

Christophers, 1911: 64-73, plus plate from Vol. III pg. 130.

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✓ II.—A NEW ANOPHELINE.*

Neocellia fowleri n. sp.

A species somewhat resembling *N. fuliginosus*, but differing in general appearance, in having scales on all segments of the abdomen (except the first), different wing markings and with no distinct band on the hind leg at the first tarsal joint as in *N. fuliginosus*.

Palpi.—Black with a broad apical band and two narrow white bands dividing the palps roughly into three equal areas. Clothed with narrow truncated outstanding scales especially on the basal third.

Clypeus bare.—*Proboscis* dark.

Antennæ.—Basal lobe with some white scales. White scales also on next two segments. Scales rather long, pointed and slightly curved.

Head.—Covered with upright scales, white over the front, black at sides. A white tuft of long scales between the eyes. The scales are narrow curved and pointed in front and around the eyes, upright forked (obscagittate) over the rest of the head. A few chaetae, light in colour in front, others darker laterally over the eyes.

Thorax.—Dorsum black, covered with numerous broadly oval creamy white scales arranged in rows with bare, or almost bare, linear areas between. Over the dorsum the scales are pointed, about two and a half times as long as broad. At the sides the scales are somewhat broader and some are truncated. In front there is a tuft of almost linear white scales. The lateral portion of the anterior promontory is covered with closely set projecting black and white scales. *Prothoracic lobes* (patagia), with a few white scales, but no projecting tuft.

* The plate illustrating this mosquito will be published in our next number.—Ed.

Scutellum with white scales similar to those on thorax, no bristles in centre, three on each side.

Pleuræ.—Black with patches of white broad scales similar to those on the thorax.

A tuft of white hairs beneath origin of wing.

Abdomen.—Dorsum covered with numerous long light coloured hairs, and with white to creamy white scales on all segments except the first. On the second and third segments there are a few very narrow scales centrally situated. On the fourth segment scales are more numerous, and they extend to the lateral portions of the dorsal surface of the segment. The fifth and sixth segments are densely covered with scales mixed with hairs, there being a few black scales in this situation. The genitalia are densely covered with white and black scales.

The scales on the abdomen are narrow and slightly curved, especially at their base, broader towards their free ends and narrowing somewhat at the apices, which are for the most part truncated. Some are more linear. The hairs on the abdomen are much more numerous than in *N. fuliginosus*. The scales and hairs resemble both in arrangement and in character the scales on the abdomen of *N. stephensi*. Ventrally there are broad white scales, most of them truncated. These scales are present on at least six segments, but most numerous on the last three.

Legs.—1st pair. Coxæ with some narrow white scales. The femora are darkish brown above, very faintly, if at all, mottled. Under surface is paler. The tibiae are rather more distinctly mottled, extreme apex pale. The first to third tarsal segments apically banded, the last two segments entirely black.

2nd pair. Coxæ with some white scales. Femora brown, a faint spot towards apex like that in *fuliginosus*, but much

fainter, extreme apex pale. Tibia faintly mottled, extreme apex pale. Faint narrow pale bands on apex of first two tarsal segments. Last three segments dark.

3rd pair. Coxae with some white scales. Femora brown, tibia faintly mottled; on each a narrow pale band at extreme apex. Last three tarsal segments and about one-sixth of the preceding tarsal segment pure white. At the tarsal joints any banding that is present is extremely faint and narrow, contrasting strongly with the appearance in *N. fuliginosus*, in which species there is a prominent tarsal band at the junction of the first and second tarsal segments.

Wings.—The costa with four main dark spots, the third from the apex of the wing being the longest, and two small basal spots, the basal one being the longer.

The subcostal has two small dark scaled areas corresponding in situation, but not quite in extent, with the two small basal spots on the costa. The first longitudinal vein is marked like the costa except in regard to the longest of the dark spots, the dark area in this case being interrupted near either end by a few white scales. The second longitudinal is mostly dark scaled, but with lighter areas just above the fork and a little higher up the vein. The lower branch of the vein forming the forked cell is also white except for a dark spot in the centre and one at the extreme end of the vein. The third longitudinal is mainly white with two dark spots close together at its upper end and one at its termination. The fourth longitudinal has a dark stem with a small light interruption about its middle. The actual bifurcation is covered with light scales and there is a long light interruption in the middle of each branch, each of which may be better described as having two dark spots. The fifth longitudinal is mainly white with a small dark spot at its upper end. There are three dark spots on the upper branch, two basal and one apical, and one on the lower

at its termination. The bifurcation is white. The sixth longitudinal has three black spots.

The wing fringe has light areas opposite each vein, the apex of the wing being pale with two small dark areas. The second posterior cell is short, being between one-half and two-thirds of the anterior cell in length.

The wing scales resemble those of *N. fuliginosus*.

The male differs very little in markings from the female, but has fewer scales on the abdomen. Fore unguis biserrate, mid and hind unguis simple.

Habitat.—Amritsar and Central Provinces. Collected at Amritsar from September to November in huts.

Observations.—Captain Fowler, after whom the species is named, first drew my attention to a specimen of this species which differed considerably from *N. fuliginosus*, the species which it most nearly resembles. A small number of specimens were afterwards obtained in the same village, but Major Kenrick, I.M.S., has sent me a number of specimens from the Central Provinces and informs me that it is one of the commonest species in certain parts of the Central Provinces at the time he was collecting (October and November).

I was at first doubtful whether it was not a very marked variety of *N. fuliginosus*, but the differences are so considerable, especially in appearance and in scale structure, and so constant that there can be little doubt it is a distinct species.

It differs from *N. fuliginosus*—

- (1) in the generally lighter colour of the insect which enables one at once to pick it out from among the much blacker *N. fuliginosus*;
- (2) in the marked scale structure of the abdomen;

- (3) in the wing markings, which resemble those of *N. theobaldi*,
- (4) there is no distinct apical white band to the second hind tarsal segment as in *N. fuliginosus* and the banding of the tibio-femoral joint and tibio-tarsal joint is much less distinct than in that species. The mid tarsus is also less distinctly banded than in *N. fuliginosus*.

It differs from *N. theobaldi* and other species in the absence of speckling of the legs, $3\frac{1}{2}$ tarsal segments being pure white and other particulars.

The question of its being either *N. nivipes*, *N. phillipinensis* or the variety of *N. fuliginosus* described as variety *adieii*, was considered, but the characters do not agree with the descriptions of those mosquitoes.

In scale structure it resembles very closely *Ne. stephensi*, the characters of these two species being intermediate between those of the genus *Nyssorhynchus* and *Neocellia*. It is possible that a further generic sub-division having *Ne. stephensi* as the type may be desirable if other species are found to fit naturally into this group, but for the present, as *Ne. stephensi* has been included in *Neocellia*, the species *fowleri* may most appropriately be placed in this genus also.

Type and about 20 specimens in the collection of the Central Malaria Bureau at Kasauli.

(S. R. Christophers.)

III.—A NEW CULICINE.*

Leslieomyia taeniorhynchoides, nov. gen. et. sp.

Proboscis swollen towards the apex, yellowish brown with terminal portion darker and with scattered dark scales along the dorsum.

* The plate illustrating the mosquito will be published in our next number.—Ed.

Clypeus deep brown, bare.

Palpi short, appear from dried specimen to be four jointed, two small basal joints and two longer apical ones, the last with white scales.

Head.—Greyish to naked eye. Surface dark, covered with narrow scales lying rather flat upon the head. Those towards the centre are very narrow linear scales; towards the sides the scales are broader and more curved. The scales are for the most part silvery white, but in front and between the eyes they are yellowish. There are some small narrow white scales arranged regularly just behind the eyes and laterally an area of flat scales, white at the sides but dark as they pass on to the vertex. (Fig. A.) Posteriorly there are scattered upright forked scales. There are a few yellow chaetae in front projecting over the clypeus, and a few darker ones projecting over the eyes laterally. The basal lobes of the antennæ do not carry scales.

Thorax.—Greyish to naked eye; obscurely marked with two indistinct pale parallel lines. Surface dark, covered with densely aggregated narrow curved scales, some almost silvery white, others brownish in tint. Posteriorly there is a bare space in front of the scutellum. There is a row of chaetae projecting from among the scales on each side of the dorsum, very numerous posteriorly where they project over scutellum (Fig. C., where a few only are shewn), and a similar row of spines laterally, especially conspicuous over the roots of the wings.

Pleurae.—Almost covered with very conspicuous pure white large flat oval scales. A prominent tuft of chaetae and flat oval white scales in front lying below prothoracic lobes. *Prothoracic lobes* with chaetae and small white narrow curved scales.

Scutellum trilobed. The centre lobe with a dense tuft of white narrow curved scales and six long stout bristles. Lateral lobes with rather large oval flat white scales lying over root of tuft of long stout bristles, a number of narrow almost linear white scales beneath these.

Melanotum nude.

Abdomen.—Prominently banded, white basal bands on the second to fifth segments, sixth segment with white band notched to form two basal lateral white areas. Scattered white scales among the darker scales covering most of the dorsum give this a speckled appearance. The first segment has a row of white scales basally. Light coloured hairs project apically around each segment, and from most of the surface of the first segment.

Venter mottled with black and white scales, the penultimate segment with a broad distinct almost pure white median band, the last two segments with narrow apical white bands, very narrow on last segment. A very conspicuous patch of flat white scales projecting beyond edge of tergum of first abd. segment.

Legs.—1st pair. Femora black and white, mottled, pale at apex, under-surface pale. Tibiae similarly mottled and pale apically. Tarsal segments basally banded with white except the last which has a very slight, if any, mark.

2nd pair. Similar in markings to the first.

3rd pair. Similar, but the last tarsal segment is distinctly banded with white basally.

Wings.—Mottled owing to admixture of black and white scales on the veins. Scales broad, overlapping, varying from a rather narrow triangular shape to scales nearly as broad as long. (Fig. E.) The scales on most veins are in a double

row. There are no long lateral scales on the dorsal surface of the wings, but a number of long lateral scales are seen on focussing through the membrane to be lying on the under-surface especially on the third longitudinal, the branches of fourth longitudinal and the upper branch of the fifth.

The posterior cell large and almost as long as anterior. Wing fringe dark except near origin of wing where the fringe scales are silvery white.

Ungues are large, the first two pairs consist of two equal biserrate claws. The last pair are small and simple. (Fig. F.)

Genital lobes narrow with hairs only.

Male.—General tint lighter than that of female.

The head of the male differs very considerably in scale arrangement from that of the female, broad flat white scales nearly covering the head and the narrow scales being restricted to a few rows of rather yellowish linear scales lying on either side of a bare central area and some small narrow scales in front over the eyes. (Fig. B.) There are a few upright forked scales, and yellow chaetae project in front.

Antennae.—Markedly plumose.

Proboscis.—Swollen apically with a swelling in its length, covered with rather large dark and lighter scales.

Palpi.—Longer than proboscis, two large apical segments with flat white and dark scales and long projecting hairs. A long narrow basal portion chiefly covered with dark scales swollen where it joins the apical portion and shewing signs of being two segments.

Thorax.—As in female. Prothoracic lobes with hairs and narrow scales. *Abdomen* with large black and white scales, the last three segments having large lateral patches of pure white scales.

Scutellum.—As in female, but with fewer narrow scales on outer lobes.

Wings.—Similar to female, but with fewer scales on veins, these in parts being quite devoid of scales.

Ungues.—The first pair unequal, the larger claw biserrate, the second pair very similar, but the larger claw rather more slender, the third pair simple and equal.

Genitalia.—So far as can be seen in the dried specimen, the genitalia are simple, showing little other structure than a rather small curved clasper. (Fig. G.)

Habitat.—Amritsar. One female and two males bred from nymphs taken in September from a small muddy puddle in which larvae of *N. rossi* were present.

Observations.—The general appearance of the species, especially of the male, is rather like a small taeniorhynchus, the resemblance to *T. tenax* being increased by the mottling of the wing veins. The scale structure of the head and scutellum is very striking and the species does not fall into any of Mr. Theobald's genera.

The nearest approach is to *Howardina*, but the scutellar characters are different, and there are six very conspicuous chaetae instead of the four described in all the species of this genus.

The genus has been named after Lieutenant-Colonel Leslie, I.M.S.

Type in the collection of the Central Malaria Bureau at Kasauli.

(S. R. Christophers.)

THE DEVELOPMENT OF THE EGG
FOLLICLE IN ANOPHELINES

BY

S. R. CHRISTOPHERS.

(With plate.)

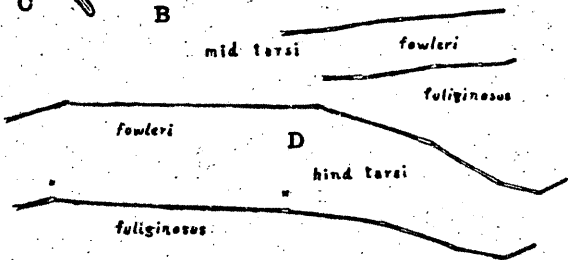
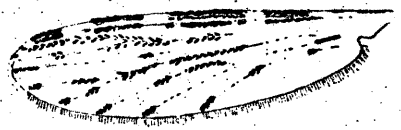
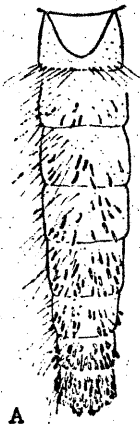
The following note on the changes which take place during the development of the ovum in anophelines seems called for, because, so far as I am aware, with the exception of a brief reference by Dr. Stephens and myself in our description of the anatomy of the ovaries, these changes have hitherto not been mentioned by any writer.

A more complete and extended series of observations on the state of the ovaries under different conditions in nature is intended to form part of the investigation into the bionomics of anopheles referred to in the scheme of investigation given on page 7 of the first number of PALUDISM. The present short note will serve to give the general character of the developmental changes, and to shew not only that the changes may be made use of in studying almost any question relating to the bionomics of anopheles, but that there is a considerable field for enquiry on the subject.

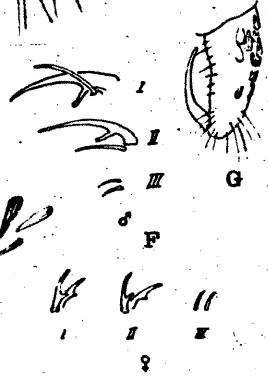
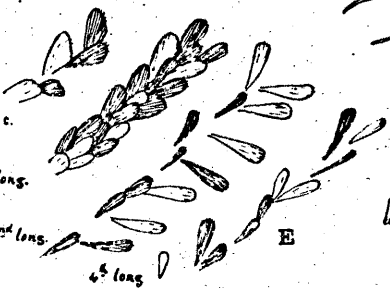
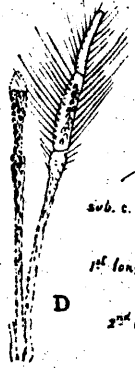
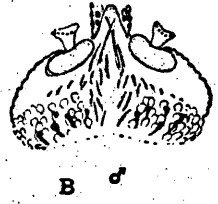
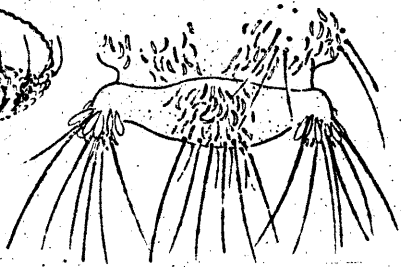
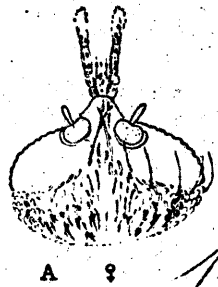
General Structure of the Ovary.

The female organs of generation in anopheles consist of two *Ovaries*, each with a short *Ovarian Tube* (Fig. 9, o. t.) opening into a common gynaecophoric canal, a single *Spermatheca* (*Culex*, *Stegomyia*, etc., have three) opening by a long narrow thick walled duct near the base of the gynaecophoric canal, and a small gland, the *Mucus gland*, opening also low down.

Each ovary is a more or less fusiform organ. (Fig. 9.) It has a delicate limiting membrane which is continuous below with the ovarian tube and is continued upwards as a delicate



Ne. fowleri, nov. sp.



Leslieomyia tæniorhynchoides, nov. sp.

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