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**FIVE NEW SPECIES OF ROSENSTEINIIDAE (ACARINA,
ASTIGMATA) FROM INDONESIA, ASSOCIATED WITH BATS OR
WITH THE EARWIG *XENIARIA JACOBSONI***

by

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With 16 text-figures

ABSTRACT

Five new species of Rosensteiniidae are described from Indonesia, one from a bat *Cheiromeles jacobsoni* (Thomas, 1923) (*Molossilichus macrobursatus* spec. nov.) and four from the earwig *Xeniaria jacobsoni* Burr, 1912, living in the guano of this bat (*Micronychites postverrucosus* spec. nov., *Nycteriglyphus xeniariae* spec. nov., *Nycteriglyphus longipilis* spec. nov. and *Xeniarioteles scutellatus* gen. nov., spec. nov.).

INTRODUCTION

Fain et al. (1981) described three new species, two new genera and a new sub-family of mites living either on guano or on Dermaptera associated with bats of the genus *Cheiromeles* in Malaysia. In the present paper we describe five new species living in similar conditions but from Indonesia. The earwigs, *Xeniaria jacobsoni*, were collected by Dr. P. H. van Doesburg, Rijksmuseum van Natuurlijke Historie, Leiden, Nederland.

All the measurements are in microns (μm). Nomenclature of idiosomal setae as in Fain (1963).

Holotypes in the Rijksmuseum van Natuurlijke Historie Leiden, Nederland (RMNH).

DESCRIPTIONS

Rosensteiniidae Cooreman, 1954; Nycteriglyphinae Fain, 1963.

Molossilichus Fain, 1980**Molossilichus cheiromeles** (Fain, 1970)

Nycteriglyphus cheiromeles Fain, 1970: 2.

Molossilichus cheiromeles; Fain, 1980: 170.

The typical series consisted of tritonymphs and protonymphs found on *Cheiromeles torquatus* Horsfield, 1824, in Selangor, Malaysia. New specimens of this species including nymphs and adults were found later on the same host, from the same locality. These adults turned out not to be congeneric with *Nycteriglyphus* and a new genus (*Molossilichus*) was erected for that species (Fain, 1980).

New specimens (3 females and 2 males) of this species were found on *Cheiromeles jacobsoni*, in Sinabang, Simalur, Sumatra (bat in RMNH, no. 1793, collected in vii.1913). In the most strongly sclerotized female specimens the epimeres I are prolonged posteriorly into two parallel paramedian sclerites (18 μm long) very close to each other. In the specimen figured in a previous paper (Fain, 1980) these sclerites were poorly sclerotized.

Molossilichus macrobursatus spec. nov.

(figs. 1, 2)

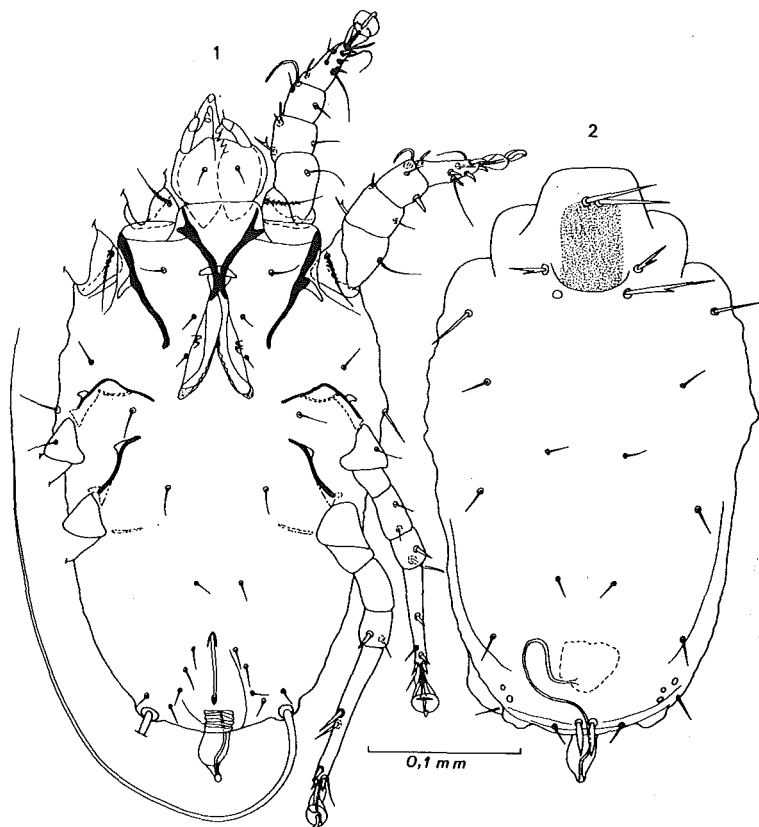
This species is known only from the holotype.

Female (figs. 1, 2). — Holotype 360 μm long (idiosoma) and 208 μm wide (maximum). The cuticle is macerated and in bad condition which probably explains why striations are not visible. Dorsum. — There is a small propodosomal plate, poorly sclerotized. Venter. — Epimeres I are Y-shaped with posterior parts contiguous and not really fused; other epimeres free. Bursa thick, sclerotized, ending externally at the apex of a large conical copulatory tube 30 μm long, 18 μm wide. Idiosomal chaetotaxy. — Setae *vi* thick, spinous, 42 μm long. They are badly oriented and it is not possible to ascertain the presence of a tooth; *sci* and *scie* unequal (60 and 27 μm) with a well-marked tooth. Setae *h* thinner, 30 μm long. Other dorsal setae thin and short except a pair of thick and short paramedian setae (? *d4*) situated dorsally close to the posterior margin of body. Ventral setae thin and short (12-15 μm). Legs long, the legs IV distinctly longer than legs III. Gnathosoma and chelicerae strongly developed. Tarsus I with five spines and four thin setae; tarsus II as tarsus I but with only three thin setae; tarsus III with four spines and three thin setae; tarsus IV with five spines and one thin seta.

Male unknown.

Host and locality. — From *Cheiromeles jacobsoni*, Sinabang, Simalur, Sumatra (Bat in RMNH, no. 1730, collected in vii.1913).

Remark. — This species is distinguished from *Molossilichus cheiromeles* (Fain, 1970) mainly by the characteristic shape of the copulatory tube.



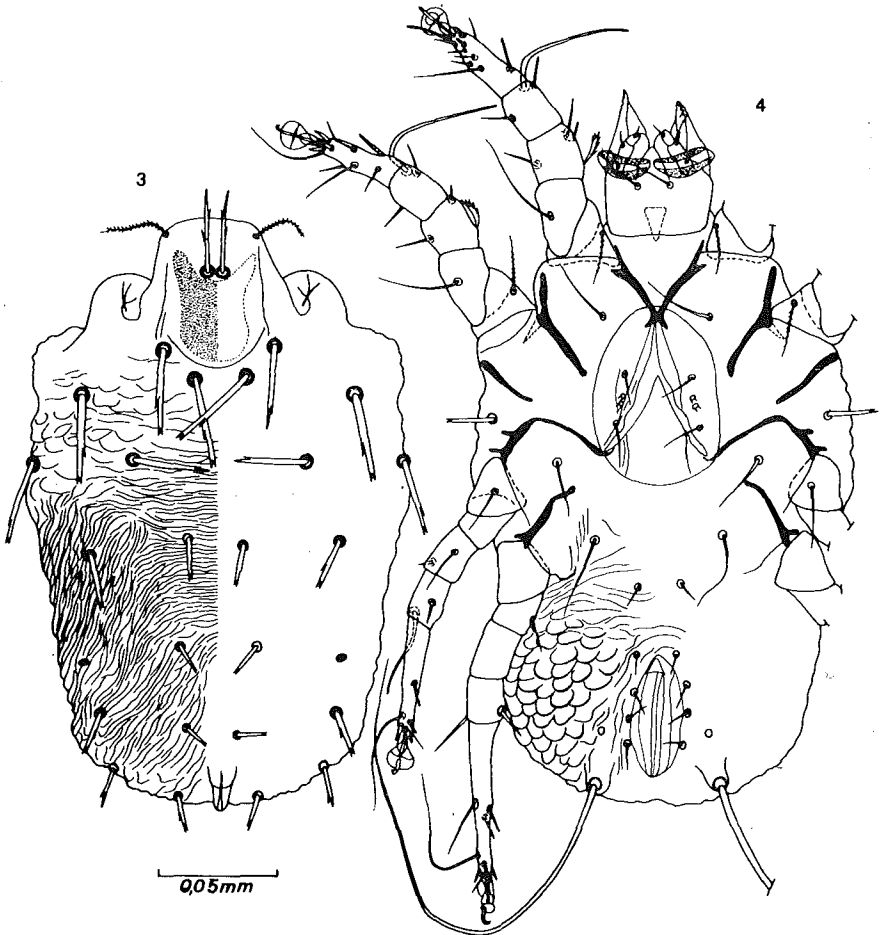
Figs. 1-2. *Molossilichus macrobursatus* spec. nov., female. Fig. 1, venter; fig. 2, dorsum.

Nycteriglyphus Zachvatkin, 1941

***Nycteriglyphus xeniariae* spec. nov.**

(figs. 3-6)

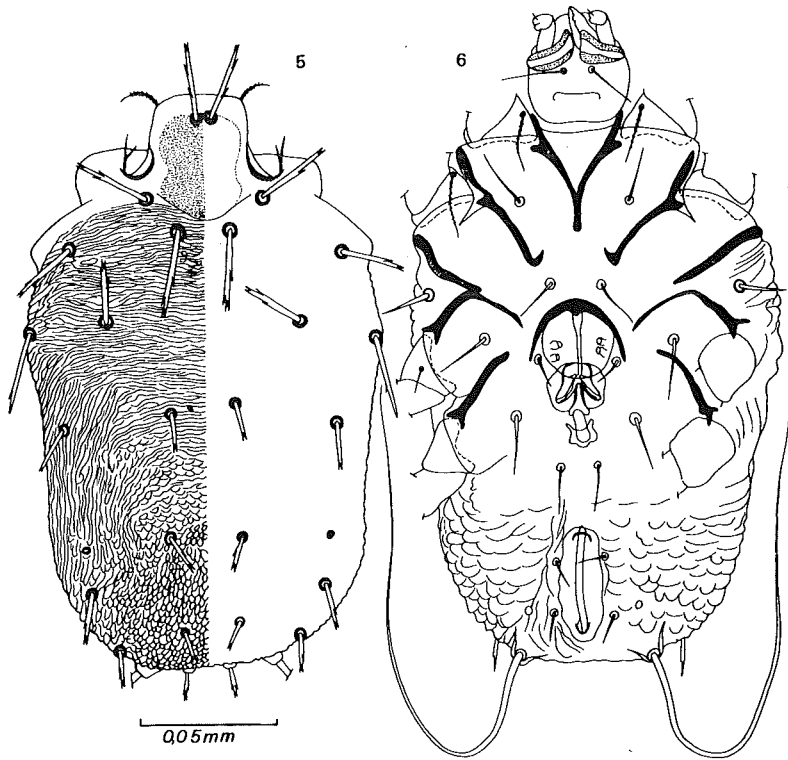
Female (figs. 3, 4). — Holotype 264 μm long and 160 μm wide (idiosoma). In 2 paratypes 232 \times 150 μm and 250 \times 152 μm . Dorsum. — Propodanotum with a punctate shield. Behind this shield the cuticle bears scales or sinuous striations. The scales are located in an area situated in front of *d 1*. Behind these setae the cuticle bears numerous and thin sinuous striations. In the postero-median part of the dorsum the striations are absent. Copulatory tube conical, subterminal, setae *sc* bifid. Length of setae (in μm): *v i* 36, *sc i* 39, *sc e* 33, *d 1* 30, *d 2* 18, *d 3* 13, *d 4* 11, *d 5* 15, *l 1* 39, *l 2* 21, *l 3* 18, *l 4* 16, *l 5* 220, *h* 36. Venter. — Epimeres I fused in V, vulva in an inverted Y. Other epimeres free. Lateral regions of opisthogaster with large scales, other areas bare. Legs well-developed, ending in



Figs. 3-4. *Nycteriglyphus xenariae* spec. nov., female. Fig. 3, dorsal view; fig. 4, ventral view.

a large claw. Tarsi with three apical or subapical rather small spines, other setae of legs thin and bare except dorsal setae of genua I and II which are rather thick and barbed. Genu I with two very unequal solenidia. Gnathosoma with two ventral triangular sucking membranes. Chelicerae well-developed.

Male (figs. 5, 6). — Allotype 208 μm long and 130 μm wide (idiosoma). Dorsum. — Propodonal shield as in female. Anterior half of hysteronotum with very numerous thin and sinuous striations; posterior part of hysteronotum with numerous and very small scales in the middle part and longitudinal scaly striations in the lateral parts. Dorsal setae as in female but shorter, the setae *d 2* to *d 3* are distinctly shorter and thinner than the *sc i*, *sc e* and *d 1*. Venter. — Epimeres I fused, forming a sternum 14 μm long. Other epimeres free. Male organ thick,



Figs. 5-6. *Nycteriglyphus xeniariae* spec. nov., male. Fig. 5, dorsal view; fig. 6, ventral view.

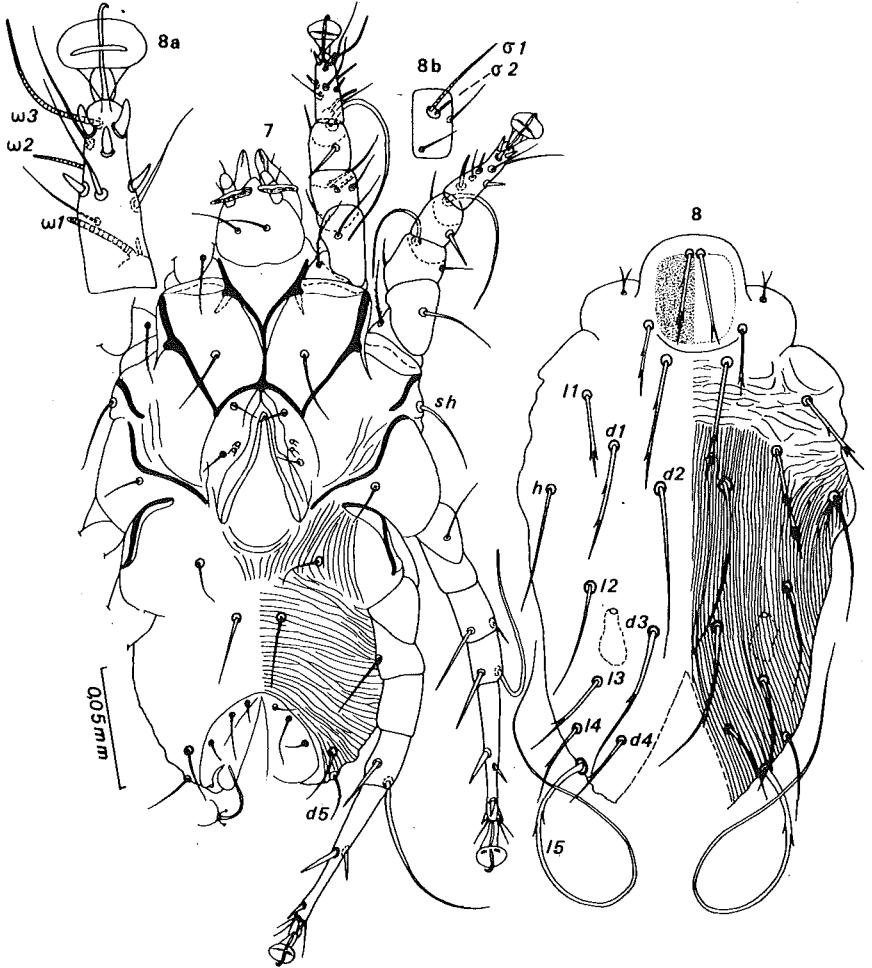
strongly sclerotized. In front of this organ is a strong curved sclerite in the form of an inverted U. Opisthogaster with large scales in lateral areas. Legs as in female but some setae are stronger.

Host and locality. — Holotype, five paratype females, two paratype nymphs from earwig *Xeniarja jacobsoni*, Pelabuhan Ratu, W. Java. The earwigs were collected by P. H van Doesburg, 13.x.1977 and are in the RMNH, Leiden. Holotype in RMNH, two paratype females and two paratype nymphs in the author's collections; one paratype female in the British Museum (Nat. Hist.); one paratype female in the U.S. National Museum, Washington, and one female paratype in the Institut des Sciences naturelles de Bruxelles.

Remark. — This species is distinguished from the other species in the genus by the structure of the dorsal cuticle and chaetotaxy, and by the leg chaetotaxy in females. Males differ by having a large sclerotized arc in front of the genital organ.

Nycteriglyphus longipilis spec. nov.
(figs. 7-10)

Female (figs. 7, 8, 8a, b). — Holotype 240 μm long, 135 μm wide. Dorsum. — Propodonotum with a punctate shield. Hysteronotum finely striated longitudinally except in its anterior and antero-lateral parts where the striations are transverse, more spaced and scaly. Dorsal setae thin. Some, especially on hysteronotum, are relatively very long. Some of these setae bear a few barbs. Length of setae (in μm): *v i* 36, *sc i* 51, *sc e* 27, *d 1* 48, *d 2* 71, *d 3* 70, *d 4* 30, *d 5* 22, *l 1* 39, *l 2* 51, *l 3* 45, *l 4* 35, *l 5* 225, *h* 54. Setae *v e* not observed. Copulatory

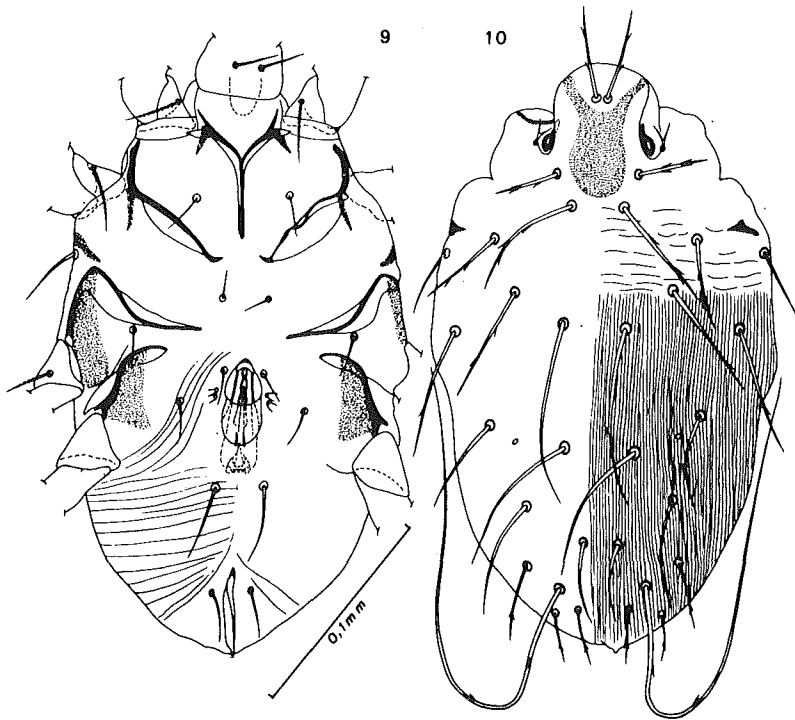


Figs. 7-8. *Nycteriglyphus longipilis* spec. nov., female. Fig. 7, ventral view; fig. 8, dorsal view; fig. 8a, tarsus I ventrally; fig. 8b, genu I dorsally.

papilla not observed, probably because the posterior part of the abdomen is crushed. Venter. — Epimeres I fused in a Y with a sternum $22\ \mu\text{m}$ long. A thin sclerotized arc joins epimeres II and the sternum. Vulva in an inverted Y. Opisthogaster striated transversely. Gnathosoma. — Normally developed, with two ventral triangular small sucking membranes. Chelicerae moderately developed. Legs strong, all ending in a large claw. Some setae of tarsi and tibiae I-IV are spines. Genu I with two very unequal solenidia.

Male (figs. 9, 10). — All the males are homeomorphic. A paratype is $264\ \mu\text{m}$ long and $160\ \mu\text{m}$ wide. Dorsum. — As in the female but the propodosomal plate is prolonged anteriorly in two narrow lateral arms. Venter. — Epimeres I fused in a sternum $33\ \mu\text{m}$ long. Other epimeres free. Opisthogaster striated as in female. Genital organ long ($50\ \mu\text{m}$) and narrow (maximum width $18\ \mu\text{m}$). Anus ventro-terminal. Legs and gnathosoma as in the female. Genital organ long ($50\ \mu\text{m}$) and narrow (maximum width $18\ \mu\text{m}$). Anus ventro-terminal. Legs and gnathosoma as in the female, the posterior legs being much longer than the anterior ones.

Tritonymph. — Length $195\ \mu\text{m}$, width $117\ \mu\text{m}$. Dorsum. — As in the female. Venter. — As in female but the genital split is replaced by a small orifice situated



Figs. 9-10. *Nycteriglyphus longipilis* spec. nov., male. Fig. 9, ventral view; fig. 10, dorsal view.

between coxae III and IV, and the sternum is not fused with epimeres III. Legs and gnathosoma as in female.

Host and locality. — Holotype from *Xeniaria jacobsoni*, Pelabuhan Ratu, W. Java, 13.x.1977; 26 females, 20 homeomorphic males and 5 tritonymphs, all paratypes, from bat guano from the same locality but on 12.x.1977 (guano collected by Dr. P. H. van Doesburg, mites by F.S.L.).

Remarks. — This species is well characterized by the longitudinal striations of the hysteronotum and the shape of the dorsal setae which are thin and long. The sternum is fused laterally with epimeres II as in genus *Mydopholeus* MacDaniel & Baker, however there are two solenidia on genu I, compared to only one in the present genus. *N. longipilis* is, therefore, somewhat intermediate between *Nycteriglyphus* and *Mydopholeus*.

Genus *Xeniarioptes* gen. nov.

Definition. — Only the female is known. General aspect as in *Nycteriglyphus*. Body elongate. Cuticle of dorsum bearing two punctate median shields; one in the propodosomal area, the other covering the anterior third of the hysteronotum. Posterior two-thirds of the hysteronotum present oblique irregular, partly scaly striations and are finely punctate. Epimeres I fused in a V. A thin curved and sclerotized line joins the epimeres I and II. Vulva in an inverted Y. Legs and gnathosoma as in *Nycteriglyphus*, the two ventral membranous expansions of the palpal area are present here. Genu I with two unequal solenidia. Dorsal setae forming long toothed spines.

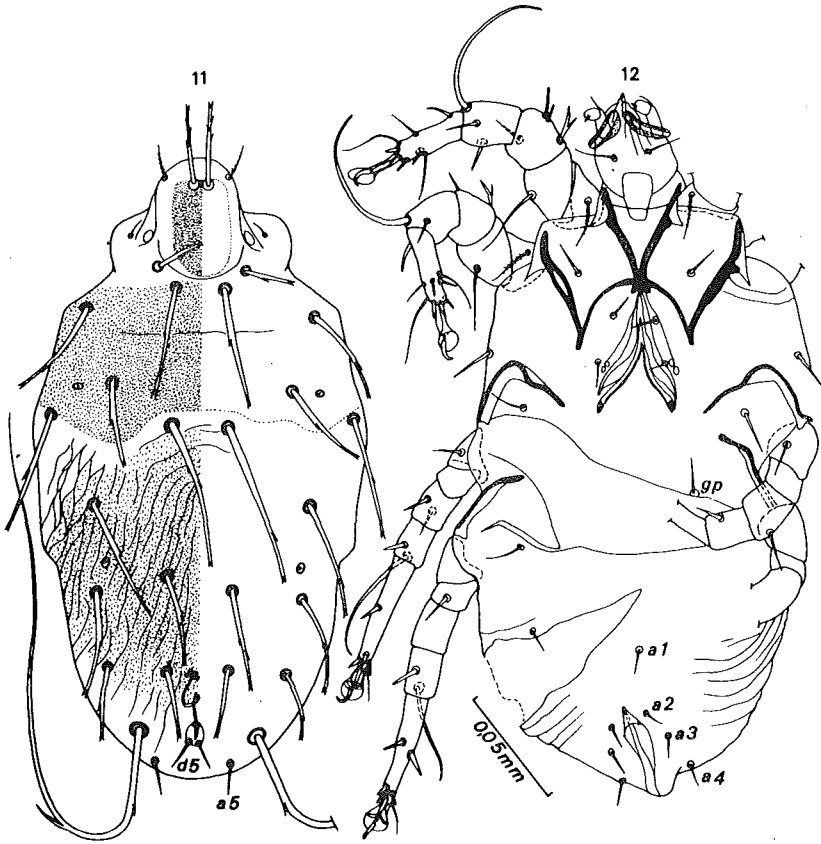
Type species. — *Xeniarioptes scutellatus* spec. nov.

Remark. — This genus differs from all the other genera in the Nycteriglyphinae by the presence of a punctate shield in the anterior part of the hysteronotum.

Xeniarioptes scutellatus spec. nov.

(figs. 11, 12)

Female (figs. 11, 12). — Holotype 252 μm long and 135 μm wide (idiosoma). Dorsum. — Bearing two punctate, not striated shields, a propodonotal situated in front of the *sc i* setae and an hysteronotal, 55 μm long in midline. The latter covers the anterior third of the hysteronotum and reaches the lateral surfaces of the body. Posterior two thirds of the hysteronotum punctate with poorly developed striations, partly scaly, and mainly longitudinal or oblique. Most of the dorsal setae are spines with one or two teeth and with forked apex. Length of setae (in μm): *v i* 33, *sc e* 19, *sc i* 46, *d 1* 33-36, *d 2* 63-66, *d 3* 39, *d 4* 27, *d 5* 12, *l 1* 39, *l 2* 45, *l 3* 39, *l 4* 25, *l 5* 210, *h* 48. Bursa short, copulatory orifice situated at the top of a small triangular papilla. Venter. — Epimeres I fused in V. Epimeres II fused with epimeres I by means of a very thin curved sclerite. Other epimeres free. Vulva in an inverted Y. The opisthogaster is in rather bad condition, bearing sinuous striations only in its lateral regions. Gnathosoma and chelicerae



Figs. 11-12. *Xeniaroptes scutellatus* spec. nov., female. Fig. 11, dorsal view; fig. 12, ventral view.

moderately developed. A pair of triangular membranes is present on the ventral surface of the gnathosoma. Legs. — Claws well-developed. Some setae are modified into spines. Genu I which two unequal solenidia.

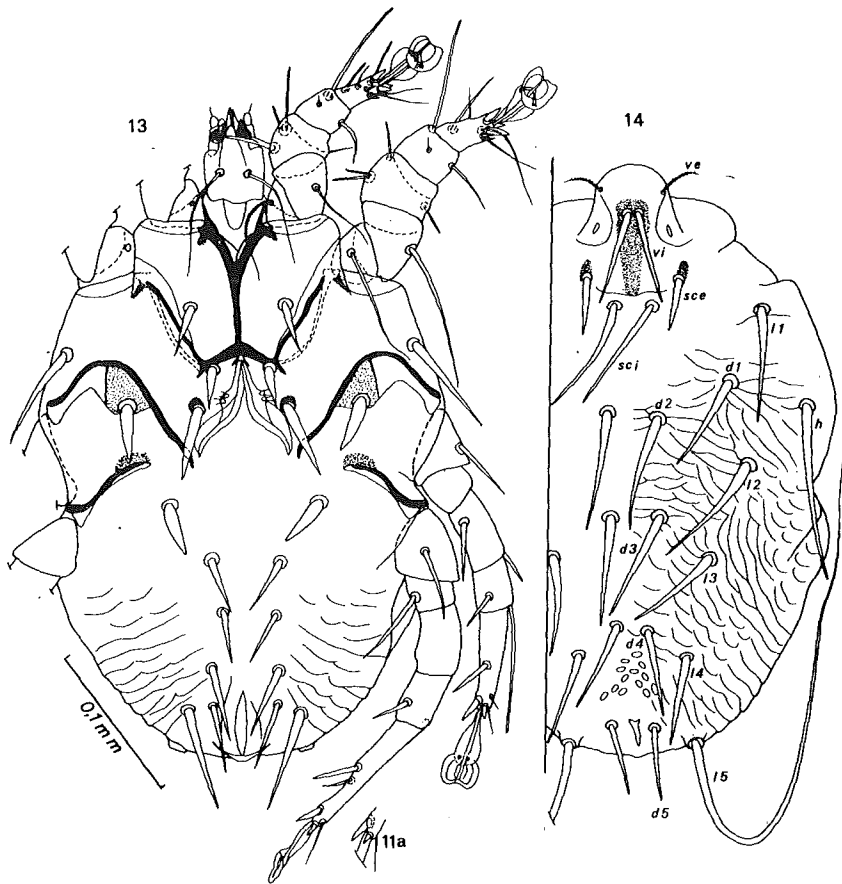
Host and locality. — Holotype and only known specimen from *Xeniaria jacobsoni*, Pelabuhan Ratu, W. Java, 13.x.1977 (F.S.L.). Insects collected by Dr. P. H. van Doesburg.

Micronychitinae Fain, Lukoschus & Nadchatram, 1981

Micronychites Fain, Lukoschus & Nadchatram, 1981

Micronychites postverrucosus spec. nov.
(figs. 13-16)

Female (figs. 13, 14). — Holotype 350 μ m long (idiosoma) and 230 μ m wide. In a paratype 360 \times 240 μ m. Dorsum. — With partly scaly striations. These



Figs. 13-14. *Micronychites postverrucosus* spec. nov., female. Fig. 13, venter; fig. 14, dorsum; fig. 14a, apex of tarsus IV dorsally.

striations are poorly developed or absent in front of the *d 2* setae and in the median part of the hysteronotum. Between setae *d 4* and *d 5* the cuticle is verrucose. Propodonotum bearing a narrow punctate plate. Copulatory tube dorsal, conical (length 15 μm). Venter. — There is a long sternum, fused with the epigynum. Most of ventral setae are thick spines, especially coxals III and *gp*. Chaetotaxy of idiosoma (dorsum). — Length of setae (in μm): *vi* 50, *sci* 72, *sce* 30, *d 1* 60, *d 2* 72, *d 3* 66, *d 4* 53, *d 5* 42, *h* 100, *l 1* 66, *l 2* 72, *l 3* 57, *l 4* 57, *l 5* 320. Legs well-developed, resembling those of *M. spinifer*. Gnathosoma small.

Male. — Homeomorphic (fig. 15); idiosoma 340 μm long, 225 μm wide. This specimen is crushed and the cuticle torn on the ventral surface. Dorsum as in female, except that there is no verrucose area behind setae *d 4*. Venter. — Sternum very long, free. Ventral setae strong, some are thick spines. Legs as in



Figs. 15-16. *Micronychites postverrucosus* spec. nov., males in ventral view. Fig. 15, male homeomorphic; fig. 16, male polymorphic.

female. Genital organ badly oriented and partly deformed because the specimen has been crushed. Male. — Polymorphic (fig. 16); idiosoma 350 μm long, 245 μm wide. Dorsum and venter as in homeomorphic male. The only difference with it is the monstrous development of legs II in the polymorphic specimen.

Host and locality. — From *Xeniaria jacobsoni*, living in guano of bat *Cheiromeles jacobsoni* (Doesburg Field Collection no. 245 A). Pelabuhan Ratu, W. Java. Holotype and 30 paratype females, 20 paratype males (most of these being polymorphic) and six paratype nymphs (mostly tritonymphs). Holotype and two female paratypes, two male paratypes and one nymph in the RMNH. Paratypes (one male and one female each) in the following Institutions: British Museum

(Nat. Hist.); U.S. National Museum, Washington D.C.; Field Museum of Natural History, Chicago; Acarology Laboratory, Columbus; Zoologisches Museum, Hamburg; Museum National d'Histoire Naturelle, Paris; Institut royal des Sciences naturelles, Bruxelles; Institute for Medical Research, Kuala Lumpur, Malaysia. Other paratypes in the collections of the authors.

Remarks. — (1) This species differs from *M. spinifer* Fain et al., 1981, in the female by the presence of a verrucose area in posterior region of the opisthonotum, by the much thicker aspect of some ventral setae, especially *cx I*, *g a*, *g m*, *g p*, and the more unequal lengths of solenidia *sigma 1* and 2. The male differs in the shape of the *cx I*, *g a* and *g m* setae forming thick spines.

(2) Male polymorphism in Nycteriglyphinae has been observed for the species *Chiroptoglyphus americanus* by O'Connor & Reisen, 1978. These authors observed a wide variation in the development of leg I according to the specimens. They have shown that this variation is positively allometric with respect to body size. We have observed the same relationship between the width of the femur II and the body length in the males of *M. postverrucosus*. This suggests that the variation in the width of leg II in the males is merely polymorphism related with the size of the body and not true heteromorphism.

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