

## SOME PROSTIGMATA (ACARI) FROM SIGNY ISLAND, SOUTH ORKNEY ISLANDS, AND DECEPTION ISLAND, SOUTH SHETLAND ISLANDS

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A NUMBER of prostigmatic mite species were represented in collections made by P. J. Tilbrook during the course of a general study of the terrestrial arthropods of the Scotia Ridge and Antarctic Peninsula region between January 1962 and March 1964.

The geographical and ecological distribution of many of the Prostigmata collected have already been discussed (Tilbrook, 1967*a, b*) and some of the new species described (Strandtmann, 1967).

Three more species, two of which are new, are described here with comments on their distribution. Type specimens will be deposited in the British Museum (Nat. Hist.).

### FAMILY EUPODIDAE KOCH 1842

#### Genus *Cocceupodes* Thor 1934

Small soft-bodied mites. Internal vertical setae inserted behind the vertex and generally clavate. Legs I long and slender; legs IV with swollen femur. Differs from *Eupodes* in the position of the internal verticals (i.e. posterior to the epivertex), shorter dorsal setae, the anterior rostral setae subapical and the generally more distinct coxae.

#### *Cocceupodes australis* n. sp.

Fig. 1 a-e

Small; 275  $\mu$  long (265–290  $\mu$ ). Faintly and very finely striatopunctate. Leg I, measured from the apex of the coxa, slightly longer than the body. Eyes without cornea.

*Dorsal side.* The claviform and pedicillate internal verticals are uniformly covered with tiny barbs and are inserted in sunken pits behind the clearly delineated epivertex. External verticals and scapulars subequal, 20–25  $\mu$  long. The scapulars placed nearer the trichobothria than to the margin of the body. Trichobothria long (about 80  $\mu$ ), thin, sparsely ciliated, the ciliations especially fine and longer on the apical than on the basal half. External humeral about twice the length of the internal humeral. Internal humeral and dorsal 1 and 2 equal, approximately 25  $\mu$ . The lumbar and sacral setae are approximately 37  $\mu$  long, with the internal lumbar (*l.i.*) a bit longer.

*Ventral side.* In this paper, as in several previous ones (Strandtmann, 1964, 1967), the intercoxal setae of authors have been assigned to specific coxae and are referred to as coxal setae. In the eupodoid mites (including Penthalodidae, Rhagidiidae and Tydeidae) there are typically three pairs of intercoxal setae. They are frequently found on the coxae and it seems justifiable to consider them as coxal. Beginning anteriorly, the intercoxal setae are assigned to coxae I, III and IV. There seems never to be one associated with coxa II. The setal numbers of coxae I and II are remarkably constant, being three and one, respectively. Coxa III is the most variable, ranging generally from three to eight. Coxa IV is less erratic, having generally three setae, but sometimes with two or with four.

Coxae (epimera) in two distinct groups. Middle seta of coxa I very long (approximately 30  $\mu$ ), about five times as long as the very small distal seta and one and a half times as long as the proximal seta. All other coxal setae subequal, 15–20  $\mu$ . Coxal seta formula 3–1–3–3. Genitalia (female): four pairs of paragenital setae of which the anterior two pairs are about twice as long as the two posterior pairs; each genital cover bears four subequal setae, and internally there are two knobs and three pairs of internal genital setae. No males were available for study. Anal setae probably number three pairs but in all five females available, the second pair was missing, although the bases were clearly present. Seta  $a_1$  about one-fifth to one-quarter as long as  $a_3$ .

*Gnathasoma.* Hypostome with two pairs of plumose setae; the internal pair approximately

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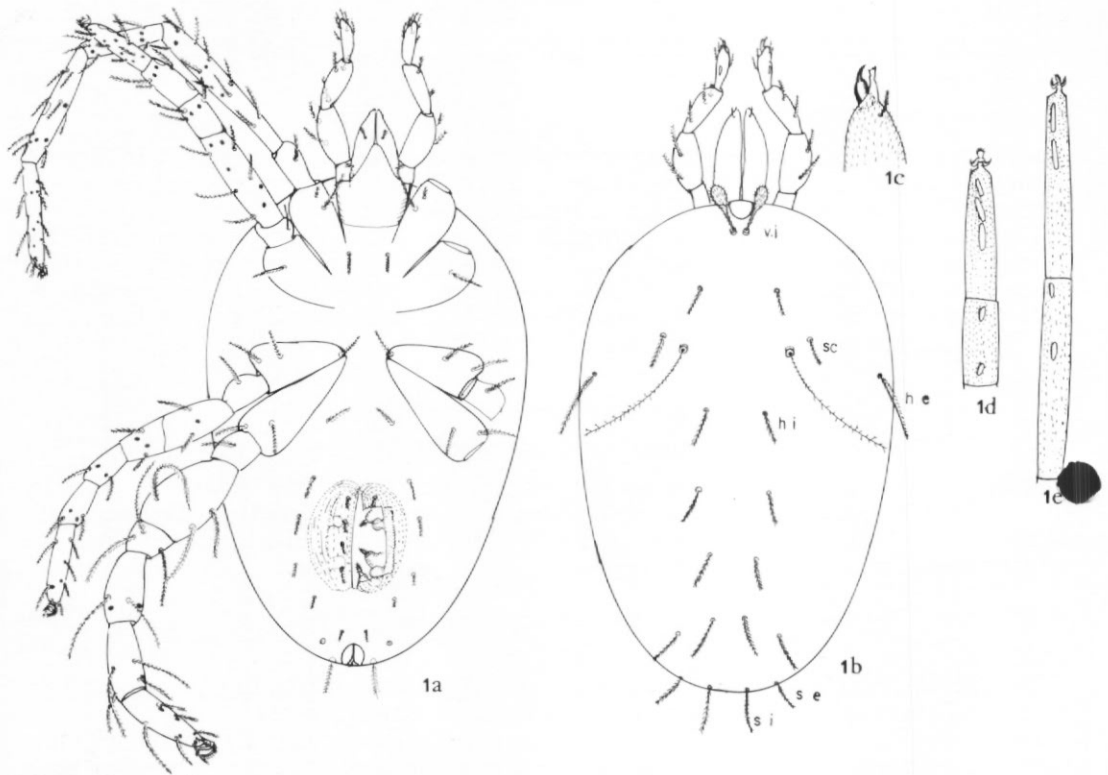


Fig. 1. *Cocceupodes*.

- Ventral view of female; black spots on legs represent setae on opposite side.
- Dorsum of adult (*he* and *hi*, external and internal humerals; *se* and *si*, external and internal sacralis; *sc*, scapular; *vi*, internal verticals).
- Enlarged view of chela, dorsal side.
- d and e. Dorsal side of tarsus and tibia II and I, respectively, showing position of rhagidial fields.

medial, being therefore much farther basad than in *Eupodes*. Outer pair marginal. Chelicera normal for the family, except that the cheliceral seta is plumose, which is rather unusual. Pedipalp with four free segments which bear, basal to apical, 0-2-3-7 or 8 plumose setae. The apical segment, in addition to the seven or eight setae, has a small sensory pit dorsolaterally, containing a small recumbent solenidion.

*Legs.* Leg I slender, a bit longer than the body. Legs II and III, thicker and about half as long as I. Leg IV slightly longer than II and III and with swollen femur. Femora I and II entire, femora III and IV divided. All leg setae feathered. Setae of leg I about 20  $\mu$ , those of leg IV up to 50  $\mu$ . Tarsus I slightly constricted in the middle; the apical half with two long rhagidial organs. Tibia I and II each with two small rhagidiforms. If there are other rhagidiforms or solenidia, they escaped notice. Chaetotaxy of legs:

	<i>Tarsus</i>	<i>Tibia</i>	<i>Genu</i>	<i>Femur</i>	<i>Trochanter</i>	<i>Coxa</i>
I	18 (+3)	11 (+2)	8	13	1	3
II	11 (+3)	5 (+2)	4	11	1	1
III	14	4	4	3+4	1	3
IV	13	5	4	3+3	1	3

The seta of trochanter II is obscurely feathered, appearing nude.

## Types

Holotype ♀—moss, Deception Island, 20 January 1964. Paratypes seven ♀—same data as holotype.

## Locality data

*Cocceupodes australis* was found only on Deception Island and it was confined to two samples of *Polytrichum alpinum* from a flat area of volcanic ash north of Whalers Bay. The moss formed very loose and shallow mounds scattered over the area and interspersed were smaller patches of other bryophytes. Extraction of these samples revealed a particularly interesting arthropod fauna. Apart from *Cocceupodes australis*, five Acari and three Collembola species were represented and it proved to be the only sample taken on the island in which the cryptostigmatic mite *Liochthonius mollis* was abundant.

## Remarks

Four species of *Cocceupodes* appear in the literature. They are *C. mollicellus* (C. L. Koch 1838), *C. clavifrons* (R. Canestrini 1886), *C. curviclava* (S. Thor 1934) and *C. paradoxus* (Weis-Fogh 1948). *C. paradoxus* has piliform epivertical setae, the trichobothria are only 50  $\mu$  long. The genital covers have six pairs of setae and the total body length, including gnathosoma, is only 215  $\mu$ . Hence it is concluded that the species here described is not *paradoxus*. *C. curviclava* differs by having shorter setae throughout and legs I are no longer than the body. This leaves *mollicellus* and *clavifrons*, which according to Haarløv (1957) are the same, and the name *mollicellus* applies by priority. There is really nothing in the brief descriptions and illustrations given by Thor and Willmann (1941, p. 35) that would serve to separate the Antarctic form from *mollicellus*, except geographic distribution, but until it may be proved otherwise, the Antarctic form is considered to be new.

Genus *Halotydeus* Berlese 1891

Soft-bodied eupodoid mites. Palp segments short, thick, especially the fourth. Differs from *Penthaleus* in having fewer body setae, all feathered, and in the terminal rather than dorsal position of the excretory pore.

*Penthaleus* and *Halotydeus* are closely related to *Eupodes*, *Linopodes*, *Prottereunetes* and *Cocceupodes*. Many authors place the two groups in separate families (Penthaleidae and Eupodidae, respectively; *vide* Thor and Willmann, 1941) but Baker and Wharton (1952, p. 174) combined the two groups under the family Eupodidae, which seems much the more logical thing.

The following key to genera applies primarily to Antarctic and sub-Antarctic forms:

1. Pedipalps short, thick, the end segment very short. Movable arm of chela strong, recurved, long . . . . . 2  
 Pedipalps longer; the segments more slender; end segment tapering and may be longer than the third segment. Chela not so strong, the movable arm recurved but smaller . . . . . 3
2. Many body setae nude; polytrichy common. Excretory pore dorsal . . . . . *Penthaleus*  
 Few or none of the body setae nude. Polytrichy uncommon. The excretory pore terminal . . . . . *Halotydeus*
3. Setae *verticales internae* placed behind the epivertex, generally clavate . . . . . *Cocceupodes*  
 Setae *verticales internae* piliform and placed on the vertex . . . . . 4
4. Dorsal hysterosomal setae as long as the interspaces between setae. Internal setae of hypostome near the apex. Femur IV generally swollen. Leg I may be slender and as long or somewhat longer than the body . . . . . *Eupodes*  
 Dorsal hysterosomal setae shorter, generally about half as long as interspaces. Internal setae of hypostome midway between base and apex. Femur IV not, or only slightly, swollen . . . . . 5
5. Leg I twice or more the length of the body . . . . . *Linopodes*  
 Leg I no longer than the body . . . . . *Prottereunetes*

*Halotydeus signiensis* n. sp.

Fig. 2 a-i

Soft-bodied, very finely and delicately punctatostriate. Average length 500  $\mu$  (475–550  $\mu$ ). Legs not as long as body. All body and leg setae feathered, approximately equal.

*Dorsal side.* Vertical setae at the side of, rather than on, the epivertex. External verticals shorter than the scapulars. Scapulars inserted over the eye. Trichobothria slightly longer, finer and more sparsely feathered than the other setae.

*Ventral side.* Female genitalia covered with two poorly defined elongate flaps, each bearing six setae, of which the fourth is more lateral. Five pairs of paragenital setae; six pairs of densely plumose internal genital setae; two pairs of knobs. The male has seven pairs of internal genital setae and a small sperm sac. The only male seen has six pairs of paragenital setae and six external genital setae on one cover, seven on the other. Excretory pore terminal. Three pairs of anal setae, the third pair dorsal. Coxal seta formula 3–1–3–2. Only two setae for coxa III seems a bit unusual.

*Gnathosoma.* Hypostome with two pairs of feathered basal setae and one pair nude terminal setae. Pedipalp with four thick segments, the fourth or terminal segment the shortest. Number of setae per segment, beginning proximally, 0, 2, 3, 7. The median seta of segment 3 is small and sparsely feathered. On segment 4 the seven setae are faintly serrated (or perhaps smooth) and there is a solenidion on the outer basal angle. Movable arm of chela long, sharp, recurved, fixed arm with a double point. Cheliceral seta nude.

*Legs.* All tarsi ending in two claws and rayed empodium. Claws ciliated along inner margin. Tarsi I and II each have two subapical solenidia; on tarsus I a stellate seta sits between the two solenidia; on tarsus II a small branched seta is distal of the solenidia. Tibia I and II have each two solenidia, one distal and one proximal. Tibia III and IV each have a basal solenidion. Chaetotaxy of legs (all feathered and subequal):

	<i>Tarsus</i>	<i>Tibia</i>	<i>Genu</i>	<i>Femur</i>	<i>Trochanter</i>	<i>Coxa</i>
I	16 (+2)	5 (+2)	4	7	1	3
II	11 (+2)	5 (+2)	4	7	1	1
III	10	5 (+1)	4	4	1	3
IV	9	5 (+1)	2	3	1	2

The solenidia on tarsi I and II are semi-recumbent but they do not appear to lie in grooves and are perhaps not rhagidial organs in the same sense that they are in the Penthalodidae. A small nude piliform seta is associated with the apical solenidion of tibia I. All solenidia are dorsal; the genua are without solenidia.

*Types*

Holotype ♂—moss, northern slope of Robin Peak, Signy Island, 9 January 1964. Paratypes three ♂ and two ♀—same data as for holotype.

*Locality data*

This species was collected only at Signy Island, and although present in samples taken from many different localities throughout the island, it had a low frequency of occurrence and was seldom abundant. More common in vegetated habitats.

*Remarks*

The previously described species of this genus are *Halotydeus hydrodromus* (Berlese and Trouessart 1889), *H. destructor* (Jack 1908) and *H. h. albolineatus* (Halbert 1915). *H. hydrodromus* has many short, strongly feathered setae of various lengths on the dorsal side; *H. destructor* has eight pairs of external genital setae and seven pairs of internal genitalia; *H. h. albolineatus* has three solenidia on tarsus I, plus a solenidion in each genu. Also, according to Schuster (1958, p. 91), legs I, at least, have many more setae, viz. tarsus 20, tibia 9, genu 11.

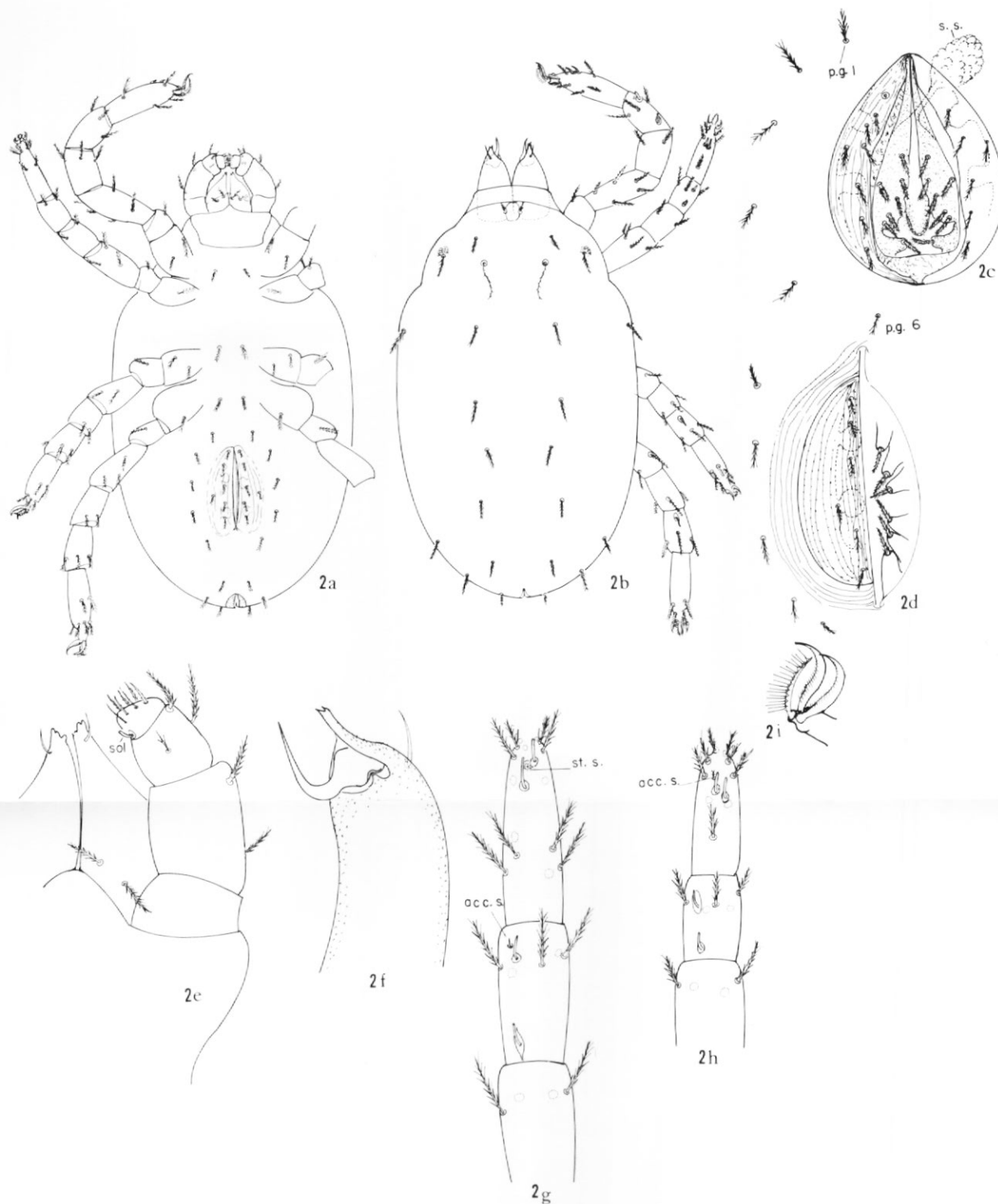


Fig. 2. *Halotydeus*.

- a. Ventral view of female.
- b. Dorsum of adult.
- c. Genitalia of male with genital covers drawn back to expose internal setae (*pg* 1-6, paragenital setae; *ss*, sperm sac).
- d. Female genitalia, with left genital cover removed to show internal setae.
- e. Ventro-lateral view of left pedipalp and hypostome (*sol*, solenidion).
- f. Ventro-lateral view of chelicera.
- g. Dorsal view of tarsus, tibia and genu I, showing positions and relative sizes of sensory setae (*acc s*, accessory setule; *st s*, stellate seta).
- h. Dorsal view of tarsus, tibia and genu II.
- i. Tarsal claws and empodium.

The new species further differs from all the above in its smaller size, 500  $\mu$ , compared to 700–900  $\mu$  for the three previously described forms.

## FAMILY EREYNETIDAE OUDEMANS 1931

Genus *Ereynetes* Berlese 1883

Small mites with a more or less extensive network of subcuticular lines, especially in the legs, and generally also on the propodosoma. Dorsal shield may be present. No epivertex. Two pairs of trichobothria, one pair in the usual location on the propodosoma, the second pair on the hysterosoma, occupying the site of seta *e.l.* (external lumbar). Pedipalps with five free segments, the terminal small and cylindrical. All tarsi excavated dorso-apically to receive the retracted claws. Femur IV divided. Sexually dimorphic in that the male has a shorter genital cover and three pairs of small, internal, closely clustered setae. The female has a more elongate genital cover and no internal setae but with a pair of small knobs, in addition to the two pairs of larger knobs found in both sexes. The genital knobs (four) are pedicillate, elongate, and have terminal acetabulae. They resemble an unarmed scolex of a cestode.

*Ereynetes macquariensis* Fain 1962

## Fig. 3 a–i

Average length 330  $\mu$  (313–375  $\mu$ ). Legs and body finely striatopunctate. Reticulations of subcuticular lines sparse, generally fairly obvious in the legs and epimeres, rarely obvious on the dorsum.

*Dorsum.* Anterior verticals half as long as the posterior verticals; both pairs near the trichobothria. Scapulars three times as long as the anterior verticals. Hysterosomal setae subequal, shorter than the scapulars. Anterior and posterior trichobothria are equal, long, slender, delicately ciliated. Eyes without cornea.

*Ventral side.* Coxae (epimeres) distinct, with sparse internal reticulations that may be distinct or not. Coxal seta formula, 3–1–4–3. Five pairs of paragenital setae, six pairs of external genital setae, of which the fourth pair is more lateral. Two pairs of capitate, pedicillate genital knobs. The female with an extra pair of small, median knobs; the male with three pairs of internal genital setae. No sperm sac is visible in the male but the large testis frequently is visible if the specimen is not cleared completely. Excretory pore terminal, with two pairs of anal setae.

*Gnathosoma.* Hypostome with four prominent, feathered basal setae and four small, obscure, nude apical setae. Pedipalps with five free segments, with chaetotaxy as follows: trochanter 0, femur 2, genu 2, tibia 3 plus a basilateral solenidion, tarsus with a terminal, nude claw-like seta and a basal feathered seta that appears to be either forked or broad and flat apically. Chela normal for the genus, with a strong, recurved movable arm and a small, apparently functionless fixed arm.

*Legs.* Shorter than the body. Very finely striatopunctate. Femora I–III entire, femur IV divided at the apical quarter. Solenidia: tarsi I and II each with a prominent dorso-medial solenidion lying parallel to the long axis of the leg. Tibia I with the characteristic ereynetal organ described by Fain (1962a). Chaetotaxy of legs (all setae plumed):

	<i>Tarsus</i>	<i>Tibia</i>	<i>Genu</i>	<i>Femur</i>	<i>Trochanter</i>	<i>Coxa</i>
I	12 (+1)	6	4	7	1	3
II	9 (+1)	3	4	4	1 (nude)	1
III	8	3	3	3	1	4
IV	7 (?)	3	3	2+2	0	3

Nymph with no genital opening but with two sets of four small pores in the genital area, surrounded by four–five pairs of genital setae.

*Re-described from:* two ♀, two ♂ and two nymphs—moss, Berntsen Point, Signy Island, 22 November 1963. Two ♀, one ♂ and one nymph—moss, northern slope of Robin Peak, Signy Island, 9 January 1964.



Fig. 3. *Ereynetes macquariensis* Fain.

- a. Ventral view of female ( $a_1$ ,  $a_2$ , anal setae;  $c_{iii}$  and  $c_{iv}$ , seta of coxa III and coxa IV, respectively).
- b. Dorsum of adult ( $a_2$ , anal;  $d_1$ ,  $d_2$ , dorsals;  $he$ ,  $hi$ , humerals, external and internal;  $li$ , internal lumbar;  $se$ ,  $si$ , sacrals, external and internal;  $va$ ,  $vp$ , anterior and posterior verticals).
- c. Male genitalia.
- d. Genital suckers and internal setae of male.
- e. Genital suckers, female.
- f. Lateral view of right pedipalp.
- g. Chela.
- h. Ventral view of the gnathosoma with a dorsal view of the pedipalp on the right.
- i. Lateral view of tarsus and tibia I ( $eo$ , ereynetal organ;  $sol$ , solenidion).

*Locality data*

This mite was collected from a variety of habitats on Signy Island but it occurred most frequently, and reached its highest densities, in bryophytes. It was commonly associated with other small prostigmatic mites, notably *Protoreunetes minutus*. A number of samples taken at Deception Island also contained small numbers of *Ereynetes macquariensis*.

*Remarks*

Allowing for discrepancies of interpretation of setae, these Signy Island specimens fit the description of *E. macquariensis* Fain (1962*b*) very well. The only disturbing element is that Fain made no mention of the solenidion on tarsi I and II and on the outer basal angle of the palp tibia. If it is assumed that the specimens of Fain have these solenidia and that Fain merely failed to mention them, then there would be no doubt that the Signy Island and Macquarie Island materials are conspecific.

MS. received 22 November 1967

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