Ann. Soc. belge Méd. trop.
1990, **70**, 281-287

FIRST RECORD OF *GLOSSINA FUSCIPES FUSCIPES* NEWSTEAD, 1910 AND *GLOSSINA MORSITANS SUBMORSITANS* NEWSTEAD, 1910 IN SOUTHWESTERN SAUDI ARABIA

by

P. ELSEN[1], M.A. AMOUDI[2] & M. LECLERCQ[3]

[1]*Prince Leopold Institute of Tropical Medicine, Dept of Entomology, Nationalestraat 155, B-2000 Antwerpen, Belgium*
[2]*King Saud University, College of Sciences, Riyadh, Saudi Arabia*
[3]*Faculty of Agricultural Sciences, General Zoology and Applied Entomology, Gembloux, Belgium*

Summary — Two species of tsetse flies, *Glossina fuscipes fuscipes* and *G. morsitans submorsitans,* are, for the first time, recorded from southwestern Saudi Arabia, near Gizan. This discovery is shortly discussed in relation with the presently known distribution of these species.

KEYWORDS: Tsetse flies; *Glossina fuscipes fuscipes; Glossina morsitans submorsitans;* Saudi Arabia

Introduction

The only known record of tsetse flies in the Arabian peninsula is the one of Carter (3), who catched *G. tachinoides* in 1903 around Aden, in South Yemen. Carter is the only one who found tsetse-flies in that country; nobody after him did, nor in other areas of the Arabian peninsula.

In the present note, we state for the first time the presence of two species of tsetse flies catched by one of us (M.A.A.) in southwestern Saudi Arabia, in the neighbourhood of Gizan, near the northwestern border of Yemen. These catches have been made by mere chance as explained in the next paragraph. Both records (Yemen and the present work) are situated at more than 1000 kilometers of the distribution limits of tsetse flies.

Localities and method

In 1984, on January the 16th and September the 16th, in order to make the faunistic of flies with special attention for Tabanids, one of us (M.A.A.) catched by means of areal nets all flies found in barns of sheeps, goats and donkeys near Amjara and Hakimah. At the end of 1989, looking at the non-Tabanid Diptera catched, 23 specimens of tsetse flies were recognised in the collections and sent to one of the authors (P.E.) for determination.

The two sites of catching (Amjara and Hakimah) are situated at several kilometers of each other, east of the town Gizan, along the river wadi Gizan, around the coordinates of 17° N and 43° E at an altitude of 170 m. (fig. 1).

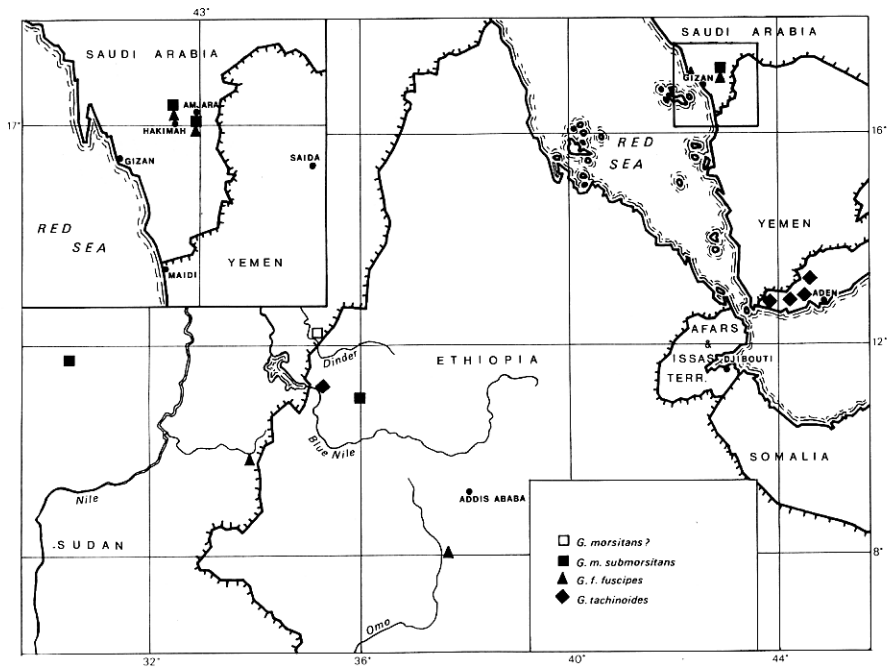
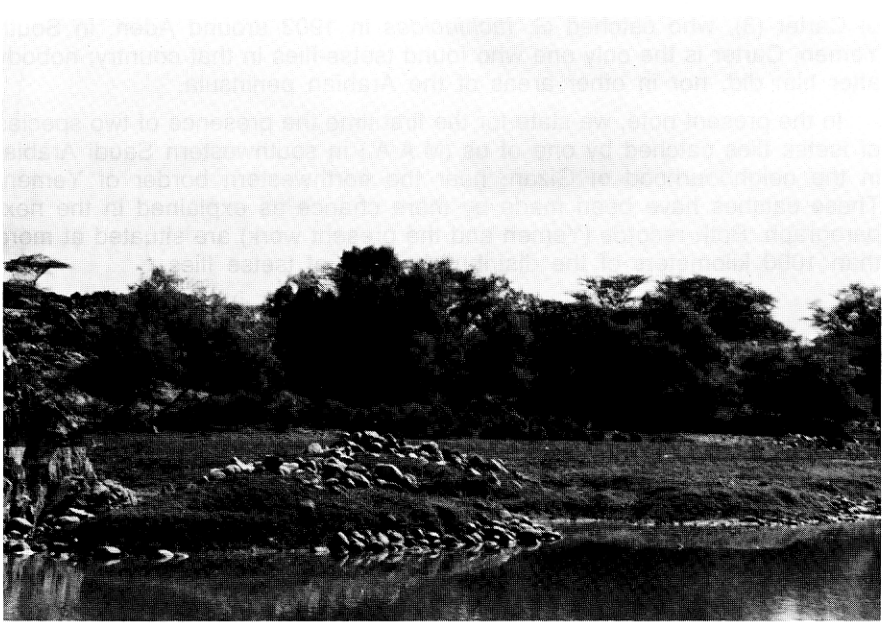
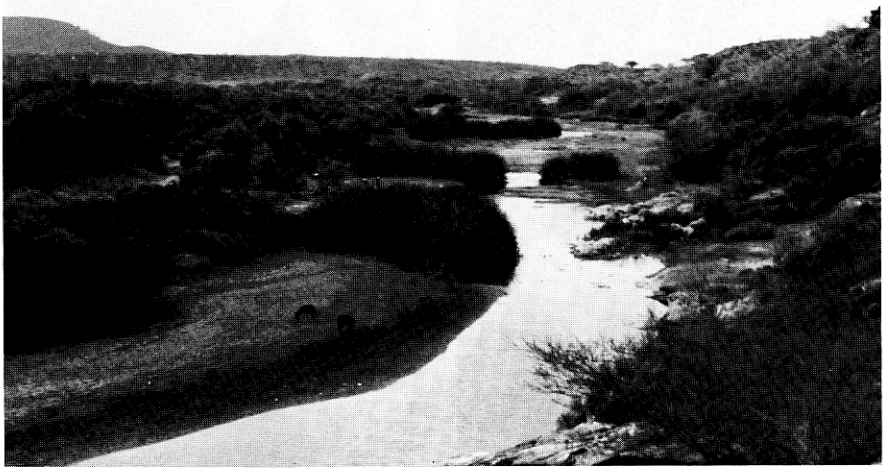


Figure 1.
Map of extreme northern distribution of tsetseflies in southwestern Arabian peninsula and northeastern Africa.



Figures 2.
Amjara site with low trees distributed in a thin galery.



Figures 3.
Hakimah site with thickets in mosaic.

The river flows permantly on large deposits of gravil, sand and slit, and the riverine vegetation is dense, but not continuous, spreading in mosaic on the surrounding degrading hills and constituted of low trees (fig. 2) or thickets (fig. 3). Animal life is composed of cattle, donkeys, sheeps, rabbits, monkeys, reptiles, amphibia and birds, providing the full range of possible hosts for tsetse flies.

Determinations of the tsetse flies have been done by examination of their genitalia after dissection in Hoyer medium and using the keys provided by Machado (9,10) and Potts (12). Specimens have been compared with the collections of the Musée Royal de l'Afrique Centrale in Tervuren and of the Institut Royal des Sciences Naturelles in Brussels.

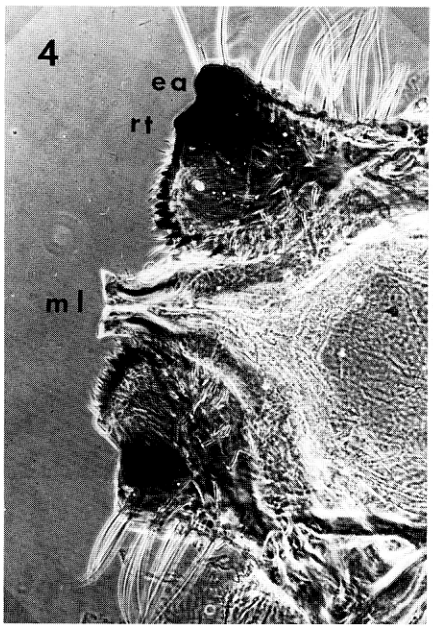
Results of determinations

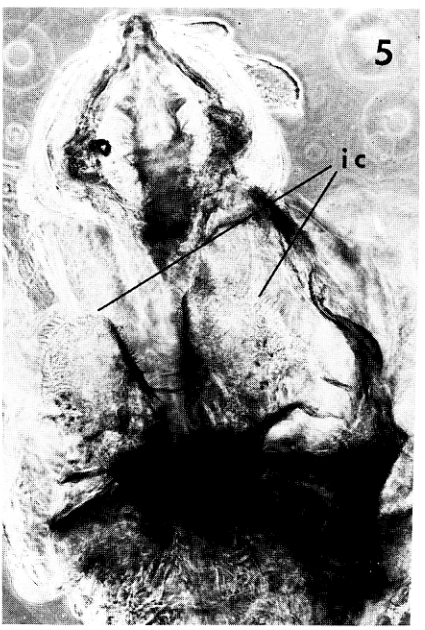
The 14 specimens examined are composed of 7 males and 1 female of *Glossina morsitans submorsitans* Newstead, 1910 and 5 females and 1 male of *G. fuscipes fuscipes* Newstead, 1910. No specimens of *G. tachinoides* were recorded.

G. m. submorsitans

Male genitalia with superior claspers (fig. 4) are as follows: the external angle angular, the rudimentary tooth well marked, the median lobes being large with divergent tips and their internal edges joined on a long distance.

The inferior claspers (fig. 5) are apically rounded without tooth on their internal apical angle and with straight external sides. All these characters constitute a mixing between the typical *submorsitans* and its *ugandensis* form as described before (10).





Figures 4-5.
(4) Superior claspers and (5) Inferior claspers from male genitalia of *G. m. submorsitans*.
(ea = external angle; *ic* = inferior claspers; *ml* = median lobes; *rt* = rudimentary tooth)

G. f. fuscipes

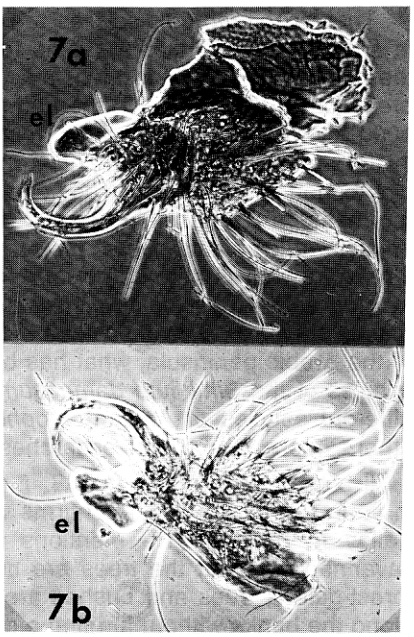
Female genitalia (fig. 6) are typical. They are less typical in the male in that they have inferior claspers with the external lobe very markedly hatchet shaped with very slight differences between the two claspers (fig. 7a & b), but much more shaped in that way than in the extreme form described by Machado (9). But we only have a single male specimen!

The general colour of the insect is here slightly different from the one in the African populations, in that the lateral light marks on the abdominal tergites are not grey but yellowish and the last abdominal segment not grey but quite black with a lateral yellow-brown stripe. The face below the antenna is not a silky yellow-white but a dull brown-toffee.

One male and one female of each species are deposited in the Musée Royal de l'Afrique Centrale, in Tervuren, Belgium. The other specimens are deposited in the collection of the King Saud University.

Discussion

Our finding of tsetse flies at 17° N in Saudi Arabia is the highest latitude recorded for the entire genus *Glossina*. The former highest latitude recorded



Figures 6-7.
(6) Female genitalia and (7a & b) Inferior claspers from male genitalia of *G. f. fuscipes*; (*el* = external lobe).

was 15° N in Senegal (West Africa), for *G. palpalis* and *G. m. submorsitans* (4). In East Africa, the latitude records were much lower, the highest being from Lewis (8) who writes « unconfirmed reports, possibly *G. morsitans* » on the river Dinder (12° N; 35° 15' E) at the border between Sudan and Ethiopia. This extreme record and others for the three species we are concerned with are given in table 1 and figure 1, and the distribution of these species and all other *Glossina* is only south of these records. The only exceptions are the one in Yemen (3) and the one in Saudi Arabia (present work). Concerning *G. tachinoides* in Yemen, nobody seems to have looked at the genitalia (9) and Van Emden (in 9, p. 152) determined the single female from « Arabia » in the British Museum collection as a typical *G. tachinoides* and observed there were no males in the original material of Newstead in Liverpool.

TABLE 1
The highest latitudes records in East Africa for *G. m. submorsitans, G. f. fuscipes* and *G. tachinoides*

species	geographical coordinates	country	reference
G. m. submorsitans (?) (unconfirmed)	12° N; 35° 15' E	border Sudan Ethiopia	8
G. m. submorsitans	11° 45' N; 30° 30' E	Sudan	8
	11° N; 36° E	Ethiopia	4
G. f. fuscipes	10° N; 34° E	Sudan	4,8
	8° N; 37° 30' E	Ethiopia	11
G. tachinoides	11° 30' N; 35° 30' E	Ethiopia	4

The reason why tsetse flies are present only below the latitude of 12° N in south-western Ethiopia seems to be related to the fact that «the rest of the country is partly too high and partly pertaining to the desert» (11). The presence of tsetse flies in the south of the Arabian peninsula, at more than 1000 kilometers of the limits of their distribution in Africa, might be explained in the same way as did Buxton (2) who wrote: «The present geographical distribution of these insects is consistent with the view that this part of Africa (northeastern) is becoming drier. It seems that these insects and many other animals and plants were more continuously distributed, and that they inhabited what is now desert during the last pluvial period. But now, owing to progressive dessication, they remain only in certain relatively restricted patches of land». These patches of land occur in the lowlands along the coast of the Arabic peninsula, what has been confirmed by the discovery of a new species of the *Simulium damnosum* complex in Yemen (5), the presence of different species of African *Anopheles* (6), Tabanids (1) and maybe many others. More faunistical researches in this part of the World are needed.

It seems suprising to find *G. f. fuscipes* in the type of biotope as shown in figures 2 and 3, but it confirms what Ovazza (11) described in the Ghibie Valley in Ethiopia. He mentions that «the vegetation is of the wooded savannah type but the trees are not high and not dense. There is no true forest-galery; trees and bushes are simply in a little more dense settlement along the banks without forming a continuous shade». This is in contrast with the more shaded habitat of its main range of distribution more south, and it should not be surprising if this species is composed of different populations adapted to quite different habitat conditions. The small morphological differences observed in our specimens are maybe an indication for this and further morphological and genetical studies, together with hybridisation experiences with the true *G. f. fuscipes* from Central Africa, should state its definitive status.

The role these two species play in the transmission of trypanosomes is unknown, although *Trypanosoma evansi* is known from Arabia (7). Normally, this parasite is mechanically transmitted by other blood sucking insects, but tsetse flies also act as vectors in Africa. Further investigations in this part of Saudi Arabia are needed to state if tsetse flies are still there, and if so, which is their actual density and distribution and which is the prevalence of trypanosomes in domestic animals, keeping in mind that the cattle of Saudi Arabia are essentially coming from East Africa.

Première découverte de *Glossina fuscipes fuscipes* Newstead, 1910 et de *Glossina morsitans submorsitans* Newstead, 1910 au sud-ouest de l'Arabie Saoudite.

Résumé — Deux espèces de mouches tsétsé, à savoir *Glossina fuscipes fuscipes* et *Glossina morsitans submorsitans,* sont, pour la première fois, rapportées du sud-ouest de l'Arabie Saoudite, près de Gizan. Cette découverte est brièvement discutée en relation avec leur distribution actuellement connue.

Eerste ontdekking van *Glossina fuscipes fuscipes* Newstead, 1910 en van *Glossina morsitans submorsitans* Newstead, 1910 in het zuidwesten van Saudi-Arabië.

Samenvatting — Twee soorten tseetseevliegen, namelijk *Glossina fuscipes fuscipes* en *Glossina morsitans submorsitans,* worden, voor de eerste maal, gerapporteerd in het zuidwesten van Saudi-Arabië, dichtbij Gizan. Deze ontdekking wordt besproken in het licht van de huidige gekende verspreiding van deze soorten.

Received for publication on June 27, 1990.

REFERENCES

1. Amoudi MA: New records of Tabanids (Diptera) from Southwest Saudi Arabia with some aspects on their descriptions and biological information. J. Biol. Sc. Res., 1989, **20**: 115-127.
2. Buxton PA: The natural history of tsetse-flies. Lond. Sch. Hyg. Trop. Med., 1955, Memoir n° 10.
3. Carter, RM: Tsetse-fly in Arabia. Brit. Med. J., 1906, 17 Nov., 1393-1394.
4. Ford J, Katondo KM: The distribution of tsetse-flies *(Glossina)* in Africa. 1973, OAU/STRC maps, printed by Cook, Hammond & Kell Ltd, London.
5. Garms R, Kerner M, Meredith SEO: *Simulium (Edwardsellum) rasyani* n.sp., the Yemen species of the *Simulium damnosum* complex. Trop. Med. Parasit., 1988, **39**: 239-244.
6. Gillies MT, de Meillon B: The Anophelinae of Africa South of the Sahara. 1968, The South African Institute for Medical Research, n° 54, Johannesburg.
7. Kasim AA: Detection of *Trypanosoma evansi* in the Arabian Camel. J. Cool Sci., King Saud Univ., 1984, **15**: 423-427.
8. Lewis DJ: The tsetse-fly problem in the Anglo-Egyptian-Sudan. Sudan Notes and Records, 1949, **30** (2): 179-210.
9. Machado A (de Barros): Révision systématique des Glossines du groupe *palpalis* (Diptera). 1954, Companhia de Diamantes de Angola, Museo do Dundo, Lisboa, 189 pp.
10. Machado A. (de Barros): Les races géographiques de *Glossina morsitans.* In J. Fraga de Azevedo, Ed. Criacao da mosca tsétsé em laboratorio e sua aplicacao pratica. (1st Int. Symp. on Tsetse Fly Breeding under Lab. conditions and its practical application. 22nd and 23rd April, 1969), 1970, Lisbon: 471-486.
11. Ovazza M: Contribution à l'étude des Diptères vulnérants de l'Empire d'Ethiopie. IV. *Glossina.* Bull. Soc. Path. exot., 1956, **49**: 204-209.
12. Potts WH: Glossinidae (Tsetse-flies). In Smith K.G.V. (Ed.) Insects and other Arthropods of medical importance. British Museum, (NH), London, 1973: 209-249.