

TWO NEW PARASITIC MITES (ACARI: SARCOPTIDAE AND ATOPOMELIDAE) FROM TASMANIAN MARSUPIALS

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Synopsis

Tasmanian marsupials harbour the two mite parasites figured and described: *Diabolipectes sarcophilus*, n. g., n. sp. (Sarcoptidae), from the Tasmanian devil, *Sarcophilus harrisii* (Boitard) (Dasyuridae), and *Petrogalochirus macropus*, n. sp. (Atopomelidae), from the red wallaby, *Macropus rufogriseus* (Desmarest) (Macropodidae). Diabolipectinae, n. subfam., is erected for the former because it differs markedly in tibiotarsal structure from the two known sarcoptid subfamilies (Sarcoptinae and Notoedrinae).

Interesting Australian mites continue to come to hand, and this note will describe two new sarcoptiform (astigmatic) species from Tasmanian marsupials. The first was taken in association with a Tasmanian devil; it belongs to a new sarcoptid genus, which, since it presents an unusual combination of characters and does not correspond with either known sarcoptid subfamily, is placed in a new subfamily. The second is a listrophoroid from the widespread red wallaby. Relevant current papers are Fain (1968, 1972) and Fain and Domrow (1973).

Family SARCOPTIDAE Murray

Within the Acaridia, the presence of either spines (modified setae) or sclerotized processes on the tarsi is a character useful in separating the families of mange- and skin-mites of mammals and birds. In the Sarcoptidae (and the allied Teinocoptidae), the tarsi in both sexes always bear several spines, but lack recurved processes; in the other families (e.g., Psoroptidae, Knemidokoptidae and Epidermoptidae), the reverse is true, there being at least one well-developed sclerotized process on the tarsi, while spines are only exceptionally present.

The new genus described below presents aberrant characters and does not fit exactly into any of these families. Its most curious character seems to be the strong sexual dimorphism in the structure of the tarsi. In the female and immatures, the tarsi lack spines and carry only normal setae and strong, recurved sclerotized processes. In the male, all tarsi bear one or two strong spines and one to three rather weakly developed sclerotized processes.

In other characters, the new genus resembles more the family Sarcoptidae: Body rounded, with cuticle completely striate and without shields. Propodosomal shield absent. Setae v_1 present. Gnathosomal base rather long, but nearly completely obscured dorsally by prolongation of body (tegmen). Chelicerae short. Legs short and conical, but normally formed, I being narrower than II. Tarsi I–II with sucker carried on long stalk, but III–IV without suckers. Tarsi III–IV of female and nymph, and III in male and larva, with three long setae. Vulva transverse, without epigynium. Male without adanal suckers.

We therefore think the new genus should be placed in a new subfamily of the family Sarcoptidae. The two subfamilies already recognized may be defined:

Subfamily Sarcoptinae Murray: Tibiae-tarsi III–IV fused in both sexes. Tarsi I–II and tibiotarsi III with two spines in both sexes. Tibiotarsus IV with two spines in female and one spine in male. Sclerotized processes on tarsi absent in both sexes. Type-genus *Sarcoptes* Latreille.

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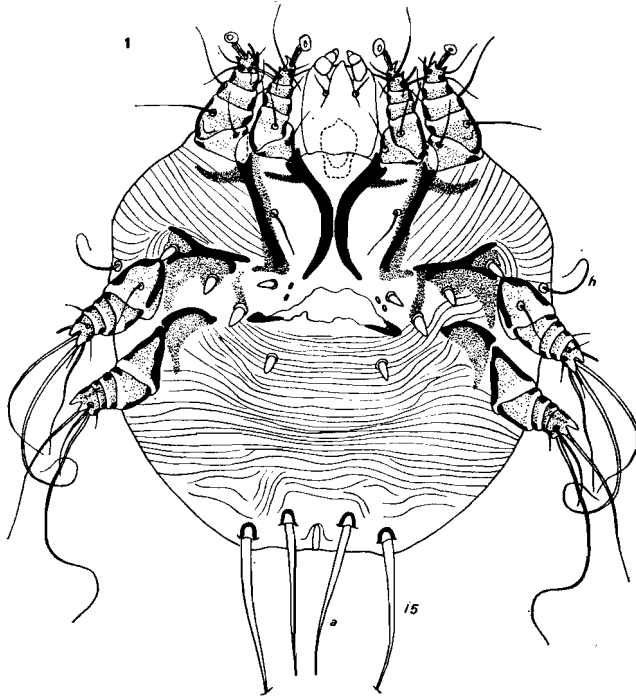


Fig. 1. *Diablicoptes sarcophilus* female. Venter.

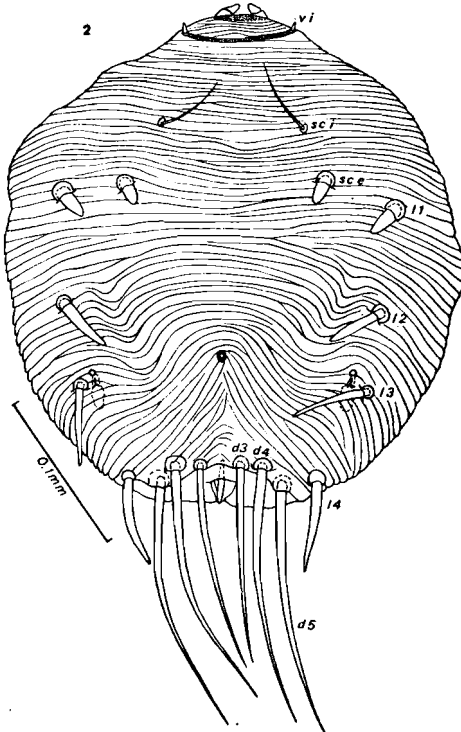


Fig. 2. *Diablicoptes sarcophilus* female. Dorsum.

Subfamily Notoedrinae Fain : Tibiae-tarsi III-IV as in Sarcoptinae, but tarsus IV free in male. Tarsi I-II with four, and tibiotarsus III with two to five, spines in both sexes. Tibiotarsus IV with two to four spines in female. Tarsus IV with one to two spines in male. Sclerotized processes on tarsi absent in both sexes. Type-genus *Notoedres* Railliet.

The new taxon at this level is

Subfamily DIABOLICOPTINAE, n. subfam.

Definition.—All tarsi free in both sexes. Tarsi I-II with two, and III-IV with three, sclerotized processes in female and nymph, but without spines. Tarsi I-IV with one or two spines and one to three sclerotized processes in male. Type-genus *Diablicoptes*, n. g. (masculine).

Genus DIABOLICOPTES, n. g.

Definition.—Epimera I contiguous in female, but fused in midline to form Y in male. Adults with anus ventroterminal and genital suckers vestigial. Female with bursa copulatrix opening dorsally. Male with small aedeagus situated at level of epimera III, and without adanal suckers. Adults and nymphs with following idiosomal chaetotaxy: $v_1, sc_1, sc_e, h, sh, d_{3-5}, l_{1-5}, a, g_a, g_m, g_p, cx_I$ and cx_{III} (some of these setae are modified into strong spines; the posterior setae d_{3-5}, a , and l_5 are long to very long, maximum 165μ , and situated along the posterior border of the idiosoma). Solenidiotaxy: tarsi 2.1.0.0; tibiae 1.1.1.1; genera 1.1.0.0. Type-species *Diablicoptes sarcophilus*, n. sp.

Diablicoptes sarcophilus, n. sp.

(Figs 1-20)

Types.—Holotype and three paratype females, allotype and one paratype male, two paratype nymphs, and one paratype larva, all extracted from faeces of a Tasmanian devil, *Sarcophilus harrisii* (Boitard) (Marsupialia: Dasyuridae), Launceston, Tas., 17.xi.1972, J. H. Arundel. Holotype, allotype and one paratype female, nymph and larva in Australian National Insect Collection, C.S.I.R.O., Canberra; remainder in P.L.I.T.M.

These mites are probably skin parasites, and their presence in faeces would then be due to the host's biting itself. It is also possible that the mites originated from the host's food (mutton, rabbit, guinea-pig—it was held in captivity for 10 weeks).

Female.—See Figs 1-2, 5-12. Holotype 305μ long (including gnathosoma), 270μ wide. Longest setae on posterior border of idiosoma 150μ long. Gnathosomal base longer than wide, more or less parallel-sided. All tarsi with normal setae (7.7.6.5); tarsi I-II with two curved and pointed, and III-IV with three conical, sclerotized processes.

Male.—See Figs 3-4, 13-20. Allotype 276μ long, 258μ wide. Gnathosomal base trapezoidal, wider anteriorly. Tarsus I with five simple setae, one strong, recurved spine apically, and two sclerotized processes. Tarsi II-III with four simple setae, two strong spines, and one (tarsus II) or three (tarsus III) sclerotized processes. Tarsus IV with three simple setae, one strong spine, and three sclerotized processes.

Nymph.—Length 310μ , width 270μ . Closely resembling adult female, but vulva absent.

Larva.—Length 234μ , width 210μ . Idiosomal chaetotaxy as in adult, but d_{3-5}, l_4, a , and genital setae absent. Tarsi I-III with 7.7.6 simple setae and 2.1.3 sclerotized processes.

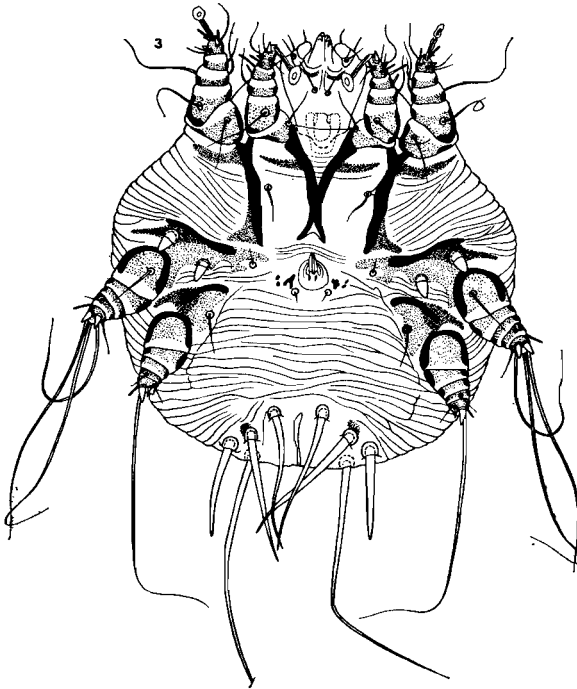


Fig. 3. *Diablocyrtus sarcophilus* male. Venter.

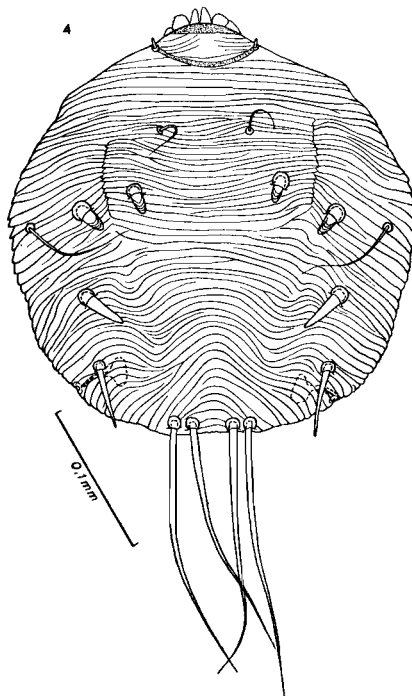


Fig. 4. *Diablocyrtus sarcophilus* male. Dorsum.

Family ATOPOMELIDAE Gunther

Genus PETROGALOCHIRUS Fain

Petrogalochirus Fain, 1970, *Bull. Anns Soc. r. ent. Belg.*, 106 : 278. Type-species *P. tasmaniensis* Fain, 1970, *ibid.*

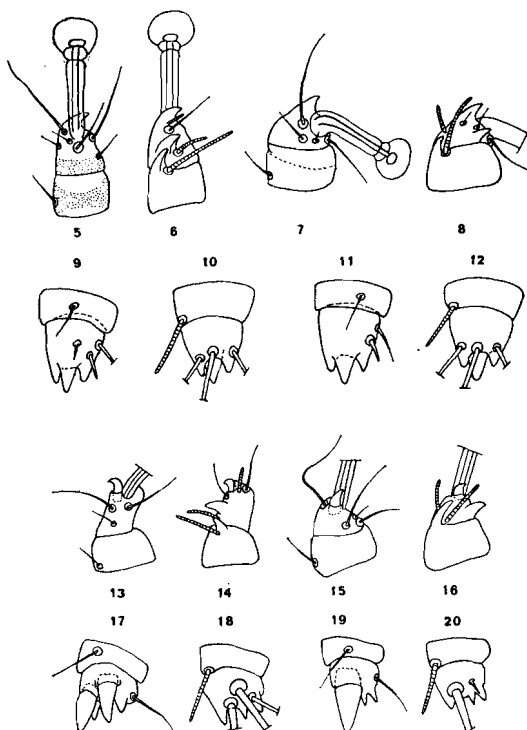
The genus *Petrogalochirus* to date contains two parasites of Australian marsupials: *P. tasmaniensis* was described from the brush-tailed rock-wallaby, *Petrogale penicillata* (Griffith) (Macropodidae), in Tasmania, while *P. dycei* (Domrow, 1960) was taken on the brush-tailed possum, *Trichosurus vulpecula* (Kerr) (Phalangeridae), in the Australian Capital Territory.

The new species described below is immediately distinguishable from the known species by showing, in the female, a well developed, sclerotized shield on the posterior part of the dorsum. This shield is completely lacking in the other two species.

Petrogalochirus macropus, n. sp.

(Figs 21–22)

Types.—Holotype and one paratype female, and one paratype tritonymph from the red wallaby, *Macropus rufogriseus* (Desmarest) (Marsupialia: Macropodidae), Nile, Tas., vii.1972, B. L. Munday. Holotype and paratype tritonymph in A.N.I.C.; paratype female in P.L.I.T.M.



Figs 5–12. *Diablicoptes sarcophilus* female. Ventral (or ventrolateral) and dorsal (or dorsolateral) views of tibiae-tarsi I–IV.

Figs 13–20. *Diablicoptes sarcophilus* male. Ventral (or ventrolateral) and dorsal (or dorsolateral) views of tibiae-tarsi I–IV.

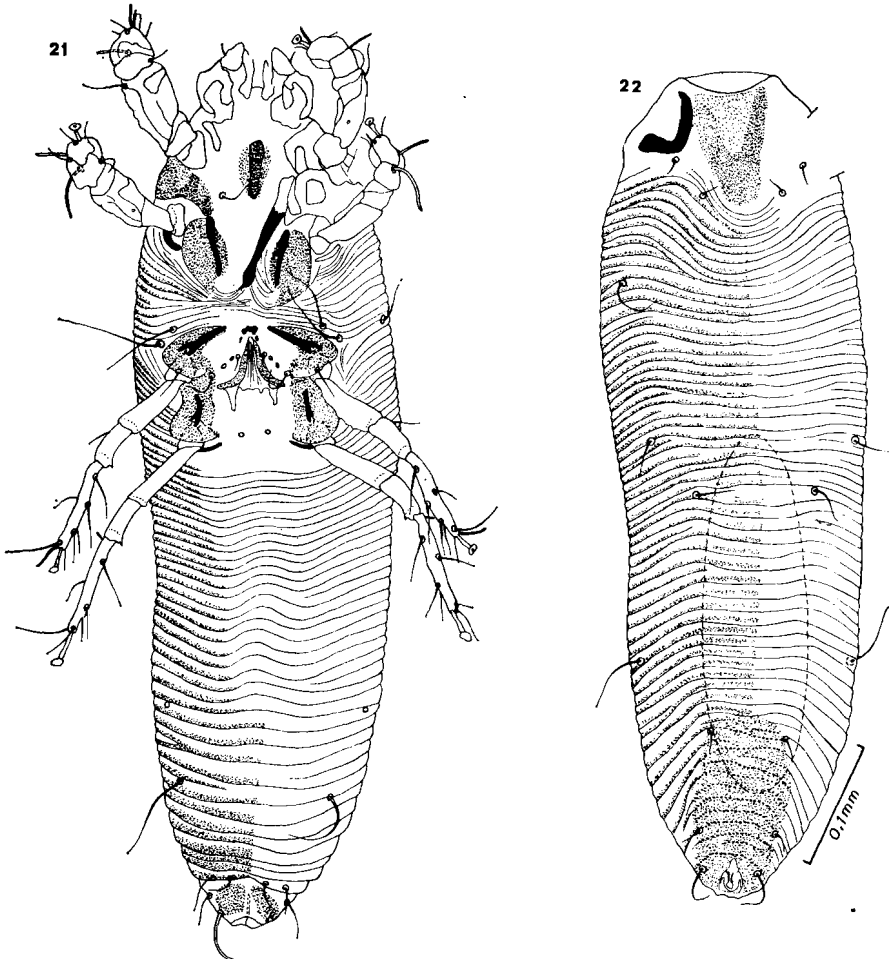
Female.—See Figs 21–22. Holotype 630 μ long (including gnathosoma), 188 μ maximum width. Propodosomal (prescapular) shield longer than wide; postscapular shield absent. Cuticle behind shield regularly striate and soft, except on posterior part of dorsum, which is covered by strongly sclerotized and striate shield 130 μ long and 72 μ wide. Holotype contains elongate egg (255 μ \times 75 μ); bursa copulatrix only partially visible. Paratype non-ovigerous, bursa very long, with basal extremity situated at level of coxa III. Genital papilla situated dorsally in posterior part of opisthosomal shield. Venter of opisthosoma striate. All legs with pedunculate sucker. Posterior legs very thin, with elongate femora and tibiotarsi.

Male.—Unknown.

Tritonymph.—Length 585 μ . Very similar to female, but vulva and opisthosomal shield absent.

Larva.—Unknown.

Nomenclature.—As generic names are nouns by definition, see Art. 11 (f), both specific names proposed in this paper are also nouns. They stand in apposition to the generic names, and refer less to any morphological or ecological peculiarity than to the hosts involved.



Figs 21–22. *Petrogalochirus macropus* female. Venter and dorsum.

Family ATOPOMELIDAE Gunther
Genus PETROGALOCHIRUS Fain

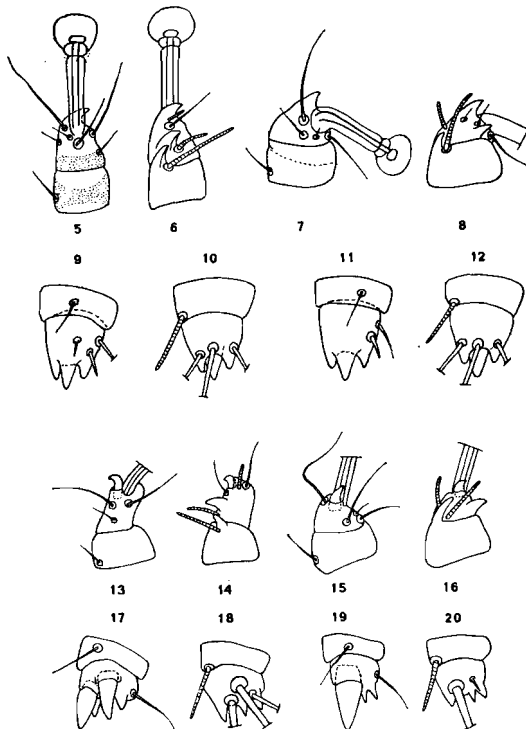
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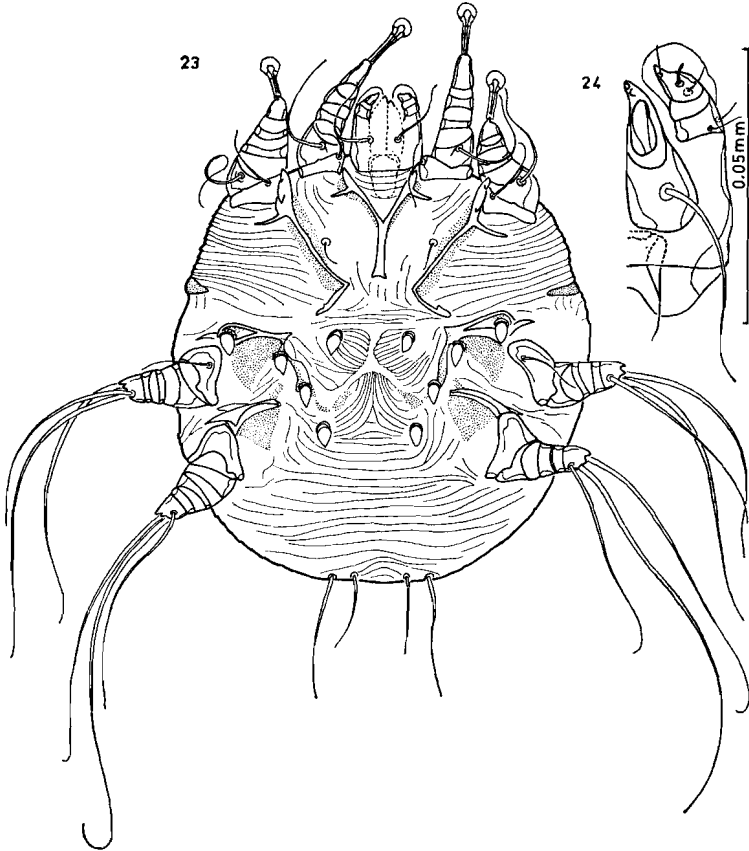
Petrogalochirus macropus, n. sp.
(Figs 21–22)

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Figs 5–12. *Diablicoptes sarcophilus* female. Ventral (or ventrolateral) and dorsal (or dosolateral) views of tibiae-tarsi I–IV.

Figs 13–20. *Diablicoptes sarcophilus* male. Ventral (or ventrolateral) and dorsal (or dorsolateral) views of tibiae-tarsi I–IV.



Figs 23-24. *Diablicoptes phascogale* female. Venter, with details of gnathosoma in ventral view.

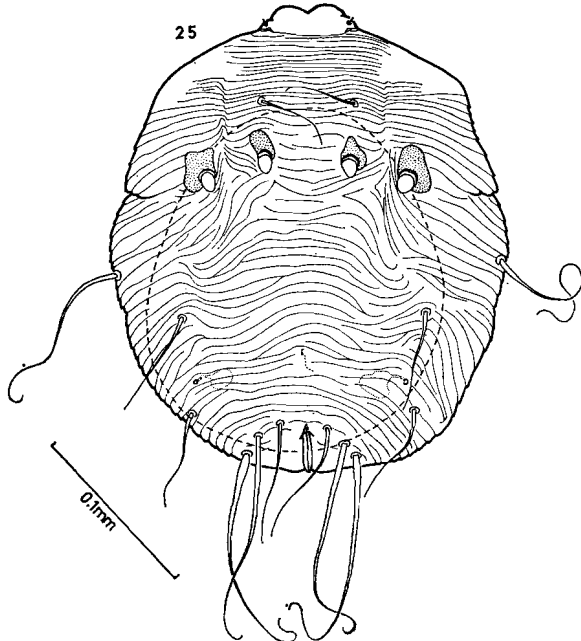
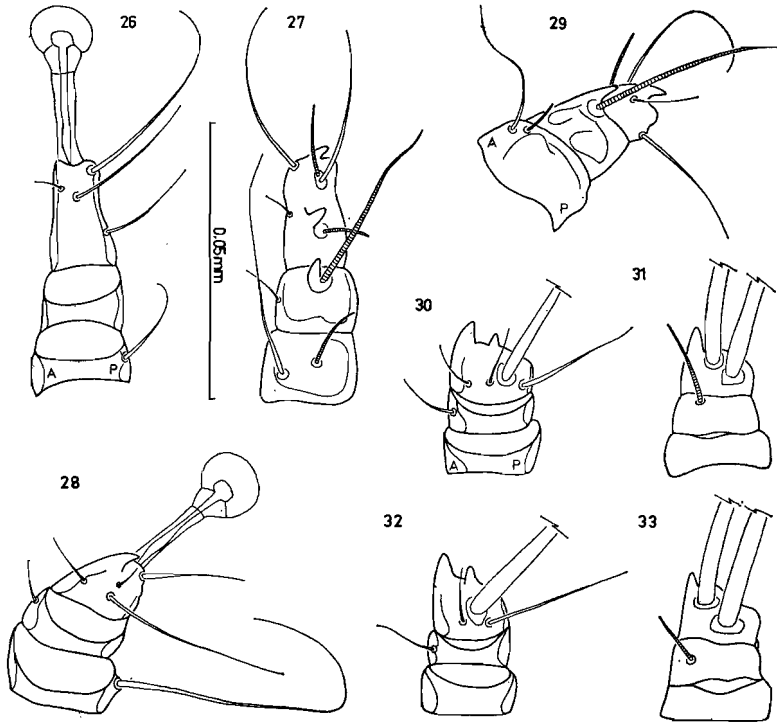


Fig. 25. *Diablicoptes phascogale* female. Dorsum.



Figs 26-33. *Diablicoptes phascogale* female. Ventral and dorsal views of genua-tarsi I-IV (II somewhat foreshortened).

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References

- DOMROW, R., 1960.—The genus *Austrochirus* (Acarina, Listrophoridae). *Acarologia*, 2 (1) 92-100.
- FAIN, A., 1968.—Étude de variabilité de *Sarcoptes scabiei* avec une révision des Sarcoptidae. *Acta zool. path. antverp.*, (47): 1-196.
- , 1972.—Les listrophoridés d'Australie et de Nouvelle-Guinée. *Bull. Inst. r. Sci. nat. Belg.*, 48 (5): 1-196.
- FAIN, A., and DOMROW, R., 1973.—Two new fur-mites (Acari: Atopomelidae) from an Australian tiger cat (Marsupialia: Dasyuridae). *Proc. Linn. Soc. N.S.W.*, 97 (3): 161-164.

ADDENDUM

Diablicoptes phascogale, n. sp.

(Figs 23-33)

Diagnosis.—*D. phascogale* is separable from *D. sarcophilus* on several counts: (i) *idiosomal seta* l_4 absent, and only sc_e and l_1 hypertrophied (these latter set on distinct shieldlets); (ii) *epimera I* fused to form perfect Y; (iii) *epimera II* each with two retrorse hooklets; and (iv) *tarsus I* decidedly longer than II-IV.

Types.—Holotype female and one paratype female from tuan, *Phascogale tapoatafa* (Meyer) (Dasyuridae), Christmas Hills, near Melbourne, Vic., viii.1973, T. Ealey. Holotype in A.N.I.C.; paratype in Q.I.M.R.

Female.—See Figs 23–33. Idosoma (including gnathosoma and undifferentiated ovum) 285 μ long, 225 μ wide. Most dorsal setae slenderly tapering, to 145 μ long. *Genital suckers not detected*. Opening of bursa copulatrix a minute slit. *Anus dorsoterminal*. Gnathosoma sarcoptid. Chaetotaxy, solenidiotaxy, and processes on legs typical.

Notes.—The specific name is formed according to the paragraph on nomenclature in the text proper.

The characters italicized necessitate minor modification to the generic definition.