

SOME CRYPTOSTIGMATA (ACARI) FROM SOUTH GEORGIA

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ABSTRACT. Records and descriptions are given of 13 species of Cryptostigmata collected from South Georgia. The list comprises *Liochthonius mollis* (Hammer), *Liochthonius* sp., *Eobrachychthonius oudemansi* van der Hammen (family Brachychthoniidae), *Platynothrus skottsbergii* Trgdh. ssp. *expansus* n. ssp. (family Camisiidae), *Oppia crozetensis* (Richters), *Globoppia intermedia* Hammer (family Oppiidae), *Halozetes belgicae* (Mich.), *Podacarus auberti* Grndj. ssp. *occidentalis* n. ssp. (family Podacaridae), *Scotiazetes bidens* n. gen. n. sp., *Edwardzetes elongatus* n. sp., *Porozetes polygonalis* Hammer ssp. *quadrilobatus* n. ssp., *Magellozetes antarcticus* (Mich.) (family Ceratozetidae) and *Sandenia georgiae* (Oudms.) (family Parakalummidae). The fauna has a strong South American element represented by the species *L. mollis*, *E. oudemansi*, *P. skottsbergii*, *O. crozetensis*, *G. intermedia*, *P. polygonalis* and *M. antarcticus*. A sub-Antarctic element is also present in the form of *H. belgicae* and *P. auberti*, the latter species being recorded from the western region for the first time.

TERRESTRIAL ACARI have a special significance in Antarctic and sub-Antarctic regions because of their ability to tolerate, to a greater extent than most land animals, the extreme environmental conditions. The mechanisms by means of which this tolerance is achieved are, as yet, poorly understood, but evidently behavioural and physiological characteristics are involved (Dalenius and Wilson, 1958). As a first step in the investigation of some of the ecological problems concerned, surveys are being undertaken to determine species composition of the mite fauna collected from various parts of the region. The results obtained so far provide an interesting picture, albeit incomplete, of the distribution patterns of several species (Dalenius and Wilson, 1958; Wallwork, 1965), and they provide a basis for the interpretation of future collections.

Antarctica can be considered as a faunal province linking South America and Australasia. Its special significance, in this respect, stems from the similarities occurring between the soil mites, particularly the Cryptostigmata, of South America and those of New Zealand. The available evidence suggests that species from each of these regions may have penetrated into the Antarctic and sub-Antarctic to varying extents and mingled with endemic forms. The extent of this penetration may well reflect the ecological tolerance of the species concerned, so that accurate determinations of distribution patterns are of the greatest importance.

The Cryptostigmata of South Georgia are of considerable interest for the position of this island on the Scotia Ridge and its proximity both to South America and the Antarctic Peninsula may be reflected in its acarine fauna. Although collections of mites have been described previously from South Georgia, notably by Michael (1895) and Trägårdh (1908), these descriptions evidently did not provide a complete picture of the faunal composition, nor did they permit adequate comparisons with species from the Antarctic Peninsula and South America. The present paper attempts to provide a more detailed survey of the Cryptostigmata, and is based on extensive collections made in 1964 by P. J. Tilbrook of the British Antarctic Survey.

TAXONOMIC DESCRIPTIONS

Five of the 13 forms present in the collections are described below as new species or sub-species. One new genus is proposed. The remainder, with the exception of *Sandenia georgiae* (Oudms.), have been adequately described previously and are merely identified with comments on their distribution. *S. georgiae* is re-described.

FAMILY BRACHYCHTHONIIDAE

Three species belonging to this family are recorded, one of which, represented by a single damaged specimen, can be identified only to genus. The other two are identified with

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Liochthonius mollis (Hammer) and *Eobrachychthonius oudemansi* van der Hammen, respectively.

Liochthonius mollis (Hammer)

Syn. *Brachychthonius mollis* Hammer 1958

The species was first described from Argentina (Hammer, 1958). Three specimens from South Georgia are identified with it on the basis of similarities of body size, the position of a pale rounded area just anterior to each pseudostigma and the form of the rostral microsculpture, prodorsal and notogastral setae, and the sensillus. The specimens are identical with Hammer's description in all these respects.

Locality data. The three specimens were collected from *Acaena* at Hestesletten, South Georgia. Leg. P. J. Tilbrook, 1964.

Remarks. The species has been recorded only once from South America apparently, namely from the type locality in Argentina. South Georgia evidently does not mark the southern limit of the distribution of this form, however, for it has also been collected by the British Antarctic Survey from Deception Island in the South Shetland Islands.

Liochthonius sp.

One specimen belonging in this genus is badly damaged and cannot be identified to species. It does not appear to be conspecific with *L. mollis*, but it is similar to *L. lapponicus* (Trgdh.) in some respects.

Locality data. Collected from *Acaena* at Hestesletten, South Georgia. Leg. P. J. Tilbrook, 1964.

Eobrachychthonius oudemansi van der Hammen 1952

Syn. *Eobrachychthonius argentinensis* Hammer 1958

This species is readily recognized by the strongly developed dorsal setae, the pattern of pale areas on prodorsum and hysterosoma, the characteristic rostral microsculpture and the serrated form of the lateral margins of the prodorsum.

Locality data. Three specimens collected from *Acaena* at Hestesletten, South Georgia. Leg. P. J. Tilbrook, 1964.

Remarks. *E. oudemansi* was described from Europe. Evidently the species has a wide distribution for it has also been recorded from mainland Argentina (Hammer, 1958) and Tierra del Fuego (Hammer, 1962). It has not previously been recorded as far south as South Georgia.

FAMILY CAMISIIDAE

One representative of this family, a species belonging in the genus *Platynothrus*, is present in the collections. The species resembles *P. skottsbergii* Trgdh. in two important respects, namely in the possession of tridactylous tarsi and the separation of left and right halves of epimeres III and IV on the ventral region of the podosoma. However, the South Georgia specimens differ from *P. skottsbergii* in certain respects and it is considered that these are sufficient to warrant the creation of the new sub-species described below.

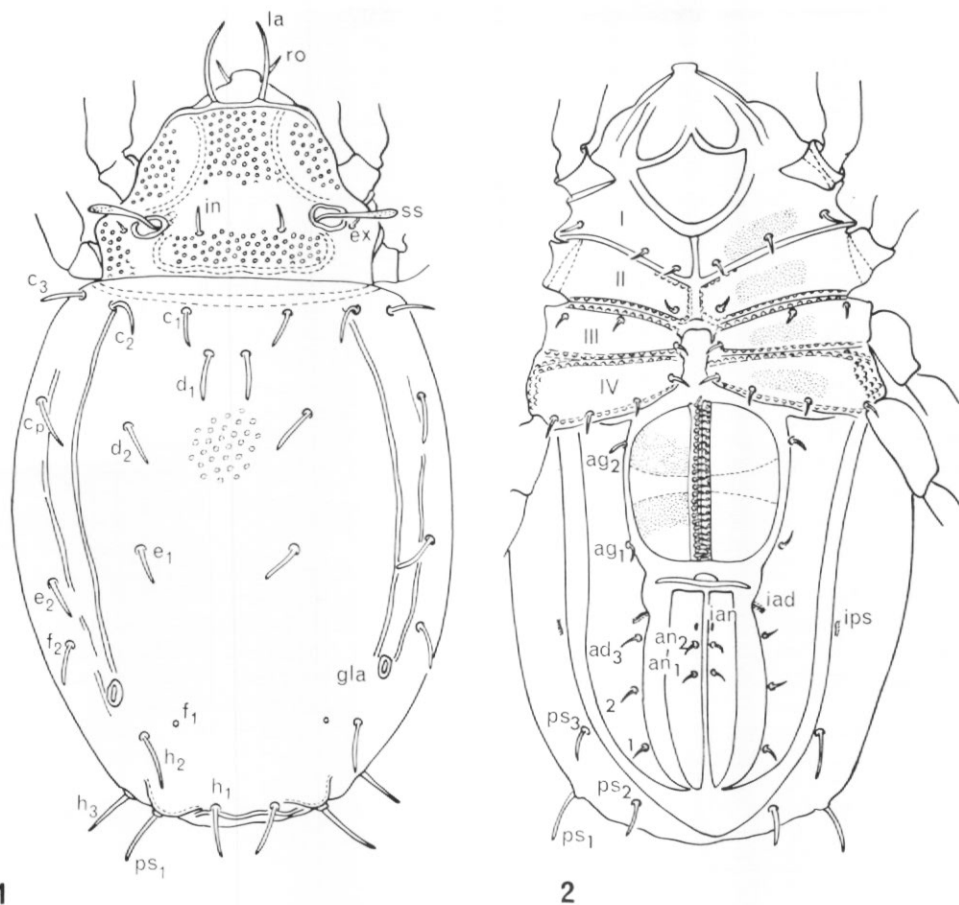
Platynothrus skottsbergii Trgdh. 1931 ssp. *expansus* n. ssp.

Figs. 1, 2

Material examined. Five adults.

Measurements. Average length of body: $1,119.2\mu$ (range: $1,048.6-1,144.9\mu$); average width of body (at widest part): 703.5μ (range: $674.1-749.0\mu$).

Integument. The cuticle is dark in colour in preserved specimens and requires some clearing before the chaetotaxy can be determined. The integumental microsculpture is of the pattern typical for the genus. The prodorsal sculpture consists of rounded, light-coloured pits, more or less regularly arranged, each having a diameter of about 5μ . The dorsal surface of the hysterosoma has a similar pattern but here the pits are less clearly defined. The coxisternal



Figs. 1 and 2. *Platynothrus skottsbergii* Trgdh. ssp. *expansus* n. ssp. Holotype. 1. Dorsal view. 2. Ventral view. la. lamellar seta; ro. rostral seta; in. interlamellar seta; ex. exopseudostigmatic seta; ss. sensillus; c₁, c₂, c₃, d₁, d₂, c₄, e₁, e₂, f₁, f₂, h₁, h₂, h₃, ps₁, ps₂, ps₃. notogastral setae; gla. aperture of lateral abdominal gland; I, II, III, IV. coxisternal fields; ag₁, ag₂. aggenital setae; ad₁, ad₂, ad₃. adanal setae; an₁, an₂. anal setae; ian. anal fissure; iad. adanal fissure; ips. hysterosomal fissure.

region of the podosoma is covered with fine refractive punctations. Rounded, dark-coloured tubercles are present along the coxisternal ridges and antiaxially on the coxisternal plates.

Prodorsum. Rostrum is constricted to form a rounded "nose" on which are located the insertions of the rostral setae. These setae are thickened, pale in colour, divergent and approximately as long as their mutual distance. Lamellar setae are inserted on apophyses located on a prominent transverse prodorsal ridge (Fig. 1). The setae are strongly thickened, minutely barbed, pale in colour, incurved, rather blunt apically, longer than their mutual distance and longer than the other prodorsal setae. Interlamellar setae are very difficult to detect, being very pale in colour, and located just median to each pseudostigma. The pseudostigma is a strongly chitinized cup with broad aperture. Sensillus has a slender stem which broadens gradually into a slightly thicker head carrying minute barbs. Exopseudostigmatic seta is short, inserted just lateral to each pseudostigma. The posterior region of the prodorsum has a transverse ridge of irregular contour which curves forwards in a semi-circle behind each pseudostigma.

Hysterosoma. Anterior border of notogaster is straight, lateral contours rounded, posterior

contour truncate. Two series of longitudinal ridges are evident, as shown in Fig. 1. Hysterosomal setae are similar in form to the prodorsals, being thickened, pale-coloured and blunt apically. Their distribution (Fig. 1) follows closely that of the nominate form, and characteristically setae d_1 are inserted closer together than are setae d_2 and e_1 . Setae f_1 are represented by a pair of small rounded alveoli. The posterior setae are inserted on short apophyses.

Ventral region. The aggenital plate is fused with the corresponding adanal plate, so that the genito-anal region is flanked by a pair of elongate sclerites, each of which bears, along its inner margin, the insertions of two aggenital setae (ag_1 and ag_2) and three adanal setae (ad_1 , ad_2 and ad_3) (Fig. 2). The adanal fissure is present (iad) and aligned obliquely. Anal plates are long and narrow, each with two setae (an_1 and an_2) and the anal fissure (ian) located along the inner margin. The pre-anal plate is seen as a darkly coloured transverse bar, in ventral view, separating the anal plates from the genitals. Genital plates are broadly rounded, each having an inner marginal zone in which are inserted about 25 short thickened setae, arranged in a longitudinal row down the plate. A broad light band crosses the genital field.

The right and left halves of coxisternal fields I and II are fused in the mid-line; those of fields III and IV are separated by an inverted U-shaped excavation (Fig. 2). Coxisternal chaetotaxy is normal, and is expressed by the formula: (3-1-3-4). All coxisternal setae are short, thickened and pale in colour.

Legs. The chaetotaxy of the legs was not examined in detail, except to ascertain that each tarsus terminates in three well-developed claws.

Locality data. Five adult specimens (two from *Sphagnum*, three from *Acaena*) were collected from Hestelletten, South Georgia. Several nymphs, believed to belong to this species, were taken from grass tussocks at this same locality. Leg. P. J. Tilbrook, 29 February 1964.

Remarks. The majority of species placed in the genus *Platynothrus* possess monodactylous tarsi, and thus may be separated readily from the form described above. Hammer (1958) has reported the tridactylous condition in two South American species, *P. skottsbergii* Trgdh. and *P. altimontanus* Hammer, two species rather similar to each other morphologically. As far as can be judged from a comparison between the specimens examined and the descriptions of Trägårdh (1931) and Hammer (1958), the form from South Georgia has much in common with *P. skottsbergii*, namely in body size, cuticular microsculpture, dorsal chaetotaxy, genital neotrichy, the separation of right and left halves of coxisternal fields III and IV, and the possession of tridactylous tarsi. It is proposed to identify the form from South Georgia with *P. skottsbergii*, on the basis of these similarities. It is of interest to note that this species, which was first described from the islands of Juan Fernandez, is widely distributed in South America, and apparently is common in the Punta Arenas and Puerto Natales regions of southern Chile (Hammer, 1962).

A detailed comparison with Hammer's description reveals some differences, however, between the specimens she examined and those from South Georgia. Thus Hammer described the hysterosomal setae as "thin, smooth spines", whereas these setae are thickened, almost digitiform, and minutely barbed in the specimens from South Georgia. Further, Hammer's specimens have 20-21 genital setae on each plate compared with 25 in the specimens from South Georgia. These differences are recognized in the creation of a new sub-species for the specimens from South Georgia, *P. skottsbergii* ssp. *expansus*, so named after the expanded form of prodorsal and hysterosomal setae.

FAMILY OPPIIDAE

The family is represented by two species in the collections, namely *Oppia crozetensis* (Richters) and *Globoppia intermedia* Hammer. Detailed descriptions of both are available in the literature.

Oppia crozetensis (Richters)

Syn. *Notaspis crozetensis* Richters 1908

? *Oppia magellanicus* Hammer 1962

The species is recognized by the form of the prodorsal ridges which consist of a pair of

lamellae joined anteriorly by a translamella of equal thickness, the clavate sensillus, mucronate rostrum and moderately long notogastral setae.

Locality data. Several specimens extracted from tussock base collected on the beach at Maiviken, South Georgia. Leg. P. J. Tilbrook, 1964.

Remarks. The species is apparently not uncommon in the sub-Antarctic, and it has been re-described from collections made on Macquarie Island (Wallwork, 1963). *Oppia magellanicus* Hammer, described from mainland southern Chile (Punta Arenas) and Tierra del Fuego, is probably conspecific. The species has not been recorded from the Antarctic Peninsula or the South Shetland Islands, and possibly South Georgia marks the southern limit of its distribution.

Globoppia intermedia Hammer

G. intermedia is the type species for the genus *Globoppia* and was first described from southern Chile. It is identified by the heterotrichous condition of the notogastral chaetotaxy. Notogastral setae *te*, *ms* and *r*₂ are very long and curved; setae *ta*, inserted on anterior margin of notogaster, are very short. Setae *ti*, *r*₁, *r*₃, *p*₁, *p*₂ and *p*₃ are intermediate in length between these two extremes. Setae *p*₁ are longer than *p*₂ and *p*₃, and approximately the same length as *ti* which curve strongly away from the body and appear foreshortened in dorsal view. Hammer (1962) described the sensillus as having an almost globular head, and this appears so in dorsal view. In lateral view, the head is quite elongate and rather slender. This species is also characterized by a transverse prodorsal chitinization just anterior to the insertion of the lamellar setae. This transverse thickening marks the location of a groove which crosses the prodorsum in this region.

Locality data. Several specimens extracted from tussock base collected on the beach at Maiviken, South Georgia. Leg. P. J. Tilbrook, 1964.

Remarks. Three South American species belonging to this genus, namely *G. intermedia*, *G. minor* and *G. major* (see Hammer, 1962), together with *G. gressitti* Wallwork from Campbell Island, differ from each other principally in body size and length of dorsal setae. Evidently the four species are closely related. *G. intermedia* has not been recorded from the Antarctic Peninsula or the South Shetland Islands, but it has been identified from Candlemas Island in the South Sandwich Islands group, a locality which may mark the southern limit of this species' distribution.

FAMILY PODACARIDAE

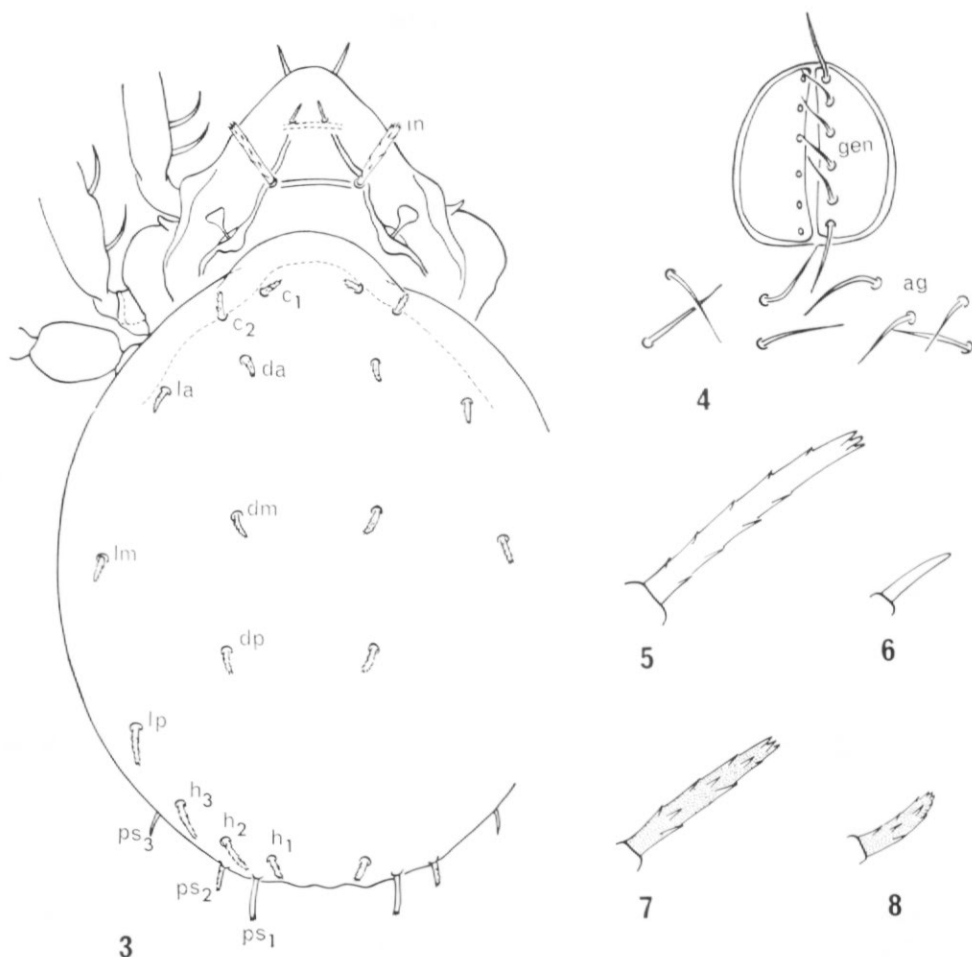
This family of mites is known principally from the sub-Antarctic and maritime Antarctic. Its distribution is circum-polar, and it is represented in such widely separated localities as the Antarctic Peninsula, Adelaide Island, South Shetland Islands, South Orkney Islands, South Sandwich Islands, South Georgia, Îles de Kerguelen, Heard Island, Prince Edward Islands, Îles Crozet, Macquarie Island and Campbell Island. It is of interest to note that the family has not been recorded from South America, up to the present time.

Two species, *Alaskozetes antarcticus* (Mich.) and *Halozetes belgicae* (Mich.), have been recorded previously from South Georgia (Trägårdh, 1908).* The collections of the British Antarctic Survey also contain two species belonging in this family, namely *H. belgicae* and *Podacarus auberti* Grndj. *P. auberti* was described from Îles de Kerguelen (Grandjean, 1955), and it has been recorded hitherto only from the eastern part of the sub-Antarctic (Îles de Kerguelen, Heard and Macquarie Islands). *P. auberti* from South Georgia differs in some respects from its eastern relative, and these differences are recognized in the creation of a new sub-species, *P. auberti* ssp. *occidentalis*, which is described below.

Podacarus auberti Grndj. ssp. *occidentalis* n. ssp.
Figs. 3-8

A complete description of this form is not necessary, for it has many characteristics in common with the nominate form described by Grandjean (1955). It is proposed to restrict

* This record of *A. antarcticus* is probably erroneous. It occurs in a "synopsis of distribution" provided by Trägårdh (1908). However, the text of this paper clearly indicates that this record should refer to a locality in Gerlache Strait and not to South Georgia.



Figs. 3-8. *Podacarus auberti* Grndj. ssp. *occidentalis* n. ssp. 3. Holotype, female, dorsal view. 4. Allotype, male, genital region. 5. Notogastral seta ps_1 . 6. Notogastral seta ps_3 . 7. Notogastral seta h_2 . 8. Notogastral seta h_1 . da , dm , dp . centro-dorsal notogastral setae; la , lm , lp . latero-dorsal notogastral setae; gen . genital plate; ag . aggenital setae; other notations as in Figs. 1 and 2.

the present account to a record of the differences between the two forms, for the purposes of identification.

Material examined. 13 adults.

Measurements. The body sizes of the specimens fall within the wide limits given for the nominate form (body length of males: 1,100-1,300 μ ; body length of females: 1,160-1,400 μ).

Dorsal region. An important character by means of which the western form may be recognized is the length of the interlamellar setae (setae *in*, Fig. 3). These are strongly thickened, apically blunt and barbed, approximately two-thirds as long as their mutual distance, with little variation in their length in the specimens examined. In the nominate form these setae are extremely variable in length and may be lacking entirely. When present and developed in a normal manner they apparently do not achieve a length greater than half their mutual distance in the nominate form. Notogastral setae are distributed as in the nominate form, but their appearance shows a departure from that described by Grandjean (1955). The anterior setae (c_1 and c_2), the centro-dorsals (da , dm and dp), the latero-dorsals (la , lm and lp) and setae h_1 , h_2 and h_3 are strongly thickened, barbed and dark in colour (Figs. 3, 7 and 8);

setae h_2 and h_3 are longer than h_1 and the centro-dorsals; setae h_1 are as long as setae c_1 and c_2 . Setae ps_1 , ps_2 and ps_3 are inserted on the posterior contour of the notogaster; setae ps_3 are short, spiniform and not markedly barbed (Fig. 6); setae ps_2 are slightly more strongly developed than ps_3 , and setae ps_1 are very much more so (Fig. 5). This pattern of dorsal chaetotaxy applies to adults of both sexes.

Ventral region. As in the nominate form, adult males differ from females in possessing a greater number of aggenital setae (i.e. aggenital neotrichy). Aggenital neotrichy is expressed in adult males of the nominate form by the duplication or, at most, the triplication of the aggenital seta. In the sub-species *occidentalis* there are frequently as many as four pairs of aggenital setae (Fig. 4), indicating a stronger degree of neotrichy than in the nominate form. These setae are usually long, dark in colour and barbed, with fine tips in the form from South Georgia. Genital setae are similar in form and length to the aggenitals and they appear to be relatively longer than in the nominate form.

Locality data. All the specimens examined were extracted from tussock (*Poa flabellata*) base collected on the beach at Maiviken, South Georgia. Leg. P. J. Tilbrook, 26 February 1964.

Remarks. The occurrence of a western form of a species, which has been regarded to date as an eastern sub-Antarctic form, is of special interest. Two other members of the Podacaridae, *Alaskozetes antarcticus* and *Halozetes belgicae*, are similarly distributed. Further, in both of these species, as in *P. auberti*, the western form differs from the eastern form in having relatively longer interlamellar setae and stronger aggenital neotrichy in adult males. Subspeciation in these three related genera has evidently occurred along parallel lines of morphological differentiation.

Halozetes belgicae (Mich.)

Syn. *Notaspis Belgicae* Michael 1903

Halozetes belgicae (Mich.); Berlese 1916

Pertogunia Belgicae (Mich.); Dalenius and Wilson 1958

This species, which has been re-described recently (Wallwork, 1965), is much smaller in body size than *A. antarcticus* and *P. auberti*, and can be distinguished readily on this basis from these other western representatives of the family. Aggenital neotrichy is strongly developed in adult males, the number of setae varying from five to nine on each side. Only one specimen, an adult female, is present in the collections examined, and this differs from the nominate form in having a larger than average body size, shorter lamellar setae and shorter notogastral setae c_3 , ps_1 , ps_2 and ps_3 .

Locality data. The single specimen was collected on South Georgia by P. J. Tilbrook in 1964.

Remarks. The distribution of the species in the western maritime Antarctic is well documented. It has been found frequently in samples from the Antarctic Peninsula and the South Shetland Islands, and it has recently been identified in collections made by the British Antarctic Survey on the South Sandwich Islands, the South Orkney Islands and Adelaide Island. Usually *H. belgicae* is found in association with *Alaskozetes antarcticus*, and the distribution of these two species extends farther south than that of other members of the family, according to the records presently available.

FAMILY CERATOZETIDAE

Members of this family form a much more conspicuous element of the acarine fauna of South Georgia than they do in the maritime Antarctic regions farther south. Two of the four species present can be identified closely with South American relatives. The other two species are new, and one of them evidently represents a new genus, described below under the name *Scotiazetes* n. gen., with *S. bidens* n. gen., n. sp. as the type. A definition of the genus is given after the description of the type species.

Scotiazetes bidens n. gen. n. sp.

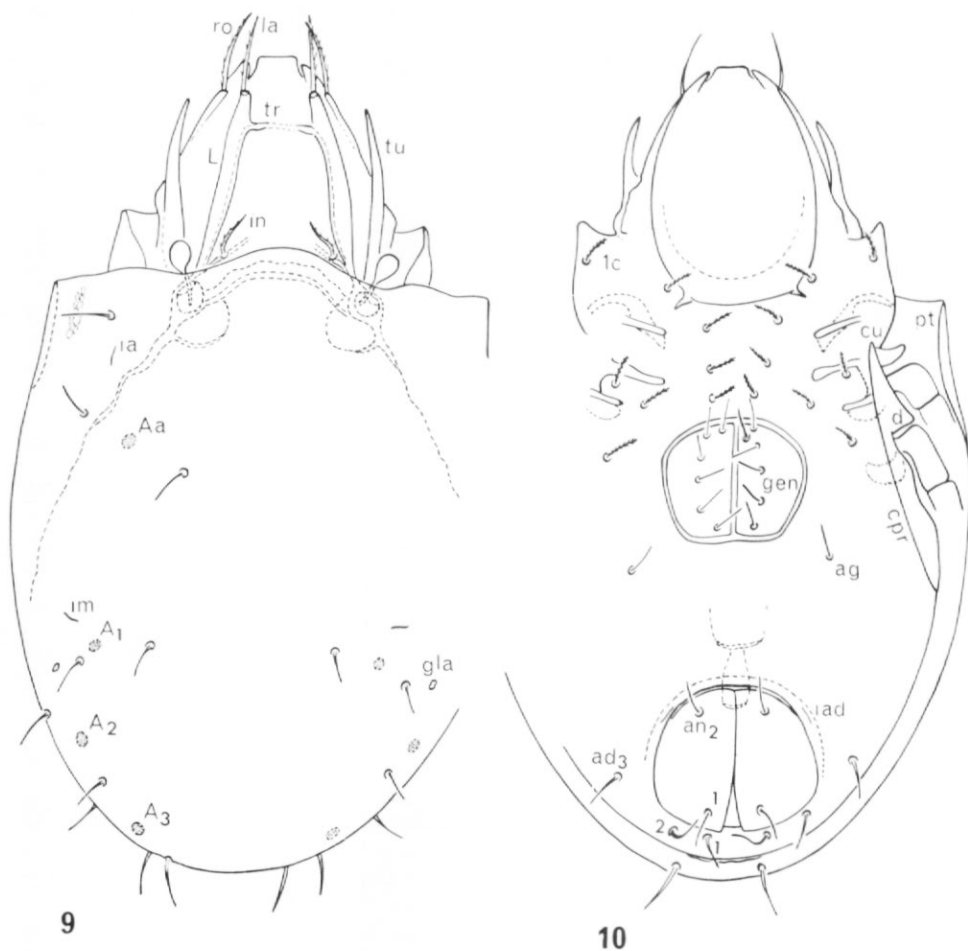
Figs. 9-12

Material examined. Eight adults.

Measurements. Average length of body: 432.1μ (range: 414.4 – 448.0μ); average width of body (at widest part): 270.7μ (range: 246.4 – 313.6μ).

Integument. Brown in colour, generally smooth. A few pale rounded areas are present on anterior region of pteromorphs in some specimens.

Prodorsum. Rostrum has two incisions which separate a lateral tooth on each side from the central lobe. Lateral teeth are rather broad, not sharply pointed; central lobe curves ventrad, sub-triangular in shape, with truncate anterior margin. Rostral setae are shorter than their mutual distance, finely barbed, slightly curved and extending beyond the anterior limit of the rostrum for a distance approximately equal to one-third of their length; each seta is inserted rather far back on the rostrum at the apex of a rostral ridge which runs back along the lateral contour of the prodorsum for a short distance. The lamellae are long, extending from the pseudostigmata for almost the entire length of the prodorsum, almost parallel for most of their length. These ridges are in the form of blades which project freely away from the surface of the prodorsum in a dorso-lateral plane (Figs. 9 and 11). Anteriorly each lamella projects antero-dorsad away from the surface of the prodorsum as a free lamellar



Figs. 9 and 10. *Scotiazetes bidens* n. gen., n. sp. Holotype. 9. Dorsal view. 10. Ventral view. *L.* lamella; *tr.* translamella; *tu.* tutorium; *ia.*, *im.* notogastral fissures; *Aa*, *A1*, *A2*, *A3*. notogastral areas porosae; *1c.* coxisternal seta; *pt.* pteromorph; *cu.* custodium; *d.* discidium; *cpr.* circum-pedal ridge; other notations as in Figs. 1–8.

cuspid which is approximately one-quarter as long as the attached portion of the lamella. The lamellar cuspid is as broad as the lamella, rounded anteriorly, with the insertion of the lamellar seta borne at its apex. Lamellar seta is as long as the rostrals, and similar in form, curving ventrad over the rostrum. A translamella is developed to varying degrees in the specimens examined. This transverse ridge is always very narrow, and it does not project above the surface of the prodorsum as a free blade. In five specimens it is represented by medially directed chitinizations, originating at the base of each lamellar cuspid, which do not form a complete transverse bar; in the other specimens the translamella is complete. Interlamellar setae are similar in form and length to the lamellars and rostrals in seven specimens, rather longer than these in the eighth. Each interlamellar seta is inserted on an interlamellar ridge, which originates as an antero-medially directed offshoot of the lamellar ridge; the setae are located just anterior to the rim of the notogaster. Each pseudostigma is completely covered by the tectal extension of the notogastral margin. The sensillus has a short stem, which is also covered, and a relatively large globular head, which is exposed.

Notogaster. The anterior margin is produced into a tectum which covers the posterior part of the prodorsum, and forms a connecting "bridge" between the two pteromorphs; this tectum is arched forwards and extends to the level of the insertions of the interlamellar setae. Pteromorphs are well developed and strongly curved ventrad; they are fixed, i.e. there is no basal hinge. There are ten pairs of moderately long, barbed notogastral setae, distributed as shown in Fig. 9, and four pairs of dark-coloured, circular areolae porosae. Fissures *ia*, *im* and the aperture of the lateral abdominal gland may be identified in dorsal view, in their normal positions.

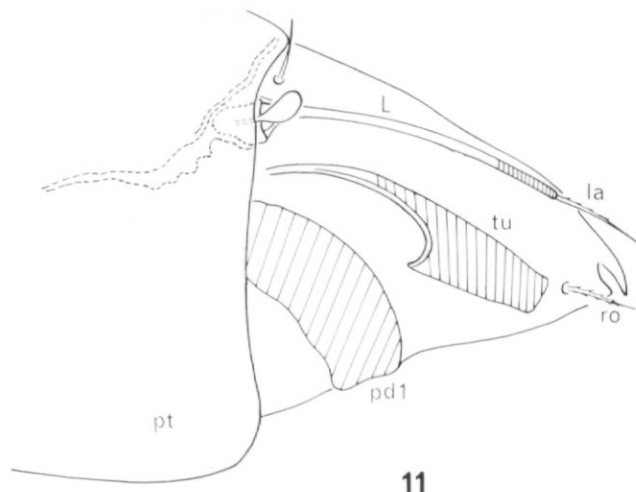
Ventral region. The ventral characters are typically those associated with the family. Coxisternal apodemes do not extend to the mid-line, and there is no conspicuous sternal ridge. Coxisternal setae are moderately long, dark-coloured and clearly barbed. Genital aperture is trapezoidal in shape, rather broader anteriorly than posteriorly. Each genital plate bears six straight roughened setae arranged, in most cases, in a longitudinal row down the plate; occasionally the two setae anteriorly are inserted side by side on the anterior margin of the plate. Aggenital setae (one pair) are similar in form to the genitals. Chaetotaxy of the anal region is normal, the adanal and anal setae being rather longer than the genitals. Adanal fissure is a moderately long slit lying close to and parallel with the antero-lateral rim of the anal aperture. These details are shown in Fig. 10.

Lateral region of podosoma. The tutorium is well developed on each side of the prodorsum and, in dorsal view, it projects for some distance beyond the lateral contour of this region as a tooth-like protuberance (Fig. 9). When viewed from the lateral aspect (Fig. 11), the tutorium is seen to consist of a posterior portion in the form of a narrow ridge, closely applied to the lateral surface of the prodorsum, and an anterior portion which is greatly expanded and blade-like, projecting away from the surface of the propodosoma as a cuspid with a truncate anterior margin. Pedotectum I is large, and it curves upwards around the insertion of leg I which it embraces like a sleeve; coxisternal seta *lc* is inserted on the ventral face of this pedotectum. Pedotectum II is also developed. The discidium is broad and triangular in shape, and is produced forwards where it joins the circum-pedal ridge to form a custodial point lying across the base of pedotectum II.

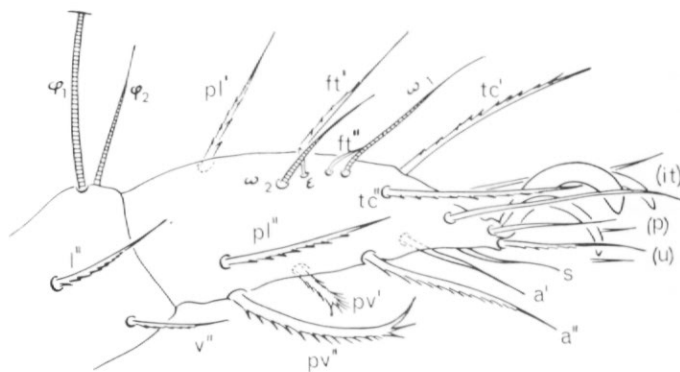
Legs. Ventral crests are not strongly developed on the femora. Cuticle of femora III and IV has a microsculpture of striae. Tarsus and tibia are broadly joined to each other on all legs. Tarsal chaetotaxy is normal (Fig. 12) and there are no additional lateral tarsal setae. Seta *ft'* on tarsus I is short, curved and in juxtaposition to solenidion ω_1 ; the paraxial primiventral seta on this tarsus (*pv'*) is shorter and more strongly barbed than its antiaxial counterpart. On tarsus II both primiventrals are short and strongly pectinate. Setae (*p*) and *s* are eupathidial on tarsus I. All tarsi are tridactyle, the central claw being more strongly developed than the two laterals, which are devoid of subsidiary teeth.

Locality data. All specimens examined were collected on South Georgia by P. J. Tilbrook, 29 March 1964.

Remarks. The family Ceratozetidae contains a relatively large number of poorly defined genera. Despite the obvious ceratozetid features of the present species, it is not possible to assign this to any of these genera with certainty. The presence of a notogastral tectum,



11



12

Figs. 11 and 12. *Scotiazetes bidens* n. gen., n. sp. Holotype. 11. Lateral view of propodosoma. 12. Tarsus I, antiaxial. *pd1*. pedotectum I; notations for tarsal chaetotaxy follow Grandjean's scheme; other notations as in Figs. 9 and 10.

which covers the posterior region of the prodorsum and which forms an anterior "bridge" between the pteromorphs, is a feature frequently associated with the related family Mycobatidae. However, the form and position of the prodorsal lamellae are reminiscent of ceratozetid genera (cf. *Fuscozetes* and *Melanozetes*). Accordingly the new genus, *Scotiazetes*, is placed tentatively in the Ceratozetidae and is defined by the following list of characters:

- i. Rostrum with two incisions, demarcating a pair of lateral teeth from the central lobe which is truncate anteriorly.
- ii. Prodorsal lamellae are long, extending for almost the full length of the prodorsum, sub-parallel, with narrow complete or incomplete translamella. Lamellar cusps present, one-quarter as long as lamella proper, bearing insertions of lamellar setae at apices.
- iii. Tutorium well developed with projecting cusp.

- iv. Notogastral tectum developed, covering posterior part of prodorsum and pseudostigmata, and forming an anterior connecting "bridge" between the pteromorphs.
- v. Pteromorphs deeply curved ventrad, not hinged.
- vi. Ten pairs of moderately long notogastral setae.
- vii. Four pairs of circular areae porosae, on notogaster.
- viii. Pedotecta I and II present; discidium well developed, joining circum-pedal ridge in a custodial point.
- ix. Six pairs of genital setae.
- x. All tarsi tridactyle, heterodactyle; tarsal chaetotaxy of the normal ceratozetid type.

Little can be said, at this stage, about the distribution of *Scotiazetes bidens*. It is not closely related to other members of the Ceratozetidae found on South Georgia (see below), nor can it be linked closely with representatives of this family recorded from South America. However, the family is relatively common in the latter region, which still remains to be investigated fully, and it is not improbable that close relatives of *S. bidens* may be present in the South American fauna.

Edwardzetes elongatus n. sp.

Figs. 13-14

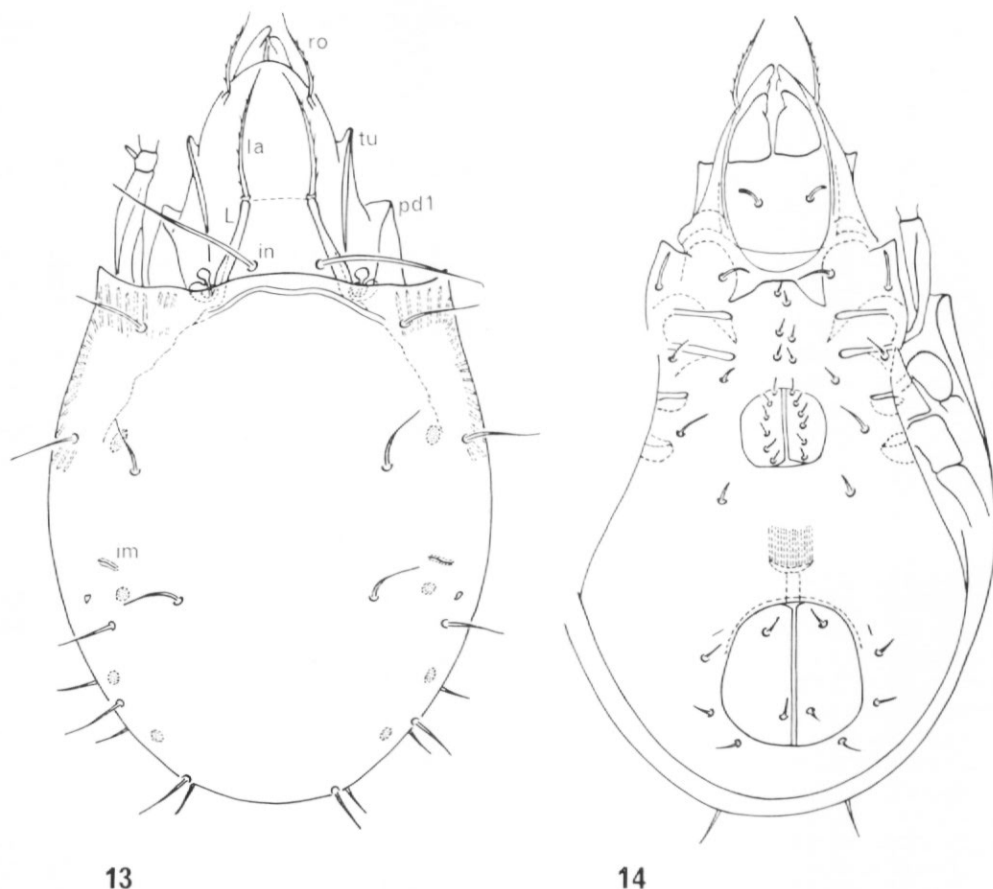
Material examined. 25 adults.

Measurements. Average length of body: 898.2μ (range: $834.6-941.6\mu$); average width of body (at widest part): 550.7μ (range: $524.3-588.5\mu$). The specimens examined show some variation in size and form. The appearance is usually elongate, although some specimens are more strongly rounded than others. This is reflected in the rather wide range of measurements given above.

Integument. Colour of body and legs is brown. The surface is generally smooth. In some specimens, brown spot markings, irregularly arranged, are present on the anterior half of the notogaster.

Prodorsum. Rostrum rounded; rostral setae inserted laterally, dark in colour, finely barbed, slightly incurved, approximately as long as their mutual distance. The lamellae are rather short, more or less straight, slightly convergent, with an anterior portion which is flattened and closely applied to the surface of the prodorsum and a posterior portion which is in the form of a vertically aligned blade projecting upwards away from the prodorsum. There is no free lamellar cusp, and the only trace of a translamella is an extremely fine line joining the lamellar apices. A lamellar seta is inserted at the apex of each lamella, and this insertion extends down into the cuticle below the apex. The lamellar setae are long, spine-like structures, finely barbed, slightly curved, extending forwards over prodorsum almost as far as the anterior margin of the rostrum. A tutorium is well developed on each side of the prodorsum, and it is a bract-like structure embracing the lateral contour of the prodorsum; it extends posteriorly to the level of the pseudostigma where it curves sharply ventrad. Interlamellar setae are inserted in the interpseudostigmatic region, just anterior to the dorso-sejugal suture; these setae are similar to the other prodorsal setae but rather longer than the lamellars. Each pseudostigma is partly covered by anterior margin of notogaster, cup-shaped and rather small. The sensillus has a very short stem and a roughened, clavate head. Pedotectum I is very large, developed in a manner similar to that of the tutorium, but more pronounced than the latter, embracing the insertion of leg I like a large sleeve. These details are shown in Fig. 13.

Notogaster. The dorsal shield is rather longer than broad, in most specimens, giving the body an elongate appearance from which the species takes its name. The cuticle covering this region is generally smooth, except over the pteromorphs where a pattern of radiating striae is evident (Fig. 13). Ten pairs of notogastral setae are moderately long, dark-coloured, apparently smooth and terminating in fine tips. Their distribution follows the usual pattern. There are four pairs of rounded areae porosae. Fissure *im* is evident as a short dark-coloured slit. The pteromorphs are broad, deeply curved ventrad, enclosing the proximal parts of legs II-IV.



Figs. 13 and 14. *Edwardzetes elongatus* n. sp. Holotype. 13. Dorsal view. 14. Ventral view. Notations as in Figs. 9-12.

Ventral region. All ventral setae are relatively short, dark-coloured, smooth spines. Their distribution on the coxisternal region follows that commonly found in the family Ceratozetidae, although the lateral setae 3c and 4c were not identified. Development of coxisternal ridges and apodemes is normal; there is no conspicuous sternal ridge. Genital aperture is rounded, and each genital plate bears six spine-like setae, arranged in longitudinal row. Other features of the ventral region are shown in Fig. 14; these are normal in all respects. On the ventro-lateral region a heavy discidium is developed between the insertions of legs III and IV. A circum-pedal ridge, terminating anteriorly in a weak custodial point, is also present.

Legs. All tarsi are tridactyle, with dark-coloured claws of which the central one is more heavily developed than the two laterals. The lateral claws do not bear subsidiary teeth. Ventral crests are present on femora I and II and genu I and II as tooth-like projections, and on femora III and IV as blade-like ridges. Leg setae are dark-coloured, generally simple in form, except for the antiaxial seta on genu II which is modified into a short thick spine.

Locality data. All the specimens were collected on South Georgia by P. J. Tilbrook, 29 March 1964.

Remarks. The present species has been identified with the genus *Edwardzetes* on account of the form of the lamellae, the absence of lamellar cusps, the location of the insertion of the lamellar seta, the form of the tutorium and pedotectum I and the notogastral chaetotaxy.

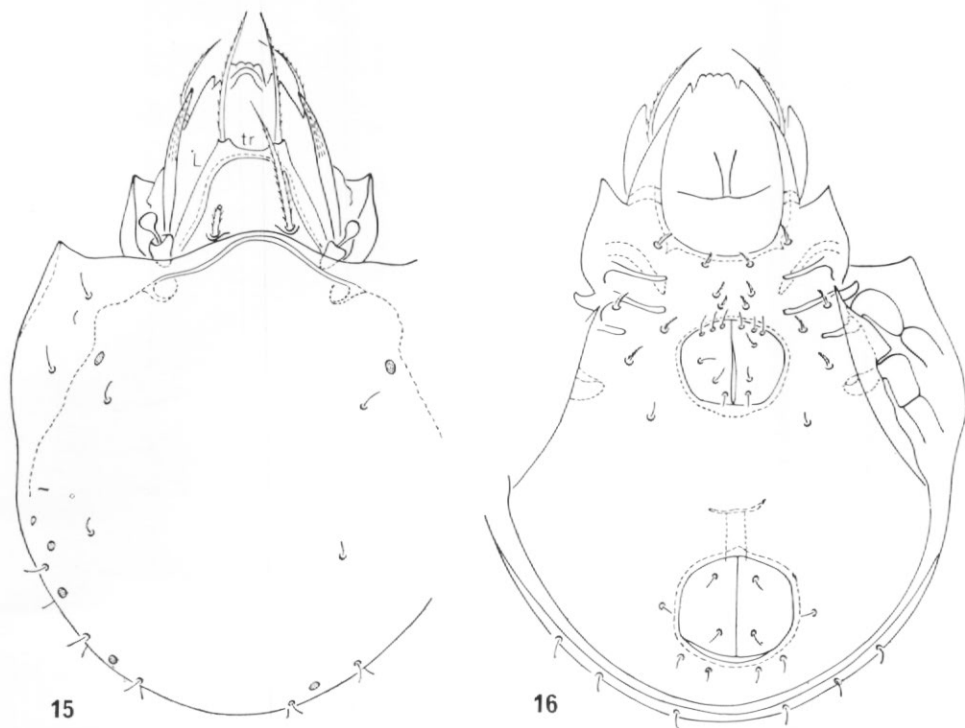
The genus is apparently not a common one, but it is of interest to note that it has been recorded from South America on several occasions. Hammer (1958) described *E. andicola* from Argentina and Bolivia. *E. elongatus* differs from the South American species in that it is larger, has a different pattern of notogastral microsculpture, a larger number of genital setae (*E. andicola* has five per plate), shorter ventral setae and a shorter antiaxial spine on genu II. *E. dentifer* Hammer 1962 resembles *E. andicola* in many respects, but it possesses a short spine on genu II, as does *E. elongatus*. Thus *E. elongatus* and *E. dentifer* may be more closely related than *E. elongatus* and *E. andicola*. It is of interest to note that *E. dentifer* has been recorded from mainland southern Chile, Tierra del Fuego and Argentine Patagonia. One specimen collected by the British Antarctic Survey on Candlemas Island in the South Sandwich Islands group has also been identified with *E. dentifer*. A comparison between this specimen and those described above from South Georgia confirms the differences discussed above. Thus the brown spot markings on the anterior half of the notogaster are much more strongly developed in *E. dentifer* than in *E. elongatus*; the notogastral setae are short, thread-like and less conspicuous in *E. dentifer* than in *E. elongatus*. From this it may be concluded that *E. elongatus* and *E. dentifer* have several features in common, and may be related, but that they are clearly distinct morphologically and evidently not conspecific.

Porozetes polygonalis Hammer ssp. *quadrilobatus* n. ssp.
Figs. 15-18

Material examined. Eight adults.

Measurements. Average length of body: 485.8μ (range: 476.0 – 492.8μ); average width of body (at widest part): 355.6μ (range: 347.2 – 364.0μ).

The genus *Porozetes* was described from South America (Hammer, 1962) and to the present



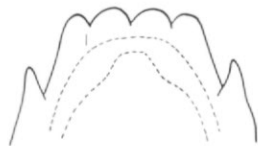
Figs. 15 and 16. *Porozetes polygonalis* Hammer ssp. *quadrilobatus* n. ssp. 15. Dorsal view. 16. Ventral view. Notations as in Figs. 9 and 10.

date it contains two species, namely *P. chavinensis* (Hammer, 1962) from Peru and *P. polygonalis* Hammer 1962 from Tierra del Fuego. The two species appear to be similar in several respects, but they may be distinguished by the form of the rostrum and the degree of development of the translamella. The specimens from South Georgia show a closer resemblance to *P. polygonalis* than to *P. chavinensis* and are considered as a sub-species of the former which differs from the nominate form in the following ways:

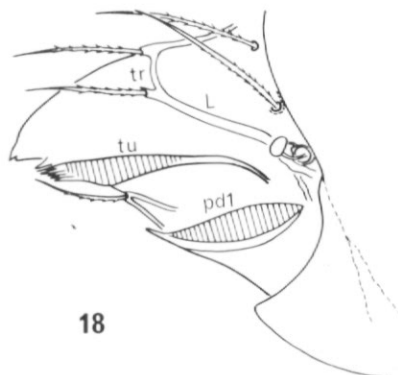
- i. The rostrum consists of a central lobe flanked by a pair of teeth, as in the nominate form but, whereas this central lobe is rounded anteriorly in this form, it bears four small, but well-defined, rounded subsidiary lobes in *P. polygonalis* ssp. *quadrilobatus* (Figs. 15 and 17), a character reflected in the sub-species name.
- ii. The translamella consists of a vertical blade attached basally to the prodorsum from which it projects. This freely projecting blade is apparently lacking in the nominate form, although it may be present in *P. chavinensis*.
- iii. The areae porosae dorso-sejugales are much less distinct than in the nominate form.
- iv. The leading edge of the pteromorph has a much more strongly developed concave contour than in the nominate form; *P. polygonalis quadrilobatus* resembles *P. chavinensis* in this respect.

Locality data. All specimens were collected on South Georgia by P. J. Tilbrook, 1964.

Remarks. It is evident from the above comparisons that the forms from Peru, Tierra del Fuego and South Georgia are closely related morphologically. Unfortunately the descriptions of the South American species are based on single specimens, so that it is impossible at present to assess the range of variation within the species. The exact taxonomic status of the three forms can only be determined when more collections are available. Undoubtedly the form from South Georgia has affinities with the South American forms, and this locality is the southernmost limit of the distribution of *Porozetes* so far recorded.



17



18

Figs. 17 and 18. *Porozetes polygonalis* Hammer ssp. *quadrilobatus* n. ssp. 17. Rostrum, dorsal view. 18. Lateral region of propodosoma. Notations as in Figs. 9-12.

Magellozetes antarcticus (Mich.)

Syn. *Oribata antarctica* Michael 1895

Ceratozetes antarctica (Mich.); Dalenius and Wilson 1958.

This species, which has been re-described recently (Wallwork, 1965), was originally described from South Georgia (Michael, 1895). It is characterized by the unusual form of the rostral tectum which has a broad, rounded, median lobe flanked by a pair of teeth, and by the broad, free lamellar cusp on the prodorsum.

Locality data. *M. antarcticus* is present in samples collected by the British Antarctic Survey from two localities on South Georgia, namely Maiviken (*ex Poa flabellata* tussock base on beach) and Grytviken (*ex* rock and moss above reservoir). Leg. P. J. Tilbrook, 1964.

Remarks. The distribution pattern of this species, as far as it is known, indicates that it is more tolerant of sub-Antarctic and maritime Antarctic conditions than other ceratozetids. The species has been recorded previously from the Antarctic Peninsula (Wallwork, 1965), and it is also present in the British Antarctic Survey collections from Adelaide Island, farther south. *M. processus* Hammer 1962, described from southern Chile, is closely related to, if not conspecific with, *M. antarcticus*. The affinities of this species are evidently with the South American fauna.

FAMILY PARAKALUMMIDAE

South Georgia is the type locality for a galumnoid mite first described by Oudemans (1914) as *Galumna georgiae* and later assigned to a new genus (Oudemans, 1917) under the name *Sandenia georgiae*. The affinities of this genus have long been in doubt, for it differs in a number of ways from other galumnids. The collections of the British Antarctic Survey from South Georgia afford the opportunity to re-examine this position, for they contain specimens which can be identified with *S. georgiae*. For the moment the genus is regarded as monotypical and is assigned to the family Parakalummidae. The reasons for this are discussed after the re-description given below.

Sandenia georgiae (Oudms. 1914)

Figs. 19–21

Syn. *Galumna georgiae* Oudms. 1914

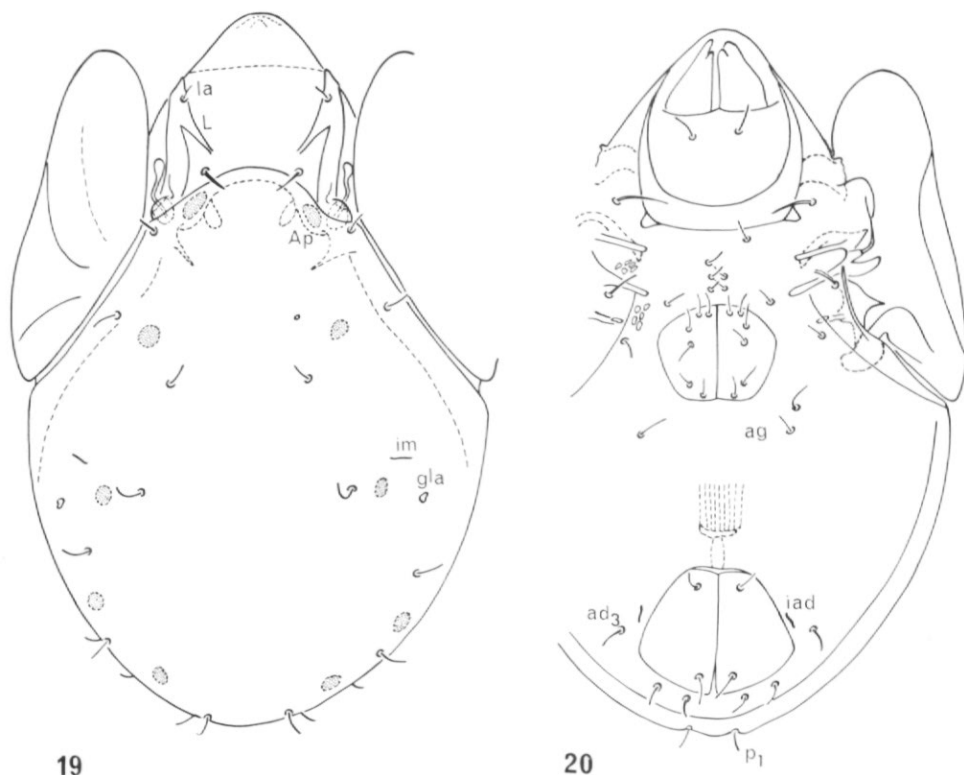
Material examined. Four adults.

Measurements. Average length of body: 552.1μ (range: 545.2 – 560.0μ); average width of body (at widest part): 348.8μ (range: 347.2 – 352.8μ).

Prodorsum. Rostrum broadly rounded, with hyaline margin; rostral setae not visible in dorsal view, being inserted laterally (Fig. 21). These setae are relatively long, barbed, curved, closely applied to lateral margin of rostrum. The lamellae are most characteristic, each consisting of a pair of chitinated ridges which become confluent in a flattened cusp closely applied to the lateral surface of the prodorsum. Figs. 19 and 21 show dorsal and lateral views respectively of these ridges. Lamellar setae are short and fine, inserted on median margin of lamella at the level of the base of the cusp. A fine transverse line runs across the prodorsum just anterior to the apices of the lamellar cusps, but it does not connect them (Fig. 21). The cuticle covering the prodorsum anterior to this line is darker in colour than the remainder. Interlamellar setae are inserted near posterior margin of prodorsum; these setae are rather longer than the lamellars, curved mediad, with surface roughened or finely barbed. Each pseudostigma is situated on the external arm of the lamella and is covered only basally by the anterior rim of the notogaster; it is cup-shaped and flares into a broad aperture directed antero-laterally (Fig. 21). Sensillus has a strongly elbowed stem and a small club-shaped head covered with short bristles. Median to each pseudostigma is a large ovoid dorso-sejugal porose area covered by the notogastral tectum.

Notogaster. Anterior margin of this dorsal shield is produced into an arched tectum covering the dorso-sejugal area. Postero-lateral contour is rounded in dorsal view, and the posterior margin has a pair of indentations marking the locations of the insertions of notogastral setae p_1 ; these indentations are not visible in dorsal view owing to the curvature of the dorsal shield, but they can be seen in ventral view (Fig. 20). In lateral view the notogaster is only moderately arched. Pteromorphs have the normal galumnoid form, being broadly hinged to the notogaster, rounded anteriorly, deeply curved ventrad, with a notch in the ventral edge. All notogastral setae (ten pairs) are inserted on the notogaster proper, i.e. pteromorphs do not carry any setae; these setae are fine, inserted as shown in Fig. 19. Four pairs of rounded notogastral porose areas are present, clearly defined, brown in colour and distributed as shown in Fig. 19. The fissure *im* and the aperture of the lateral abdominal gland are in the usual positions.

Ventral region. Details of this region are shown in Fig. 20. Anal aperture is trapezoidal, being considerably narrower and more rounded anteriorly than posteriorly. Two pairs of



Figs. 19 and 20. *Sandenia georgiae* (Oudms.). 19. Dorsal view. 20. Ventral view. *Ap.* dorso-sejugal porose area; *p₁*, notogastral seta; other notations as in Figs. 1–10.

adanal setae are inserted posterior to the anal aperture, the third pair (*ad₃*) is inserted posterolateral to the adanal fissure. Adanal fissure is a slit, located lateral to the anal aperture on each side, aligned parallel with long axis of the body. Aggenital setae are slender, inserted postero-lateral to genital aperture; typically one pair of these setae is present, but one specimen has an additional seta present on one side, a condition illustrated on the right side of Fig. 20. Each genital plate carries six slender setae, two of which are inserted on the anterior margin. The integument covering the coxisternal region is weakly fenestrated in the apodemal fields, smooth over the sternal region. The apodemes are developed in the usual way. There is some variation in the insertion pattern of the most anterior pair of coxisternal setae (Fig. 20).

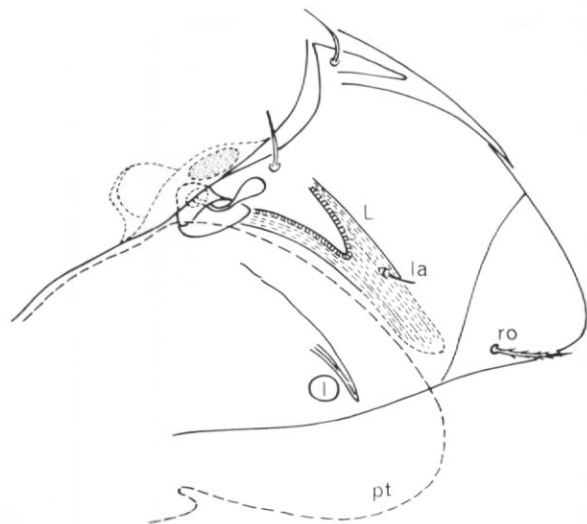
Lateral region of podosoma. The biramous form of the prodorsal lamella can be seen clearly in lateral view. The lamellar cusp anterior to the insertion of the lamellar seta is a very thin, weakly chitinized, flattened blade. Below the lamella, there is a narrow ridge, running more or less parallel with it, terminating just anterior to the insertion of leg I. Pedotecta I and II are well developed, as is the sharply pointed discidium. A circum-pedal ridge is present, extending forwards to the level of the ventro-sejugal apodeme on each side.

Gnathosoma. The hypostome is normal, not prolonged anteriorly as a large tectum. Labiogenal articulation is complete and diarthral. Rutellum has a pantelebasic expansion.

Legs. The chaetotaxy was not studied in detail. All tarsi terminate in three well-developed claws of approximately equal size.

Locality data. The specimens were collected from rock and moss above the reservoir, Grytviken, South Georgia, by P. J. Tilbrook, 29 February 1964.

Remarks. A comparison between the specimens described above and the description by Oudemans (1917) reveals few points of difference. Oudemans has stated that the rostral



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Fig. 21. *Sandenia georgiae* (Oudms.). Lateral region of propodosoma, with pteromorph removed (indicated by broken line). I. insertion of leg I; other notations as in Figs. 1-10.

and lamellar setae are lacking, and that there are seven pairs of notogastral setae and five pairs of genital setae. Rostral and lamellar setae are difficult to see in dorsal view, as are the three pairs posteriorly on the notogaster, and may have been overlooked. On the other hand, the specimens examined in the present work are clearly identifiable with *S. georgiae* in the distinctive form of the prodorsal lamellae, the form of the pteromorphs and the characteristics of the pseudostigmatic region.

Sandenia has obvious galumnoid features, but it differs from members of the family Galumnidae in the normal development of the hypostome which forms the ventral wall of the camerostome. The hypostome is prolonged forwards as a tectum covering, almost entirely, the maxillary elements, in the Galumnidae. Furthermore, the prodorsal ridges are absent or reduced to chitinized lines, without cusps, in the Galumnidae. In the Parakalummidae the lamella is in the form of a thickened ridge, terminating in a cusp which bears the insertion of the lamellar seta. The biramous condition of the lamella in *Sandenia* is a departure from the conditions typical of the Galumnidae and Parakalummidae, but it may be more closely identified with the condition in the latter family than with that in the former in view of the presence of a definite ridge and cusp. Taken as a whole, the genus *Sandenia* shows a mixture of galumnid and parakalumnid features. The presence of six genital setae on each plate and the well-developed notogastral areolae porosae are characteristic of the Galumnidae. The form of the hypostome, the restriction of notogastral setae to the notogaster proper, and the form of the lamellae are indicative of the Parakalummidae. Greater importance is attached to these parakalumnid features because they have greater morphological stability. The galumnid characters noted above are relatively unstable and may show variations even within species populations. Accordingly, it is proposed that the genus *Sandenia* be included in the family Parakalummidae for the time being. It may be necessary, subsequently, to separate this genus off in a family of its own, but a thorough investigation of the family Parakalummidae must be undertaken before this can be done with any degree of confidence.

In a previous paper (Wallwork, 1963) the species *Sandenia rotunda* was described from Macquarie Island. This species conforms with the general characters of the Parakalummidae, and resembles *S. georgiae* in the character of the notogastral chaetotaxy. It differs from the latter, however, in having an unbranched, linear lamella, similar in form to that found in

the genus *Neoribates*. In view of the considerable taxonomic significance attached to the form of the prodorsal lamella in this family (Jacot, 1929), it is difficult to sustain the position of this species in the genus *Sandenia*. It is equally difficult to assign it to the genus *Neoribates*, as presently conceived, for it possesses well-developed notogastral areae porosae, indented pteromorphs and has the most anterior pair of adanal setae inserted postero-lateral to the adanal fissure; these characters are not usually associated with *Neoribates*. It is proposed, therefore, to create a new genus within the family Parakalummidae, namely *Porokalumma* n. gen. with the new combination *P. rotunda* (Wallwork) as type. This genus has many of the usual parakalummid characters, particularly in the prodorsal region, but it differs from other genera in the family by having four pairs of well-developed notogastral areae porosae, indented pteromorphs and the most anterior pair of adanal setae (*ad*₃) located postero-lateral to the adanal fissure.

This re-classification of the species from Macquarie Island leaves only one species, the type, in the genus *Sandenia*, at the present time. *S. georgiae* has been recorded only from South Georgia, as far as can be ascertained, but much of the South American and sub-Antarctic regions remains to be investigated before its endemism can be confirmed.

DISCUSSION

The systematic account presented above gives some idea of the characteristics of the cryptostigmatid fauna of South Georgia. The collections examined contain many more species than have been recorded previously from this locality, and in this respect may provide a more representative picture of the fauna than has hitherto been possible. Thus 13 species are listed above, compared with only four previously (Dalenius and Wilson, 1958). Of the four species previously listed only one, *Magellozetes antarcticus*, can be identified with certainty with material collected by the British Antarctic Survey. The remainder consist of two separate records of a galumnoid mite (Michael, 1895; Trägårdh, 1908), which may correspond to *Sandenia georgiae*, and a record of *Alaskozetes antarcticus* which, as noted above, must be considered as very doubtful. *A. antarcticus* is not present in the collections examined in this work, which were evidently more comprehensive than those made previously.

It would be premature to undertake a detailed evaluation of the Cryptostigmata of South Georgia at present, in view of the lack of information on the species composition of the fauna of adjacent regions, such as South America. However, several points emerge from the above account, and these may be stated briefly.

In the first instance, endemism is apparently low at the generic level (one new genus), and only a little higher at specific and sub-specific levels. Secondly, an appreciable South American element is present in the fauna, represented by the species *Liochthonius mollis*, *Eobrachychthonius oudemansi*, *Platynothrus skottsbergii*, *Oppia crozetensis*, *Globoppia intermedia*, *Porozetes polygonalis* and *Magellozetes antarcticus*. Of these, only *L. mollis*, *O. crozetensis* and *M. antarcticus* have been recorded farther south than South Georgia. *L. mollis* and *M. antarcticus* are present in collections from the South Shetland Islands and the latter species has also been collected on Adelaide Island. *O. crozetensis* occurs on Macquarie Island in the eastern sub-Antarctic, but it has not been recorded farther south than this. These distribution patterns may be interpreted in terms of differences in the degree of penetration of South American forms into the sub-Antarctic, but it must be borne in mind that some of these South American forms may have been introduced accidentally in recent times through human agencies. The third component of the fauna is the sub-Antarctic and maritime Antarctic element represented by *Halozetes belgicae* and *Podacarus auberti*. *H. belgicae* has been recorded frequently from the western part of the maritime Antarctic, and it occurs as far south as Adelaide Island. *P. auberti* has not been recorded previously from the western region, but apparently it is widely distributed in the eastern sub-Antarctic. These two species, together with another podacarid, *Alaskozetes antarcticus*, have a circum-Antarctic distribution pattern and have distinct western and eastern sub-species. These members of the Podacaridae have not been recorded from South America, and they appear to be very largely restricted to the sub-Antarctic and maritime Antarctic regions.

TABLE I. GEOGRAPHICAL DISTRIBUTION OF SPECIES OF CRYPTOSTIGMATA
FOUND ON SOUTH GEORGIA

Species	Localities					
	South Georgia	South America	South Sandwich Islands	South Orkney Islands	Antarctic Peninsula	Macquarie Island
<i>Eobrachychthonius oudemansi</i>	+	+	—	—	—	—
<i>Platynothrus skottsbergii</i>	+	+	—	—	—	—
<i>Porozetes polygonalis</i>	+	+	—	—	—	—
<i>Globoppia intermedia</i>	+	+	+	—	—	—
<i>Liochthonius mollis</i>	+	+	—	—	+	—
<i>Magellozetes antarcticus</i>	+	+	—	—	+	—
<i>Oppia crozetensis</i>	+	+	—	—	—	+
<i>Halozetes belgicae</i>	+	—	+	+	+	+
<i>Podacarus auberti</i>	+	—	—	—	—	+
<i>Edwardzetes elongatus</i>	+	—	?	—	—	—
<i>Scotiazetes bidens</i>	+	—	—	—	—	—
<i>Sandenia georgiae</i>	+	—	—	—	—	—

Thus, a tentative analysis of the Cryptostigmata of South Georgia indicates three components, namely a small endemic element, a relatively large South American element and a small sub-Antarctic and maritime Antarctic element. These various elements are indicated in Table I. An analysis of the Cryptostigmata of Macquarie Island (see Wallwork, 1963) reveals a somewhat similar faunal structure, with endemic, Australasian and sub-Antarctic elements. In contrast to the fauna of South Georgia, that of Macquarie Island appears to be richer in numbers of species and is characterized by a better representation of sub-Antarctic forms. There also appears to be a higher degree of endemism on Macquarie Island but, as the fauna of other islands in this region is little known, this cannot be confirmed as yet.

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