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OBSERVATIONS ON CHEYLETID
MITES PARASITIC ON MAMMALS
(ACARI, CHEYLETIDAE & CHEYLETIELLIDAE)

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OBSERVATIONS ON CHEYLETID MITES PARASITIC ON MAMMALS
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BY

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INTRODUCTION

The purpose of this paper is to complete the descriptions and figures of several species and genera of Cheyletidae described previously in a preliminary note (FAIN, 1972). In addition we describe here a new genus and a new species.

The Cheyletidae have been divided by VOLGIN (1969) in several subfamilies. Among them the most evolved is the subfamily Cheyletiellinae which contains only species parasitic on Vertebrates. SMILEY (1970) has given the family rank to this subfamily. These two families are separated according to the degree of regression of the palp-tarsus and the presence or absence of various organs (e.g. comb-like setae on palp-tarsus, eyes, teeth on the palp-tibia apical spine, claws on legs I-IV).

All the Cheyletiellidae are parasites of vertebrates, while the Cheyletidae contain mostly free-living predators and only a small number of species living in association with vertebrates (*Cheyletus* spp., *Eucheyletia* etc...).

With the discovery of new genera and species parasitic on mammals it becomes more and more difficult to separate clearly the Cheyletidae from the Cheyletiellidae because some genera exhibit intermediate characters between these two families.

As a matter of fact the presence (or absence) of one or two comb-like setae on the palp-tarsus is considered an important character in the separation of the higher groups of Cheyletidae *s. lat.* However there are two genera (*Muricheyla* and *Promuricheyla*) which by all the characters are very close to each other and differ only significantly by the number of combs on the palp-tarsus. In *Promuricheyla* there are two well-formed combs, while in *Muricheyla* there is only one comb. This example proves that this character is less important than expected so far.

We prefer therefore to maintain provisionally these genera into the Cheyletidae and to restrict the Cheyletiellidae to the two genera *Cheyletiella* and *Eucheyletiella*.

NOMENCLATURE OF IDIOSOMAL CHAETOTAXY IN THE CHEYLETIDAE

A nomenclature for the idiosomal chaetotaxy has been developed in several families of Prostigmata (e.g. Tydeidae, Ereyneidae and Myobiidae).

The usefulness of such nomenclature is obvious. It simplifies notably the descriptions and makes possible a careful comparison of the chaetotaxy in different genera and species.

In the Cheyletidae the identification of the idiosomal setae is much more difficult than in the Myobiidae and the Ereyneidae owing to the frequency in this group of neotrichia. However these additional setae, when they exist, are almost always situated in the middle part of the dorsum (the "dorsomedians" of SUMMERS and PRICE, 1970). The lateral setae ("dorsolaterals" of these authors) are more constant in number and they follow generally the same pattern as in the Ereyneidae and the Myobiidae (see FAIN, 1973).

In some genera (e.g. *Cheyletus*, *Bicheyletiella* and *Cheyletiella*) the dorsal and ventral chaetotaxy resemble closely that of the Ereyneidae and the same nomenclature may therefore be utilized.

The following setae can be recognized in the females of these genera (see FAIN, 1979 b).

1) In *Bicheyletiella romerolagi* (Cheyletiellidae) the following setae are present (fig. 36-37).

Dorsum : *v i* barbed, in front of the propodonal shield ; *v e* and *sc i* barbed and on the shield ; *sc e* on the cuticle, not far from the *h* seta ; *l 1* barbed lateral and in front of hysteronotal shield ; *l 2*, *l 3*, *l 4* very thin and short ; *l 5* very long and strong ; *d 1* and *d 2* in postero-medial part of anterior shield ; *d 3* paramedian long, in front of posterior shield ; *d 4*, *d 5* very short and thin, close to the vulva. There are 3 pairs of preterminal anal setae : *a 1* is posterior and internal, *a 2* is posterior and lateral *a 3* is the most anterior.

Venter : There are 3 pairs of intercoxal setae : *ic 1* between coxa I or II, *ic 3* between coxae III, *ic 4* between coxa IV. On the opisthogaster there are 3 pairs of anterior genital setae *g 1*, *g 2*, *g 3*, and on the vulvar lips 2 other pairs *g 4* and *g 5*. The *l 5* is either terminodorsal or ventral.

Coxae (I-IV) : They bear 2-1-2-2 setae.

This chaetotaxy resembles basically that of the genera *Ereynetes* spp. (Ereyneidae) and *Radfordia* spp. (Myobiidae). The differences consist in the following minor points (see FAIN, 1973).

- 1) The *h* setae are always lacking in the Ereyneidae and Myobiidae.
- 2) The number of coxal setae in Ereyneidae and Myobiidae varies according to the genera and species.
- 3) There are only 2 pairs of anal setae and a greater number of genital setae in the Ereyneidae and Myobiidae but the number of the latter varies according to the genera and species.
- 4) There are 4 pairs of *ic* in the Myobiidae.

2) In the genus *Cheyletus* (Cheyletidae) the setae *v i*, *v e*, *sc i*, *sc e*, *h*, *l 1* to *l 5*, *ic 1*, *ic 3*, *ic 4* and genitals are as in *Bicheyletiella* (and *Cheyletiella*). There is generally only one pair of well-formed *d* setae, this pair (*d 5*) is either paramedian or more or less lateral and in the line of the *l* setae, between *l 4* and *l 5*. The *d 1* to *d 4* are inconstant, and often modified. There are 3 pairs of anal setae : *a 1* is ventral and internal, *a 2* is ventro-lateral and *a 3* is dorsal.

FAMILY CHEYLETIDAE LEACH, 1815

SUBFAMILY CHELONOTINAE VOLGIN, 1969 nov. tax.

VOLGIN (1969) erected the tribe Chelonotini for the single and monotypic genus *Chelonotus* Berlese, 1893 (type species *C. selenirhynchus* Berlese, 1893) (= *Chelonotus oudemansi* Baker and *C. ewingi* Baker, 1949).

We think that the monotypic genera *Muricheyla* Fain, 1972 and *Promuricheyla* g. n. belong also this group, and we give here the subfamily rank to it.

We also place provisionally in this group two other monotypic genera only known from male specimens: *Thryonomycheyla* Fain, 1972 and *Hylopecheyla* Fain, 1972.

KEY TO THE SUBFAMILY CHELONOTINAE
(Females)

(N.B. : The females of the genera *Thryonomycheyla* and *Hylopecheyla* are unknown)

1. Tarsi III-IV with 2 or 3 dorsal conical processes. Palp-femur as long or longer than wide and directed anteriorly. Palp-tarsus with either 1 or 2 combs. Apical spine of palp-tibia with 2 basal teeth..... 2
- Tarsi III-IV without processes. Palp-femur distinctly wider than long and directed obliquely and outwardly. Palp-tarsus with 1 comb-like setae. Apical spine of palp-tibia with 1 basal tooth..... genus *Chelonotus* Berlese, 1893
2. Palp-tarsus with 1 comb-like seta. Tarsi III-IV with 3 dorsal conical processes
genus *Muricheyla* Fain, 1972
- Palp-tarsus with 2 comb-like setae. Tarsi III-IV with 2 dorsal conical processes.....
Promuricheyla g. n.

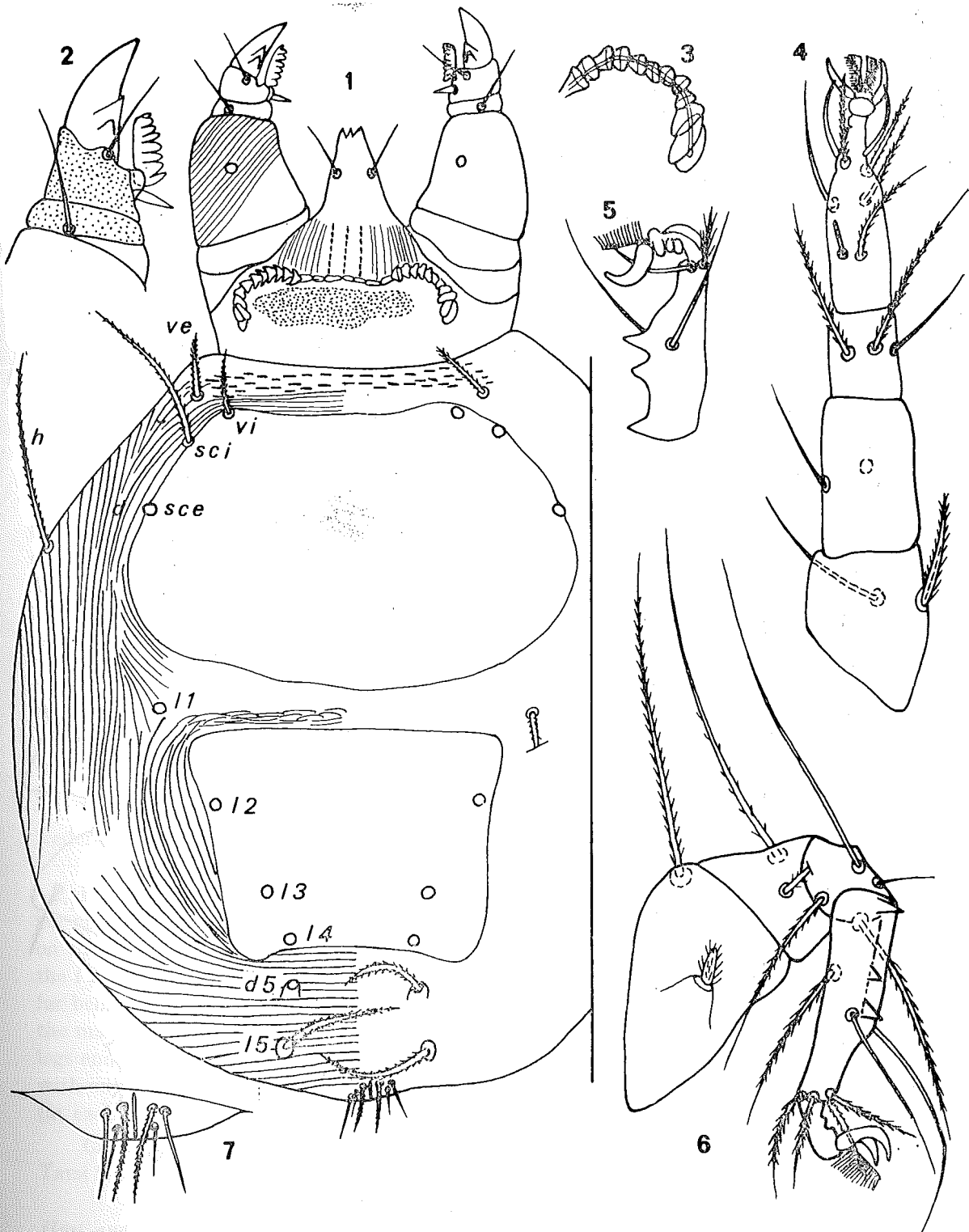
Genus *Muricheyla* Fain, 1972

Definition: Only the female is known. Body broadly elliptical. *Dorsum* with two median shields, the rest of the cuticle is striated. Eyes absent. Propodonal shield with 3 pairs of antero-lateral barbed unequal setae; there is a 4th pair on the striated cuticle in the antero-lateral corner of the dorsum. Hysteronotal shield with 3 pairs of setae; striated cuticle of hysteronotum with 3 pairs of barbed setae. *Venter* partly crushed and in bad condition, it is therefore difficult to estimate how far the coxae II and III are separated from each other. Coxae not striate but covered by slightly punctate shields. Anus terminal, with 3 pairs (or ? 4 pairs) of small setae. Vulva ventro-terminal. Gnathosoma large, with well-developed palps. The two peritremes with about 12 segments laterally (at each side) and 3-4 very narrow paramedian segments. Palp-tibia with a big apical slightly recurved spine bearing 2 basal teeth. Palp-tarsus with one comb-like seta bearing 8 thick teeth, 2 sickle setae, one short spine and one short cylindrical solenidion. Leg I much longer than the other legs; all the legs with a pair of claws and rayed empodia. Tarsus I with a long solenidion ω and a shorter and thin guard seta. Tarsi III-IV with 3 dorsal sclerotized conical processes.

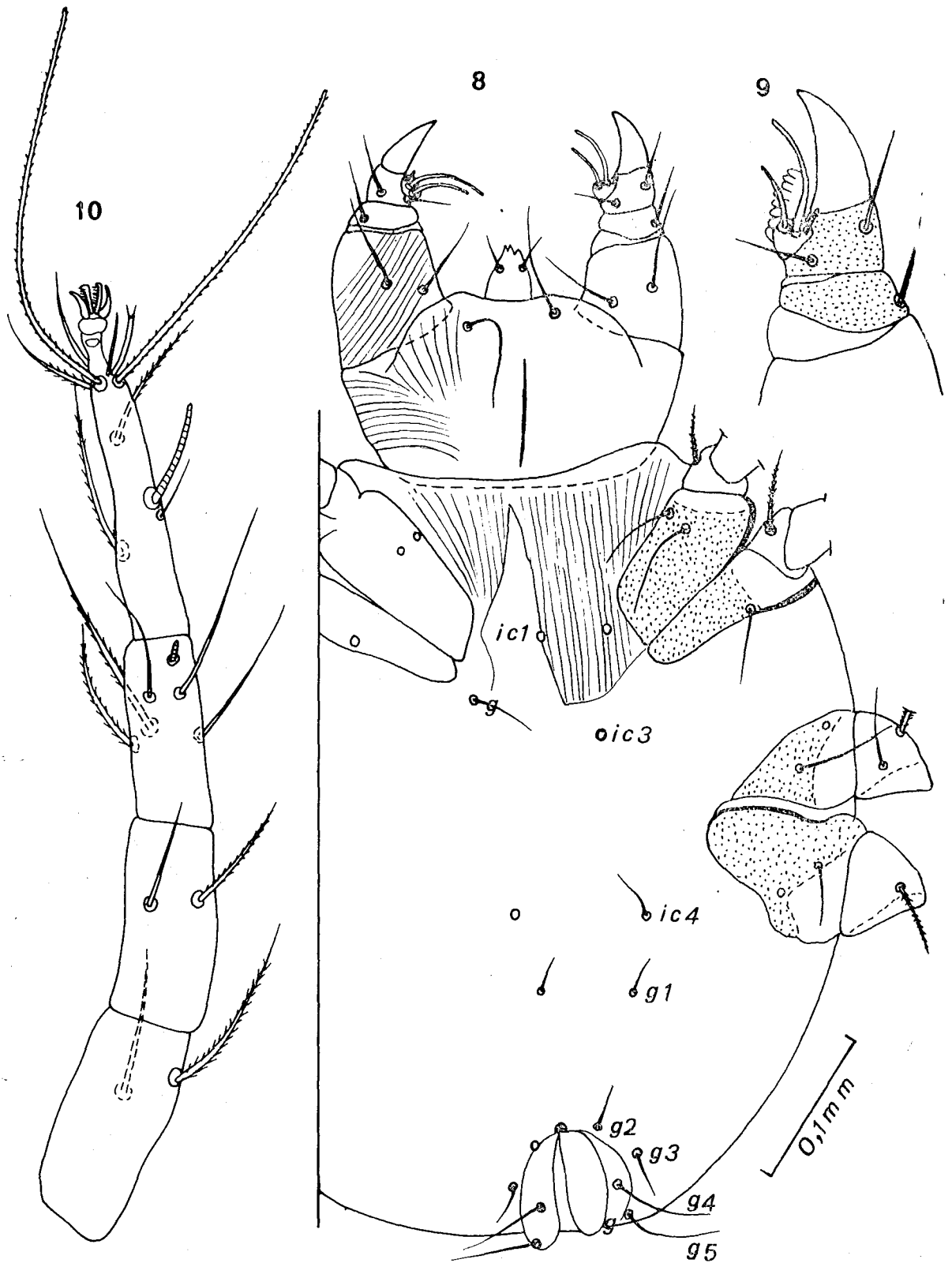
Types species: *Muricheyla sicista* Fain, 1972.

Muricheyla sicista Fain, 1972

FEMALE (fig. 4-10): Holotype and only known specimen, 480 μ long and 450 μ wide (idiosoma). Total length, including gnathosoma 630 μ . The exact size of the body is probably smaller for



Figs. 1-7. — *Muricheyla sicista* Fain, 1972. Holotype female : 1) Dorsal view ; 2) Palp-tarsus and palptibia dorsally ; 3) Peritreme ; 4) Leg II (4 apical segments) ventrally ; 5) Tarsus III laterally ; 6) Leg IV (4 apical segments) ; 7) Anal setae.



FIGS. 8-10. — *Muricheyla sicista* Fain, 1972. Holotype female : 8) Ventral view ; 9) Palp-tarsus and palp-tibia ventrally ; 10) Leg I (4 apical segments) dorso-laterally.

the holotype is strongly flattened and partly crushed. Maximum width of gnathosomal base 225 μ .

Leg chaetotaxy (leg I-IV) : Coxae with 2-1-2-2 setae. Trochanters I-II and IV with one barbed seta, trochanter III with 2 setae, one simple and one barbed. Femora and genua 2-2-2-2 setae. Tibiae 5-4-4-4. Tarsi 9-8-7-7.

Host and locality.

The holotype and only known specimen was found on *Sicista subtilis*, from Caucasia. Type in Institut des Sciences naturelles de Belgique.

Genus **Promuricheyla** gen. nov.

Definition : This genus is very close to *Muricheyla*. It is distinguished from it mainly by the presence of a second small comb-like seta on palp-tarsus. Body in broad oval. *Dorsum* with 2 large median shields. Eyes absent. Dorsal setae thick and barbed. *Venter* striated, except coxae slightly punctate. Seta as in *Muricheyla*. Legs as in this genus except that the tarsi III and IV present each 2 conical dorsal processes (a preapical and a basal) instead of 3 conical processes in *Muricheyla*. *Gnathosoma* : structure of peritremes as in *Muricheyla*. Palp-tibia with a short but thick apical spine bearing 2 basal teeth. Palp-tarsus welldeveloped bearing an external comb-like seta with 9 thick teeth, a smaller internal comb-like seta bearing 8 small teeth, 2 sickle-like setae and a short solenidion.

Type species : *Promuricheyla lukoschusi* spec. nov.

Promuricheyla lukoschusi spec. nov.

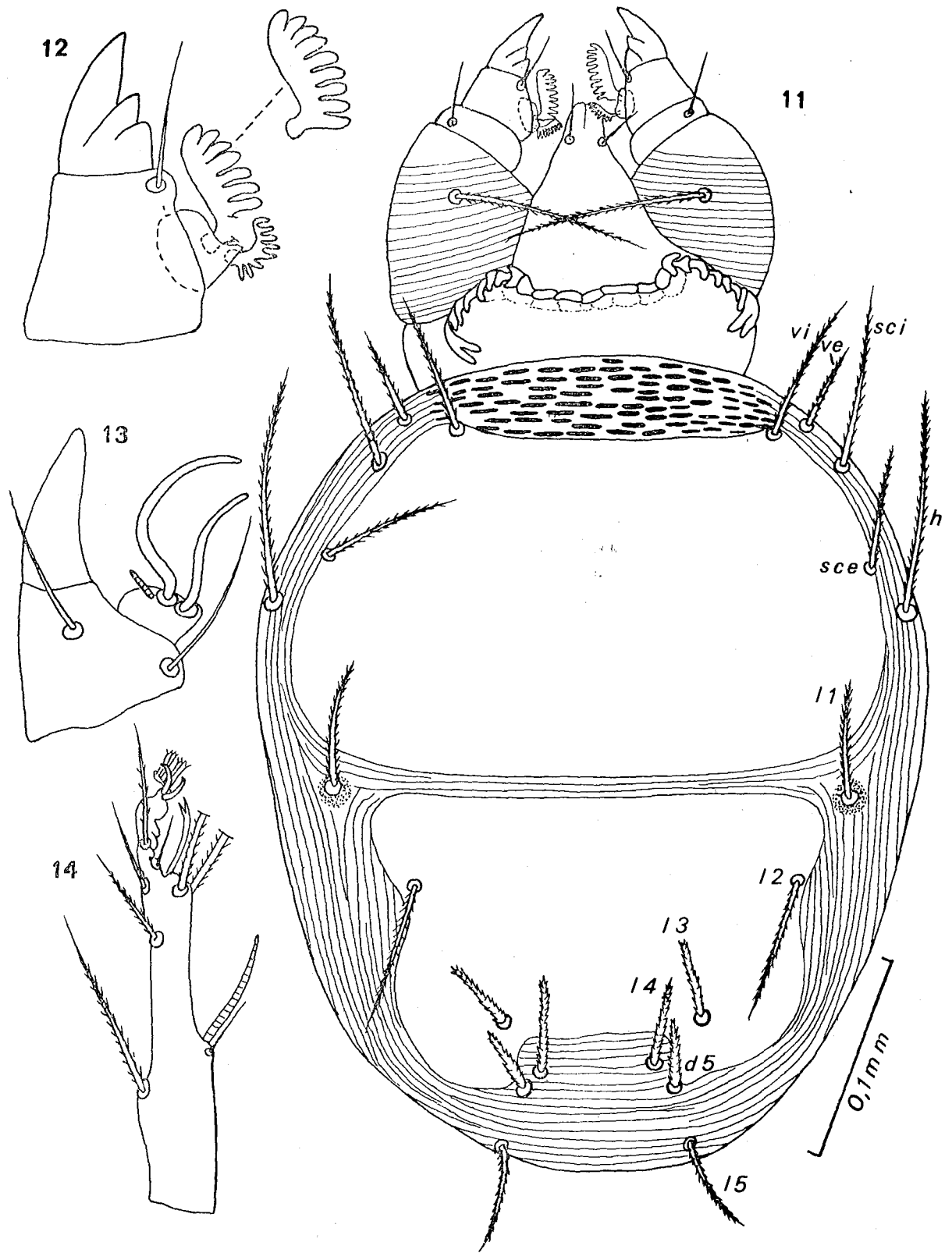
This species is named for our Colleague and friend Dr. F. Lukoschus, University of Nijmegen, Nederland, who collected these specimens.

FEMALE (fig. 11-15) : Holotype 417 μ long and 360 μ wide (idiosoma). Total length, including gnathosoma 555 μ . *Dorsum* : All the setae are barbed. The setae *ve* and *sci* are situated on the striated cuticle, the setae *vi* and *se* are on the shield. Setae *l1* are on the soft cuticle, the *l2*, *l3* and *l4* are thick, barbed and situated on the hysteronotal shield, the *l5* thinner are far behind the shield. Seta *d5* is thick and barbed and situated either on the soft cuticle or on the margin of the shield. *Venter* : coxae II and III close to each other but not contiguous. All legs ending in 2 claws and rayed empodia ; shape of legs as in *Muricheyla sicista* but tarsi III-IV with only 2 strong conical dorsal processes. *Gnathosoma* large. Peritremes with 12-13 segments (at each side). Palp-tibia and palp-tarsus as defined above.

Chaetotaxy of legs (I-IV) : Trochanters 1-1-2-1 ; femora and genua 2-2-2-2 ; tibiae 5-4-4-4. Tarsi 9-8-7-7. Solenidion ω of tarsus I with a thin guard seta shorter than ω .

Host and locality.

On *Nannosciurus surrutilus*, Mt Katanglad, Mindanao, X.1965. Animal in the Senckenberg Museum, Frankfurt n^o 29536 (Holotype and 5 paratype females ; coll. F. Lukoschus). Type in Senckenberg Museum.



Figs. 11-14. — *Promuricheyla lukoschusi* sp. n. Female (holotype and paratypes) :
 11) Dorsal view ; 12-13) Palp-tarsus dorsally and ventrally ; 14) Tarsus I laterally.

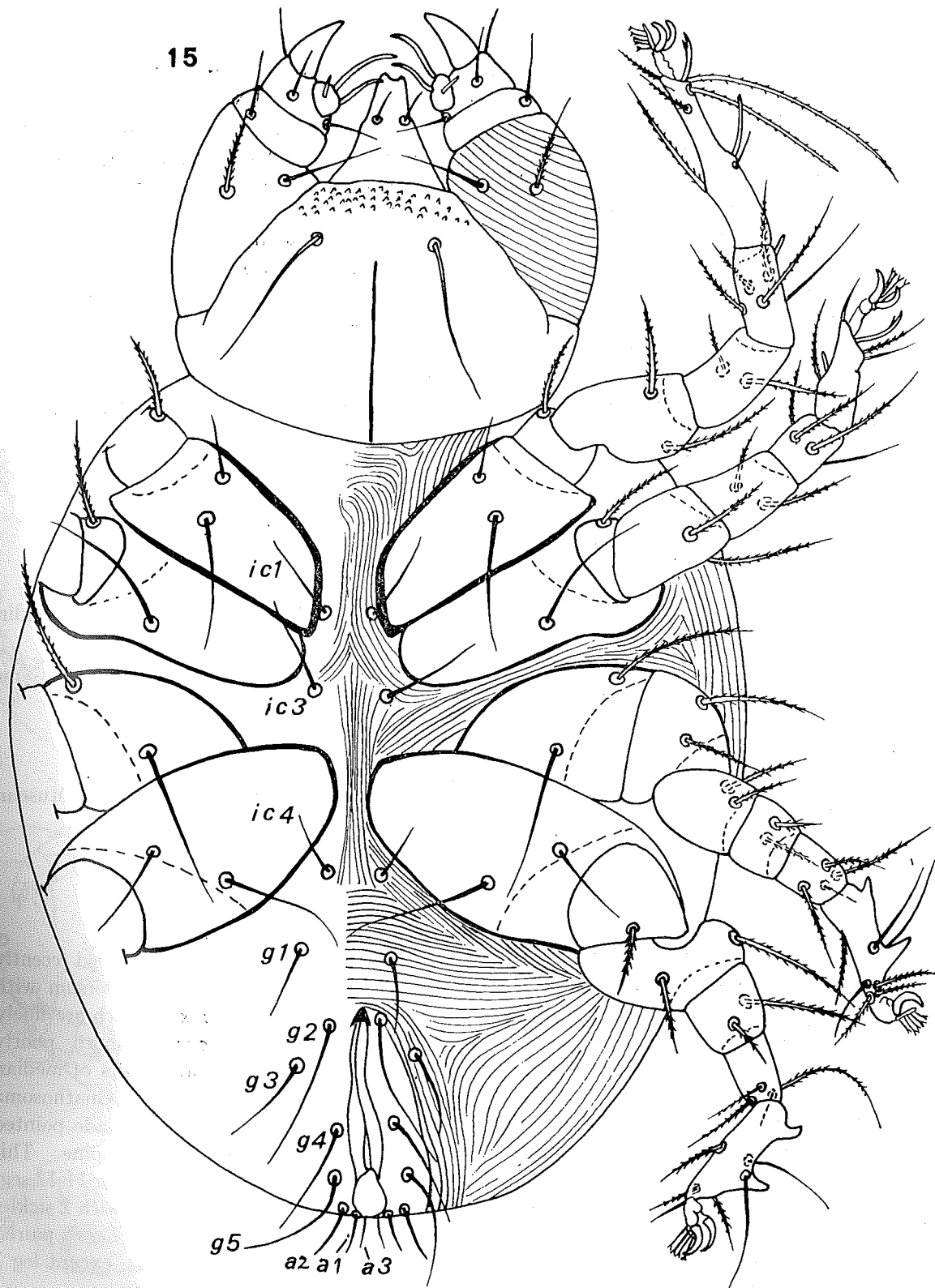


FIG. 15. — *Promuricheyla lukoschusi* sp. n. Female ventraly (from holotype and paratypes).

Genus *Thryonomycheyla* Fain, 1972

Definition : Only the male is known. Body in broad oval. All the body and the gnathosomal setae are simple and bare. *Dorsum* with two median shields, the posterior being oval; the rest of the cuticle is striated, in some regions the striations bear very small nodules. Genital orifice situated in the posterior part of the hysteronotal shield. Anterior shield with 4 pairs of thin simple external setae and two pairs of median smaller setae. Posterior shield bearing 7 pairs of simple setae, and 2 pairs of genital setae also simple. Seta *h* very long (150 μ). Eyes absent. *Venter* completely striated, including the coxae. Coxae I-II and IV well formed, coxae III badly formed. Penis short, J-shaped. *Gnathosoma* large, peritremes with 10 to 12 segments at each side. Palp-tibia with a short and bifid apical spine. Palp-tarsus small with 2 sickle-hairs but without comb-like setae. Legs long, the legs I the longest, all tarsi ending in a pair of claws and rayed empodia. All the tarsi short. Solenidion ω of tarsus I not observed (? broken).

Types species : *Thryonomycheyla congolensis* Fain, 1972.

Thryonomycheyla congolensis Fain, 1972

MALE (fig. 16-25) : Holotype 315 μ long and 330 μ wide (idiosoma). Total length, including gnathosoma 435 μ .

Leg chaetotaxy (I-IV) : Trochanters 1-1-2-1 (all simple setae). Femora 2-2-2-1. Genua 2-2-2-2. Tibiae 5-4-4-4. Tarsi 8-(?)6-7-7.

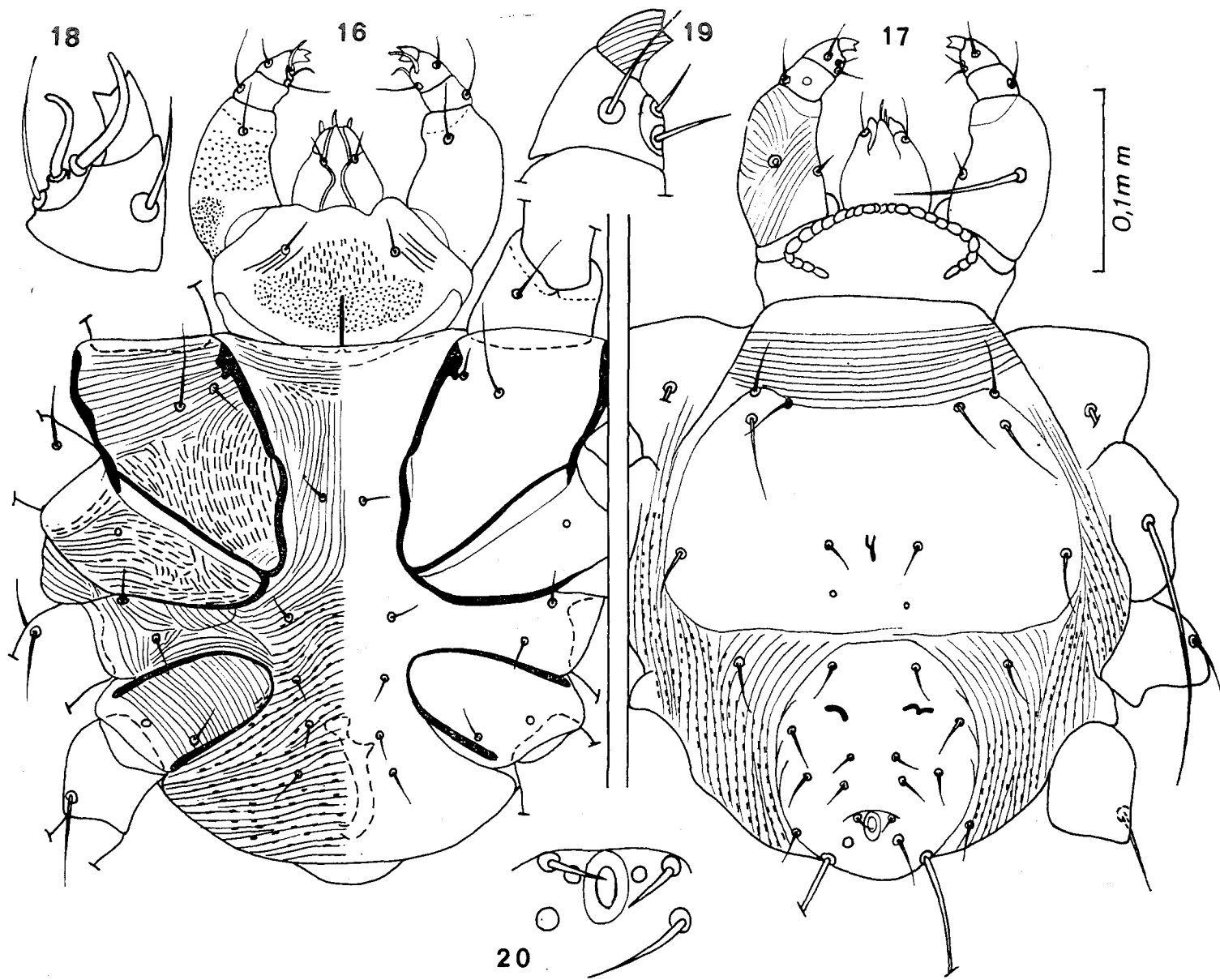
Host and locality.

On *Thryonomys swinderianus*, Bagata, Zaire (Coll. A. Fain, 1946) (Holotype male, in Museum of Tervuren).

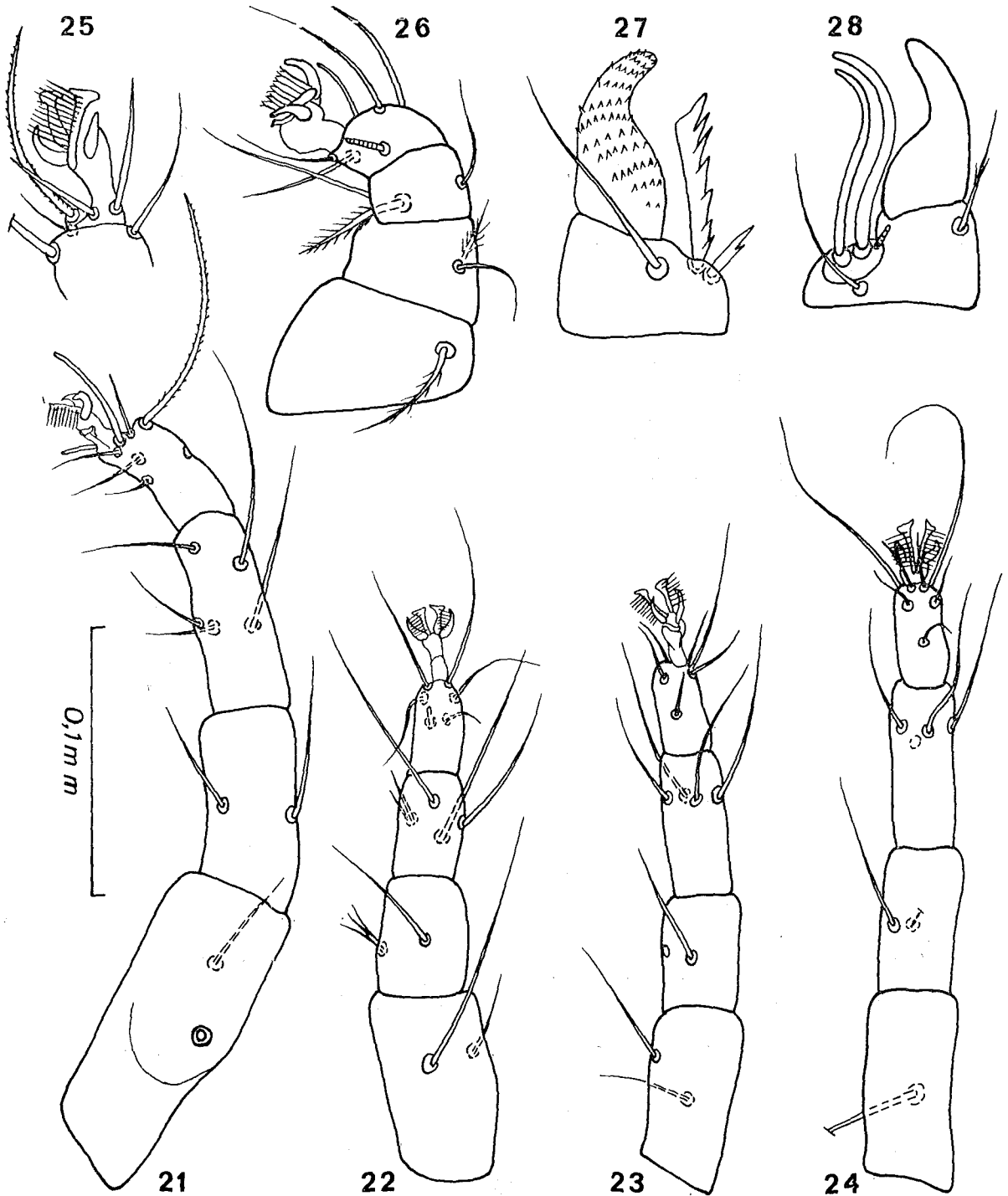
Genus *Hylopecheyla* Fain, 1972

Definition : Only the male and nymphs are known. The female has been described recently (FAIN and NADCHATRAM, 1980. — Inst. J. Acarol. 6 (3)). Body broadly oval. *Dorsum* with two large median shields. The rest of the idiosoma is striate except the coxae which are finely punctate. Opisthosoma very short. Genital orifice terminal. Penis curved short, poorly visible. *Dorsum* : Eyes absent. Anterior shield with 4 pairs of lateral and 2 pairs of median setae. Posterior shield with 3 pairs of setae. *Venter* : All the coxae well formed. *Gnathosoma* very strong with large femora. Internal border of these femora with a chitinous blade pointed apically. Palp-genu poorly distinct. Palp-tibia with a thick apical, slightly curved spine. This spine presents dorsally a series of transverse rows of small spinelets. Peritremes with 11-12 segments, at each side, its transverse part slightly concave in the middle. Palp-tarsus with 2 sickle-setae, one comb-like setae with 7 teeth, one short spine and one short solenidion. *Legs* : paired claws and rayed empodia are present on all the legs. Legs rather thick and short, except leg I which is longer. Tarsus I with a long solenidion and a shorter very thin guard seta.

Type species : *Hylopecheyla bunguranensis* Fain, 1972.

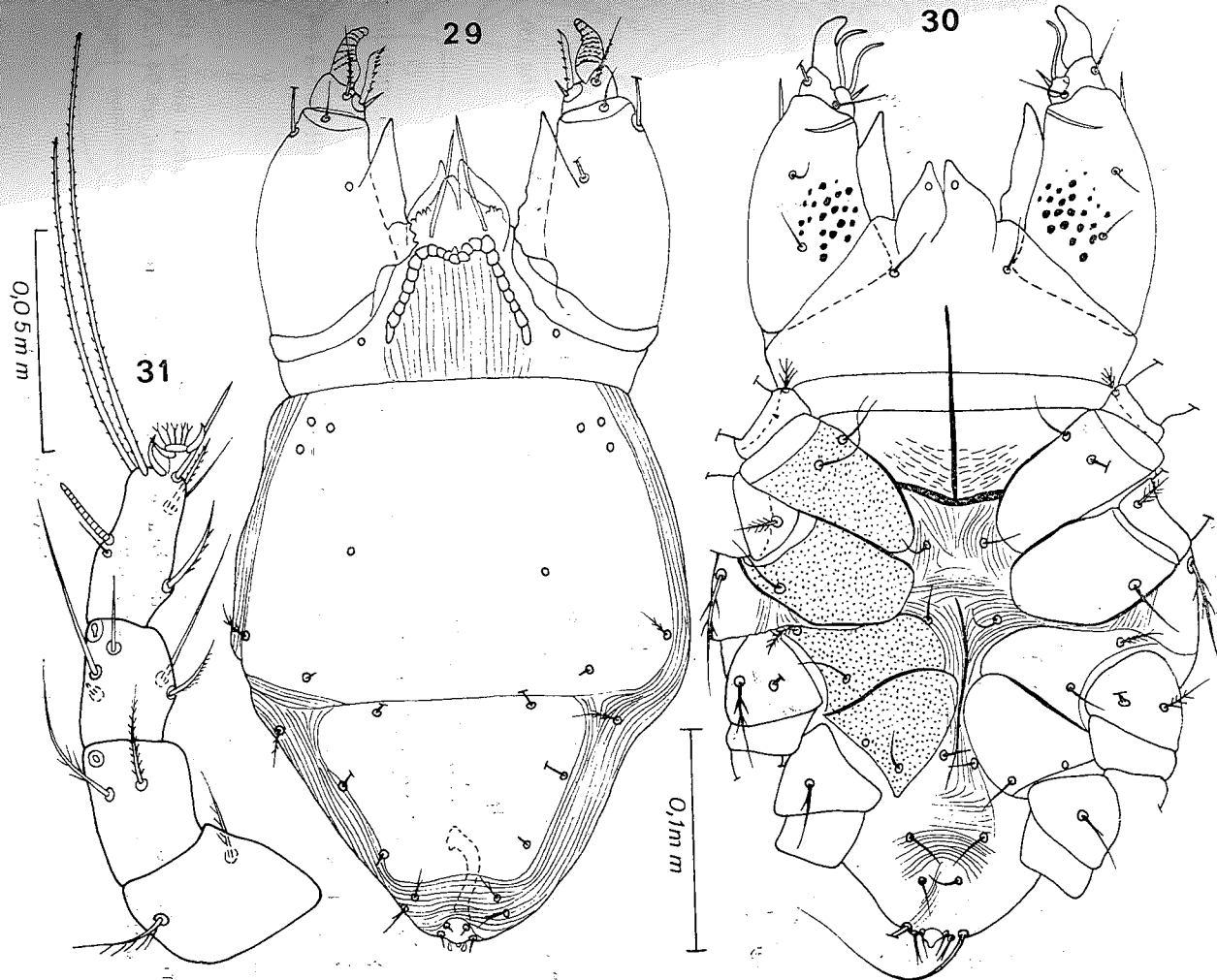


FIGS. 16-20. — *Thryonomycheyla congolensis* Fain, 1972. Holotype male ventrally (fig. 16) and dorsally (fig. 17). Palp-tibia and palp-tarsus ventrally (fig. 18) and dorsally (fig. 19). Genital setae (fig. 20).

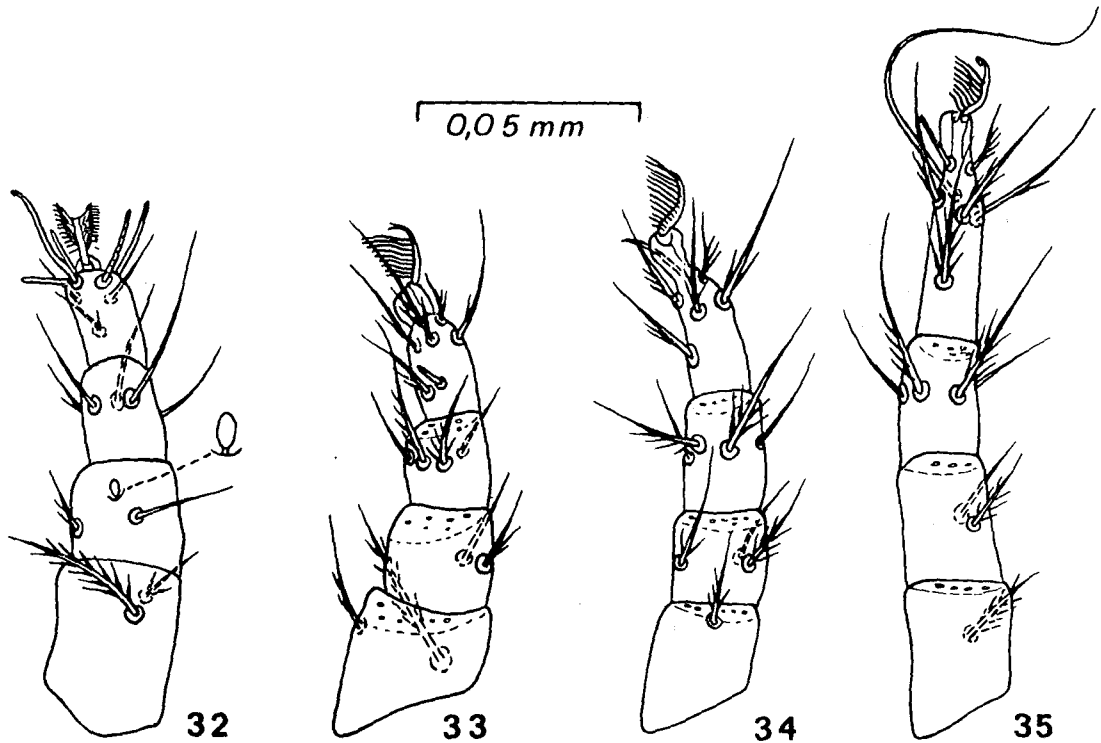


FIGS. 21-25. — 21-25) *Thryonomys* *congolensis* Fain, 1972. Holotype male : leg I dorsolaterally (fig. 21), leg II dorsally (fig. 22), leg III ventrally (fig. 23), leg IV ventrally (fig. 24). Apex of tarsus I (fig. 25).

26-28) *Hylopecheyla* *bunguranensis* Fain, 1972. Holotype male. Leg II (fig. 26); palp-tarsus and palp-tibia dorsally (fig. 27) and ventrally (fig. 28).



FIGS. 29-31. — *Hylopecheyla bunguranensis* Fain, 1972. Holotype male.
29) Dorsal view; 30) Ventral view; 31) Leg I (4 terminal segments) laterally.



FIGS. 32-35. — *Bicheyletiella romerolagi* Fain, 1972.
Female. Dorsal surface of leg I (fig. 32); ventral surface of legs II (fig. 33), III (fig. 34) and IV (fig. 35).

Hyllopecheyla bunguranensis, Fain, 1972

MALE (fig. 26-31) : Holotype 235 μ long and 195 μ wide (idiosoma). Total length, including gnathosoma 345 μ .

Leg chaetolaxy (I-IV) : Trochanters 1-1-2-1; Femora 2-2-2-1. Genua 2-2-2-2. Tibiae 5-4-4-4. Tarsi 9-8-8-8.

Host and locality.

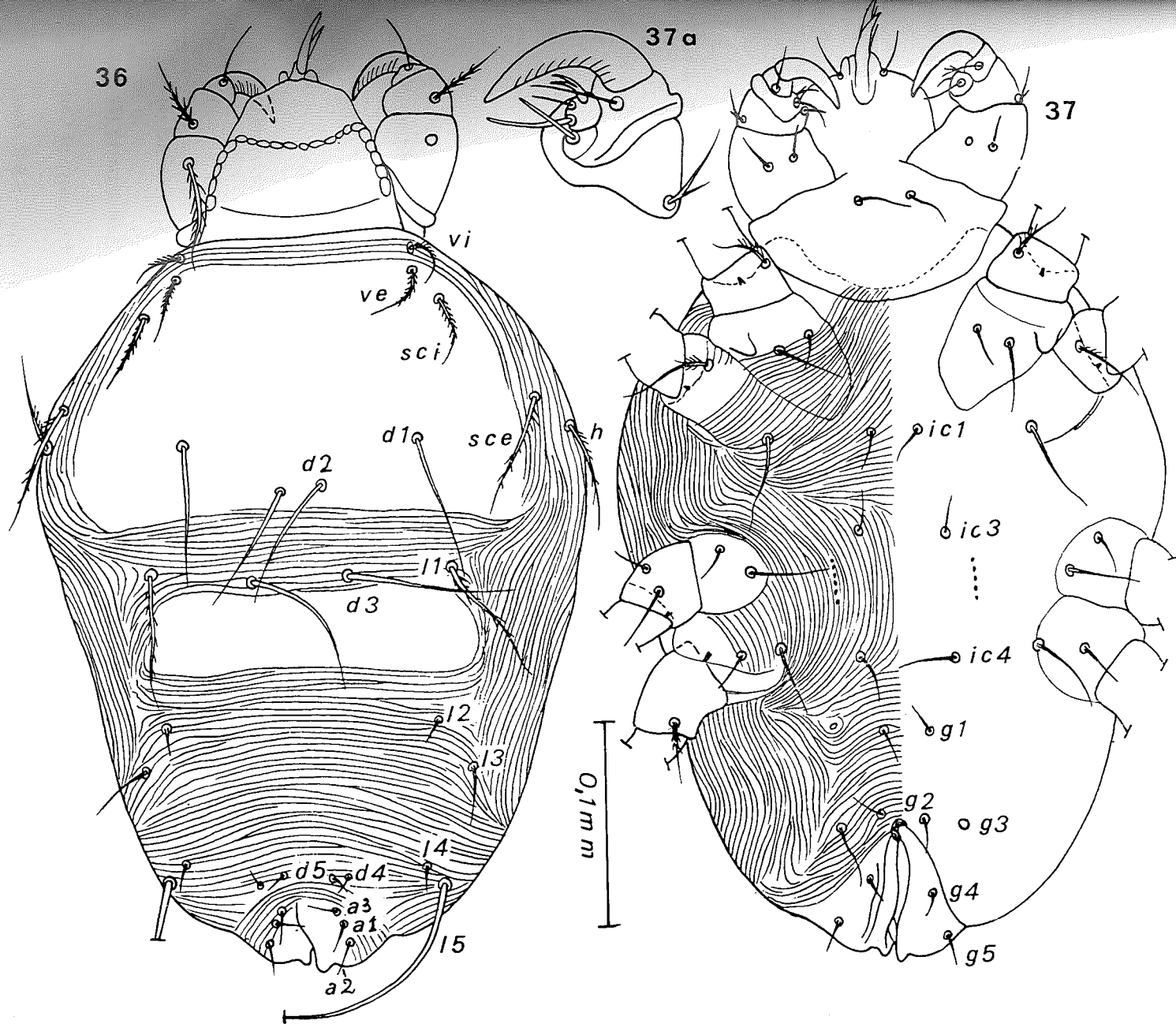
On *Hyllopetes everetti*, of Bunguran Island, Natunas. The mites were located along the anterior and posterior border of the wing membrane. Animal in British Museum n^o 94.4.28 (Holotype and 2 nymphs). Type in British Museum.

FAMILY CHEYLETIELLIDAE VOLGIN, 1969

Genus *Bicheyletiella* Fain, 1972

Definition : This genus is known only from the female. It is distinguished from the genus *Cheyletiella* by the presence of a median hysteronotal shield wider than long and by the very small length of the setae *l* 3. Other characters as in *Cheyletiella*.

Types species : *Bicheyletiella romerolagi* Fain, 1972.



FIGS. 36-37a. — *Bicheyletiella romerolagi* Fain, 1972.
 Female dorsally (fig. 36) and ventrally (fig. 37). Genu, tibia and tarsus of the palp (fig. 37a).

Bicheyletiella romerolagi Fain, 1972

FEMALE (fig. 32-37) : Holotype 350 μ long and 275 μ wide (idiosoma). Total length, including gnathosoma, 450 μ . The posterior part of the base of gnathosoma is ventral. *Dorsum* with two median shields. Setae *vi* barbed, situated in front of the propodosomal shield, the *ve* and *sci* are also barbed and situated on the shield, the *sci* is situated on the striated cuticle. Setae *d 1* and *d 2* long and bare are on the shield. Hysteronotal shield wider than long not bearing setae. Setae *d 3* long, bare ; *d 4* and *d 5* very short. The seta *l 1* is long and barbed, *l 2*, *l 3*, *l 4* are thin and short ; seta *l 5* strong and long. *Venter* striated. Coxae partly striated with 2-1-2-2 setae. Setae *ic 1*, *ic 3* and *ic 4* present. There are 5 pairs of genitals and 3 pairs of anals. Gnathosoma and legs as in *Cheyletiella*. *Chaetotaxy of legs* (I-IV) : Trochanters 1-1-2-1. Femora 2-2-2-1. Genua 2-2-2-2. Tibiae 5-4-4-4. Tarsi 8-8-7-7.

Host and locality.

On *Romerolagus diazi*, Mexico. Holotype in the Institut royal des Sciences naturelles de Belgique.

SUMMARY

The author gives descriptions and figures of several genera and species of Cheyletidae and Cheyletiellidae (Acari, Prostigmata) parasitic on mammals, among which are 1 new genus and 1 new species.

RÉSUMÉ

L'auteur décrit et figure plusieurs espèces et genres de Cheyletidae et Cheyletiellidae (Acari, Prostigmata) parasites de mammifères. Parmi ceux-ci il y a 1 genre nouveau et 1 espèce nouvelle.

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