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UDGIVNE AF

KOMMISSIONEN FOR VIDENSKABELIGE UNDERSØGELSER I GRØNLAND

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COLLEMBOLLES AND ORIBATIDS FROM
THE THULE DISTRICT (NORTH WEST
GREENLAND) AND ELLESMERE ISLAND
(CANADA)

COLLECTED BY J. C. TROELSEN
AND CHR. VIBE

BY

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WITH 15 FIGURES IN THE TEXT

KØBENHAVN
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BIANCO LUNOS BOGTRYKKERI

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On an expedition to Ellesmere Island during the summer of 1952, financed by the Arctic Institute of North America, Dr. J. TROELSEN took some samples of the soil. All the samples were collected on the West side of Ellesmere Island, at Slidre Fjord, situated about 80° N, 87° W. Dr. TROELSEN has told me the following facts of the geological formations of Slidre Fjord: The country round Slidre Fjord consists of marine formations, chiefly a very soft, cretaceous clayey schist, which is almost impenetrable by water, and which is, therefore, not easily washed out. In some places the surface is covered with a very thin layer of marine, post glacial sand. The quaternary slope of the land amounting to at least 365 ft., the lowland round Slidre Fjord has chiefly been below the level of the sea during or after the glacial period. We may therefore expect the soil to contain large quantities of soluble salts, and as a matter of fact river plains and ravines are covered by rather thick, white crusts of salt, when they dry out towards the end of the summer. As far as I have been able to ascertain the salty crusts do not disappear until the melting of the snow in spring. In Peary Land, where a similar phenomenon could be observed, it is chiefly a question of chlorides and sulphates of calcium and magnesium. I may add that according to "Arctic", vol. 4, no. 1, page 26 of 1951 the annual precipitation (expressed in water) amounts to about 1,62 inches at Eureka, Slidre Fjord. Even if the measurements have been made only for a small number of years, it is seen that the climate is uncommonly dry.

In 1940 a few collemboles and oribatids were likewise collected in the Bache Peninsula (about 79° N, 75° W), Ellesmere Island by mag. sc. CHR. VIBE, who in 1941 and 1951 also collected a small number of the same groups of animals in the Thule district, that is, near the colony of Thule, and also in Inglefield Land (about 79° N, 70° W). I beg Dr. J. TROELSEN and mag. sc. CHR. VIBE, to accept my best thanks for having collected the material for me.

As collemboles have only been mentioned once before from Ellesmere Island (WAHLGREN 1907), and oribatids have never been found so far towards the North, neither in Canada nor in Greenland, the specimens found though few in number are yet of great zoo-geographical interest.

The following species were found:

Collembola:

1. *Neogastrura viatica* (L.) Tullb. Slidre Fjord: A few in moss from a moist bog; a great number in a lemming's winter dwelling.
2. *Ceratophysella armata* (Nic.). South coast of Slidre Fjord: 1 specimen in a cushion of *Stellaria* sp.
3. *Polyacanthella* sp. South coast of Slidre Fjord: 1 specimen together with *Ceratophysella armata*. Unfortunately, the ventral side of the creature had burst so that the furca, if present, cannot be seen. The ground colour is light grey, a little bluish on the back; 8 eyes on each side; 6 anal spines, 4 in the foremost row and 2 behind; no clavate hairs. It thus seems to be closely related to *P. acuminata* Denis.
4. *Anurida granaria* (Nic.). Slidre Fjord: Several specimens in moss from a meadow dry during part of the summer, about 100 feet a.s.l.; in moss 400 feet a.s.l.
5. *Onychiurus groenlandicus* (Tullb.). Slidre Fjord: A great number in moss taken in a meadow, dry during part of the summer, about 100 feet a.s.l.; in moist moss in the bottom of the valley on the south coast about 30 feet a.s.l. and in moss from a moist bog 400 feet a.s.l.
6. *Onychiurus debilis* (Moniez). Slidre Fjord: Several specimens in a cushion of *Stellaria* sp. on the south coast; in moss taken in a meadow dry during part of the summer about 100 feet a.s.l.; in a lemming's winter dwelling on the north coast; a great number in moist moss on the south coast about 30 feet a.s.l.
 BAGNALL (1937) writes that this species is halophile and in Scotland found below high-water mark. It is interesting, therefore, to see that in Ellesmere Island this species is able to live far from the shore up the mountain slopes where as everywhere in Slidre Fjord the soil is rich in salt, never washed out of the old marine formations.
7. *Folsomia quadrioculata* (Tullb.). Slidre Fjord: Several in moss taken in a moist bog about 400 feet a.s.l.; in moss in a meadow dry during part of the summer, about 100 feet a.s.l.
8. *Folsomia regularis* n. sp. Size 0,95 mm exclusive of antenna. Colour white. The ratio between head and antenna as 87:75. The ratio between Ant. I:II:III:IV = 11:18:18:40. On I Ant. segment 2 short sensory hairs can be seen dorsally and medially (fig. 1). The sense organ of III Ant. segment consists of 2 short curved

sense rods. On IV Ant. segment dorsally a number of rather long soft distinct olfactory hairs. At the tip a papilla.

The postantennal organ (fig. 1) is a little longer than the I Ant. segment is broad at its base, and about four times longer



Fig. 1. *Folsomia regularis* n.sp. The postantennal organ with surroundings.

than the diagonal of an eye. In the middle of its foremost margin it is slightly constricted, the inner margin is smooth. It is protected by five setae. There is one eye on each side faintly bluish pigmented at its base. Close to the eye medially a curved seta is situated. The clothing (fig. 2) consists of rather long stiff and smooth setae of which the ones in the hindmost row of Th. II and III and the abdominal segments I—III are arranged exactly

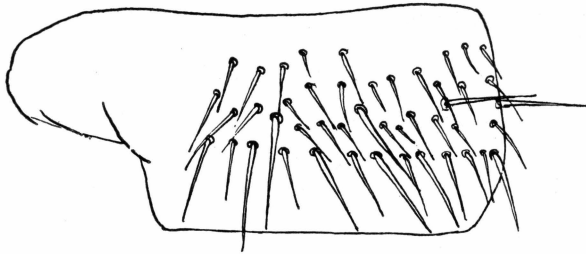


Fig. 2. *Folsomia regularis* n.sp. I abdominal segment in lateral-dorsal view. Small enlargement.

in a line. The ones in the foremost row of the segments in question are completely out of line. On I abdominal segment there are four rows of hairs which are unequally long. The hairs are on an average longest in the hindmost row where about every

second hair is longer and stronger than the ones in between. In the middle of the segment or a little proximally to the middle there are some macrochaetae about $\frac{1}{3}$ of the length of the segment in question. On the dorsum the macrochaetae are erect. In the hindmost part of the abdomen the hairs are

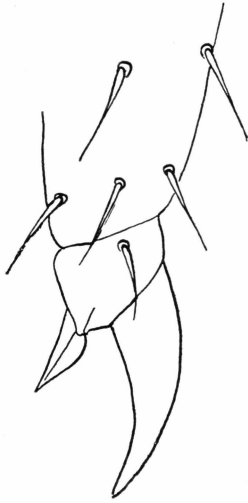


Fig. 3. *Folsomia regularis* n. sp.
The distal part of leg III.

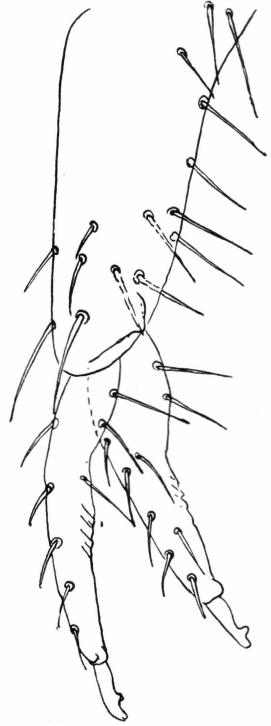


Fig. 4. *Folsomia regularis* n. sp.
Furca.

stronger. A little behind the middle on the tergite of the ancylosed abdominal segments a fine short sensory (?) hair is situated about $\frac{1}{3}$ as long as the ordinary hairs. It is placed a short distance in front of a very strong macrochaeta with 2 ordinary hairs between the macrochaeta and the sensory hair. A similar short blunt hair is seen on each side a short distance in front of the first mentioned and more laterally. The claw (fig. 3) is strong, unarmed. Empodial appendage broad lanceolate, about half the length of the ventral side of the claw. Tenaculum with 4+4 barbs; only one strong seta on corpus. Furca (fig. 4) is rather short, it stretches to about the hind margin of II abdominal segment. The ratio between manubrium:dens:mucro = 6:5:1.

Manubrium (figs. 4—5) has on its ventral side 3+3 setae arranged in two almost straight lines. The two proximal setae are weak and short; they are placed a little more laterally than the four more distal hairs. The two in the middle are a little stronger,



Fig. 5. *Folsomia regularis* n. sp.
Manubrium from the ventral side.
Enlargement as figs. 1, 4.

Fig. 6. *Folsomia regularis* n. sp. Dens
and mucro. Enlargement as fig. 3.

and the two distal ones almost twice as long as the ones in the middle, and much stronger. On fig. 4 one of the setae from the pair in the middle is lacking. Dorsally manubrium has about 10 long and stiff setae. Dens (figs. 4, 6) on its ventral margin with 7 strong hairs; on its dorsal side proximally two long and thin hairs, and $\frac{2}{5}$ from its base another long thin hair. The proximal part of dens is almost twice as thick as the distal part being divided by an incurvation dorsally about $\frac{2}{5}$ from its base. In the middle of the dorsal side there are a few (4—5) crenulations. Mucro with two equally strong teeth.

This species is closely related to *F. diplophthalma* (Axelson) but is distinguishable from the latter by its greater number of setae on the ventral side of manubrium and by its longer and regularly arranged hair clothing.

Slidre Fjord: 10 individuals in moss from a moist bog about 400 feet a.s.l.; 4 specimens in a lemming's winter dwelling on the north coast of the fjord.

9. *Folsomia fimetaria* (L.). Slidre Fjord: A few specimens in a cushion of *Stellaria* sp. on the south coast; in moss taken in a meadow dry during part of the summer about 100 feet a.s.l.; in a lemming's winter dwelling on the north coast; a great number in moist moss on the south coast about 30 feet a.s.l.
10. *Ágrenia bidenticulata* (Tullb.). Agrees in all essential characters with FOLSOM'S description (1937, p. 69) with the exception that all eyes are almost equally large, the two inner distal ones being only a little smaller than the others, especially the hindmost and not as FOLSOM says "much smaller" (FOLSOM p. 69: the two inner proximal (distal? M.H.) eyes much smaller).
Slidre Fjord: 1 specimen in moss from the moist bottom of the valley on the south coast.
11. *Proisotoma mackenziana* Hammer. Like the single specimen described from the Mackenzie Delta (HAMMER 1953) this specimen has four rather long spines on the dorsum of VI abdominal segment.
Slidre Fjord: 1 individual in moist moss in the valley bottom on the south coast about 30 feet a.s.l.
12. *Isotoma viridis* Bourlet. Ground colour light grey with diffuse purple pigment especially in two not very distinct longitudinal stripes on the dorsum.
Slidre Fjord: A few specimens in a cushion of *Stellaria* sp. on the south coast and in moist moss in the bottom of the valley about 30 feet a.s.l. also on the south coast; a single specimen in a lemming's winter dwelling on the north coast; several specimens in moss from a meadow dry during part of the summer about 100 feet a.s.l.
13. *Isotoma violacea* Tullb. Slidre Fjord: 5 specimens in moss from a meadow dry during part of the summer, about 100 feet a.s.l.; 2 individuals in moss from a moist bog about 400 feet a.s.l.
Isotoma violacea Tullb. var. *mucronata* Axelson. Slidre Fjord: 1 specimen in moss from a meadow dry during part of the summer 100 feet a.s.l. and in moss from the moist bottom of the valley on the south coast.

14. *Isotoma olivacea* Tullb. Slidre Fjord: Several specimens in moss from a moist bog 400 feet a.s.l.; a few individuals in moss from a meadow dry during part of the summer 100 feet a.s.l.
15. *Archisotoma besselsi* (Packard). Slidre Fjord: 6 specimens on the north coast in old musk-ox dung at least 50 feet a.s.l. rather far from the shore. This occurrence a good distance from the shore is very interesting, as *Archisotoma besselsi* is a pronounced litoral species. The content of salt in the soil, however, apparently creates proper conditions of life even rather high up the mountain slopes.
16. *Isotomurus palustris* (Müller) var. *prasinus* (Reuter). Slidre Fjord: 5 young specimens in moist moss 30 feet a.s.l. on the south coast and 5 young specimens in moss from a moist bog 400 feet a.s.l.
17. *Entomobrya* sp. Indeterminable, due to its lack of any pattern on abdomen which is completely unpigmented. Eye spots dark blue connected anteriorly by a blue band. Antennae faintly purple pigmented, strongest on the III segment.
 Slidre Fjord: 1 specimen in moss from a crack in the rock.
 Bache Peninsula: 1 specimen. Biotope not indicated by the collector.
18. *Megalothorax minimus* Willem. Slidre Fjord: Abundant in moss from a moist bog 400 feet a.s.l.; a few individuals in moss from a meadow dry during part of the summer 100 feet a.s.l.
19. *Sminthurides malmgreni* (Tullb.) var. *palustris* Folsom and Mills. Slidre Fjord: Many individuals in moist moss in the bottom of the valley about 30 feet a.s.l. on the south coast.
 Inuarfigssuaq, Inglefield Land: 1 specimen. Biotope not indicated.

Oribatidae:

1. *Brachychthonius scalaris* Forssl. Slidre Fjord: 20 individuals in a lemming's winter dwelling on the north coast; a single specimen in moss from a meadow dry during part of the summer 100 feet a.s.l. The species measures 0,25 mm.
2. *Hermannia scabra* (L. Koch), 1,2 mm long.
 Kap Kent, Inglefield Land: 7 specimens. June 1941.
 At a lake, — — 1 specimen. July 1941.
3. *Belba groenlandica* n. sp. Colour yellowish, faintly chitinized; length 0,68—0,72 mm, breadth 0,41 mm.
 Propodosoma almost triangular, a little longer than broad. There is no projection between leg I and II (fig. 7). The lamellar

hairs are placed at a slightly shorter distance than the rostral hairs. The pseudostigmatic organs are thin, soft and flexible bristles, thinnest at the distal end, which is beset with secretion. They are directed outwards and about $2\frac{1}{2}$ times longer than

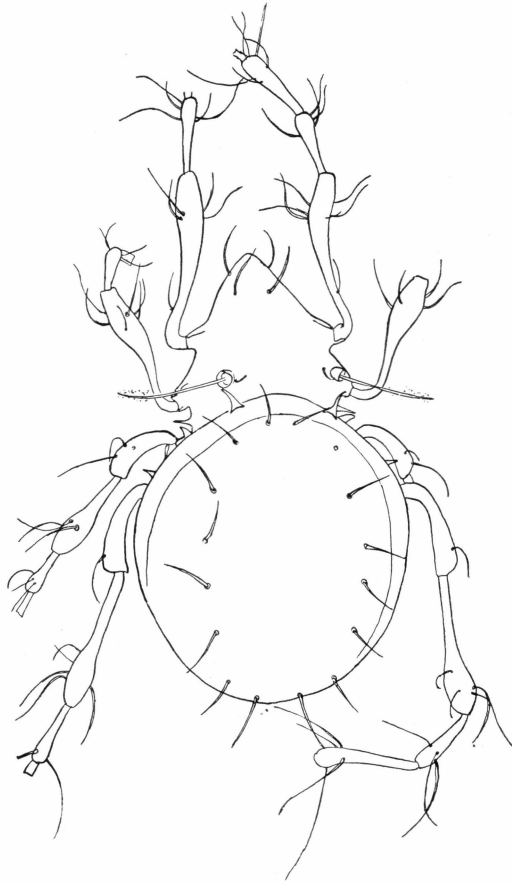


Fig. 7. *Belba groenlandica* n. sp.

the foremost setae on hysterosoma. The interlamellar hairs are very short setae which are directed backwards and outwards, about $\frac{1}{2}$ — $\frac{2}{3}$ the length of spinae adnatae. No tubercles behind the pseudostigmatae. Spinae adnatae rather long, shaped like a thorn of a rose, with a broad faintly bipartite base. They stretch to the posterior margin of the pseudostigmatae. 8 pairs of rather long slightly curved yellow smooth hairs are placed in two rows across the hysterosoma with the tips radially arranged. They are scarcely $\frac{1}{3}$ the length of the pseudostigmatic

organs. The hindmost pair is about 50 % longer than the others. Genital and anal plates are distinctly separated, not connected by a chitinized thickening (fig. 8). Hysterosoma without dirt and cast off skins. The legs are rather long and surrounded by a thin layer of secretion; all joints club-shaped. The hairs on the legs are often more or less outstanding with the distal end sometimes parallel to the longitudinal direction of the joints. All hairs are smooth. The outer hair on genu IV is somewhat stouter than the others and a little longer. The sensory hair on tibia IV



Fig. 8. *Belba groenlandica* n. sp.
Genital and anal plates.

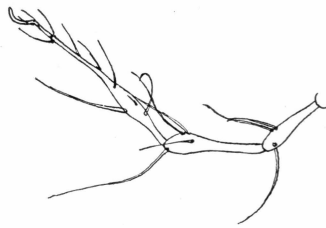


Fig. 9. *Belba groenlandica* n. sp. Distal part of leg IV (left side).

is erect and a little longer than the joint. As regards the legs see figure 7, 9. The length of the different joints of leg I and IV are as follows:

| | Coxa | Femur | Genu | Tibia | Tarsus |
|--------|------|-------|------|-------|--------|
| Leg I | — | 310 | 115 | 160 | 240 |
| Leg IV | 160 | 220 | 115 | 165 | 260 |

Kap Kent, Inglefield Land: 5 specimens. June 1941.

- Tectocephus velatus* (Mich.), 0,45 mm long (cracked). Slidre Fjord: 1 adult and 2 nymphs in a lemming's winter dwelling on the north coast.
- Fuscozetes sellnicki* Hammer, 0,46 mm long. Slidre Fjord: 1 specimen in a cushion of *Stellaria* sp. on the south coast.
- Trichoribates notatus* (Thorell), 0,65 mm long (shrivelled). Thule: 1 young not fully pigmented specimen in soil grown with *Dryas* sp. 1951.
- Trichoribates polaris* n. sp., 0,61—0,62 mm long (fig. 10).

The propodosoma inclusive of tectp. II is more than twice as broad as long. Rostrum angular. A pointed chitinized tip is seen a short distance behind the anterior margin of rostrum, at each side with a faintly chitinized incurvation (figs. 10—11).

Rostral hairs very stout, hairy, especially on the outer sides, directed forwards and almost meeting in front of the tip of the rostrum. The lamellar hairs as long as the lamellae, parallel, directed forward and rough, as thick as the rostral hairs. They reach with about half their length beyond the tip of the rostrum. The lamellae converging, narrow at the base, broadening evenly towards the translamella. The translamella is very short as the

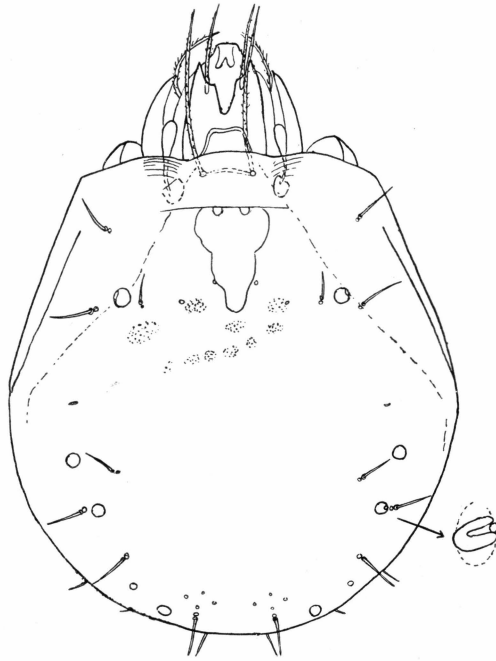


Fig. 10. *Trichoribates polaris* n. sp.

cusps are exceedingly broad at their base, almost meeting, forming a rather broad and short translamella. The space between the cusps is very narrow, broadest anteriorly. The cusps have at their end an outer, very long and broad tooth (fig. 10) and at the inner side a sharp edge not forming a real tooth. One specimen, however, had a rather short outer tooth and an almost equally long inner tooth (fig. 12). The lamellar hairs are inserted in the medial half of the cusps; a narrow canal is seen running from the base of the hair through the translamella to a minute light point or hole just behind the thickened margin of the translamella (fig. 12). The interlamellar hairs are inserted under the anterior margin of hysterosoma on a chitinized thickening. They are directed forwards, parallel and

rough, about twice as long as the lamellar hairs. Seen from above they reach as far beyond the tip of the rostrum as the lamellar



Fig. 11. *Trichoribates polaris* n.sp. Rostrum, rostral hair and the chitinized tip.

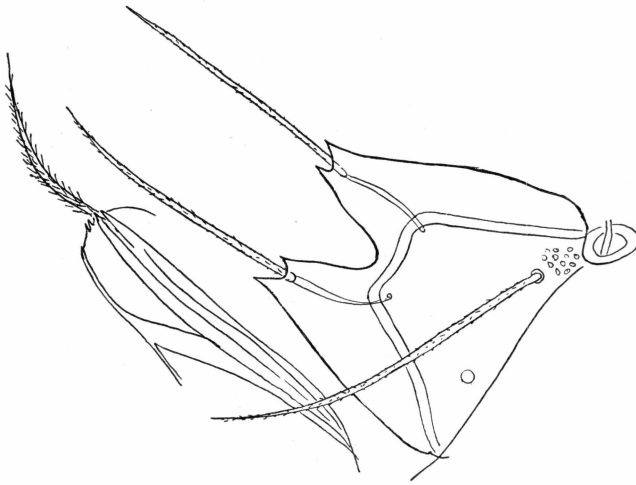


Fig. 12. *Trichoribates polaris* n. sp. Lamellae with lamellar hairs, one inter-lamellar hair and Tectp. I. The pseudostigmatic organ broken.



Fig. 13. *Trichoribates polaris* n.sp. The tip of Tectp. I with the teeth and the base of the rostral hair.

hairs. The pseudostigmatae are concealed under the anterior margin of hysterosoma. There is no tip on the cup. The pseudostigmatic organs are club-shaped, blunt at the end. Only the head which is of the same length as the stalk is free. Tectp. I (figs. 12, 13) has several teeth on a long free tip projecting almost

as far as the outer tooth of the cusp (fig. 10). Its dorsal side is deeply furrowed with a few teeth at the tip.

Hysterosoma almost as broad as long, broadest behind the middle. The anterior margin is almost straight with two faint incurvations a little medially to the pseudostigmatic organs. The shoulders rounded. Pteromorphae distinctly separated from the notogaster except at anterior margin. A light spot is seen on



Fig. 14. *Trichoribates polaris* n. sp.
Leg I.

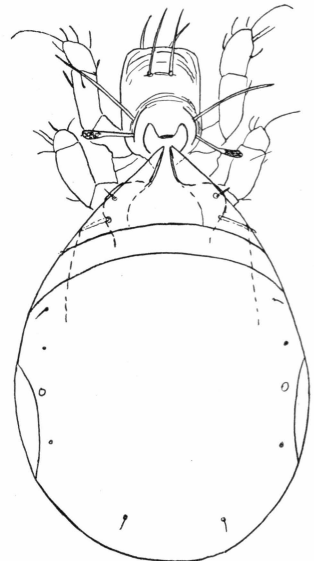


Fig. 15. *Trichoribates polaris* n. sp.
Nymph.

hysterosoma a little behind the anterior margin. There are 10 pairs of short stiff and rough hairs, the arrangement of which is seen in fig. 10. At the base of each hair a little pore. Areae porosae present as seen in fig. 10 but they are not ordinary areae porosae with numerous small pores. Instead one light hole on the outer margin can be seen in each area porosa surrounded by strongly chitinized walls or lips (see the detail drawing in fig. 10, right down). The integument uneven, but no sculpturing. The appearance of the leg I is seen in fig. 14. There are 3 claws of which the one in the middle is the strongest. The nymph is seen in fig. 15.

This species slightly resembles *T. incisellus* (Kramer), but is distinguishable from the latter by the much longer interlamellar hairs, by having no tip on the cup of the pseudostigmata, and by the unusual areae porosae.

Slidre Fjords: 2 adult and 2 nymphs in moss in a meadow dry during part of the summer about 100 feet a.s.l.; 2 specimens in moss from a moist bog about 400 feet a.s.l.

8. *Jugoribates gracilis* Sell., 0,62—0,72 mm (average 0,67). Inuarfigssuaq, Inglefield Land: 2 specimens. June 1941.

The species found here in no way give a sufficient impression of which animals live in Ellesmere Island. This is best seen from the fact that only two of the six species mentioned by WAHLGREN (1907): *Neogastrura (Achorutes) tullbergi* (Schäffer), *Morulina (Neanura) gigantea* (Tullb.), *Vertagopus (Isotoma reuteri* Schött) *arborea* (L.), *Isotoma viridis* Bourlet, *Isotomurus palustris* (Müller) and *Sira erudita* Nic. are found again here. The extremely poor oribatid fauna may be due to the uncommonly dry climate, but may also be due to a defective collecting technique.

As a consequence of the geographical position of Ellesmere Island as a bridge between Canada and North Greenland we may expect to meet with interesting zoo-geographical conditions. However, most of the species found have a wide holarctic distribution. *Proisotoma mackenziana* is only found before near the Mackenzie delta in arctic Canada (HAMMER 1953). *Fuscozetes sellnicki* has a wide distribution in arctic Canada (HAMMER 1952a), but was formerly known only from the Upernivik district in West Greenland (HAMMER 1944). *Jugoribates gracilis* was formerly known from Upernivik, West Greenland (HAMMER 1944), the Disko Fjord district (69°45' lat. N) (STRENZKE 1952) and likewise from the inner part of Søndre Strømfjord (67° lat. N) West Greenland (HAMMER 1952b), but has not yet been found outside Greenland; none of these species is known from East Greenland. Whether it is a question of American species which have come to Greenland by Ellesmere Island may possibly be decided by further investigations in arctic territories.

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