

POLSKA AKADEMIA NAUK
ZAKŁAD ZOOLOGII SYSTEMATYCZNEJ
A C T A Z O O L O G I C A
C R A C O V I E N S I A

Tom XI

Kraków, 30. IV. 1966

Nr 7

Jan STACH

On some *Collembola* of Newfoundland and Nova Scotia

[Plate XIV]

Skoczogonki (*Collembola*) Nowej Fundlandii i Nowej Szkocji

Ногохвостики (*Collembola*) из Ньюфаундленда и Новой Шотландии

In 1957 appeared an important zoogeographical work by LINDROTH on the faunal connection between Europe and North America. In that work many species of animals common to both these continents, but with exception of those occurring on arctic islands, are taken by the author under consideration. The group of *Apterygota* is omitted in the list although at that time many species of the *Collembola* were already registered from North America. Only from the New Foundland no one species of this group was known so far.

I have thus willingly examined the specimens of *Collembola* group found in the material collected by eminent Polish zoologists Prof. S. FELIKSIĄK and Prof. T. JACZEWSKI during their zoogeographical studies on Newfoundland and Nova Scotia, in 1938. The number of these species, caught occasionally, is unfortunately small, restricted to 15 ones only, all being, however, new to the fauna of these islands and one new to science. They are:

<i>Neanura muscorum</i> (TEMPL.)	Cosmopolit.
<i>Folsomia quadrioculata</i> (TULLB.)	Cosmopolit.
<i>Folsomia multiseta</i> STACH.	Holaret.
<i>Isotoma viridis</i> BOURL.	Holaret.
<i>Isotomurus palustris</i> BÖRN.	Cosmopolit.
<i>Entomobrya multifasciata</i> (TULLB.)	Holaret.
<i>Entomobrya indigena</i> sp. n.	America
<i>Orchesella cincta</i> (L.)	Holaret.
<i>Pogonognathus flavescens separatus</i> FOLS.	America

<i>Tomocerus minor</i> (LUBB.)	Cosmopolit.
<i>Lepidocyrtus cyaneus</i> TULLB.	Cosmopolit.
<i>Bourletiella spinata</i> (MCGILLIV.)	America
<i>Allacma fusca</i> (L.)	Holarct.
<i>Dicyrtoma minuta</i> (O. FABR.)	Cosmopolit.
<i>Ptenothrix atra apigmentata</i> ssp. n.	America

Almost all of these species belong zoogeographically to the elements of the Holarctic fauna dispersed very widely all over Europe. Some of these are even cosmopolitans. Two only, e. g. *Entomobrya indigena* sp. n. and *Bourletiella spinata* (MCGILLIV.) seem to be the species indigenous of North America. The latter known from many localities of USA and Canada was indeed lately registered by YOSII & LEE from one locality in Corea, but it has been doubtless introduced artificially. The subspecies *Pogonognathellus flavescens separatus* FOLS. and *Ptenothrix atra apigmentata* ssp. n. differ from their principal forms in very insignificant body details.

The reason of so great number of elements of European fauna of islands lying so near to American continent was explained by LINDROTH as caused by human transport, especially by „the peculiar character of balast traffic in older times, sailing vessels going almost exclusively on their way west, to Newfoundland and the maritime Provinces of Canada. The main area of departure for animals, mostly belonging to the soil fauna, was southwestern England“.

Some species of soil *Collembola* have been introduced doubtless from Europe to Newfoundland already by the Vikings in Xth century, the settlements of which have been lately found by the archaeologists on this island.

Neanura muscorum (TEMPL.)

A species very constant in its body marks. The specimens from Newfoundland and Nova Scotia agree with the European ones in all their body details.

Loc.: Newfoundland, St. Georges, on bank of a stream, 24. VIII. 1938; 1 spn. Newfoundland, Corner Brook, under a tree-trunk, lying on the ground, 23. VIII. 1938; 1 spn.

Nova Scotia, on the bank of a river, 23. IX. 1938; 1 spn.

Neanura muscorum (TEMPL.) is very widely distributed over Europe, known also from many localities of North America (USA, Canada, Greenland), recorded also from Costa Rica, Australia, New Zealand and Tasmania.

Folsomia quadrioculata (TULLBERG, 1871)

The Newfoundlandian specimens of this species agree in their characteristics with those from Europe. They have two ocelli on either side of the head lying in a distance one beyond another, and the anterior is distinctly larger

than the posterior one. Furcula relatively short. Manubrium somewhat longer than dentes, provided ventrally near to basis with one pair of setae. Posterior abdominal tergites with stiff, long setae. Ground colour of the body white with dispersed irregular black spots.

FOLSOM (1937) found in American specimens two pairs of setae at the basis of manubrium, ventrally.

Loc.: Newfoundland, Port aux Basques, on the bank of a small river on the tundra, 21. VIII. 1938; 1 spn. Saint Pierre-Isl., on tundra, 17. IX. 1938; 4 spns.

Folsomia quadrioculata (TULLB.) is a species very widely distributed in Holarctic Region, known from many arctic territories and islands of Europe and North America, registered also from Algeria, Lebanon and New Zealand.

Folsomia multiseta STACH, 1947

The specimens of this species found in examined material agree with the European form *dives* STACH, 1947, provided at manubrium with three ventral setae arranged in an oblique row near to basis of each dens and higher with greater number 8—13 of ones.

This species found in Europe mostly on mountainous terrains is in Newfoundland caught on the tundra.

Loc.: Newfoundland, Port aux Basques, on bank of a small stream on the tundra, 21. VIII. 1938, 1 spn.

St. Pierre-Isl., near to New Foundland, on tundra, 17. IX. 1938; 4 spns.

Species widely distributed in Europe, registered by BELLINGER, 1954 from one locality in USA (Connecticut).

Isotoma viridis BOURLET, 1839

Single pale yellowish coloured specimen.

Loc.: Nova Scotia, Point Pleasant Park, Martella Tower, 21. IX. 1938; 1 spn.

A common Holarctic species widely distributed also in arctic territories.

Isotomurus palustris f. *unifasciata* (BÖRNER, 1907)

Without any markings except for dark violet longitudinal band on dorsum.

Loc.: Nova Scotia, North Sydney, Poltle Lake, under a stone, 18. VIII. 1938; 1 spn.

A very widely distributed cosmopolitan species.

Entomobrya multifasciata (TULLBERG, 1871)

The specimen caught on St. Pierre-Isl. has the same characteristic pattern as European individuals of forma principalis of this species, namely black-blue cross stripe at posterior margin of each tergite, a transverse, wide, irregular

band on anterior half of fourth abdominal tergite, and a pair of large triangular patches at posterior margin of this tergite. It agrees with the European specimens also in remaining details of the body.

Loc.: Saint Pierre-Isl. brushwood on the tundra, 17. IX. 1938; 1 spn.

This common, very widely distributed, probably a cosmopolitan species is registered by some authors from North America (USA and Canada). Lately (1958) it is well figured by CHRISTIANSEN (Pl. 2, fig. 2) on ground of a specimen from North America, but considered by this author as a dark colouring form of another species, *Entomobrya nivalis* (L.).

Entomobrya indigena sp. n.

Pl. XIV, figs. 5—6

Body somewhat compressed dorsoventrally, densely covered with many short, fine, curved, indistinctly ciliated hairs being gradually longer towards the ends of abdominal tergites. The „flexed“ bristles, forming at thoracic tergites a mane, are relatively short and only weakly thickened apically. Trichobothria on Abd. II—IV in normal number and arrangement.

Antennae half as long as the body measured together with the head, and about twice longer than the diameter of the head. They are densely covered with setae of various length, especially on first and second joints, and all finely ciliated. Ant. III with normal sensory organ and Ant. IV with small retractile papilla at the tip.

Eight ocelli on either side of the head; two median ocelli are distinctly smaller than the remaining ones.

Labrum with three rows of setae (5,5, 2—2) dorsally and the front with four minute papillae, each provided with a relatively long, fine setula.

Differentiated seta of external labial papilla fine and short.

Legs of normal length, densely covered with many moderately long, short ciliated common setae, and provided with some long ciliated macrochaetae at dorsal and ventral edges of all joints. Stout bristles on ventral edge of tibiotarsus rather thick, densely short ciliate. Unguis provided with teeth: one small external, a pair of indistinct lateral, a pair of inner and one subapical. Empodial appendage narrow, half as long as the inner side of the unguis. Tibiotarsal tenent hair weakly thickened, not turned, shorter than the unguis.

Abd. III about 3 times shorter than Abd. IV.

Furcula almost as long as antennae, abundantly setaceous. Mucro somewhat longer than unguis, provided with large apical and anteapical teeth and well developed basal spine.

Ground colour of the body yellowish white. Black pigment coloured lateral edges of Thor. II and III and forms small, irregular, more or less elongate dorso-lateral patches on Thor. II — Abd. II. At Abd. III appears a black wide irregular cross band, and at either side of Abd. IV a pair of longitudinal stripes.

The head grayish spotted. Antennal joint with black rings apically. Legs and furcula unpigmented.

Length of the body 1.8—2 mm.

Loc.: St. Pierre at Miquelon-Isl., in brushwood on the tundra, 17. IX. 1938; 5 spns.

Orchesella cincta (L.)

The examined specimens agree in all morphological body marks with those from Europe. They appear also the same colour varieties as *f. principalis*, with broad black patch on third abdominal tergite, and *f. vaga*, almost entirely black coloured.

Loc.: Newfoundland, Ferryland, on a small arable field, 10. IX. 1938; 1 spn.

Grande Miquelon, near to seashore on tundra, 16. IX. 1938; 1 spn.

St. Pierre-Isl., on mountainous ground, 17. IX. 1938; 1 spn.

Nova Scotia, Windsor, on banks of a river, 23. IX. 1938; 8 spns. of *f. principalis*.

Orchesella cincta (L.) is in Europe a common species, occurring generally in lowland in vicinity of human settlements. From North America it is recorded from USA, Canada and Greenland.

Pogonognathus flavescens separatus (FOLSOM, 1913)

Syn.: *Tomocerus flavescens* var. *separatus* FOLSOM, 1913

One adult, 6 mm long specimen, with antennae almost as long as the body, and three inner teeth on either unguis. It differs from the European type of *f. principalis* in arrangement of dental spines, namely at the front of dental row only one spine is located and at the end of row there is a pair of large, close one to another spines, placed transversally.

In 1913 FOLSOM described for such American specimens a variety *separatus*.

Loc.: Nova Scotia, Halifax, Point Pleasant Park, 22. IX. 1938; 1 spn., in company with *Tomocerus minor* (LUBB.).

Tomocerus minor (LUBBOCK, 1862)

The American specimens of this species do not differ in their characters from the European ones. They have the dental spines uncoloured, distinctly tridentate, arranged in formula 3—4/3—5, 1 1 1, mucro 5 times shorter than dens, armed with 5—7 intermediate teeth, and unguis usually with 6 small teeth.

Loc.: Newfoundland, St. Georges, on tundra, 24. VIII. 1938; 1 spn.

Newfoundland, Bouring Park, under dead leaves, 11. IX. 1938; 2 sp.

Grande Miquelon-Isl., on the tundra-ground, 16. IX. 1938; 1 sp.

Saint Pierre-Isl., on the tundra, 17. IX. 1938; 7 sp.

Nova Scotia, Annapolis Royal, under stones and pieces of wood, 25. IX. 1938; 11 spns.

Tomocerus minor (LUBB.) is a species very common and widely distributed all over Europe and North America (USA, Canada), recorded also from Japan, Abyssinia and New Zealand.

***Lepidocyrtus cyaneus* TULLBERG, 1871**

The examined specimens of this species do not differ from those occurring in Europe. They have the mesothorax not prominent anteriorly, antennae scaleless, empodial appendage narrow, the body small, pale bluish coloured.

Loc.: Nova Scotia, Halifax, Point Pleasant Park, Martell Tower, on moist wall, 21. IX. 1938; spns.

Lepidocyrtus cyaneus TULLB. is a cosmopolitan, recorded from North America (USA, Canada, Greenland).

***Bourletiella spinata* (MACGILLIVRAY, 1893)**

Syn.: *Smynthurus spinatus* MACGILLIVRAY, 1893,

Bourletiella spinata FOLSOM, 1928

The specimens of this species caught in Newfoundland and Nova Scotia agree in all their body marks with those collected in Canada and many localities of USA, described more accurately by FOLSOM (1934) and MAYNARD (1951), lately also recorded by YOSII & LEE (1963) from Corea.

Bourletiella spinata MCGILL. is a supraquatic species very well adapted to life on the surface of the water, thanks to its dentes furnished at both sides with many long, specifically modified bristles, and by the broad mucro.

Loc.: Newfoundland, Deer Lake, on bank of lake, in forest, 1. IX. 1938; 1 spn.

Newfoundland, Port aux Basques, on bank of a small stream, 21. VIII. 1938; 1 spn.

Nova Scotia, Windsor, near to Three Mile Plains, on bank of a pond situated on a pasture, 23. IX. 1938.

Bourletiella spinata MCGILL. is an indigenous North American species restricted in its distribution to the middle part of this continent. It does not occur in high north of Canada and on arctic American islands. The specimens from Corea examined by YOSII & LEE were found in only one locality in two individuals and were doubtless introduced there by human transport.

***Allacma fusca* (L.)**

The species found in examined material in single specimen only is similar to European specimens in chaetotaxy. It is characterized by long, stout, finely rough setae on the head and on the body, fourth antennal joint composed

of 13 secondary joints, the claws with strongly developed tunica, the shape of empodial appendages, furcula and dark coloured body.

Loc.: Newfoundland, Corner Brook, on a tree trunk, 27. VIII. 1938; 1 spn.

Allacma fusca (L.) is widely distributed all over Europe and in North America (USA), recorded also from northern Africa.

Dicyrtoma minuta (O. FABR.)

The specimens from Nova Scotia, accurately examined, agree with the European ones in all morphological characteristics. Claws provided with distinct tunica, empodial appendage armed with inner tooth and long, sharply pointed filament, the blunt and smooth special seta on inner side of tibiotarsus of third pair of legs, lamellae of the mucro densely abundantly serrated, dental setae smooth or only with 2—3 minute teeth at their bases, and all setae on anal valves smooth.

The colour of animals is dirty yellowish. At posterior part of abdomen appears a longitudinal rectangular black patch dorsally. The second circular patch similarly coloured is located at dorsal side of anal segment.

Loc.: Nova Scotia, Halifax, Point Pleasant Park, Martella Tower, on moist wall, 21. IX. 1938, many specimens.

Dicyrtoma minuta (O. FABR.) is a common species, widely distributed all over Europe (From Lappland up to Spain and Italy), known also from Algeria and Iceland.

It was, moreover, registered from Argentina, New Zealand, South Africa and Japan.

Ptenothrix atra apigmentata ssp. n.

(Pl. XIV, figs. 1—4)

Antennae twice as long as the diameter of the head. Relative lengths of antennal joints in average are 1:8:9:1,6. First joint provided with 3—4 fine short setae. The second one has unequal edges and is armed besides common setae also with four stout bristles. The third joint in distal part subdivided into six secondary joints and provided with a knobby part at the tip. The fourth joint divided distinctly into basal part, two median secondary joints and conical apical part.

Eight ocelli on either side of the head, the central one and one adjacent, are distinctly smaller than the remaining ocelli.

Unguis slender, equally shaped on all legs, provided with two distinct inner teeth, two pairs of lateral ones and indistinct outer tooth. Empodial appendage also of equal shape on all the legs having on inner lamella a distinct spine and the subapical filament sharply pointed, longer than unguis. Clavate tenent hairs absent. Tibiotarsus of third pair of legs at inner side with two strong, long bristles distinctly serrated laterally.

Furcula well developed. Dens about as long as the second antennal joint, armed with 10 bristles at outer side, two basal of which are smooth and eight following ones ciliated dorsally to about half of their length. The ratio of lengths of four last distal outer bristles in average is 1:1:2,5:4. The number and shape of bristles at inner side of the dens is also similar, and the bristles are arranged in a row of 3, 2, 1, 1 1, ventrally. Mucro about 2,5—3 times shorter than dens, straight, gutterlike, densely serrated on both edges.

The arrangement of stout bristles on the head is shown in fig. 4. Anterior part of the dorsum with strong, straight macrochaetae arranged 2, 2, 2, 4 in a distance one beyond the other, farther in about half length of the dorsum a pair of fine trichobothria each located on a distinct papilla, and at posterior half of dorsum five pairs of minute spines and some fine curved hairs.

The arrangement of setae at the anal segment is shown in fig. 1. Two cross-rows of stout macrochaetae in the segment dorsally, anterior composed of three longer, posterior of two somewhat shorter ones. Behind the last ones a pair of long, very fine trichobothria. Closely to the upper limit of anal valvae, on either side, one long stout and one short macrochaetae are located. Across the upper edge of valva runs a row of seven long, strong, smooth bristles. Below this row is inserted in the middle on a distinct papilla a stiff, cylindrical, pointed apically, strong macrochaeta and a short seta on either its side in a distance. Each lateral valva with five lateral and two dorsal bristles, moreover, with a long, bristlelike, weakly curved anal appendage.

Ground colour yellowish at dorsal part of abdomen grayish. Antennae pale violet in proximal part, dark black-blue in distal part. Tibiotarsi of all legs pale violet too.

Body length 2,5 mm.

Loc.: Nova Scotia, Annapolis Royal, on a tree and stones near to a stream, 25. IX. 1938; 4 spns.

The here described specimens are in their body characteristics very similar to *Ptenothrix atra* (L.); but differ in colour distinctly from the European individuals of this species.

Ptenothrix atra (L.) is distributed all over central Europe, but not registered from North America, Greenland and arctic islands.

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STRESZCZENIE

Autor opisuje 15 gatunków *Collembola* z Nowej Fundlandii i jej sąsiednich mniejszych wysp. Są to pierwsi przedstawiciele *Collembola* z tej wyspy, wszystkie więc dla poznania fauny jej z tej grupy owadów nowe, a między nimi jeden gatunek *Entomobrya indigena* sp. n. dotychczas nie znany dla nauki. Z wyjątkiem dwóch wszystkie one należą zoogeograficznie do grupy elementów fauny europejskiej. Przeniesione zostały one na Nową Fundlandię prawdopodobnie ongiś przez okręty żaglowe płynące do Ameryki Północnej, obciążone balastem pobranym z wybrzeży europejskich.

РЕЗЮМЕ

Автор описывает 15 видов *Collembola* из Ньюфаундленда и соседних островов. Эти насекомые являются первыми представителями *Collembola* вышеупомянутого острова. Для познания фауны острова все они являются новыми, из них один вид *Entomobrya indigena* sp. n. до сих пор не был известен в науке. За исключением двух все они зоогеографически принадлежат к группе элементов европейской фауны. На Ньюфаундленд они попали вероятно при помощи парусных судов, направляющихся в Северную Америку, которые нагружались у европейских берегов.

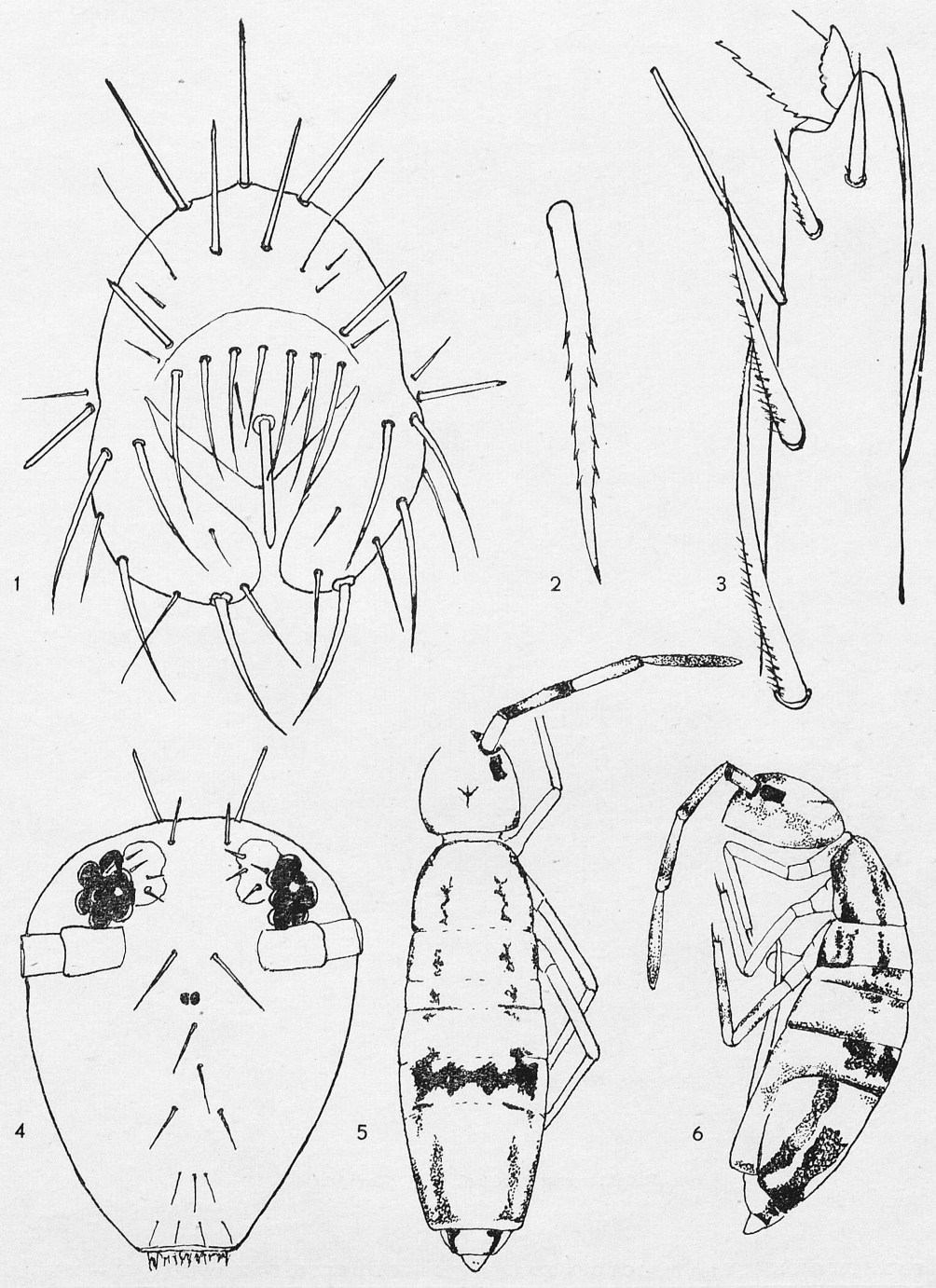
Plate XIV

Ptenotherix atra apigmentata ssp. n.

- Fig. 1. Anogenital segment;
- Fig. 2. Modified seta from tibiotarsus of third pair of legs;
- Fig. 3. Terminal part of dens;
- Fig. 4. The head.

Entomobrya indigena sp. n.

- Fig. 5. Dorsal view of animal;
- Fig. 6. Lateral view of animal.



Redaktor zeszytu: Prof. dr K. Kowalski

PAŃSTWOWE WYDAWNICTWO NAUKOWE — ODDZIAŁ W KRAKOWIE — 1966

Nakład 800+100 egz. — Ark. wyd. 0,75. — Ark. druk. $\frac{12}{16}$ — Papier ilustr. kl. III 80 g 70×100
Zam. 888/65 Cena zł 6,—

DRUKARNIA UNIWERSYTETU JAGIELLOŃSKIEGO W KRAKOWIE