FRESH-WATER CRUSTACEA FROM LABRADOR AND NEWFOUNDLAND.

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It is a well-established fact that the fauna of the eastern coast of boreal North America is very closely related to that of northern Europe in many ways. An additional evidence of this will be given here from the relationships of the minute fresh-water crustacea. Of the seven species of Cladocera, for instance, all are found in northern Europe. Certain of these are Arctic species, and in Europe are found only at higher latitudes, but that is simply an additional proof of the boreal character of our Labrador coast. As an example of this, *Eurycercus glacialis* is found only in the extreme northern border of Europe, very much farther north than the localities from which the present material came. *Macrothrix hirsuticornis* is recorded here for the first time from the Western Hemisphere. A single species of Ostracoda was obtained, but that in considerable numbers. It seems not to have been previously described, but is related to certain European species. The single species of Copepoda is also a species common to Europe and America.

The material on which the present paper is based has been presented to the U. S. National Museum. It was in six separate lots, five collected on the eastern coast of Labrador at about latitude 52° north, by Dr. Glover M. Allen. The other material was from Funk Island, a small island a considerable distance off the coast of Newfoundland and in about latitude 49° north. It was collected by Mr. Owen Bryant.

The data for these collections are as follows:

1. From St. Marys River, running into Lewis Inlet, Labrador, July 12, 1906. "Among grass with scum and Sphagnum."

2. From fresh-water pools on island, Battle Harbor, Labrador. July 14, 1906.

3. From two fresh-water pools on island, Battle Harbor, Labrador. July 14, 1906.

4. From small pond on the barren summit of Great Caribou Island, opposite Battle Harbor, Labrador. July 14, 1906.

5. From fresh-water pool, Battle Harbor, Labrador. August 1, 1906.

These five lots of material were collected by Dr. Glover M. Allen.

6. From fresh water or very slightly brackish pond, Funk Island, about 30 miles off the northern coast of Labrador. May, 1906. This last lot was collected by Mr. Owen Bryant.

Order OSTRACODA.

Family CYPRIDIDÆ.

Subfamily HERPETOCYPRIDINÆ.

Genus HERPETOCYPRIS Brady and Norman, 1889.

HERPETOCYPRIS TESTUDINARIA, new species.

Plate LVIII, figs. 1–10.

Length 2.10 mm.; height 1 mm.; breadth 0.80 mm.

Shell nearly twice as long as high, the greatest height behind the middle, the width somewhat less than the height (Plate LVIII, figs. 1 and 2). Surface of the shell with short scattered hairs (Plate LVIII, fig. 3), the anterior border minutely crenulated and thickly set with slender hairs. The lucid spots are eight in number, mostly very much longer than wide (Plate LVIII, fig. 4).

The antennula (Plate LVIII, fig. 5) has a single short spine on the second joint, two on the third joint, and on the fourth two long and two short setæ. The last three joints have each three long setæ.

The antenna (Plate LVIII, fig. 6) has the group of swimming setæ of the second joint shortened as is usual in this genus. The third joint has two setæ at the middle of the outer border and four on the opposite border. The arrangement of the other setæ is shown in the figure.

The first foot (Plate LVIII, fig. 7) has a single spine on each of the three joints above the last, that one having two spines and the long claw characteristic of this appendage.

The second foot (Plate LVIII, fig. 8) has a short last joint with a beak-shaped short claw and a single spine. The penultimate joint has a single spine at the middle. The antepenultimate joint has a single spine near the distal end and the basal joint has two spines at its distal end. The abdominal furca (Plate LVIII, fig. 9) is smooth throughout. At the base of the proximal one of the two claws is a short spine (Plate LVIII, fig. 10).

Specimens of this species were collected in May, 1906, by Mr. Bryant at Funk Island, Newfoundland.

Type.—Cat. No. 38339, U.S.N.M.

Order CLADOCERA.

Family DAPHNIDÆ.

Genus DAPHNIA O. F. Müller, 1785.

DAPHNIA PULEX (DeGeer.)

Plate LIX, figs. 1–3.

Monoculus pulex De Geer, Memoires pour servir a l'histoire naturelle des Insectes, VII, 1778, p. 442, pl. xxvii, figs. 1–8.

Daphnia pulex Baird, British Entomostraca, 1850, p. 89, pl. vi, figs. 1–3; pl. ix, fig. 5.—Lilljeborg, Cladocera Sueciæ, Nova Acta Reg. Soc. Sc. Upsala, 3d ser., XIX, 1900, p. 79, pl. ix, fig. 8; pl. x, figs. 1–9; pl. xi, figs. 1–11; pl. xii, figs. 1–13.

Length of female about 3.5 mm.

The outline of the females of this and other species varies according to the condition of the ephippium. A typical outline is shown in Plate LIX, fig. 1. The shell sculpture consists of two sets of straight lines at an oblique angle, forming a network with four-sided meshes. The outline of the head, (Plate LIX, fig 2,) has the rostrum more or less acuminate, by which it differs from its close ally, *D. atkinsoni* Baird. The basal line of the post-abdomen is nearly straight, thus easily separated from *D. magna* Strauss, which is very sinuate in outline. From the two common species, *D. hyalina* Leydig and *D. longispina*, O. F. Müller, it may be distinguished by the spines at the base of the furcal claws. (Plate LIX, fig. 3.)

This species was common in the material from Labrador, being found in four of the five lots of material. St. Marys River, July 12, 1906, common. Great Caribou Island, July 14, 1906, few. Battle Harbor, July 14, 1906, few. At this last place a little later in the season, August 1, 1906, the species was abundant and the young in all stages of development were found. No males were found in any of the material. This species is widely distributed both in the Old World and in America.

Genus SIMOCEPHALUS E. Schoedler, 1858.

SIMOCEPHALUS SERRULATUS (Koch).

Plate LIX, figs. 4, 5.

Daphnia serrulata Koch, Deutschlands Crustaceen, Myriapoden und Arachniden, 1841, Heft 35, pl. xiv.

Simocephalus serrulatus E. Schoedler, Die Branchipoden der Umgegend von Berlin, Jahresbericht über die Louisenstadtische Realschule, Berlin, 1858, p. 22.—Lilljeborg, Cladocera Sueciæ, Nova Acta Reg. Soc. Sc. Upsala, 3d ser., XIX, 1900, p. 179, pl. xxvi, figs. 9–16.

Length of females about 2.5 mm.

As in Daphnia, this species varies greatly in outline. In the specimen of which an outline is given (Plate LIX, fig. 4), there were several eggs in the ephippial sac, causing a distention of the body at the

upper posterior angle. This species may at once be distinguished from the other two common species, *S. vetulus* (O. F. Müller) and *S. expinosus* (Koch), by the head, which is decidedly angled below and has many small spines (Plate LIX, fig. 4). The sculpture of the shell consists of nearly parallel lines (Plate LIX, fig. 5), but anastomosing here and there and in certain parts of the shell making an irregular network.

This species was found in but one of the lots of material, that collected at St. Marys River, Lewis Inlet, Labrador, July 12, 1906. In this lot of material it was fairly well represented. No males were found. The distribution of this species includes Europe and both North and South America.

Family LYNCODAPHNIDÆ.

Genus OPHRYOXUS G. O. Sars, 1861.

OPHRYOXUS GRACILIS G. O. Sars.

Plate LIX, fig. 6; Plate LX, figs. 1–4.

Ofryoxus gracilis G. O. Sars, Om de i Omegnen af Christiana forekommende Cladocerer, Christiana Vidensk, Selsk. Fordhandl., 1861, p. 16.
Ophryoxus gracilis G. O. Sars, Oversigt af Norges Crustaceer (Branchiopoda, Ostracoda, Cirripedia), Christiana Vidensk. Selsk. Forhandl., 1890, No. 1, p. 45.—Lilljeborg, Cladocera Sueciæ, Nova Acta Reg. Soc. Sc. Upsala, 3d ser., XIX, 1900, p. 311, pl. li, figs. 6–11; pl. lii, figs. 1–10.

Length of females about 1.80 mm.

The outline of a female specimen of this species is shown in Plate LX, fig. 1. There is less variation in the outline of this species than in the two previously noted. The pigment fleck is small and close to the insertion of the antennula. The antennula (Plate LIX, fig. 6) is an organ of complicated structure. There is a double row of setæ along the proximal half of the inner margin, the distal portion being only slightly spinose, as is the whole of the outer margin. Very near the upper end is the sense seta, longer and somewhat stouter than the setæ of the inner margin. Close to this is a large pigment fleck which, in these specimens, seemed to be larger than those usually found in this species. At the distal end of the antennula are three lanceolate projections and several shorter, smaller ones. One point which has not been particularly noted is the peculiar median constriction in the lanceolate spines. This is shown in Plate LIX, fig. 6.

The post-abdomen (Plate LX, fig. 2) has, besides the strong terminal claws, a series of smaller projections. These are not smooth as usually shown but, as may be seen in the enlargement of the fourth projection (Plate LX, fig. 3), are fringed on the posterior border by filamentous projections decreasing in length toward the base. The various appendages have a complicated structure, as may be seen from the figure of the second foot (Plate LX, fig. 4).

This species was found in but one of the lots of material, that from St. Marys River, Labrador, July 12, 1906. But few specimens were present. The small number of specimens found is surprising, as this species is a northern one, being found in the northern part of Europe and America.

Genus MACROTHRIX Baird, 1843.

MACROTHRIX HIRSUTICORNIS Norman and Brady.

Plate LX, figs. 5–7; Plate LXI, fig. 1.

Macrothrix hirsuticornis Norman and Brady, A Monograph of the British Entomostraca, Nat. Hist. Trans. of Northumberland and Durham, I, 1867, p. 10, pl. xxiii, figs. 6, 7.—Lilljeborg, Cladocera Sueciæ, Nova Acta Reg. Soc. Sc. Upsala, 3d ser., XIX, p. 346, pl. v, figs. 6–14.

Length of females a little less than 1 mm.

The general appearance of this species is shown in Plate LX, fig 5. The pigment fleck is nearly as large as the eye and is directly below it. The antennula (Plate LX, fig. 6) is long and club-shaped with a long sensory seta near the proximal end. The anterior margin has several rows of short setæ increasing in number in the rows as the distal end is approached. The posterior margin is nearly smooth. At the distal end of the antennula are two long lanceolate projections and several shorter more slender ones.

The antenna (Plate LXI, fig. 1) has the outer two joints of each ramus with a series of short setæ. The three-jointed ramus has a long process from the basal joint with short spines instead of the ciliary setæ of the others. The post-abdomen is shown in Plate LX, fig. 7.

A few specimens of this species were found in the material from Funk Island, Newfoundland, collected by Mr. Bryant, May, 1906.

This species is widely distributed in the Old World but has not previously been reported from America. In some of its characters this approaches the more northern forms of the species.

Genus ACANTHOLEBERIS W. Lilljeborg, 1853.

ACANTHOLEBERIS CURVIROSTRIS (O. F. Müller).

Plate LXI, figs. 2–4.

Daphne curvirostris O. F. Müller, Zoologiæ Danicæ Prodromus, 1776, p. 200, No. 2403.

Acantholeberis curvirostris Lilljeborg, De Crustaceis ex ordinibus tribus; Cladocera, Ostracoda, et Copepoda, in Scania occurrentibus, 1853, p. 52, pl. iv, figs. 5–7; pl. xxiii, figs. 10, 11; Cladocera Sueciæ, Nova Acta Reg. Soc. Sc. Upsala, 3d ser., XIX, 1900, p. 375, pl. lvii, fig. 17; pl. lviii, figs. 1–17.

Length of females about 1.5 mm.

The outline and general appearance of this species is shown in Plate LXI, fig. 2. The eye is large and the pigment fleck very small

and close to the point of the rostrum. The antennula (Plate LXI, fig. 3) is claviform with the anterior border set with short spines throughout its length. The sensory seta is near the proximal end. The distal end of the antennula is obliquely truncate, slightly spinose, especially on the posterior angle, and with about nine lanceolate processes of varying lengths. The antennæ (Plate LXI, fig. 4) have the margins of the joints spinose. From the basal joint of the three-jointed ramus is a long process, longer than any of the others and much stouter. The outer joint of this is armed with short, stout spines.

A few specimens of this species were found in the material from Great Caribou Island, opposite Battle Harbor, Labrador, July 14, 1906. This species is widely distributed in Europe and North America.

Family LYNCEIDÆ.

Genus EURYCERCUS Baird, 1843.

EURYCERUS GLACIALIS Lilljeborg.

Plate LXI, fig. 5; Plate LXII, figs. 1–3.

Eurycercus glacialis LILLJEBORG, Contributions to the Natural History of the Commander Islands, On the Entomostraca collected by Mr. Leonhard Stejneger, on Bering Island, 1882–83, Proc. U. S. Nat. Mus., X, 1887, p. 154; Cladocera Sueciæ, Nova Acta Reg. Soc. Sc. Upsala, 3d ser., XIX, 1900, p. 393, pl. LX, fig. 11, pl. LXI, figs. 1–13.

Length of females about 4.5 mm.

This is the largest species in the collections and one of the largest of the Cladocera. The outline and general appearance is shown in Plate LXII, fig. 1. The pigment fleck is small and placed some distance back from the rostrum. The ornamentation of the shell is made up of a network of irregular polygonal meshes (Plate LXII, fig. 3). The antennula (Plate LXI, fig. 5) is broadest near the basal portion and then gradually tapers toward the outer end. It is marked by rows of fine setæ arranged in three rows as seen from one side. The distal end has a number of short spinose projections, and at the end of the antennula are inserted a number of elongated projections. The sense seta is close to the distal end of the antennula, thus differing from *E. lamellatus* (O. F. Müller), which has it at about the middle and broadest part. The post-abdomen (Plate LXII, fig. 2) is large and bordered by a row of closely set teeth. The borders of this part of the animal are much thicker and darker in color than in the common species *E. lamellatus* (O. F. Müller).

A number of specimens of this species were found by Doctor Allen at Battle Harbor, Labrador, on July 14 and August 1, 1906, and on Great Caribou Island July 14, 1906.

This species was originally described from Bering Island, one of the Commander Islands off Alaska. It has also been found in Greenland, Nova Zembla, and along the Arctic coast of northern Europe. It is clearly an Arctic species and its occurrence in southern Labrador is only an added indication of the boreal conditions there, although so much farther south than most of the previous records.

Genus CHYDORUS Leach; Baird 1843.

CHYDORUS SPHÆRICUS (O. F. Müller).

Plate LXII, fig. 4.

Lynceus sphæricus O. F. Müller, Entomostraca seu Insecta testacea, quæ in aquis Daniæ et Norvegiæ reperit, descripsit, et iconibus illustravit, 1785, p. 71, pl. IX, figs. 7–9.

Chydorus sphæricus Baird, British Entomostraca, 1850, p. 126, pl. XVI, fig. 8.—Lilljeborg, Cladocera Sueciæ, Nova Acta Reg. Soc. Sc. Upsala, 3d ser., XIX, 1900, p. 561, pl. LXXVII, figs. 8–25.

Length of females about 0.40 mm.

This small species is to be looked for in every collection of Cladocera, as it has a worldwide distribution, being found in North and South America, Europe, Africa, Asia, and Australia. It is found far inside the Arctic Circle in Spitzbergen and Nova Zembla, and in warmer regions such as Algiers and Senegal. A number of specimens were obtained at Funk Island, Newfoundland, by Mr. Bryant in May, 1906. It was not obtained at Labrador, probably because no bottom material was taken, the forms being all surviving species and taken with a net. The post-abdomen is shown in Plate LXII, fig. 4.

Order COPEPODA.

Family CALANIDÆ.

Genus DIAPTOMUS Westwood, 1836.

DIAPTOMUS EISENI Lilljeborg.

Plate LXII, figs. 5, 6.

Diaptomus ciseni Lilljeborg, in De Guerne, J., and Richards, J.; Revision des Calanides d'eau douce, Mém. Soc. Zool. Fr., II, 1889, p. 96, pl. I, figs. 19, 20, 33.

Length of males about 3.5 mm.

The fifth feet of the male of this species are shown in Plate LXII, fig. 6, and the tip of one of the stylets in fig. 5. This is a comparatively large species and was found in considerable numbers by Doctor Allen at Battle Harbor, Labrador, July 14, 1906. The species is common to Europe and America, and is widely distributed in this country. For help in the identification of this species I am indebted to Mr. A. S. Pearse, to whom specimens were submitted.

EXPLANATION OF PLATES.

PLATE LVIII.

Herpetocypris testudinaria, new species.

Fig. 1. Shell from side. × 20.
2. Shell from below. × 20.
3. Anterior border of shell. × 45.
4. "Lucid spots" of shell. × 45.
5. Antennula. × 75.
6. Antenna. × 75.
7. First foot. × 75.
8. Second foot. × 75.
9. Abdominal furca. × 75.
10. Tip of furca. × 100.

PLATE LIX.

Daphnia pulex (De Geer).

Fig. 1. Outline of female from side. × 25.
2. Outline of head of female from side. × 55.
3. Furca of female. × 55.

Simocephalus serrulatus (Koch).

4. Outline of female from side. × 25.
5. Shell sculpture. × 25.

Ophryoxus gracilis G. O. Sars.

6. Antennula of female. × 125.

PLATE LX.

Ophryoxus gracilis G. O. Sars.

Fig. 1. Outline of female from side. × 25.
2. Furca of female. × 125.
3. Fourth small claw of furca. × 240.
4. Second foot of female. × 125.

Macrothrix hirsuticornis Norman and Brady.

5. Outline of female from side. × 55.
6. Antennula of female. × 125.
7. Furca of female. × 90.

PLATE LXI.

Macrothrix hirsuticornis Norman and Brady.

Fig. 1. Antennæ of female. × 90.

Acantholeberis curvirostris (O. F. Müller).

2. Outline of female from side. × 55.
3. Antennula of female. × 240.
4. Antenna of female. × 55.

Eurycercus glacialis Lilljeborg.

5. Antennula of female. × 125.

PLATE LXII.

Eurycercus glacialis Lilljeborg.

Fig. 1. Outline of female from side. × 20.
2. Post abdomen of female. × 40.
3. Shell sculpture. × 55.

Chydorus sphæricus (O. F. Müller).

4. Furca of female. × 240.

Diaptomus eiseni Lilljeborg.

5. Caudal stylet of male. × 55.
6. Fifth feet of male. × 55.