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New observations on mites of the family Myobiidae MEGNIN, 1877 (Acari: Prostigmata) with special reference to their host-parasite relationships

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Summary

Several species of myobiid mites belonging to ten, of the 50 known genera are revised. Among them 5 new species and 4 new subgenera are described: *Crocidurobia* (*Crocidurobia*) *dusbabeki* **sp. nov.**, *Radfordia* (*Radfordia*) *colomys* **sp. nov.**, *Radfordia* (*Radfordia*) *dephomys* **sp. nov.**, *Radfordia* (*Radfordia*) *myomysci* **sp. nov.** and *Radfordia* (*Radfordia*) *delectori* **sp. nov.**, *Emballomyobia* **subgen. nov.**, *Otomyobia* **subgen. nov.**, *Acomyobia* **subgen. nov.** and *Petromyscobia* **subgen. nov.**

The following stages of recognised species are described and depicted for the first time: **Females** (1 species): *Ugandobia (Emballomyobia) emballonurae* FAIN, 1972 **comb. nov. Males** (4 species): *Ugandobia* (*Ugandobia*) *garambensis* FAIN, 1973, *Idiurobia idiuri* (FAIN, 1973), *Radfordia* (*Radfordia*) *hystricosa* FAIN, 1972 **comb. nov.** and *Radfordia* (*Lophurmyobia*) *brevipilis* FAIN, 1972. **Tritonymphs** (12 species): *Idiurobia idiuri, Myobia* (*Myobia*) *malaysiensis* FAIN, LUKOSCHUS et NADCHATRAM, 1980, *Myobia* (*Myobia*) *hyatti* FAIN, 1973, *Myobia* (*Myobia*) *afromuris* FAIN, 1972, *Myobia* (*Otomyobia*) *otomyia* LAWRENCE, 1951, *Austromyobia* (*Dendromyobia*) *mesomelas* (FAIN et LUKOSCHUS, 1976), *Radfordia* (*Radfordia*) *pogonomys* FAIN et LUKOSCHUS, 1976, *Radfordia* (*Radfordia*) *thamnomys* FAIN, 1972, *Radfordia* (*Radfordia*) *malacomys* FAIN, 1972, *Radfordia* (*Radfordia*) *bukokoensis* FAIN et LUKOSCHUS, 1976 **comb. nov.**, *Radfordia hystricosa* and *Radfordia brevipilis*.

Four species are synonymized: *Acanthophthirius miniopteri* FAIN, 1972 **syn. nov.** with *Acanthophthirius capensis* (de MEILLON et LAVOIPIERRE, 1944), *Binuncus rousetti* FAIN, 1972 **syn. nov.** with *Binuncus jamesoni* (HIREGAUDAR et BAL, 1956), *Radfordia praomys trifurcata* FAIN, 1973 **syn. nov.** with *Radfordia praomys* ZUMPT et COFFEE, 1971, *Radfordia chrysophila* CURFS *et al.*, 1986 **syn. nov.** with *Radfordia angolensis* FAIN, 1972.

Keys are provided to the genera *Ugandobia* and *Crocidurobia*. Lists of hosts and localities are given for the genera, *Ugandobia, Neomyobia, Crocidurobia*, and the subgenus *Radfordia* s.str. Host-parasites relationships are analysed for some myobiid genera.

Key words: Acari, Prostigmata, Myobidae, host-parasite relationships.

Introduction

Mites of the family Myobiidae MEGNIN, 1877 are permanent, mono- or oligoxenous parasites of marsupial and placental mammals (DUSBABEK, 1969b; FAIN, 1994). The anterior pair of legs in these mites is strongly modified into clasping organs which are used for the attachment to the hairs of their hosts. In some genera, the two or three apical segments of the legs I are fused, which increases the effectiveness of this clasping organ. The myobiid mites are true parasites, feeding on lymph and cell contents of the host. Some of them may cause a dermatitis in laboratory rodents. Specificity for certain taxa of hosts and traces of parallel evolution with hosts are well marked at all taxonomical levels of Myobiidae. Most representatives of particular species group, subgenera, genera, tribes and subfamilies of the myobiids are associated with a well-defined taxonomic group of hosts (DUSBABEK, 1969b; UCHIKAWA, 1988; FAIN, 1994; BOCHKOV, 1997b, 1999a,b). Therefore, these mites constitute a good model for study the phenomenon of parallel evolution.

According to the traditional point of view, the family Myobiidae belongs to the superfamily Cheyletoidea (KETHLEY, 1982). However, VOLGIN (1969) noted the absence of direct phylogenetic relationships between Myobiidae and the other Cheyletoidea. This author was apparently right to place the myobiid mites into a separate superfamily Myobioidea (VOLGIN, 1969). This point of view was however not accepted by other acarologists. A new attempt to reconstruct the phylogenetic relationships among the cheyletoid families was carried out by BOCHKOV (2002). This author arrived to the conclusion that the myobiid mites are phylogenetically distant from both the typical cheyletoids and the archaic free-living Prostigmata such as Stigmaeidae or Raphignathidae, which are, by certain characters related to Cheyletoidea. The myobiids are clearly different from these mites by the following characters: well developed chaetotaxy on coxae, trochanters, femora and genua, presence of setae *ic2*, presence of deutonymphal stage and in the female by the clear separation of genital and anal orifices. Moreover, the myobiid mites have a full set of idiosomal setae (*vi, ve, sci, sce, d1-d5, l1-l5*) but they lack the setae *h*, which are always present in the cheyletoids. The only organ which is common for these two groups is the stylophore. However, the development of this structure is probably an adaptation for piercing the integuments of animals or plants. The stylophore is also present in some parasitic Prostigmata, for example in many Heterostigmata. On the other hand, the family Myobiidae shows some similarities with the mites of the family Pomerantziidae (BOCHKOV, 2002). This family is represented by a few species living in deep soils in North America, and its phylogenetic relations are questionable (KETHLEY, 1982).

The family Myobiidae has a world wide distribution, up to now it includes more than 450 species. The mites infest mammals of nine orders. It is remarkable, that all the hosts of these mites are of small or relatively small sizes. The reason for this situation is unknown but we may assume that it is related with some ecological conditions peculiar to small animals e.g. The formation of colonies in shetters or the construction of nests where individuals can meet more easily and exchange their parasites. Another condition that could have facilitated the attachment of these mites is the structure of the hairs generally thinner in small mammals than in the large ones.

According to the distribution observed among the host taxa, the parasitism of the myobiid mites on mammals, probably, originated not after the Low Cretaceous, but at the time of the assumed divergence into placental mammals and marsupials (CARROLL, 1993). The origin and the centre of dispersion of the Myobiidae is probably South America. Actually, the most primitive marsupials are represented in this area (CARROLL, 1993), and the most primitive myobiid: *Xenomyobia hirsuta* FAIN et LUKOSCHUS, 1976, has been found from a Peruvian marsupial, *Lestoros inca* (Paucituberculata: Caenolestidae) (FAIN and LUKOSCHUS, 1976a). In this mite, the anterior legs I are almost unmodified and devoid of clasping organs. In other primitive myobiids parasitizing marsupials, the legs I have also a full set of segments, but they are always provided with special clasping structures. In the more evolved myobiids associated with bats and insectivores, the genu, the tibia and the tarsus of the legs I may be fused (FAIN, 1994). It is in the group of myobiids associated with rodents that the regression of the legs I is the most marked. In this group the three apical segments, tarsus, tibia and genu, are fused into one large segment devoid of claws. It appears therefore that in Myobiidae the evolution of the legs I has consisted essentially of the elaboration of a more and more efficient attachment organ.

The present paper provides the descriptions of four new subgenera, five new species and various unknown stages of several recognised species. The species composition of certain genera and subgenera is discussed; keys, host lists and localities of these supraspecies taxa are given. In the descriptions special attention is paid to immature stages, whose importance in the systematics of this family has been neglected for a long time. Furthermore, we give the analysis of host parasite relationships in each case where it seems to be appropriated.

Material and methods

A most part of the material studied was collected by the senior author during his postdoctoral fellowship from the ethanol preserved mammals in the collections of the following institutes:

IRSNB - Institut royal des Sciences naturelles de Belgique, Bruxelles, Belgium (Fain Collection);

MRAC - Musée royal de l'Afrique Centrale, Tervuren, Belgium;

ZIN - Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia.

All measurements in descriptions and keys are given in micrometers (μm). We follow here the setal nomenclature of the female idiosoma proposed by FAIN (1973a). Homologies of idiosomal setae in the males are based on the hypothesis of FAIN and BOCHKOV (2002). The Scientific names of host genera and species are given according to WILSON and READER (1992); the suprageneric classification of bats is that of JONES *et al.* (2002), and the suprageneric classification of the "insectivores" and rodents are based on the monograph of PAVLINOV (2002).

Systematic part

Family Myobiidae MEGNIN, 1877

Subfamily Protomyobiinae BOCHKOV, 1997

This subfamily includes 37 myobiid genera arranged into the three tribes, Acanthophthiriini, Protomyobiini and Elephantulobiini; each tribe is restricted in host associations to certain order of mammals, Chiroptera, Soricomorpha and Macroscelidea, respectively (BOCHKOV, 1997a).

The latter host group was originally included into the Insectivora (GRASSE, 1955). At the present time, some specialists consider the macroscelids as a group related to the Rodentia and Lagomorpha (CARROLL, 1993). According to newly obtained molecular data, the macroscelids are closely related to Tenrecidae (Soricomorpha) (MURHY *et al.*, 2001). The myobiids from Macroscelidea are represented by the specific genus *Elephantulobia* FAIN, 1972, which is much more close in the phylogenetic sense to the myobiids from bats and soricomorph insectivores than to the myobiids from the rodents (BOCHKOV, 1997a). Thus, the parasitological data support the original point of view of mammologists and the hypothesis based on molecular data, that the Macroscelidea have close affinities with the "insectivorous" mammals (Lipotyphla).

Tribe Acanthophthiriini BOCHKOV, 1997

This tribe includes 22 genera, all associated with bats of both suborders, Microchiroptera and Megachiroptera (BOCHKOV, 1997a). The monophyly of the Chiroptera contested by some investigators, is confirmed now (SIMMONS , 1994). Two genera, *Binuncus* and *Pteropimyobia*, inhabiting macrochiropterans are closely related with the other myobiid genera from Microchiroptera (UCHIKAWA, 1988; BOCHKOV, 1997a).

Among 18 families of bats recognized until now (JONES *et al.*, 2002), only three, Craseonycteridae, Megadermatidae and Noctilionidae were completely free from myobiid mites (UCHIKAWA, 1988).

Genus *Ugandobia* DUSBABEK, 1968

Up to now, this genus has included 11 species and 2 subspecies (FAIN, 1978a,b; UCHIKAWA *et al.*, 1991) associated with bats of the family Emballonuridae. There is a key for only the African species of this genus (FAIN, 1978a). Moreover, the diagnoses of this genus (DUSBABEK, 1968; FAIN, 1978a) and the analysis of host-parasite relationships of its species need a more complete definition. Therefore, we give here a new diagnosis of this genus based on all developmental stages, key to females and males, and a brief analysis of host-parasite relationships of these mites.

Definition. Gnathosoma variable in shape, with full set of setae: *rp, ra* and *rd* - all hair-like. Idiosoma elongated. Legs I with 4 segments, tibia and tarsus completely fused, claws absent. Tibiotarsus I with 13 hair-like setae, one thickened seta and one small striated seta ventrally. Genu I with 5 setae and solenidion σ. Clasping tubercle of genu I directed forwards. Femur I with 2 thickened dorsal setae, 3 hair-like ventral setae and one large striated scale-like seta situated on antiaxial margin of the segment. Trochanter I with large antiaxial projection and 3 hair-like setae. Tarsi II-IV with 2 subequal claws, their pretarsi strongly reduced. Chaetotaxy of legs II-IV (number of solenidia between brackets): coxae 2-3-0-1 or 3-2-0-1, trochanters 3-3-3, femora 5-2-2, 5-2-1 or 5-1-1, genua 6(1)-6-6, 6(1)-6-5 or 7(1)-6-6, tibiae 6-6-6 and tarsi 7(1)-6-6.

Female. Vulva with well developed lobes and full set of setae (*g1-g3, ai, ae*). Setae *g3* variable in shape, from hair like to claw-like. Paragenital setae hair-like, slightly thickened, represented by 3 pairs, *pg1, pg2* and *pg3* or *pg2* lacking. Spermatheca well sclerotized. Chaetotaxy of idiosoma: *vi* - short, hair-like in most species; *ve, sci, sce, l1, l2, d1, d2* - striated lanceolate; setae *l3, l4, d3* and *d4* - variable in shape, mostly narrowly lanceolate, *d5* hair-like, slightly thickened, *l5* - whip-like, *ic1-ic4* - hair-like, sometimes *ic4* slightly thickened. Striated seta of tibiotarsus I scale-like.

Male. Genital shield with bilateral symmetry. With a maximum of 7 pairs of well developed setae and two pairs of setal vestiges (5 pairs of genital-anal setae and 3 pairs of dorsomedian setae *d1-d3*, ninth pair of setae probably neotrichial). In some species these vestiges completely disappear, and the number of setae is reduced from 9 pairs to 7 pairs. Chaetotaxy of idiosoma: *vi* - short, hair-like in most species; *sci* - hair-like or thorn-like, situated anterior the level of genital shield; *l2* – striate-lanceolate, flanked the genital shield; *ve, sce* and *l1* – striate-lanceolate; *d4, d5, l3* and *l4* - variable in shape; *l5* - whip-like. Ventral chaetotaxy as in female. Striated seta of tibiotarsus I inflated.

Developmental stages

Larva. Gnathosoma dorsally with a pair of microsetae *rd*. Idiosomal dorsum with 7 pairs of setae: *sce, d1-d3, l1-l3*. Setae *l5* whip-like, situated ventrally. Idiosomal venter bears only setae *ic1*. Legs I with bilateral symmetry. Chaetotaxy of legs II-III (number of solenidia between brackets): coxae 0-0, trochanters 0-0, femur+genua 2(1)-0, tibiae 5-4, tarsi 7(1)-6. Coxae I without setae. Tarsi II with 2 claws, tarsi III with a single claw.

Protonymph. With a ventral pair of setae on gnathosoma added (*rp*). Setae *ve, d4, ic2* and *ic3* added. Legs I bilaterally asymmetric. Chaetotaxy of legs II-IV: coxae 0-0-0, trochanters 0-0-0, femur + genua 3(1)-1-0, tibiae 5-4-4, tarsi 7(1)-6-6. Coxae I with one scale-like seta. Tarsi II with 2 claws, tarsi III and IV with a single claw. The protonymph of *U. saccolaimis* UCHIKAWA *et al.*, 1991, which strongly differs from this diagnosis, is probably represented by an abnormal specimen.

Deutonymph. Setae *l4* and *ic4* added. Legs I asymmetrical. Chaetotaxy of legs II-IV: coxae 1-0-0, trochanters 0-0-0, femora+genua 4(1)-2-1, tibiae 5-4-4, tarsi 7(1)-6-6. Coxae I with one scale-like seta. Tarsi II with 2 claws. Tarsi III and IV with a single claw.

Tritonymph. Spermatheca as in female, well sclerotized. Chaetotaxy of legs II-IV: coxae 2-0-0, trochanters 1-1-1, femora+genua 4(1), tibiae 6-5-5, tarsi 7(1)-6-6. Coxae I with 2 scale-like setae. Tarsi II with 2 claws. Tarsi III and IV with a single claw. There are two morphological different forms, large and small ones (probably male and female tritonymphs) (Uchikawa *et al.*, 1991).

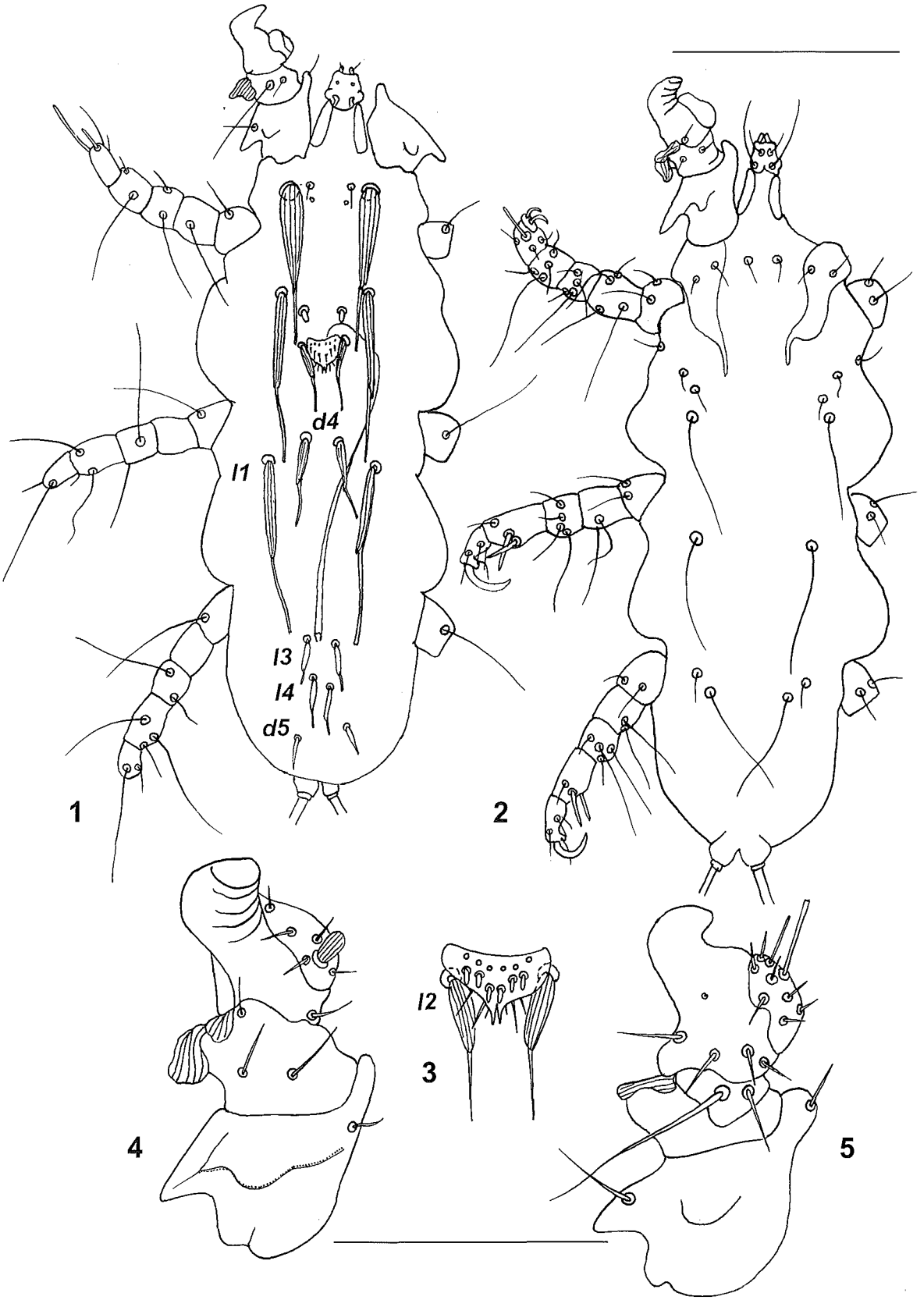
Type species: *Foliomyobia barnleyi* RADFORD, 1951

This genus includes 13 species parasitizing bats of the family Emballonuridae in the Old World.

Remark. FAIN (1972b) divided the genus *Ugandobia* into two subgenera, *Ugandobia* s.str. and *Embamyobia* FAIN, 1972. Later on, FAIN (1978a) cancelled the subgeneric division of this genus, because of an absence of clear differential characters between these subgenera. Based on a re-examination of all available species and also on reference data (UCHIKAWA and KOBAYASHI, 1978, UCHIKAWA *et al.*, 1991) two natural species groups have been recognised, which are clearly different from each other. We treat them as subgeneric taxa. It is important to point out, that formerly proposed subgeneric name *Embamyobia* **syn. nov.** cannot be used, since its type species *U. taphozous* FAIN, 1972 actually belongs to the nominative subgenus and it should be considered as an junior synonym of *Ugandobia* s. str. Therefore, we create here a new subgenus *Emballomyobia* **subgen. nov.**

Host-parasite relationships

The host distribution and locality of all the known *Ugandobia* species are given in the Table 1. Species of this genus parasitize bats of the family Emballonuridae in the Old World only, while, the representatives of the genus *Expletobia* DUSBABEK, 1968 are associated with emballonurid bats in the New World. The findings of the



Figs. 1-5 — *Ugandobia (Ugandobia) garambensis* FAIN, 1973, male. Dorsal view (1), ventral view (2), genital shield (3), leg I in dorsal view (4), same in ventral view (5). Scale lines 100 μm (figs. 1, 2) and 50 μm (figs. 3-4).

species *U. balionycteris* FAIN, 1973 on *Balionycteris maculata* (Pteropodidae) in Malaysia and *U. euthrix* FAIN, 1972 on *Asellia tridens* (Hipposideridae) in Africa (FAIN, 1978a,b) are obviously accidental contaminations.

According to the modern taxonomic views (JONES *et al.*, 2002), the family Emballonuridae consists of two subfamilies, Taphozoinae and Emballonurinae. The latter subfamily is separated into two tribes, Emballonurini distributed in both hemispheres and Diclidurini occurring only in the New World. The distribution of *Ugandobia* species among the emballonurid taxa strongly supports this system. The subgenus *Ugandobia* s.str. is restricted to the subfamily Taphozoinae and the subgenus *Emballomyobia* **subgen. nov.** is associated with bats of the tribe Emballonurini. It should be noted, that two species of the nominal subgenus, *U. taphozous* and *U. saccolaimus* UCHIKAWA *et al.*, 1991 inhabiting bats of the genus *Saccolaimus* (Taphozoinae) well differ from other species of this subgenus parasitizing bats of the genus *Taphozous* (Taphozoinae) by having strongly modified setae *g3* in females. The female of the third species *U. australiensis* FAIN et LUKOSCHUS, 1979 described from *Saccolaimus flaviventris* is unknown. Among the 5 species of the subgenus *Emballomyobia* **subgen. nov.** parasitizing bats of the subfamilly Emballonurinae, the 4 species, including, probably, *U. balionycteris*, are associated with bats of the genus *Emballonura*. Three of them form a complex of morphologically allied forms (*U. salomonensis* FAIN, 1976 **stat. nov.**, *U. leyteensis* UCHIKAWA *et al.*, 1991 **stat. nov.** and *U. balionycteris*) and the fourth species *U. emballonurae* FAIN, 1972 parasitizing *Emballonura nigriscens* is slightly distant from this complex. While the species *U. ituriensis* FAIN, 1972 described from *Coleura afra* (Emballonurini) differs markedly from other species inhabiting bats of the subfamily Emballonurinae.

Species of the genus *Expletobia* are described from bats of the genera *Rhynchonycteris* and *Saccopteryx* (Diclidurini). Probably, the mites of this genus are restricted in their distribution to this tribe of hosts.

Subgenus *Ugandobia* s.str.

Coxae II with 3 setae, femora III and IV each with 2-setae or femora IV with 1 seta, genua III and IV each with 6 setae. In both sexes setae *ic4* whip-like, much longer than coxal setae. *Female*. Setae *d1* situated distinctly anterior to the seta *l1* bases. Setae *pg2* lacking. *Male*. Setae *d4* situated anterior to or at the level of seta *l1* bases.

This subgenus includes 8 species parasitizing bats of the subfamily Taphozoinae. The male of *U. garambensis* FAIN, 1973 is described here for the first time.

Ugandobia (*Ugandobia*) *garambensis* FAIN, 1973
(Figs. 1-5)

Ugandobia (*Embamyobia*) *garambensis* FAIN, 1973: 297, fig. 26-27.

Ugandobia garambensis, FAIN, 1978a: 138-139.

Material examined. 1 female and 1 male from *Taphozous sudani* (Chiroptera, Emballonuridae) (specimen n 13539 IRSNB), National Park of Garamba, Congo, 4° 20' N, 29° 35' E. 23.II.1951.

Male. Body including gnathosoma 315 long and 110 width. *Gnathosoma* stubby. *Idiosoma*. Setae *vi* hair-like; *sci* thorn-like, *ve, sce, d1, l1* and *l2* - all striate lanceolate, setae *d4* situated anterior the level of seta *l1* bases, distance between levels of the setae *d4* and *l1* bases 12. Setae *l3* and *l4* narrowly lanceolate. Setae *d5* thickened. Setae *ic1* hair-like, *ic2-ic4* whip-like. Genital shield with 3 pairs of inflated setae, 3 pairs of hair-like setae and 3 pairs of vestigial setae as in Fig. 3. Penis 140 long. Chaetotaxy of legs II-IV (number of solenidia between brackets): coxae 2-3-0-1, trochanters 3-3-3, femora 5-2-2, genua 6(1)-6-6, tibiae 6-6-6, tarsi 7(1)-6-6. Dorsal setae of trochanters III and IV long, reaching posterior margins of respective tibiae. Length of idiosomal setae: *vi* 10, *ve* 70, *sci* 9, *sce* 80, *l1* 85, *l2* 23, *l3* 25, *l4* 23, *l5* 225, *d4* 40, *d5* 15, *ic*1 23, *ic*2 40, *ic3* 53, *ic*4 50.

Subgenus *Emballomyobia* subgen. nov.

Coxae II with 2 setae, femora II-IV each with 1 seta, genua III and IV each with 5 setae or genua IV with 5 setae. In both sexes setae *ic4* relatively short, only slightly longer than coxal setae. *Female*. Setae *d1* situated at the level of seta *l1* bases. Setae *pg2* present or lacking. *Male*. Setae *d4* situated distinctly posterior the level of seta *l1* bases.

Type species: *Ugandobia emballonurae* FAIN, 1972

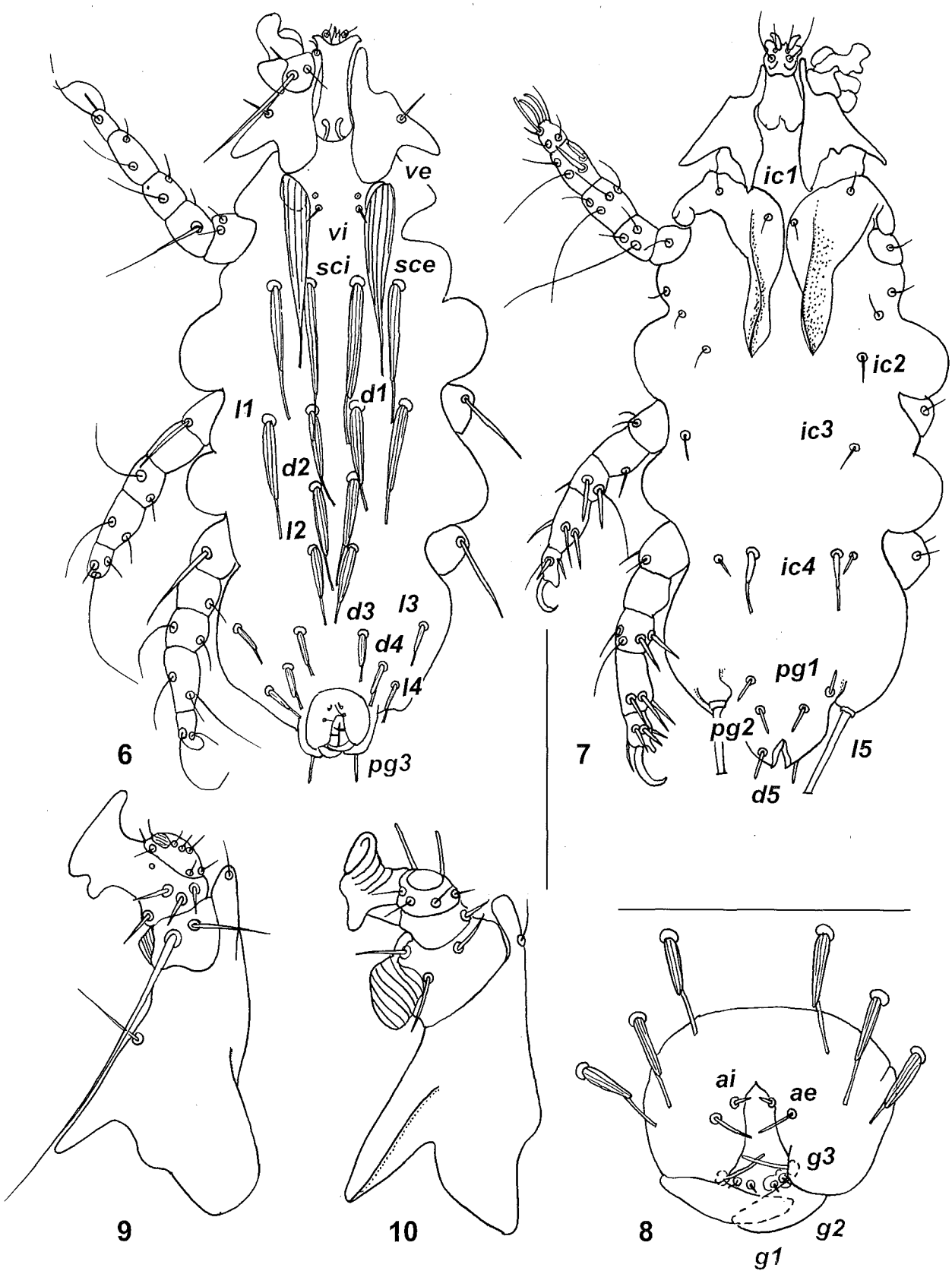
This subgenus includes 5 species parasitizing bats of the subfamily Emballonurinae. The subspecies *U. balionycteris salomonensis* FAIN, 1976 and *U. balionycteris leyteensis* UCHIKAWA *et al.*, 1991 are treated here as separate species. The female of *U. emballonurae* is described below for the first time.

Ugandobia (*Emballomyobia*) *emballonurae* FAIN, 1972 comb.nov.
(Figs. 6-10)

Ugandobia emballonurae FAIN, 1972a: 250; 1978b: 217-218, figs 64, 65.

Material examined. 1 female from *Emballonura nigriscens* (Chiroptera, Emballonuridae) (specimen n 6346 IRSNB), New Guinea, 15.IX.1938. Coll. R.P. PONCELET.

Female. Body including gnathosoma 295 long, 125 width. Gnathosoma elongate, its dorsal length about 3 times more than width. Idiosoma. Vulvar lobes well



Figs. 6-10 — *Ugandobia (Emballomyobia) emballonurae* FAIN, 1972 **comb.nov.,** female. Dorsal view (6), ventral view (7), vulva (8), leg I in dorsal view (9), same in ventral view (10). Scale lines 100 μm (figs. 6, 7) and 50 μm (figs. 8-10).

developed, setae *g3* slightly thickened (Fig. 8). Setae *vi* hair-like; setae *ve, sci, sce, d1, d2, l1* and *l2* - all striated lanceolate, setae *d1* situated at the level of seta *l1* bases; setae *d2, d4, l3* and *l4* narrowly lanceolate; setae *ic1-ic3* hair-like, setae l4 thickened. Setae *pg2* present. Legs. Chaetotaxy of legs II-IV (number of solenidia between brackets): coxae 2-2-0-1, trochanters 3-3-3, femora 5-1-1, genua 6(1)-6-6. Dorsal setae of the trochanters III and IV thickened. Length of idiosomal setae: *vi* 11, *ve* 80, *sci* 70, *sce* 58, *d1* 42, *d2* 39, *d3* 16, *d4* 20, *d5* 13, *l1* 46, *l2* 32, *l3* 19, *l4* 16, *l5* 205, *ic1-ic3* 10-12, *ic4* 23, *pg1-pg3* 11-13.

Key of the species of the genus *Ugandobia*

Females

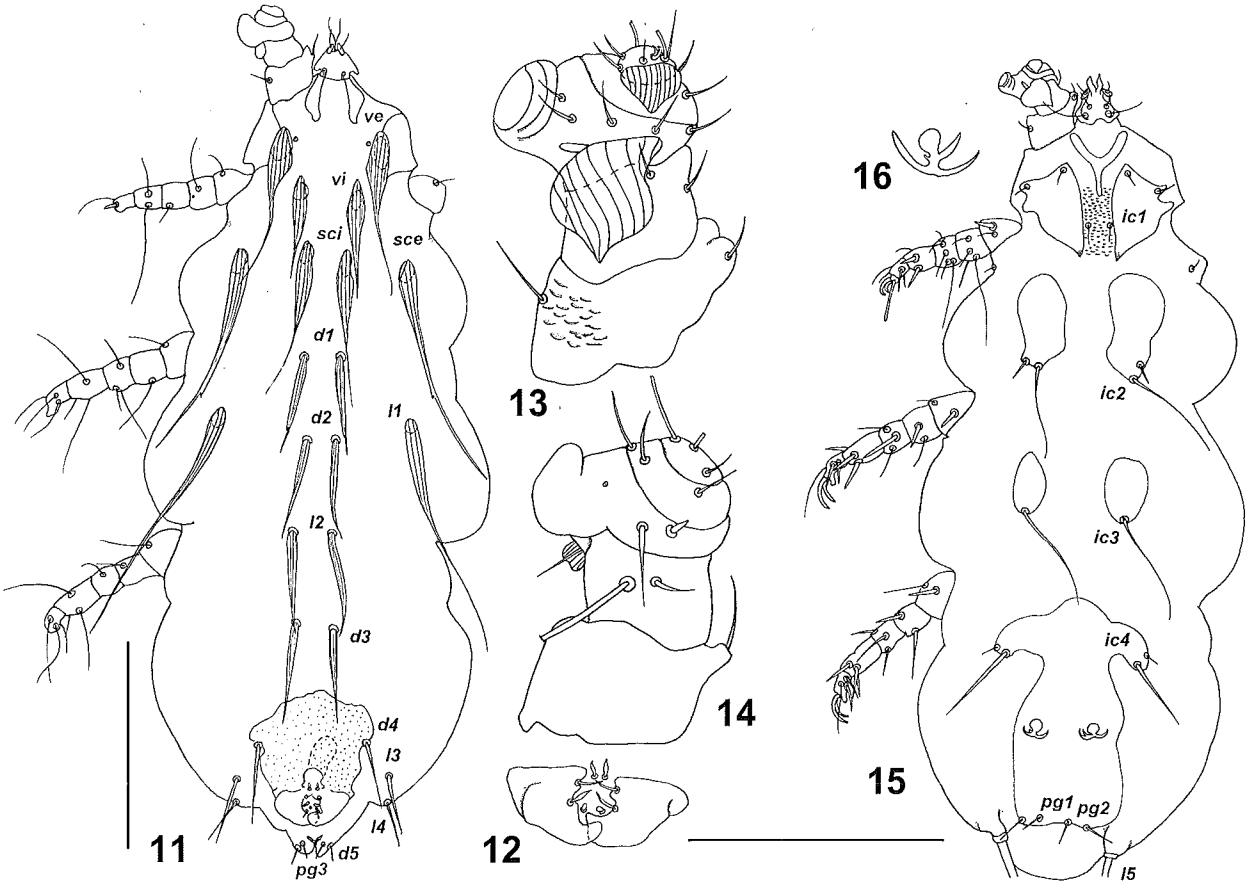
(females of *U. euthrix* FAIN, 1972 and *U. australiensis* FAIN et LUKOSCHUS, 1979 are unknown)

1. Setae *d1* situated at the level of seta *l1* bases. Setae *ic4* short, subequal or 2-3 times longer than coxal setae. Chaetotaxy on femora II-IV 5-1-1. Coxae II with 2 setae ... subgenus *Emballomyobia* **subgen. nov.** . . 7
– Setae *d1* situated distinctly anterior to the seta *l1* bases. Setae *ic4* whip-like, much longer than coxal setae. Chaetotaxy on femora II-IV 5-2-2 or 5-2-1. Coxae II with 3 setae ... subgenus *Ugandobia* s.str. 2
2. Femur IV with 2 setae 3
– Femur IV with 1 seta ..... *U. dissimilis* UCHIKAWA et KOBAYASHI, 1978
3. Setae *l3* lanceolate 4
– Setae *l3* hair-like ..... *U. vachoni* FAIN, 1973
4. Setae *vi* hair-like or slightly thicker, much shorter than *ve* 5
– Setae *vi* lanceolate, about 2/3 of length *ve* ..... *U. garambensis* FAIN, 1973
5. Setae *vi* hair-like. Setae *l3* situated anterior to the level of seta *d4* bases, almost at the level of setae *d3* bases. Setae *g3* claw-like 6
– Setae *vi* thickened. Setae *l3* situated at the level of seta *d4* bases. Setae *g3* thickened ..... *U. barnleyi* (RADFORD, 1951)
6. Genu II with 8 setae (including solenidium). Gnathosoma without lobes ventrally ..... *U. saccolaimus* UCHIKAWA, OCONNOR et KLOMPEN, 1991
– Genu II with 7 setae (including solenidium). Gnathosoma with a pair of well developed lobes ventrally .. .. *U. taphozous* FAIN, 1972
7. Setae *ic2* and *ic3* whip-like, much longer than *ic1*, setae *ic4* hair-like. Genu IV with 5 setae 8
– Setae *ic2* and *ic3* short, as long as setae *ic1*, setae *l4* thickened. Genu IV with 6 setae ..... *U. emballonurae* FAIN, 1972
8. Setae *d3* and *d4* narrowly lanceolate. Setae *sci* and *l1* reaching the levels of setae *d1* and *l2* bases, respectively. Setae *pg2* present 9
– Setae *d3* and *d4* hair-like. Setae *sci* and *l1* reaching the levels of setae *d2* and *d4,* respectively. Setae *pg2* lacking ..... *U. ituriensis* FAIN, 1972
9. Setae *l3* situated distinctly anterior to the level of seta *d3* bases 10
– Setae *l3* situated at the level of seta *d3* bases ..... *U. leyteensis* UCHIKAWA, OCONNOR et KLOMPEN, 1991 **stat. nov.**
10. Gnathosoma with convex lateral margins, length and width subequal ..... *U. salomonensis* FAIN, 1976 **stat. nov.**
– Gnathosoma with parallel lateral margins, length about 1.5 times more than width ..... *U. balionycteris* FAIN, 1973

Males

(males of *U. taphozous* FAIN, 1972, *U. balionycteris* FAIN, 1973 and *U. vachoni* FAIN, 1973 are unknown)

1. Setae *d4* situated distinctly posterior the level of seta *l1* bases. Setae *ic4* relatively short, only slightly longer than coxal setae. Chaetotaxy of femora II-IV 5-1-1. Coxae II with 2 setae . . . subgenus *Emballomyobia* **subgen. nov.** 7
– Setae *d4* situated anterior or at the level of seta *l1* bases. Setae *ic4* whip-like, much longer than coxal setae. Chaetotaxy of femora II-IV 5-2-2 or 5-2-1. Coxae II with 3 setae subgenus *Ugandobia* s.str. ... 2
2. Setae *ic2* and *ic3* subequal 3
– Setae *ic3* much shorter than *ic2* ..... *U. barnleyi* (RADFORD, 1951)
3. Setae *l3* and *l4* thickened, much narrowly than *d3*. Genu II with 7 setae (including solenidium) 4
– Setae *l3* and *l4* striated lanceolate, subequal to *d3* in width. Genu II with 8 setae (including solenidium) .. *U. saccolaimus* UCHIKAWA, OCONNOR et KLOMPEN, 1991
4. Femur IV with 2 setae 5
– Femur IV with 1 seta ..... *U. dissimilis* UCHIKAWA et KOBAYASHI, 1978
5. Dorsal seta of trochanters III and IV long, reaching the posterior margins of the respective tibiae 6
– Dorsal seta of trochanters III and IV short, reaching the posterior margin of the respective genua or not reaching it ..... *U. australiensis* FAIN et LUKOSCHUS, 1979
6. Genital shield with 7 pairs of developed setae. Setae *sci* hair-like ..... *U. euthrix* FAIN, 1972
– Genital shield with 6 pairs of developed setae and 3 pairs of setal vestiges. Setae *sci* thorn-like ..... *U. garambensis* FAIN, 1973
7. Setae *d4* short, thickened, much shorter than *l1*. Genu IV with 5 setae 8
– Setae *d4* long, striate lanceolate, only 1.2 times shorter than *l1*. Genu IV with 6 setae ..... *U. emballonurae* FAIN, 1972
8. Setae *ic2* and *ic3* relatively short, only 1.2-1.3 times longer than *ic1* and *ic4* 9
– Setae *ic2* and *ic3* whip-like, much longer than *ic1* and *ic4* ..... *U. ituriensis* FAIN, 1972



Figs. 11-16 — *Acanthophthirius* (*Acanthophthirius*) *capensis* (de MEILLON et LAVOIPIERRE, 1944), female. Dorsal view (11), vulva (12), leg I in dorsal view (13), same in ventral view (14), ventral view (15), opisthogastric sclerite (16). Scale lines 100 μm (figs. 11, 15) and 50 μm (figs. 12-14, 16).

9. Gnathosoma stubby, with convex lateral margins . . . . . *U. salomonensis* FAIN, 1976 **stat. nov.**
– Gnathosoma elongate, with parallel lateral margins . *U. leyteensis* UCHIKAWA, OCONNOR et KLOMPEN, 1991 **stat. nov.**

Genus *Acanthophthirius* PERKINS, 1925

This genus is divided into 2 subgenera, *Acanthophthirius* s.str. (31 species and 4 subspecies) and *Myotimyobia* FAIN, 1972 (41 species and 2 subspecies) (UCHIKAWA and BAKER, 1993). The species of this genus are parasites of bats of the subfamilies Vespertilioninae, Kerivoulinae and Murininae (Chiroptera, Vespertilionidae). The records of some species from the genus *Miniopterus* (Vespertilionidae, Miniopterinae) are obviously accidental (UCHIKAWA and BAKER, 1993). The monotypic subfamily Miniopteridae is a sister branch of the other vespertilionid bats (JONES *et al.*, 2002) and it is occupied by the mites of the genus *Calcarmyobia* RADFORD, 1948.

Acanthophthirius (*Acanthophthirius*) *capensis* (de MEILLON et LAVOIPIERRE, 1944)

(Figs. 11-16)

Myobia capensis de MEILLON and LAVOIPIERRE, 1944: 59 (fig. 5c)
Radfordia capensis, RADFORD, 1951: 511
Acanthrophthirius capensis, DUSBABEK, 1969a: 552
Acanthophthirius (Myotimyobia) capensis, FAIN, 1978a: 44-45
Acanthophthirius (s.str.) *capensis*, UCHIKAWA and BAKER, 1993: 106
Acanthophthirius (Chiromyobia) miniopteri FAIN, 1972a: 152; 1978: 56-60 (figs 61-70) **syn. nov.**

Material examined. 3 females and 1 tritonymph from *Eptesicus capensis* (specimen n 15626 IRSNB) Banagi Serengeti, 24.XII.1963. Coll. J. PLISNIER.

Female. Body including gnathosoma 620-655 long (in 3 specimens) and 260-275 wide. *Idiosoma.* Length of idio-

somal setae: *vi* 80-85, *ve* 120-125, *sci* 120-125, *sce* 170-195, *d1* 85-92, *d2* 90-105, *d3* 82-92, *l1* 190-215, *l2* 90-95 – all striated and lanceolate; *d4* 60-65, *l3* 57-65, *l4* 35-45 – all thickened; *d5* 20-25, *ic1* 13-15, *ic2* 85-95, *ic3* 85-92, *ic4* 62-68, *pg1* 18-23, *pg2* 27-32, *pg3* 18-20. Prevulvar shield developed. Opisthogastric shield bears setae *ic4, cxIV 1, pg1* and *pg2*. Vulvar setae as in Fig. 12. Opisthogastric sclerites bulbous (Fig. 16). Distance between *ic4-ic4* 2.5 times longer than between opisthogastric sclerites. Paragenital setae *pg1* and *pg2* almost the same level. *Legs*. Tarsi I with two claws, claws of tarsi II subequal. Dorsal seta of trochanters I distinctly thickened.

Remark. The species *A. capensis* was described from *Eptesicus capensis* (Vespertilionidae, Vespertilioninae) in South Africa (de MEILLON and LAVOIPIERRE, 1944). The original description of this species is superficial and the type specimens are, probably, lost (FAIN, 1978a). We examined the specimens of *Eptesicus capensis* (type host of *A. capensis*) kept in ethanol and collected the mites from them. These mites belong to the species *Acanthophthirius miniopteri* FAIN, 1972 described by FAIN (1972, 1978a) from *Miniopterus shreibersi* (Vespertilionidae, Miniopteridae) from South Africa. Since, according to our opinion and suggestion of other authors (UCHIKAWA and BAKER, 1993), the miniopterid hosts are accidental for *Acanthophthirius* species, and the true host of *A. miniopteri* is *E. capensis*. Therefore, *A. miniopteri* **syn. nov**. is a junior synonym of *A. capensis*.

Genus *Binuncus* RADFORD, 1954

This genus is divided into 2 subgenera, *Binuncus* s.str. (15 species) and *Probinuncus* FAIN, 1975 (4 species) (UCHIKAWA, 1986). The species of this genus are associated exclusively with bats of the family Pteropodidae (Megachiroptera).

Binuncus (*Binuncus*) *jamesoni* (HIREGAUDAR et BAL, 1956)

Folimyobia jamesoni HIREGAUDAR and BAL, 1956: 117-120 (figs 147, 148)
Binuncus jamesoni, DUSBABEK, 1969a: 4
Binuncus (*Binuncus*) *jamesoni*, UCHIKAWA and KOBAYASHI, 1978: 368-370 (figs 1, 2)
Binuncus rousetti FAIN, 1972b: 154; 1978a: 104-107 (figs 126-130) **syn. nov.**

Material examined. Binuncus rousetti: holotype male (N 148 640 MRAC), paratype female from *Rousettus aegyptiacus*, Mahyusha, Katana, Kivu, Zaire, 14.X.1956. 1 male and 2 females from *Rousettus* sp. (specimen n 71866 ZIN), North Vietnam, 21.IV.1986. Coll. M.N. MEYER. Type specimen is deposited in MRAC, other in ZIN.

Remark. The species *B.*(s.str.) *jamesoni* (HIREGAUDAR et BAL, 1956) was described from *Rousettus leschenaulti* from India (HIREGAUDAR and BAL, 1956). Unfortunately, this mite species was insufficiently described and inaccurately figured. FAIN (1972) described *B.* (s.str.) *rousetti* from *Rousettus aegyptiacus* from Zaire. It differed from the description of the previous species by the thickness of dorsal setae, length of the ventral setae and by the position of the setae *d4* and *d5* (FAIN, 1978a). UCHIKAWA and KOBAYASHI (1978) re-described *B. jamesoni* from the type host from Thailand. Later on, UCHIKAWA (1986) found this species on *Rousettus amplexicaudatus* from Java and *R. aegyptiacus* (type host *of B. rousetti*) from Egypt. The similarity of these two species is quite clear after this re-description as it was mentioned by UCHIKAWA (1986) therefore *B. rousetti* should be consider a junior synonym of *B.*(s.str.) *jamesoni*.

Binuncus (*Binuncus*) *epomophori* FAIN, 1972

Binuncus (*Binuncus*) *epomophori* FAIN, 1972c: 57-58 (figs 57-59)
Binuncus (*Binuncus*) *epomophori*, UCHIKAWA, 1986: 259 (fig. 1)

Material examined: 3 males and 10 females from *Epomophorus anurus* (n 1525 IRSNB), Park National Albert, Congo. 2 females from the same host (n 1535 IRSNB) and locality. 1 female from *Nanonycteris veldkampi* (n 16055 IRSNB), Congo.

Remarks. This species was described from *Epomophorus labiatus* (type host) from Rwanda and *E. wahlbergi* from Angola (FAIN, 1972). Later on, UCHIKAWA (1986) found this species from *Micropteropus pusillus* from Sudan. *Epomophorus anurus* and *Nanonycteris veldkampi* are new hosts for this species. According to the pteropodid's supertree (JONES *et al.*, 2002), the genera *Micropteropus, Nanonycteris* and *Epomophorus* form a single clade. Thus, the parasitological data support this phylogenetical hypothesis of Pteropodidae.

Binuncus (*Binuncus*) *myonycteris* UCHIKAWA, 1986

Binuncus (*B.*) *myonycteris* UCHIKAWA, 1986: 259-260 (figs 2-6)

Material examined. 2 males and female from *Myonycteris torquata* (n 16851 IRSNB), Liberia, 14.III.1966. 2 males and 2 females from the same host (n 16841 IRSNB), Liberia, 28.XII.1961. 1 male and 1 nymph from the same host (n 16074 IRSNB), Liberia, 21.III.1966. The first finding since the original description.

Remark. *Binuncus myonycteris* is closely related to *B. epomophori*. These two species differ from each other by the body length and position of the opisthogastric sclerite

in the females (Uchikawa, 1986). According to our data, in the females of *B. myonycteris* (3 specimens), the body length including gnathosoma is 580-640, the distance between opisthogastric sclerite and seta *l5* bases is 2 times longer than distance between opisthogastric sclerite and seta *ic4* bases and the body length of male (5 specimens) is 440-475. In females of *B. epomophori* (10 specimens), the body length is 650-700, the opisthogastric sclerite is equidistant from the seta *ic4* and *l5* bases; the body length in males (3 specimens) is 520-550.

Genus *Neomyobia* RADFORD, 1948

This genus is divided into 2 subgenera *Neomyobia* s.str. (2 species and one subspecies) and *Rhinomyobia* Fain, 1978 (11 species and one subspecies) (BOCHKOV, 1996). All species of this genus parasitize bats of the family Rhinolophidae. The data on their host distribution and locality are summarized for the first time in the Table 2.

Neomyobia (*Neomyobia*) *jacksoni* (RADFORD, 1940)

Myobia jacksoni RADFORD, 1940: 94 (figs 5-6)
Neomyobia jacksoni, RADFORD, 1952: 543 (fig. 123)
Neomyobia africana LAWRENCE, 1951: 93 (figs 2-3)
Neomyobia jacksoni, FAIN, 1978a: 64-69 (figs 71-76)

Material examined. 1 female and 1 nymph from *Rhinolophus fumigatus* (n 1949 IRSNB) from Africa. 3 females and 5 nymphs from *Rhinolophus* sp. (n 493 ZIN), near to Victoria lake, Africa, 15.VII.1912. Coll. TROICKIY.

Remark. This species was described from an unidentified bat from Kenya (RADFORD, 1940). Later on, it was found on *Rhinolophus clivosus* from Natal and Zaire (LAWRENCE, 1951; FAIN, 1978a) and on *Rh. capensis* from the South Africa (FAIN, 1978a). *Rh. fumigatus* is new host of this species.

Tribe Protomyobiini BOCHKOV, 1997

The tribe includes 15 genera associated with the soricomorh insectivores (Soricomorpha). This host order includes four families, Tenrecidae, Soricidae, Talpidae and Solenodontidae. The myobiid mites are unknown only from the species of the latter family.

Genus *Placomyobia* JAMESON, 1970

This genus was established by JAMESON (1970) for a single species *Placomyobia wilsoni* JAMESON, 1970 from *Anourosorex squamipes* (Soricidae) from Taiwan. The original diagnosis of this genus is very short and incomplete. Therefore we give here a new diagnosis of this genus.

Definition. Gnathosoma normal in shape, with full set of setae: *rp, ra* and *rd* - all hair-like. Idiosoma rather short and oval. Legs I with 5 segments, but tarsus strongly reduced, claws absent. Tibiotarsus I with one solenidium, 9 setiform setae and a very large striated scale-like seta, covering all ventral surface of the segment. Genu I with 8 setae, solenidion σ invisible. Clasping tubercle of genu I directed forwards. Femur I with 4 setiform setae, one thickened finger-like seta and one large striated scale-like seta situated on antiaxial surface of the segment. Trochanters II with 2, trochanters III - IV with 3 setiform setae and without projections. Tarsi II-IV with 2 subequal claws, their pretarsi strongly reduced. Chaetotaxy of legs II - IV (number of solenidia between brackets): coxae without setae, trochanters 2-3-3, femora 5-3-2, genua 6(1)-5-5, tibiae 6-6-6 and tarsi 7(1)-6-6.

Female. Vulva with well developed lobes and full set of setae (*g1-g3, ai, ae*). Setae *g3* hair like. Paragenital setae presented by 3 pairs, *pg1, pg2* and *pg3*. Spermatheca almost invisible. Chaetotaxy of idiosoma: *vi, sci, d3* and *ic1-ic4* - short; *ve, sce* and *l1* - narrowly lanceolate; *l5* - whip-like; other setae absent.

Male (based on the description of JAMESON, 1970). Genital shield symmetrical. It bears 2 pairs of minute setae. Setae *vi, sci, ic1-ic4* short; *ve, sce* and *l1* - narrowly lanceolate; *l5* - whip-like; other setae lacking. Penis slender and coiled.

Type species: *Placomyobia wilsoni* JAMESON, 1970

Placomyobia wilsoni JAMESON, 1970
(Figs 17-20)

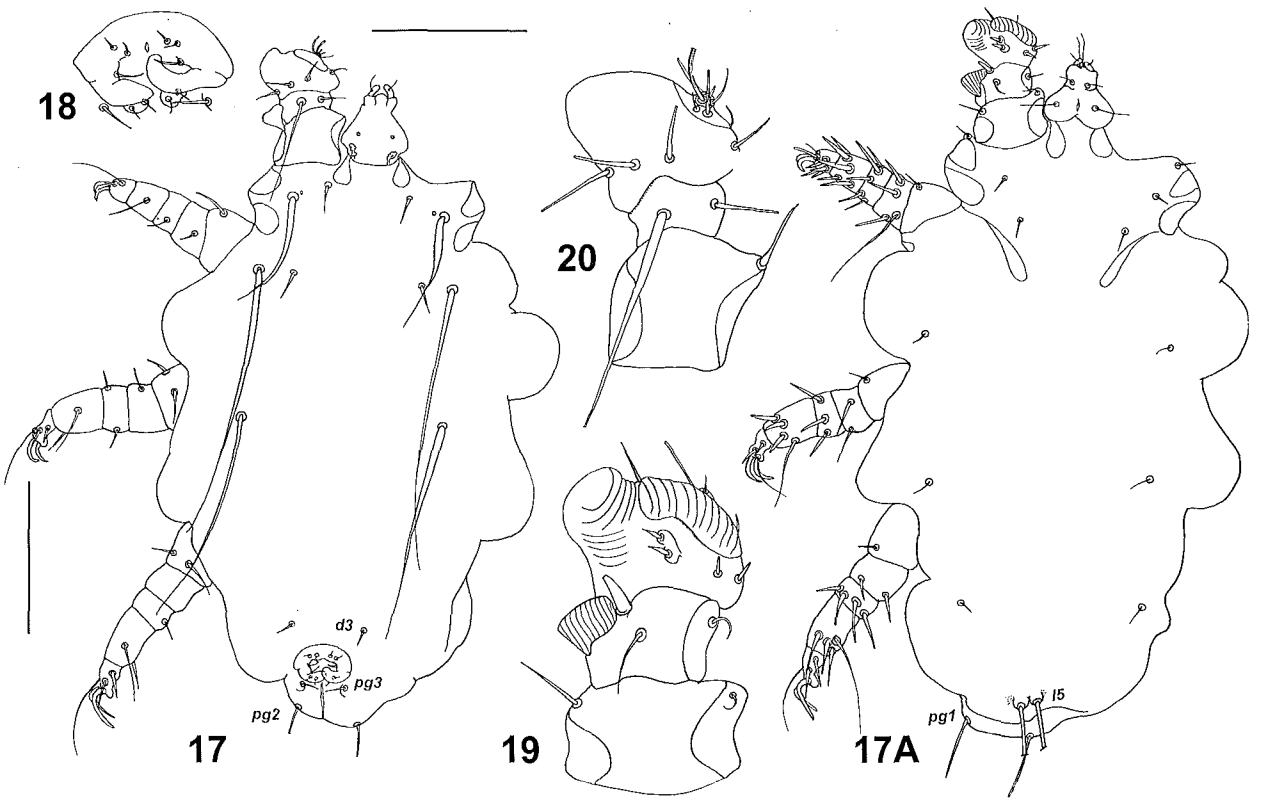
Placomyobia wilsoni JAMESON, 1970: 83-84 (fig. 2 A, B)

Material examined: 1 female from *Anourosorex squamipes* (specimen n 9175 IRSNB) from Mt. Carin, Burma, 26.VII.1932.

Body length, including gnathosoma 525, width 310. Length of setae: *vi, sci* and *d3* about 15-18, *ve* 85, *sce* 185 and *l1* 165. Vulva as in Fig. 18.

Genus *Crocidurobia* JAMESON, 1970

This genus is divided into 2 subgenera *Crocidurobia* s.str. (8 species) and *Suncomyobia* FAIN et LUKOSCHUS, 1976 (3 species). All these mites are parasitizing shrews of the subfamily Crocidurinae (Soricidae). The diagnosis of the genus was given by FAIN (1978a) and BOCHKOV (1997b). We give here the description of one new species and complete the generic description. The data on host distributions and localities of the *Crocidurobia* species are summarized for the first time in the Table 3.



Figs. 17-20 — *Placomyobia wilsoni* JAMESON, 1970, female. Dorsal view (17), ventral view (17A), vulva (18), leg I in dorsal view (19), same in ventral view (20). Scale lines 100 μm (figs. 17, 17A) and 50 μm (figs. 18-20).

Definition. Gnathosoma normal in shape, with full set of setae: *rp, ra* and *rd* - all hair-like. Idiosoma elongate. Legs I with 5 segments, but tarsus strongly reduced, claws lacking. Tibiotarsus I with one solenidion, 12 setiform setae and a very large striated scale-like setae, covering all ventral surface of the segment. Genu I with 8 setae, solenidion σ well visible. Clasping tubercle of genu I directed forwards. Femur I with 4 setiform setae, one thickened finger-like seta and one large striated scale-like seta situated on anti-axial margin of the segment. Trochanter I with 3 setiform setae and without projections. Tarsi II-with 2 subequal claws, claws of tarsi III-IV subequal or unequal. Pretarsi II-IV strongly reduced. Chaetotaxy of legs II-IV (number of solenidia between brackets): coxae II with 3 setae, coxae III-IV without setae, trochanters 2-3-3, femora 5-2-2, genua 6(1)-6-6, tibiae 6-6-6 and tarsi 7(1)-6-6.

Female. Vulva with well developed lobes and full set of setae (*g1-g3, ai, ae*). Setae *g3* hair like. Paragenital setae represented by 3 pairs, *pg1, pg2* and *pg3*; setae *pg1* mostly multiple. Spermatheca almost invisible. Opisthogastric sclerite present, unpaired. Chaetotaxy of idiosoma: *ve, sce, sci, d1-d3, l1, l2* and *pg1* lanceolate; *vi* short or long lanceolate; *d3-d5, l3, l4* various in shape; *ic1-ic4* - hair like; *l5* - whip-like.

Male. Genital shield oval. It bears 3-5 pairs of setae. Setae *vi* - microsetae; *ve, sce, l1* - lanceolate; *sci* - short; *d1-d3, d5, l2-l4* - variable in shape; *ic1-ic4* - hair-like; setae *d4* present or lacking. Penis slender and coiled.

Developmental stages

Larva unknown; a single known deutonymph in a bad condition (FAIN, 1978a).

Protonymph. Gnathosoma with two pairs of microsetae, *rd* dorsal and *rp* ventral. Set of dorsal setae of idiosoma variable. Idiosomal venter: setae *ic1-ic3* present. Anal slit without anal setae, nicked. Legs I with bilateral symmetry. Legs IV normally developed. Chaetotaxy of legs II-IV (number of solenidia between brackets): coxae and trochanters without setae, femur+genua 4(1)-2-0, tibiae 6-4-4, tarsi 7(1)-6-6. Coxae I with one pair of scale-like setae. Tarsi II with 2 claws, tarsi III and IV with 1 claw.

Tritonymph. Set of dorsal setae of idiosoma variable. Setae *ve, sci, sce, l1, d3, d5, l3, l4* and *l5* always present, other setae present or absent. Idiosomal venter: setae *ic1* short, hair-like; *ic2-ic4* microsetae. Anal slit without anal setae, naked. Legs I with bilateral symmetry. Chaetotaxy of legs

II-IV (number of solenidia between brackets): coxae 2-0-0, trochanters 1-2-2, femur+genua 4(1)-2-2, tibiae 6-5-5, tarsi 7(1)-6-6. Coxae I with two pairs of scale-like setae. Tarsi II with 2 claws, tarsi III and IV with 1 claw.

Type species: *Myobia blairi* RADFORD, 1936

Remarks. This genus until now included 12 species. However, *C. notata* FAIN, 1973 was described from a single male collected on the ethanol preserved specimen of *Glirulus japonicus* (Rodentia: Gliridae) from Japan (FAIN, 1973b). This species is shortly described and its systematic position and the host are questionable. Therefore, we consider here this species as a *species inquirenda* within the family Myobiidae. The mites of the genus *Crocidurobia* parasitize shrews of the three closely related genera *Crocidura, Suncus* and *Diplomesodon* (Crocidurinae: Crocidurini). The shrews of the genera *Crocidura* and *Suncus* are widely distributed in Africa and Eurasia, while the single species of the genus *Diplomesodon, D. pulchellum* has an area extending from Volga river to Balkhash lake. The representatives of both mite subgenera could infest the same host species (Table 3).

Subgenus *Crocidurobia* s.str.

Female. Setae *vi* short, more than 3 times shorter than *ve*. *Male*. Genital shield with 3-5 pairs of setiform setae.

This subgenus includes 8 species.

***Crocidurobia* (*Crocidurobia*) *crocidurae* (LAWRENCE, 1951)**

Neomyobia crocidurae LAWRENCE, 1951: 97 (figs. 4, 5)
Radfordia bifoliata LAWRENCE, 1951: 102 (fig. 9)
Eadiea crocidurae, LAWRENCE in ZUMPT, 1961: 121
Eutalpacarus crocidurae, DUSBABEK, 1969b: 557
Crocidurobia crocidurae, FAIN, 1978a: 16-21 (figs. 1-7)

Material examined. 2 males and 3 females from *Crocidura flavescens* (specimen n 18940 MRAC), Rwanda, Astrida.

Remark. This species was redescribed from the type material by FAIN (1978a). Only a few corrections should be added to this description. In male of this species, the setae *vi* are represent as hardly visible microsetae and the genital shield bears 5 pairs of setae. In female, there is only a single pair of setae *pg1*. In tritonymph, the setae *vi* are lacking.

***Crocidurobia* (*Crocidurobia*) *dusbabeki* sp. nov.**
(Figs. 21-30)

Material examined. Holotype female, 1 male, 1 female and 1 TN paratypes from *Crocidura gracilipes* (specimen 29475 MRAC), Lwiro, Kivu Prov., Congo, 02.VII.1956. Host collected by Rahm, specimens are deposited in MRAC.

Additional material. 1 male and 3 TN from *Crocidura gracilipes* (specimen 29403 MRAC), Lwiro, Congo. 5 TN from the same host (specimen from MRAC), Congo, 28.III.1967. Female from *Crocidura jacksoni* (specimen n AC1 008-M-0047 MRAC), Congo. 2 females from *Crocidura sellina* (specimen AC1 008-M-0007 MRAC), Chyulu, Kenya.

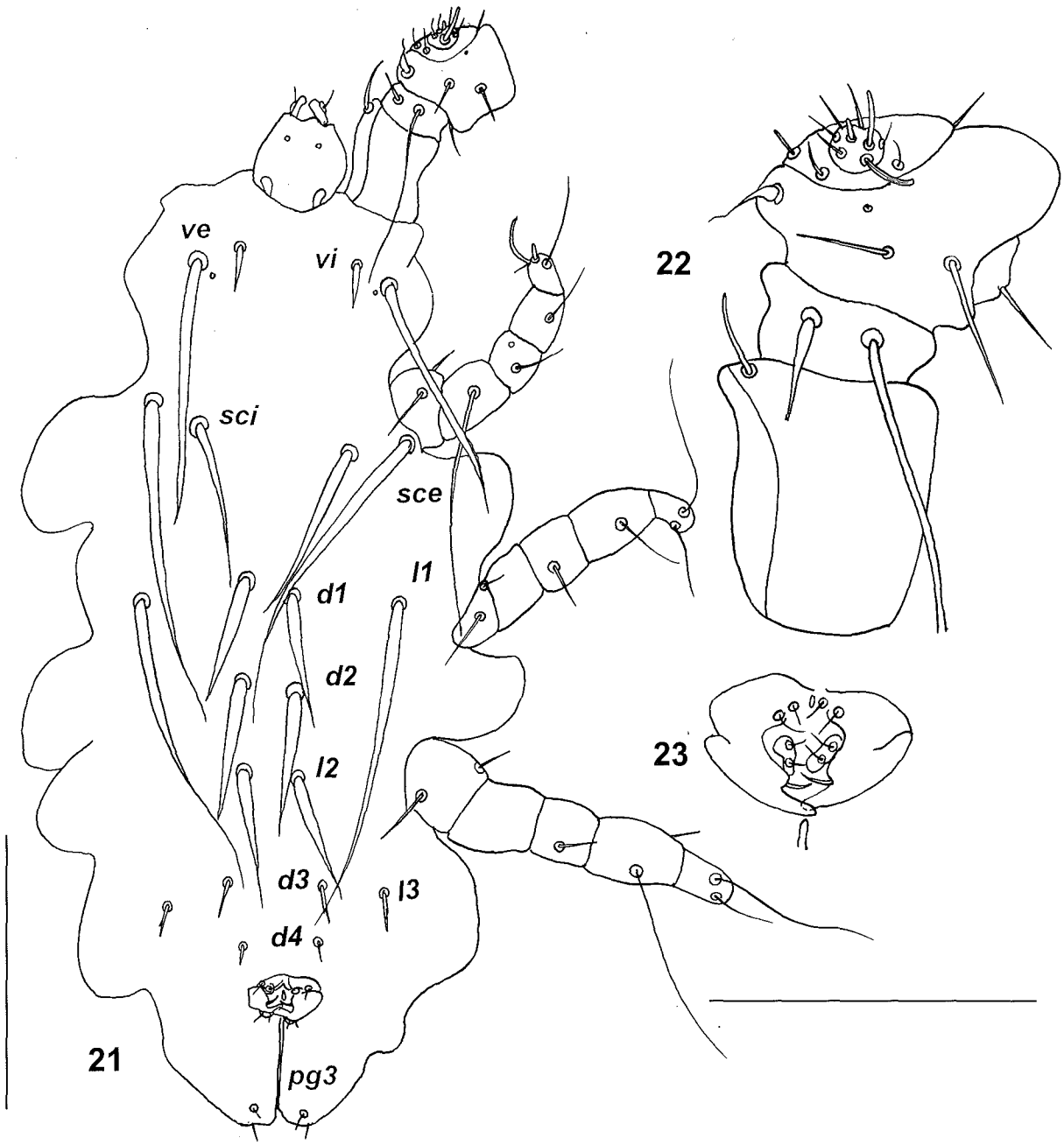
Female (holotype): Body length, including gnathosoma, 420 (440 in paratype), width 190 (225). Length of setae: *vi* 14 (15) short and slightly lanceolate; *ve* 87 (80), *sci* 48 (50), *sce* 125 (115), *d1* 50 (52), *d2* 55 (57), *l1* 140 (120), *l2* 55 (60) - all lanceolate; *d3* 16 (12), *l3* 18 (15) - thickened; *d4* 13 (9) - all hair-like; *d5* 15 (13) and *l4* 15, *pg1* about 15-20 - thickened in basal part; *pg2* and *pg3* microsetae; *ic1* 15, *ic2* 55 (65), *ic3* 60 (70), *i4* 55 (60) - hair like. There are 2 pairs of setae *pg1* in holotype and 2-3 pairs in other specimens. The distance between opisthogastric sclerite and seta *ic4* bases is 2 times longer than the distance between opisthogastric sclerite and seta *pg1* bases.

Male. Body length, including gnathosoma, 370, width 155. Length of setae: *vi* hardly visible microsetae; *ve* 75, *sce* 125, *l1* 125 - narrowly lanceolate; *sci* 10, *d1, d2* about 11, *d3, l2* 15, *d5, l3, l4* about 13, *ic1* 16, *ic2* and *ic3* about 50, *ic4* 25 - all hair-like. Setae *d1* situated anterior to the genital shield. Setae *d4* lacking. Genital shield with 4 pairs of setae (Fig. 27), situated distinctly posterior to the level of seta *l1* bases. Aedeagus 115 long.

Tritonymph. Length of setae: *ve* 25, *sce* 35 and *l1* 25, - all lanceolate; *sci, d3, d5, l3* and *l4* 11-15 - all thickened. Setae *d1, d2, d4, l2* lacking.

Differential diagnosis. This new species is closely related to *Crocidurobia toroensis* DUSBABEK, 1983 from *Crocidura pilosa* from Uganda (DUSBABEK, 1983). In the males of both species, the genital shield bears 4 pairs of setae, the setae *d1* are situated distinctly anterior to this shield, and the setae *d4* are lacking. In females, the setae *d3, d4* and *l3* are short, the setae *pg1* are multiple and thickened in their basal part. This species differs from *C. toroensis* by the following characters. In the female of *C. dusbabeki* sp. nov., the setae *sci* are relatively long (50), subequal to *d1*, the setae *l1* are subequal or slightly longer than *sce*; in the male, the setae *sce* and *l1* are subequal. In the female of *C. toroensis*, the setae *sci* are short, at least , 1/2 length of *d1*, the setae *l1* are about 3/4 length of *sce*; in the male, the setae *sce* are about 1/3 length of *l1*.

This new species also differs from females of *C. crocidurae* by the setae *pg1* multiple and thickened in their basal parts and by the distance between the opisthogastric sclerite and seta *ic4* bases which is 2 times longer than the distance between opisthogastric sclerite and seta *pg1*



Figs. 21-23 — *Crocidurobia* (*Crocidurobia*) *dusbabeki* **sp. nov.,** female. Dorsal view (21), vulva (22), leg I in dorsal view (23). Scale lines 100 μm (fig. 21) and 50 μm (figs. 22-23).

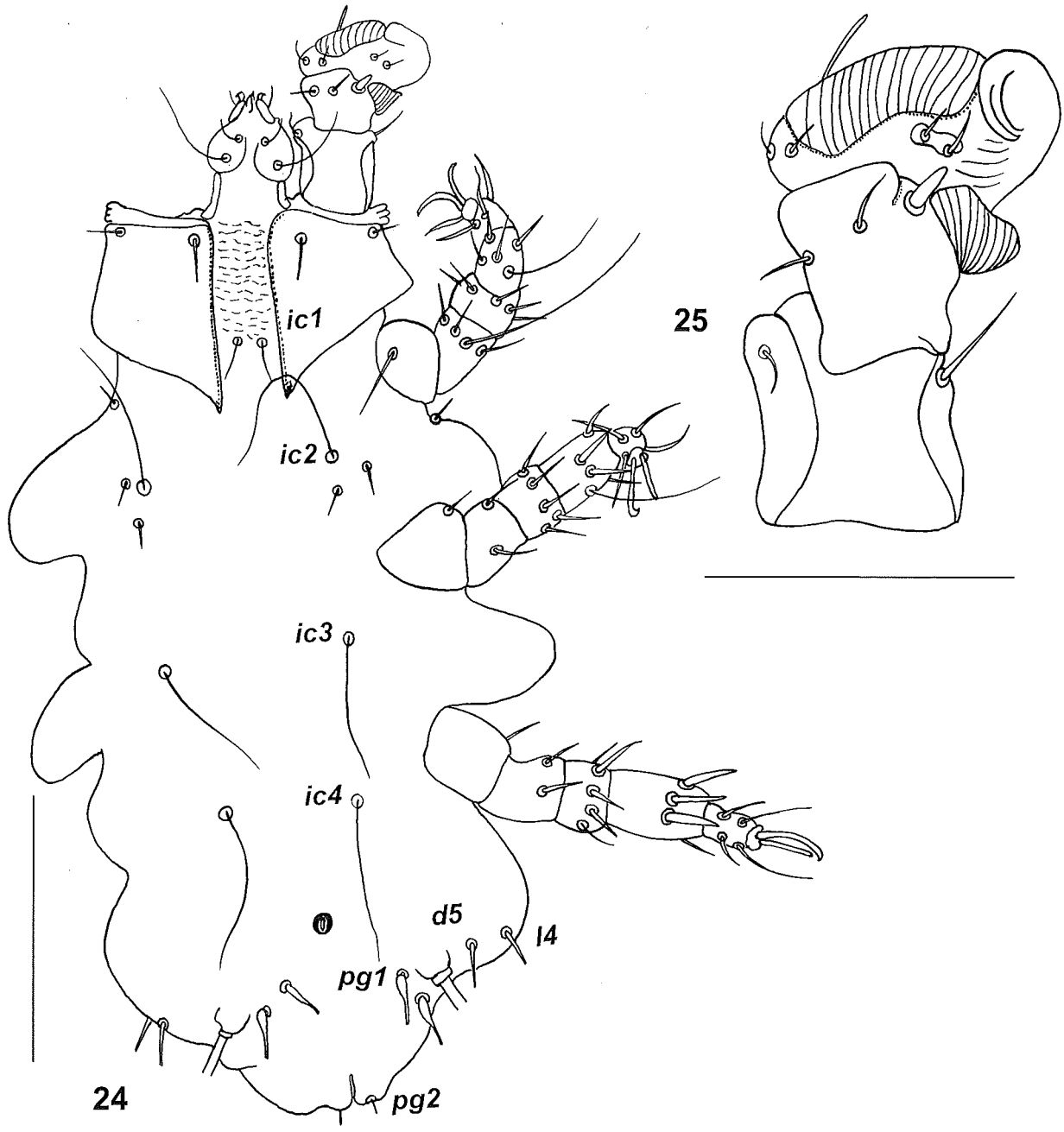
bases; in male, 4 pairs of the genital setae are present and by the seta *d1* bases are situated distinctly anterior to the genital shield. In the female of *C. crocidurae*, there is only a single pair of slightly thickened setae *pg1,* the distance between the opisthogastric sclerite and seta *pg1* bases is 2 times longer than the distance between the opisthogastric sclerite and seta *ic4* bases; in the male, the genital shield bears 5 pairs on the genital setae, the seta *d1* bases are situated at the level of the genital shield.

Subgenus *Suncomyobia* FAIN et LUKOSCHUS, 1976

Female. Setae *vi* long, subequal to *ve* in length. *Male.* Genital shield with 3 pairs of setiform setae and 2 pairs of vestigial setae.

Type species: *Myobia ingens* VITZTHUM, 1914

This subgenus includes 3 species.



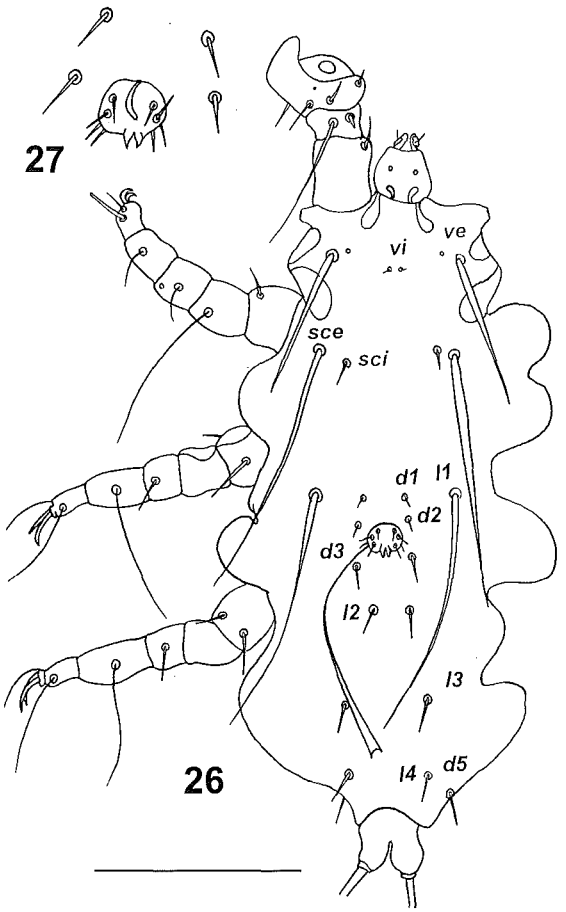
Figs. 24-25 — *Crocidurobia* (*Crocidurobia*) *dusbabeki* **sp. nov.**, female. Ventral view (24), leg I in ventral view (25). Scale lines 100 μm (fig. 24) and 50 μm (fig. 25).

Key of the species of the genus *Crocidurobia*

Females

(female of *C. diplomesodon* FAIN, 1973 is unknown)

1. Setae *vi* and *ve* subequal . . . . . *Suncomyobia* FAIN et LUKOSCHUS, 1976 . . . 7
– Setae *vi* one third of the length of *ve* . . . . . *Crocidurobia* s.str. . . . 2
2. Setae *sci* and *d1* subequal in length 3
– Setae *sci* more than half of the length *d1* . . . . . *C. toroensis* DUSBABEK, 1983
3. Opisthogastric sclerite situated distinctly anterior to the level of the first seta *pg1* bases 5
– Opisthogastric sclerite situated at the level of the first seta *pg1* bases 4
4. First pair of *pg1* setae situated almost at the same level as seta *ic4* bases . . . . . *C. blairi* (RADFORD, 1936)



Figs. 26-27 — *Crocidurobia* (*Crocidurobia*) *dusbabeki* **sp. nov.**, male. Dorsal view (26), genital shield (27). Scale lines 100 μm (fig. 26) and 50 μm (fig. 27).

- First pair of *pg1* setae situated far from the level of seta *ic4* bases, the distance between seta *ic4* and *pg1* bases is about 90 ..... *C. lasiurae* BOCHKOV, 1997
5. Opisthogastric sclerite situated 2 times closer to seta *ic4* bases than to seta *pg1* bases 6
- Opisthogastric sclerite situated 2 times closer to seta *pg1* bases than to seta *ic4* bases .. *C. dusbabeki* **sp. nov.**
6. With 3-4 pairs of setae *pg1* .... *C. michaeli* (POPPE, 1896)
- With 1 pair of setae *pg1* .... *C. crocidurae* (LAWRENCE, 1951)
7. Opisthogastric sclerite situated distinctly behind the level of seta *ic4* bases 8
- Opisthogastric sclerite situated slightly anterior to the level of seta *ic4* bases .... *C. transvaalensis* FAIN et ZUMPT, 1974
8. Opisthogastric sclerite situated at the level of first seta *pg1* bases ..... *C. ingens* (VITZTHUM, 1914)
- Opisthogastric sclerite situated at the level of the posterior seta *pg1* bases .... *C. multisetosa* (LUKOSCHUS et DRIESSEN, 1969)

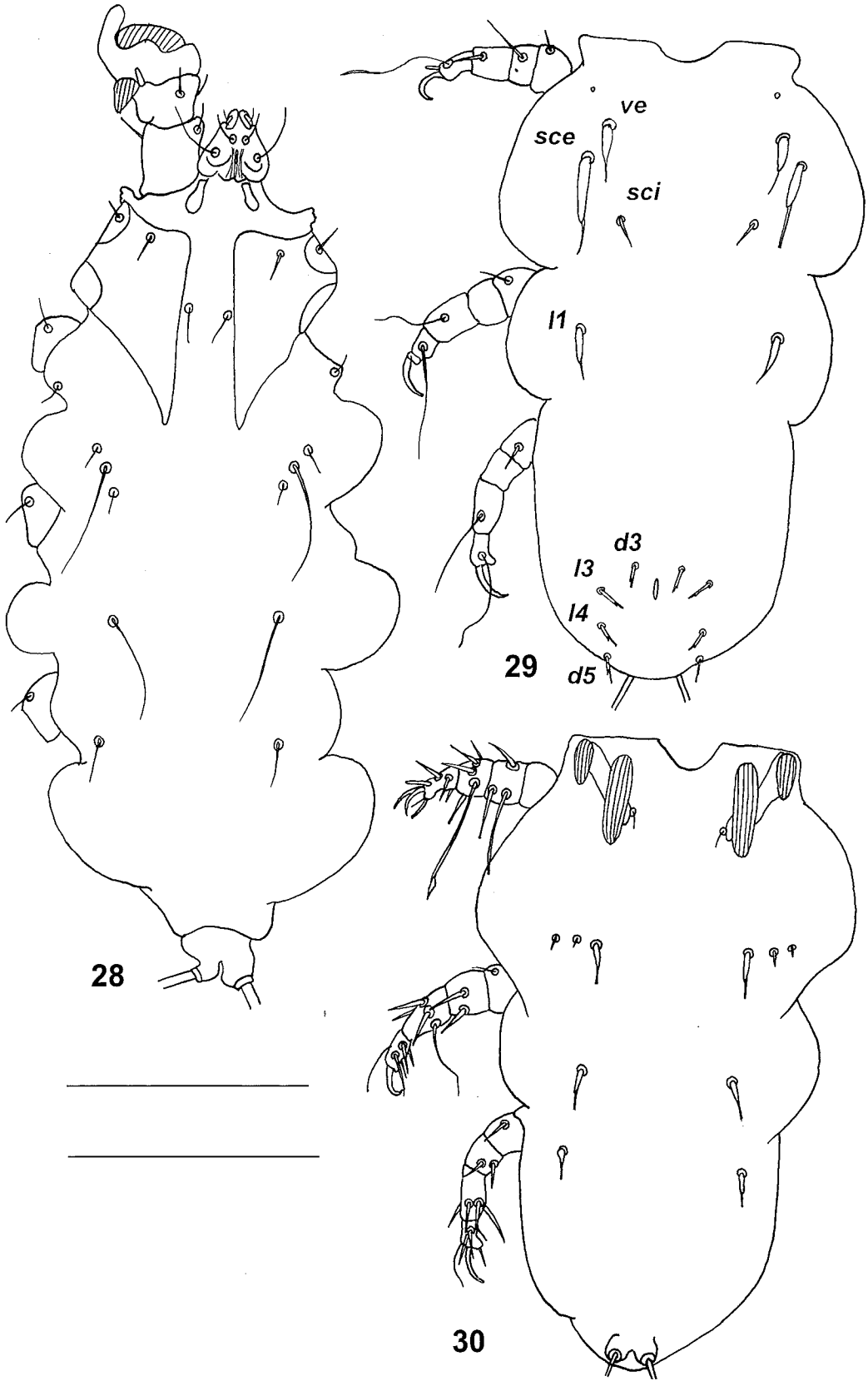
Male

(males of *C. ingens* (VITZTHUM, 1914) and *C. leucodoni* BOCHKOV, 1997 are unknown)

1. Genital shield with 5 pairs of setae, 3 pairs of setiform and 2 pairs of vestigial ones .... *Suncomyobia* FAIN et LUKOSCHUS, 1976 . . . 8
- Genital shield with 3-5 pairs of setiform setae .... *Crocidurobia* s.str. . . . 2
2. Setae *d4* lacking 3
- Setae *d4* present ..... *C. diplomesodon* FAIN, 1973
3. Genital shield situated slightly anterior or at the level of seta *l1* bases, between seta *d1* and *d2* bases . . . 6
- Genital shield situated distinctly posterior to the level of seta *l1* bases, between seta *d2* or *d3* bases 4
4. Genital shield with 4 pairs of setae, situated between seta *d2* bases, setae *l2* subequal to *d1-d3* in length . 5
- Genital shield with 3 pairs of setae, situated between seta *d3* bases, setae *l2* 4 times longer than *d1-d3* . . . . *C. lasiurae* BOCHKOV, 1997
5. Setae *sce* and *l1* subequal in length .... *C. dusbabeki* **sp. nov.**
- Setae *sce* 1.3 times longer than *l1* .... *C. toroensis* DUSBABEK, 1983
6. Setae *l2* and *d3* subequal in length 7
- Setae *l2* about 3 times longer than *d3* .... *C. blairi* (RADFORD, 1936)
7. Setae *ic4* long, subequal to *ic2* and *ic3* in length . . . . *C. michaeli* (POPPE, 1896)
- Setae *ic4* relatively short, 1/2 times length of *ic2* and *ic3* ..... *C. crocidurae* (LAWRENCE, 1951)
8. Genital shield situated distinctly anterior to the level of seta *l1* setae. Setae *l2* subequal to *d3* in length .. .. *C. transvaalensis* FAIN et ZUMPT, 1974
- Genital shield situated distinctly posterior to the level of seta *l1* bases. Setae *l2* 3-4 times longer than *d3* .. .... *C. multisetosa* (LUKOSCHUS et DRIESSEN, 1969)

Subfamily Myobiinae s. l.

This subfamily includes eight genera exclusively associated with rodents. They occur on rodents of all the five suborders represented in the system of PAVLINOV (2002). Among rodents of the superfamily Muroidea, these mites parasitize 15 host families and 3 subfamilies *incerta sedis* (BOCHKOV, 1999b). The distribution of the myobiid mites on their host taxa is given in the Table 4. The phylogenetic systems of the subfamily Myobiinae and the Rodentia correspond very well to each other with however two exceptions (BOCHKOV, 1999b). The first discordance is observed in the genus *Cryptomyobia* RADFORD, 1954 whose species are associated with hosts belonging to two phylogenetically distant superfamilies - Bathyergoidea (mites of subgenus *Cryptomyobia* s.str.) and Dipodoidea (mites of subgenus *Dipodomyobia* BOCHKOV, 1997). However, it is possible, that these two subgenera are associated by false synapomorphies (BOCHKOV, 1999b). The second discordance is that the myobiid subgenera of



Figs. 28-30 — *Crocidurobia* (*Crocidurobia*) *dusbabeki* **sp. nov.**. Male in ventral view (28), tritonymph in dorsal view (29), same in ventral view (30). Scale line 100 μm.

the genus *Radfordia* EWING, 1938, which are associated with so much remote taxa in the PAVLINOV's system as the family Myoxidae (mites of the subgenus *Graphiurobia* FAIN, 1973) and the superfamily Muroidea (mites of the subgenera *Microtimyobia* FAIN et LUKOSCHUS, 1976 and *Hesperomyobia* BOCHKOV, 1996), are closely related according to our concept (BOCHKOV, 1999b). Moreover, *Radfordia ewingi* (FOX, 1937) from *Zapus hudsonicus* (Myomorpha: Zapodidae) belongs to the subgenus *Graphiurobia* which includes the parasites of Myoxidae (FAIN and BOCHKOV, 2001). The rodents of these two families are quite dissimilar in their mode of life. Therefore, the probability of secondary transition seems to be quite low in this case. Since, according to the PAVLINOV's system, the family Myoxidae belongs to the separate suborder Gliromorpha, some authoritative authors include it into the suborder Myomorpha (GAMBARYAN, 1983). The presence of the genera *Gliricoptes* LAWRENCE, 1956 (Astigmata: Myocoptidae) and *Radfordia* (subgenus *Graphiurobia*) (Prostigmata: Myobiidae) on rodents of both families Zapodidae and Myoxidae suggests the existence of close affinities between these rodent families (FAIN and WHITAKER, 1974; FAIN, 1994).

Genus *Idiurobia* FAIN, 1973

This genus is represent only by the type species *Idiurobia idiuri* (FAIN, 1973), described from a single female collected on *Idiurus zenkeri* (Anomaluridae) from Kivu (FAIN, 1973d, 1974a). We give here description of the male and tritonymph of this species.

Remark. FAIN (1974a) mentioned that the tibio-tarsus of the legs I is clearly separated from the genu. However, the re-examination of this species shows that the structure of the legs I does not differ markedly from that in the other myobiine mites. This leg I consists of three free segments: trochanter, femur and genu-tibio-tarsus.

Idiurobia idiuri (FAIN, 1973)
(Figs. 31-37)

Radfordia (*Idiurobia*) *idiuri* FAIN, 1973d: 330
Idiurobia idiuri, FAIN, 1974a: 445 (figs 3-7)

Material examined. 1 male, 1 female and 2 TN from *Idiura macrotis* (specimen 82011-M-524 MRAC), Park National Albert, Congo. It is recorded from this host species for the first time.

Male. Body length, including gnathosoma, 295, width 130. Length of setae: *ve* 57, *sce* 70, *l1* 80- all lanceolate; *vi* 25, *sci* 11, *d5* 11, *l3* 23 and *l4* 18 - all thickened setiform; *ic1* 30, *ic2* and *ic3* about 75, *ic4* 120. Genital shield as in Fig. 32. It bears 8 pairs of setae, 5 pairs of anal-genital and 3 pairs of median, *d1* 16, *d2* 29 and *d3* 10. Penis 73 long. Leg chaetotaxy as in the female, except the absence of the setae *cx III* 1.

Tritonymph. Length of setae: *vi* 35-40, *ve* 35-45, *sci* 96-100, *sce* 50-60, *d1* 50-57, *d2* 25-35, *l1* 18-20, *l2* 15-25 - all lanceolate; *d3* 16-18, *d4* 10-12, *l3* 16-18, *l4* 10-12, *ic2-ic4* about 65 - all setiform. Setae *d5* lacking. Legs I symmetrical. Two pairs of anal setae present. Chaetotaxy of legs II-IV (number of solenidia between brackets): trochanters 1-1-1, femora+genua 4(1)-2-2, tibiae 5-4-4, tarsi 7(1)-6-6. Coxal setae I invisible, coxal setae *cxIII* and *cxIII1* relatively long, not shorter than *ic1*. Tarsi II-IV with a strong claw.

Remark. The absence of the setae *cxIII1* in the male is obviously an anomaly, because the females collected from the same specimen of the host have these setae.

Genus *Myobia* van HEYDEN, 1826

This genus is divided into two subgenera *Myobia* s.str. (13 species) and *Angomyobia* (2 species). The differences between these subgenera consist in the coxal and leg chaetotaxy, the shape of dorso-idiosomal setae of adults and immature instars. It is possible, that these subgenera are actually separate genera. However, the additional investigations concerning the immature instars of the subgenus *Angomyobia* are needed before to make a decision. All *Myobia* species are parasites of the subfamily Murinae and only one, *Myobia* (s.str.) *otomyia* Fain, 1972 parasitizes *Otomys irroratus*, an Afrotropical rodent of the subfamily Otomyinae. The emended diagnosis of the subgenus *Myobia* s.str. and the data about host distribution and locality of the *Myobia* species were given by BOCHKOV and LABRZYCKA (2003). The re-examination of the species *M. otomyia* showed that a new subgenus should be established for this species. The diagnosis of a new subgenus is given below.

Subgenus *Myobia* s.str.

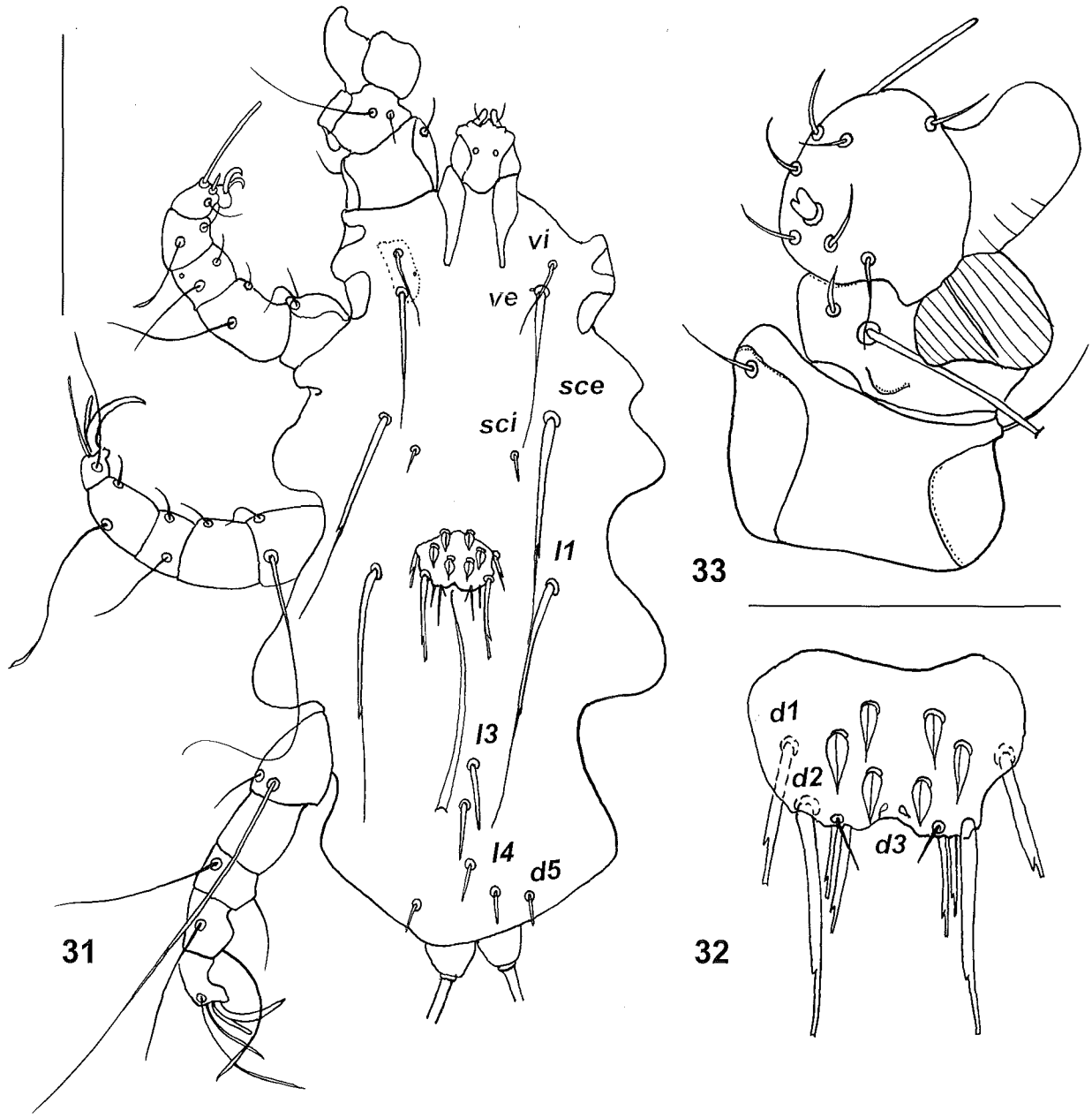
Myobia (*Myobia*) *malaysiensis* FAIN, LUKOSCHUS et NADCHATRAM, 1980
(Figs. 38-39)

Myobia (*Myobia*) *malaysiensis* FAIN, LUKOSCHUS and NADCHATRAM, 1980: 117-119 (figs. 21-24)

This species was described from *Chiropodomys gliroides* (Murinae) from Malaysia (FAIN *et al.*, 1980). We depict here the tritonymph of this species for the first time from the type series.

Myobia (*Myobia*) *hyatti* FAIN, 1973
(Fig. 40)

Myobia (*Myobia*) *hyatti* FAIN, 1973b: 619, 1974b: 458-460 (figs. 13-15)
This species have been described from *Vandeleuria oler-*



Figs. 31-33 — *Idiurobia idiuri* (FAIN, 1973), male. Dorsal view (31), genital shield (32), leg I in dorsal view (33). Scale lines 100 μm (fig. 31) and 50 μm (figs. 32-33).

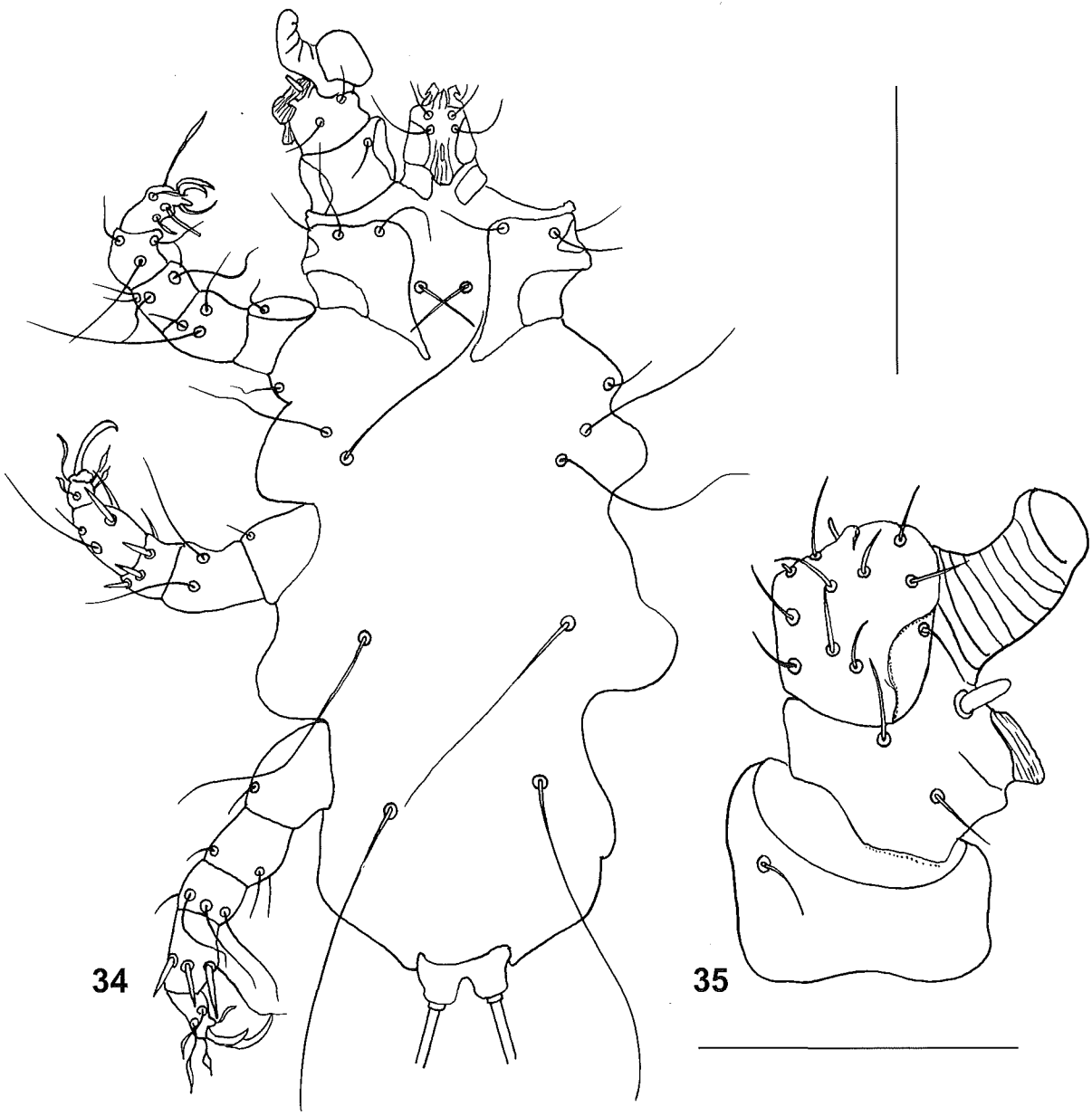
acea (Murinae) from India (FAIN, 1973, 1974). We depict here the tritonymph of this species from the type series for the first time.

Myobia (Myobia) afromuris FAIN, 1972
(Fig. 41)

Myobia afromuris FAIN, 1972c: 31 (figs 31-34)

Material examined. 3 males, 2 females and 5 TN from *Grammomys surdaster* (Murinae) (specimen n 78-39-M-666), Congo, Park National Albert. 2 males, 3 females and 2 TN from *Grammomys dolichurus* (specimen n 80-11-M-1010), Congo, Park National Albert.

This species has been described from different African murines, *Praomys jacksoni* (type host), *Grammomys surdaster* and *Mus minutoides* from Angola (Fain, 1972c).



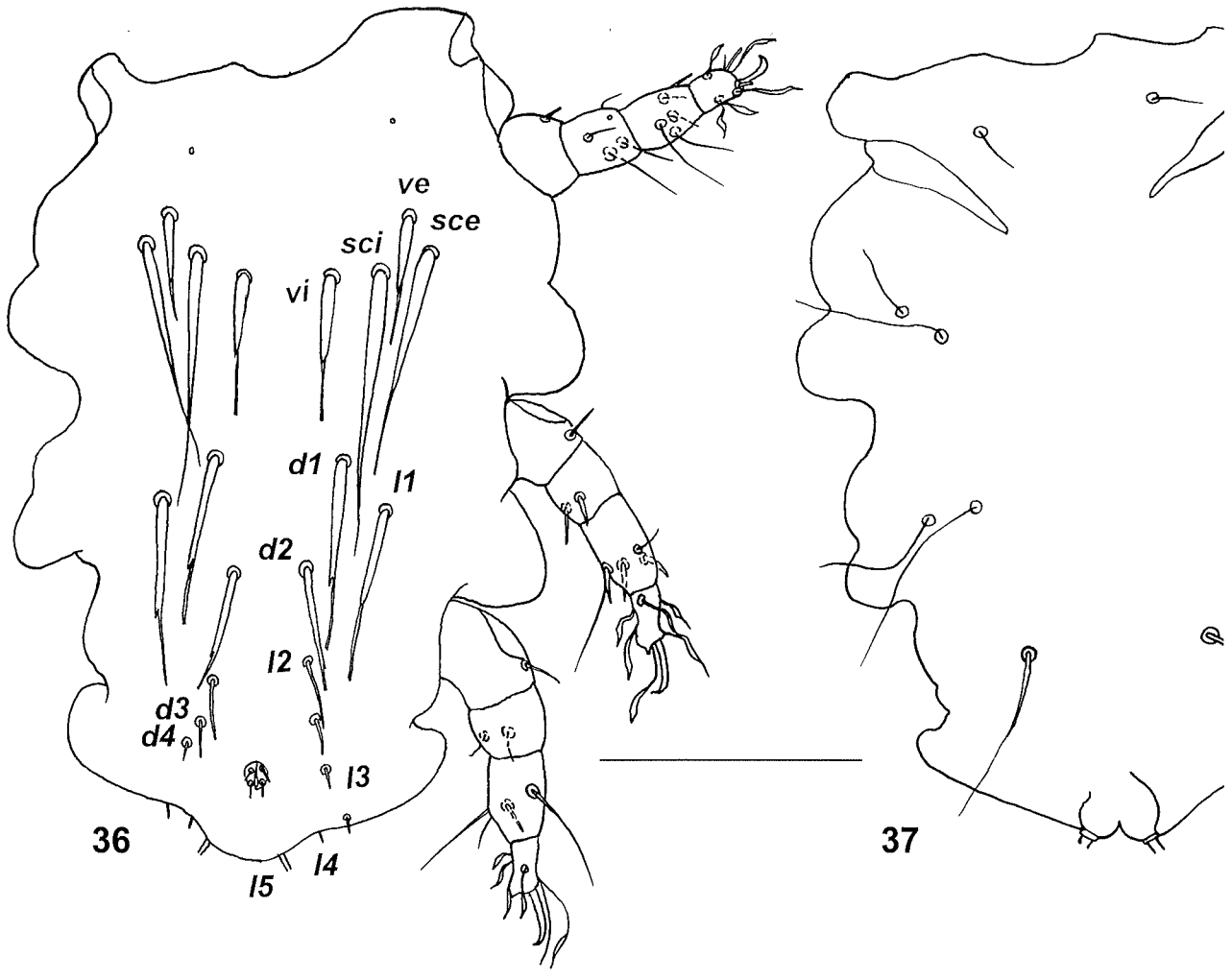
Figs. 34-35 — *Idiurobia idiuri* (FAIN, 1973), male. Ventral view (34), leg I in ventral view (35). Scale lines 100 μm (fig. 34) and 50 μm (fig. 35).

We depict here the tritonymph of this species from *Grammomys surdaster* for the first time.

Subgenus *Otomyobia* subgen. nov.

Gnathosoma elongated, its length about 1.5-2 times longer than maximal width. *Female*. Setae *d3, d4* and *l3* short, hair like. *Tritonymph*. Setae *ic2* and *ic3* relatively long, about 50. Anal setae lacking. Leg chaetotaxy II-IV (number of solenidia between brackets): coxae 1-1-0, trochanters 1-1-1, femora+genu 3(1)-1-1, tibiae 5-3-3, tarsi 7(1)-6-6. Tarsi II-IV with claw. Coxae I with 2 scarcely visible setae.

Differential diagnosis. *Otomyobia* **subgen. nov.**: In adults, the gnathosomal length is about 1.8 times more than width; in female, the setae *d3, d4* and *l3* are short,



Figs. 36-37 — *Idiurobia idiuri* (FAIN, 1973), tritonymph. Dorsal view (36), ventral view (37). Scale line 100 μm.

hair like; in tritonymph, the setae *ic2* and *ic3* are relatively long (about 50), the setae *cxII1* and *cxIII1* present, well developed.

Myobia s.str.: In both sexes, the gnathosomal length and width are subequal; in female, the setae *d3, d4* and *l3* are lanceolate; in tritonymph, the setae *ic2* and *ic3* are microsetae, the setae *cxII1* and *cxIII1* are lacking.

Type species: *Myobia otomyia* LAWRENCE, 1951.

This genus includes the type species only.

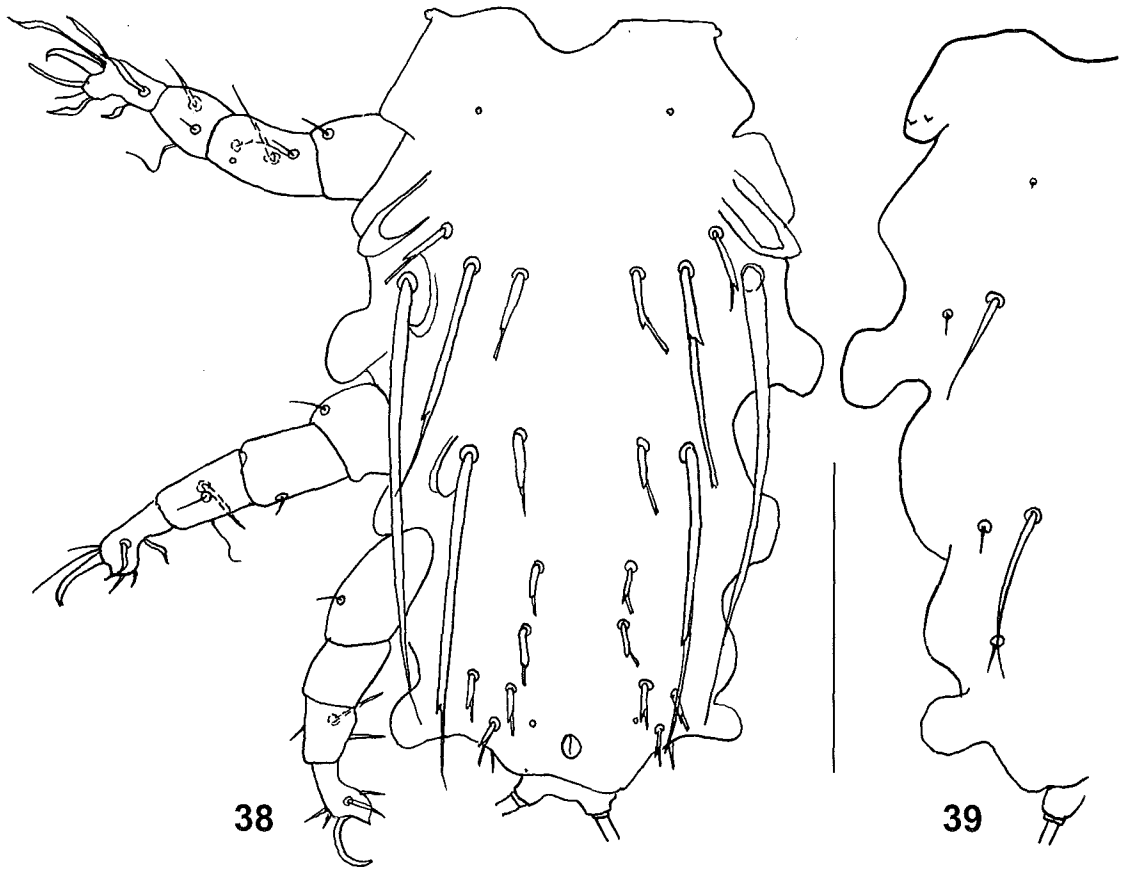
Myobia (*Otomyobia*) *otomyia* LAWRENCE, 1951
(Fig. 42-45)

Myobia otomyia LAWRENCE, 1951: 109 (fig. 14-15)
Myobia (*Myobia*) *otomyia*, FAIN, 1978a: 168-169 (figs 199-202)

Material examined. 3 females and 2 TN from *Otomys irroratus* (specimen from MRAC), Congo, Park National Albert.

This species was described from *Otomys irroratus* from the South Africa (LAWRENCE, 1951). Later on, FAIN (1978a) redescribed this species based on the type material. It should be noted that the membranous setae *ra* in the holotype female which were depicted by FAIN (1978: fig. 200, p. 169) are actually hair-like in their shape (Fig. 43). Probably, these setae are overlapped with the well developed hypostomal membranes in the type specimen. We give below a description of the tritonymph for the first time.

Tritonymph (3 specimens). Length of setae: *vi* 33-35, *ve* 28-30, *sci* 35-40, *sce* 100-115, *d1* 25-30, *d2* 29-35, *l1* 100-105, *l2* 80-85 and *l3* 79-82 - all lanceolate; *d3* 20-23 and *d4* 16-18 slightly thickened; *d5* and *l4* about 3-5; ic1 20-25; *ic2* and *ic3* about 50 – all slightly thickened; *ic4* microsetae.



Figs. 38-39 — *Myobia* (*Myobia*) *malaysiensis* FAIN, LUKOSCHUS et NADCHATRAM, 1980, tritonymph. Dorsal view (38), ventral view (39). Scale line 100 μm.

Genus *Austromyobia* LAWRENCE, 1954

Subgenus *Dendromyobia* BOCHKOV, 1997

This subgenus includes two species associated with rodents of the subfamily Dendromurinae (Muroidea *s.l.*) (BOCHKOV, 1997c).

Austromyobia (*Dendromyobia*) *mesomelas* (FAIN et LUKOSCHUS, 1976)

(Fig. 46)

Radfordia (*Austromyobia*) *mesomelas* FAIN and LUKOSCHUS, 1976: 178; 1977: 24 (figs 11, 12)
Radfordia (*Dendromyobia*) *mesomelas*, BOCHKOV, 1997c: 701
Austromyobia (*Dendromyobia*) *mesomelas*, BOCHKOV, 1999: 771

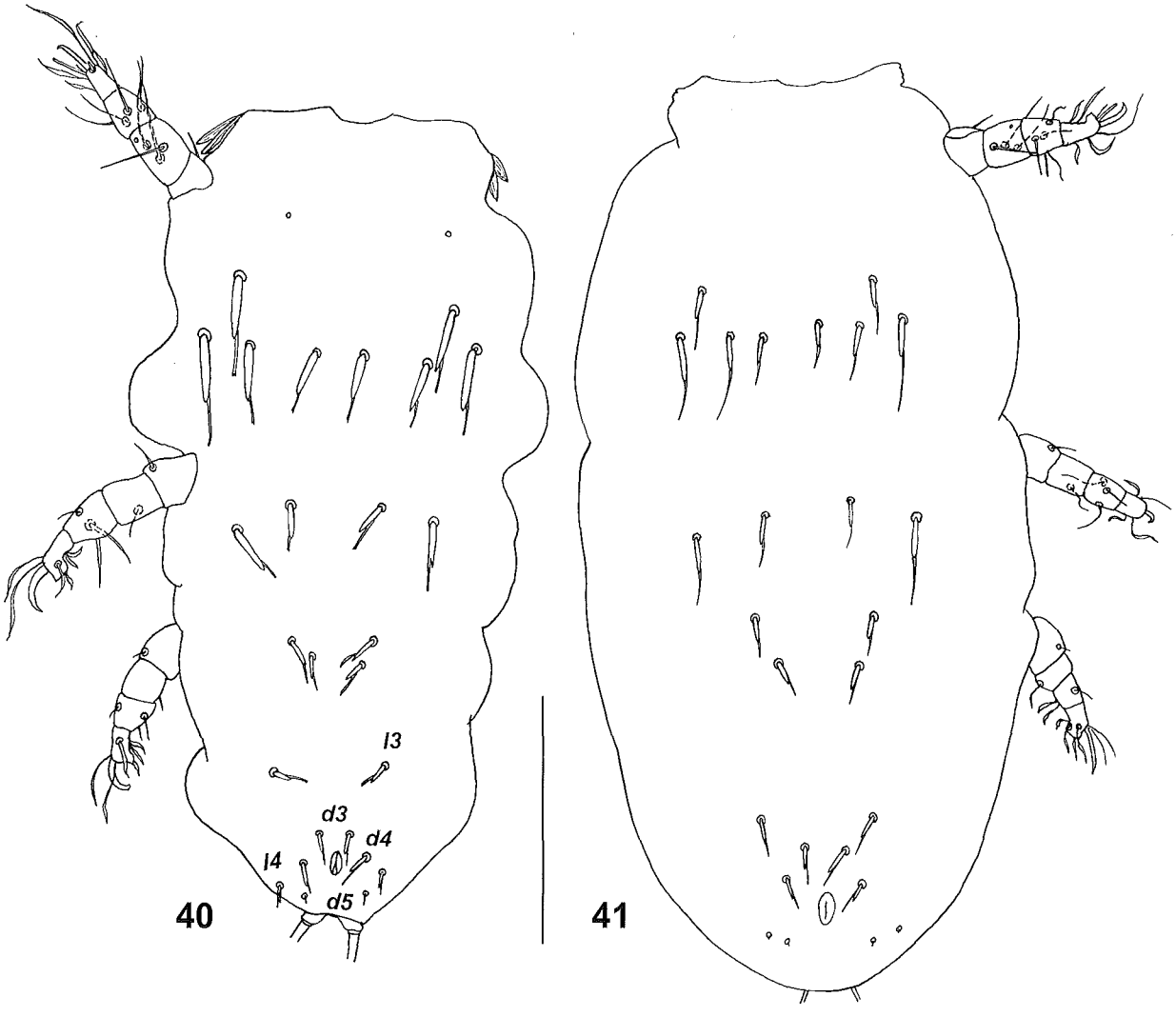
Material examined. 2 females and 4 TN from *Dendromus mesomelas* (Dendromurinae) (specimen n 38412 MRAC) from Zaire.

This species was described from *Dendromus mesomelas* from the South East Africa (FAIN and LUKOSCHUS, 1976, 1977). The tritonymph is described here for the first time.

Tritonymph (5 specimens). Stylets of chelicerae dentate. Length of setae: *vi* 15-20, *ve* 30-35, *sci* 30-35, *sce* 40-45, *d1* 14-18, *d2* 17-19, *d3* and *d4* 14-17, l1 60-65, *l2* 17-19, *l3* 12-15 - all narrowly lanceolate; *d5* and *l4* microsetae; *ic1* 10-12, *ic2* 60-65, *ic3* 65-70 - all hair like; *ic4* 16-18 - slightly thickened. Anal setae present. Leg I bilaterally asymmetrical. Leg chaetotaxy II-IV (number of solenidia between brackets): coxae 2-1-1, trochanters 1-1-1, femora+genu 3(1)-1-1, tibiae 5-3-3, tarsi 7(1)-6-6. Tarsi II-III with claw, tarsi IV without claw. Coxae I with 2 well developed scale-like setae.

Genus *Radfordia* EWING, 1938

This genus includes nine subgenera, six of them occur on rodents of the subfamily Murinae (Muridae) or on closely related taxa of an uncertain taxonomic status from the Tropical Africa (BOCHKOV, 1999b). The taxonomic status



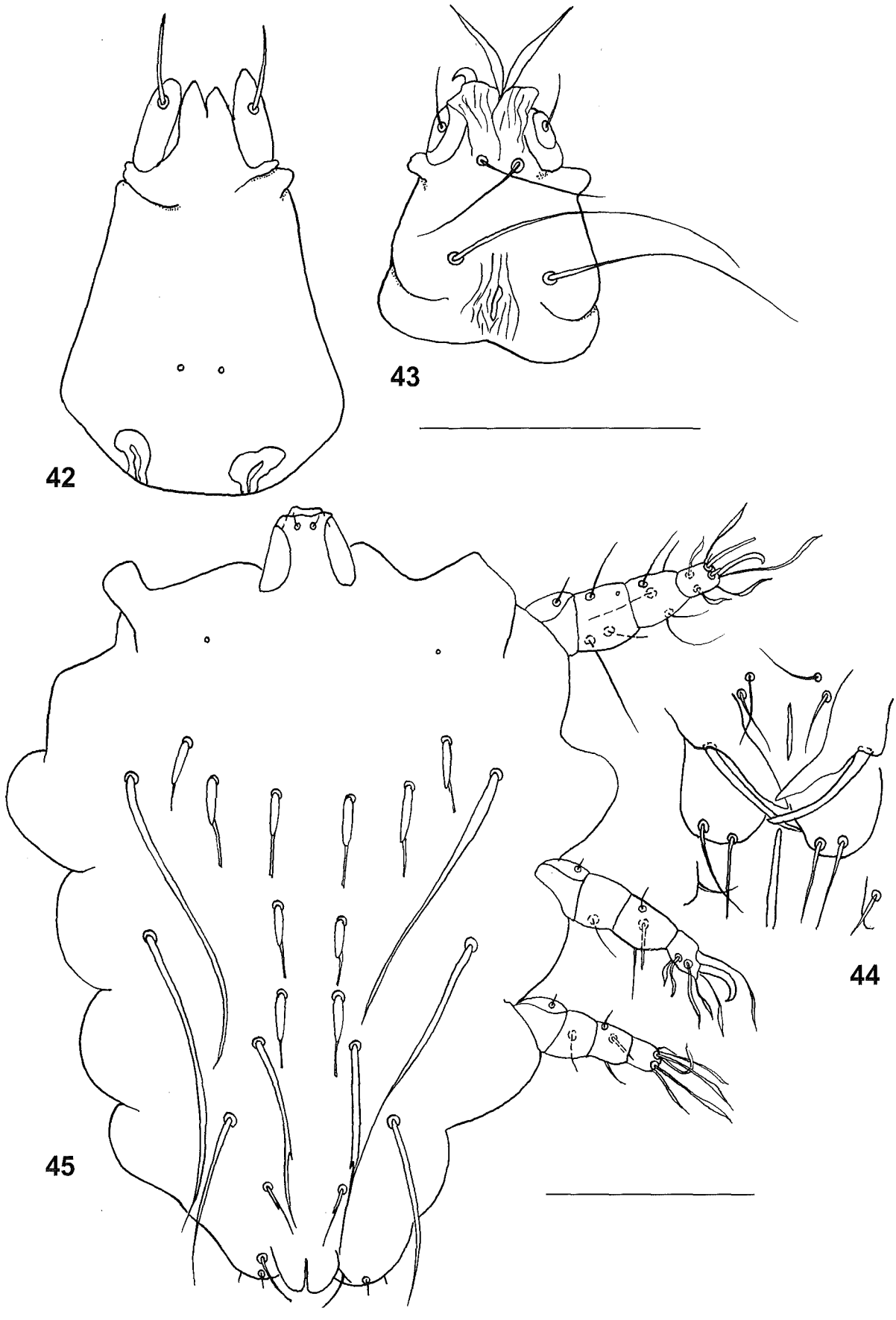
Figs. 40-41 — *Myobia* tritonymphs in dorsal view. (*Myobia*) *hyatti* FAIN, 1973 (40), *Myobia* (*Myobia*) *afromuris* FAIN, 1972 (41). Scale line 100 μm.

of the three subgenera, *Radfordia* s.str., *Rattimyobia* FAIN *et al.*, 1980 and *Syconycterobia* FAIN, 1973 is not contestable. Differences between these taxa are most well expressed in the females, males and immatures. The males and immatures of the monotypical subgenera *Lophurmyobia* FAIN, 1973 and *Hystricomyobia* FAIN, 1974 have not been described until now.

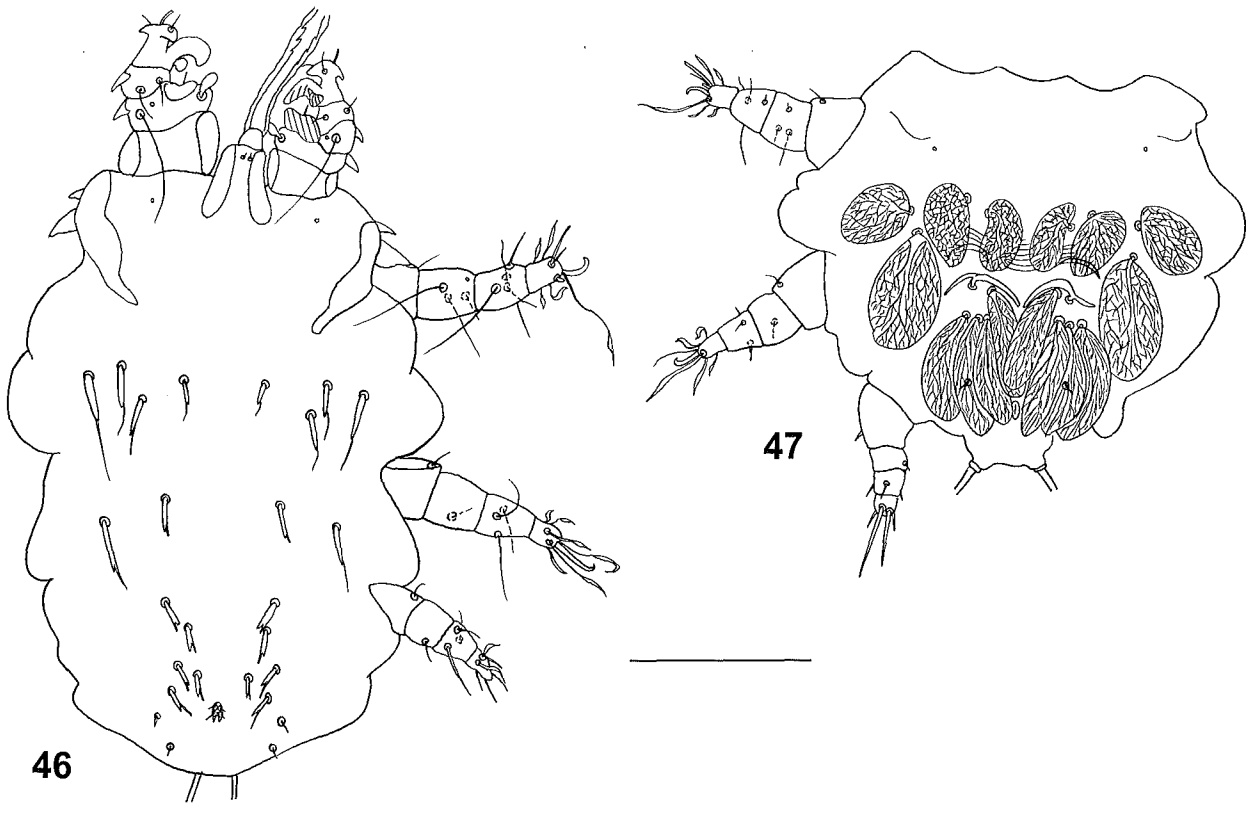
The new morphological data obtained from the study of male and immature instars allow to examine the phylogenetic relationships of these subgenera and to re-estimate their taxonomical status.

Among the species of the subgenus *Radfordia* s.str., *Radfordia acomys* FAIN et LUKOSCHUS, 1996 and *Radfordia petromyscus* LUKOSCHUS *et al.*, 1986 were treated as species groups, "*acomys*" and "*petromyscus*", respectively (BOCHKOV and FAIN, 1997). Both species differ clearly from each other and from the other species of the subgenus. Therefore we establish for them two new subgenera *Acomyobia* **subgen. nov**. and *Petromyobia* **subgen. nov**.

The subgenus *Hylomyscobia* includes 4 species and is obviously heterogeneous. In three species of them, including the type species *Radfordia hylomyscus* FAIN, 1972, the trochanters II-III bear 3 setae, the setae of coxae III are absent and the setae *ic2-ic4* are short. These mites are associated with rodents of closely related genera *Hylomyscus* and *Zelotomys* belonging to the section "*Rattus*" (Murinae). In *Radfordia grammomys* FAIN, 1972, the fourth species of the subgenus *Hylomyscobia*, the trochanters II-III bear 2 setae, the coxae III have one seta and the setae *ic2-ic4* are long. This species parasitize rodents of the genus *Grammomys*, which belongs to the section "*Arvicantis*" (Murinae). We think, that the first three species should be treated as the subgroup



Figs. 42-45 — *Myobia* (*Otomyobia*) *otomyia* LAWRENCE, 1951. Gnathosoma of female in dorsal view (42), same in ventral view (43), vulva (44), tritonymph in dorsal view (45). Scale lines 100 μm (figs. 42-44) and 50 μm (fig. 45).



Figs. 46-47 — Tritonymphs in dorsal view. *Austromyobia* (*Dendromyobia*) *mesomelas* (FAIN et LUKOSCHUS, 1976) (46), *Radfordia* (*Radfordia*) *pogonomys* FAIN et LUKOSCHUS, 1976 (47). Scale line 100 μm.

''*praomys*'', within the species group ''*affinis*'', subgenus *Radfordia* s.str. The short dorsal setae of the trochanters III-IV is a single difference between these species and the other representatives of the subgroup ''*praomys*''. The length of these setae is a variable character and in the species *R. bukokoensis* (from the former subgenus *Hylomyscus*) they are only slightly shorter than in some species of the subgroup ''*praomys*''. Furthermore, according these new data, the structure of the immatures of *R. bukokoensis* does not differ from that in the other species of *Radfordia* s.str. Therefore, we include here these three species to the subgroup ''*praomys*''. While, the last species, *R. grammomys* differs from the species of the subgenus *Radfordia* s.str. only by the absence of the dorsal seta on the trochanters III-IV. Other characters of this species correspond to these in the species group ''*ensifera*'', subgroup ''*angolensis*''. Therefore, we include this species into the species subgroup ''*angolensis*'' of the nominative subgenus, and we consider the subgenus *Hylomyscomyobia* **syn. nov**. as an junior synonym of the subgenus *Radfordia* s.str.

The subgenus *Lophurmyobia* can be distinguished from the typical *Radfordia* s.str. species by the following characters: In adults of the *Lophurmyobia*, the gnathosoma has the lateral lobes, the genu III bears 5 setae, the coxae III and IV are without setae; in the male, the genital shield oval, with 4 pairs of setae, the setae *d1* and *d2* are flanked this shield; in the tritonymph, the anal slit is covered with the cuticular folds.

A single species of the subgenus *Hystricomyobia*, *Radfordia hystricosa* FAIN, 1972, differs from the typical species of the subgenus *Radfordia* s.str. only by the extremely long dorsal setae of idiosoma. However, the relationships of this species with the representatives of the species group ''*ensifera*'' of the subgenus *Radfordia* s.str. are obvious. Therefore we include here this species into this group as the separate subgroup ''*hystricosa*''and consider the subgenus *Hystricomyobia* **syn. nov.** as a junior synonym of *Radfordia* s.str.

Finally, the species group ''*subuliger*'' has been established for the three species from rodents of the subfamily Neotomynae (Sigmodontidae) within the nominative subgenus (FAIN and BOCHKOV, 2002). This group shows the intermediate characters between the subgenera *Radfordia* s.str. and *Hesperomyobia*. Probably, a new subgenus may be established for this group after the finding of its immature instars, which are still unknown. Therefore, we consider conventionally this group as a group *incertae sedis* within the genus *Radfordia*.

Thus, after recombinations listed above, we separate the genus *Radfordia,* onto the nine subgenera, including the two newly recognized subgenera; the subgenera *Hystricomyobia* and *Hylomyscobia* are synonymized with the subgenus *Radfordia* s.str.

Subgenus *Radfordia* s.str.

This subgenus includes now two species groups, "*ensifera*" and "*affinis*"; both are associated with rodents of the subfamily Murinae (BOCHKOV and FAIN, 1997). The group "*ensifera*" consists of the four subgroups: "*ensifera*", newly recognized "*hystricosa*" with a single species, "*malacomys*" and "*angolensis*". The group "*affinis*" consists of the two subgroups: "*affinis*" and "*praomys*". The name of the former group should be changed, because the species *Radfordia affinis* (POPPE, 1896), as it is shown by the present study, actually belongs to the "*praomys*" subgroup. Therefore, we give here a new name "*lancearia*" for the former "*affinis*" group and subgroup, respectively. The data on the host distribution and locality of the *Radfordia* s.str. species are summarized in the Table 5.

Definition. Gnathosoma without lobes and it bears full set of setae, *rp, ra* and *rd* - all hair-like. Idiosoma elongated. Chaetotaxy of legs II-IV (number of solenidia between brackets): coxae 3-2-0 or 1-1, trochanters 3-3-3 (3-2-2 in *R. grammomys*), femora 5-3-3, genua 7(1)-6-5, tibiae 6-6-6 and tarsi 7(1)-6-6. Dorsal seta of trochanters III-IV whip-like.

Female. Vulva with well developed lobes and full set of setae (*g1-g3, ai, ae*), setae *g3* claw -like. Paragenital setae *pg1, pg2* and *pg3* - short, hair like. Chaetotaxy of idiosoma: *vi, ve, sci, sce, d1, d2, l1, l2* - always lanceolate; *d3, d4, l3*- in different shape, mostly hair-like; *d5, l4, ic1- ic4* - hair-like; in some species *ic2-ic4* -whip-like; *l5* - whip-like.

Male. Genital shield conical. It bears 3 pairs of genito-anal setae and also 2 pairs of setae (*d1* and *d2*) situated immediately behind this shield. Chaetotaxy of idiosoma: *ve, sce, l1* - lanceolate; *vi, sci, d5, l3* and *l4* - in different shape; *l5* - whip-like. Seta *sci* far distant from *sce,* distances *sci-sce* and *sci* -genital shield subequal. Striated seta of tibiotarsus I inflated.

Tritonymph. Gnathosoma with a pair of microsetae *rd* dorsally and *rp* ventrally. Idiosomal dorsum with 8-14 pairs of setae of different shape. Setae *l5* whip-like, situated ventrally. Anal slit without setae or with vestigial ones, naked. Legs I bilaterally symmetric. Legs IV in different shape. Chaetotaxy of legs II-III (number of solenidia between brackets): coxae 1-0-, trochanters 1-1, femur+genua 3(1)-1, tibiae 4-3, tarsi 7(1)-6. Coxae I with two pairs of small scale-like setae. Tarsi II-III with 1 claw, tarsi III without claws.

Species group "*ensifera*"

Coxal chaetotaxy 3-2-1-1

Species subgroup "*ensifera*"

Setae *ic2-ic4* short. In female, setae *d1, d2* and *l2* foliate, the seta *d2* bases 2 times close to *l2* than to *d1*; setae *l3* short, mostly hair-like. In tritonymph, setae *d5, l4* lacking.

It includes 11 species from the Oriental, New Guinea and Australian rodents of the subfamily Murinae.

Radfordia (*Radfordia*) *pogonomys* FAIN et LUKOSCHUS, 1976
(Fig. 47)

Radfordia (*Radfordia*) *pogonomys* FAIN et LUKOSCHUS, 1976: 177, 1978: 36-39 (figs. 30-35)

This species was described from the ancient New-Guinea endemic, *Pogonomys loriae* (Murinae) (FAIN and LUKOSCHUS, 1976, 1977). We depict here the tritonymph of this species based on a type series for the first time.

Species subgroup "*angolensis*"

Setae *ic2-ic4* whip-like. In female, setae *d1, d2* and *l2* lanceolate, the distance between seta *d1-d2* and *d2-l2* bases subequal; setae *l3* short, mostly hair-like. In tritonymph, setae *d5, l4* present.

We consider the species *Radfordia chrysophila* CURFS *et al.,* 1986 **syn. nov.** as a junior synonym of *Radfordia angolensis* FAIN, 1972. These mites are described from *Aethomys chrysophilus* (Murinae) from South Africa. The insignificant differences in measurements between these species are probably the result of individual variability.

One more species, *Radfordia grammomys* **comb. nov.** is added here to this subgroup.

Thus, the subgroup includes four species parasitizing the African rodents of the genera *Aethomys* and *Grammomys* (Murinae).

Radfordia (*Radfordia*) *thamnomys* FAIN, 1972
(Fig. 48)

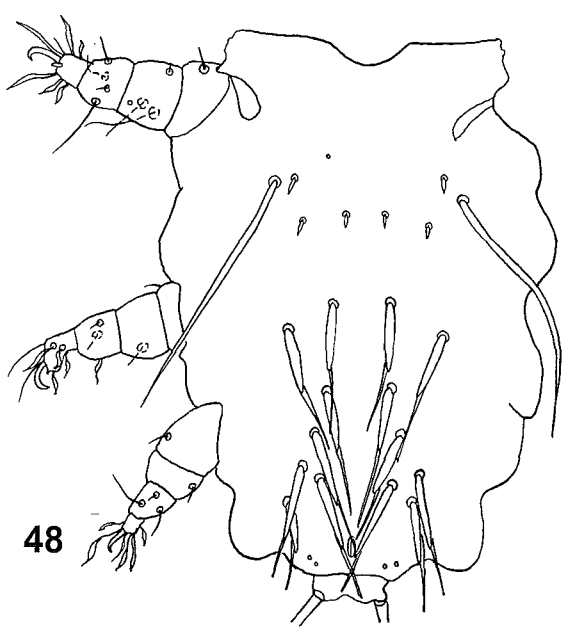
Radfordia thamnomys FAIN, 1972c: 46-47 (figs 47-48)

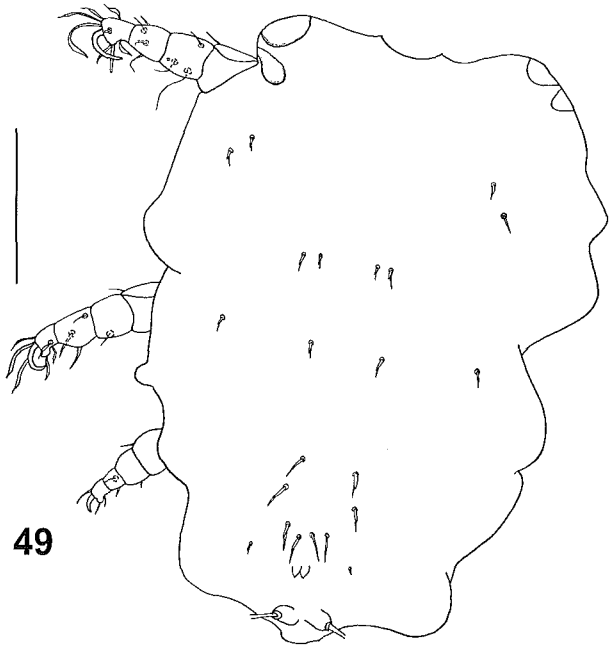
This species has been described from *Grammomys rutilans* (Murinae) from Angola (FAIN, 1972c). We depict here the tritonymph from the type series for the first time.

Species subgroup "*malacomys*"

Setae *ic2-ic4* short. In female, setae *d1, d2* and *l2* lanceolate, the distance between seta *d1-d2* and *d2-l2* bases subequal; setae *l3* short, hair-like. In tritonymph, setae *d5* and *l4* lacking.

The subgroup includes two species parasitizing the African rodents of the genus *Malacomys* (Murinae)





Figs. 48-49 — Tritonymphs in dorsal view. *Radfordia* (*Radfordia*) *thamnomys* FAIN, 1972 (48), *Radfordia* (*Radfordia*) *malacomys* FAIN, 1972 (49). Scale line 100 μm.

***Radfordia* (*Radfordia*) *malacomys* FAIN, 1972**
(Fig. 49)

Radfordia malacomys FAIN, 1972b: 148, 1978a: 153-155 (figs 181-185)

Material examined. 2 TN from *Malacomys longipes* (Murinae) (specimen n 97-009-M-2609), Zaire, Basiana.

This species was described from *Malacomys* sp. and *Malacomys longipes* from Zaire and Angola (FAIN, 1978a). We depict here the tritonymph of this species from *Malacomys longipes* for the first time.

Species subgroup "*hystricosa*"

Setae *ic2-ic4* short. In female, setae *d1, d2* and *l2* lanceolate, the distances between seta *d1-d2* bases and seta *d2-l2* bases subequal; setae *l3* lanceolate. In tritonymph, setae *d5, l4* lacking, anal setae vestigial.

This new subgroup differs from all other subgroups by the extremely long dorsal setae, especially long and lanceolate setae *l3* in the female. It differs from subgroup "*ensifera*" by the lanceolate setae *d1, d2* an *l2* setae and by the subequal distances between bases of these setae in the female. It differs from "*angolensis*" by the short setae *ic2-ic4* in female and by the absence of the setae *d5, l4* and anal setae in the tritonymph.

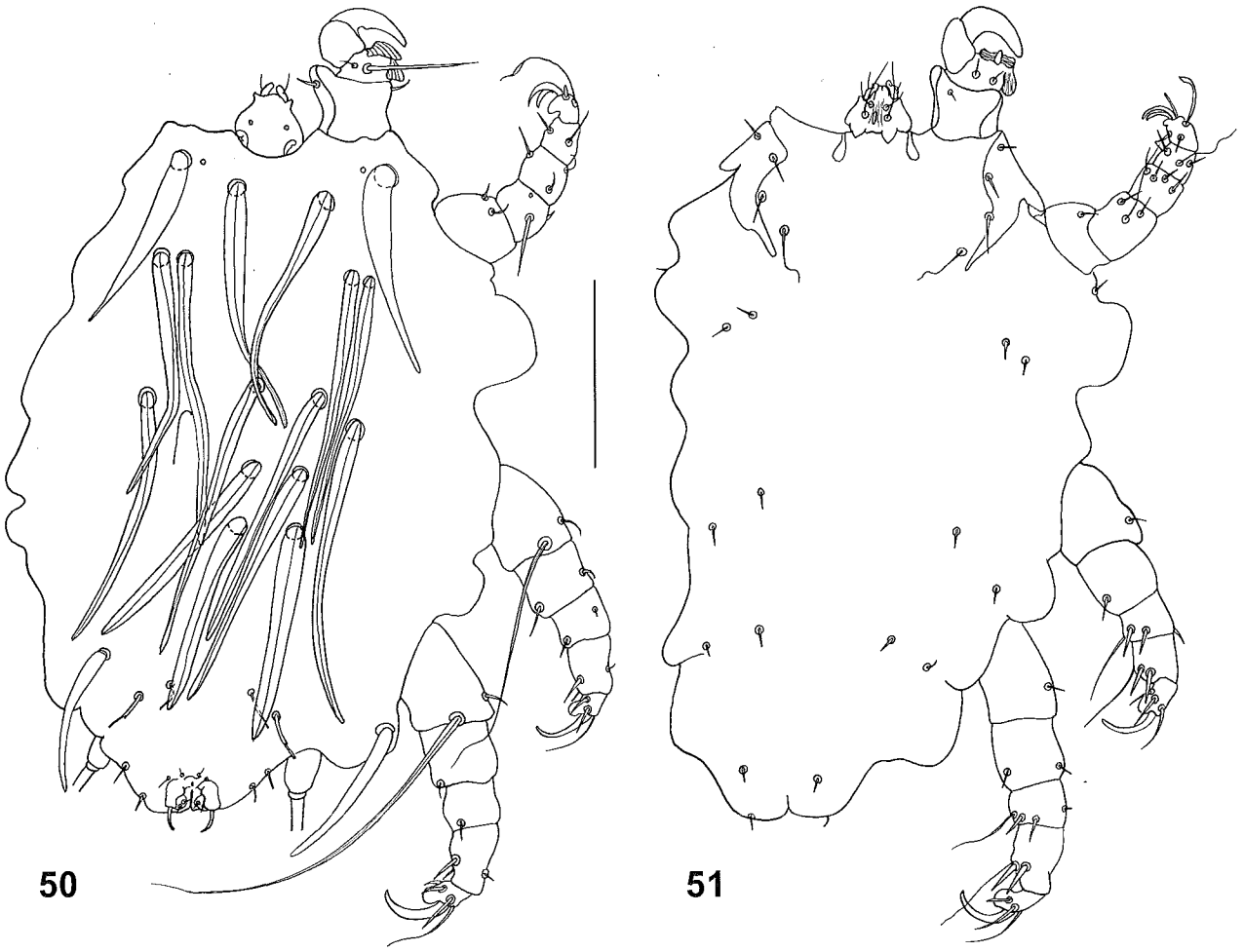
***Radfordia* (*Radfordia*) *hystricosa* FAIN, 1972 comb. nov.**
(Figs. 50-54)

Radfordia (*Radfordia*) *hystricosa* FAIN, 1972b: 149
Radfordia (*Hystricomyobia*) *hystricosa*, FAIN, 1974b: 449-450; 1978a: 164-166 (figs. 197, 198)

Material examined. 1 male and 2 females from *Stochomys longicaudatus* (specimen n 95-051-M-1671 MRAC) from Masako, Zaire. 2 females and 2 TN from the same host (specimen 95-051-M-1673 MRAC) and from the same locality. 1 male and 2 females from the same host and locality.

This species was described by FAIN (1972) from *Stochomys longicaudatus* (Murinae) from Rwanda. The male and immature stages of this species were unknown (FAIN, 1978a). We give below a description of the male and tritonymph for the first time.

Male. Body length including gnathosoma 295-310, width 175-180. Length of setae: *vi* 13-15, *ve*70-80, *sci* 35-40, *sce* 120-130, *l1* 140-150, *l3* 50-52, *l4* 10-13, *d1* 40-45, *d2* 40-45, *d5* 35-40 - all lanceolate, *l3* and *d5* with multifurcate apices; setae *ic1-ic4* short, hair-like. Aedeagus 115-145 long. Genital shield conical. It bears 3 pairs of genito-anal setae, 2 pairs of lanceolate setae *d1-d2* 40-45 (Fig. 53). Seta *sci* situated closer to *sce* than to the genital



Figs. 50-51 — *Radfordia* (*Radfordia*) *hystricosa* FAIN, 1972 **comb. nov.**, female. Dorsal view (50), ventral view (51). Scale line 100 μm.

shield. Striated seta of tibiotarsus I inflated. Chaetotaxy of legs II-IV (number of solenidia between brackets): coxae 3-2-1-1, trochanters 3-3-3, femora 5-3-3, genua 7(1)-6-5, tibiae 6-6-6 and tarsi 7(1)-6-6. Dorsal seta of trochanters III-IV whip-like.

Tritonymph. Gnathosoma with two pairs of microsetae, *rd* dorsally and *rp* ventrally. Idiosomal dorsum with 11 pairs of setae: *vi, ve, sce, sci, d1-d4, l1-l3*; setae *l4* and *d5* lacking. Setae *l5* whip-like, situated ventrally. Idiosomal venter: setae *ic1* short, hair-like; *ic2-ic4* microsetae. Anal slit with 2 pairs of vestigial setae, naked. Length of setae: *vi* 95-100, *ve* 125-140, *sci* 135-140, *sce* 120-125, *l1* 120-150, *l2* 55-57, *l3* 45, *d1* 95-105, *d2* 75-85, *d3* 55, *d4* 45 - all narrowly lanceolate. Legs I bilaterally symmetric. Legs IV normally developed. Chaetotaxy of legs II-IV (number of solenidia between brackets): coxae 1-0-0, trochanters 1-1-1, femur + genua 3(1)-1-1, tibiae 4-3-3, tarsi 7(1)-6-6. Coxae I with two pairs of small scale-like setae. Tarsi II-III with 1 claw, tarsi III without claws.

Species group "*lancearia*"

Coxal chaetotaxy 3-2-0-1

The immatures of *Radfordia elegantula* ZUMPT et COFFEE, 1971 are unknown. Therefore we consider this species as a species *incertae sedis* within this group.

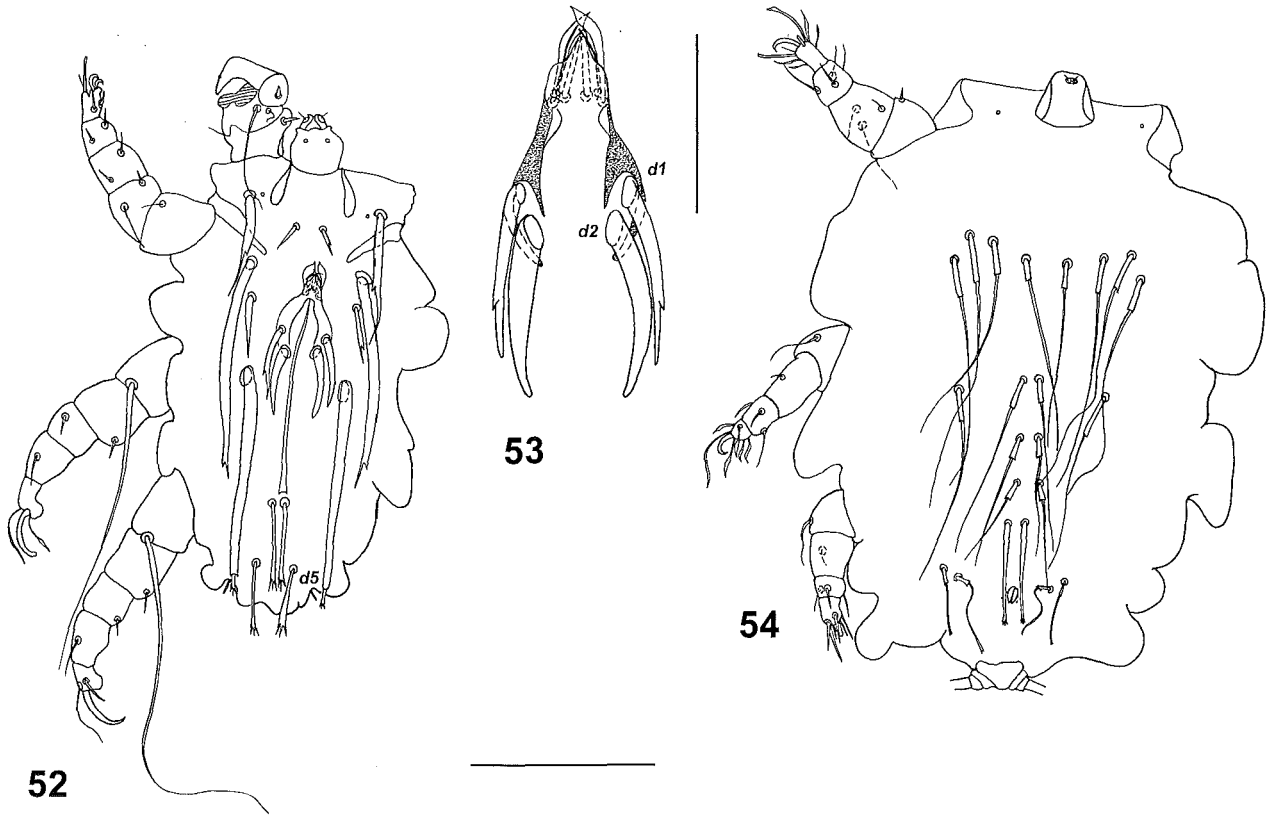
Subgroup "*lancearia*"

Setae *ic3* and *ic4* whip-like. Tritonymph. Setae *d1-d5* and *l1-l5* present. Legs IV normally developed, without spur.

The subgroup includes 2 species, the parasites of the genera *Mus* and *Apodemus* (Murinae)

Subgroup "*praomys*"

Setae *ic2-ic4* short, or only setae *ic4* whip-like. Tritonymph. Some dorsal idiosomal setae lacking. Legs IV strongly reduced with lateral spur.



Figs. 52-54 — *Radfordia* (*Radfordia*) *hystricosa* FAIN, 1972 **comb. nov.**, Male in dorsal view (52), genital shield of male (53), tritonymph in dorsal view (54). Scale lines 100 μm (figs. 52, 54) and 50 μm (fig. 53).

The species *Radfordia hylomyscus* FAIN, 1972, *R. zelotomys* FAIN, 1976 and *R. bukokoensis* FAIN and LUKOSCHUS, 1976 are added here to the subgroup "*praomys*".

Four new species are described here. The discriminative characters of these new species, being closely related to them *Radfordia praomys* and *R. daltoni,* are given in the Table 6.

It includes now 6 already described and 4 new species from a group of closely related African murines of the genera *Praomys, Myomyscus, Colomys* and others belonging to of the section "*Rattus*" (PAVLINOV, 2002).

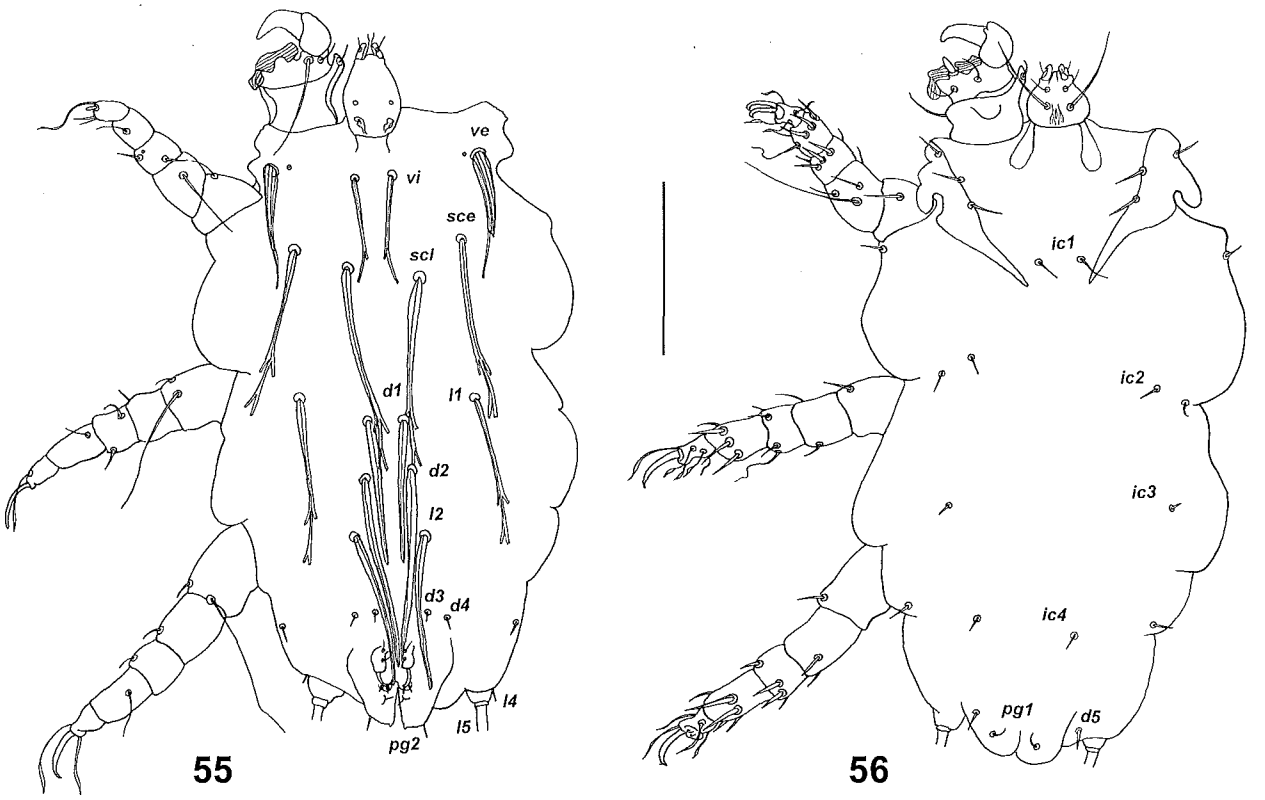
***Radfordia* (*Radfordia*) *colomys* sp. nov.**
(Figs. 55-58, 60)

Material examined. Holotype female, 11 paratypes, 3 males and 5 TN paratypes from *Colomys goslingi* (specimen 97-009-M-4647 MRAC), Zaire, Tshopo. Coll. M. COLYN. The holotype and most of the paratypes are deposited in MRAC.

Female. Body length, including gnathosoma, 370 (345-375 in 10 paratypes), width 208 (190-210). Length of setae: *vi* 52 (46-52), *ve* 62 (57-65), *sci* 105 (103-105), *sce* 87 (85-90), *d1* 80 (73-80), *d2* 105 (98-105), *l1* 85 (80-85), *l2* 80 (75-80), *pg2* 9 (5-9), *ic1* 11 (10-15), *ic2-ic4* very short. Width of setae: *vi* 4, *ve* 9, *sci* 6, *d1, d2, l1* and *l2* 3-4. Setae *sci, sce* and *l1* with pair of lateral barbs and bifurcate apices. Dorsal seta of trochanters III and IV about 75 in length; seta *cxIV1* situated laterally.

Male (3 paratypes). Body length, including gnathosoma, 273-297, width 165-178. Length of setae: *vi* 11-13, *ve* 40-45, *sci* 18, *sce* 73-87 and *l1* 87-92. Setae *d5, l3* and *l4* very short. Setae *vi* and *sci* setiform; setae *ve, sce* and *l1* narrowly lanceolate, with a pair of lateral barbs and bifurcate apices. Genital shield oval in shape (Fig. 58). Penis 75-82 in length. Setae *d1* and *d2* short lanceolate, about 10.

Tritonymph (5 paratypes). Setae *ve* 18-23 narrowly lanceolate, with a pair of lateral barb, *sce* 90-110 narrowly lanceolate, with a pair of lateral barbs and bifurcate apex, *vi* and *sci* very short, lanceolate, with a single lateral barb; *d3* 18-20 narrowly lanceolate with slightly bifurcate apex, *d4* 37-42 narrowly lanceolate, with forked apex; l3 with



Figs. 55-56 — *Radfodia* (*Radfordia*) *colomys* **sp. nov.**, female. Dorsal view (55), ventral view (56). Scale line 100 μm.

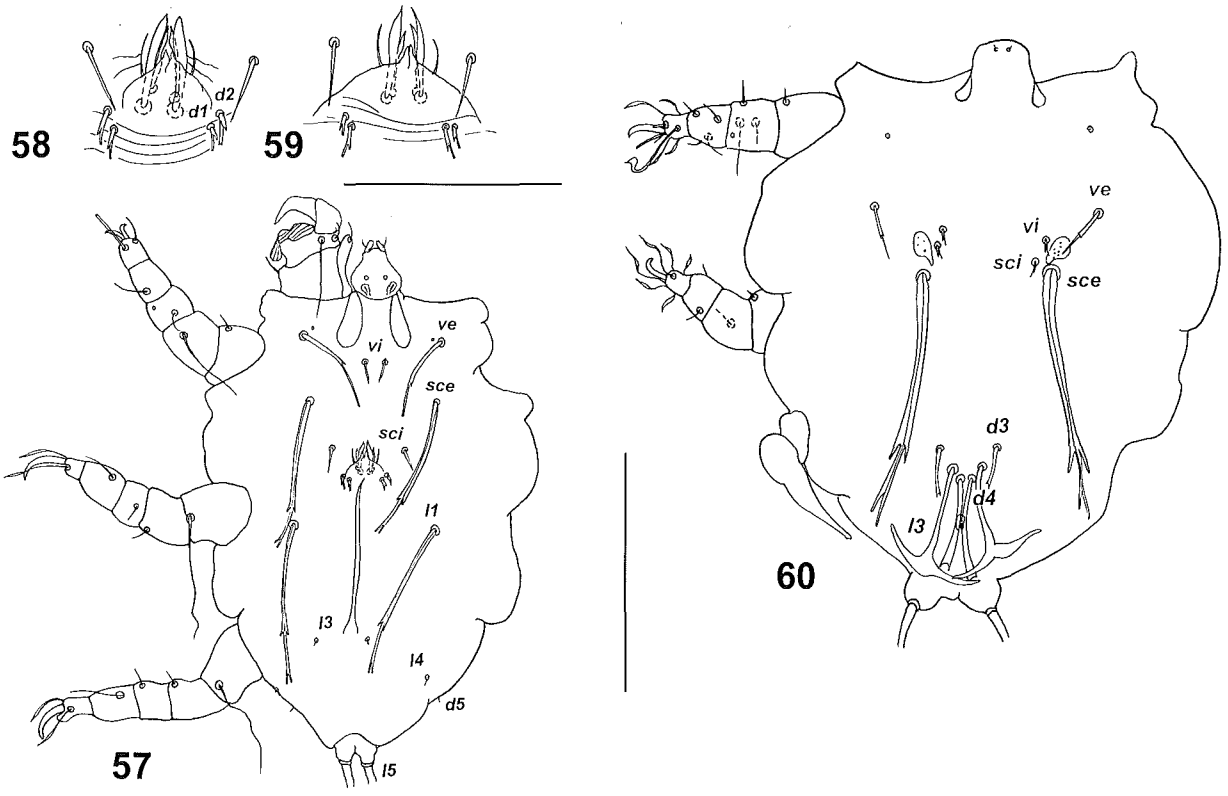
forked – foliate (anchor-like) apex (Fig. 60). There is a pair of small sclerotized plates situated anterior to base *sce* setae. Leg II-III chaetotaxy (number of solenidia between brackets): trochanters 1-1, femora + genua 3(1)-1, tibiae 4-3, tarsi 7(1)-6. Tarsi I-II with claw, coxae I with 2 scale-like setae. Legs IV with 3 segments without setae, its intermediate segment with well developed spur.

Differential diagnosis. This new species is closely related with *Radfordia praomys* from *Mastomys natalensis* and *Radfordia daltoni* SCHEPERBOER *et al.,* 1987 from *Myomyscus daltoni* from Ivory Coast (SCHEPERBOER *et al.,* 1987). Both sexes of *R. colomys* **sp. nov**. are clearly distinguished from these species by the bifurcate apices of the setae *sce* and *l1*. *R. colomys* **sp. nov**. differs from *R. praomys* and *R. daltoni* by the following characters. In the female of *R. colomys*, the setae *sci* are slightly longer than *sce*; in the male, the genital shield is oval, the setae *d1* and *d2* are subequal in length; in the tritonymph, the small sclerotized plates are present anteriorly to seta *sce* bases, the setae *vi* and *sci* are subequal in length. In the females of *R. praomys* and *R. daltoni,* the setae *sci* are slightly shorter than *sce;* in the males, the genital shield is conical (*R. praomys,* Fig. 59) or rectangular (*R. daltoni),* the setae *d1* are 1/3 of length *d2*; in the tritonymphs, the small sclerotized plates situated anterior to seta *sce* bases are absent, the setae *vi* are 2 times shorter than *sci* (*R. praomys*).

Radfordia (*Radfordia*) *dephomys* sp. nov.
(Figs. 61-63)

Material examined. Holotype female, 3 males and 3 females paratypes from *Dephomys defua* (Murinae) (specimen n 93-012-M-0229 MRAC), Ivory Coast. The holotype and most part of paratypes are deposited in MRAC.

Female. Body length, including gnathosoma, 380 (368-370 in 4 paratypes), width 200 (202-215). Length of setae: *vi* 45 (50-57), *ve* 48 (55-57), *sci* 62 (62-65), *sce* 85 (90-95), *d1* 80 (80-92), *d2* 105 (103-105), *l1* 110 (105-110), *l2* 80 (70-85), *ic1* 20 (18-20), *ic2-ic4* very short. Width of setae: *vi* 5, *ve* 9, *sci* 6, *d1, d2, l1* and *l2* 3-4. Setae *sci, sce* and *l1* with a pair of lateral barbs and bifurcate apices. Dorsal seta of trochanters III and IV about 65 in length; seta *cxIV1* situated laterally.



Figs. 57-60 — Species of "*praomys*" group. *Radfodia* (*Radfordia*) *colomys* **sp. nov.**, male in dorsal view (57), same, genital shield (58), *Radfordia (Radfordia) praomys* ZUMPT et COFFEE, 1971, genital shield (59), *Radfodia* (*Radfordia*) *colomys* **sp. nov.**,tritonymph in dorsal view (60). Scale lines 100 μm (fig. 57) and 50 μm (figs. 58-60).

Male (3 paratypes). Body length, including gnathosoma, 260-270, width 165-190. Length of setae: *vi* 9-11, *ve* 52-57, *sci* 11-13, *sce* 85-92 and *l1* 100-115. Setae *d5, l3* and *l4* very short. Setae *vi* and *sci* setiform; setae *ve, sce* and *l1* narrowly lanceolate, with pair of lateral barbs and bifurcate apices. Genital shield oval in shape (Fig. 63). Penis 80-85 in length. Setae *d1* 11-18, *d2* 6-9.

Differential diagnosis. This new species differs from *Radfordia colomys* by the length ratio of the setae *sci* and *sce*:in the female (1:1.3) and by the length ratio of the setae *d1* and *d2* in the male (2:1). It differs from the *Radfordia praomys*, *R. daltoni, R. derooi* **sp. nov.** and *R. delectori* **sp. nov**. by having the apices of the setae *sce* and *l1* bifurcate in both sexes.

Radfordia (*Radfordia*) *praomys* ZUMPT et COFFEE, 1971
(Fig. 59)

Radfordia praomys ZUMPT and COFFEE, 1971: 100 (figs 5, 6)
Radfordia (*Radfordia*) *praomys*, FAIN, 1978a: 150
Radfordia (*Radfordia*) *praomys trifurcata* FAIN, 1973a: 304, 1978a: 150 (fig. 180) **syn. nov.**

Material examined. 1 female, 1 male and 1 TN from *Mastomys natalensis* (Murinae) (specimen n 96-037-M-1050 MRAC), Tanzania. 1 female, 1 male and 1 TN from the same host (specimen 81 MRAC), Congo, 06.VI.1946.

According to the original description of FAIN (1973a), *Radfordia trifurcata* FAIN, 1973 differs from *Radfordia praomys* ZUMPT et COFFEE, 1971 by the presence of the two lateral barbs in some dorsal setae. Both species were found from one host, *Mastomys natalensis* (Murinae). Re-examination of large series from the type host has shown that these setae always have the lateral barbs, but in some specimens they setae may be situated in a such aspect that are almost invisible. Therefore we consider here *R. trifurcata* **syn. nov.** as a junior synonym of *R. praomys*.

Radfordia (*Radfordia*) *myomysci* **sp. nov.**
(Figs. 64-65)

Material examined. Holotype TN, 2 females, 4 males and 3 TN paratypes from *Myomyscus derooi* (Murinae) (specimen n 73-13-M-161 MRAC), Togo, Borgou. The ho-

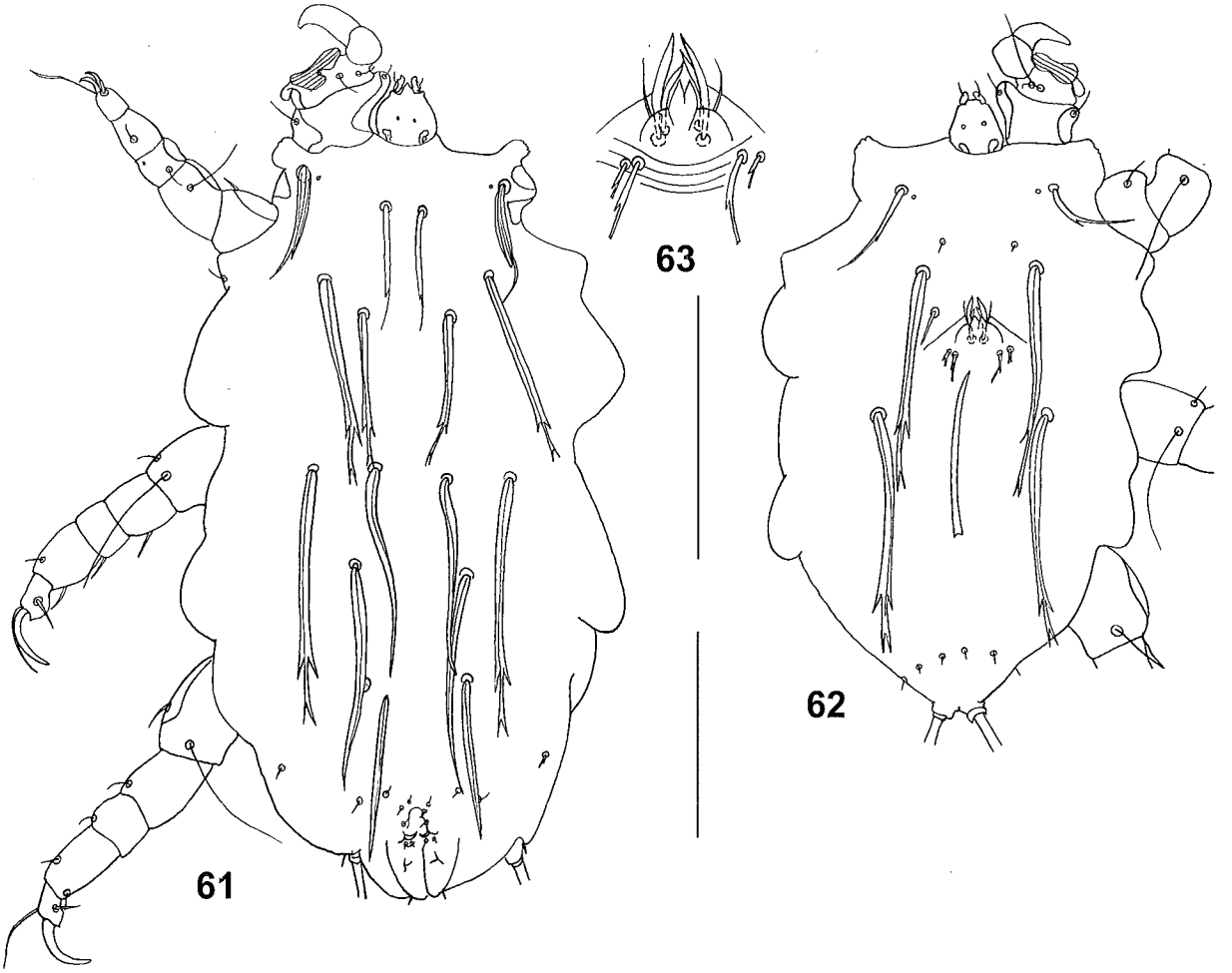


Fig. 61-63 — *Radfordia* (*Radfordia*) *dephomys* **sp. nov**. Female in dorsal view (61), male in dorsal view (62), genital shield of male (63). Scale line 100 μm (61, 62) and 50 μm (fig. 63).

lotype and most part of paratypes are deposited in MRAC.

The females and males of this species are not distinguished from *Radfordia daltoni*, while the tritonymphs are clearly different by the shape of the setae *d4* and *l3*.

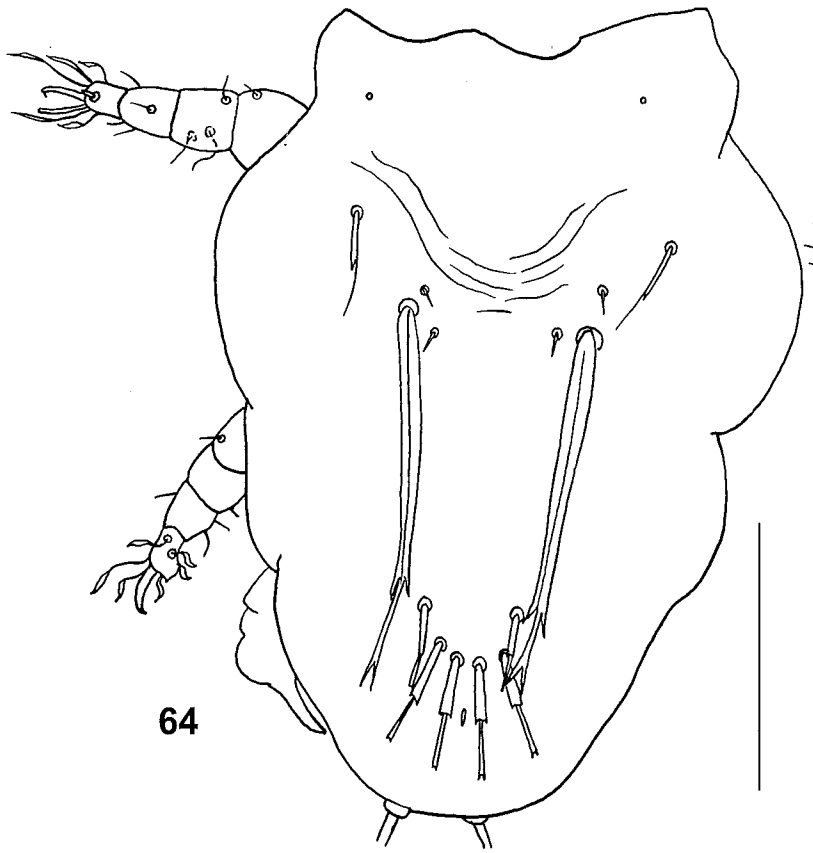
Tritonymph. Setae *ve* 25 (20-35 in 3 paratypes) narrowly lanceolate, with a single lateral barb, *sce* 105 (90-100) lanceolate, with a pair of lateral barbs and bifurcate apex, *vi* and *sci* very short, *d3* 23 (23-25), *d4* 40 (25-29) and *l3* 35 (27-35) - all similar in shape, lanceolate, with slightly bifurcate apex (Fig. 64). Small sclerotized plates situated anterior to base *sce* setae absent. Leg II-III chaetotaxy (number of solenidia between brackets): trochanters 1-1, femora+genua 3(1)-1, tibiae 4-3, tarsi 7(1)-6. Tarsi I-II with claw, coxae I with 2 scale-like setae. Legs IV primordial, with 3 segments without setae, its intermediate segment with well developed spur.

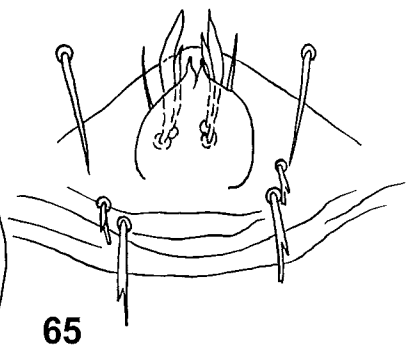
Differential diagnosis. The tritonymph of the new species differs from *R. daltoni* by having a similar shape of the setae *d4* and *l3*; the tips of these setae are devoid of bifurcation.

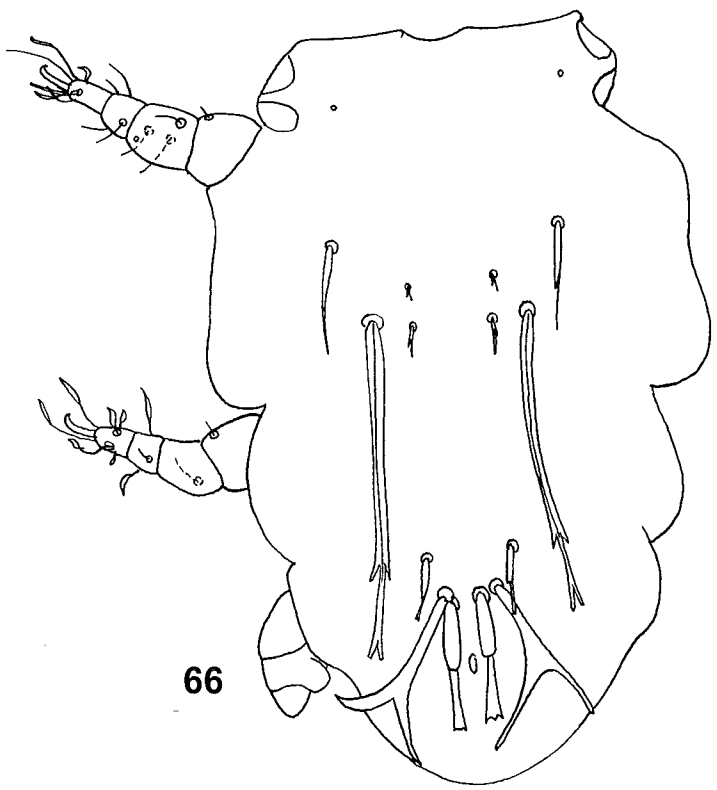
***Radfordia* (*Radfordia*) *delectori* sp. nov.**
(Figs 66-67)

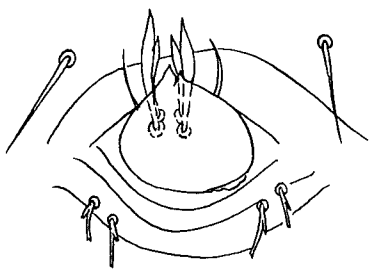
Material examined. Holotype TN, 10 females, 5 males and 3 TN paratypes from *Praomys delectorum* (Murinae) (specimen n 96-037-M-4841), Tanzania, Bungue, 9°10'S and 33°39'E. Coll. VERHEYEN. 1 female, 3 males and 1 TN from the same host (specimen n 96-037-M-4614 MRAC), Tanzania, Mbete. The holotype and most part of paratypes are deposited in MRAC.

The female and male of this new species are not distinguishable from *Radfordia praomys*, while the tritonymph









Figs. 64-67 — Species of "*praomys*" group. *Radfordia* (*Radfordia*) *myomysci* **sp. nov:** Tritonymph in dorsal view (64), genital shield of male (65). *Radfordia* (*Radfordia*) *delectori* **sp. nov**.: Tritonymph in dorsal view (66), genital shield of male (65). Scale lines 100 μm (figs. 64, 66) and 50 μm (figs. 65, 67).

clearly differs from this species by the poorly developed spur on the legs IV.

Tritonymph (4 paratypes). Setae *vi* 5 (5-9), *sci* 13-(13-16) and *ve* 35 (35-45) all with single lateral barb, *sce* 92 (89-115) with a pair of lateral barbs and bifurcate apex, *d3* 23 (23-34) narrowly lanceolate with slightly bifurcate apex, *d4* 45 (36-59) narrowly lanceolate, with bi- or trifurcate apex, *l3* with bifurcate-foliate apex as in Fig. 66. Small sclerotized plates situated anterior to base *sce* setae lacking. Leg II-III chaetotaxy (number of solenidia between brackets): trochanters 1-1, femora+genua 3(1)-1, tibiae 4-3, tarsi 7(1)-6. Tarsi I-II with claw, coxae I with 2 scale-like setae. Legs IV primordial, with 3 segments without setae; spur of the intermediate segment poorly developed (Fig. 66).

Remark. Within the "*praomys*" subgroup, the species *Radfordia praomys, R. delectori, R. daltoni* and *R. myomysci* are more closely related to each other than to the other species of this group. They infest rodents of the genera *Mastomys, Praomys* and *Myomyscus*. The species. *praomys* parasitizes rodents of the genus *Mastomys* and *Praomys*. Some mammologists include the genera *Mastomys* and *Myomyscus* into *Praomys* (QUMSIYEH *et al.*, 1990). Our data are indirectly support this point of view.

Radfordia (Radfordia) bukokoensis FAIN et LUKOSCHUS, 1976 comb. nov.

(Figs. 68-70)

Radfordia (*Hylomyscobia*) *bukokoensis* FAIN and LUKOSCHUS, 1976: 177-178; 1977: 29-33 (figs. 26-29).

Material examined. 2 males, 6 females and 2 TN from *Hylomyscus stella* (Murinae) (specimen in ZIN), Zaire, Masako.

This species was described from *Hylomyscus* sp. and *Hylomyscus stella* (Murinae) from Central African Republic (FAIN and LUKOSCHUS, 1976, 1977). The original description of the male was based on specimen in a bad condition. We give here figures of tritonymph for the first time (Fig. 70). It should be noted that in a contrast to the original description, the male of this species actually has the setae *l4* and *d5* and three pairs of setae on the genital shield (Figs. 68-69). The tritonympal structure does not differ from that in other species of the subgroup "*praomys*", except the serrate setae *l5* (Fig. 70).

Subgenus *Acomyobia* subgen. nov.

Definition. Gnathosoma without lobes, with full set of setae: *rp, ra* and *rd* - all hair-like. Idiosoma elongated. Chaetotaxy of legs II-IV (number of solenidia between brackets): coxae 3-1-0-0, trochanters 3-3-3, femora 5-3-3, genua 7(1)-5-5, tibiae 6-6-6 and tarsi 7(1)-6-6. Dorsal seta of trochanters III-IV whip-like.

Female. Vulva with well developed lobes and full set of setae (*g1-g3, ai, ae*), setae *g3* claw -like. Paragenital setae *pg1* and *pg2* slightly thickened, *pg3* - short, hair like. Chaetotaxy of idiosoma: *vi, ve, sci, sce, d1, d2, l1, l2* - lanceolate; *d3, d4, l3*- narrowly lanceolate; *d5, l4, ic1, ic3* and *ic4* - short, hair-like; *l5* - and *ic2* - whip-like.

Male. Genital shield oval. It bears 5 pairs of genito-anal setae also 3 pairs of dorso-median setae *d1-d3* flanked this shield. Chaetotaxy of idiosoma: *vi, ve, sci, sce, l1* - lanceolate; *d5, l3* and *l4* - narrowly lanceolate; *l5* - whip-like. Seta *sci* situated close to *sce* than to the genital shield. Ventral chaetotaxy as in female. Striated seta of tibiotarsus I inflated.

Tritonymph. Gnathosoma with two pairs of microsetae: *rd* dorsally and *rp* ventrally.

Idiosomal dorsum with 14 pairs of setae: *ve, vi, sce, sci, d1-d4, l1-l4* - lanceolate, d5, ic1, ic3 and ic4 - short, hair-like, *ic2* - 4-5 times longer, 25-30. Setae *l5* whip-like, situated ventrally. Anal slit without setae, naked. Legs I bilaterally symmetric. Legs IV normally developed. Chaetotaxy of legs II-IV: coxae 1-0-0, trochanters 1-1-1, femora+genua 3(1)-1-1, tibiae 5-3-3, tarsi 7(1)-6-6. Coxae I with two scale-like seta. Tarsi II and III with 1 claw. Tarsi IV without claw.

Type species: *Radfordia* (*Radfordia*) *acomys* FAIN et LUKOSHUS, 1976

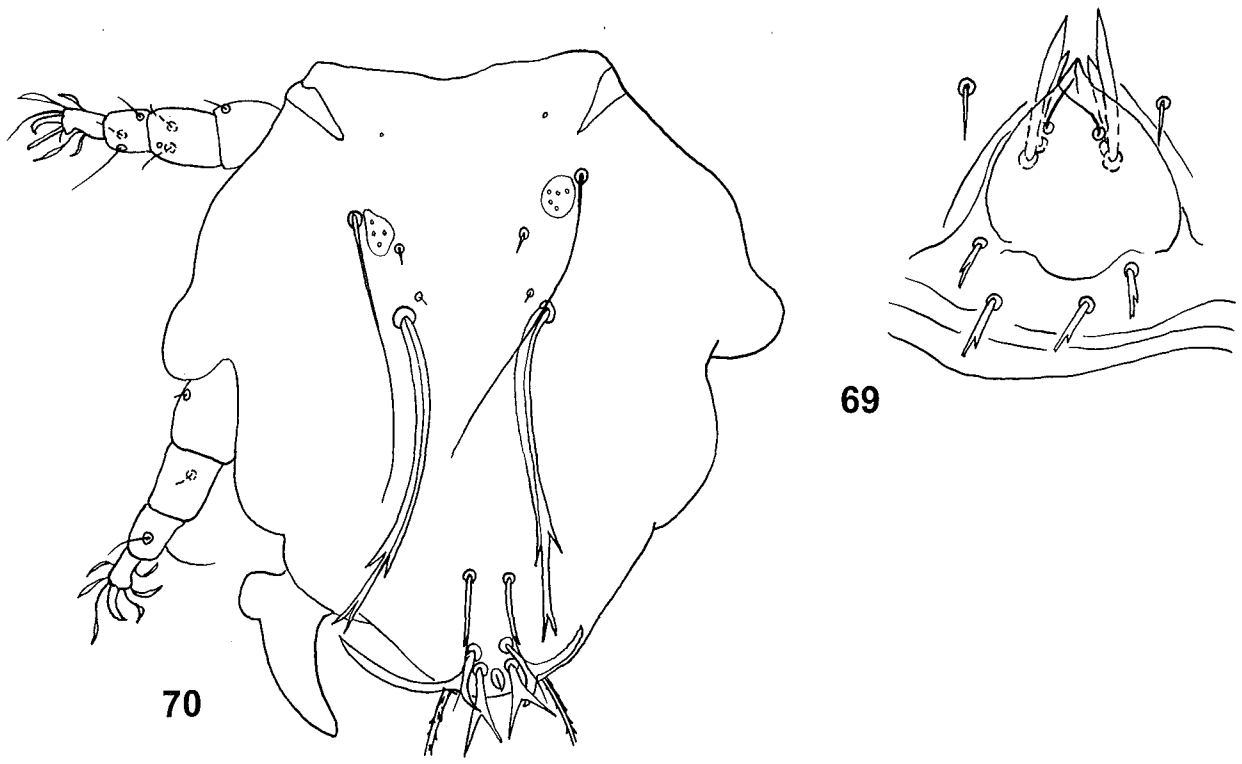
This subgenus includes a single species *Radfordia acomys,* which was described from *Acomys cahirinus* from Hamburg Zoo (FAIN and LUKOSCHUS, 1977) and later it was collected again from the same host species from Iran (BOCHKOV *et al.*, 2000).

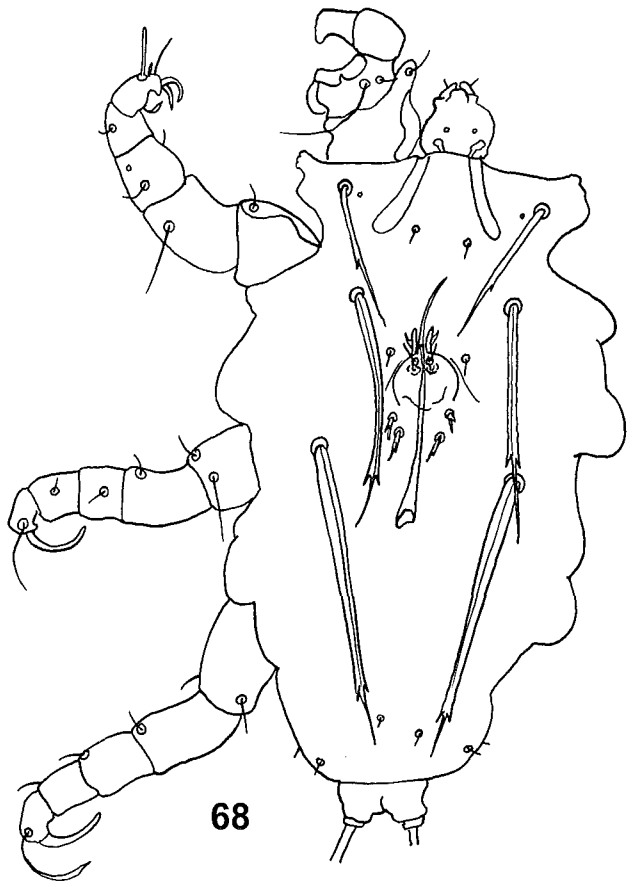
Differential diagnosis. This new subgenus differs from subgenus *Radfordia* s.str. by the presence a single seta on the coxae II, the absence of setae on coxae III and IV, the presence on the genu II of 5 pairs of setae only in both sexes, and by the oval genital shield with numerous pairs of setae associated with the genital complex in the male.

Subgenus *Petromyscobia* subgen. nov.

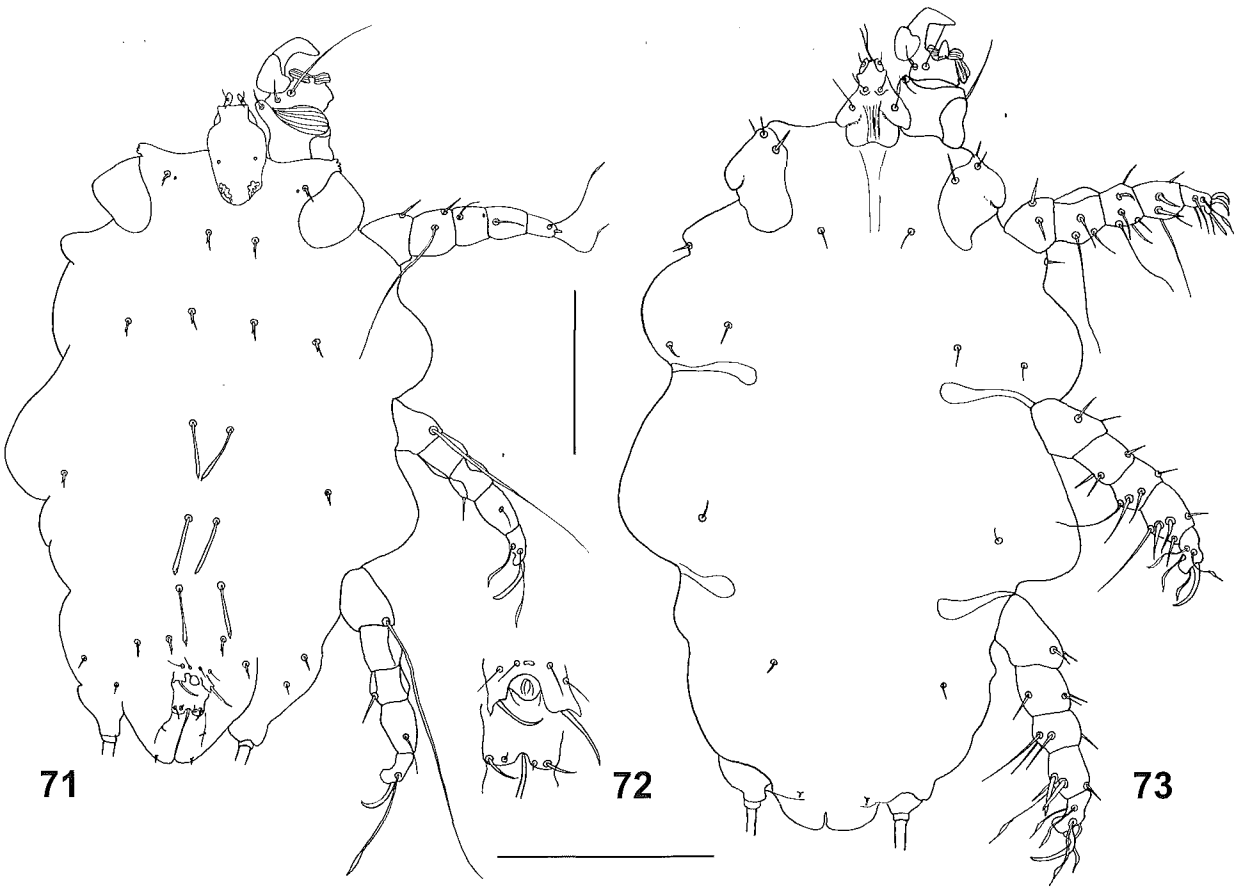
Definition. Gnathosoma without lobes, with full set of setae: *rp, ra* and *rd* - all hair-like. Idiosoma elongated. Chaetotaxy of legs II-IV (number of solenidia between brackets): coxae 3-2-0-0, trochanters 3-3-3, femora 5-3-3, genua 7(1)-6-6, tibiae 6-6-6 and tarsi 7(1)-6-6. Dorsal seta of trochanters III-IV whip-like.

Female. Vulva with well developed lobes, with full set of setae (*g1-g3, ai, ae*), setae *g3* claw-like. Paragenital setae *pg1* and *pg3* slightly thickened, *pg1* - short, hair like. Chaetotaxy of idiosoma: *vi, ve, sci, sce, d1, d2, l1, l2* - lanceolate; *d3, l3*- narrowly lanceolate; *d4, d5, l4, ic1, ic4* - short, hair-like; *l5* -and *ic2, ic3* - whip-like.





Figs. 68-70 — *Radfordia* (*Radfordia*) *bukokoensis* FAIN et LUKOSCHUS, 1976 **comb. nov**. Male in dorsal view (68), genital shield of male (69), tritonymph in dorsal view (70). Scale lines 100 μm (fig. 68, 70) and 50 μm (fig. 69).



Figs. 71-73 — *Radfordia* (*Lophurmyobia*) *brevipilis* FAIN, 1972, female. Dorsal view (71), vulva (72), ventral view (73). Scale lines 100 μm (figs. 71, 73) and 50 μm (fig. 72).

Male. Genital shield oval. It bears 5 pairs of genito-anal setae also 2 pairs of dorsomedian setae *d1-d2* situated immediately behind this shield. Chaetotaxy of idiosoma: *ve, sce, l1* - lanceolate; *vi, sci* - narrowly lanceolate; *l3* and *l4* thickened; *d5* short, hair-like; *l5* - whip-like. Seta *sci* equidistant from *sce* and the genital shield. Ventral chaetotaxy as in the female. Striated seta of tibiotarsus I inflated.

Tritonymph. Gnathosoma with two pairs of microsetae, *rd* dorsally and ventrally (*rp*). Idiosomal dorsum with 14 pairs of setae: *ve, vi, sce, sci, d1-d4, l1-l3* - lanceolate, l4, d5 - short, hair-like; setae *l5* whip-like, situated ventrally. Anal slit with a single pair of setae. Legs I bilaterally symmetric. Legs IV normally developed. Chaetotaxy of legs II-IV: coxae 1-0-0, trochanters 1-1-1, femora+genua 3(1)-1-1, tibiae 5-4-3, tarsi 7(1)-6-6. Coxae I with two scale-like seta. Tarsi II and IV with claw.

Type species: *Radfordia* (*Radfordia*) *petromyscus* LUKOSHUS, CURFS et FAIN, 1976

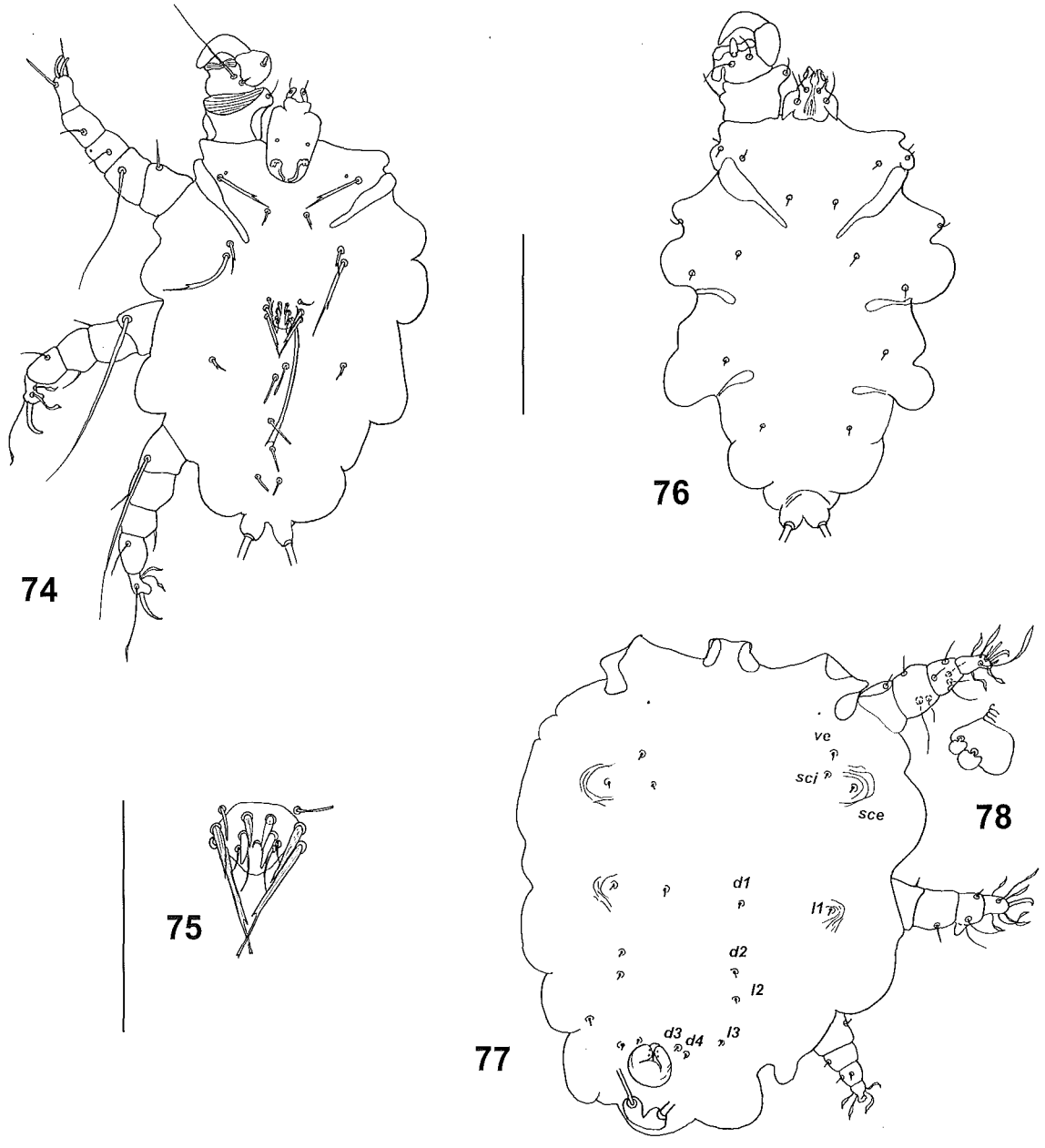
This subgenus includes a single species *Radfordia petromyscus,* described from *Petromyscus collinus* (Petromyscinae) from Namibia (LUKOSCHUS *et al.*, 1981).

Differential diagnosis. The new subgenus differs from the species of the nominative subgenus by the oval genital shield, which bears the 5 pairs of the genital setae and two pairs of setae *d1, d2* situated slightly posterior to this shield, and by the absence the setae on coxae III and IV. It also differs from *Acomyobia* **subgen. nov**. by the presence the 2 setae on coxae II and 6 setae on genu III in both sexes and by the chaetotaxy of the genital shield in the male.

Subgenus *Lophurmyobia* FAIN, 1973

This monotypic subgenus was established by FAIN (1973a) for the species *Radfordia* (*L.*) *brevipilis* FAIN, 1972 from *Lophuromys sikapusi* (Rodentia: Murinae) from Tropical Africa. The male of this subgenus was unknown and a single specimen of tritonymph was in a poor condition (FAIN, 1978a). Therefore, we give below a new diagnosis of this subgenus, which is based on an addition material including males and immature stages, and a redescription of *R.* (*L.*) *brevipilis*.

Definition. Gnathosoma with ventro-lateral lobes, with full set of setae: *rp, ra* and *rd* - all hair-like. Idiosoma



Figs. 74-78 — *Radfordia* (*Lophuromyobia*) *brevipilis* FAIN, 1972. **M**ale in dorsal view (74), genital shield (75), male in ventral view (76), tritonymph in dorsal view (77), coxa I of tritonymph (78). Scale lines 100 μm (fig. 74, 76, 77) and 50 μm (fig. 75, 78).

elongated. Chaetotaxy of legs II-IV (number of solenidia between brackets): coxae 3-2-0-0, trochanters 3-3-3, femora 5-3-3, genua 7(1)-5-5, tibiae 6-6-6 and tarsi 7(1)-6-6. Dorsal seta of trochanters III-IV whip-like.

Female. Vulva with short lobes, with full set of setae (*g1-g3, ai, ae*). Setae *g3* very long and thin. Paragenital setae *pg1*, *pg2* and *pg3* – all microsetae. Chaetotaxy of idiosoma: *vi, ve, sci, sce, l1, l3, l4, d3, d4* and *d5* - all very short; setae *d1, d2* and *l2* narrowly lanceolate; *l5* - whip-like; *ic1-ic4* - very short.

Male. Genital shield oval. It bears 4 pairs of genito-anal setae, and also 3 pairs of dorso-median setae *d1-d3* situated near this shield. Chaetotaxy of idiosoma: *vi, sci, l1* - short and narrowly lanceolate; setae *ve, sce, l3, l4* and *d5* - narrowly lanceolate; *l5* - whip-like. Seta *sci* closer to *sce* than to the genital shield. Ventral chaetotaxy as in female. Striated seta of tibiotarsus I inflated.

Tritonymph. Gnathosoma with two pairs of microsetae: *rd* dorsally and *rp* ventrally. Idiosomal dorsum with 11 pairs of setae represented by microsetae: *ve, sce, sci, d1-*

d4, l1-l3, setae *vi* lacking. Setae *l5* whip-like, situated ventrally. Idiosomal venter bears microsetae *ic1-ic3*, setae *ic4* not registered. Anal slit without anal setae, covered with cuticular folders. Legs I bilaterally symmetric. Legs IV normally developed. Chaetotaxy of legs II-IV: coxae 1-0-0, trochanters 1-1-1, femora+genua 3(1)-1-1, tibiae 5-3-2, tarsi 7(1)-6-4. Coxae I with two scale-like seta. Tarsi II and II I with 1 claw. Tarsi IV without claw.

Type species: *Radfordia* (*Radfordia*) *brevipilis* FAIN, 1972

This genus includes only the type species parasitizing rodents of the genus *Lophuromys* in Tropical Africa.

***Radfordia* (*Lophurmyobia*) *brevipilis* FAIN, 1972**
(Figs 71-78)

Radfordia (*Radfordia*) *brevipilis* FAIN, 1972b: 149
Radfordia (*Lophurmyobia*) *brevipilis*, FAIN, 1973a: 308; 1978a: 160-161 (figs 192, 193)

Material examined.: Female holotype from *Lophuromys* sp. , Guiglo Mbla, Ivory Coast (MRAC). Paratypes: 2 males, 4 females, 5 TN, 2 DN and 3 PN from *Lophuromys sikapusi* (Deomyinae) from Mbwambala, Zaire.(MRAC)

Female. Body length, including gnathosoma, 420-440, width 250-270. Length of setae: *d1* 33-34, *d2* 30-32, *l2* 34-36. Other setae, excluding whip-like *l5*, 9-12 in length. Vulva as in Fig. 72.

Male. Body length, including gnathosoma, 280-290, width 175-185. Aedeagus 80-90 long. Length of setae: *vi* 10-12, *ve* 35-45, *sci* 15-18, *sce* 45-50, *l1* 10-12, *d3* 33-35, *l3* 18-20, *l4* 16-18, *d5* 14-16. Genital shield as in Fig. 75.

Remark. The rodents of the genus *Lophuromys,* hosts of *Radfordia brevipilis,* belong to the subfamily Deomyinae which also includes three genera i.e., *Deomys*, *Uranomys, Acomys*. This subfamily is probably not closely allied to other Afrotropical murines and their relations with the other murines are still unclear (MUSSER and CARLETON, 1992). At present, this taxon is considered as the subfamily *incerta sedis* within the superfamily Muroidea (PAVLINOV, 2002).

The myobiids from the genera *Deomys* and *Uranomys* are unknown, species of the genus *Acomys* are infested by *Radfordia acomys*. Among the mite species of the genus *Radfordia*, the oval genital shield and naked coxae III and IV are also present in a single species of the subgenus *Petromysconia* **subgen. nov**. (see above). This species, *Radfordia petromyscus*, is a parasite of the Afrotropical rodents of the subfamily Petromyscinae, which in turn has unclear relationships. However, the chaetotaxy of this shield in *R. petromyscus* differs from this in *R. acomys* by the absence of setae *d3* and by the position of the setae *d1* and *d2*, which are situated immediately behind the shield. At the same time, the structure of this shield is almost identical in *R. lophuromys* and *R. acomys,* a single species of the newly recognized subgenus *Acomyobia*. In spite of the peculiar characters of *R. lophuromys*, the structure of the genital shield and leg chaetotaxy shows the close affinity of the subgenera *Lophurmyobia* and *Acomyobia*. Thus, the parasitological data indirectly support the monophyly of Deomyinae and they prove relatively independent positions of the host subfamilies Deomyinae and Petromyscinae in the system of the Afrotropical murines.

Table 1. Distribution of species of the genus *Ugandobia* DUSBABEK, 1968 on hosts of the family Emballonuridae

* - type host, ** - type species, *** - accidental host

Mite species	Host species	Host subfamily	Locality	Reference
Ugandobia s.str.				
U. barnley (RADFORD, 1951) **	Not determined bat		Uganda	RADFORD, 1951
''	*Taphozous longimanus*	Taphozoinae	India	HIREGAUDAR and BAL, 1956
''	*Taphozous sudani*	Taphozoinae	Africa	FAIN 1978a
U. euthrix FAIN, 1972	*Asellia tridens* ***	Hipposideridae	Arabia	FAIN, 1972a, 1978a
U. vachoni FAIN, 1973	*Taphozous sudani**	Taphozoinae	Zaire	FAIN, 1973a, 1978a
U. garambensis FAIN, 1973	*Taphozous sudani* *	Taphozoinae	Zaire, Congo	FAIN, 1973a, 1978a, present study
U. dissimilis UCHIKAWA et KOBAYASHI, 1978	*Taphozous melanopogon* *	Taphozoinae	Thailand	UCHIKAWA and KOBAYASCHI, 1978
U. australiensis FAIN et LUKOSCHUS, 1979	*Saccolaimus flaviventris* *	Taphozoinae	W. Australia	FAIN and LUKOSCHUS, 1979
U. taphozous FAIN, 1972	*Saccolaimus peli* *	Taphozoinae	Zaire	FAIN, 1972a, 1978a
U. saccolaimus UCHIKAWA *et al.*, 1991	*Saccolaimus saccolaimus* *	Taphozoinae	The Philippines	UCHIKAWA *et al.*, 1991
Emballomyobia **subgen.nov.**				
U. emballonurae FAIN, 1972 **	*Emballonura nigrescens* *	Emballonurinae	New Guinea	FAIN, 1972a, 1978b; present study
U. balionycteris Fain, 1973	*Balionycteris maculata* ***	Pteropodidae	Malaysia	FAIN, 1973b, 1978b
U. salomonensis FAIN, 1976	*Emballonura dianae* *	Emballonurinae	Solomon Islands	FAIN, 1976
''	*?Emballonura rivalis*	Emballonurinae	Borneo	UCHIKAWA *et al.*, 1980
U. leyteensis UCHIKAWA *et al.*, 1991	*Emballonura alecto* *	Emballonurinae	The Philippines	UCHIKAWA *et al.*, 1991
U. ituriensis FAIN, 1972	*Coleura afra* *	Emballonurinae	Zaire	FAIN, 1972a, 1978a

Table 2. Distribution of species of the genus *Neomyobia* RADFORD, 1948 on hosts of the family Rhinolophidae

* - type host, ** - type species, *** - accidental host

Mite species	Host species	Locality	Reference
Neomyobia s.str.			
N. rollinati (POPPE, 1909) **	*Rh. ferrumequinum* *	England, Germany, Switzerland, Belgium, Bulgaria, Greece, Armenia, Kirghizia	BOCHKOV, 1996
''	*Rh. bocharicus*	Turkmenia	BOCHKOV, 1996
''	*Rh. blasii*	Bulgaria	Bochkov, 1996
N. jacksoni (RADFORD, 1940)	*Rh. clivosus*	Zaire, South Africa	LAWRENCE, 1951, FAIN, 1978a
''	*Rh. capensis*	South Africa	FAIN, 1978a
N. jacksoni adsimilis FAIN, 1974	*Nycteris thebaica* *** (Nycteridae)	South West Africa	FAIN, 1974a, 1978a
N. slovenica DUSBABEK, 1968	*Rh. euryale* *	Czech Republic, Corsica, Armenia	BOCHKOV, 1996
''	*Rh. mehelyi*	Azerbaijdjan	BOCHKOV, 1996
''	*Rh. blasii*	Turkmenia	BOCHKOV, 1996
N. chiropteralis (MICHAEL, 1884)	*Rh. hipposideros* *	England, Switzerland, Belgium, Czech Republic, Greece, Bulgaria, Poland, Moldova, Russia, Crimea, Slovakia	BOCHKOV, 1996
N. chiropteralis camerounensis FAIN, 1974	*Rhinolophus* sp.	Cameroon	FAIN, 1974a, 1978a
N. birmana FAIN, 1973	*Rh. affinis* *	Burma	FAIN, 1973c, 1976
N. orientalis FAIN, 1973	*Rh. affinis* *	Burma	FAIN, 1973b, 1976
N. africanoides KELLMANN, 1964	*Rh. blasii* *	South Africa	FAIN, 1978a
''	*Rh. capensis*	South Africa	FAIN, 1978a
N. guineensis FAIN, 1972	*Rh. landeri* *	Guinea Bissau	FAIN, 1973b, 1978b
N. riekonis Uchikawa et al., 1983	*Rh. acuminatus* *	Thailand	UCHIKAWA *et al.*, 1983
N. abberans UCHIKAWA, 1978	*Rh. ferrumequinum* *	Japan	UCHIKAWA, 1978
N. plurihospitalis UCHIKAWA, 1978	*Rh. cornutus* *	Japan	UCHIKAWA, 1978
''	*Rh. yunanensis*	Thailand	UCHIKAWA and KOBAYASHI, 1978
N. tulsi HIREGAUDAR et BAL, 1956	*Rh. rouxi* *	India	HIREGAUDAR and BAL, 1956
Rhinomyobia FAIN, 1978c			
R. rhinolophi ** (FAIN, 1973 b)	*Rh. hipposideros* *	Belgium	FAIN, 1973 b

Table 3. Distribution of species of the genus *Crocidurobia* JAMESON, 1970 on hosts of the subfamily Crocidurinae

* - type host, ** - type species

Mite species	Host species	Locality	Reference
Crocidurobia s.str.			
C. blairi (RADFORD, 1936)**	*Crocidura suaveolens* *	England, Bulgaria, Poland, Crimea, Ukraine, Kirghizia	BOCHKOV, 1997b
''	*Crocidura russula*	Bulgaria, Georgia	BERON, 1973, BOCHKOV, 1997b
''	*Crocidura sibirica*	Russia	BOCHKOV, 1997b
''	*Crocidura guldenstadti*	Georgia	BOCHKOV, 1997b
''	*Crocidura horsfieldi*	Taiwan	JAMESON, 1970
C. leucodoni BOCHKOV, 1997	*Crocidura leucodon* *	Caucasus	BOCHKOV, 1997b
C. lasiurae BOCHKOV, 1997	*Crocidura lasiura* *	Russia (Far East)	BOCHKOV, 1997b
C. michaeli (POPPE, 1896)	*Crocidura russula* *	Germany, Switzerland, France, Czech Republic	BOCHKOV, 1997b
''	*Crocidura suaveolens*	Bulgaria	KOLEBINOVA, 1967 cite: BOCHKOV, 1997b
''	*Crocidura leucodon*	Poland	HAITLINGER, 1988 cite: BOCHKOV, 1997b
C. crocidurae (LAWRENCE, 1951)	*Crocidura flavescens* *	South Africa	LAWRENCE, 1951, FAIN, 1978a
C. diplomesodon FAIN, 1973	*Diplomesodon pulchellum* *	?Asia	Fain, 1976
C. toroensis DUSBABEK, 1983	*Crocidura pilosa* *	Uganda	DUSBABEK, 1983
C. dusbabeki **sp. nov.**	*Crocidura gracilipes* *	Congo	Present study
''	*Crocidura jacksoni*	Congo	Present study
''	*Crocidura sellina*	Kenya	Present study
Suncomyobia FAIN et LUKOSCHUS, 1976 b			
C. ingens (VITZTHUM, 1914)**	*Suncus etruscus* *	Portugal, Poland	BOCHKOV, 1997b
C. transvaalensis FAIN et ZUMPT, 1974	Shrew	South Africa	FAIN and ZUMPT, 1974
C. multisetosa LUKOSCHUS et DRIESSEN, 1969	*Crocidura russula* *	Holland *Lophuromys*	LUKOSCHUS and DRIESSEN, 1969

Table 4. System of the order Rodentia at the family level (from PAVLINOV, 2002)

* - taxon associated with myobiid mites

Suborder	**Infraorder**	**Superfamily**	**Family**
Sciurognatha *			Aplodontidae
		Sciuroidea	Sciuridae
		Castoroidea	Castoridae
		Geomyoidea *	Geomyidae Heteromyidae *
Myomorpha *		Dipodoidea *	Sminthidae Zapodidae * Allactagidae * Dipodidae *
		Muroidea *	Rhizomyidae Spalacidae Cricetidae * Myospalacidae Sigmodontidae * Placanthomyidae * Muridae *
		Muroidea * *incertae sedis*	Cricetomyinae Dendromurinae * Petromyscinae * Deomyinae Otomyinae * Lophiomyinae Nesomyinae Gerbillidae *
Anomaluromorpha *			Anomaluridae *
Gliromorpha *			Myoxidae *
Hystricognathi *	Hystricomorpha		Hystricidae
		Erithizontoidea	Erithizontidae
	Caviomorpha *	Cavioidea	Caviidae Hydrochoeridae Dasyproctidae Dinomyidae
		Chinchilloidea	Chinchillidae Abrocomidae
		Octodontoidea	Capromyidae Octodontidae Ctenomyidae Echimyidae
	Phiomorpha		Thryonomyidae Petromuridae
		Ctenodactyloidea *	Ctenodactylidae *
	Bathyergomorpha *	Bathyergoidea *	Bathyergidae *

Table 5. Distribution of species of the subgenus *Radfordia* EWING, 1938 on hosts of the subfamily Murinae

* - type host, ** - type species

Mite species	**Host species**	**Locality**	**Reference**
Species group "*ensifera*"			
Species subgroup "*ensifera*"			
R. ensifera (POPPE, 1896) **	*Rattus norvegicus* *	Cosmopolitan	BOCHKOV and FAIN, 1997
"	*Rattus rattus*	Cosmopolitan	BOCHKOV and FAIN, 1997
"	*Rattus turkestanicus*	Turkmenia	BOCHKOV and FAIN, 1997
"	*Rattus tanezumi*	Malaysia	FAIN *et al.*, 1981
R. davisi (RADFORD, 1938)	*Rattus norvegicus* *	Africa (Sierra Lione)	FAIN, 1978a
"	*Rattus exulans*	Burma, New Zealand, China	BOCHKOV and FAIN, 1997
R. hornerae (DOMROW, 1963)	*Rattus fuscipes* *	Australia	DOMROW, 1991
R. jalorensis FAIN *et al.*, 1980	*Rattus tiomanicus* *	Malaysia	FAIN *et al.*, 1980
R. expansa JAMESON et WHITAKER, 1975	*Rattus losea* *	Taiwan	JAMESON and WHITAKER, 1975
R. australiana FAIN et LUKOSCHUS, 1979	*Rattus tunneyi* *	Australia	FAIN and LUKOSCHUS, 1979
R. niviventris BOCHKOV et FAIN, 1997	*Niviventer* sp. *	Tibet, South China	BOCHKOV and FAIN, 1997
R. berylmysi BOCHKOV and FAIN, 1997	*Berylmys berdmorei* *	Vietnam	BOCHKOV and FAIN, 1997
R. lukoschusi BOCHKOV and FAIN, 1997	*Niviventer flaviscens* *	North Vietnam	BOCHKOV and FAIN, 1997
"	*Niviventer niviventer*	North Vietnam	BOCHKOV and FAIN, 1997
R. pogonomys FAIN et LUKOSCHUS, 1976	*Pogonomys loriae* *	New Guinea	FAIN and LUKOSCHUS, 1976, 1977
R. chiropodomys Fain, 1974	*Chiropodomys gliroides* *	Malaysia	FAIN *et al.*, 1981
Subgroup "*angolensis*"			
R. angolensis FAIN, 1972	*Aethomys chrysophila* *	Africa (Namibia)	CURFS *et al.*, 1986
R. aethomys CURFS *et al.*, 1986	*Aethomys namaquensis* *	South Africa	CURFS *et al.*, 1986
R. thamnomys FAIN, 1972	*Grammomys rutilans* *	Africa (Angola)	FAIN, 1972c
R. grammomys FAIN, 1972 **comb. nov.**	*Grammomys surdaster* *	Africa (Rwanda, Angola)	FAIN, 1972a
Subgroup "*malacomys*"			
R. eburneensis FAIN, 1972	*Malacomys* sp *	Africa (Ivory Coast)	FAIN, 1978a
Radfordia malacomys FAIN, 1972	*Malacomys* sp. *	Africa (Zaire)	FAIN, 1978a
"	*Malacomys longipes*	Africa (Zaire, Angola)	FAIN, 1978a

Mite species	Host species	Locality	Reference
Subgroup "*hystricosa*"			
R. hystricosa FAIN, 1972	*Stochomys longicaudatus* *	Africa (Rwanda)	FAIN, 1978a
Group "*lancearia*"			
R. elengatula ZUMPT et COFFEE, 1971	*Mus minutoides* *	South Africa, Angola	FAIN, 1978a
"	*Mus bellus*	Zaire	FAIN, 1978a
"	*Mus gratus*	Rwanda	FAIN, 1978a
Subgroup "*lancearia*"			
R. lancearia (Poppe, 1909)	*Apodemus sylvaticus* *	Europe	BOCHKOV, 1997d
"	*Apodemus agrarius*	Europe	BOCHKOV, 1997d
R. mironovi BOCHKOV, 1997	*Apodemus flavicollis* *	Eurasia	BOCHKOV, 1997d
Subgroup "*praomys*"			
R. affinis (POPPE, 1896)	*Mus musculus* *	Cosmopolitan	BOCHKOV, 1997d
"	*Mus booduga*	India	BOCHKOV, 1997d
"	*Apodemus sylvaticus*	Europe	BOCHKOV, 1997d
"	*Apodemus flavicollis*	Europe	BOCHKOV, 1997d
R. praomys ZUMPT et COFFEE, 1971	*Mastomys natalensis* *	Africa (South Africa, Angola, Ivory Coast)	FAIN, 1978a
"	*Praomys morio*	Africa (Liberia)	FAIN, 1978a
"	*Praomys jacksoni*	Africa (Angola)	FAIN, 1978a
R. daltoni SCHEPERBOER *et al.*, 1987	*Myomyscus daltoni* *	Africa (Ivory Coast)	SCHEPERBOER *et al.*, 1987
R. colomys **sp. nov.**	*Colomys goslingi* *	Africa (Zaire)	Present study
R. myomysci **sp. nov.**	*Myomyscus derooi* *	Africa (Togo)	Present study
R. delectori **sp. nov.**	*Praomys delectorum* *	Africa (Tanzania)	Present study
R. dephomys **sp. nov.**	*Dephomys defua* *	Africa (Ivory Coast)	Present study
R. hylomyscus FAIN, 1972 **comb. nov.**	*Hylomyscus simus* *	Africa (Ivory Coast)	FAIN, 1978a
R. zelotomys FAIN, 1976 **comb. nov.**	*Zelotomys hildegardae* *	Africa (Kenya)	FAIN, 1976
R. bukokoensis FAIN et LUKOSCHUS, 1976 **comb. nov.**	*Hylomyscus* sp. *	Centro African Republic	FAIN and LUKOSCHUS, 1977
"	*Hylomyscus stella*	Centro African Republic	FAIN and LUKOSCHUS, 1977

Table 6. The distinctions of the new and closely related species of the group "*praomys*"

Species	Characters						
	Both sexes	Female	Male		Tritonymph		
	Tips of setae *sce* and *l1* bifurcate (+), not bifurcate (–)	Setae *sci* longer than *sce* (+); shorter (–)	Genital shield conical (0), rectangular (1), oval (2)	setae *d1* and *d2* subequal (0), *d1* longer than *d2* (1)	setae *vi* 2 times shorter than *sci* (0), subequal to *sci* (1)	Setae *l3* modified (0), not modified (1)	Spur of legs IV present (+), absent (–)
praomys	–	–	0	1	0	0	+
daltoni	–	–	1	1	1	0	+
colomys	+	+	2	0	1	0	+
myomysci	–	–	2	1	1	1	+
delectori	–	–	0	1	0	0	–
dephomys	+	–	2	1	?	?	?

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