factors that determine their relative distribution and abundance are currently being studied.

Adults reared from larvae collected on Grand Bahama correspond in general to type specimens of *Aedes albonotatus* deposited in the U. S. National Museum.² A complete taxonomic description, how-

ever, has not been published. The descriptions in Howard, *et al.*, (1912-1917) and in Lane (1953) do not correspond to specimens in hand and Coquillett's original (1905) description does not permit comparison. The descriptions that follow are based on larval exuvia and on adult specimens derived from larvae found in an automobile tire in the village of Hunter on November 28, 1964. Pinned adults, together with their associated larval and pupal exuvia have been deposited at the U. S. National Museum.

Aedes (Howardina) albonotatus (Coquillett)

ADULT FEMALE. Small to medium size (wing length: approximately 3.0 mm). **Head:** proboscis with uniformly dark-brown scales. Palpi about one-sixth as long as proboscis, dark-brown with silver-white scales at the tip. Clypeus brown, nude. Occiput with a prominent median stripe of narrow appressed silver-white scales that are elongate and erect between the antennae, bounded on either side by a wider (twice as wide) stripe of broad dark-brown scales; a line of broad golden scales lies between the sub-median dark stripes and the marginal dark and white patches; small spot of silver-white scales marginal to outermost portion of eye. Tori light-brown, nude.

Thorax: Integument light-brown to yellow, clothed with narrow, dark-brown scales. Mesonotum with a spot of silver-white scales at the middle of the anterior margin; medial stripe of silver-white scales from posterior margin extending one-third of the distance to the anterior margin; a pair of submedian stripes of narrow golden and intermixed silvery

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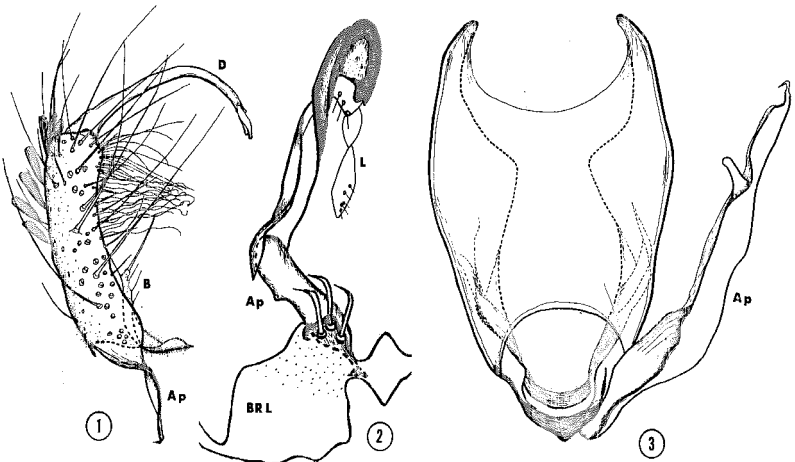
²Specimens were compared by Dr. Alan Stone.

scales extending from the anterior margin and terminating on either side of the medial stripe; mediolateral pair of darker, gold-scaled stripes arising at the posterior margin and extending anteriorly on either side of the submedial lines and ending in a thinly-scaled area near the anterior third of the mesonotum; lateral stripes of silver-white scales extend from the insertions of the wings to the anterior margin. Scutellum thinly clothed with dark-brown scales and with a medial stripe of silver-white scales; a long bristle arises from each lateral lobe and a pair of bristles lies on either side of the medial stripe. Sides with a line of 4 silver-grey scale patches extending from the anterior pronotum to the posterior spiracle; additional patches on the propleuron, on the sternopleuron just above the second coxa and on all coxae. Wings with veins densely clothed with dark-brown scales. Halteres with light integument; stem clothed with dark-brown scales and apex with silver-white scales. Fore legs with femur clothed with dark-brown scales above and white scales below; tibia dark-scaled and with a few silver-white scales at the base, tarsi dark-brown except for a broad silver-white band at the base of second segment. Mid-

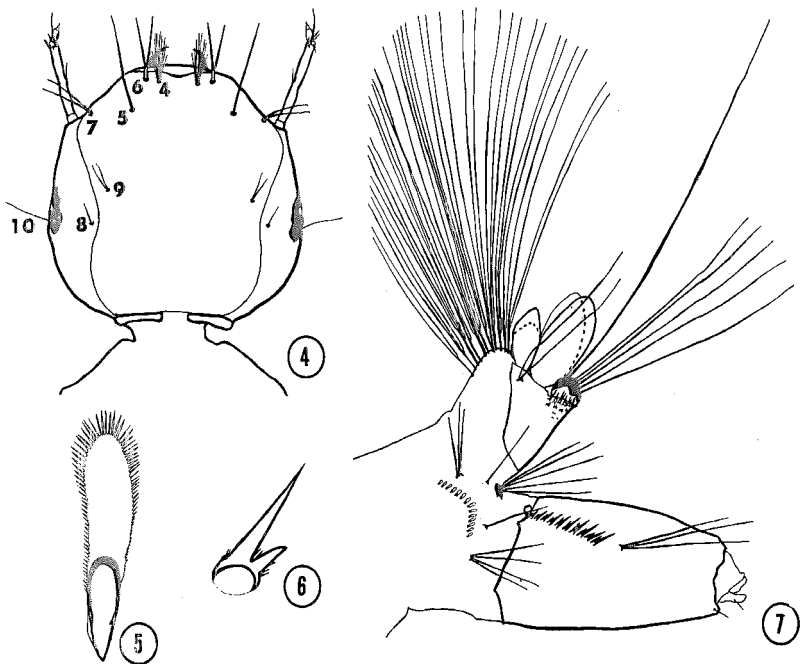
dle leg similar to fore leg except that femur has a few white scales at its apex, and first tarsal segment broadly banded with white at its base. Hind leg similar to middle leg except that the third tarsal segment has a broad band of silver-white scales at the base.

Abdomen: dorsal surface densely clothed with narrow, dark-brown scales; a prominent lateral patch of silver-white scales placed centrally near the lateral margins of each of the first 7 segments; sternites of first 5 segments clothed with white scales medially and with silver-white patches at lateral margins; dark scales surrounding the silvery patch become progressively prominent on segments posterior to the second and predominate on the seventh.

ADULT MALE. Coloration similar to that in the female except as indicated in the following. *Head:* Palpi slightly longer than the proboscis, few white scales at base of penultimate segment. *Sides:* Patch of silver-grey scales at apex of sternopleuron. *Terminalia:* The terminology of the male copulatory apparatus follows that in Spielman (1964). Each sclerite is shaped as though molded from a sheet of cuticle. Clasper (Fig. 1) 4 times as



FIGS. 1-3.—Male copulatory apparatus. Fig. 1, clasper with basal segment (B), distal segment (D) and apodeme (Ap) indicated. Fig. 2, Paraproct with lateral segment (L) and apodeme indicated. Apodeme is attached to a lobe of the basal ring (BRL). Fig. 3, aedeagus with apodeme (Ap) indicated.



FIGS. 4-7.—Larval characteristics. Fig. 4, head with dorsal hairs indicated. Fig. 5, comb scale. Fig. 6, pecten scale. Fig. 7, terminal abdominal segments.

long as wide, parallel sided, slightly curved, densely covered with long setae, some of which have tangled ends; basal segment (B) small, conical, nearly continuous with inner margin of clasper and bearing a strong spine at the apex that extends to the distal third of the clasper; distal segment (D) nearly as long as clasper, evenly tapered and strongly curved, without setae, terminal spine strong, cylindrical, infuscated; apodeme (Ap) truncate caudally. Paraprocts (Fig. 2) two-thirds as long as clasper, strongly thickened and hook-like at apex; lateral segment (L) lightly sclerotized, twisted. Lobes of basal ring (BRL) compact, prominent, with 3-5 strong setae at apex. Aedeagus (Fig. 3) approximately one half as long as clasper and somewhat cylindrical, anatomical dorsal surface lightly sclerotized and excavate on apical third, ventral surface deeply excavate from apex almost to the base, forming a narrow

bridge of cuticle; apices of aedeagus strongly curved toward each other and attenuated.

LARVA. Head (Fig. 4): Subglobose, slightly wider than long, the dorsum highly arched and dome-shaped. Mentum broadly triangular with 11 sharp teeth on either side of the central tooth. Pre-clypeal spines long, curved and heavily infuscated. Antennae straight, cylindrical, slightly more than a third as long as the head; apex with 4 stout spines of unequal length and a conical process; single hair inserted in the middle of shaft. Postclypeal hairs (4) 5-8 branched, half the length of the antenna; upper frontal hairs (5) single, longer than the antenna; preantennal hair (7) double, slightly shorter than the antenna; sutural hair (8) single, approximately half the length of the antenna; transsutural hair (9) single; supraorbital hair (10) single or double, approximately half as long as the antenna.

Thorax and abdomen: glabrous, clothed with numerous short, multiple stellate hair tufts. Lateral abdominal hairs double on all segments. Comb of eighth segment comprised of 10 to 17 long, slender scales arranged in a single, sharply angled row, the row with a distinct, chevron-like appearance (Fig. 7); each scale approximately parallel-sided; blunt and finely fringed around the tip (Fig. 5). Siphon moderate to short, twice as long as basal width, evenly tapered. Pecten composed of 8 to 10 teeth along the basal third of the siphon; each tooth long and with a short basal barb (Fig. 6); teeth progressively longer distally. Siphon tuft 2 to 4 branched, placed at middle of siphon, usually well beyond the pecten. Anal segment incompletely ringed by the saddle; saddle small, bearing patch of spines on dorsolateral margin. Lower caudal hair long, 1 to 4 branched. Upper caudal hairs shorter, 3 to 6 branched. Anal gills broad, rounded; upper pair approximately as long as the saddle; lower pair approximately half as long as upper.

BIOLOGICAL NOTES. Males of *A. albonotatus* proved to be sexually active in lantern chimneys and females, when inseminated, deposited viable eggs without blood meals. Thus, the study population may be described as stenogamous and autogenous. Although females were reluctant to feed on man or canaries, on several occasions a few did feed to repletion on human hosts. Eggs deposited by laboratory reared females hatched readily in tap water after storage at 76 percent relative humidity and 76° F. for 1 to 2 weeks. A laboratory colony was established employing standard techniques. This colony has been reared through 6 laboratory generations and is now in continuous culture.

DISCUSSION. Our adult female specimens of *A. albonotatus* resemble those described by previous authors (Howard, *et al.*, 1912-17; Lane, 1953). However, male adults and larvae differ from earlier descriptions with respect to the copulatory

apparatus of the male and the terminal abdominal segments of the larva. The claspers of the male, described as ovate in published records, are long and slender in our *A. albonotatus*. Among other differences, that of the shape of the aedeagus is especially marked. The comb scales of the larvae are recorded as arranged in an approximately straight line, while in our forms they are arranged as in a chevron. The pecten is described as two-thirds as long as the siphon, while in the Bahamian material, it is approximately a third as long. The anal gills are all of equal length in published records, while in our specimens the dorsal pair is twice as long as the ventral pair. It may well be that these discrepancies reflect past confusion in identification of available material. Suárez and Cova García (1961) concluded that published descriptions of *A. albonotatus* actually correspond to *A. ioliota* D. and K. and Stone (1963) recognized this change in nomenclature.

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SUMMARY. Specimens of *Aedes albonotatus* from Grand Bahama Island are described. Although the larvae were found in habitats considered to be typical of *A. aegypti*, and both species were present on the island, they were not found in association. This *A. albonotatus* population is autogenous and stenogamous and has been established in a standard laboratory culture.

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