

# Prostigmatid mites (Acari, Prostigmata) from Sverdrupfjella, Dronning Maud Land, with description of four new species

RUSSELL W. STRANDTMANN & LAURITZ SØMME

Strandtmann, R. W. & Sømme, L. 1977. Prostigmatid mites (Acari, Prostigmata) from Sverdrupfjella, Dronning Maud Land, with description of four new species. *Norw. J. Ent.* 24, 137-146.

Four new species, and one previously described, of terrestrial prostigmatid mites were collected in Sverdrupfjella, Dronning Maud Land, Antarctica during the austral summer of 1970/71. The following species are described as new: *Eupodes angardi*, *Eupodes winsnesi*, *Nanorchestes brekkerista*, and *Nanorchestes bellus*.

R. W. Strandtmann, Dept. of Biological Sciences, Texas Tech. University, Box 4149 Lubbock, Texas 79409, U.S.A.

L. Sømme, Zoological Institute, University of Oslo, Box 1050 Blindern, Oslo 3, Norway.

The Sverdrupfjella mountain range in Dronning Maud Land is situated at about 72° to 73°S and from 0°30'W to 1°30'E (Fig. 1). The range consists of a large number of peaks or nunataks, some of them reaching an elevation of more than 2500 m a.s.l. The Sverdrupfjella was visited by the Norwegian Antarctic Expedition 1970-71 (Winsnes 1972). During this expedition several samples of collembolans and mites were collected by Mr. J. Angar. A report on the collection of Collembolans will be published later, while the present paper gives an account of the prostigmatid mites in the samples.

The terrestrial arthropod fauna of Dronning Maud Land is poorly investigated. Only one oribatid mite is known from the area (Dalenius & Wilson 1957), and previously no collembolans have been found. Four species of prostigmatid mites were collected at Heimefrontfjella by personnel from the British Antarctic Survey (Bowra et al. 1966). These included *Nanorchestes antarcticus* Strandtmann, which is widespread in Antarctica (Strandtmann 1967), *Tydeus erebus* Strandtmann,

which has also been found in East Antarctica, as well as two previously undescribed species *Nanorchestes bifurcatus* Strandtmann and *Eupodes tottanfjella* Strandtmann.

The mites for the present study were collected from the underside of stones with an aspirator and preserved in alcohol. They were stored at the Norwegian Polar Research Institute until cleared and identified by one of the authors (Strandtmann).

The holotypes and paratypes of the new species are deposited in the Zoological Museum, University of Oslo, Norway. The number of specimens recorded are not always the total number collected. Some specimens remain in alcohol, and are deposited at the Zoological Museum University of Oslo. For holotypes and paratypes the numbers given in brackets refer to the original number of the sample.

Genus *EUPODES* C. L. Koch, 1835

Small, soft-bodied, slender-legged herbivorous mites. All body setae with short cilia. Femora IV generally greatly swollen.

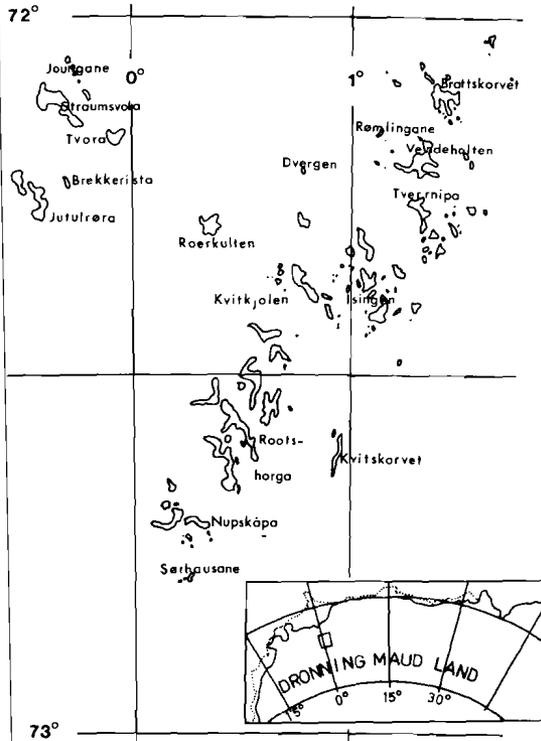


Fig. 1. Map of Sverdrupfjella, and their position in Dronning Maud Land, Antarctica.

*Eupodes angardi* sp. novo. (Figs. 2 a-1).

A medium sized *Eupodes*, approximately 0.5 mm long, with short, slender setae. Legs relatively short, legs I no longer than the body. Femur IV not swollen.

**Female** (Figs. 2a,b). Length 500 to 600  $\mu$ . **Dorsum** (Fig. 2a). Without ornamentation or obvious striations. Optical pigment not evident in preserved specimens. Suture between pro and metapodasoma not obvious. Dorsal setae filiform, finely ciliated, relatively short. Trichobothria slender, sparsely ciliated. Average lengths of dorsal setae in microns: v.i.-22, v.e.-30, sc.-35, tr.-60, h.i.-44, h.e.-44, d<sub>1</sub>-45, d<sub>2</sub>-48, l.i.-52, s.i.-50, s.e.-50. **Venter** (Fig. 2b). Coxal setae 3-1-4-3, slightly enlarged apically but not truly clavate; somewhat more coarsely ciliated than dorsals. All the coxal setae of about equal length (ca 30  $\mu$ ) except the outer apical seta of coxa I, which is only half as long. **Genitalia**. Genital setae, 6 + 6 (occasionally 6 + 7 or 7 + 7), paragenital setae 5 + 5. Two pairs of genital knobs and

several pairs of internal (or eugenital) setae. **Anal pore** terminal. Anal seta 1 about 1/3 as long (15  $\mu$ ) as anal seta 2 (44  $\mu$ ). Anal seta 3, 50  $\mu$  and inserted on dorsal side. **Gnathosoma**. Hypostome conical, with 2 pairs small, ciliated setae; one pair apical, the other basilateral, typical of the genus. Chelicera with small shears, the movable digit stronger, and the fixed digit weak, typical of the genus. Cheliceral seta nude. Pedipalpal setae 0-2-3-8. (The pedipalpal tibiotarsus has either 8 or 9 setae. They are difficult to distinguish). **Legs**. (Figs. 2 e-1). Slender and shorter than the body. Leg I from 440 to 500  $\mu$ . Femur IV not enlarged. Tarsal claws basally ciliated. Tarsi I and II each with 2, tandem, rhagidial organs subtended by a stellate seta on tarsus I and a spine on tarsus II (see Figs. 2e, f). Tibia I has a small dorsoapical rhagidial organ with apical spine, tibia II with a dorsoapical r.o. without the spine. A solenidion on the dorsobasal aspect of tibiae I-IV and genera I-III. The solenidia are prominent in the male but are difficult to find in the female. The normal leg setae are filiform, ciliated, and of moderate length. Tarsi III and IV each with a single dorsobasal seta, tarsi I and II with paired dorsobasal setae.

**Male**. Length 450 to 580  $\mu$ . Differs from the female only in the genitalia (Fig. 2c) and in having more prominent solenidia (tibia I-IV and genera I-III, Figs. 2i-1). The genital covers are slightly smaller than in the female and the eugenital setae more tightly clustered. The sperm sac about as long as the genital covers and typically clavate. The genital setae of 6 + 6 are arranged 5 in a row and one more lateral, on each cover. In one male, one cover has 2 lateral setae making the count 6 + 7. Another male has 2 lateral setae on each cover, 7 + 7.

**Deutonymph**. One specimen, somewhat crushed. Approximate length, 375  $\mu$ . Dorsal setae ca. 30  $\mu$ . Genital setae 2 + 2, paragenital setae 2 + 2. Coxal formula 3-1-4-2, trochanters 1-1-1-0. Rhagidial organs on tarsi I and II as in the adult.

**Holotype**. Female. Brattskarvet, Sverdrupfjella, Dronning Maud Land, Antarctica, 8 Jan. 1971 (No. 20). Collected on north-facing slope, breeding grounds for snow petrels, 1600 m a.s.l.

**Paratypes**. 8 ♀♀, 6 ♂♂, 1 deutonymph. Same locality as holotype.

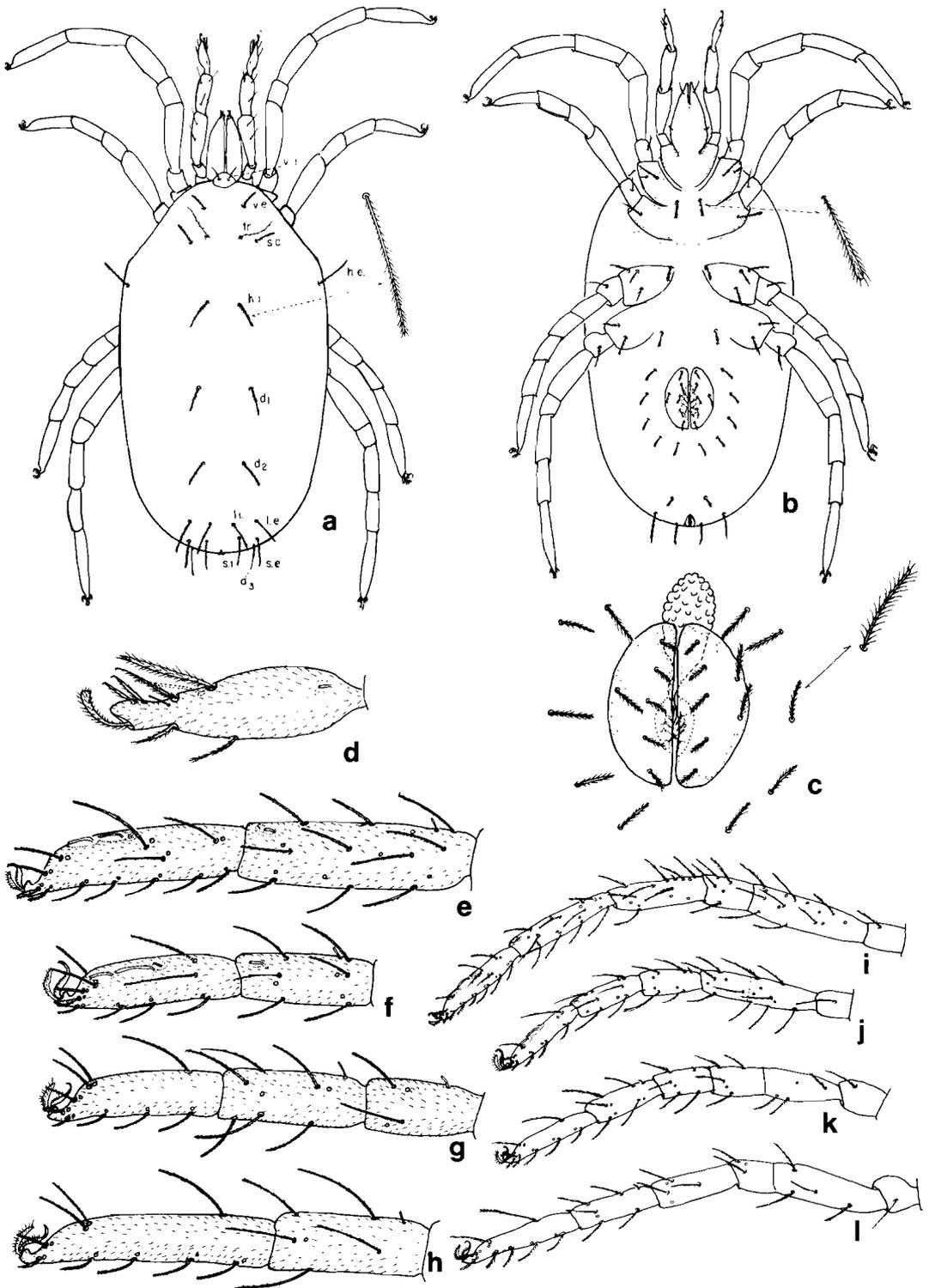


Fig. 2. *Eupodes angardi* sp. novo. a. dorsum; b. venter of female. c. male genitalia, d. tibiotarsus of pedipalp, e. tarsus and tibia of leg I, f. tarsus and tibia of leg II, g. tarsus, tibia and genu of leg III, h. tarsus and tibia of leg IV, i, j, k and l. side view of legs I to IV respectively. Abbreviations: as, anal seta; d<sub>1</sub> and d<sub>2</sub>, first and second dorsal setae; h.e., humeralis externa; h.i., humeralis interna; l.e., lumbar externa; l.i., lumbar interna; sc., scapularis; s.e., sacral externa; s.i., sacral interna; tr., trichobothrium; v.e., verticalis externa; v.i., verticalis interna.

*Type locality.* Queen Maud Land, Antarctica, Brattskarvet.

*Remarks.* This species differs from all others of the genus by the combination of short legs, short dorsal setae, and slender femora IV.

It is named after J. Angard, the collector of these specimens.

One might question whether this species is truly a *Eupodes* but there is no other place to put it without drawing the limits of *Eupodes* too fine to be meaningful.

*Eupodes winsnesi* sp. novo. (Figs. 3a-h).

A medium-large mite, about 0.5 millimeters long, with long legs and long dorsal setae. Legs I about 0.7 mm long; femur of leg IV slightly swollen. Suture between pro and metapodium evident.

*Female.* (Figs. 3a-b). Length. 485-525  $\mu$ . Leg I, 640-690  $\mu$ . *Dorsum* (Fig. 3a). No obvious ornamentations or striations. Optic pigment not apparent in preserved specimens. Transverse suture apparent but not pronounced. Setae filiform, finely ciliated. Opisthosomal setae very long, overlapping bases of succeeding setae. Setae l.i. shorter and noticeably more slender than l.e. Trichobotrium slender, sparsely ciliated. Average lengths of the dorsal setae: V.I.-30, v.e.-50, s.c.-45, tr.-75, h.i.-125, h.e.-80, d<sub>1</sub>-130, d<sub>2</sub>-140, l.i.-95, l.e.-115, s.i.-115, s.e.-90, setae a<sub>3</sub>-90. *Venter* (Fig. 3b). Coxal setae 3-1-4-3; trochanters 1-1-1-1. All the coxal setae narrowly clavate; the trochantal setae filiform and longer. Genital setae 6 + 6, of which one pair is lateral to the other 5 pairs. Paragenital setae 5 + 5. All ventral setae finely ciliated but more coarsely so than the dorsals. Anal pore terminal; setae a<sub>1</sub>-25  $\mu$  and ventral, a<sub>2</sub>-65  $\mu$  and terminal, a<sub>3</sub>-90  $\mu$  and dorsal. *Gnathosoma.* With no unusual features. *Legs* (Figs. 3e-h). Long and slender. Leg I approximately 700  $\mu$ , leg IV about 550  $\mu$ . Setae long, mostly filiform, finely ciliated. Some of the ventral setae slightly enlarged apically. Femur IV slightly but noticeably swollen. Tarsi I and II each with 2 tandem rhagidiforms, subtended by a stellate seta in I and a spine in II. Tibia I with a small spine-and-rhagidiform combination anteriorly; tibia II with the rhagidiform only. Small solenidia basally on tibiae I-IV and mediobasally on genua

Table I. Leg Chaetotaxy of 3 species of *Eupodes*

Leg	ta.	<i>winsnesi</i> n.sp.		
		ti.	gen.	fem.
I	22	20-23	20	28-30
II	16	9	6-7	16
III	17	9	5	9
IV	15	6	5	7
<i>angardi</i> n.sp.				
I	22-24	17	12-13	20
II	16	9	7	15
III	15	8	5	9
IV	15	6	5	7
<i>tottanfjella</i> Strandmann				
I	22	16	15	20
II	16	9	7	15
III	15	8	4	9
IV	15	7	5	7

I-III but they are difficult to find in the female. In the male they are more obvious.

*Male.* Length 470-500; leg I 655-720. Similar to the female except a trifle smaller, legs a bit longer, and the dorsal setae a few microns shorter. The solenidia of tibia I-IV and genua I-III small but more easily found than in the female. Sperm sac relatively short (Fig. 3c).

*Tritonymph.* 370-400  $\mu$  long. Coxal setae 3-1-4-3; trochantal setae 1-1-1-1; genital setae 3 + 3; paragenitals 4 + 4. Setae d<sub>1</sub> and d<sub>2</sub> from 80 to 100  $\mu$ .

*Holotype.* Female. Brattskarvet, Sverdrupfjella, Dronning Maud Land, Antarctica 8 Jan. 1971 (No. 20). Collected on north-facing slope, breeding grounds for snow petrels, 1600 m a.s.l.

*Paratypes.* 9 ♀♀, 14 ♂♂, 7 tritonymphs, all from Sverdrupfjella, Dronning Maud Land, as follows: Brekkerista 29 Jan. 1971, scree facing north, 1150 m a.s.l. (No. 1), 1 ♀, 2 ♂♂, 5 Ny III. Brekkerista 24 Jan. 1971, in vegetation of moss and lichens, facing north, 1150

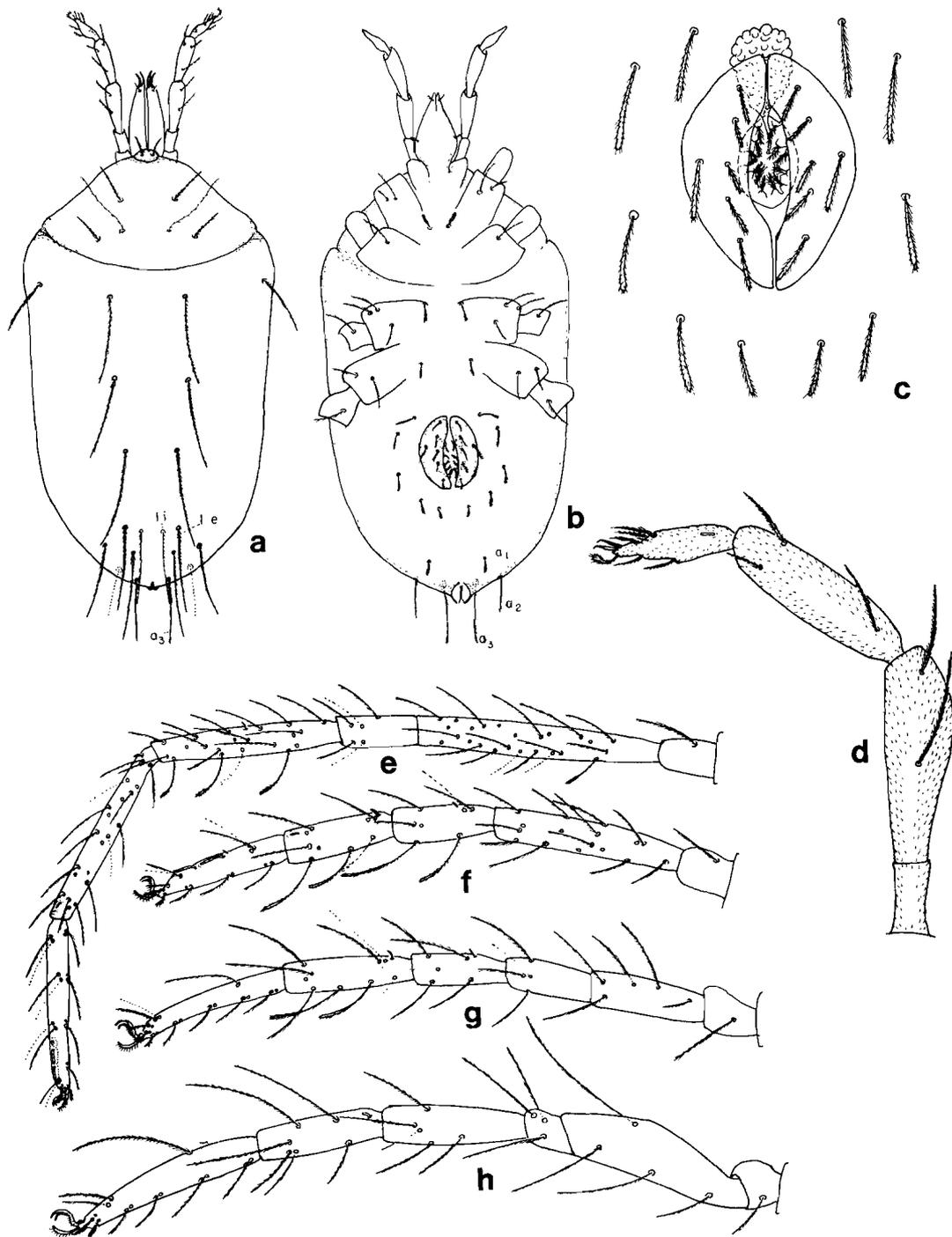


Fig. 3. *Eupodes winsnesi* sp. novo, a. dorsum, b. venter of female, c. male genitalia, d. dorsolateral view of left pedipalp, e, f, g and h. side views of legs I to IV respectively. Abbreviations: a<sub>1</sub>, a<sub>2</sub>, a<sub>3</sub>, anal setae; l.e., lumbar externa; l.i., lumbar interna.

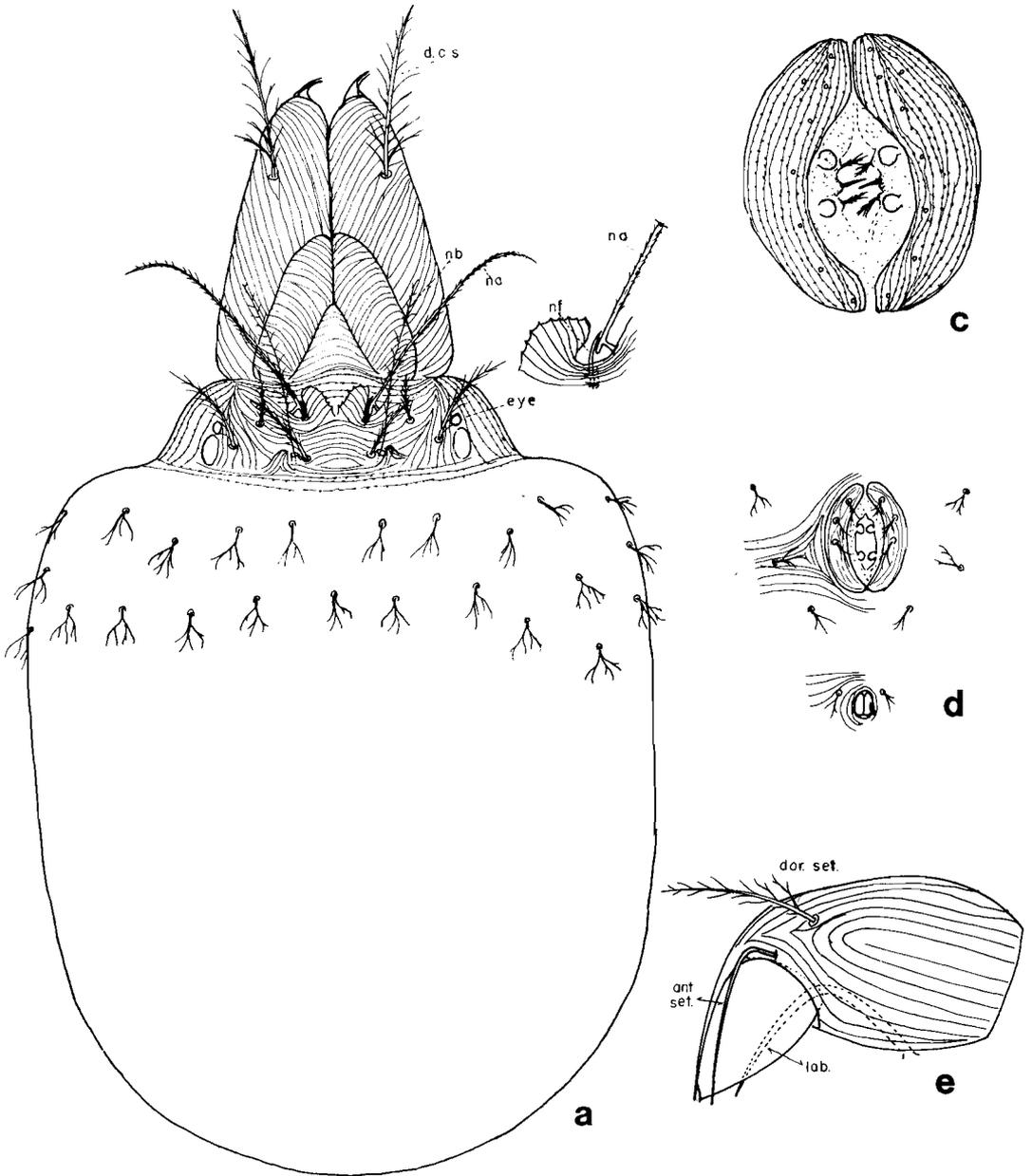
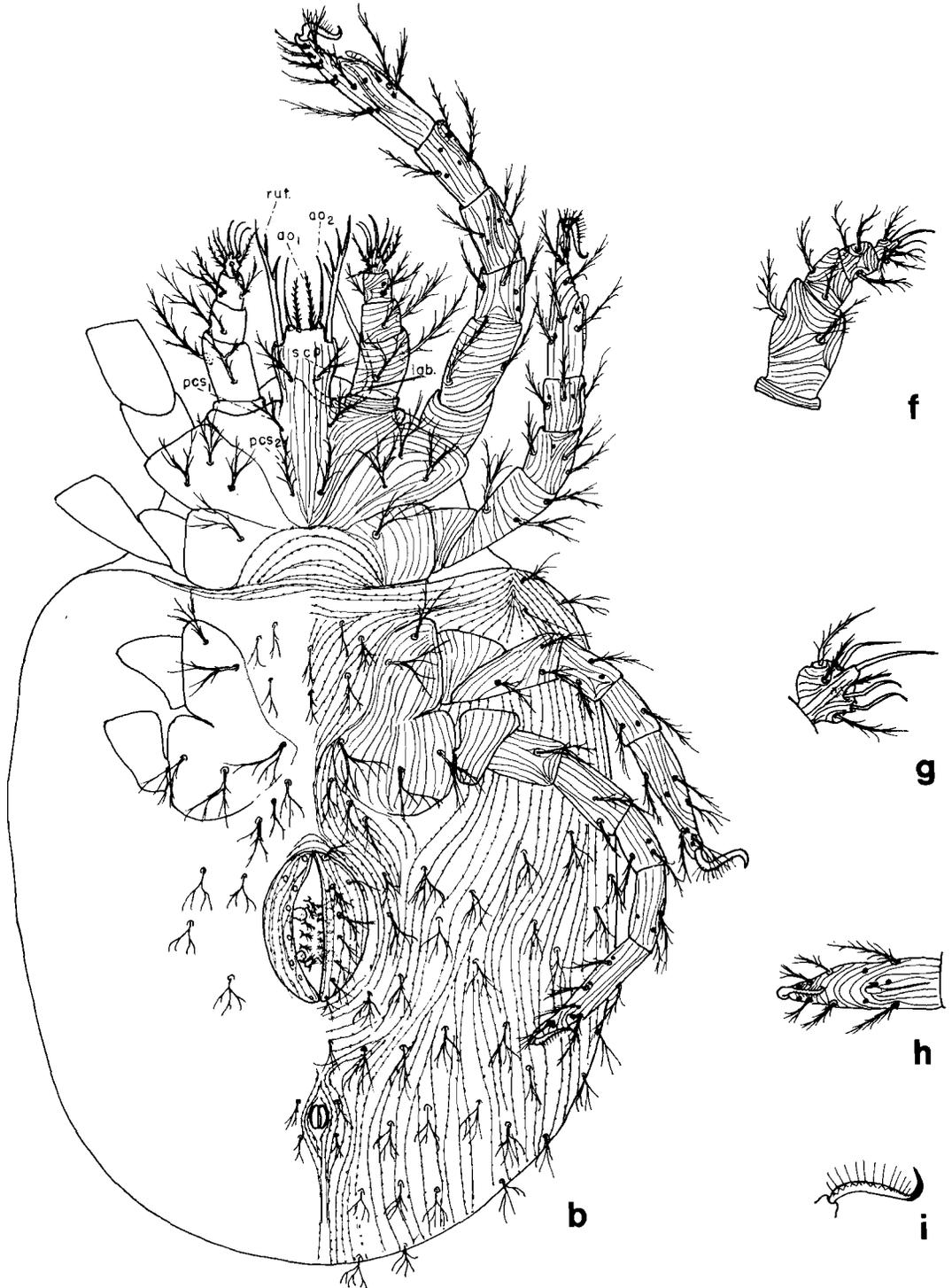


Fig. 4. *Nanorchestes brekkerista* sp. novo. a. dorsum with an enlarged view of the anterior sensory complex and part of the nazo, b. venter of male, c. female genitalia with the external genital setae omitted, d. genital and anal pores of the deutonymph, e. side view of chelicera, f. pedipalpus, g. tarsus of pedipalp, h. dorsal view of tarsus II, i. empodial claw of leg. Abbreviations: ao<sub>1</sub>, ao<sub>2</sub>, adoral setae; ant. set., anterior cheliceral seta; d.c.s.; dorsal cheliceral seta; dor. set., same as d.c.s.; lab., labrum; na, trigger seta for anterior sensilla; nb, posterior sensilla; nf, anterior sensilla; pcs<sub>1</sub>, pcs<sub>2</sub>, first and second pedipalpal coxal setae; rut., rutellum; scp, subcapitular seta.



m a.s.l. (No. 32), 9 ♂♂, 1 ♀. Tvora 25 Dec. 1970, north-facing slope, 1500 m a.s.l. (No. 7) 1 ♂. Straumsvola 21 Dec. 1970, scree facing north, 850 m a.s.l. (No. 3), 6 ♀♀, 1 Ny III. Straumsvola 21 Dec. 1970, scree facing north, 880 m a.s.l. (No. 5), 1 ♀, 2 ♂♂. Vendeholten 4 Jan. 1971, scree NW side, 1600 m a.s.l. (No. 14), 1 Ny III.

*Type locality.* Bratskarvet, Queen Maud Land, Antarctica.

*Remarks.* This new species resembles *E. tottanfjella* Strandtmann, 1967 in having long dorsal setae, but *E. winsnesi* is larger, has longer dorsal setae, and has more setae on tibia, genu, and femur I. For a comparison of the leg chaetotaxy of *E. angardi*, *E. winsnesi* and *E. tottanfjella*, see Table I. Average lengths of dorsal seta 1 ( $d_1$ ) of the 3 species are: *E. angardi* 50  $\mu$ , *E. tottanfjella* 75  $\mu$ , *E. winsnesi* 125  $\mu$ .

Named after Dr. T. S. Winsnes, leader of the Norwegian Antarctic Expedition 1970–71 to Dronning Maud Land.

Genus *NANORCHESTES* Topsent and Trouessart, 1890.

Very small, globular mites with numerous branched body setae. Legs short, tarsi with only one claw.

*Nanorchestes brekkeristae* sp. novo. (Figs. 4a–i)

*Adult* (Figs. 4a–i). Average length 300  $\mu$ , including chelicerae (250–340). Prominently striated; idosomal striae punctulate; striae of appendages, gnathosoma and chelicerae, smooth. Dorsal seta of chelicera not furcate. Chelate portion of chelicera comprises 1/3 of the total length of chelicera. *Dorsum* (Fig. 4a). Propodosoma about twice as wide as long. Distance between bases of anterior sensillae (nf), 20  $\mu$ . Posterior sensilla (nb) shorter and finer than seta na; both are uniformly ciliated from base to apex. Seta na is 75  $\mu$ , sensilla nb is 55  $\mu$ . The cuticular flap (naso) between bases of ng is coarsely striate and medially divided. Eye and post-ocular orb well developed. Dorsal hysterosoma punctato-striate, the striations longitudinal laterally and transverse medially. The setae numerous, not in rows, arborescent, about 15  $\mu$  long—(10–18). *Venter* (Fig. 4b). Genital pore about 50  $\mu$  long, each cover with 8 arborescent setae. 2 pairs of small genital knobs. Female with 3

pairs eugenital (internal) setae of which the outer 2 are ciliated, the middle pair simple (Fig. 4c). Male with 7 pairs coarsely ciliated eugenital setae borne on papillae. Anal pore less than 10  $\mu$ , bracketed by 2 pairs branched setae. Coxal setae 3–1–2–3, large and branched. About 8 pairs of branched setae not unlike those of the dorsum. *Gnathosoma* (Figs. 4e, f, g). Pedipalps typical for the genus, with 5 segments beyond the coxa. The trochanter is small and easily overlooked. Setal formula, troch. to tarsus, is 0–2–2–3–8. The eight setae include 3 that are nude and sickle-shaped, and one that is claw-like and born on a prominent tubercle. The setae of the other segments are all coarsely plumed. The chelicerae are long, with a dorsal, non-furcate, coarsely plumed seta, and a long, nude, needle-like anterior seta. The chela is large, comprising about 2/5 of the total length of the chelicera. The movable digit is massive and scoop-like, the immobile digit is long, narrow, needle-like. The long anterior chelical seta arises at the base of the chela and extends forward as far as the tip of the immovable digit. The antlered rutella of the hypostome are long, extending beyond the tips of the pedipalps. The inner adoral setae ( $ao_1$ ) are coarsely ciliated and a bit shorter than the nude outer adoral setae ( $ao_2$ ). The subcapitular setae (sc) are branched and subequal. *Legs* (Figs. 4b, h, i). Relatively long for the size of the body. Empodial claws with 8–10 rays each side. Tarsi I & II each with a small, middorsal sensory seta (the famulus). Tarsus I with one middorsal and 2(?) lateral sensory ridges, none of which curve transversely over the segment. Tibia I with 2 sensory ridges, one of which curves over the top of the segment. Genu I with 2 longitudinal ridges. Tarsus II with a longitudinal ridge that is slightly inflated apically. Tibia II & III each with a sensory ridge. Femora I and IV are divided. All leg setae are strong and coarsely plumed. Those of the femora tend to be branched. All trochanters are without setae. Chaetotaxy, from tarsus to femur: Leg I, 16–6–5–6(4+2); leg II, 11–5–4–3; leg III, 8–3–3–3; leg IV, 11–3–3–3(2+1).

*Holotype.* Female. Brekkerista, Sverdrupfjella, Dronning Maud Land, Antarctica, 26 Jan. 1971 (No. 34) (one of two specimens mounted on the same slide. The other specimen is a male, the allotype.)

*Allotype*. Male. Same data and mounted on the same slide as the holotype.

*Paratypes*. 8 ♀♀, 9 ♂♂, 1 deutonymph, all from Sverdrupfjella, Dronning Maud Land, as follows: Brekkerista 26 Jan. 1971 (No. 34), 3 ♀♀, 1 ♂. Brekkerista 24 Jan. 1971, scree with lichens, 1150 m a.s.l. (No. 30), 2 ♀♀, 6 ♂♂. Joungane 23 Dec. 1970, north-facing slope, 1000 m a.s.l. (No. 6), 2 ♀♀, 2 ♂♂, Roerkulten 17 Jan. 1971, north-facing slope, 1500 m a.s.l. (No. 25), 1 deutonymph.

*Remarks*. The chelicerae, and (especially) the long, needle-like fixed digit serve to distinguish this species from all others. It is nearest *N. amphibius* T. & T. in size but in *amphibius* the branches of the body setae are heavy, finger-like, whereas in *brekkeristae* they are fine and hairlike.

The specific name is for the locality in which it was found.

*Nanorchestes bellus* sp. novo. (Figs. 5a, b)

Dorsal seta of chelicera not furcate. Propodosoma about 1/3 as long as wide. Idiosomal setae numerous, branched, about 8 microns long.

*Male*. (Figs. 5a, b). Length, including chelicera, 300  $\mu$ . *Dorsum* (Fig. 5a). Idiosomal striae mostly transverse medially and longitudinal laterally; punctulate except in the sensory area. Distance between bases of sensory setae *nf* 10  $\mu$ . Setae *nm* inserted posterior to, and on the same longitude as, the bases of sensillae *nb*. Seta *na* and sensilla *nb* of equal length, ca. 38  $\mu$ . Both are of equal thickness but *na* has short, close, fine ciliation, whereas *nb* has more sparse, coarse, and long ciliations. The intersensillary flap (*naso*) is convex, entire. Hysterosomal setae arborescent, about 7 to 9  $\mu$  long, numerous (ca 250). *Venter* (Fig. 5b). Genital pore 50  $\mu$  long; the 7 pairs of eugenital (internal) setae are bifurcate and weakly plumed. The genital setae (external) are arborescent and 8 on each flap, one of which is more lateral. Anal pore with 2 pairs of setae, similar to the body setae. Coxal seta formula, 3-1-2-3. All are large and all are furcate except the inner posterior seta of coxa IV, which is single. About 11 furcate or arborescent setae in the intercoxal region between coxae III & IV; 2 setae medially between coxae II & III. Ventral hysterosomal setae numerous, similar to the dorsals. *Gnathosoma*. Pedipalps typical for

the genus; setae 0-2-2-3-8. Chelicera rather short and broad. Dorsal seta coarsely plumose not bifurcate. Anterior seta and chela not decipherable. Striations prominent, smooth. Hypostoma with weakly antlered rutella that barely reach the tips of the pedipalps. The smooth external adoral setae (*AO*<sub>1</sub>) much longer than the ciliated internal adoral setae (*AO*<sub>2</sub>). *Legs*. Empodial claws with 6-8 rays each side. Tarsi I & II each with a small, middorsal famulus. One of the sensory lines on tibia I curves over the top of the segment. Femora I & IV are divided. All the leg setae, except one or two on femora III & IV are single and coarsely plumose. Chaetotaxy of legs I to IV, tarsus to femur, respectively: I, 16-6-5-6(4+2); II, 11-5-4-3; III, 8-3-3-3; IV, 11-3-3-2(1+1).

*Holotype*. Female. Tvoja, Sverdrupfjella, Dronning Maud Land, Antarctica 25 Dec. 1971 (No. 7). Collected from underside of stone, north-facing slope, 1500 m a.s.l.

*Paratype*. Male. Same locality as holotype.

*Remarks*. One cannot determine from only two specimens whether the characters used for differentiation will hold true, we can only assume, and hope, they will.

Only 2 setae on femur IV, the short, very broad chelicerae, equal thickness and length of seta *na* and sensilla *nb*, the absence of unusual modifications on the pedipalps are characters which, when used in combination, serve to differentiate this species.

This struck us as an unusually pretty little mite, hence the name, *bellus*.

*Nanorchestes antarcticus* Strandtmann, 1963. Brekkerista 24 Jan. 1971, facing north, in vegetation of lichens, 1150 m a.s.l., 1 ♀, 1 ♂. Tvoja 2 Jan. 1971, scree facing north-west, 1200 m a.s.l., 1 ♀, Tverrnipa 4 Jan. 1971, scree facing north-west, 1700 m a.s.l., 1 ♀, Dvergen 11 Jan. 1971, slope facing north, 1500 m a.s.l., 2 ♂♂.

#### ACKNOWLEDGEMENTS

We are most grateful to Mr. Tore S. Winsnes and The Norwegian Polar Research Institute for permission to publish the present material, and to Mr. J. Angar, who collected the mites.

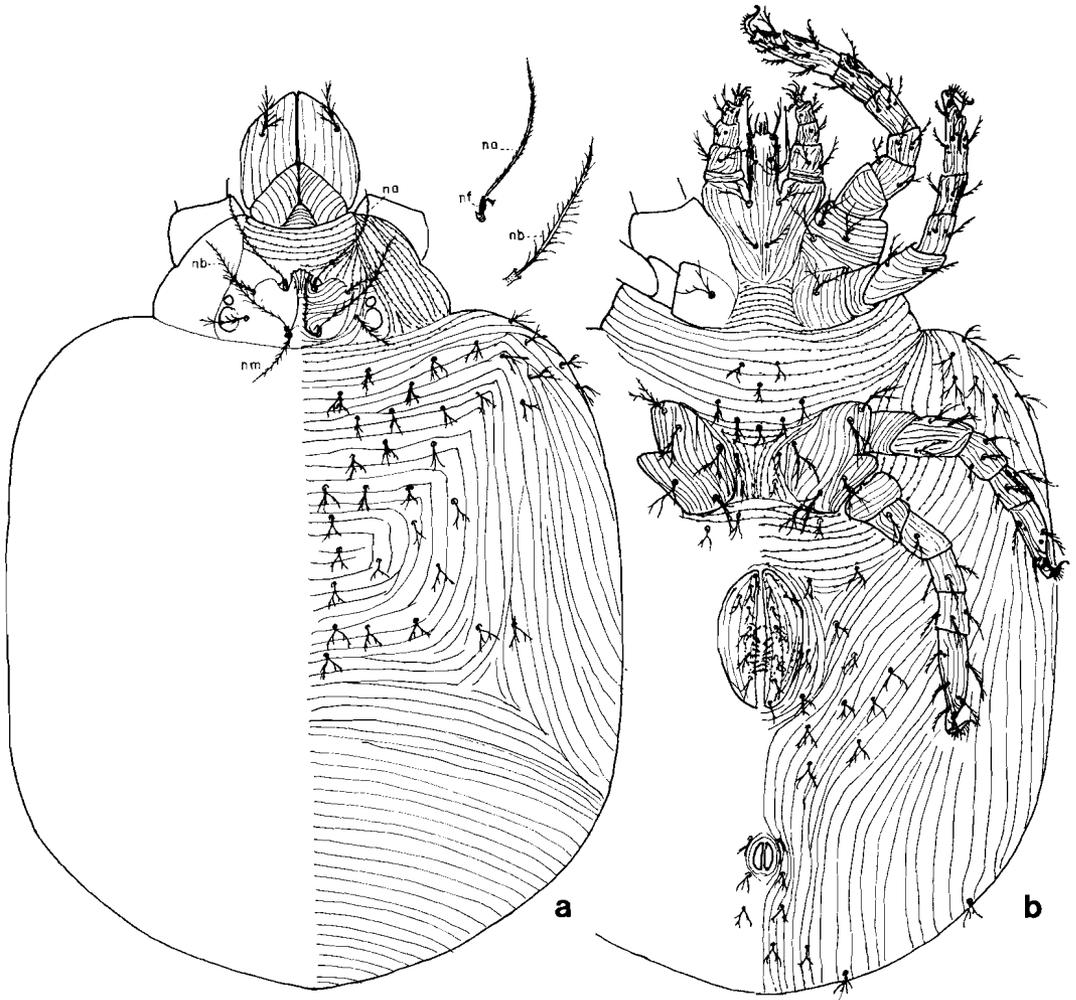


Fig. 5. *Nanorchestes bellus* sp. novo. a. dorsum, with enlarged view of the anterior sensory complex and the posterior sensilla. Abbreviations: na, trigger seta for anterior sensilla; nb, posterior sensilla; nf, anterior sensilla; nm, posterior seta in the dorsal sensory area.

REFERENCES

Bowra, G. T., Holdgate, M. W. & Tilbrook, P. J. 1966. Biological investigations in Tottanfjella and Central Heimfrontfjella. *Br. Antarct. Surv. Bull. No. 9*, 63-70.

Dalenius, P. & Wilson, O. 1958. On the soil fauna of the Antarctic and of the Sub-Antarctic islands. The Oribatidae (Acari). *Ark. Zool.* 11, 393-425.

Strandtmann, R. W. 1967. Terrestrial Prostigmata (Trombidiform mites), pp. 51-80 in Gressitt, J. L. (ed.) *Entomology of Antarctica*. American Geophysical Union, Washington, D. C.

Winsnes, T. S. 1972. The Norwegian Antarctic expedition 1970-71. *Norsk Polarinst. Arbok* 1970, 224-226.

Received 25 August 1977