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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* Fain, 1972, *Radfordia* (*Radfordia*) *praomys trifurcata* Fain, 1973, *Radfordia* (*Lophuromyobia*) *brevipilis* Fain, 1972, *Crocidurobia* (*Crocidurobia*) *toroensis* sp. n., *Listrophoroides* (*Olistrophoroides*) *lemniscomys* Radford, 1940, *Listrophoroides* (*Olistrophoroides*) *africanus* Radford, 1944, *Listrophoroides* (*Afrolistrophoroides*) *mastomys* Radford, 1940, *Listrophoroides* (*Afrolistrophoroides*) *teinophallus* Fain, 1970 and *Afrolistrophorus lophuromys* (Radford, 1940). A description and illustration are presented of the female and male of the new species *Crocidurobia* (*Crocidurobia*) *toroensis*, and the special position of the rodent *Pelomys 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 Semliki Valley, Western Uganda. The results of the activities of this expedition were summed up in research reports (Verner 1978, Verner and Jeník 1984). Out of parasitic mites only gamasid mites (Dusbábek et al. 1982) and sarcoptids of bats (Dusbábek 1980) were treated. The treatment of other groups in the material collected will be the subject of subsequent studies.

In the total area of 548.56 square km, over which the Toro Game Reserve extends, collections were made in six sites:
1. Partly deforested flood plain of the Wasa river near the Semliki Safari Lodge.
2. Waterhole in the grass savanna, about 1 km east-south-east of the Semliki Safari Lodge.
3. Waterhole in the Borassus savanna drained by a little stream, north of the Semliki Safari Lodge.
4. Riverine forest, right bank of the Wasa river near the Semliki Safari Lodge.
5. Waterhole in the grass savanna, north of the Semliki Safari Lodge.
6. Waterhole in the Borassus savanna with channels of still water north of the Semliki Safari Lodge.

All material treated in this paper had been collected by F. Dusbábek 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 Fain, 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-*

xanthus Pucheran and *Lophuromys 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 paratype 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) praomys trifurcata Fain, 1973

Material: Only from *Pelomys minor* Cabr. et Ruxton in the following sites: 1♀, 2♂♂ site 3, 7. 2. 1978; 1 ♀ site 6, 11. 2. 1978.

This subspecies was described from *Mastomys 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. praomys* Zumpt et Coffee, 1971 described from the Republic of South Africa. Fain (1972a) 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*, *Praomys morio* (Trouessart) and *Praomys morio jacksoni* (de Winton) to be the true hosts. Zumpt and Coffee (1971) pointed out, that *R. praomy* 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 *Pelomys minor*. Only two specimens of this host species out of nine examined by us were infested with this myobiid mite.

Radfordia (Lophuromyobia) brevipilis Fain, 1972

Material: Only from *Lophuromys sikapusi* (Temminck) in the following sites: 1 ♀ site 2, 30. 1. 1978; 1 ♀ site 3, 7. 2. 1978.

A mite described from *Lophuromys* sp. and *L. sikapusi* from the Ivory Coast was also found on *L. sikapusi* 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.

Crocidurobia (Crocidurobia) toroensis sp. n.

Material: Female holotype, male allotype and 26 ♀♀, 15 ♂♂, 3 Tn, 3 Dn and 1 larva, paratypes, from *Crocidura pilosa turba* Dollman, partly deforested flood plain of the Wasa river near the Semliki Safari Lodge, 27. 1. 1978 (site 1).

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

Dorsum: Dorsal setae only slightly expanded (*v e* only 8 μm width) and striated, the posterior ones hairlike. Dorsal chaetotaxy complete, i.e. the *d* and *l* series consisting each of five setae. Setae *v i* only slightly shorter than *sc i*, *e* conspicuously longer than l_1. First three setal pairs of the *d* series slightly expanded, d_3 shorter than d_1 and d_2. Setae d_4 and d_5 minute and hair-like, situated anteriorly to vulva. Setae l_1 subequal in form to *sc e*, but shorter, l_2—l_4 short and setiform, l_2 and l_3 situated laterally to the vulva, l_4 ventrally.

Venter: Only four pairs of intercoxal setae are true ventral setae, the *ic 1* being short and subequal to the coxal setae I, the *ic 2* — *ic 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: *ai* very short, *ae* slightly spine-like, a_3 long and thickened, g_4 slightly spine-like, g_5 rather setiform. Vulvar valves very broad. Setae g_1—g_3 situated aspically on the genito-anal conus, setiform and blunt. Paragenitals form two descendent rows between l_5. Their number vary between 5 and 8 and frequently there are unpaired setae. In the holotype there are

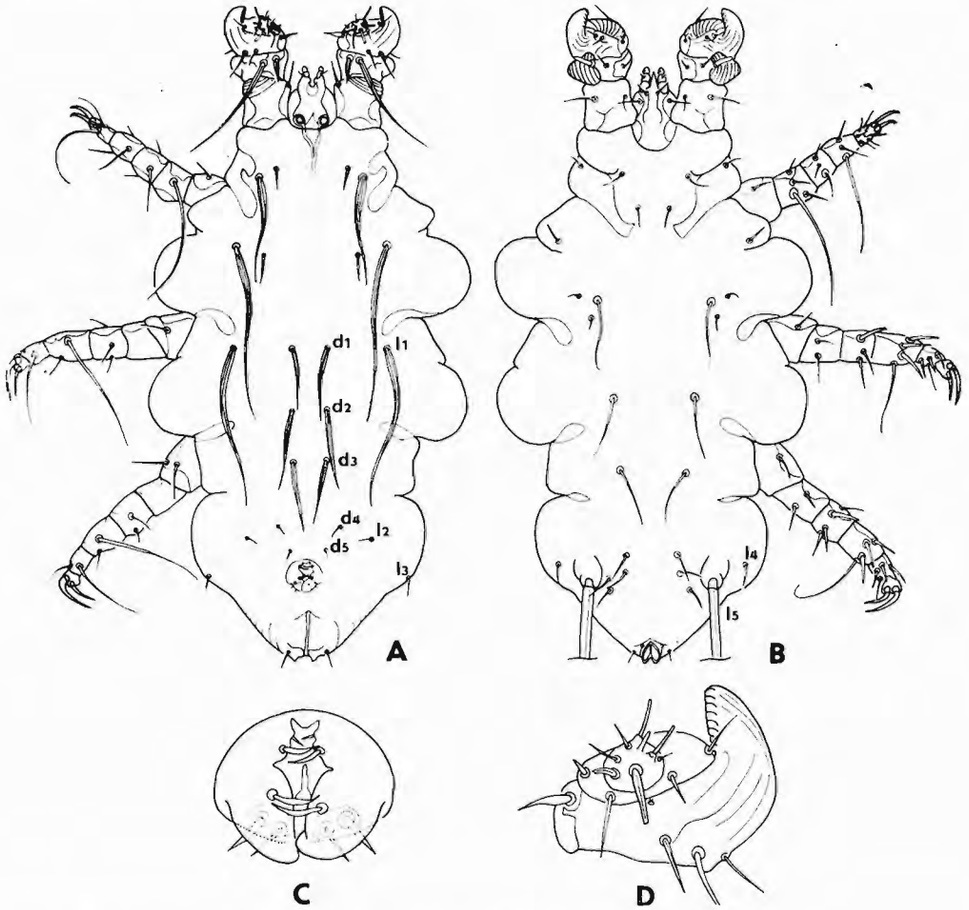

Fig. 1. *Crocidurobia* (*Crocidurobia*) *toroensis* sp. n., female.
A — dorsal view, B — ventral view, C — vulva, D — genu, tibia and tarsus I.

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:

cx	2—3—0—0	ge	6—6—6—6
tr	3—2—3—3	ti	6—6—6—6
fe	5—5—2—2	ta	5—7—6—6

The solenidiotaxy of legs: ge 1—1—0—0
ta 3—2—0—0

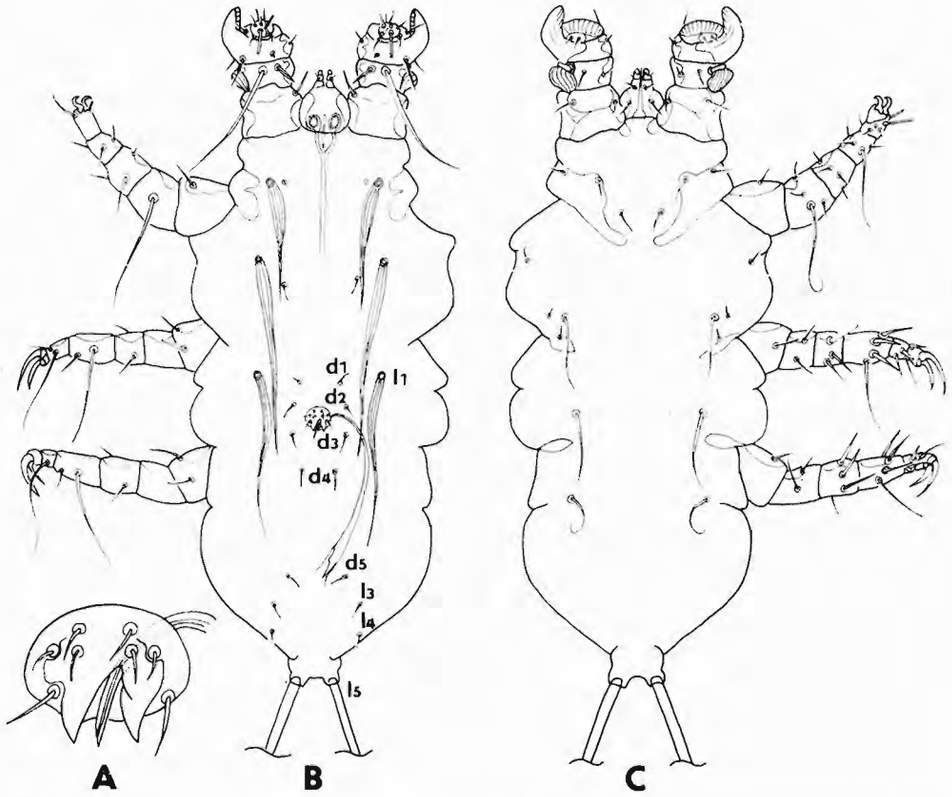

Fig. 2. *Crocidurobia* (*Crocidurobia*) *toroensis* sp. n., male.
A — genital aperture, B — dorsal view, C — ventral view.

Gnathosoma: Gnathosoma 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. 536 (508—583 in five paratypes), W. 282 (276—295), *v e* 98 (91—103), *v i* 22 (17—22, but 39 in one case), *sc e* 169 (159—176), *sc i* 32 (27—38), d_1 66 (54—71), d_2 66 (56—66), d_3 51 (51—56), d_4 12 (10—12), d_5 8 (8—10), l_1 127 (122—135), l_2 15 (12—16), l_3 15 (12—15), l_4 17 (12—19), l_5 410 (388—426), *ic 1* 15 (12—26), *ic 2* 71 (73—81), *ic 3* 64 (76—90), *ic 4* 66 (69—76), pg_1 29 (22—26), pg_2 17 (15—19), pg_3 16 (12—19), g_{1-3} 10 (8—10), *cxI 1* 17 (17—20), *cx I 2* 10 (11—12), *cx II 1—3* 11—12 (10—12), distance *v e—v e* 91 (83—93), *sc e—sc e* 135 (127—142), l_1—l_1 136 (128—147), *ic 4—ic 4* 66 (67—71).

Male (Allotype) (Fig. 2): Body form as in female, but smaller and more slender.
Dorsum: Only *v e*, *sc e* and l_1 long, slightly expanded (*v e* only 7 um broad), the other dorsal setae short, setiform and blunt. Setae *v i* minute, *sc i* short. The *d* series complete, d_1 and d_2 anterior to genital plate, d_3 and d_4 slightly posterior to this plate and d_5 together with l_3 and l_4 situated near the posterior end of body. Setae l_2 are missing. Genital plate situated at the level between legs III and IV, posterior to the base of l_1. Four pairs of genital setae are situated on the plate as figured (Fig. 2A). Penis strong, short and arched.
Venter: Intercoxals *1—4* setiform, *ic 1* very short, subequal to coxals *I*, *ic 2* and *ic 3* long, subequal. Setae *ic 4* relatively shorter.
Gnathosoma: As in female.
Legs: Chaetotaxy and solenidiotaxy of legs similar to those of female. Postero-dorsal seta on tarsus II long and blunt. Some ventral setae on genu, tibia and tarsus III and IV spine-like, some of them blunt. Tarsus II with two equal curved claws, tarsus III and IV each with two unequal straight claws.
Measurements (in microns): Body L. 470 (458—495), W 210 (213—238), *v e* 93 (91—103), *sc e* 157 (142—159), *sc i* 8 (7—8), d_{1-2} 11 (7—11), d_3 16 (12—15), d_4 18 (15—22), d_5 8 (8—10), l_1 115 (103—122), l_{3-4} 10 (8—11), l_5 (344—357), *ic 1* 15 (12—14), *ic 2* 51 (54—63), *ic 3* 67 (54—61), *ic 4* 39 (31—40), *cx I 1* 20 (15—19), *cx I 2* 10 (10—11), *cx II 1—3* 8—10 (8—11), distance *v e—v e* 71 (71—76), *sc e—sc e* 83 (88—93), l_1—l_1 87 (84—92), *ic 4—ic 4* 86 (93—104), penis L. 157 (152—169) (five paratypes measured).

Only *Crocidurobia* (*C.*) *crocidurae* (Lawrence, 1951) from *Crocidura flavescens* (Geoffroy) is known as the only representative of the subgenus *Crocidurobia* in Africa (Lawrence 1951, Fain 1978). Apart from the smaller length of body and setae the females of this species differ from *C.* (*C.*) *toroensis* sp. n. in having the *sc i* setae relatively long, subequal to d_1, in having only one pair of paragenital 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 situation of the genital plate in relation to d_1 and d_2 setae and legs III. Also the position of *cx II* posterior to *ic 2* in *C.* (*C.*) *toroensis* sp. n. appears to be different if compared with figures of Fain (1978).

Female holotype (No. PaÚ ČSAV 1927), male allotype (No. PaÚ ČSAV 1928) and several female and male paratypes together with nymphs and larva 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) lemniscomys Radford, 1940

Material: Numerous females, males and immature stages were collected only from *Lemniscomys striatus* (L.) in the following sites: site 1, 27. 1. 1978; site 4, 2. 2. 1978; site 5, 4. 2. 1978; site 6, 11. 2. 1978.

A specific parasite of striped grass mice, known from *Lemniscomys striatus* (L.), *L. s. massaicus* Pagenst. and *L. griselda zuluensis* Roberts from Uganda (Kampala,

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) africanus africanus Radford, 1944

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

The species is known in the nominate subspecies from *Mastomys coucha erythroleucus* (Temminck) in Sierra Leone and *M. natalensis* from Ivory Coast. The subspecies *Listrophoroides* (*O.*) *africanus praomys* Fain, 1972 was described from *Praomys 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 infested with this mite.

Listrophoroides (Afrolistrophoroides) mastomys Radford, 1940

Material: Only from *Pelomys minor* Cabr. et Ruxton in the following sites: 10 ♀♀, 1 immature, site 2, 31. 1. 1978; 16 ♀♀, 4 immatures, site 5, 1978; 13 ♀♀, 4 immatures, site 5, 14. 2. 1978; 34 ♀♀, 8 ♂♂, 6 immatures, site 3, 7. 2. 1978; 5 ♀♀, 8 immatures, site 6, 11. 2. 1978.

This species, originally found on *Mastomys coucha erythroleucus* in the Sierra Leone, was later redescribed as *Marquesania elongata* Lawrence, 1951 from *Thallomys paedulcus* 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 (Afrolistrophoroides) teinophallus Fain, 1970

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

Our male specimens, collected along with the species *L.* (*A.*) *mastomys* 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.*) *mastomys*. We admit the possibility that these three specimens may belong to the species *L.* (*A.*) *teinophallus*. The mites were found on six out of nine *P. minor* hosts examined.

Family Listrophoridae

Afrolistrophorus lophuromys lophuromys (Radford, 1940)

Material: 4 ♀♀ from *Lophuromys sikapusi* (Temminck), 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 *Lophuromys* from which the two known subspecies *A. l. lophuromys* (Radford, 1940) and *A. l. congoicola* Fain, 1971 were described, and on which it most frequently occurs (Fain 1971). The first subspecies was reported from Sierra Leone (Radford 1940), Ivory Coast, Liberia and Cameroon, the second one from Congo and Uganda (from *Lophuromys flavopunctatus* Thomas, Entebbe) (Fain 1971). The mite was encountered in the Toro Game Reserve only on one out of the three specimens of the harsh-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.*) *machadoi* and *Listrophoroides* (*O.*) *lemniscomys* are specific parasites of the striped grass mouse of the genus *Lemniscomys*, the mites *Radfordia* (*L.*) *brevipilis* and *Afrolistrophorus lophuromys* are specific parasites of the genus *Lophuromys* and the new species *Crocidurobia* (*C.*) *toroensis* sp. n. is probably a specific parasite of *Crocidura pilosa*. The second mite group, *Radfordia* (*R.*) *praomys*, *Listrophoroides* (*A.*) *mastomys*, *Listrophoroides* (*A.*) *teinophallus* and *L.* (*O.*) *africanus*, 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 *Pelomys minor* which has been almost uknown 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 ot 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 laelapid mites in the Toro Game Reserve (Dusbábek 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 *Pelomys minor* may be explained in this way, although their ecology and biology is different and direct phylogenetic relationships are not apparent too much.

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НЕКОТОРЫЕ ПАРАЗИТИЧЕСКИЕ КЛЕЩИ (*PROSTIGMATA, ASTIGMATA: ACARINA*) МЕЛКИХ МЛЕКОПИТАЮЩИХ В ЗАПОВЕДНИКЕ ТОРО, УГАНДА

Ф. Дусбабек

Резюме. В материале астигматических и простигматических клещей, собранных в заповеднике Торо, Уганда в период засухи, было определено следующих 9 видов из семейств Myobiidae, Atopomelidae и Listrophoridae: *Myobia* (*Angomyobia*) *machadoi* Fain, 1972, *Radfordia* (*Radfordia*) *praomys trifurcata* Fain, 1973, *Radfordia* (*Lophuromyobia*) *brevipilis* Fain, 1972, *Crocidurobia* (*Crocidurobia*) *toroensis* sp. n., *Listrophoroides* (*Olistrophoroides*) *lemniscomys* Radford, 1940, *Listrophoroides* (*Olistrophoroides*) *africanus* Radford, 1944, *Listrophoroides* (*Afrolistrophoroides*) *mastomys* Radford, 1940, *Listrophoroides* (*Afrolistrophoroides*) *teinophallus* Fain, 1970 и *Afrolistrophorus lophuromys* (Radford, 1940). В работе дано описание и изображение самки и самца нового вида *Crocidurobia* (*Crocidurobia*) *toroensis* и обсуждается особое положение грызуна *Pelomys minor* Cabr. et Ruxton среди хозяев эктопаразитов в данной области.

REFERENCES

ANSELL W. F. H., Mammals of Northern Rhodesia. 31. Government Printer, Lusaka, 210 pp., 1960.

DUSBÁBEK F., *Notoedres ovatus* sp. n. and *N. tadaridae* Fain (Sarcoptidae) parasitizing bats of the genus *Tadarida* in Toro Game Reserve, Uganda. Folia parasit. (Praha) 27: 93—95, 1980.

—, DANIEL M., TILL W. M., Laelapidae (Acarina) of some small mammals from Toro Game Reserve, Uganda. Folia parasit. (Praha) 29: 167—176, 1982.

FAIN A., Diagnoses de nouveaux Listrophorides de la famille Atopomelidae (Acarina: Sarcoptiformes). Bull. Ann. Soc. roy. Ent. Belg. 106: 275—306, 1970.

—, Les Listrophorides en Afrique au sud du Sahara (Acarina: Sarcoptiformes). II. Familles Listrophoridae et Chirodiscidae. Acta Zool. Path. Antwerp. 54: 1—231, 1971.

—, Myobiidae de l'Angola (Acarina: Trombidiformes). Publ. Cult. Co. Diam. Ang., Lisboa: 13—68, 1972a.

—, Diagnoses de nouveaux Myobiidae (Acarina: Trombidiformes). Rev. Zool. Bot. Afr. 86: 148—157, 1972b.

—, Les Listrophorides en Afrique au sud du Sahara (Acarina: Sarcoptiformes). III. Famille Atopomelidae. Ann. Mus. Roy. Afr. Centr., Tervuren, Série in —8°, Sci. Zool. 197: 1—200, 1972c.

—, Notes sur la nomenclature des poils idiosomaux chez les Myobiidae avec description de taxa nouveaux (Acarina: Trombidiformes). Acarologia 15 : 279—309, 1973.

—, Les Myobiidae d'Afrique au sud du Sahara et de Madagascar (Acarina — Prostigmata). Ann. Mus. Roy. Afr. Centr., Tervuren, Série in —8°, Sci. Zool. 224: 1—186, 1978.

—, LUKOSCHUS F. S., Nouvelles observations sur les Myobiidae parasites des Rongeurs (Acarina: Prostigmata). Acta Zool. Path. Antverp. 69: 11—98, 1977.

—, —, RACK G., Notes on parasitic mites from some small mammals in Liberia. Mitt. Hamburg Zool. Mus. Inst. 71: 165—174, 1974.

HENRY L. G., McKEEVER S., A modification of the washing technique for quantitative evaluation of the ectoparasite load of small mammals. J. Med. Ent. 8: 504—505, 1971.

HUBBARD C. A., Observations on the life histories and behaviour of some small rodents from Tanzania. Zool. Afr. 7: 419—449, 1972.

KINGDON J., East African mammals. Vol. II, Part B (Hares and Rodents). Academic Press, London, 343 pp., 1974.

LAWRENCE R. F., New fur-mites from South African mammals. Ann. Natal Mus. 12: 91—133, 1951.

—, Two new fur-mites from rodents. J. Ent. Soc. S. Afr. 17: 38—46, 1954.

—, Studies on South African fur-mites (Trombidiformes and Sarcoptiformes). Ann. Natal Mus. 13: 337—375, 1956.

RADFORD C. D., Notes on some species of parasitic mites. Parasitology 32: 91—104, 1940.

VERNER P. H. (Ed.), Uganda kob and other wildlife problems in Toro Game Reserve, Uganda. Report to the Uganda Game Dept. and Ministry of Information, Broadcasting, Wildlife and Tourism. Mimeographed. Prague, 107 pp., 1978.

—, JENÍK J. (Eds.), Ecological studies in Toro Game Reserve (Uganda) with special regard to Uganda Kob. Rozpravy ČSAV, in press, 1984.

ZUMPT F., COFFEE G., The genus *Radfordia* in the Ethiopian Region, with descriptions of two new species (Acarina: Trombidiformes, Myobiidae), Ann. Natal Mus. 21: 97—105, 1971.

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