SOME PARASITIC PROSTIGMATA AND ASTIGMATA (ACARINA) OF SMALL MAMMALS IN TORO GAME RESERVE, UGANDA

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Abstract. In the material of astigmatic and prostigmatic mites, collected in the Toro Game Reserve, Uganda at the peak of the drought period, the following nine mite species of the families Myobiidae, Atopomelidae and Listrophoridae were identified: Myobia (Angomyobia) machadoi Paim, 1972, Radfordia (Radfordia) pyromyis trifurcata Pain, 1973, Radfordia (Lophuromyobia) brevipilis Pain, 1972, Crocidiscus (Crocidiscus) torrensii sp. n., Listrophoridae (Listrophorina) leniscomys Radford, 1943, Listrophoridae (Oxisthorphoridae) africansus Radford, 1944, Listrophoridae (Afristhorphoridae) mastomys Radford, 1940, Listrophoridae (Afroxisthorphoridae) teimophallus Pain, 1970 and Afroxisthorphoridae loophorius (Radford, 1940). A description and illustration are presented of the female and male of the new species Crocidiscus (Crocidiscus) torrensii, and the special position of the rodents Pelmomys minor Cabr. et Ruxton among the hosts of ectoparasites in the region studied is discussed.

The material of prostigmatic and astigmatic mites dealt with in this paper, had been collected within the scientific programme of the Czechoslovak "Expedition Africa—Wildlife 78", involving a multidisciplinary research in the Toro Game Reserve, in the Semiliki Valley, Western Uganda. The results of the activities of this expedition were summed up in research reports (Verner 1978, Verner and Jenik 1984). Out of parasitic mites only gamasid mites (Dubbábek et al. 1982) and sarcocysts of bats (Dubbábek 1980) were treated. The treatment of other groups in the material collected will be the subject of subsequent studies.

In the total area of 648.56 square km, over which the Toro Game Reserve extends, collections were made in six sites:
1. Partly deforested flood plain of the Wassa river near the Semiliki Safari Lodge.
2. Waterhole in the grass savanna, about 1 km east-south-east of the Semiliki Safari Lodge.
4. Riverine forest, right bank of the Wassa river near the Semiliki Safari Lodge.
5. Waterhole in the grass savanna, north of the Semiliki Safari Lodge.

Material treated in this paper had been collected by F. Dubbábek and M. Daniel and obtained primarily by flotation method after Henry and McKeever (1971).

In this material nine species of the families Myobiidae, Atopomelidae and Listrophoridae were identified.

Family Myobiidae

Myobia (Angomyobia) machadoi Pain, 1972

Material: 7♀♂, 4♂♂ from Lemniscomys striatus (L.), site 1, 27. 1. 1978.

The species so far known only from Angola, was collected from Lemniscomys striatus in large numbers. One male specimen was also found on Oenomys h. hypo-
zanthus Pucharian and Lophoromys flavopunctatus rita Dollman respectively, but these two hosts were considered by Fain (1978) and Fain and Lukoschus (1977) to be uncertain. Only a single one out of seven L. striatus specimens examined by us was infested with the mite.

The females in our material are characterized by slightly shorter dorsal setae, unlike parasite specimens loaned by courtesy of Prof. A. Fain (Antwerp). Between the males from our material and those of the type series no difference was found.

Radfordia (Radfordia) praemyris trifurcata Fain, 1973

**Material:** Only from Pelomyx minor Cabr. et Ruxton in the following sites: 15, 2α of site 3, 7. 2. 1978; 1 α site 6, 11. 2. 1978.

This subspecies was described from Mastomyx natalensis (A. Smith) and other “different hosts” in the Ivory Coast (Fain 1973). M. natalensis is also the typical host of the nominate subspecies Radfordia (R.) p. praemyris Zumpt et Coffee, 1971 described from the Republic of South Africa. Fain (1973a) reported additional 11 host species of this mite subspecies from Angola, but in his later papers (Fain et al. 1974, Fain et Lukoschus 1977, Fain 1978) he considered only M. natalensis, Praomyx morio (Trouessart) and Praomyx morio jacksoni (de Winton) to be the true hosts. Zumpt and Coffee (1971) pointed out, that R. praemyris was also found on laboratory white rats reared in one laboratory together with the typical host of the species. Consequently, secondary transfers to new, non-specific hosts are not rare with this parasite species. The mite has not yet been found on Pelomyx minor. Only two specimens of this host species out of nine examined by us were infested with this myobid mite.

Radfordia (Lopharomyxobia) brevipilis Fain, 1972

**Material:** Only from Lopharomyx sikaupi (Temminck) in the following sites: 1 α site 2, 30. 1. 1978; 1 α site 3, 7. 2. 1978.

A mite described from Lopharomyx sp. and L. sikaupi from the Ivory Coast was also found on L. sikaupi in Liberia (Fain 1972, Fain et al. 1974). In our collections from Uganda this mite was encountered on two out of three host species examined.

Crocidurobiosa (Crocidurobiosa) toroensis sp. n.

**Material:** Female holotype, male allotype and 25 ♀, 18 ♂♂, 3 To, 3 Dn and 1 larvae, paratypes, from Crocidurobiosa toroensis Dollman, partly deforested flood plain of the Wasse river near the Semiliki Safari Lodge, 27. 1. 1978 (site 1).

**Female:** (Holotype) (Fig. 1): Body elongated and thickest, body integument finely transversely striated.

**Dorsum:** Dorsal setae only slightly expanded (♂ only 8 μm width) and striated, the posterior ones hair-like. Dorsal chaetotaxy complete, i.e. the d and h series consisting each of five setae. Setae u is only slightly shorter than set e, conspicuously longer than t1. First setal pairs of the d series slightly expanded, d3 shorter than d4 and d5. Setae d4 and d5 minute and hair-like, situated anteriorly to vulva. Setae t1 subequal in form to set e, but shorter, t1—t4 short and setiform, t2 and t4 situated laterally to the vulva, t4 ventrally.

**Venter:** Only four pairs of intercoxal setae are true ventral setae, the t 7 being short and subequal to the coxal setae I, the t 2 — t 4 long and subequal. Remaining setae on venter belong to coxal regions and the genito-anal complex.

**Genito-anal complex:** Vulva very small, with five pairs of setae: t 1 very short, t 2 slightly spine-like, t 3 long and thickened, t 4 slightly spine-like, t 5 rather setiform. Vulvar valves very broad. Setae t1—t2 situated apically on the genito-anal conus, setiform and blunt. Paragenitals form two descending rows between t4. Their number vary between 5 and 8 and frequently there are unpaired setae. In the holotype there are four setae on the right side and three setae on the left. These setae are slightly expanded basally. In ten paratypes these setae were developed as follows (number of setae on left/right = number of cases): 2/3 = 2, 2/4 = 1, 3/2 = 1, 3/3 = 3, 3/4 = 1, 4/2 = 1, 5/3 = 1.

**Legs:** Legs I consist of five segments and are modified in a form typical for the genus. Tarsus I without claws, tarsus II with two subequal claws, tarsus III and IV each with two unequal claws. Leg setae mostly setiform except setae on legs I as figured.
(Fig. 1) and some distal ventral setae on genu, tibia and tarsus III and IV, which are spine-like and sometimes blunt. The leg chaetotaxy is as follows:

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ex 2-3-0-0
tr 3-2-3-3
ti 6-6-6-6
fe 5-5-2-2
ta 5-7-6-6
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The solenidiontaxy of legs: ge 1-1-0-0
ta 3-2-0-0

**Gnathosoma:** Gnathosomata rounded with prominent three segmented palps terminated with palpal hooks. A pair of gnathosomal, a pair of hypostomal and two pairs of fine palpal setae are setiform.

**Measurements (in microns):** Body L 470 (458-495), w 93 (91-103), sc e 157 (142-159), ac i 8 (7-8), d II 11 (7-11), d III 16 (12-15), d IV 18 (15-22), d V 8 (8-10), l I 115 (103-122), l II 10 (8-11), l III 344 (307-357), l IV 15 (12-14), l V 51 (54-63), l IV 67 (54-61), ic 39 (31-40), cx I 20 (15-19), cx II 20 (10-11), cx III 3 (8-10), cx IV 67 (54-56), cx V 468 (39-53), l IV 140 (152-169) (five paratypes measured).

**Only Crocidurubis (C.) crocidurae (Lawrence, 1951) from Crocidura flavescens (Geoffroy) is known as the only representative of the subgenus Crocidurubis in Africa (Lawrence 1951, Fain 1978).** Apart from the smaller body of the females of this species differ from C. (C.) torosae sp. n. in having the sc i setae relatively long, subequal to d I in having only one pair of paragénital setae and in different form of vulva and vulvar setae. The male of C. (C.) crocidurae differs from males of the new species also in smaller length of body and setae and in more posterior position of the genital plate in relation to d I and d II setae and legs III. Also the position of cx II posterior to ic 2 in C. (C.) torosae sp. n. appears to be different if compared with figures of Fain (1978).

Female holotype (No. PaU CSAV 1927), male allotype (No. PaU CSAV 1928) and several females and male paratypes together with typys and larvae are deposited in the collection of the Institute of Parasitology of the Czechoslovak Academy of Sciences, Prague. One female and one male paratypes are deposited in the Prince Leopold Institute of Tropical Medicine Antwerp, and in the Catholic University, Nijmegen.

**Family Atopomelidae**

**Listrophoroides (Olistrophoroides) lemniscosys Badford, 1940**

**Material:** Numerous females, males and immature stages were collected only from *Lemniscosys striatus* (L.) in the following sites: site 1, 7, 5, 1978; site 4, 1, 2, 1978; site 5, 4, 2, 1978; site 6, 1, 1, 1978.

A specific parasite of striped grass mice, known from *Lemniscosys striatus* (L.), *L. n. maccabria* Pagenst. and *L. grisella zuluensia* Roberts from Uganda (Kampals,
Katoke, Toro), the Republic of Central Africa, Zaire and the Republic of South Africa (Zululand) (Radford 1940, Lawrence 1954, 1956, Fain 1972c). In the Toro Game Reserve this species was encountered on three out of seven striped grass mice examined.

**Listrophoroides (Olistrophoroides) africanaus africanaus** Radford, 1944

**Material:** Only from *Pelmyns minor* Cabr. ex Ruxton in the following sites: 1 q, site 5, 4, 2. 1978; 12 q, site 6, 7, 2. 1978.

The species is known in the nominate subspecies from *Mastomys coucha erythroceus* (Sturnimisk) in Sierra Leone and *M. natalensis* from Ivory Coast. The subspecies *Listrophoroides* (O.) *africanaus praonys* Fain, 1972 was described from *Prasmys tullbergi* (Thomas) in the Ivory Coast. Our specimens belong to the nominate subspecies, as redescribed by Fain (1972c). Only three specimens out of nine hosts examined belonging to the species *P. minor*, were found to be infected with this mite.

**Listrophoroides (Afolistrophoroides) mazomys Radford, 1940**

**Material:** Only from *Pelmyns minor* Cabr. et Ruxton in the following sites: 10 q, 1 immatuer, site 2, 31. 1. 1978; 16 q, 4 immatures, site 8, 1978; 12 q, 4 immatures, site 5, 14, 2. 1978; 34 q, 8 q, 6 immatures, site 3, 7, 2. 1978; 8 q, 8 immatures, site 6, 11, 2. 1978.

This species, originally found on *Mastomys coucha erythroceus* in the Sierra Leone, was later redescribed as *Marquesania elongata* Lawrence, 1951 from *Thallomys pae- dulva* Sundevall in Natal, South Africa (Fain 1972c) reported it from *Mastomys natalensis* from the Ivory Coast and Rwanda. So far the mite has not been encountered on *P. minor*.

Our specimens fully correspond with the redescription done by Fain (1972c). The sclerotization of females is evidently weaker than in males and consequently in some cases it is difficult to discern the scale-like structure of the posterior part of hysterosomal shield. The mites were found on all nine *P. minor* hosts examined.

**Listrophoroides (Afolistrophoroides) teneophallus** Fain, 1970

**Material:** Only from *Pelmyns minor* Cabr. et Ruxton in the following sites: 2 q, site 2, 31. 1. 1978; 4 q, 1 q (1), site 5, 4, 2. 1978; 5 q, 2 q (1) at the same site, 14, 2. 1978, 1 q, site 3, 7, 2. 1978.

Only type material of males has been known so far, collected from *Mastomys natalensis* in the Ivory Coast. The description of females has not yet been published.

Four male specimens, collected along with the species *L. (A.)* *mazomys* Radf., 1940, fully correspond with the description of the species (Fain 1970, 1972c). Among the females in this material there are three specimens which lack the scale-like structure in the posterior part of hysterosomal shield and are characterized by lengthwise furrows across the scale-like structure in the anterior part of post-scapular shield. In other characters these specimens do not differ at all from females *L. (A.)* *mazomys*. We admit the possibility that these three specimens may belong to the species *L. (A.)* *teneophallus*. The mites were found on six out of nine *P. minor* hosts examined.

**Family Listrophoroidae**

**Afrolistrophorus lophourmys lophourmys** (Radford, 1940)

**Material:** 4 q from *Lophourmys silicopustuluis* (Vernimisk), site 2, 30. 1. 1978.

Although this mite was found on eleven species of murid rodents and on *Crocidura occidentalis* Puch, its specific hosts are evidently the members of the genus *Lophourmys* from which the two known subspecies *A. l. lophourmys* (Radford, 1940) and *A. l. congochole* Fain, 1972 were described, and on which it most frequently occurs (Fain 1971). The first subspecies was described from Sierra Leone (Radford 1940), Ivory Coast, Liberia and Cameroon, the second one from Congo and Uganda (from *Lophourmys flavopunctatus* Thomas, Entebbe) (Fain 1971). The mite was encountered in the Toro Game Reserve only on one out of the three specimens of the harred-furred rat examined.

**DISCUSSION**

Throughout the whole ontogenetic development the mites of the families studied are associated exclusively with the host’s body which they never leave. Therefore it seem to be interesting that in the material studied two ecologically distinct groups of species appear, i.e. the species closely adapted and specific to their hosts on one hand and the species with low specificity and a wide range of hosts on the other. In the first group *Myobia* (A.) *machaod* and *Listrophoroides* (O.) *lemniscomys* are specific parasites of the striped grass mouse of the genus *Lemniscomys*, the mites *Radfordia*, *P. tullbergi*, and *Afrolistrophorus lophourmys* are specific parasites of the genus *Lophourmys* and the new species *Crocidura* (C.) *forensis* sp. n. is probably a specific parasite of *Crocidura pilosa*. The second mite group, *Radfordia* (R.) *praomys*, *Listrophoroides* (A.) *mazomys*, *Listrophoroides* (C.) *teneophallus* and *L. (O.) africanaus* has a wider range of hosts, in which always *Mastomys natalensis*, and frequently *M. coucha* and other species play an important role. Our collections of these mites come exclusively from *Pelmyns minor* which has been almost unknown as the host of parasitic mites. This host species is rather associated with moist environment or even with swampy biotopes and proximity of water surfaces (Hubbard 1972, Kingdon 1974) and therefore its population dynamics is not influenced in any way by the alteration of periods of rains and drought (Ansell 1960). At the peak of the drought period, when the majority of other species of rodents and insectivores reach their population minimum and concentrate round waterholes, this host species maintains its population density as well as sexual activity and becomes one of the dominant species of the community. It becomes very attractive to secondary transfers of ectoparasites from other hosts and thus plays the role of a “substitute” or “universal host”. This is evidenced by the results obtained in the parallel studies on heaped mites in the Toro Game Reserve (Dunabóek et al. 1982). A certain role is evidently also played by the high activity of this rodent during its search for food, as reported by Hubbard (1972) in the case of fleas and *Mastomys natalensis* which is also a certain “universal host” of many ectoparasites. Under the presumption of a certain immunotolerance of these “universal hosts” the large number of joint species of ectoparasites (gamasid, astigmatic and prostigmatic mites) occurring on *M. natalensis* and *Pelmyns minor* may be explained in this way, although their ecology and biology is different and direct phylogenetic relationships are not apparent too much.
REFERENCES


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