

## Some new localities for *Polyartemia forcipata* Fischer and *Branchinecta paludosa* (O. F. Müll.) in Sweden.

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During zoological excursions in northern Sweden last summer I had the opportunity of observing the two above named arctic Phyllopods. The hitherto but little studied distribution of these animals in Sweden as well as the fact, that my own localities are situated, for *Polyartemia* nearly two and for *Branchinecta* more than four parallels farther to the south of the previously known, are the reasons for this little paper.

The two Phyllopods are found in the province of Härjedalen, the southernmost arctic alp-region in Sweden. They are observed in the northern part of the highplateau, that is extending round the mountain Helagsfjället (about lat.  $62^{\circ} 55'$  N.). The height of the alp-plateau above the level of the sea (from about lat.  $62^{\circ} 43'$ — $62^{\circ} 55'$  N.) varies a little between 900 and 1100 meters, the southern part descending into Regio subalpina (the birch zone), the most part of the plateau, however, being situated above the limit of trees (Regio alpina, including the willow and lichen zones). Regio alpina is the specific »arctic zone» (EKMAN), the true high-alp. This region especially affords pure arctic conditions. The snow-melting here takes place very late in the year, and in the middle of July snowdrifts still are remaining at many places, often on the shores of the highest ponds and lakes, and in some of them ice-floes are swimming about. At a height of 1000—1100 metres spring generally comes in the end of

June. But most waters are by this time fully thawed, and, though often fed with cold ice-water, the animal life is already in developing. The waters are also, as the case generally is in this zone, very small and are therefore quickly heated up.

*Polyartemia forcipata* FISCHER. — I have met with this species at only one locality, a small, rather deep pond (one of the Folo-ponds) in Regio subalpina (900 m. above the



Fig. 1. Map, showing the distribution of *Polyartemia forcipata* in Scandinavia.

sea-level) about 5 km. in the south of Mittåkläpp, Härjedalen (lat.  $62^{\circ} 43' N.$ ). The animals were seen in great abundance, males and females being found in almost equal numbers. Also very young and small specimens were rather common. The muddy bottom was covered with a thick deposit of old leaves from the surrounding thickets of *Salix lapponum*. At 12,30 p. m. the temperature was found to be  $+21^{\circ} C.$  by the shore, though the little lake was fed by a melting snow-drift close to it. The lake belongs to those, which do not

dry up at the end of the summer. EKMAN says he has also found the species in similar waters. — The animals were caught on July 6th.

*Branchinecta paludosa* (O. F. MÜLL.). — A great many specimens of this form were captured in a very shallow pond (depth 20 cm.) at a height of 1033 metres in Regio alpina close to the northern base of Helagsfjäll (on the 8th of July). Besides males and females, which were equally com-

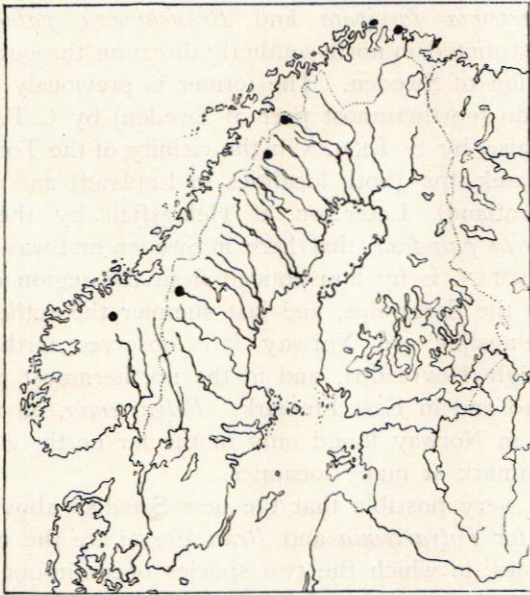


Fig. 2. Map, showing the distribution of *Branchinecta paludosa* in Scandinavia.

mon, I also saw many young individuals, the smallest being about 4 à 5 mm. in length. Certain details seem to indicate that even the greatest specimens observed had not reached their maximum size; so, for instance, the sac-like marsupium of the female was not yet so much prolonged and did not hold any eggs. Owing to the sunny position of the pond and the very shallow water it was heated very quickly to considerable temperatures; so was the temperature of the water +18° C. at 10 a. m. and +22° C. four hours later

(on July 9th). EKMAN tells us, he has never found this species in water warmer than  $+14^{\circ}$  C. It seems therefore in the region of Helagsfjäll to be exposed to less arctic conditions than farther north. But for all that this animal, as also *Polyartemia forcipata*, must be looked upon as a real arctic species. Besides in the above named pond, I saw the creature also close to the south of the mountain in two other, though not so extremely heated waters. All of them are drying up later in the year.

*Polyartemia forcipata* and *Branchinecta paludosa* are widely distributed in north-southerly direction through the arctic alproregion of Sweden. The former is previously found at Karesuando (northernmost part of Sweden) by C. P. LÆSTADIUS, as also by S. EKMAN in the vicinity of the Torne träsk, in the Sarek-alps (both localities in Lapland) and at Frostviken (Jämtland). Later on at Helagsfjäll by the author. *Branchinecta paludosa*, that here in Sweden first was captured by S. EKMAN, is by him noticed from the region of Torne träsk and the Sarek-alps, and last summer the author caught it at Helagsfjäll. In Norway it is observed farther south in the high Dovre-alps, and in the northernmost part, too, on Magerö and in East Finmark. *Polyartemia*, on the other hand, is in Norway found only in the far north, viz. in the whole Finmark at many localities.

It is very possible that the new Swedish above named localities for *Polyartemia* and *Branchinecta* are the most southernly ones, in which the two species occur in our country. But at the present state of our knowledge it is too early to decide, whether the area of distribution is fully continuous or not. Between the two southern Swedish localities for *Polyartemia* (see map 1) there is a lower portion of our country (the province of Jämtland), a wide alp-pass with only certain mountain tops reaching up into the birch and the arctic zone. *Branchinecta* in the Dovre mountains in Norway is by SARS regarded as being a glacial relic from the ice age. Perhaps a more careful investigation may show that also the locality at Helagsfjäll is isolated from the northern area of distribution.

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