

Received : 1 April 1996

**DESCRIPTION OF
LEPADELLA DERIDDERAE DERIDDERAE N. SP.,
N. SUBSP. AND *L. DERIDDERAE ALASKAE* N. SP., N. SUBSP.
(ROTIFERA : MONOGONONTA, COLURELLIDAE)**

HENDRIK SEGERS*, WILLEM H. DE SMET** AND DRIES BONTE*

*Laboratory of Animal Ecology, Zoogeography and Nature Conservation,
Department M.S.E, (R.U.G.), K.L. Ledeganckstraat 35, B-9000 Gent (Belgium)

**Department of Biology, University of Antwerpen, (R.U.C.A.).
Groenenborgerlaan 171, B-2020 Antwerpen (Belgium)

Abstract. A new species of *Lepadella*, *L. deridderae* n.sp., and two of its subspecies, *deridderae* and *alaskae* are described from a temporary pond in the «Westhoek» Nature Reserve, De Panne, Belgium, and a trench of a tundra polygon at Point Barrow, Alaska. The new species belongs to the group of *L. triptera*, and is diagnosed by having five dorsal carinas.

Key-words : Rotifera, *Lepadella deridderae deridderae*, *L. deridderae alaskae*, new species, new subspecies, Belgium, Alaska.

INTRODUCTION

In spite of the increase in knowledge of the systematics, biogeography and ecology of Rotifera, the subject is still in a fragmentary state. Large areas of the world, such as the Arctic have received little attention, and even in areas that have been extensively investigated many habitats have been overlooked. In Belgium as almost everywhere, most sampling efforts (see check-lists of Belgian Rotifera in DE RIDDER, 1989, 1992) have been directed to planktonic habitats. It was therefore not surprising to find a new species in periphytic habitats from both Belgium and Alaska. Moreover, we hypothesize that the morphological differences between specimens from both localities reflect a taxonomic separation at the subspecies level. The new taxa are described and illustrated here.

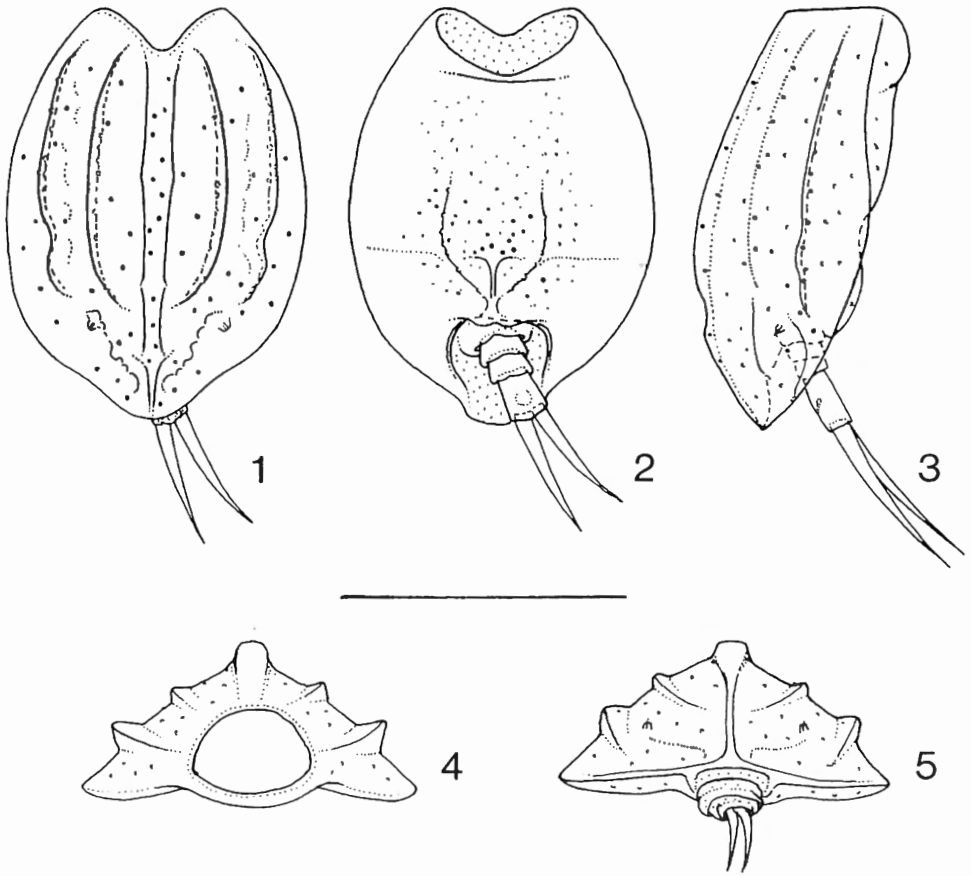
DESCRIPTIONS

***Lepadella deridderae deridderae* sp. nov., subsp. nov.**

Material examined

Holotype: (K.B.I.N.-I.r.Sc.N.B. nr. IG 28312 RIR 63) and paratype (slightly damaged specimen, in R.U.G.), permanent glass slide. Material collected on 7 April 1995.

Type locality: temporary pond in unmown, old-stabilized wet dip in the «Westhoek» Nature Reserve, De Panne, Belgium.



Figs 1-5. — *Lepadella deridderae deridderae* n. sp., n. subsp., holotype (Belgium). — 1. Dorsal view. — 2. Ventral view. — 3. Lateral view. — 4. Frontal view. — 5. Caudal view. (Scale bar 50µm).

Description

Parthenogenetic female : lorica about one and a half times as long as wide, twice as wide as high. Lateral margins smoothly curved. Ventral lorica flat, weakly pustulated, especially mid-ventrally. A transverse depression present anterior to the foot aperture. Foot aperture squarish, slightly narrowing to posterior. A broad, bilobate projection overlies the anterior rim of the foot aperture. Ventral head aperture margin relatively shallow and

broad, with weak transverse ridge posterior to the margin. Dorsal head aperture margin concave. Dorsal lorica pustulated, with five ridges. Mid-dorsal carina blunt, slightly dilated anteriorly and weakly notched at the level of the foot aperture. Intermediate carinas relatively weakly developed, curved. Lateral carinas curved, with a notch in the posterior half of the lorica. Both intermediate and lateral carinas end anteriorly to the slightly projecting apertures of the lateral antennae. Foot with three pseudosegments, the distal one about twice the length of the basal or median one, and with a transverse slit dorsally. Toes elongate, weakly curved ventrad, smoothly tapering to an acute point distally. Male unknown.

Dimensions. Lorica length 73µm, width 53µm, height 29µm; foot aperture length 18µm, width 17µm; head aperture depth 11µm, width 24µm, height 15µm; last foot pseudosegment length 11µm, toes 30µm.

Etymology

The species and nominotypical subspecies is named after Dr Margaretha De Ridder, in recognition of her important contributions to rotiferology.

Lepadella deridderae alaskae sp. nov., subsp. nov.

Material examined

Holotype: (K.B.I.N. - I.r. Sc. N.B. nr. I.G. 28.397) and 3 paratypes (in R.U.C.A.), mounted on glass slides in glycerine. Material collected on 17 July 1994.

Type locality: among submerged mosses in trench of tundra polygon, Point Barrow, Alaska.

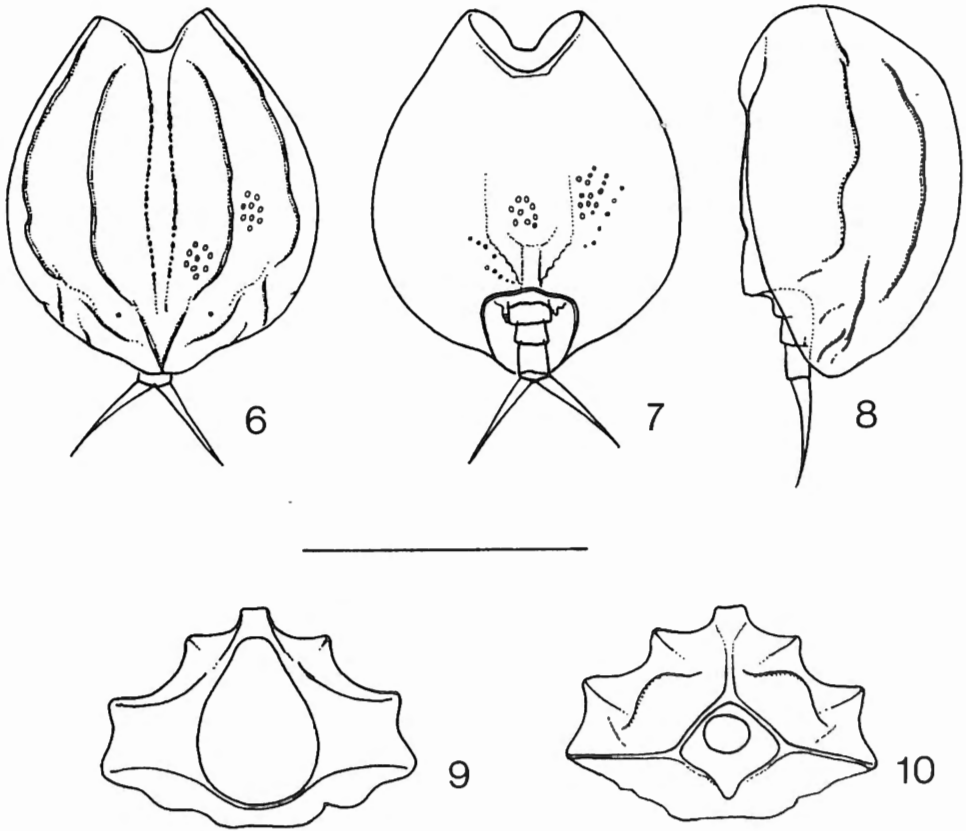
Description

The Alaskan specimens differ from the Belgian ones in the following characters. The lorica is distinctly higher and appears broader owing to its shorter length (ratio lorica length:lorica width = 1.20, 1.38 in *L.d. deridderae*). In dorsal view it narrows more quickly anteriorly, taking a more obovoid shape. The ventral lorica is more protrusive with a flattened median area, ca. 1/3 the width of the lorica. The foot aperture is preceded by a more distinct, short keel. The head aperture is much higher and obpyriform. Ventral sinus narrower; ridge posterior to the margin with rounded corners postero-laterally. The overall pattern of the dorsal carinas is fairly similar. However, the intermediate and lateral carinas are much more pronounced, and six short, symmetrically placed fainter ridges are present distally. Intermediate carina slightly indented near mid-length. Mid-dorsal carina slightly concave; its dorsal margins bordered by pustules. The toes are distinctly shorter. Male unknown.

Dimensions. Lorica length 65-68µm, width 55µm, height 37-40µm; foot aperture length 16µm, width 17µm; head aperture depth 11µm, width 19-21µm, height 29-30µm; last foot pseudosegment 6-7µm; toes 18-20µm.

Etymology

The subspecies name *alaskae* is derived from the name of the state (Alaska, U.S.A.) in which the type locality is situated.



Figs 6-10. — *Lepadella deridderae alaskae* n. sp., n. subsp., holotype (Alaska). — 6. Dorsal view. — 7. Ventral view. — 8. Lateral view. — 9. Frontal view. — 10. Caudal view. (Scale bar 50 μ m).

DISCUSSION

Differential diagnosis

Lepadella deridderae n.sp. belongs to the *L. triptera* (EHRENBERG, 1830) species group. It can not be confused with any of its close relatives, as the presence of five dorsal carinas is unrecorded for any of these. Only *Lepadella quinquecostata* (LUCKS, 1912) (figs 10a-g in SEGERS *et al.*, 1992) also has five dorsal carinas, but the two differ in several aspects:

- the head aperture has sharp lateral projections, and a punctated collar in *L. quinquecostata*, neither character is present in *L. deridderae*;
- the mid-dorsal carina is blunt in *L. deridderae*, sharp in *L. quinquecostata*;
- the intermediate carinas are relatively weak in *L. deridderae*; they are similar to the median and the lateral in *L. quinquecostata*;
- the lateral carinas are notched in the posterior half of the body in *L. deridderae*, regularly curved in *L. quinquecostata*;
- the foot aperture is relatively wider in *L. deridderae* than in *L. quinquecostata*, and a posterior, rounded projection of the dorsal plate is present in *L. deridderae*, absent in *L. quinquecostata*;
- *L. deridderae* is smaller (lorica length up to 73 µm) than *L. quinquecostata* (lorica length 92-112 µm after KOSTE, 1978);
- the lorica is pustulated in *L. deridderae*, smooth in *L. quinquecostata*.

Ecology and distribution

Lepadella deridderae deridderae was found during April in a temporary pond, produced by inundation of a unmown depression in an area of stabilized dunes. Inundation of this depression is not an annual phenomenon, but occurs irregularly and only after periods of strong precipitation such as occurred during the winter of 1994-1995. The accompanying rotifer fauna were *Brachionus urceolaris* (O.F. MÜLLER, 1773), *Cephalodella catellina* (O.F. MÜLLER, 1786), *C. gibba* (EHRENBERG, 1832), *Euchlanis dilatata* Ehrenberg, 1832, *Itura* cf. *aurita* (EHRENBERG, 1830), *Lecane* cf. *haliclysta* HARRING & MYERS, 1926, *Lepadella patella* (O.F. MÜLLER, 1786), *L. quadricarinata* (Stenroos, 1898), *L. triba* Myers, 1934, *L. triptera* (EHRENBERG, 1830), *Lophocharis salpina* (EHRENBERG, 1834), *Mytilina mucronata* (O.F. MÜLLER, 1773), *Notholca squamula* (O.F. MÜLLER, 1786), *Testudinella reflexa* (GOSSE, 1887), *Trichocerca rattus* (O.F. MÜLLER, 1776), *T. relicta* (DONNER, 1950), *T. vernalis* Hauer, 1936.

Lepadella deridderae alaskae was found during July among submerged mosses in the trench of an ice wedge polygon. The depth of water was 10cm, water temperature 4.7°C, pH 6.7, and conductivity 98 µScm⁻¹. The accompanying rotifer fauna were: *Bryceella stylata* (MILNE, 1886), *Cephalodella auriculata* (O.F. MÜLLER, 1773), *C. gibba* (EHRENBERG, 1832), *Collotheca* sp., *Colurella uncinata* (O.F. MÜLLER, 1773), *Gastropus stylifer* Imhof, 1891, *Lecane arcuata* (BRYCE, 1891), *L. cf. patella* (O.F. MÜLLER, 1786), *Mytilina mucronata* (O.F. MÜLLER, 1773), *Pleurotrocha chalicodes* MYERS, 1933, *Trichocerca* spp.

The presence of the species in arctic Alaska and its occurrence during the cold season in Belgium, suggests that it may be cold stenotherm.

Remark on taxonomy

Evidence is accumulating that several rotifer species, that are described as having a cosmopolitan distribution, or have been observed from a wide range of sites across several continents, actually represent a complex of morphologically similar but separate sub-

species or species. Indications of such divergence for European and North American populations of rotifer species have been found by *e.g.* CHENGALATH & KOSTE (1988) and DE SMET & BEYENS (1996). The new *Lepadella deridderae* might be another example of such species complexes.

ACKNOWLEDGEMENTS

We thank Prof. Dr. L. Beyens for providing Alaskan samples, and Prof. Dr. E. Schockaert for comments on the manuscript. Mrs. S. Pooters typed the manuscript. This study was partially supported by a R.A.F.O. fund awarded by R.U.C.A.

REFERENCES

- CHENGALATH, R. & W. KOSTE (1988) – Composition of littoral rotifer communities of Cape Breton Island, Nova Scotia, Canada. *Verh. Internat. Verein. Limnol.*, **23** : 2019-2027.
- DE RIDDER, M. (1989) – De huidige stand van het raderdieronderzoek in België. *Verhandelingen symposium «Invertebraten van België»*: 31-41.
- DE RIDDER, M. (1992) – Distribution of Belgian Rotifera. *Proc. 8th Internat. Coll. European Invertebrate Survey, Brussels, 9-10 September 1991*: 199-212.
- DE SMET, W.H. & L. BEYENS (1996) – Rotifers from Victoria Island (N.W.T., Canadian Arctic). *Intern. J. Meiofaun. Zool.* (in press).
- KOSTE, W. (1978) – Rotatoria. Die Rädertiere Mitteleuropas begründet von Max Voigt. Monogononta. 2. Aufl., I. Textband, 673 pp., II. Tafelband, 234 Taf., Gebr. Borntraeger, Berlin, Stuttgart.
- SEGERS, H., N. EMIR & J. MERTENS (1992) – Rotifera from north and northeast Anatolia (Turkey). *Hydrobiologia*, **245** : 179-189.