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# Notes on mites associated with Myriapoda
# 1. Three new astigmatic mites from Afrotropical Myriapoda (Acari, Astigmata)

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**Summary**

Three new genera and species of mites (Acari, Astigmata) are described from Afrotropical Myriapoda: *Chetochelacarus mamillatus* gen.n. and sp.n. (Chetochelacaridae fam.n.), *Lophonotacarus minutus* gen.n. and sp.n. (Lophonotacaridae fam.n.) and *Diplopodocoptes transkeiensis* gen.n. and sp.n. (Canestriniidae).
Key-words: Taxonomy, Acari, Myriapoda.

**Résumé**

Trois nouveaux genres et espèces d'acariens (Acari, Astigmata) sont décrits de Myriapodes afrotropicaux: *Chetochelacarus mamillatus* gen.n. et sp.n. (Chetochelacaridae fam.n.), *Lophonotacarus minutus* gen.n. et sp.n. (Lophonotacaridae fam.n.) et *Diplopodocoptes transkeiensis* gen.n. et sp.n. (Canestriniidae).
Mots-clefs: Taxinomie, Acari, Myriapoda.

## Introduction

We describe herein three new genera and species of mites (Acari, Astigmata) found in association with Myriapoda from the Afrotropical region. The mites were found either on the Myriapoda or in the alcohol containing them.
One of these mites, *Diplopodocoptes transkeiensis* gen.n., sp.n. belongs to the family Canestriniidae. It was found associated with millipedes of the families Glomeridae in Transkei, South Africa and Odontopygidae in Kenya.
The two other mites belong to new genera and new families: *Chetochelacarus mamillatus* gen.n., sp.n. (Chetochelacaridae fam.n.) from a Julidae in Zaïre and *Lophonotacarus minutus* gen.n., sp.n. (Lophonotacaridae fam.n.) from millipedes of the families Glomeridae in Transkei and Odontopygidae in Kenya.
All the measurements are in micrometers (μm).

### Family Chetochelacaridae fam.nov.

*Definition:*
Only the female is known. Medium size body. Sejugal furrow and tegmen lacking. Oil glands not observed. Cuticle relatively well sclerotized. *Dorsum* with three small punctate plates in the anterior part of the propodosoma, one median and two lateral. Rest of body covered by very numerous small mamillae. All the dorsal setae very small, their number as usual except that *ve* and *s cx* are lacking; the *l5* are ventral. *Venter:* Epimera I fused in a sternum; epimera II incompletely, epimera III completely fused with their respective epimerites. Setae *ga* and *gm* not situated on the vulvar lips but outside of them. Vulva in an inverted Y with a small posterior lip. Copulatory orifice terminoventral situated on a slightly raised area. The vulva is situated at the level of coxa III-IV. There is a very small epigynium. Genital suckers with a short basal segment. Anus subtermino-ventral, with 3 pairs of anal setae. Setae *sh* very small. *Gnathosoma* well developed bearing a pair of large and complicated membranes. Rutellar lobes very poorly sclerotized. Chelicera long, tapering posteriorly, its posterior third distinctly articulated with the anterior two thirds, bearing a strong mandibular seta at the base of the fixed digit. Fixit digit distinctly longer than the movable digit and covered in its apical part by numerous short setae. *Legs* rather short and thick; the two posterior pairs inserted ventrally. Tarsi ending in large suckers without claws. These suckers have short condylophores, large membranous envelops and reduced central sclerites, there are no lateral plates. (ATYEO, 1978) Chaetotaxy of legs (number of setae): Tarsi 7-6-5-5. Tibiae 2-2-1-1. Genua 2-2-1-0. Femora 1-1-0-1. Trochanters 1-1-1-0. Tarsus I with a thick cylindrical apico-ventral spine with an irregularly trifid apex, 4 piliform subapical setae, one short dorsal slightly ovoidal seta (seta *aa*) and a thin seta *ba* close to *ω1*. Tarsus II as I but with 6 setae (*aa* lacking). Tarsus III as II but *ba* is lacking. Tarsus IV as III but the *u* seta is a short bifid spine. A thin famulus is present close to *ω1*. Solenidiotaxy: Tarsi 3-1-0-0. Tibiae 1-1-1-1. Genua 1-1-0-0.

*Type genus:*
*Chetochelacarus* gen.nov.

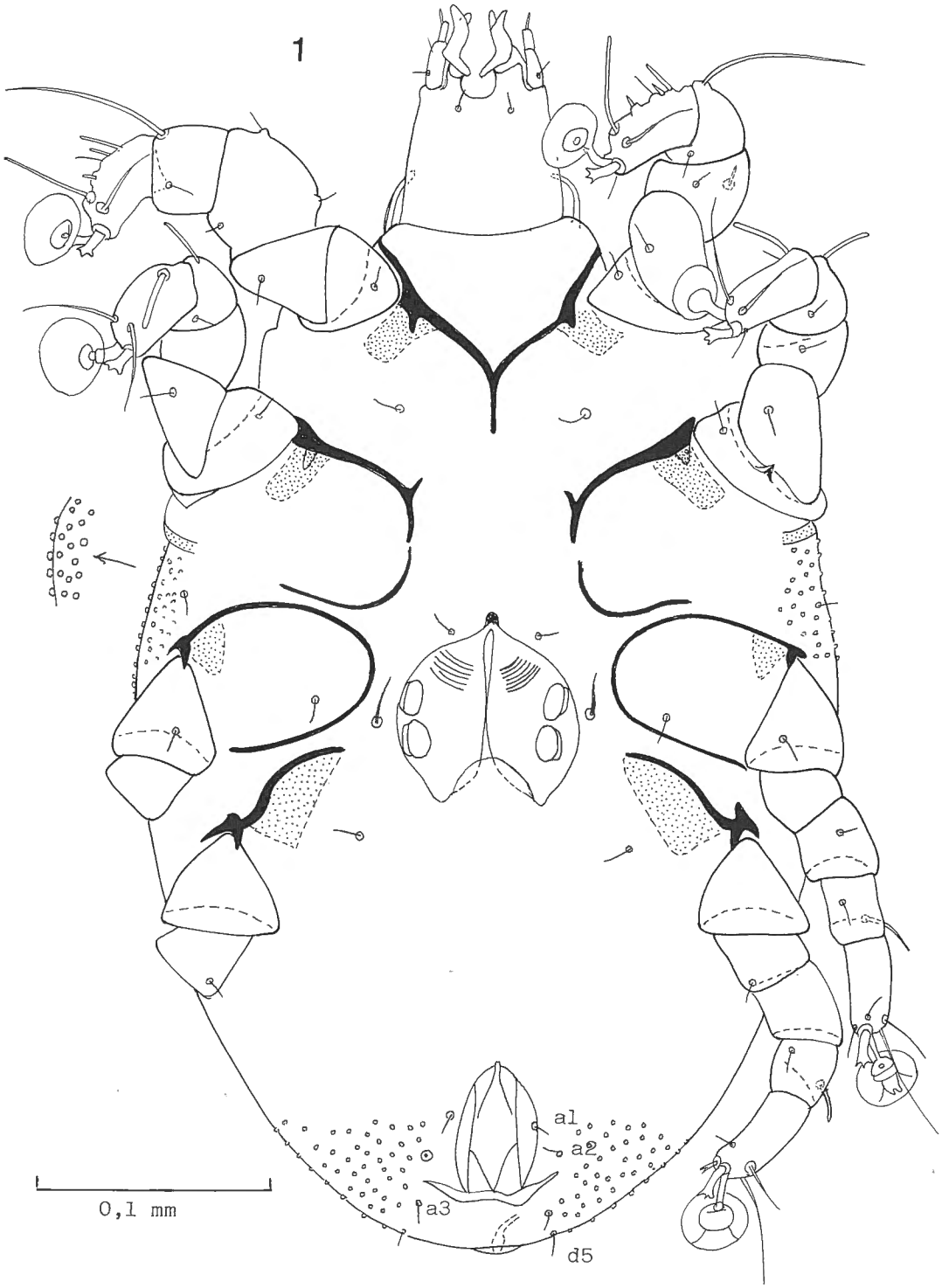



Fig. 1. Chetochelacarus mamillatus *sp.n. Female in ventral view.*

Genus **Chetochelacarus** gen.nov.

*Definition:*
With the characters of the family.

*Type species:*
*Chetochelacarus mamillatus* spec.nov.

**Chetochelacarus mamillatus** spec.nov.

*Female holotype* (Figs. 1-6):
Idiosoma 435 long and 285 wide. With the characters given above. Lengths of the dorsal setae 5-8, of the sternum 28, of the tarsi I-IV 45-45-45-48. Tibial solenidia relatively short 63-20-18-15. The holotype contains a non-embryonated egg 180 long and 105 wide.

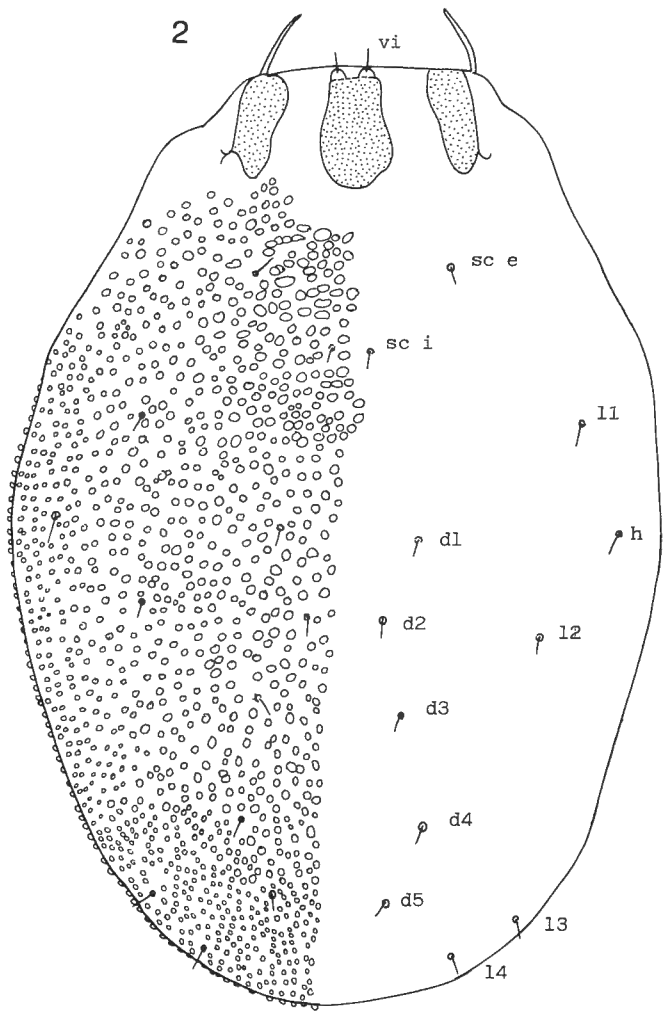



Fig. 2. Chetochelacarus mamillatus *sp.n. Female in dorsal view.*

HABITAT

Holotype and only known specimen from a millipede of the family Julidae (Diplopoda) n° 159609 from Djuma Valley, Kivu, Zaïre, and conserved in the Museum of Tervuren.

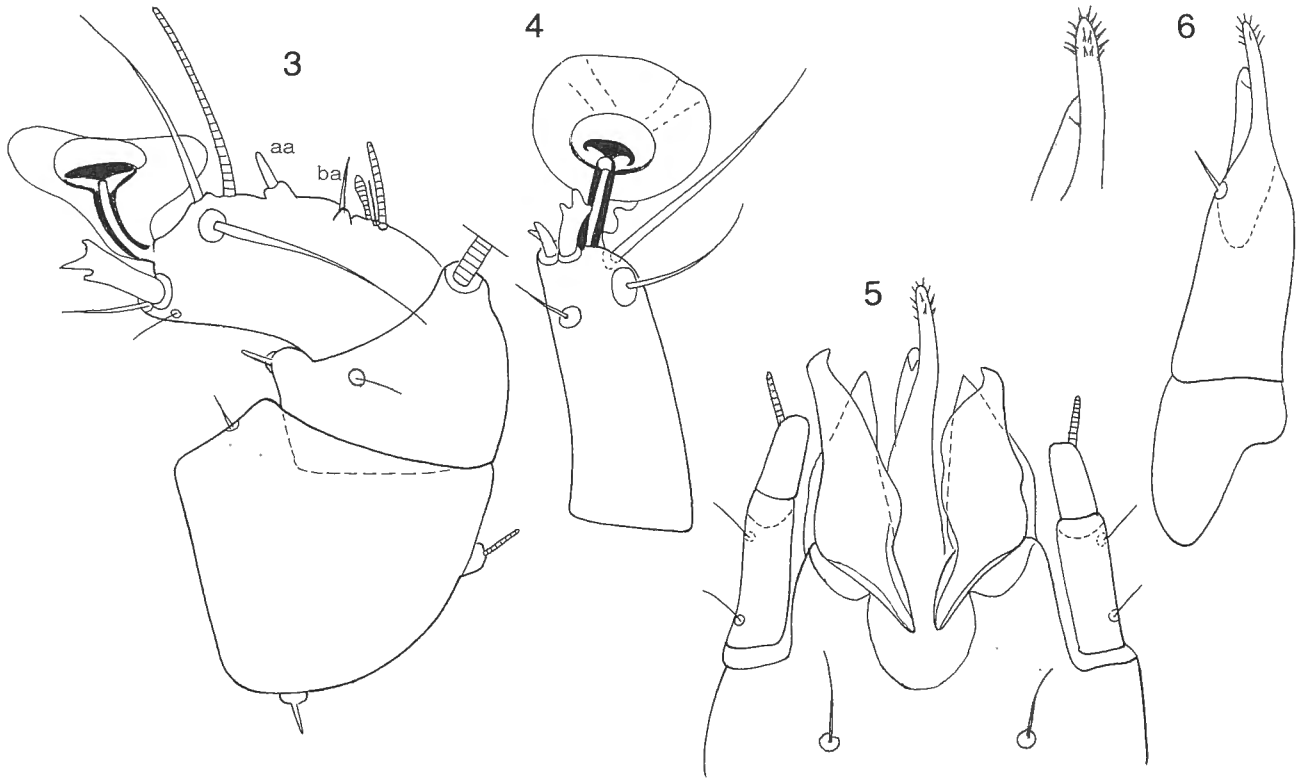
REMARK

This new family is characterized as follows: Absence of sejugal furrow and of a tegmen, the lack of setae *ve* and *s cx,* dorsal chaetotaxy very small, only 3 pairs of anal setae, gnathosoma with voluminous membranes, fixed digit of chelicera longer than movable digit and shortly pilose at apex, reduction of the number of tarsal setae and modification of seta *s* in a trifid cylindrical spine, large tarsal suckers almost completely membranous without a claw and with strongly reduced central sclerites, absence of oil glands. Organ of Grandjean narrowly cylindrical.

**Family Lophonotacaridae** fam.nov.

*Definition:*

Very small mites. Cuticle well sclerotized. Absence of sexual dimorphism; in both sexes the dorsal surface, the shape and situation of genital orifice and anus, the shape of the legs and gnathosoma are almost identical. The male lacks copulatory adanal and tarsal suckers. Oil glands not observed. There are no dorsal shields but the anterior and lateral regions of the dorsum are more sclerotized than the median area. Sejugal furrow and tegmen absent. The dorsum bears two pairs of lateral longitudinal crests formed of chitinous membranes, the most internal crests extend from *d1* to *d3,* the most external begin immediately behind *l2,* from there they run backwards and slightly externally, then, at level of *d3,* they curve inwards and end a little inside setae *l4.* These external crests become more visible in slightly compressed specimens. Lateral and anterior margins of idiosoma reinforced by a




Figs. 3-6. Chetochelacarus mamillatus *sp.n. Female: leg I (3), tarsus IV (4), gnathosoma in ventral view (5), chelicera (6).*

narrow sclerotized band. Posterior border of the body with two pairs of thick rounded papillar formations bearing a thin and short seta. These papillae are better developed in female than in male. Chaetotaxy: *vi* foliate, very large, *l2* very strong and long and with an internal membranous flange curving the seta inwards; setae *d3* very strong and long with the apex slightly bulbous, other setae very short and thin; the *ve* and *sc e* lacking. *Venter:* All epimera thick and sclerotized. Posterior margin of body with 2 pairs of large cuticular papillae each bearing a thin and short seta. Genital orifice longitudinal in male, in an inverted Y with a very short posterior lip in female. The genital setae *ga* and *gm* are situated on the genital lips. Genital area surrounded by a long sclerite in an inverted U arriving forwards close to the extremities of epimera II. Female with a well-developed epigynium. The penis of the male is voluminous. The opening of the bursa copulatrix is ventral, far in front of posterior extremity. Anus short, situated close to genital area, it is surrounded by two pairs of very small setae and in the male by an additional pair of pores. A third pair of anal setae is present in the posterior region of venter, in both sexes. *Gnathosoma* small, with relatively long palps and without distinct membranes. Ruttellar lobes narrow and deeply incised. *Legs* longer and slender, all inserted laterally; tarsi much longer than the tibiae and ending in a membranous ambulacrum containing a claw completely included in the disc except its small terminal hook which is free. Chaetotaxy of legs (number of setae): Tarsi 6-5-5-5. Tibiae 2-2-1-1. Genua 2-2-1-0. Femora 1-1-0-0. Trochanters 1-1-1-0. Tarsus I with 2 small apicoventral spines and 3 thin setae. Tarsi II-IV as tarsus I but the basal seta *aa* is lacking. *Solenidiotaxy* Tarsi 3-1-0-0. Tibiae 1-1-1-1. Genua 1-1-1-0.

*Type genus:*
*Lophonotacarus* gen.nov.

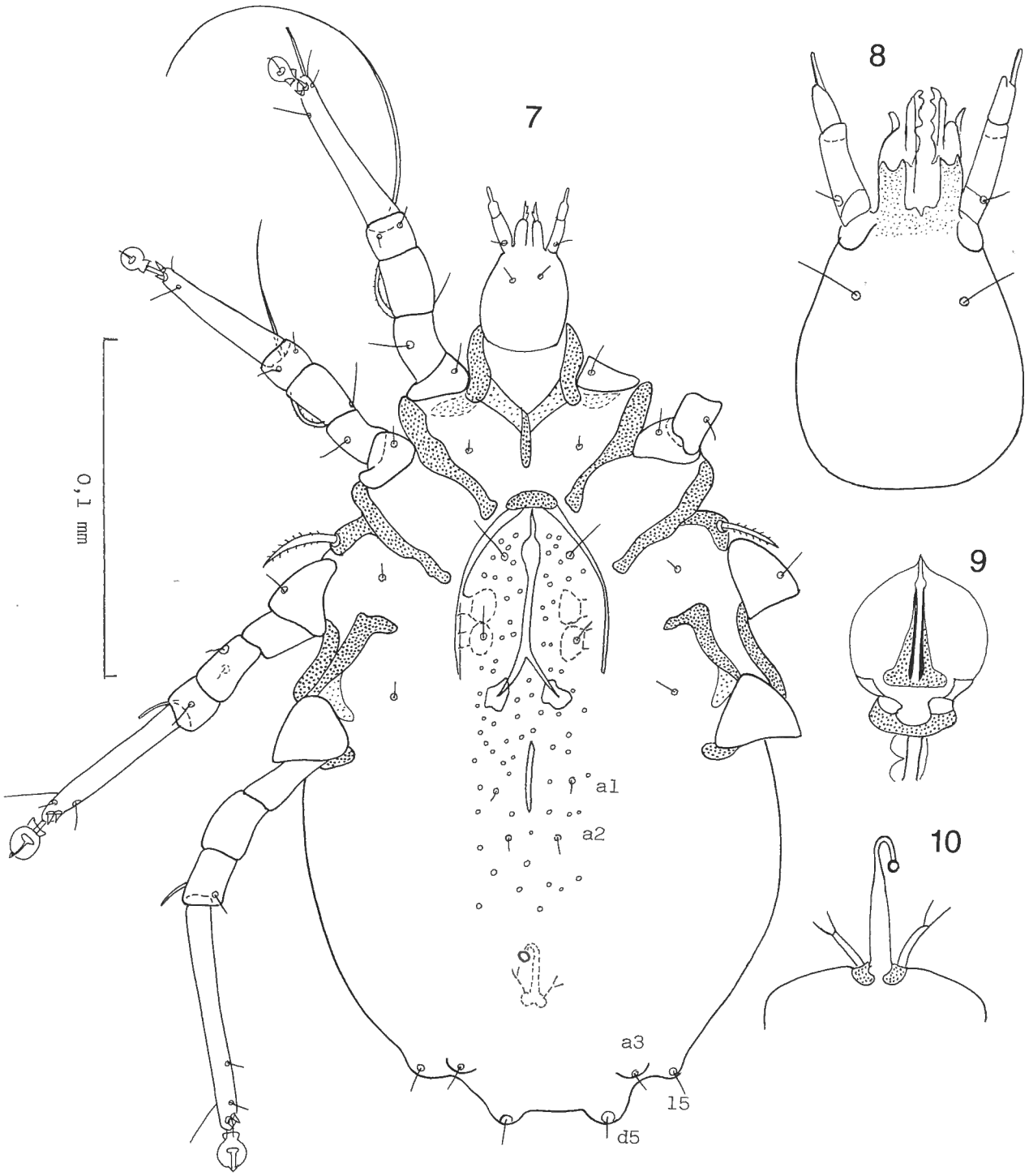
Genus **Lophonotacarus** gen.nov.

*Definition:*
Characters as for the family.

*Type species:*
*Lophonotacarus minutus* spec.nov.

**Lophonotacarus minutus** spec.nov.

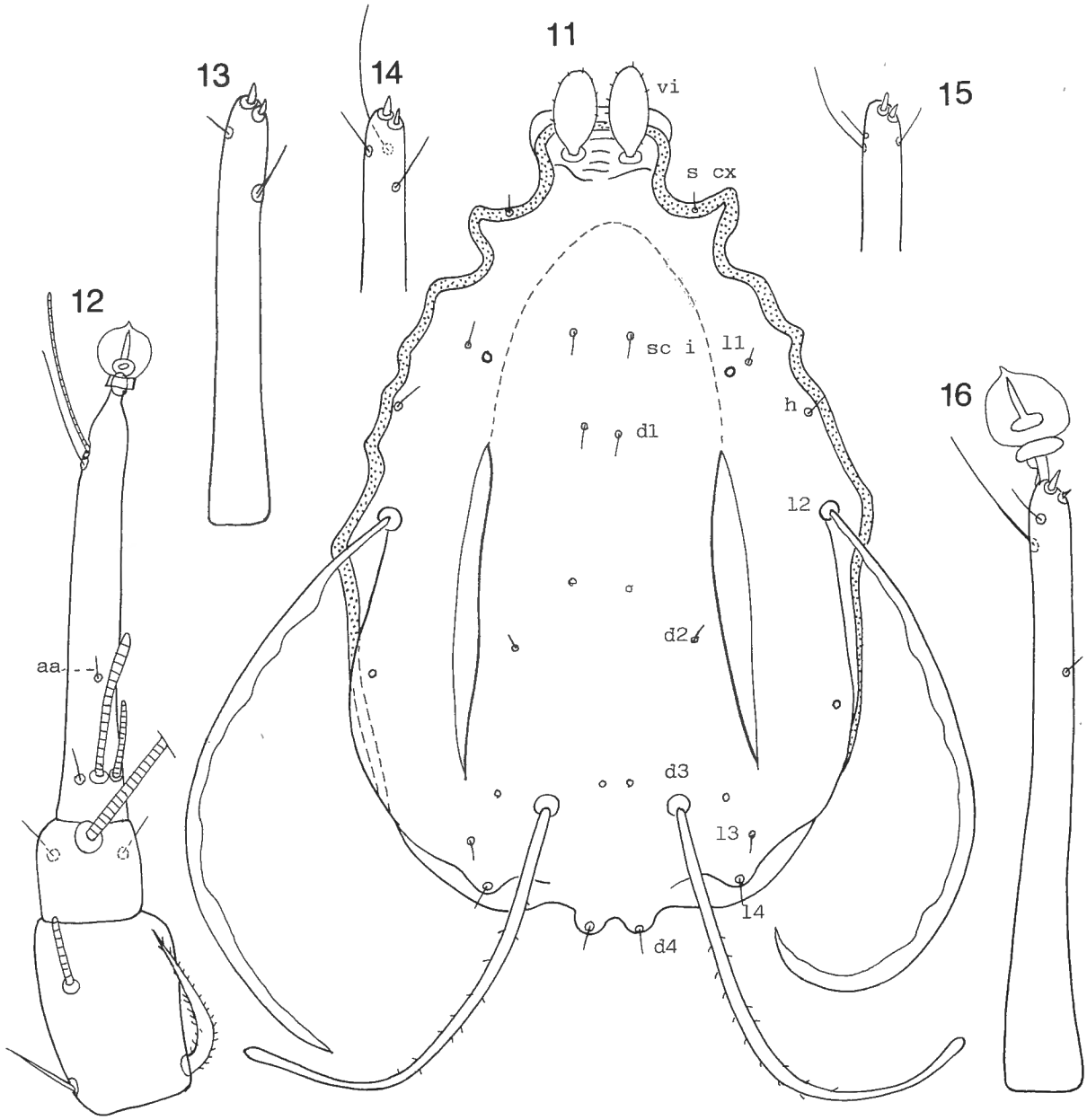
*Female holotype* (Figs. 7-16):
Idiosoma 237 long and 144 wide. In a paratype 220 × 129. *Dorsum:* Length and width of setae *vi* 30 × 12, lengths of setae *l2* 155, *d3* 120. The paramedian crests of the dorsum are 90 long, the lateral crests 130. Ventral surface sclerotized and almost completely




Figs. 7-10. Lophonotacarus minutus *sp.n. Female in ventral view (7), gnathosoma in ventral view (8), ambulacrum (9), bursa copulatrix (10).*

punctate except the inner area of the genital lips. Vulver and anal areas bearing very small mamillae. Gnathosoma 42 long and 25 wide. *Legs:* Length of tarsi 45-42-49-65. Lengths of tibial solenidia 76-39-12-12. Anus with 2 pairs of very small setae (*a1* and *a2*), posterior part of venter with the *a3*; the other anal setae are lacking.

*Male* (Figs. 17-18):
Length and width of idiosoma of 3 paratypes: 200 × 120, 204 × 120 and 210 × 123. General morphology as in the female. Penis very thick and 45 long. Anal setae as in female, but there is an additional pair of pores behind the anus.



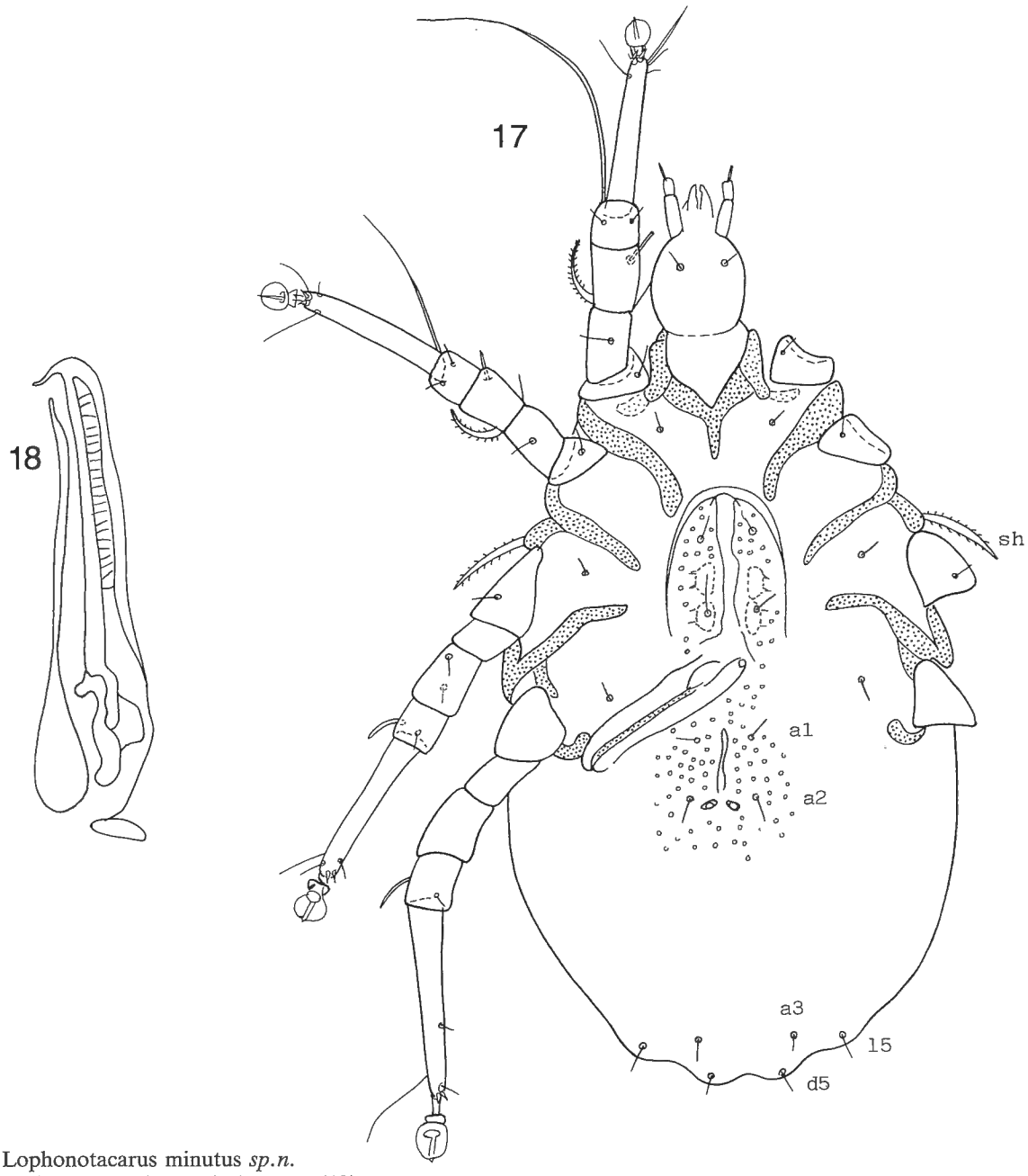

Figs. 11-16. Lophonotacarus minutus *sp.n. Female: in dorsal view (11), leg I in dorsal view (12), tarsus I in ventral view (13) apex of tarsus II in ventral view (14), apex of tarsus III in ventral view (15), tarsus IV in ventral view (16).*

HABITAT

Holotype female from a Diplopoda of the family Glomeridae (n° 159.595) from Transkei, South East Africa, District Lusikisiki, Mouth of Riv. Mzimhlava (December 1979. Coll. M.E. BADDELEY).
Paratypes: 1 female and 1 male from the same host and data as the holotype (or in the alcohol containing it); 10 males, 7 females and nymph from the same host (but n° 159.616) and locality; 1 male from a Myriapoda of the family Odontopygidae (n° 159.646) from Kenya, Machakos District, Makueni (3500 fr), (April 1965, Coll. David MUTUKU SILLA).
Holotype female and 4 paratypes female, and 6 paratypes male in the Musée royal de l'Afrique Centrale, Tervuren. Four paratypes female and 6 paratypes male in the collection of the Institut royal des Sciences naturelles de Belgique (= I.R.S.N.B.).

REMARK

This new family is characterized as follows: Very small and well-sclerotized mites with anterior and lateral margins reinforced by a sclerotized band. Tegmen and sejugal furrow are lacking. Dorsum bearing 4 longitudinal chitinous membranes forming crests. Absence of sexual dimorphism. Anus close to genital area. Male without adanal or tarsal suckers. Legs relatively long and narrow, tarsi much longer than tibiae. All the legs bearing a membranous ambulacrum contain-




Figs. 17-18. Lophonotacarus minutus *sp.n.*
*Male in ventral view (17), penis (18).*

ing a claw, the latter completely embedded in the ambulacrum except the apical hook which is free. Chaetotaxy of the tarsi reduced. Setae of the body very small except *vi* foliate and large and the *l2* and *d3* strong and long. The *ve* and *sc e* are lacking. Female with only 3 pairs of anal setae. Oil glands and organ of Grandjean not observed.

**Family Canestriniidae**
Genus **Diplopodocoptes** gen.nov.

*Definition:*
With the caracters of the family. This genus differs from the other families of Canestriniidae by the following characters: Gnathosoma with voluminous membranes extending on the ventral surface of gnathosoma forming two triangular projections. Ambulacra conical and much longer than wide with an incompletely formed claw. Setae *ve* absent. Male with posterior extremity prolonged laterally by two long partly membranous lobes bearing setae *d5* and *l5*; a pair of large adanal suckers and two pairs of tarsal suckers (legs IV) are present. In the female the setae *ga* and *gm* are situated on the vulvar lip. Larva with a well-developed Claparede organ.

*Type species:*
*Diplopodocoptes transkeiensis* sp.n.

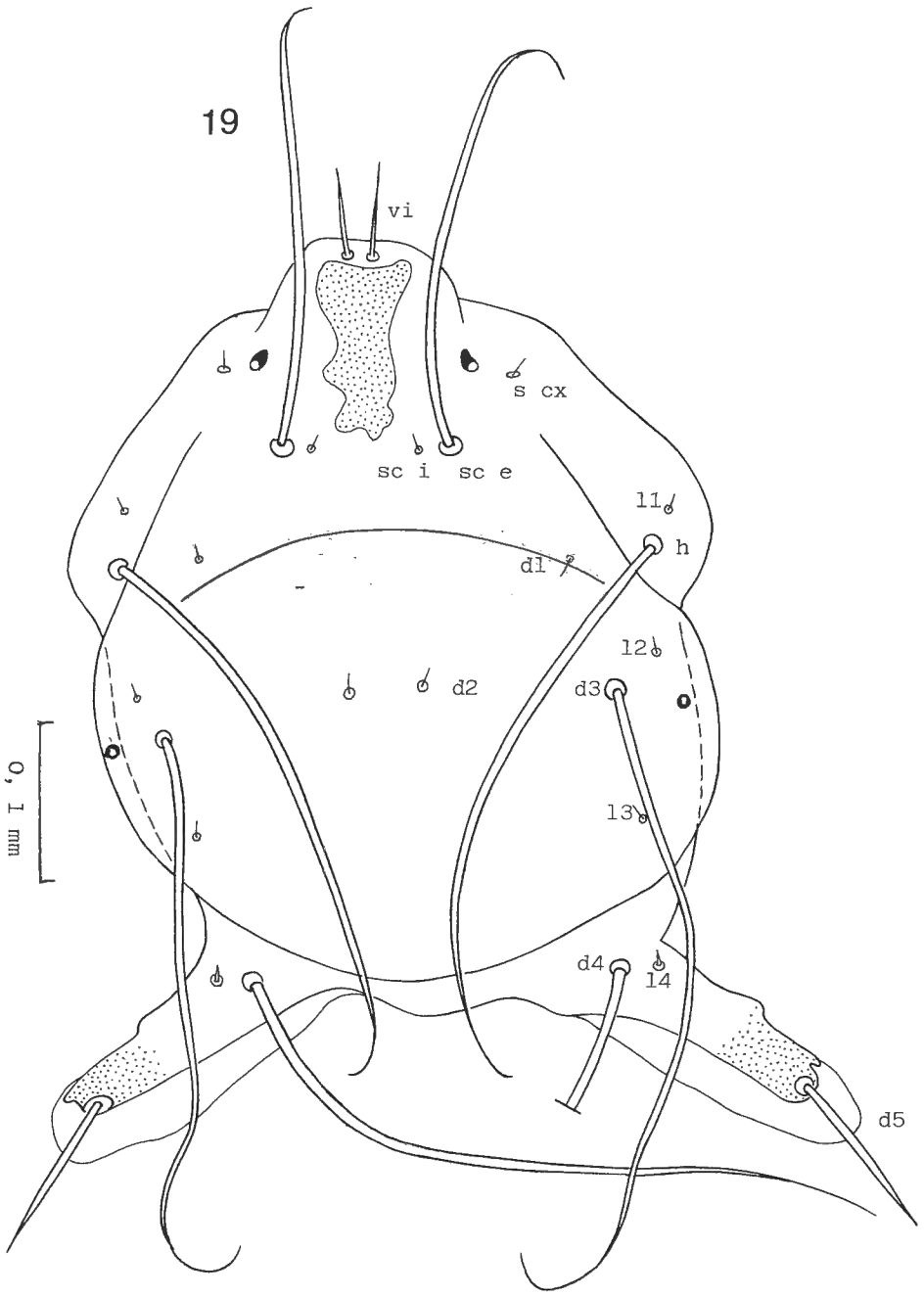



Fig. 19. Diplopodocoptes transkeiensis *sp.n. Male in dorsal view.*

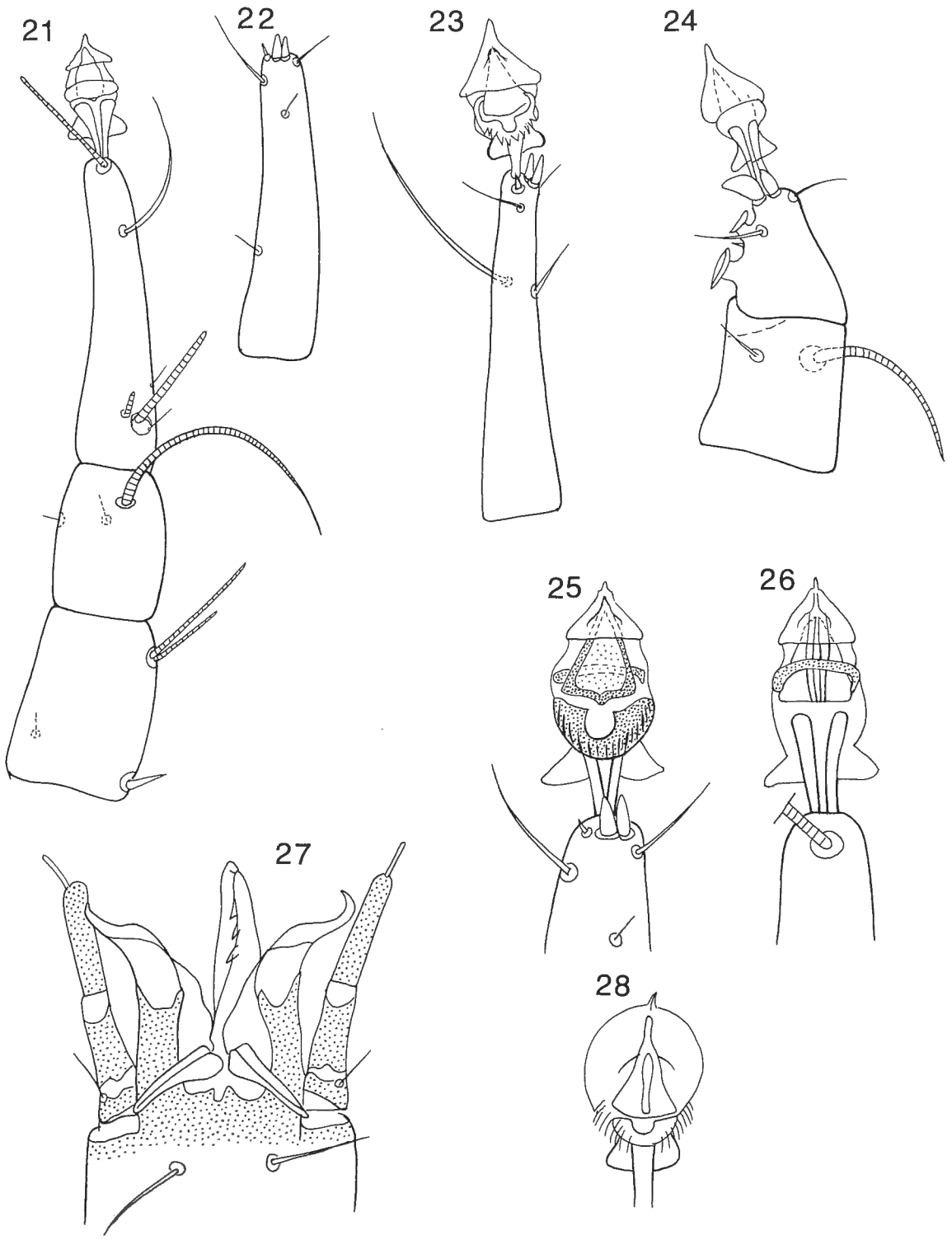
**Diplopodocoptes transkeiensis** spec.nov.

*Male* holotype (Figs. 19-27):
Idiosoma 475 long and 390 wide. *Dorsum:* Propodosoma with a punctate shield longer than wide. Sejugal furrow incomplete. Cuticle relatively sclerotized and mamillate laterally. Setae *vi* strong, 54 long; *ve* absent, *sc e, h, d3* and *d4* strong and 285, 345, 433 and 420 long respectively. Setae *s cx, sc i, d1, d2, l1, l2, l3* are microsetae; *l4* is a small spine; *d5* is strong, slightly spindle-shaped, and 105 long; *l5* is ventral and 45 long. Organ of Grandjean cylindrical and long. *Venter:* Epimera I fused in a thin sternum. Epimera III and IV convergent, arriving close together internally. Genital slit between coxae IV. Anus equally distant from genital slit and posterior extremity. There are two large adanal suckers and 3 pairs of anal short conical spines. Gnathosoma relatively wide and containing 2 large membranes curved apically and prolonged basally by 2 triangular projections lying on the antero-ventral surface of gnathosoma. Posterior legs much longer and wider than legs I-II; legs IV thicker than legs III but with shorter and thicker tarsi, the latter bearing two small suckers. All legs ending in a


Fig. 20. Diplopodocoptes transkeiensis *sp.n. Male in ventral view.*

conical elongate sucker longer than wide and containing well-formed sclerites but no distinct claws. Chaetotaxy of legs: Tarsi 9-9-7-5. Tarsi I-II with 3 ventroapical spines (one very small) and 6 unequal thin setae. Tarsi III with 3 apical spines and 4 thin setae. Tarsus IV with 2 thick apical spines, 3 thin setae and 2 suckers. Tibiae 2-2-1-1. Genua 2-2-1-0. Femora 1-1-0-0. Trochanters 1-1-1-0. Solenidia: Tarsi 3-1-0-0. Tibiae 1-1-1-1. Genua 2-1-1-0. A very thin famulus is present on tarsus I.

*Female* (Figs. 29):
Length and width of 2 paratypes (idiosoma): 648 × 460 and 575 ×435. Posterior extremity rounded. *Dorsum:* The cuticle is mamillate laterally and anteriorly. Setae *sc e, h, d3* and *l5* very long and strong, *d4* is a short spine, *d5* a short and thin seta. *Venter:* Cuticle almost completely and finely mamillate except coxal areas II to IV which bear small puntacte shields laterally. Vulva situated between coxae III and IV. A small epigynium is present. Copulatory orifice




Figs. 21-28. Diplopodocoptes transkeiensis *sp.n. Male: leg I dorsally (21), tarsus I ventrally (22), tarsus III ventrally (23), tarsus and tibia IV laterally (24), apex of tarsus I ventrally (25) and dorsally (26), gnathosoma ventrally (27). Tritonymph: ambulacrum of leg I (28).*

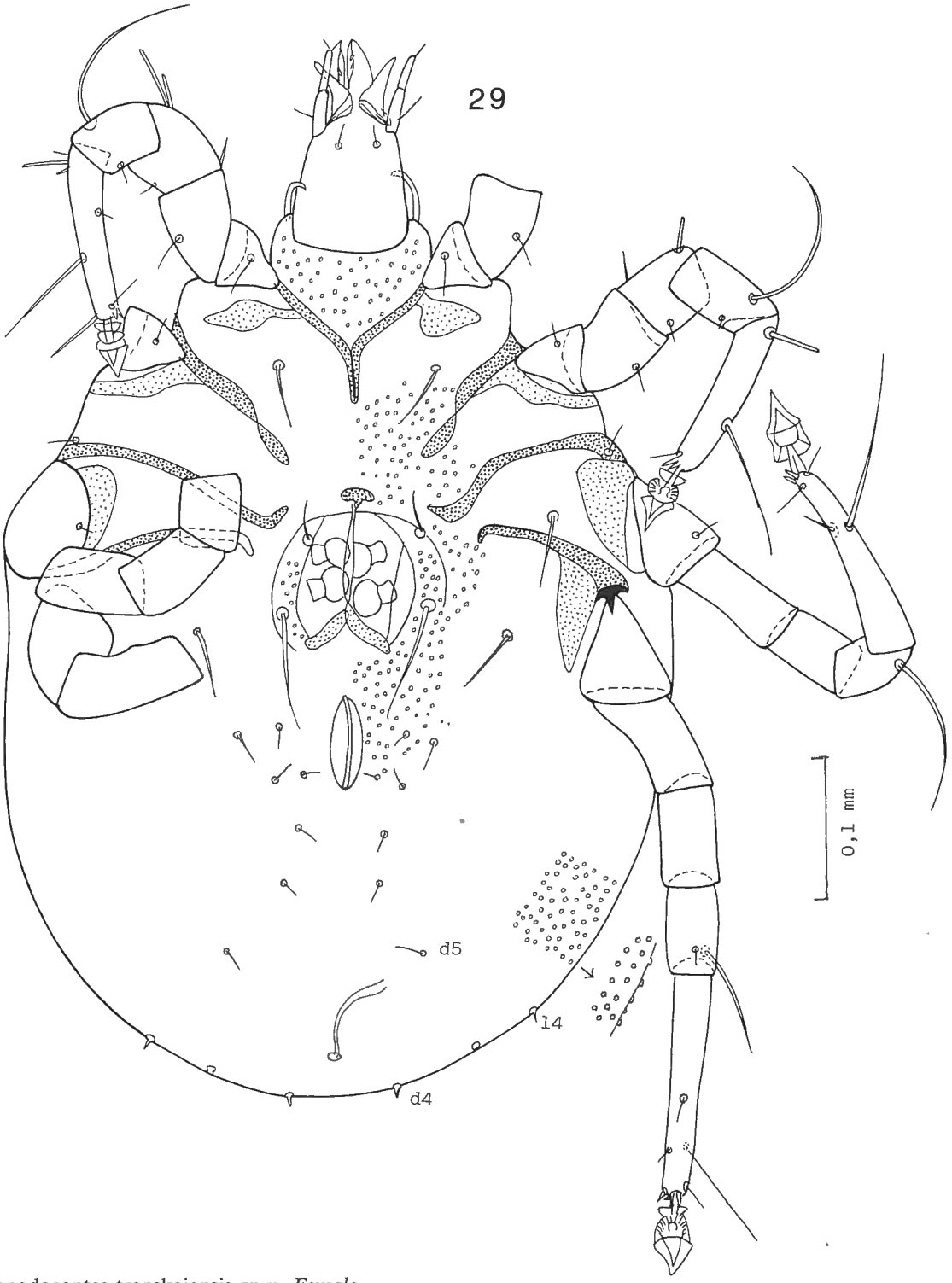



Fig. 29. Diplopodocoptes transkeiensis *sp.n. Female in ventral view.*

situated ventrally on a small rounded papilla, close to posterior extremity. Anus close to the vulva, flanked by 4 pairs of small setae, there are 2 other pairs of small anal setae behind the anus. Gnathosoma as in the male. *Legs:* Leg IV distinctly longer than leg III. Ambulacra and chaetotaxy as in the male except that the tarsus IV bears 7 setae and no suckers.

*Tritonymph* (Fig. 28):
Two paratypes measure 420 × 300 and 460 × 340. Morphology as in female except the absence of a true vulva and of a copulatory organ, the presence of only 3 pairs of anal setae and the presence of 3 pairs of very small pores between the anus and the anal setae. The cuticle is completely mamillate dorsally and

ventrally. The suckers end into a small apical recurved projection (small hook) representing the remnant of the claw.

HABITAT

Holotype male from a millipede (Diplopoda) of the family Glomeridae (n° 159.616) from Transkei, District Lusikisiki, Mouth of Riv. Mzimhlava (Coll. M.E. BADDELEY, December 1979).
Paratypes: 2 females, 2 males, 10 tritonymphs, 6 protonymphs and 1 larva, with the same data as the holotype; 2 tritonymphs from an Odontopygidae (Diplopoda) from Kenya, Machakos District, Makueni (3500 ft) (Coll. D. MUTUKU SILLA, April 1965).
Holotype male, 1 paratype female, 1 paratype male, 8 paratypes nymphs, 1 larva in the Musée royal de l'Afrique Centrale. One paratype female, 1 paratype male and 8 paratypes nymphs in the I.R.S.N.B.

REMARKS

This genus differs from all the described genera in the Canestriniidae by the combination of the following characters: Great development of gnathosomal membranes projecting on the ventral surface of gnathosoma, the particuliar shape of the ambulacrum without a true claw, the absence of setae *ve*; in the male the unusual shape of posterior extremity with two long lateral projection, the presence of adanal and tarsal suckers.

**Acknowledgements**

We thank Mr. F. PUYLAERT, Musée royal de l'Afrique Centrale, who allowed us to study this interesting material.

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