

ANOPHELES NATALIAE, A NEW SPECIES FROM GUADALCANAL

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During a search for breeding places of *Anopheles solomonis* Belkin, Knight and Rozeboom (1945) in the coral foothills of northwestern Guadalcanal a third species in the *lungae* series was discovered and is described in this paper.

Anopheles (Myzomyia) nataliae, n. sp.

ADULT FEMALE.—A medium-sized, grayish-brown, speckled anopheline; apical sixth to fifth of labium with a ring of light yellow scales. Length of wing, 3.5–4 mm.

Head (Fig. 1): Ornamentation of head and antennae as in *solomonis*. Palpi usually reaching to labella, ornamented as shown in Fig. 1; second and third morphological segments black with narrow ring of white scales at apex, frequently a patch of bronzy scales dorsally in center; fourth and fifth segments each black-scaled basally for a fourth to a third of its length, remainder white, often tinged with yellow; ratio of fourth segment to third segment 1: 1.6–1.7. Labium dark-scaled basally, apical sixth to fifth with a ring of light yellow scales, conspicuously separated from the basal black ventrally, gradually merging into it dorsally; a preapical band of dark scales, often interrupted dorsally.

Labella dull yellow. Buccopharyngeal armature (Fig. 2) of several broad central teeth forming a single row; teeth of similar character, separated by intervals; apices of teeth with many spicules, one of which is elongated, bases with bullae and lateral spines.

Thorax: Scutal integument grayish-brown with gray pollinose areas; dark brown eye spots in front of and behind scutal angle; prescutellar space, disc of scutellum and a small area in front of wing root dark brown. White scales on anterior promontory rather short and sparse; central scales elongate anteriorly, posteriorly short and extending one-fourth length of scutum; lateral scales broader, a patch of black scales on humeral angles below lateral tufts. Fossae with several small, broad, recumbent, translucent light scales; long, narrow, whitish scales mixed with whitish hairs in front of wing root. Remainder of scutum and all of scutellum without conspicuous broad scales, vestiture consisting of numerous golden hairs of varying length, some of these appear scale-like under high magnification. Scutal and scutellar bristles light brown. Prothoracic lobes with a large patch of short black scales on upper part. Pleura without scales, integument gray-brown with usual darker lines and spots. Spiracular bristles absent; propleurals 3–5 stout and 2–4 shorter, more slender dark bristles; lower sternopleurals several golden hairs; upper sternopleurals 2–3 dark bristles and variable number of light hairs; prealars 5–10 golden hairs; subalars 5–10 golden hairs; lower mesepimerals absent. Halteres light with dense white scaling on upper part of shaft and all of knob. *Wing* in general as described and figured for *solomonis*; extremely variable; dark sectoral spot (between basal and median dark costal spots) usually reduced, absent, or fused with median dark spot; dark fringe spots frequently more extensive than in *solomonis*. *Legs* speckled, in general as described for *solomonis*.

Abdomen: Integument dark grayish-brown. Devoid of scales on tergites and sternites I–VII, vestiture of narrow golden hairs similar to those on scutum. Hairs more numerous on posterior segments, grading into narrow curved scales on segment VIII. Cerci with narrow black scales.

ADULT MALE.—In general as in the female. Palpal ornamentation as in *solomonis*. Labium usually entirely dark-scaled. Abdomen as in the female except for numerous yellow scales on tergite VIII. Sidepieces densely covered with yellow scales ventrally and black scales dorsally.

Genitalia: Appear to differ from *lungae* in the following respects: phallosome shorter and broader; clubs on claspettes more slender and not as distinctly enlarged at apex; apical hairs of claspettes shorter, only slightly longer than club, inner accessory hairs shorter than club.

PUPA.—In general as in *solomonis* with the following exceptions. General coloration brownish-yellow; head shield, mesonotum, and metanotum deep brown; trumpet dark yellowish-brown with a preapical line of deep brown pigmentation. Lateral spines of abd. segment V short, acutely tapered, on the same order as those of III and IV, usually one-third as long as those on VI; lateral spines of VI and VII slender, elongate, acutely tapered, without branches or fraying.

LARVA.—Live female larvae are a deep black in color, this intense pigmentation remains particularly in the head capsule, palmate hairs and anal saddle. The male larvae are a dark

reddish-brown except for the black saddle; skins and preserved specimens are also easily recognized by the lighter pigmentation of the head capsule.

Head (Fig. 4): Inner clypeal hairs very long, usually with minute lateral barbs; outer clypeals a third to almost half the length of the inner, usually simple, very rarely with minute barbs; distance between outer and inner hairs one-fourth to one-third that between inner hairs; posterior clypeals long, 2-4-branched, sometimes simple, usually reaching tubercles of anterior clypeals, apical portion of hairs very fine. Frontal and subantennal hairs feathered. Antennae with long spines on inner surface; antennal hair simple, minute, situated one-third the distance from the base; terminal hair longer than sabers, 6-10-branched. Occipital hairs short, inner 2-4-branched, outer 2-5-branched. Head capsule in female completely pigmented a deep brown black, in male incompletely yellowish-brown.

Thorax: Tubercles of prothoracic hairs 1 and 2 (Fig. 5) fused, very rarely one set may be only approximated; hair 1 with heavy flattened shaft and 18-30 branches, branches usually radiating except at apex which may be extended; hair 2 almost twice as long as 1, 12-20-branched, branches more numerous on outer surface; hair 3 small, simple, arising from the fused tubercles. Prothoracic pleural hairs: 9 long, with 4-8 branches; 10 long, simple; 11 about one-third the long hairs, usually simple, occasionally double; 12 long, simple. Mesothoracic pleural hairs: anterior pair (9, 10) long, simple; hair 11 minute, simple; hair 12 approximately one-fourth of long hairs, simple. Metathoracic pleural hairs: 9 usually simple, occasionally double; 10 long, simple; 11 minute, simple; 12 short, 2-4-branched.

Abdomen: Hair 1 on segment I with narrow attenuated, flattened leaflets without serrations, pigmented; hairs 1 on segments II-VII full-sized palmate hairs with broad notched leaflets; 19-25 leaflets on segment III; leaflets (Fig. 3) broad, abruptly narrowed with deep indentations into a delicate terminal filament which is about one-third the length of the shaft; pigmentation heavy and uniform; frequently lateral indentations present on shaft. Hair 2 on segments IV and V simple. Hair 6 of segment IV 2-3-branched; of segment V usually 2, occasionally 3-branched. Anterior tergal plates darkly pigmented, small, half or less the distance between the palmate hairs, except on segment VIII where it is large. Posterior tergal plates very small, present on segments III-VII. Pecten (Fig. 6) with 12-15 teeth, irregularly long, short, and intermediate; larger teeth heavily pigmented, fringed beyond their bases; pecten hair with 6-10 branches. Caudal hooks 6-8. Saddle very heavily pigmented, hair long and simple. Anal gills longer than saddle. Hair 13 of segment V very large, with 8-12 branches.

Types.—Holotype ♀, Allotype ♂ with larval and pupal skins, Natalia springs, Poha River Valley, 3 miles south of coast, elevation 200 feet, Guadalcanal, 18 Feb. 1945 (J. N. Belkin). Paratypes: 16 ♀, 6 ♂ with larval and pupal skins, 1 ♂, 18 larvae, same locality as holotype, 10 Dec. 1944, 12-25 Feb. 1945 (J. N. Belkin, M. Cohen, J. J. Cuccio, F. B. Wysocki, E. J. McCormick, Jr.); 2 ♀ with larval and pupal skins, 3 ♀, small tributary of Poha River, 4 miles south of coast, elevation 400 feet, Guadalcanal, 12 Feb. 1945 (J. N. Belkin et al). Holotype and allotype deposited in U. S. National Museum. Paratypes to be deposited in the collections of Council for Scientific and Industrial Research, Canberra, Cornell University and Johns Hopkins School of Hygiene and Public Health.

Taxonomic position.—*A. nataliae* is a third member of the *lungae* series in group *Neomyzomyia*. It agrees with *lungae* and *solomonis* in palpal, haltere and wing ornamentation and the lack of conspicuous scales on the disc of the scutum in the adult stage, and in the branching of hair 9 of the prothoracic pleural group in the larval stage. The adult female of *nataliae* is separated from the other two species by the extent of light scaling on the labium, the presence of small, broad scales on the fossae, and long narrow scales in front of the wing roots, and the extension of light scales caudad from the central portion of the anterior promontory. The larval stage is immediately recognized by the fused tubercles of prothoracic hairs 1 and 2, the structure of the pecten, the unbranched condition of hair 1 on abdominal segments IV and V, and the extremely heavy pigmentation of the head capsule and anal saddle. In the pupal stage it is intermediate between *lungae* and *solomonis* but can be easily told by the unusual pigmentation of the cephalothorax, trumpets and metanotum, and the structure of the lateral spines on the abdominal segments.

The characters which have been used to separate the species in the *lungae* series are usually clear-cut and quite striking. That these forms are distinct species is

supported by the fact that in a large number of rearings of progenies of wild females of *lungae* and a few *solomonis* no intermediates have been obtained and a remarkable constancy in the specific characters has been observed. Except for the labial ornamentation and some of the features of the pupa the specific characters of *nataliae* are in no way intermediate between *lungae* and *solomonis*, but represent an entirely different line of specialization. The greater extent of scaling of the lateral and anterior portions of the scutum in *nataliae* shows closer relationship to the *punctulatus* series than is exhibited by *lungae* or *solomonis*.

Biology.—To date *A. nataliae* has been collected in two areas more than a mile apart in the Poha River valley a short distance downstream from its entrance into the coastal coral foothills from the igneous formations of the Kavo Range. Whether these localities are normal breeding places or represent small colonies established following flushing from breeding places upstream remains to be determined. Both breeding places are seepage and spring areas with clear running water and are densely shaded. The larvae and pupae are very scarce and difficult to collect because of their habit of resting on top of floating vegetation and debris or on the margins of the creeks, usually where the current is fairly swift. The larvae are extremely active and appear to rest normally parallel to an object rather than at right angles to it as is the case with most anophelines. In the laboratory the pupae behave as those of *lungae* and *solomonis* as they usually rest above the water surface and the adults emerge from this position.

Bironella hollandi, *A. solomonis*, *farauti* and *lungae* have been collected with *nataliae* in the order of their abundance.

The larvae of *nataliae* in life have the short broad appearance characteristic of the *lungae* series. They differ from *solomonis* and *lungae* in their opaque bodies. The female larvae have coal-black bodies with densely pigmented black head and saddle and are easily distinguished from male larvae which have reddish-brown bodies, dark brown heads, and black saddle.

Adults have not been collected in nature.

REFERENCES

- BELKIN, J. N. AND SCHLOSSER, R. J. 1944 A new species of Anopheles from the Solomon Islands. Jour. Wash. Acad. Sci. 34: 268-273. 11 figs.
BELKIN, J. N., KNIGHT, K. L. AND ROZEBOOM, L. E. 1945 Anopheline mosquitoes of the Solomon Islands and New Hebrides. J. Parasitol. 31: 241-265.

EXPLANATION OF PLATE

Anopheles nataliae, n. sp.

- FIG. 1. Adult female. Head, proboscis and palpus.
FIG. 2. Adult female. Buccopharyngeal armature.
FIG. 3. Larva. Leaflet of palmate hair, abd. III.
FIG. 4. Larva. Anterior portion of head.
FIG. 5. Larva. Prothoracic submedian group, right side.
FIG. 6. Larva. Pecten, left side.

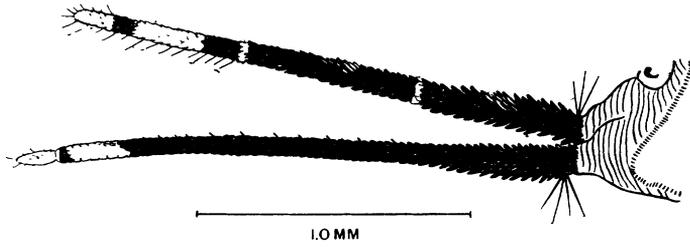


FIG. 1

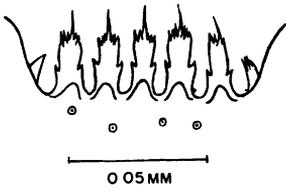


FIG. 2

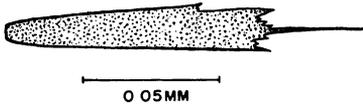


FIG. 3

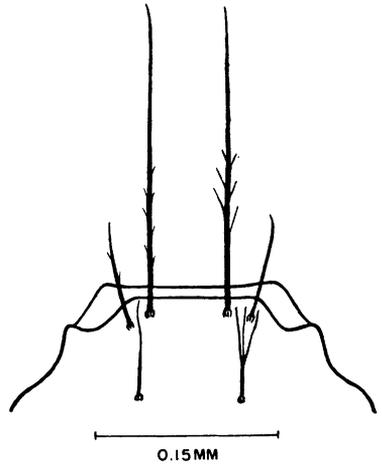


FIG. 4

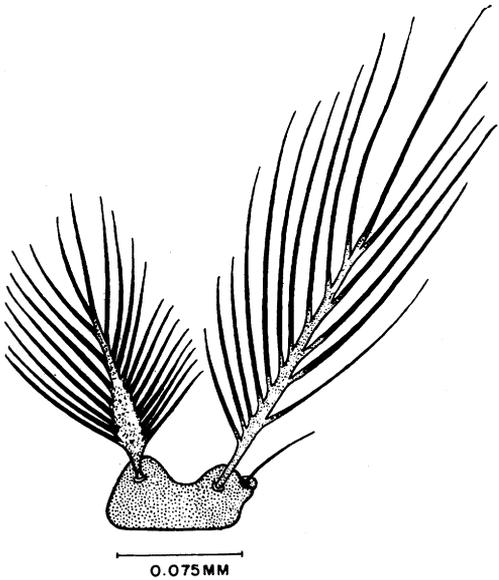


FIG. 5

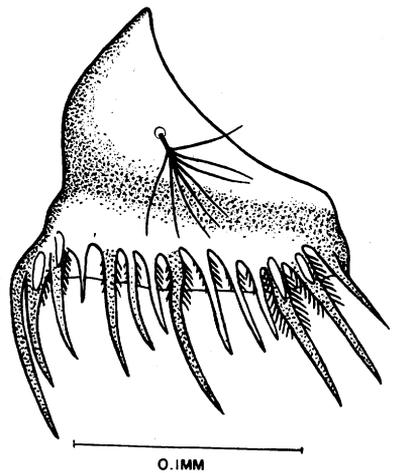


FIG. 6