NOTES ON *GLOSSINA FUSCA*, WALK., IN NORTH NYASA.

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(MAP.)

THE following notes are based on observations made during the months of June and July, in and near the Songwe valley.

Between Karonga and the River Songwe the country consists of a plain about 10 miles in width, lying between Lake Nyasa and an irregular line of foot-hills, behind which the country becomes more and more hilly, gradually rising to the Misuko Hills, some thousands of feet above sea-level.

The plain (1) * is open, *i. e.*, it is covered with long grass and a few small trees, and is crossed by numerous rivers and streams rising from the hills and running into the lake. All these streams are marked throughout their course by narrow lines of thick bush and large trees, usually including a few palms, but not invariably (fig. 1, p. 300). *G. fusca* was found in the bush on all these streams, though many of them are dry or are represented by a few stagnant pools only, at this time of the year. No fly was found on the plain, though the natives state that it is very prevalent there also during the rains (*i. e.* about January).

For the first few miles up the Songwe the character of the country is very similar, and *G. fusca* was found on the river and on all its tributaries. On leaving the plain, however, and entering the Songwe valley, the wooded hills gradually close in near the river, so that the open spaces of the plains are soon altogether absent, and the bush is continuous between the streams running into the Songwe (2). The trees, however, are smaller, and the brush-wood almost absent, being replaced by coarse grass, brambles, etc. Here in the course of every stream, however small and however dry, this species of *Glossina* was found, frequently in very large numbers, and the fly could be observed in almost any sheltered spot. They were, in this locality, invariably absent from places where the trees were thin, or where they were not protected from sun and wind. They were also found in the rank bush bordering the main river.

Towards Nkana the trees on the hills become scarcer, the hills are bigger and the valleys between them deeper, and *G. fusca* became difficult to find (3). At the River Makeye there is a wide valley with long grass and few trees, and

* These numbers will be found on the map, indicating the localities referred to.

the banks of the Songwe are of a similar nature. Here the fly was found in two places only, one some miles up the valley of the Makeye in a belt of trees about half a mile from that river, and the other on the Songwe in the long grass. The latter habitat is a very exceptional one, and only two specimens were seen on this occasion.

Beyond the Makeye the hills became bigger and the Songwe is fed by torrents, while the banks of the river are impassable owing to long grass, scrub, etc. (4). No fly was found in these hills, nor at the few places where it was possible to approach the Songwe. Near Mugofi Hill the Songwe was carefully searched for some distance. Above this the river runs through mountainous country, offering no shelter to the fly, and none was found.

Fig. 1.—Mawerela Stream, North Nyasa (see Map). The course of the stream is indicated by the narrow line of bush along its banks, the adjoining country being open and covered with long grass.

The higher reaches of the Makeye, Chungu, Kaporo, and Lufira rivers were then searched, but without success, presumably owing to the absence of trees and to the elevation. With regard to the latter, no very definite conclusions can be drawn, as in one instance, on the Karambu stream (5), *G. fusca* was found in considerable numbers near the top of a hill some 700 feet above Songwe level, here about 1700 ft. above sea-level,—at a height therefore of about 2400 ft.; this was about 3 miles distant from the Songwe.

The fly is on the wing and is desirous of feeding at two periods of the day

only, viz. :—in the early morning and in the evening ; between 8 a.m. and 4 p.m. their presence would be entirely unsuspected, though an isolated specimen might be caught after very careful search. They were found during the day under leaves of bushes or in the grass, always near the ground (*cf.* fig. 2). They continued to bite and could be heard flying about for some time after dark. At these times, the morning and evening, they were frequently present in large numbers, and 20 to 30 specimens could be caught with one net in the course of an hour. Two specimens were caught *in coitu* ; they were found on the trunk of a large tree, at a height of about 4 feet, at about 5 o'clock the evening.

Fig. 2.—The narrow, dried-up bed of the Mawerela Stream, showing how it is overgrown with dense bush, in the deep shade of which *Glossina fusca* is found during the day.

At a village on the Ponga stream (6) the cattle were found to be infected with trypanosomiasis, suggestive of Nagana, the trypanosomes having the morphological characters of *Trypanosoma brucei*. *G. fusca* was found in exceptionally large numbers, and two specimens were caught in the hut in which an infected cow was lying, and which was also the living-place of its owners. This is the only time that I have succeeded in finding the fly actually in a village. I hope to investigate this trypanosomiasis later on.

The grass and scrub in this part of the country is burnt in November and December.

The flies bite through dark clothes, but have never been seen to settle on

white surfaces. I have not observed any natural enemies, nor have I seen the fly drinking.

Cattle are kept in large herds over the whole of the country above described, and I have observed them being bitten when being watered at many of the rivers. The cattle infected with Nagana (?) at the Ponga are said to have come from the Chungu, less than a mile distant, where there are large herds apparently quite healthy, though I have seen them being bitten by *G. fusca*.

There is a history of all the cattle having died off in two places, at one of which, Katumbi on the Kaporo River, no attempt has since been made to keep them; at the other, Mwaisandoro, on the Makeye, there are at present a number of cattle, apparently healthy. *G. fusca* was found at both places.

A few isolated cases of Sleeping Sickness have been found in Nyasaland, one in this District, but none in the part described above.

[illegible]

Scale $\frac{1}{312,000}$ or 1·014 Inches to 5 Miles.

	<i>G. fusca</i> found	<i>G. fusca</i> looked for, but not found
1. <i>G. fusca</i> found	1	0
2. <i>G. fusca</i> looked for, but not found	0	1
3. <i>G. fusca</i> not found	0	0
4. <i>G. fusca</i> not looked for	0	0