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### Original Communications.

#### THE CLASSIFICATION OF THE ANOPHELINA.

By FRED. V. THEOBALD, M.A., F.E.S., &c.

The Genus *Anopheles*, founded by Meigen in 1818, has now grown to a considerable size, about fifty species being known. Some of these present very close structural features, others very diverse ones. The genus as it now stands is becoming somewhat unwieldy, like *Culex*, and as there is seen to be such a diversity of characters in these Culices with long palpi in both sexes, I have been compelled to divide them up into several genera. There is a very great difference, for instance, between *A. maculipennis* and *A. pharensis*, between *A. argyrotarsis* and *A. rossii*, the differences, in fact, are quite as great as between *Panoplitis* and *Culex* or *Sabethes* and *Aedes*.

In the classification of the *Anophelina*, I have found, just as in the *Culicidae* as a family, that the scale structure is the best to take for generic distinction. This grouping is based entirely on the scales of the thorax, abdomen and wings. It will be noticed that by these characters a natural grouping is formed, and that it, in the main, tallies with what we know of their larval structure. I do not think, however, that the minute structural differences in the larvæ should be taken as of greater value than specific characters; but it is of interest to find that, on the whole, by grouping by certain characters of the larvæ and certain adult characters we get similar results.

The following genera may be recognised:—

- Genus 1. *Anopheles*, Meigen.
- Genus 2. *Grassia*, nov. gen.
- Genus 3. *Cyclolepyteron*, Theobald.
- Genus 4. *Stethomyia*, nov. gen.
- Genus 5. *Howardia*, nov. gen.
- Genus 6. *Rossia*, nov. gen.
- Genus 7. *Loverania*, nov. gen.
- Genus 8. *Cellia*, nov. gen.

These genera may be tabulated as follows:—

Thorax and abdomen with hairs only; palpi not densely scaled	Prothoracic lobes simple	Wing scales lanceolate . . . . .	<i>Anopheles</i> .
		Wing scales long and narrow . . . . .	<i>Grassia</i> .
Thorax with narrow, curved scales; abdomen hairy	Prothoracic lobes mammillated	Wing scales partly large and inflated . . . . .	<i>Cyclolepyteron</i> .
		Wing scales lanceolate . . . . .	<i>Stethomyia</i> .
Thorax and abdomen with scales; palpi densely scaled	Prothoracic lobes simple	Wing scales small, lanceolate . . . . .	<i>Howardia</i> .
		Abdominal scales on venter only; thoracic scales hair-like . . . . .	<i>Rossia</i> .
		Abdominal scales as lateral tufts and dorsal patches; thoracic narrow curved or spindle-shaped . . . . .	<i>Loverania</i> .
		Abdomen completely scaled and with lateral tufts . . . . .	<i>Cellia</i> .

Genus 1. *Anopheles*, Meigen (fig. 1).—Thorax and abdomen with hair-like curved scales, practically hairs; palpi in the ♀ thin, not densely scaled; wings with the veins covered with lanceolate scales, which may or may not form spots, which if present are never so numerous as in the other genera. The majority are large species.

Type: *maculipennis*, Meigen.

The following species are included in this genus besides the type: *bifurcatus*, L.; *walkeri*, Theo.; *punctipennis*, Say; *lindsayii*, Giles; *nigripes*, Staeger; *pseudopunctipennis*, Say; *stigmaticus*, Skuse (?). This genus was formed by Meigen on *maculipennis* and he included *bifurcatus*; later *nigripes* was added. I have therefore retained the genus in the restricted sense for these and allied species.

Genus 2. *Grassia*, nov. gen. (fig. 2).—Thorax and abdomen with hair-like scales; wings with long, thin lateral vein-scales; the wings are usually much spotted; the majority small or moderate-sized species.

Type: *rossii*, Giles.

The following are included in this genus: *superpictus*, Grassi; *funestus*, Giles; *rhodesiensis*, Theo.; *culicifacies*, Giles; *christophersi*, Theo.; *turkhudi*, Liston; *leptomeres*, Theo.; *gigas*, Giles; *cinereus*, Theo.

Genus 3. *Cyclolepteron*, Theobald (fig. 3).—Differs from the two former genera, in that the wings have large inflated scales as well as typical lanceolate ones.

Type: *C. grabhamii*, Theo.

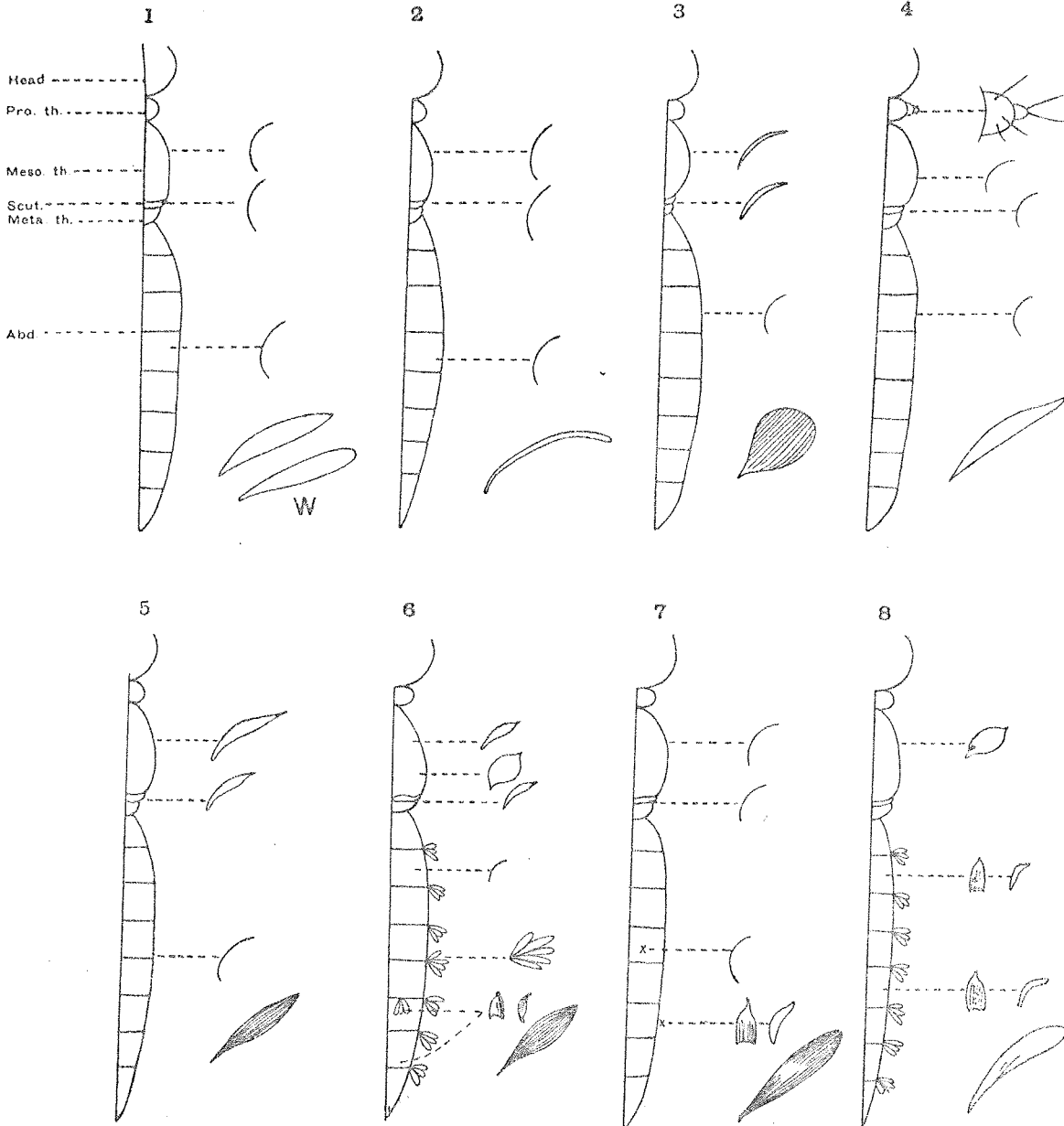
Two species only are known in this genus, the type and *C. mediopunctatus*, Lutz (ms).

Genus 4. *Stethomyia*, nov. gen. (fig. 4).—Thorax and abdomen hairy and bristly; prothoracic lobes mammillated; wings with narrow lanceolate scales, and the head with a median patch of flat scales. Palpi of the ♀ very thin.

Type: *S. nimbus* (n. sp.).

The genus contains only one species, readily separated by the head scales, mammillated prothoracic lobes and very thin palpi.

Genus 5. *Howardia*, nov. gen. (fig. 5).—Thorax with narrow curved scales; abdomen with hairs, no scales; wing-scales small and lanceolate; wings much spotted; palpi of the ♀ moderately scaled.



THE CLASSIFICATION OF THE ANOPHELINA.

1, *Anopheles*; 2, *Grassia*; 3, *Cyclolepteron*; 4, *Stethomyia*; 5, *Howardia*; 6, *Laverania*; 7, *Rossia*; 8, *Cellia*. (Showing general squamose characters.) W, Typical wing-scales.

Type: *costalis*, Low.

This genus includes besides the type, the following: *longipalpis*, Theo.; *minus*, Theo.; *atratiipes*, Skuse (?).

Genus 6.—*Rossia*, nov. gen. (fig. 7).—Thorax with hair-like scales; the abdomen with ventral and apical scales; wing scales broadly lanceolate; palpi densely scaled in the ♀, and also the proboscis.

Type: *sinensis*, Wied.

This genus includes also all the sub-species of *sinensis* (*annularis*, V. der Wulp; *niqerrimus*, Giles; *indiensis*, Theo., and *pseudopictus*, Grassi); *barbirostris*, V. der Wulp; *paludis*, Theo.; *bancroftii*, Giles.

Genus 7. *Laverania*, nov. gen. (fig. 6).—Thorax with narrow curved and spindle-shaped scales; abdomen with lateral tufts of scales, with ventral scales and sometimes dorsal patches; wing-scales bluntly lanceolate; palpi densely scaled; legs mostly banded and spotted with white, the hind tarsi being often pure white.

Type: *argyrotarsis*, Rob. Desv.

This genus contains besides the type, the following: *argyrotarsis*, sub. sp. *albipes*, Theo.; *fuliginosus*, Giles; *jamesii*, Theo.; *maculata*, Theo.; *lutzii*, Theo.; *theobaldi*, Giles; *metaboles*, Theo.; *annulipes*, Wlk. (?); *masteri*, Skuse (?); *maculipalpis*, Giles; *kochii*, Donitz; *punctulatus*, Donitz; *leucophyrus*, Donitz (?).

Genus 8. *Cellia* nov. gen. (fig. 8).—Thorax with flat, spindle-shaped scales; abdomen entirely covered with scales and with dense lateral tufts; palpi of ♀ densely scaly; wing-scales large, bluntly lanceolate, wings densely scaled.

Type: *pharansis*, Theo.

This genus also includes the following: *pulcherri-mus*, Theo.; *squamosus*, Theo.; *bigotii*, Theo.

a markedly anæmic state with a blue-black mark on his tongue; he also had ankylostomiasis. I then commenced to take notes, and found that all patients who had passed ankylostomes after treatment had more or less marked tongues. I even went further; we have a monthly inspection of new coolies on each estate during the first twelve months after arrival from India. I examined the tongues of every one of them and found fourteen who to look at were perfectly healthy; no anæmia, nor in fact any sign of disease, but who had blue-black marks on their tongues. Most of the cases said they had come from India with these marks; in fact, one man said his tongue was marked like that from childhood. I took them all into hospital and put them on the usual thymol treatment and every one of the fourteen passed mature ankylostomes. I now make it a rule that everyone with these marks on the tongue gets thymol even if no anæmia is present, and in no case have I failed to find ankylostomes. I have made an attempt to sketch and paint the tongues of the cases I have now under treatment in the hospitals, but please excuse the result, as I have no proper paint-box or colours, so have had to make the colour of tongue far too bright a pink, but the small patch of colour at the bottom of each group of tongues, I wish to represent the colour of a healthy tongue. The blue-black colour I have got more like what it should be, and the brown marks are like the colour of lightly-roasted coffee when first ground.<sup>1</sup>

It must also be noted that the edges of the marks are not so sharply defined as they appear in my sketches, but fade away into the red of the tongue. I find that under treatment, thymol repeated two or three times, and large doses of tincture ferri. with a little quinine, that in from ten to twenty days the small marks have gradually faded away beginning from the edge and getting smaller. The large ones take six weeks or more.

I intend taking further notes, as if this is a regular symptom here of ankylostomiasis it is well worth making public, as it is an early sign I take it, before there is pronounced anæmia, and of such easy diagnosis that cases can be treated and cured before there is much damage done. I have had no opportunity of making sections of these patches.

FIG. 1.—Male, aged 28, taken into hospital on account of tongue, which is healthy-looking, but with five small blue-black marks. Organs normal; passed several worms after thymol treatment. Marks faded after thymol.

FIG. 2.—Male, aged 20, shows no signs of disease. Organs normal; tongue healthy looking, three small marks blue black; passed worms after thymol.

FIG. 3.—Male, aged 34, was in a very weak anæmic state; face puffy; legs swollen; marked jaundice; urine no albumen; heart dilated, complains of palpitation; tongue dirty yellowish clay colour, with blue-black edge; treated with thymol; passed large quantity of worms. Very much improved. Tongue changing colour.

[<sup>1</sup> We found it impossible to represent these colours accurately, so we have been content to indicate the situations of the markings merely, see illustrations.—EDITOR.]

## PECULIAR MARKING OF THE TONGUE IN ANKYLOSTOMIASIS.

By PERCY H. DELAMERE, L.R.C.P., L.R.C.S.I.

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In a letter addressed to Dr. Manson, Dr. Delamere writes: I am sending you an account of a symptom in ankylostomiasis, which I have observed in about fifty or sixty cases among the coolies on the two estates I have charge of in this island, as I do not see it mentioned in the books on the subject. I refer to a peculiar marking of the tongue. There is a large amount of ankylostomiasis in this island. I had fifty-one cases in one estate hospital during the twelve months from April, 1901, to March, 1902, and have eighteen cases under treatment now. Some little time back I began to notice that all the patients under treatment for this disease had a peculiar mark on the tongue, exactly as if the patient had just wiped a penful of Stephens' blue-black ink on his tongue; in fact, the first time I did take notice of it, was to ask the nurse why he let the patient play with the pens on the ward desk. The man said he had not, and that his tongue had been marked like that for a long time. A few days after, another man came in