

## Mites (Acari) from nests of sea birds in New Zealand

### II. Mesostigmata and Astigmata

by A. FAIN & T.D. GALLOWAY

#### Abstract

The acarofauna (Acari) of five nests of two species of Sea Birds (*Eudyptula minor albosignata* and *Pachyptila turtur*) from New Zealand is studied. Four new species, one new subspecies and one new genus of mites were found and are described: *Sejus novaezealandiae* n.sp., *Liponyssoides eudyptulae* n.sp., (Mesostigmata) and *Glycyphagodes spheniscicola* n.g., n.sp., *Blomia thori novaezealandiae* n.subsp. and *Myianoetus antipodus* n.sp. (Astigmata).

**Key words:** Acari, Marine Birds'Nests, New Zealand, Systematics

#### Résumé

Les auteurs étudient l'acarofaune (Acari) de cinq nids d'oiseaux marins (*Eudyptula minor albosignata* et *Pachyptila turtur*) de Nouvelle-Zélande. Quatre nouvelles espèces, une nouvelle sous-espèce et un nouveau genre d'acariens furent découverts et sont décrits ici: *Sejus novaezealandiae* n.sp.; *Liponyssoides eudyptulae* n.sp., (Mesostigmata) et *Glycyphagodes spheniscicola* n.g., n.sp., *Blomia thori novaezealandiae* n.subsp. et *Myianoetus antipodus* n.sp. (Astigmata).

**Mots clé:** Acari, Nids d'oiseaux de Mer, Nouvelle-Zélande, Taxonomie.

#### Introduction

As a result of research on the life history of the flea, *Parapsyllus longicornis* (ENDERLEIN), associated with the White-flipped Penguin, host nest material was collected. Along with the fleas, which were the major concern of the project (GALLOWAY & CHALLIES, 1992), mites were often abundant, and they become the focus of additional study.

In a first note we described the life cycle of a new species, *Psylloglyphus parapsyllus* FAIN & GALLOWAY, 1993 (Acari, Astigmata) found in the nest of the White-Flipped Penguin, *Eudyptula minor albosignata*, on Motunau Island, New Zealand (FAIN & GALLOWAY, 1993). It was the first time that adults were described in the genus *Psylloglyphus* FAIN (1966), which was known, so far, only from its phoretic deutonymphal stage.

In addition to this new species we also found in this nest as well as in four other nests of sea birds from the same area, a series of other mites including four new species, one new subspecies and a new genus. This paper is devoted to the study of this collection.

#### Material and methods

Five nests were examined, all via Tullgren-Funnel method.

*Nest n° 1:* White-Flipped Penguin, *Eudyptula minor albosignata*, from Motunau Island, New Zealand. This nest was situated on the plateau near the edges of the cliff (8.XI.1991). Motunau is a small island (3,6 ha) about 60 km north of Christchurch, New Zealand, and about 1 1/2 km offshore.

*Nest n° 2:* Fairy Prion, *Pachyptila turtur*, also from Motunau Island but on the plateau far from the cliff (8.XI.1991). The adult bird was still present on the nest. Most of the nests of the Prions are located on the center of the plateau while the penguins' nests are mainly situated near the edges of the cliff.

*Nest n° 3:* From an open cave at Otanerito Bay, at the far end of the Banks Peninsula, New Zealand (1.VII.1991); a nest of *E. albosignata*. This cave obviously had been home for the penguins for many generations. The floor of the cave was covered to a considerable depth with moulted feathers and dandruff of the birds.

*Nest n° 4:* Same as for nest n° 3 (1.VIII.1991).

*Nest n° 5:* Abandoned nest of *E. albosignata* on the Onawe Peninsula in Akaroa Harbour on the Banks Peninsula (27.VII.1991). This penguin colony had recently been decimated by introduced predators.

Abbreviations: BMNH = British Museum of Natural History; IRSNB = Institut royal des Sciences naturelles de Belgique; NMNZ = National Museum of New Zealand, Wellington, New Zealand. All the measurements used herein are in micrometers.

## STUDY OF THE SPECIES

MESOSTIGMATA  
COHORT SEJINA  
FAMILY SEJIDAEGenus *Sejus* C.L. KOCH, 1836

The mites of this group occur in humus and litter and under the bark of rotting tree stumps. Most of the species are tropical. Their feeding habits are unknown (KRANTZ, 1978).

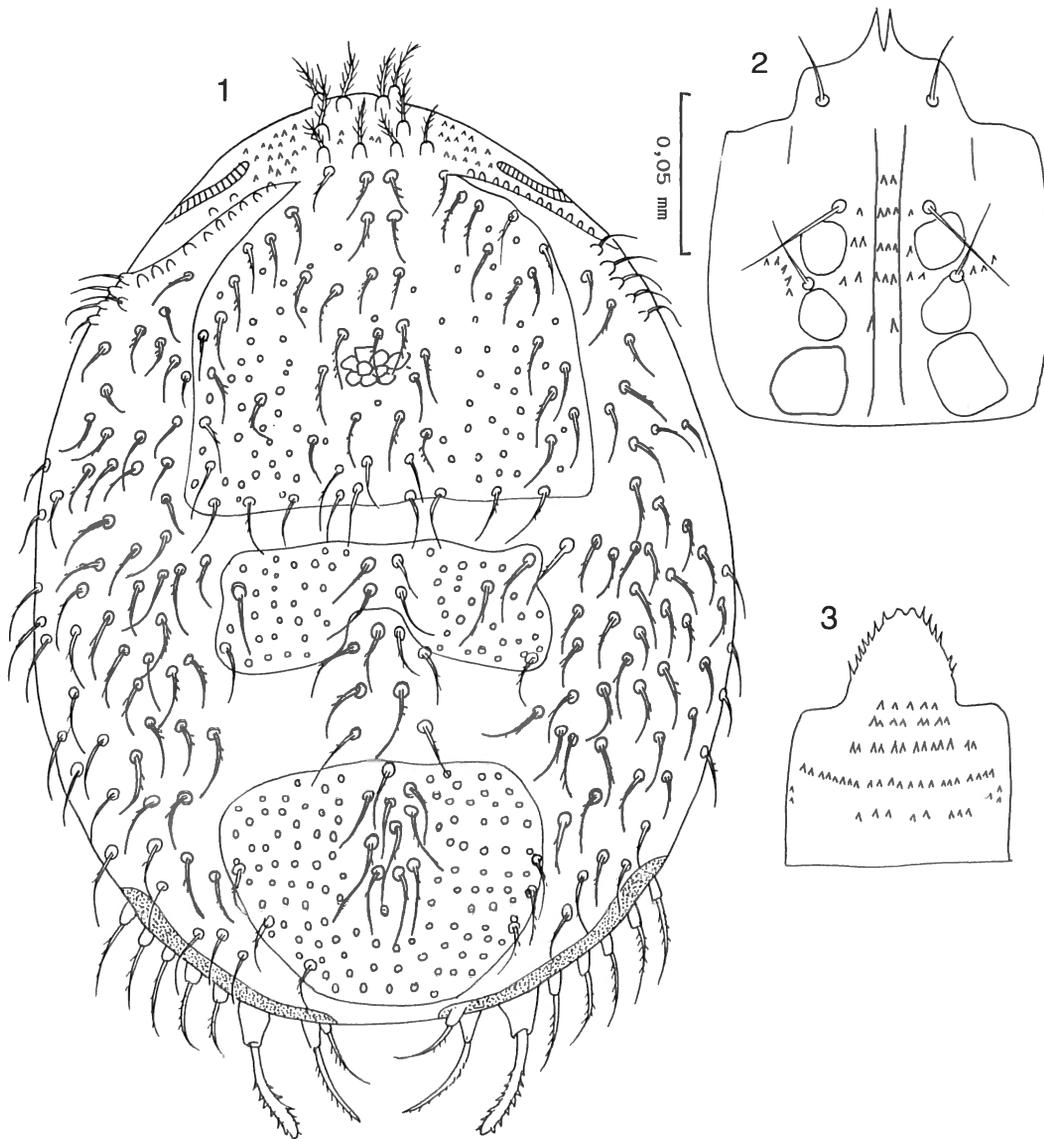
HIRSCHMANN (1991) and HIRSCHMANN et al. (1991 a and b) have revised this genus describing 26 new species. This genus currently includes 44 species. Among them 6 species are known by only their deutonymphal stage, all other species are based on adult forms, either male and female or of both sexes.

In nest n° 1, we found 2 females of a new species that are described herein.

*Sejus novaezealandiae* n.sp.

This species is represented by 2 adult females, one containing an egg.

*Female*, holotype (figs 1-6): Idiosoma broadly oval, maximum length 630, maximum width 474. Length and width in the paratype: 648 × 468. *Dorsum* carrying 3 large median shields bearing numerous small rounded tubercles. Podonotal shield 270 wide, with lateral margins almost straight and bearing about 25-30 pairs of setae. Mesonotal shield rectangular with posterior margin deeply notched in its middle and carrying 8 to 11 setae (holotype and paratype), its maximum width and length 225 and 90 respectively. Pygidial shield 174 long and 210 wide, with anterior margin almost straight and posterolateral margins rounded, it carries 8 pairs of setae of which 3 pairs lateral and 5 pairs paramedian. Soft cuticle with about 80-90 pairs of setae. In front of the



Figs 1-3 — *Sejus novaezealandiae* n.sp. Female in dorsal view (1), base of gnathosoma ventrally (2) and dorsally (3).

podonotal shield there are 4 to 5 pairs of pedunculate strong barbed setae. Most of the dorsal setae are curved, rather thin, shortly pectinate and 35 to 60 long. They arise from short stalks. Posterior margin of body with, at each side, a sclerotized stripe bearing several rows of 15-20 stalked setae similar to the dorsal setae except for two pairs of stronger paramedian setae and which arise from larger and stronger peduncles. Tectum relatively long, triangular and with rounded denticulate apex. **Venter:** The two anterior pairs of sternal setae are situated on small individual platelets (jugularia). The rest of the sternigenital plate bears 5 pairs (or 4 + 5) of short simple setae. Ventrianal plate rounded, slightly wider (238) than long (195) bearing small rounded tubercles and 7 pairs of preanal barbed setae, 2 anal setae and a posterior anal seta. One pair of large oval metapodal plates covered with tubercles. Soft cuticle of venter with about 20 pairs of setae similar to the ventral setae but smaller. Tritosternum with a wide base and ending into two narrow laciniae. Peritreme, at each side, situated along the inner margin of a relatively large tuberculate shield. Peritremes narrow and long extending to the posterior half of coxa I.

**Gnathosoma:** deutosternal groove with 4 to 6 transverse rows of 1 to 3 denticles, dorsal surface of gnathosoma with 5 transverse rows of 5 to 22 small denticles. Chelicerae 160 long, the movable digit 51 long with 2 parallel rows of inequal teeth, fixed digit with a single row of 16 to 18 teeth and a short pilus dentilis. Palptarsus with a two-tined apotele.

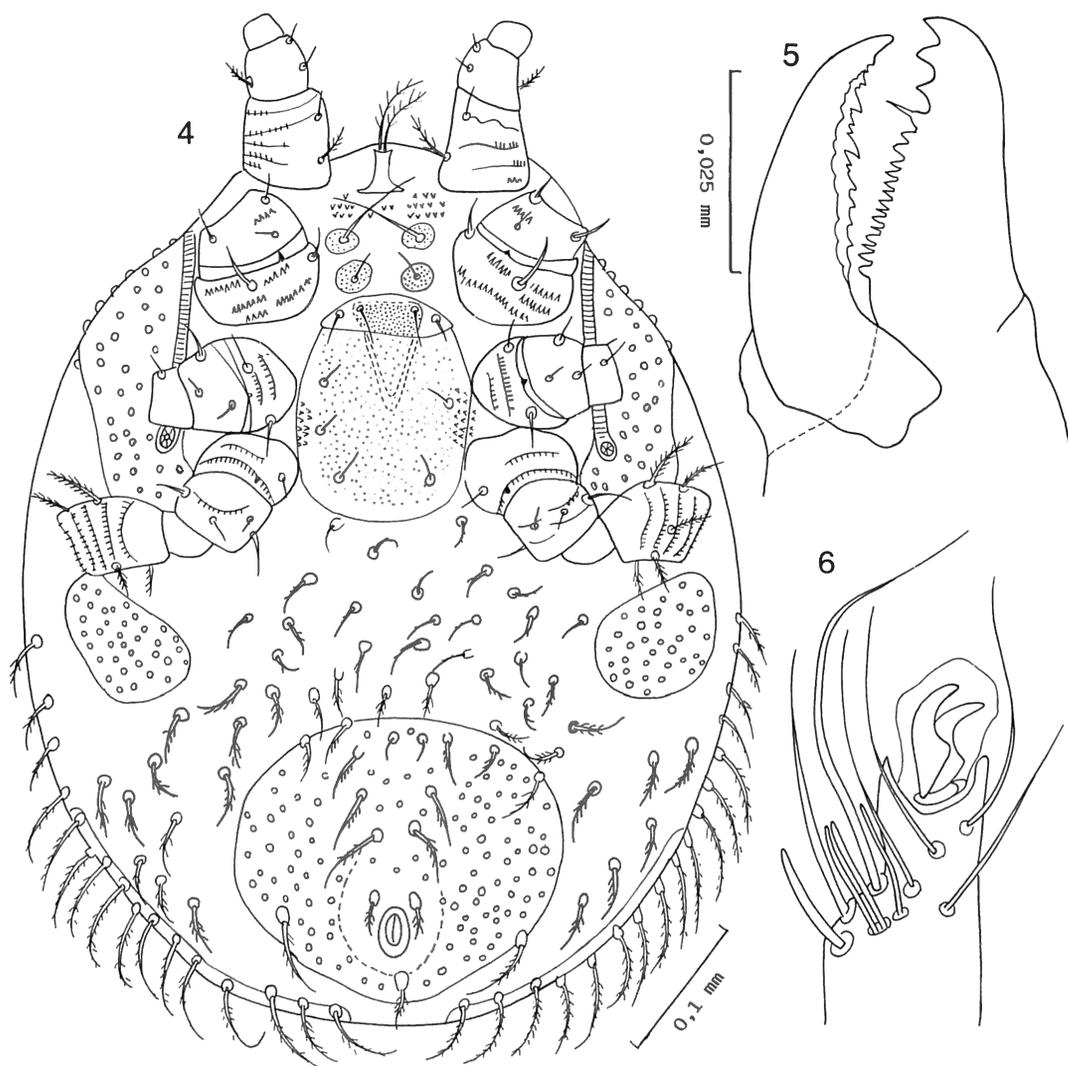
**Legs:** All the legs ending in a pair of strong claws and bear numerous rows of denticles variable in shape.

#### Habitat

Holotype and one paratype, females, from the nest n° 1 of *Eudyptula minor albosignata* from Motunau Is., New Zealand (Coll. T.G. 8.XI.1991). Holotype in NMNZ, paratype in IRSNB.

#### Remarks

*S. novaezealandiae* is distinguished from all the other species of the genus *Sejus* by the combination of the following characters: movable digit with two rows of teeth, dorsum with three median shields and without long lateral setae, posterior margin of body with two pairs of



Figs 4-6 — *Sejus novaezealandiae* n.sp. Female in ventral view (4), cheliceral digits (5), apex of tarsus I (6).

strong paramedian stalked barbed setae, tarsi I with a pair of claws. The presence of two rows of teeth on the movable digit of chelicera is observed in 8 species: *S. togatus*, *polonicus*, *hinangensis*, *geometricus*, *stebaevi*, *bugrovskii*, *insulanus* and *rafalskii* (see HIRSCHMANN, 1991), however in all these species the dorsum bears only two median shields and not three as in our new species.

**COHORT GAMASINA  
FAMILY LAELAPIDAE**

***Androlaelaps pachyptilae* (ZUMPT & TILL, 1956)**

This species was originally described from the Dove Petrel, *Pachyptila desolata* (GMELIN), on Heard Island in the Antarctic area.

Later, it was collected from three other islands, also situated in the Antarctic area, i.e. Campbell Island (HUNTER, 1964a), Macquarie Island and Auckland Island (HUNTER, 1964b). In Auckland Is. the mites were collected from nests of *Pterodroma lessoni* and from the Diving Petrel (*Pelecanoides*). DOMROW (1977), recorded this species from Tasmania, from the nests of the following marine birds: *Eudyptula minor* (FORSTER), *Puffinus tenuirostris*, *Pachyptila turtur* (KUHLE) and *Pelecanoides urinatrix* (GMELIN).

We have found very numerous specimens of this species in the nests of *Eudyptula minor albosignata* (nest n° 1) and of *Pachyptila turtur* (nest n° 2), both from Motunau Is., New Zealand.

**FAMILY DERMANYSSIDAE**

***Liponyssoides eudyptulae* n.sp.**

*Female*, holotype (figs 7-8): Idiosoma 1020 long and 636 wide (at level of coxae IV). In a paratype the length  $\times$  width is 870  $\times$  630. Dorsum: Scutum very broad, 890  $\times$  522, with a faint network of lines except in the middle of the shield where the lines become un conspicuous. The scutum carries about 22 pairs of either smooth or shortly pectinate setae 30 to 90 long, their exact number is difficult to ascertain because some are rubbed off. Soft cuticle with 16-18 pairs of setae.

*Venter*: tritosternum with a narrow base 60 long and two long pectinate laciniae. Sternal shield in the shape of an inverted U with long and broad, slightly divergent arms. This shield is well sclerotized, and it bears very distinct striations forming a network in its anterior part. Three pairs of sternal setae are on the shield, the 4th pair is on the soft cuticle, these setae are smooth and about 50 long, this shield also bears a pair of lyrifissures. This shield is 51 long in midline and 160 wide at the level of *st*2. Genital shield relatively very broad its maximum width 150, in its posterior half. Anal shield much wider (234) than long (190). Soft cuticle of opisthogaster with 20 pairs of setae. Peritreme reaching coxa I. There is a pair of small metapodal shields. Peritremal shield fused posteriorly with the podal sclerites of coxae IV.

*Gnathosoma*: pedipalps with 5 free segments and a two-tined apotele. Deutosternal groove with a single longitudinal file of 9 denticles. Chelicera 434 long, very narrow except in its posterior part (90 long) where it is dilated. Cheliceral digits very short (10 long).

*Legs*: all tarsi end in a pair of normal claws. Chaetotaxy of legs (number of setae): tibiae 13-10-9-10, genua 13-11-10-9, femora 13-11-6-6.

*Habitat*

Holotype female from the nest n° 1 (*Eudyptula minor albosignata*) from Motunau Is. (Coll. T. GALLOWAY, 8.XI.1991). Two paratypes female in rather poor conditions, with the same data as the holotype. Holotype in NMNZ, paratypes in IRSNB.

*Remarks*

Including this new species, the genus *Liponyssoides* at present comprises 7 species. *L. eudyptulae* differs from all the other species in this genus by the characteristic shape of the sternal shield and the broad size of the scutum. In addition it is distinguished from these species by several other characters:

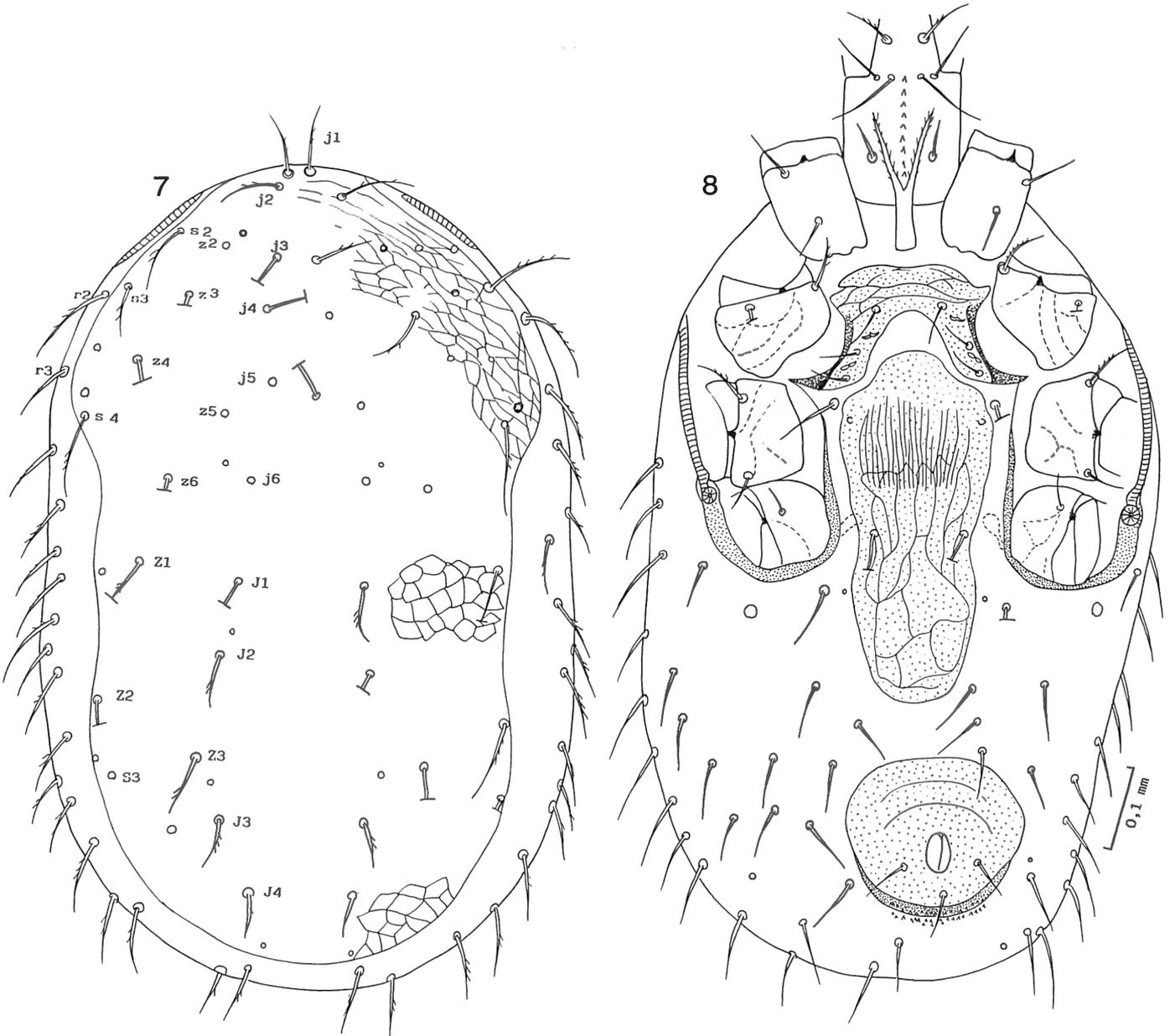
From *L. sanguineus* (HIRST, 1914): by the absence of a pygidial shield.

From *L. muris* (HIRST, 1913): by the much smaller number of setae on the soft tegument of the body dorsally and ventrally, and the broader aspect of the genital and anal shields.

From *L. warnikei* DOMROW, 1963: by the shape of the genital shield (not tapering posteriorly), the broader shape of the scutum and the greater number of scutal setae. From *L. lukoschusi* DOMROW, 1979: by the shape of the anal shield wider than long (longer than wide in this species), the non-tapering aspect of the genital shield, the much shorter scutal setae, the longer peritremes, the absence of a spur on anterior border of coxae II.

From *L. beckei* ALLRED, 1957: by the greater number of scutal setae (only 13 pairs in that species), the longer peritremes (ending in posterior half of coxa II in this species).

From *L. intermedius* (EVANS & TILL, 1964): by the greater number of scutal setae (16 pairs in that species), the narrower aspect of the genital shield, the smaller number of setae on the soft cuticle of the dorsum (35 pairs in that species), the shape of the anal shield narrower in its anterior half.



Figs 7-8 — *Liponyssoides eudyptulae* n.sp. Female holotype in dorsal view (7) and in ventral view (8).

**ASTIGMATA  
FAMILY ACARIDAE**

*Tyrophagus longior* (GERVAIS, 1844)

Four females, two males, two protonymphs, all from the nest n° 1.

*Tyrophagus similis* VOLGIN, 1949

One female, one male and one tritonymph from nest n° 1 : two females, one male and three tritonymphs from nest n° 2.

*Tyrophagus palmarum* OUDEMANS, 1924

One female from the nest n° 5.

*Thyreophagus* sp.

One tritonymph from nest n° 1.

**FAMILY GLYCYPHAGIDAE**  
**SUBFAMILY GLYCYPHAGINAE**  
**Genus *Glycyphagodes* n.g.**

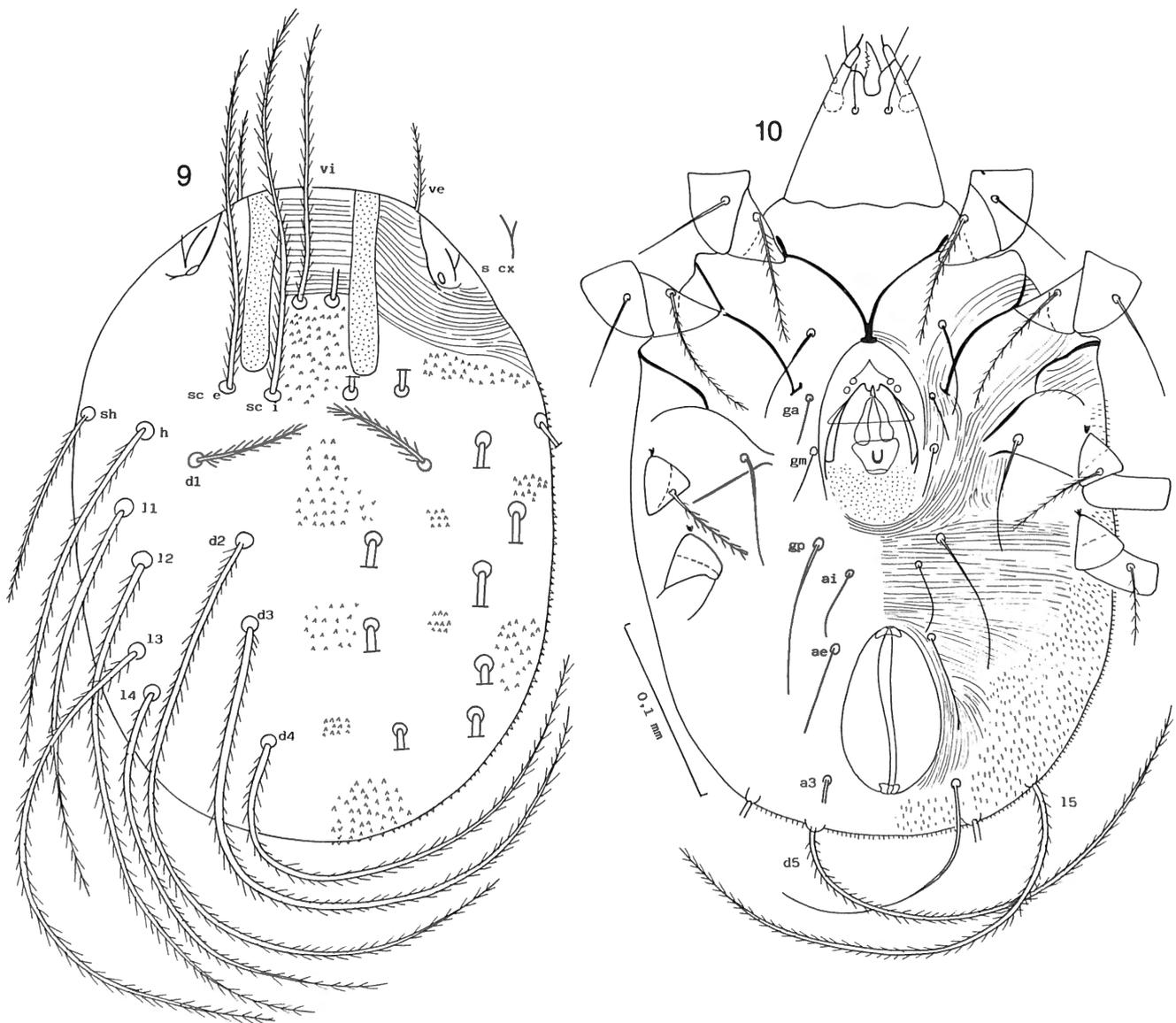
**Definition:** Cuticle poorly sclerotized with very small and numerous triangular projections. These projections are lacking at some places and replaced by fine striations (at the anterior part of the dorsum and almost all the ventral surface of the body) or by a pair of punctate longitudinal stripes flanking the setae *vi*. Crista absent. Dorsal setae long and pectinate, all ventral setae smooth. Supracoxal setae forked and smooth. Epimera I of the female forming a V which is fused posteriorly with the epigynum. In the male there is a short sternum which is very close to the sexual organ. In both sexes tarsi I and II with well-developed claws, tarsi III and IV lacking claws, but bearing a very small forked sclerite at their apices. Setae *ve* present, setae *vi* distinctly behind the anterior margin of the body. Legs elongate, especially the

posterior tarsi. In both sexes the tarsi bear only short and smooth setae. Tibiae I-II with 2 setae.  
**Type species:** *Glycyphagodes spheniscicola* n.sp.

**Remarks**

FAIN (1986) divided the Glycyphaginae into 5 tribes on the base of the presence or the absence of the setae *ve*. *Glycyphagodes* belongs to the Echimypodini characterized by the presence of the *ve* setae. This tribe includes at present five genera: *Blomia* OUDEMANS, *Echimypus* FAIN, *Cometacarus* ZACHVATKIN, *Austroglycyphagus* FAIN & LOWRY and *Muriglycyphagus* FAIN.

This new genus presents two longitudinal paramedian punctate stripes on the propodonotum as in the genera *Austroglycyphagus* and *Muriglycyphagus*. However in *Austroglycyphagus* the tarsi bear a long ventral pectinate scale attached to the base. This scale is absent in *Glycyphagodes*. Moreover in *Austroglycyphagus* and



Figs 9-10 - *Glycyphagodes spheniscicola* n.sp. Male holotype in dorsal view (9) and in ventral view (10).

*Muriglycyphagus* the claws are vestigial or completely absent.

*Glycyphagodes* differs from *Echimyopus* and *Blomia* by the lateral position of the setae *ve*, the presence of two longitudinal punctate stripes on the propodonotum, the anterior position of the genital organ, the absence of pectinate setae on the tarsi and the presence of normal claws on anterior tarsi.

*Glycyphagodes* differs from *Cometacarus* by the absence of very long setae (more than twice the length of the body) in the posterior region of the body, the anterior position of the sexual organs, the presence of claws on tarsi I-II.

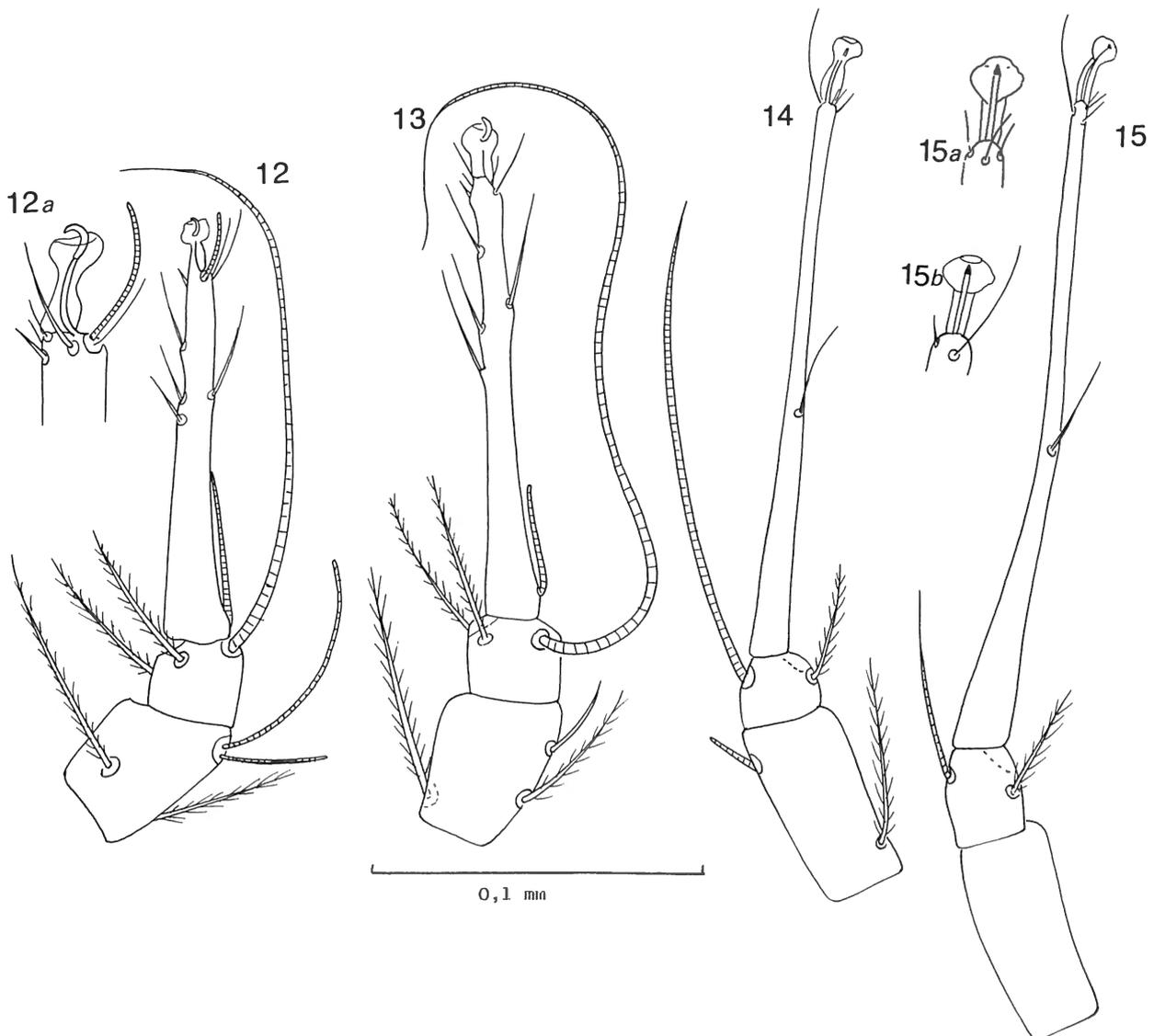
***Glycyphagodes spheniscicola* n.sp.**

*Male*, holotype (figs 9-10; 12-15). Maximum length and width of idiosoma 345 × 250. Length and width in 5 paratypes 380 × 282, 375 × 291, 332 × 243, 310 × 225 and

295 × 203. *Dorsum*: cuticle as described for the genus. Length of setae: *ve* 60, *vi* 180, *sc i* 240, *sc e* 225, *d1* 70, *d2* 430, *d3* 450, *d4* 400, *d5* 300, *sh* 135, *h* 200, *l 1* 250, *l 2* 420, *l 3* 390, *l 4* 250, *l 5* 300.

*Venter*: epimera I fused in midline in a very short sternum. The anterolateral folds of the sexual organ are attached to the sternum. Coxal setae smooth and very thin. Length of genital setae *ga* 72, *gm* 35, *gp* 90. Seta *a1* very anterior, 40 long, *ae* 48, *a3* 120. Sexual organ well sclerotized. Genital papillae (?suckers) very small, situated in front of genital sclerites. Gnathosoma very large, 81 wide at its base, length including the palps 78.

*Legs*: lengths of tarsi I-IV (ambulacrae excluded): 111-126-180-210. Posterior tarsi very narrow (width of tarsus IV 4,5). tarsi I-II with normally formed claws, tarsi III-IV with vestigial claws represented by a very small not curved sclerite; Chaetotaxy of legs (number of setae): tarsi 10-10-5-5, tibiae 2-2-1-1. Solenidions: tarsi 2-1-0-0, tibiae 1-1-1-1, genua 2-1-1-0.



Figs 12-15 — *Glycyphagodes spheniscicola* n.sp. Male: apical segments of legs I (12), leg II (13), leg III (14) and leg IV (15). Apices (enlarged) of leg I (12a), leg IV ventrally (15a) and dorsally (15b).

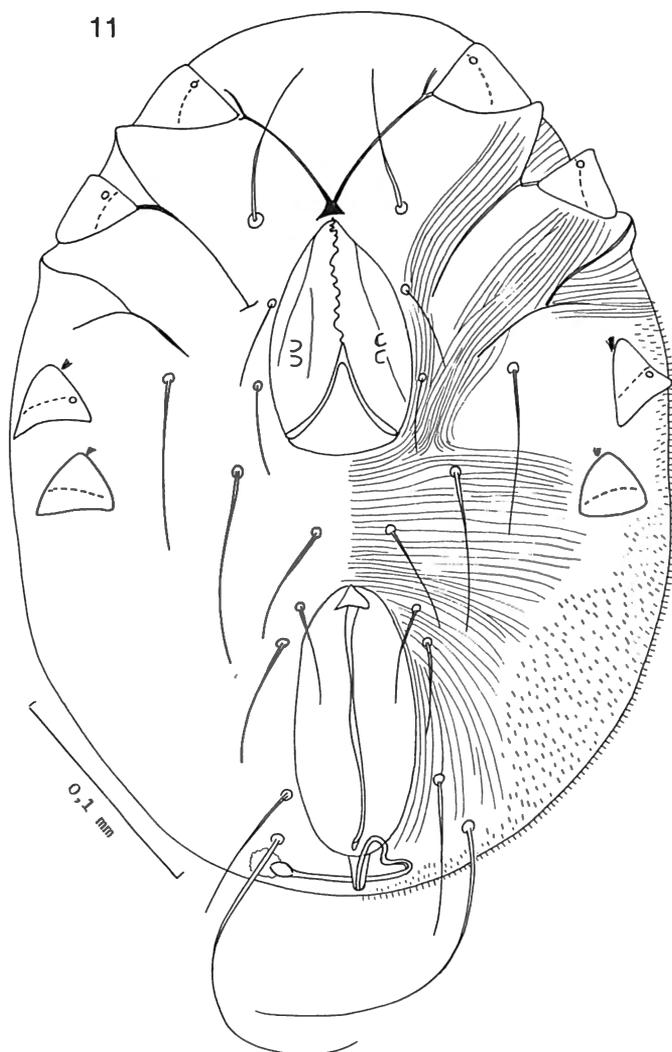


Fig. 11 — *Glycyphagodes spheniscicola* n.sp. Female in ventral view.

**Female** (fig. 11): Length and maximum width in 2 paratypes: 432 × 325 and 390 × 279. Dorsum as in male but the setae are longer.

**Venter:** epimera I V-shaped, lacking a sternum, fused with the epigynium. Genital papillae very small. Anus very long. Trochanters I-III with a long pectinate seta. All ventral setae smooth and very thin. Copulatory papilla conical with apex truncate, total length 15. Bursa copulatrix twisted, total length 85.

**Tritonymph:** Three tritonymphs measure 330 × 230, 310 × 220 and 270 × 195. Chaetotaxy as in female but shorter. Epimera I fused in a short sternum. Genital aperture very short flanked by 2 pairs of small genital papillae. Legs as in adults.

#### Habitat

Holotype male from a nest of *Eudyptula minor albosignata* in an open cave at Otanerito Bay (nest n° 3) (Coll. T. GALLOWAY 1.VII.1991).

Paratypes: 10 males, 2 females and 14 tritonymphs with the same data as the holotype. Holotype and 2 paratypes

male, 1 female and 4 tritonymphs (all paratypes) in NMNZ. Other paratypes in the IRSNB.

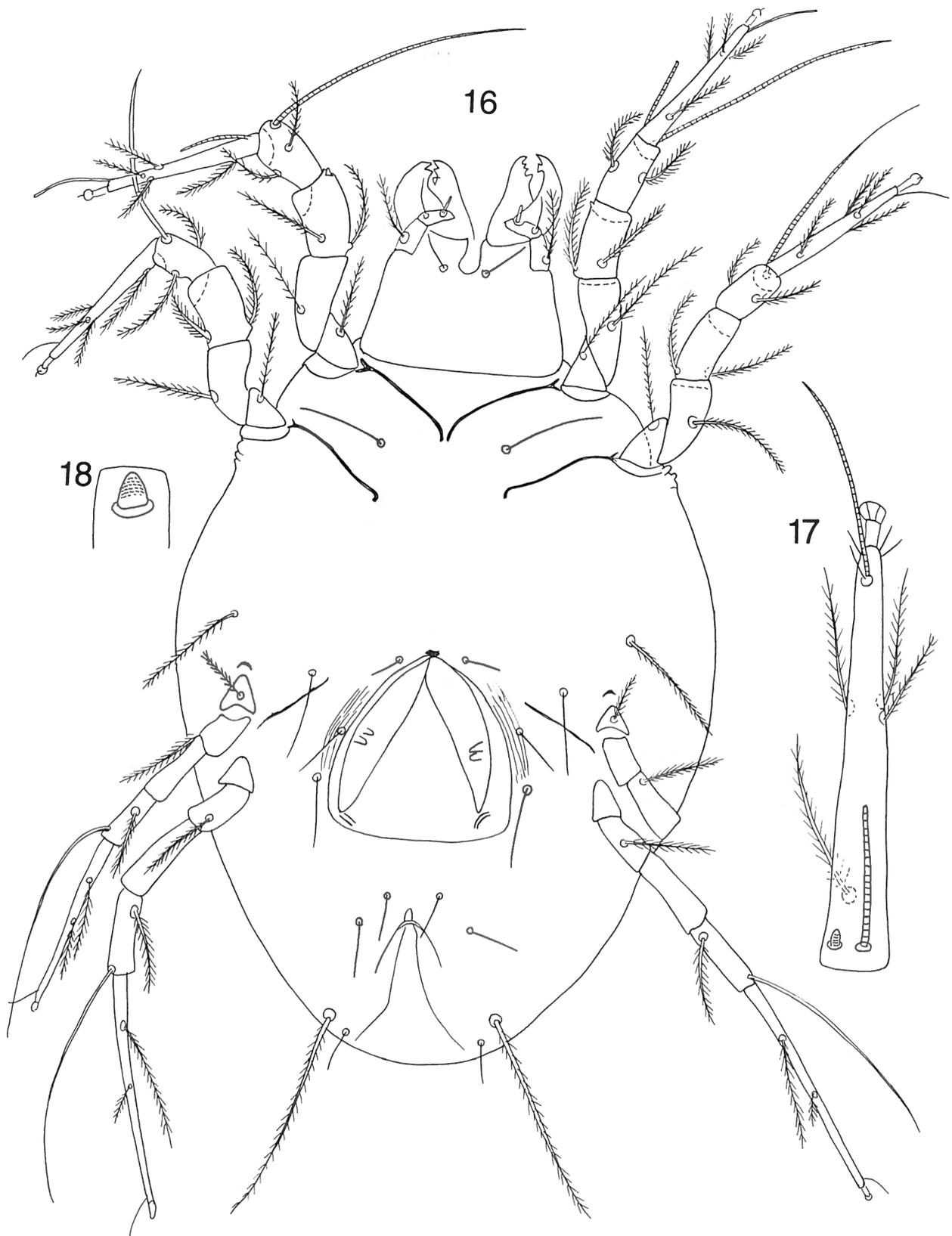
#### KEY TO THE TRIBE ECHIMYOPODINI FAIN, 1986 (Males and females)

1. Propodonotum with two paramedian longitudinal punctate stripes ..... 2  
Propodonotum lacking these longitudinal stripes ..... 4
2. All tarsi with a long ventral pectinate scale attached to their base. Setae *dl* smooth .....  
genus *Austroglycyphagus* FAIN & LOWRY, 1974  
Tarsi lacking such scale. Setae *dl* pectinate. .... 3
3. Claws of tarsi I to IV vestigial or absent. Setae *s cx* pectinate. All tarsi with both pectinate and smooth setae ..... genus *Muriglycyphagus* FAIN, 1976  
Tarsi I-II with well-formed claws, tarsi III-IV without claws. All tarsi with only short smooth setae. Setae *s cx* smooth ..... genus *Glycyphagodes* n.g.
4. Some dorsal setae more than 3 times as long as the length of the body .....  
..... genus *Cometacarus* ZACHVATKIN, 1941  
All dorsal setae not longer than the length of the body ..... 5
5. Genu I with 2 solenidions sigma ..... genus *Echimyopus* FAIN, 1967  
Genu I with only one solenidion genus *Blomia* OUDEMANS, 1928

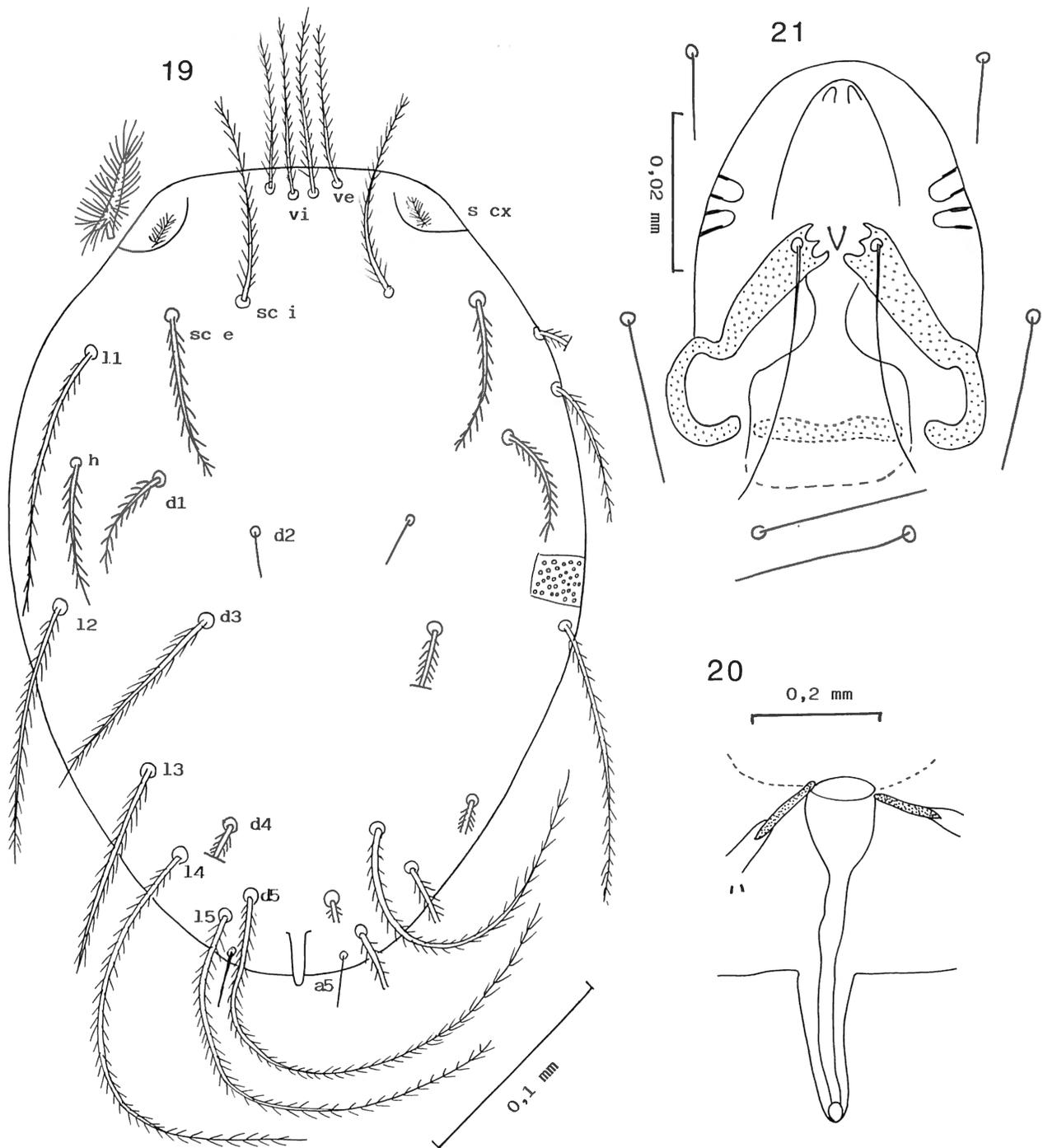
#### *Blomia thori* ZACHVATKIN, 1936

*Blomia thori* ZACHVATKIN (1936) was described from stored flax seed in Smolensk, Russia. Our specimens agree with the general description of this species except for some characters of the chaetotaxy, the shape of the copulatory tube in the female and the size of the body in both sexes.

In the typical description the copulatory tube is described as more curved than in *Blomia kulagini* ZACHVATKIN (1936), while in all our specimens this tube is only slightly curved and in some specimens it is straight. Moreover, in the original figures (see figs 22-23) of ZACHVATKIN some setae appear much shorter than in our specimens. this is the case for setae *d3* which are shorter than *d1* while in our specimens the *d3* are distinctly longer (80) than *d1* (50 long). In addition the setae *a2* are about three times as long as *a1*, while in our specimens both setae are equally long. Finally the size of the body is slightly different in both specimens. In *B. thori* the female measures



Figs 16-18 — *Blomia thori novaezealandiae* n. subsp. Female in ventral view (16), tarsus I in dorsal view (17), solenidion sigma of genu I (18).



Figs 19-21 – *Blomia thori novaezealandiae* n. subsp. Female in dorsal view (19), bursa copulatrix and external copulatory tube (20). Male: sexual organ (21).

320-375×245-280, the male 305×220. In our specimens the female is 270-300×180-198, the male 276-296×190-208. We think therefore that our specimens represent a new subspecies of *B. thori*. We describe it herein.

*Blomia thori* subsp. *novaezealandiae* n.subsp.

*Female*, holotype (figs 16-20): Maximum length and width of idiosoma in holotype: 300×198; in 4 paratypes: 298×190, 290×183, 275×195, 270×180. Cuticle covered with very small rounded projections. Setae *vi* and *ve* close to each other, the *vi* only slightly more posterior than the *ve*. All dorsal setae pectinate except the *d2* smooth and short. Lengths of setae: *ve* 66, *vi* 82, *sc e* 75, *sc i* 90, *dl* 50, *d2* 14, *d3* 80, *d5* 160, *h* 60, *sh* 48, *ll* and *l2* 80, *l3* 90, *l4* 120, *l5* 160.

*Venter*: epimera I contiguous or fused in midline in a V, epimera III and IV very poorly developed. Genital papillae very small. Copulatory tube cylindrical, with rounded apex, 4 to 4,5 wide, either very slightly curved

ventrally or straight and 15-20 long. Anal setae: *a1*, *a2*, *a4* and *a5* very thin and smooth, 18-20-24 and 27 long respectively.

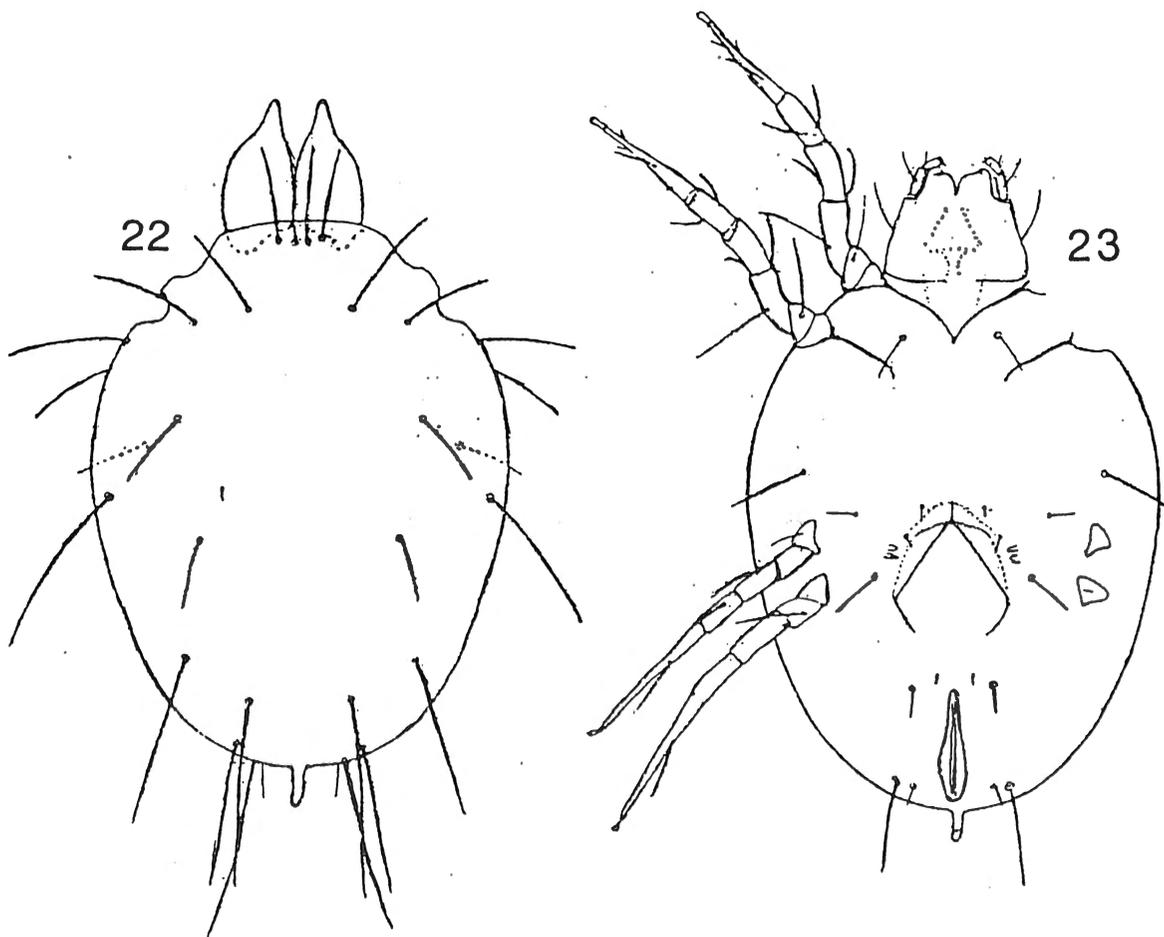
*Legs* long and slender, specially the tarsi. Claws vestigial. Genu I with one very short and thick conical solenidion.

*Male* (fig. 21): two paratypes measure 296×208 and 276×190. Lengths of tarsi I-IV 68-64-67-78. Total length of genital organ 54, maximum width 38. Genital papillae small. Penis small with two strong arms strongly curved in their posterior third. Genital setae very thin, they measure 20 (*ga*), 40 (*gm*) and 30 (*gp*).

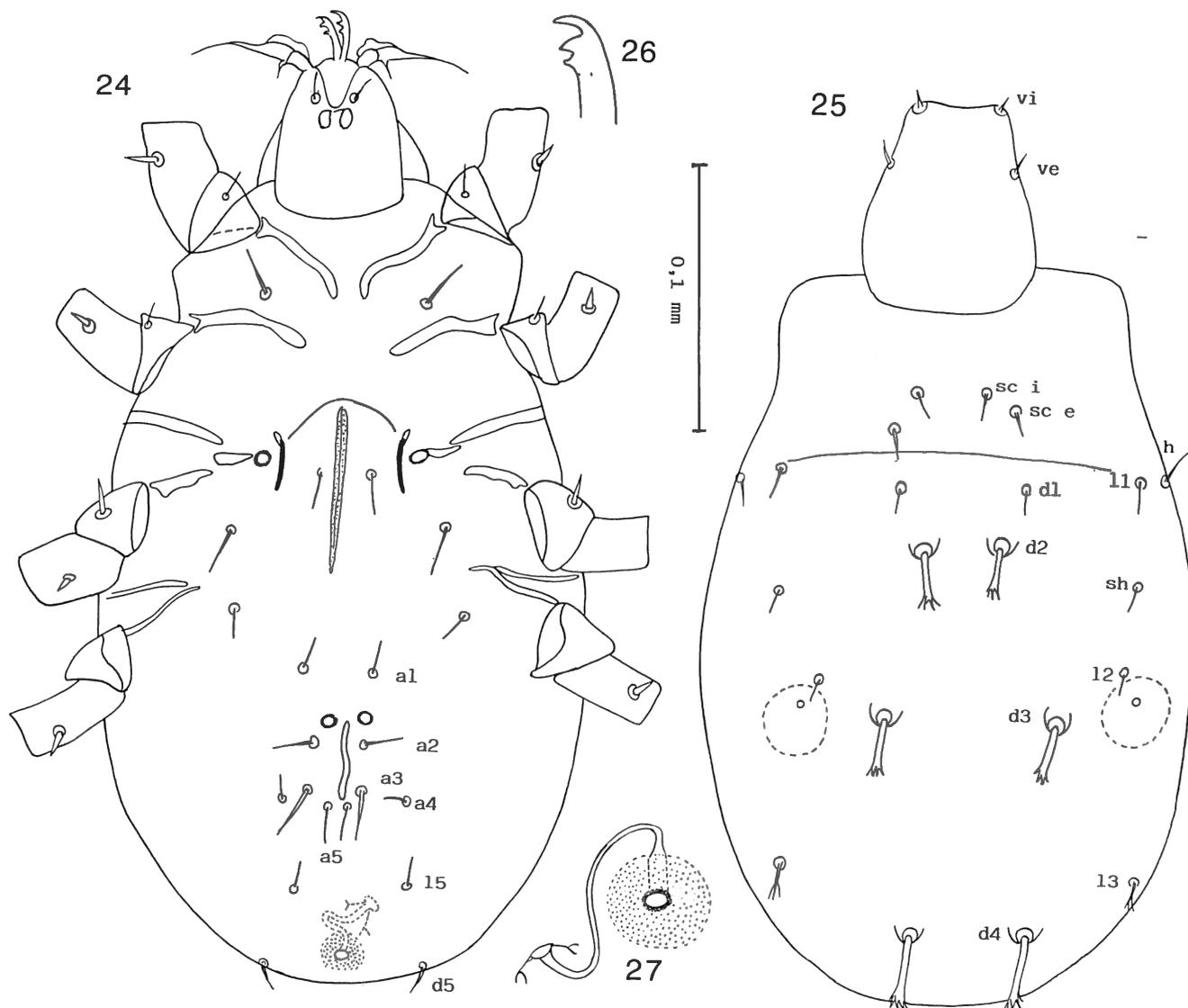
*Habitat*

Holotype female from a nest of *Eudyptula minor albosignata* (nest n° 4) at Otanerito Bay (Coll. T. GALLOWAY, 1.VIII.1991).

Paratypes: 8 females, 4 males and 7 nymphs, all with the same data as holotype. Holotype female, 2 females, 2 males and 2 nymphs all paratypes in the NMNZ, other paratypes in IRSNB.



Figs 22-23 — *Blomia thori* ZACHVATKIN, 1936. Female in dorsal (22) and ventral view (23) (Original figures of ZACHVATKIN, 1941).



Figs 24-27 — *Myianoetus antipodus* n.sp. Female in ventral (24) and dorsal view (25); apical part of fixed cheliceral digit (26); copulatory orifice and bursa copulatrix (27).

#### FAMILY HISTIOSTOMATIDAE

##### *Myianoetus antipodus* n.sp.

*Female*, holotype (figs 24-27; 30-33): maximum length and width of idiosoma  $345 \times 189$ ; in 4 paratypes:  $378 \times 225$ ,  $360 \times 225$ ,  $350 \times 185$ ,  $330 \times 210$ . Dorsum with poorly developed cuticular bosses. Sejugal furrow variably developed. Cuticle smooth. Setae *d2*, *d3* and *d4* situated on small rounded bosses, they are 25-30 long, rodlike, more or less flattened with their apices slightly widened and ending in 4 to 7 stout pectinations. Setae *l3* either smooth or pectinated. Other dorsal setae smooth and thin, 12 to 16 long.

*Venter*: epimera I and II free. Vulva transverse, flanked laterally by two longitudinal apodemes and one pair of genital papillae. A long longitudinal median sclerite (60 long) present in the depth of the vulva. Posterior pair of genital papillae situated in front of anus. The poste-

rior genital papillae are slightly more oval ( $5,9 \times 7,2$ ) than the anterior ones ( $6,2 \times 7,1$ ). Copulatory aperture very small, surrounded by a small punctate rounded area and situated close to the posterior border of idiosoma. Bursa with a short dilated vestibule followed by a narrow duct ending in the spermatheca.

*Gnathosoma*: fixed digit chelicerae with apex curved ventrally and bearing either one or more often two subequal preapical teeth. Movable digit with apex curved and lacking subapical teeth. Palps with two lateral flagellar setae, the anterior longer (18-25) than the posterior (9-10 long). *Legs*: all tarsi with a strong claw, that of tarsus I slightly shorter, thicker and more curved than the other claws. Length of tarsi (ambulacra not included) 87-73-69-86. Solenidions of leg I:  $\omega 1$  22 long, slightly inflated in apical half;  $\omega 2$  7 long, slightly more basal than  $\omega 1$ ;  $\omega 3$  72 long;  $\phi 1$  30 long, not inflated;  $\sigma 1$  and  $\sigma 2$  short, 8 and 6 long respectively.

**Male** (figs 28-29; 34-37): length and width (maximum) of the idiosoma  $330 \times 168$ . General characters as in female. All the dorsal setae are thin and short (length 6 to 12). Epimera I fused in a long (42) sternum forked posteriorly. The two pairs of sclerotized rings are situated in a trapezium in front of the male organ, they are very close to each other.

**Legs:** Tarsus I with a strongly modified claw. In ventral view this claw appears truncate with a straight edge while in lateral view its shape is conical with a pointed apex. Solenidion  $\omega 3$  relatively very thick and strongly curved, its apex is connected to the tarsus by means of a thin membrane. Other legs with normal claws.

**Tritonymph:** a tritonymph measures 240 long and 150 wide. Dorsum with 9 pairs of large cuticular bosses (1 pair on propodonotum and 8 pairs on hysteronotum). The two propodonotal bosses bear each one pair of setae, those of hysteronotum bear each on seta. These setae are very short (10-12) and bear apical pectinations. There are two pairs of sclerotized rings (genital papillae) arranged in a trapezoid at the level of coxae IV. Trochanters I to III with a seta. Tarsus I with an apical solenidion  $\omega 3$ .

**Protonymph:** two protonymphs measure (length  $\times$  width of idiosoma):  $225 \times 135$  and  $215 \times 120$ . General morphology as in tritonymph with the same number of dorsal bosses bearing short setae with apex pectinate. They differ from the tritonymphs by the absence of solenidion  $\omega 3$  on tarsus I, the presence of only one pair (the posterior) of genital papillae, the absence of coxal I to III setae, and some characters of the chaetotaxy.

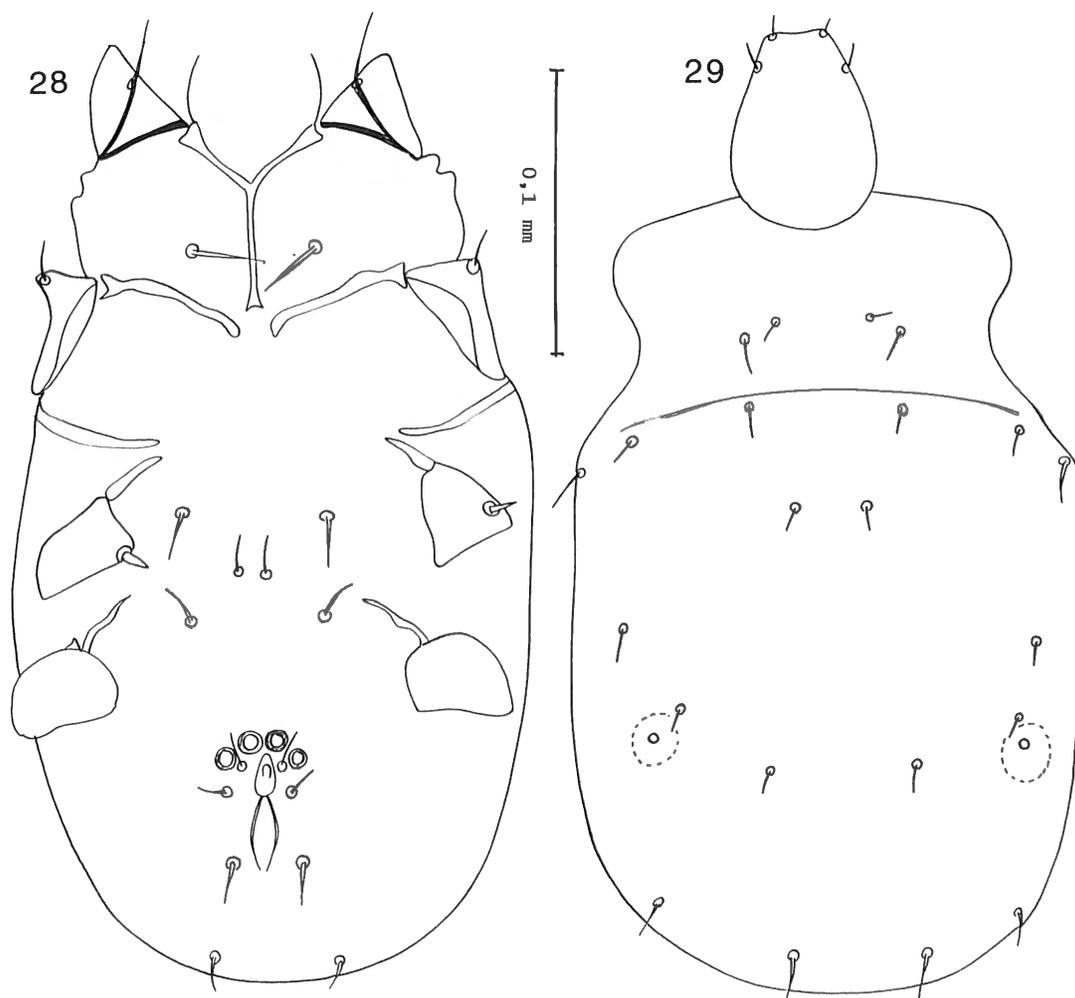
**Heteromorphic deutonymph:** unknown.

#### Habitat

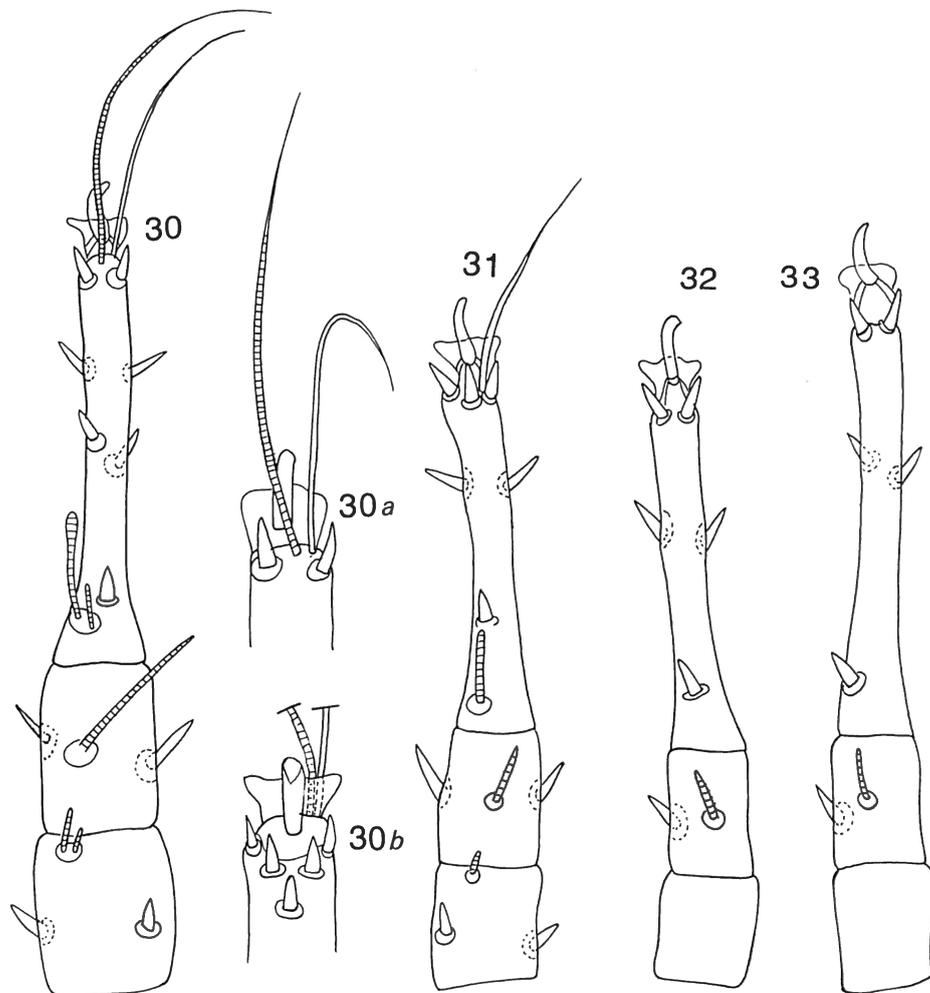
Holotype female from nest n° 1 (*E. albosignata*), from Motunau Is., New Zealand (Coll. T.D. GALLOWAY, 8.XI.1991).

Paratypes: 25 females, 2 males, 15 tritonymphs and 5 protonymphs with the same data as for the holotype; 8 females and 2 tritonymphs from nest N° 2 (Fairy Prion), 1 female from nest n° 3 (*E. albosignata*), from Otanerito Bay, 1.VII.91.

Holotype, 15 females, 1 male, 4 tritonymphs and 3 protonymphs in the NMNZ; one female and 1 tritonymph in the MBNH; the rest of the material in the IRSNB.



Figs 28-29 — *Myianoetus antipodus* n.sp. Male in ventral view (28) and in dorsal view (29).



Figs 30-33 – *Myianoetus antipodus* n.sp. Female: tarsus, tibia and genu in dorsal view of legs I (30), II (31), III (32) and IV (33); apical region of tarsus I in dorsal view (30a) and in ventral view (30b).

#### Remarks

This species is closest to *Myianoetus simplex* MAHUNKA, 1972. This species was first described from the hypopial stage. In 1985, BONGERS *et al.* described the other stages. *M. novaezealandiae* differs from *M. simplex* by the following characters:

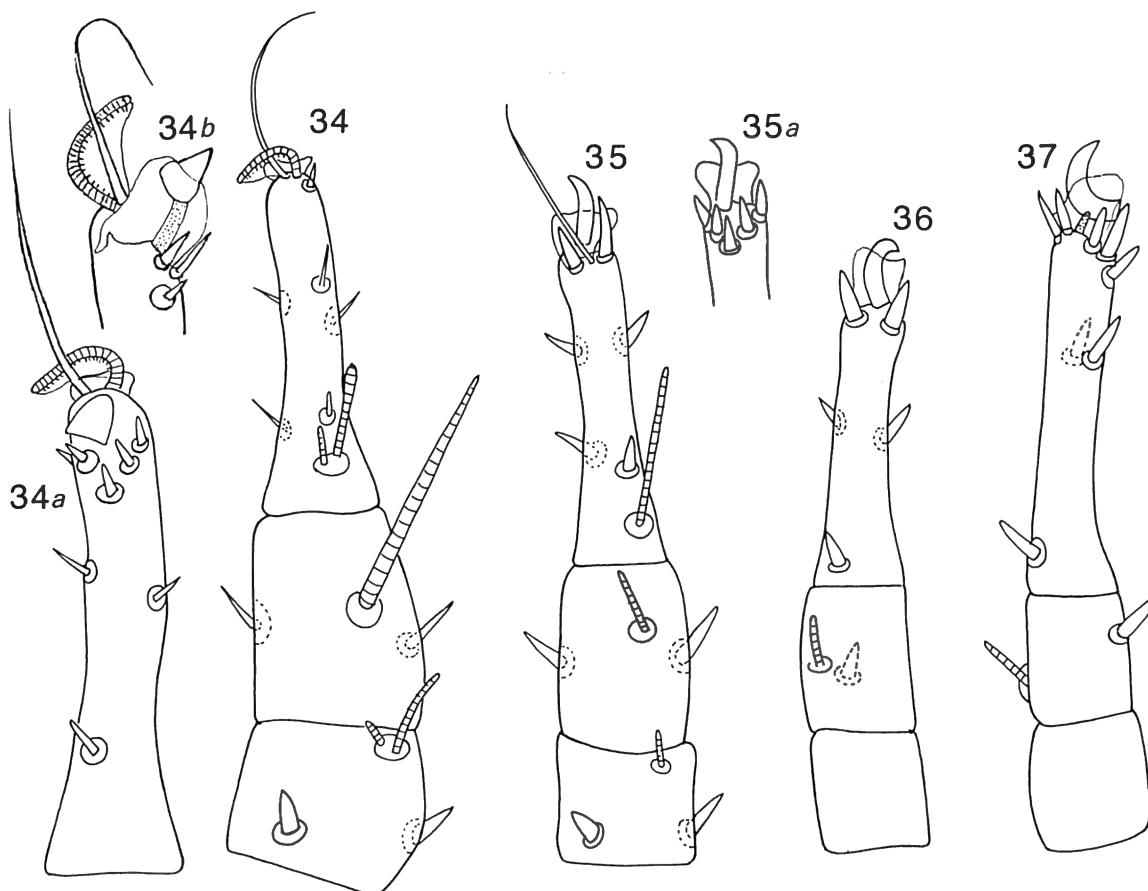
*In the female*: by the shape of setae *d4* which in all our specimens are similar to setae *d2* and *d3* (cylindrical with pectinate apex); by the shape of  $\omega_2$ , shorter in our species, and of  $\omega_1$  distinctly longer in our species and only inflated in apical half; by the presence of only 2 preapical teeth on the fixed chela; by the smaller size of the posterior pair of genital papillae (the sclerotized rings) (in *M. simplex* the posterior papillae are much larger than the anterior ones); by the longer median genital sclerite; by the absence of large membranes on the apices of tarsi II to IV; by the different shape of setae *d2* and *d3* which are not brush-like but end into 4 to 7 thick pectinations; by the ventral situation of the copulatory orifice which opens in the middle of a rounded punctate area.

*In the male*: by the aspect of tarsus I with a modified claw and a modified solenidion  $\omega_3$ ; by the much longer sternum; by the situation of the genital papillae much closer to each other.

*In the tritonymph*: by the presence of dorsal cuticular bosses and the different shape of the dorsal setae, short and ending in two or three pectinations.

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Figs 34-37 – *Myianoetus antipodus* n.sp. Male: tarsus, tibia and genu in dorsal or dorsolateral view of leg I (34), leg II (35), leg III (36) and leg IV (37). Tarsus I in ventral view (34a), apex of tarsus I in lateral view (34b), apex of tarsus II in ventral view (35a).

**LIST OF THE MITES FOUND IN THE NESTS OF  
SEA BIRDS IN NEW ZEALAND**

Mite Species	Nest number	Host of the nest	Locality
<b>MESOSTIGMATA</b>			
Family Sejidae			
<i>Sejus novaezealandiae</i> n.sp.	1	<i>Eudyptula minor</i> <i>albosignata</i>	Motunae Is.
Family Laelapidae			
<i>Androlaelaps pachyptilae</i> (ZUMPT & TILL)	1 2	<i>E. m. albosignata</i> <i>Pachyptila turtur</i>	Motunae Is. Motunau Is.
Family Dermanyssidae			
<i>Liponyssoides eudyptulae</i> n.sp.	1	<i>E. m. albosignata</i>	Motunau Is.

**LIST OF THE MITES FOUND IN THE NESTS OF  
SEA BIRDS IN NEW ZEALAND (continued)**

Mite Species	Nest number	Host of the nest	Locality
<b>ASTIGMATA</b>			
Family Acaridae			
<i>Tyrophagus longior</i> (GERVAIS)	1	<i>E. m. albosignata</i>	Motunau Is.
<i>Tyrophagus similis</i> VOLGIN	1	<i>E. m. albosignata</i>	Motunau Is.
	2	<i>Pachyptila turtur</i>	Motunau Is.
<i>Tyrophagus palmarum</i> OUDEMANS	5	<i>E. m. albosignata</i>	Onawe Peninsula
<i>Thyreophagus</i> sp.	1	<i>E. m. albosignata</i>	Motunae Is.
Family Winterschmidtiiidae			
<i>Psylloglyphus parapsyllus</i> sp.	1	<i>E. m. albosignata</i>	Motunau Is.
	2	<i>Pachyptila turtur</i>	Motunau Is.
Family Glycyphagidae			
<i>Glycyphagodes spheniscicola</i> n.sp.	3	<i>E. m. albosignata</i>	Otanerito Bay
<i>Blomia thori novaezealandiae</i> n.ssp.	4	<i>E. m. albosignata</i>	Otanerito Bay
Family Histiostomatidae			
<i>Myianoetus antipodus</i> n.sp.	1	<i>E. m. albosignata</i>	Motunau Is.
	2	<i>Pachyptila turtur</i>	Motunau Is.
	3	<i>E. m. albosignata</i>	Otanerito Bay

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