ISSN 0031-0301, Paleontological Journal, 2014, Vol. 48, No. 2, pp. 177–181. © Pleiades Publishing, Ltd., 2014.
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New Ostracodes of the Families Loxoconchidae and Trachyleberididae from the Barremian–Albian of Southwestern Crimea

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Received December 28, 2012

Abstract—New species of ostracodes of the families Loxoconchidae Sars, 1925 and Trachyleberididae Sylvester-Bradley, 1948 are described from the Upper Barremian–Albian sediments of southwestern Crimea. *Loxoella*? *macrofoveata* sp. nov. and *L*.? *microfoveata* sp. nov. belong to the family Loxoconchidae. *Exophthalmocythere posteropilosa* sp. nov. belongs to the family Trachyleberididae.

Keywords: ostracodes, Loxoconchidae, Trachyleberididae, Barremian, Aptian, Albian, Crimea
DOI: 10.1134/S0031030114020063

INTRODUCTION

New taxa of ostracodes (Crustacea) are described here from the Barremian–Albian deposits of southwestern Crimea. In our previous paper (Karpuk and Tesakova, 2013), we described in detail the history of the study of the Lower Cretaceous ostracodes of the Crimea–Caucasus region and the technique of extracting them from the rock; we also described in that paper a new genus and several new species of the family Cytheruridae G. Müller, 1894. In this paper, ostracodes of the families Loxoconchidae Sars, 1925 and Trachyleberididae Sylvester-Bradley, 1948 are described.

The studied material was collected in Upper Barremian, Aptian, and Albian deposits of the sections Verkhorech'e and Mar'ino, southwestern Crimea, partitioned by ammonites, foraminifers, and nannoplankton according to Gorbachik and Kazintsova (1998), Yanin and Baraboshkin (2000), Baraboshkin et al. (2004), Yampolskaya et al. (2006), and Mikhailova and Baraboshkin (2009).

Ostracode shells were photographed under a scanning microscope in the Instrumental Analytics Room, Borissiak Paleontological Insititute, Russian Academy of Sciences, and in the Local Substance Study Methods Laboratory, Moscow State University.

The system of suprageneric taxa accepted in this study follows Nikolaeva and Andreev (1999). The following abbreviations are used: (L) shell length, (H) shell height, (T) shell thickness. The sizes of ostracode shells are ranked as follows: small, up to 0.3 mm; medium, 0.3–0.5 mm; large, 0.5–1.0 mm.

MATERIAL

The ostracod collections are stored at the Department of Paleontology, Faculty of Geology, Moscow State University, nos. 328-V1, 328-M1, 328-M2, 328-M3, and 328-P1.

SYSTEMATIC PALEONTOLOGY

Order Podocopida

Family Loxoconchidae Sars, 1925

Genus *Loxoella* Kuznetsova, 1956

***Loxoella*? *macrofoveata* Karpuk et Tesakova, sp. nov.**

Plate 12, figs. 1–4

Etymology. From the Latin *foveatus* (pitted) and Latinized Greek *macrus* (large).

Holotype. KP MGU, no. 328-M3-46, female right valve; southwestern Crimea, Mar'ino section, bed 3, sample 108 (Karpuk and Kosorukov, 2012); Lower Cretaceous, Albian, *Pervinqueria inflata* ammonite zone, beds with foraminifers *Hedbergella infracretacea–H. globigerinellinoides*.

Description. The shell is small, irregular oval, strongly convex. The maximum length is in the central part of the shell; maximum height is in the anterior third; greatest convexity is in the lower part of the posterior third. The left valve is slightly larger than the right valve and overlaps it on the anterodorsal and pos-

terodorsal margins. The dorsal margin of the right valve is straight; the dorsal margin of the left valve is slightly concave in the posterior third, meets the anterior margin arcuately, and meets the posterior margin at a blunt angle; in the right valve, the dorsal margin has blunt angles at both ends. The ventral margin is straight or weakly concave in the anterior third has a smooth transition to the posterior and a more curved transition to the anterior. The anterior is high, smoothly arcuately rounded, weakly slanting dorsally. The posterior is lower than the anterior, also smoothly rounded, but more strongly slanting ventrally, which makes it asymmetrical. The posterior is strongly flattened; the anterior is weakly flattened or not flattened. In the central part of the shell, a conical wing-like process is present; the anterior surface of the cone is convex and smoothly straightening towards the anterior; the posterior surface is weakly convex or straight and strongly inclined towards the posterior.

The valve sculpture is represented by foveae of various sizes. The largest foveae are positioned on the conical process, becoming gradually smaller towards the margins. The foveae are chaotically arranged in the center of the valve and form concentric rows on the periphery.

Measurements, mm:

Specimen KP MGU, no.	L	H	T
328-P1-3	0.19	0.12	–
328-M3-46 (Holotype)	0.31	0.18	–
328-M1-65	0.24	0.14	–
328-P1-4	0.27	–	0.15

Variation. The species varies in the stronger or weaker convexity of the wing-like process, from a clearly pronounced wing to a tubercle; it also varies in the degree of flattening of the anterior.

Comparison. The new species differs from *L. inviolata* Kuznetsova, 1956 from the Barremian deposits of Azerbaijan (Kuznetsova, 1956, p. 57, pl. 3, figs. 1–4), which is similar to the new species in the shell shape and sculpture, in the absence of a pronounced ocular tubercle and presence of the conical process. It differs from *L. microfoveata* sp. nov. which is similar to *L. macrofoveata* in the shape of the conical process and pattern of foveate sculpture, in the larger foveae, absence of the rib along the outline of the conical process, and concavity of the dorsal margin.

Remarks. The placement of the new species in the genus *Loxoella* is not entirely reliable, because the preservation of the material makes it impossible to examine the structure of the hinge and of the inner lamella.

Occurrence. Late Aptian–Albian; southwestern Crimea.

Material. Four well-preserved valves from the Lower Cretaceous, Upper Aptian (*?Nolaniceras nolani* ammonite zone, nannoplankton zone NC7) and two well-preserved valves from the Albian (*Pervinqueria inflata* ammonite zone, beds with foraminifers *Hedbergella infracretacea–H. globigerinellinoides*), Mar'ino section.

***Loxoella*? *microfoveata* Karpuk et Tesakova, sp. nov.**

Plate 12, figs. 5–9

Etymology. From the Latin *foveatus* (pitted) and Latinized Greek *micrus* (small).

Holotype. KP MGU, no. 328-M1-62, female left valve; southwestern Crimea, Mar'ino section, bed 3, sample 107 (Karpuk and Kosorukov, 2012); Lower Cretaceous, Albian, *Pervinqueria inflata* ammonite zone, beds with foraminifers *Hedbergella infracretacea–H. globigerinellinoides*.

Description. The shell is small, irregular oval, strongly convex. The left valve overlaps the right valve on anterodorsal and posterodorsal margins; simultaneously the right valve overlaps the left valve along the dorsal margin. The maximum length is in the middle of the shell height; maximum height of the left valve is in the anterior third; maximum height of the right valve is in the middle of the valve; greatest convexity is in the posteroventral third. The dorsal margin of the right valve is arched; the dorsal margin of the left valve is almost straight, smoothly meets both ends. The ventral margin is weakly concave in the anterior third, has

Explanation of Plate 12

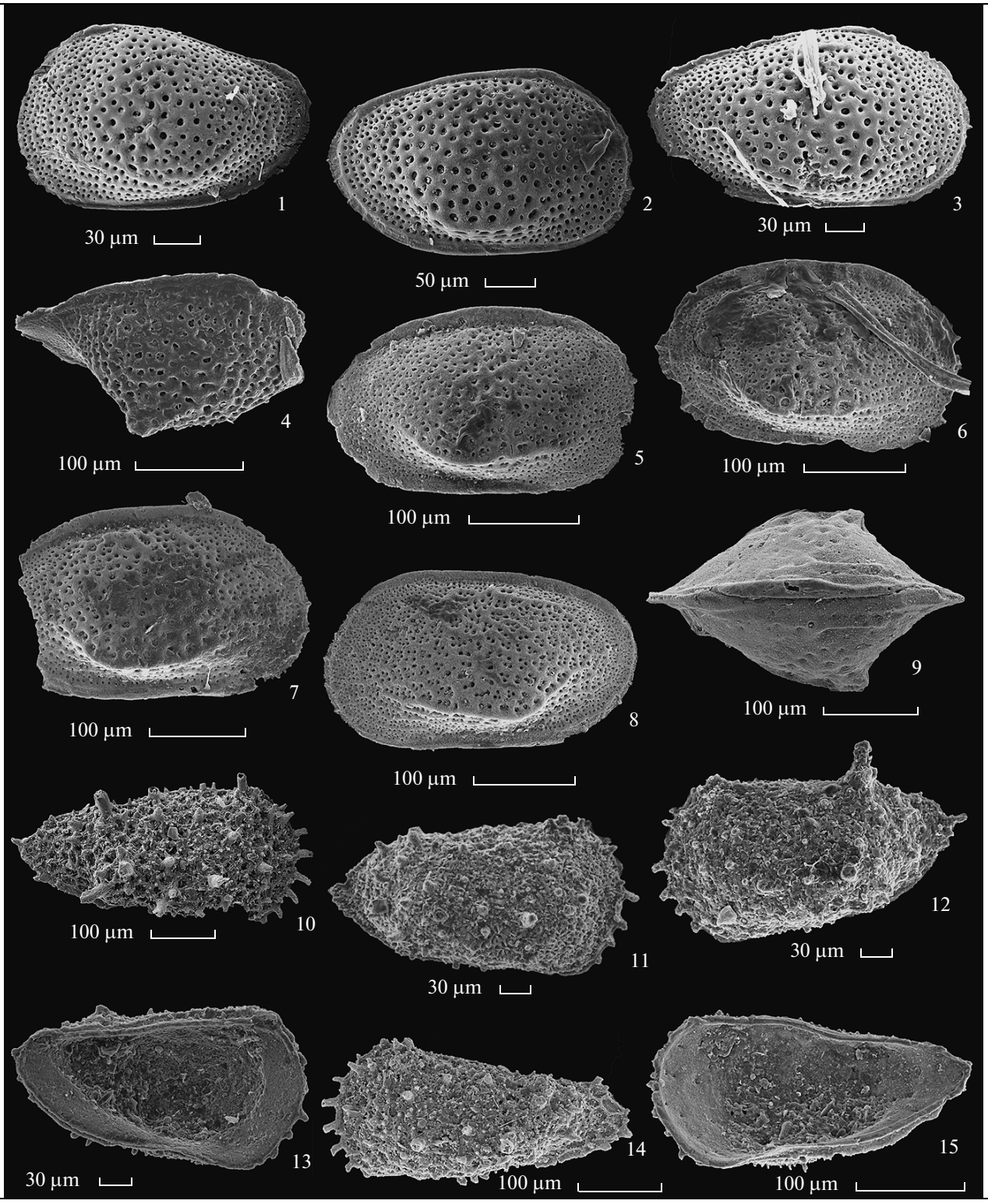
Designations: (RV) right valve; (LV) left valve; (c.c.) complete carapace.

Figs. 1–4. *Loxoella*? *macrofoveata*, sp. nov.: (1) specimen KP MGU, no. 328-P1-3, LV, external view, Partizanskoe section, sample 3; (2) holotype KP MGU, no. 328-M3-46, RV, external view, Mar'ino section, sample 108; (3) specimen KP MGU, no. 328-M1-65, RV, dorsal view, Mar'ino section, sample 101; (4) specimen KP MGU, no. 328-P1-4, RV, external view, Partizanskoe section, sample 3.

Figs. 5–9. *Loxoella*? *microfoveata*, sp. nov.: Mar'ino section: (5) specimen KP MGU, no. 328-M1-73, RV, external view, sample 102; (6) specimen KP MGU, no. 328-M1-74, RV, external view, sample 102; (7) specimen KP MGU, no. 328-M2-49, RV, external view, sample 103; (8) holotype KP MGU, no. 328-M1-62, LV, external view, sample 107; (9) specimen KP MGU, no. 328-M1-63, c.c., dorsal view, sample 107.

Figs. 10–15. *Exophthalmocythere posteropilosa*, sp. nov.: (10) holotype KP MGU, no. 328-M3-31, RV, external view, Mar'ino section, sample 110; (11) specimen KP MGU, no. 328-V1-56, RV, external view, Verkhorech'e section, sample 208; (12) specimen KP MGU, no. 328-V1-111, LV, external view, Verkhorech'e section, sample 208; (13) specimen KP MGU, no. 328-V1-58, RV, internal view, Verkhorech'e section, sample 208; (14) specimen KP MGU, no. 328-P1-75, LV, external view, Mar'ino section, sample 105; (15) specimen KP MGU, no. 328-M1-77, LV, internal view, Mar'ino section, sample 101.

Plate 12



very smooth transitions to the anterior and posterior ends. The anterior is high, smoothly arcuately rounded, also smoothly rounded, more strongly slanting ventrally. The anterior and posterior are flattened.

In the central part of the shell, a conical wing-like process is present; the anterior surface of the cone is weakly convex and inclined towards the anterior; the posterior surface is weakly straight and inclined

towards the posterior at a subequal angle. A carina is present in the ventral part of the wing-like process. The sculpture is represented by small foveae, in some specimens grouped by 2, 3, or 4. The foveae are larger in the central part of the shell, gradually becoming smaller towards the margins; they are chaotically arranged.

Measurements, mm:

Specimen KP MGU, no.	L	H	T
328-M1-73	0.27	0.17	–
328-M1-74	0.29	0.18	–
328-M2-49	0.3	0.19	–
328-M1-62 (Holotype)	0.3	0.17	–
328-M1-63	0.3	–	0.19

Variation. The new species varies in the more strongly or more weakly pronounced carina, from barely indicated to distinct.

Comparison. The new species differs from *L.* ? *macrofoveata* sp. nov. in the flattened anterior margin, straight dorsal margin of the left valve, small size of the foveae, and presence of a carina on the wing-like process.

Remarks. The placement of the new species in the genus *Loxoella* is not entirely reliable, because the preservation of the material makes it impossible to examine the structure of the hinge and of the inner lamella.

Material. Twenty valves and one complete carapace, well and satisfactorily preserved, from the Lower Cretaceous, Upper Aptian (*?Nolaniceras nolani* Zone, nannoplankton zone NC7) and Albian (*Pervinqueria inflata* ammonite zone, beds with foraminifers *Hedbergella infracretacea–H. globigerinellinoides*), Mar'ino section.

Family Trachyleberididae Sylvester-Bradley, 1948

Genus *Exophthalmocythere* Triebel, 1938

***Exophthalmocythere posteropilosa* Karpuk et Tesakova, sp. nov.**

Plate 12, figs. 10–15

Etymology. From the name of the Jurassic species *E. pilosa* Tesakova, 2003.

Holotype. KP MGU, no. 328-M3-31, male right valve; Albian; southwestern Crimea, Mar'ino section, bed 5, sample 110 (Karpuk and Kosorukov, 2012); Lower Cretaceous, Albian, *Pervinqueria inflata* ammonite zone, beds with foraminifers *Hedbergella infracretacea–H. globigerinellinoides*.

Description. The shell is small, oval-triangular. The maximum length is in the middle of the shell height; maximum height is in the anterior third; greatest convexity is in the posteroventral third. The dorsal margin is weakly concave in the posterior half. The ventral margin is not parallel to the dorsal margin, ascends towards the posterior, and is weakly concave in the anterior half. The anterior is wide, evenly smoothly rounded. The posterior is considerably lower than the anterior, triangular. The anterior and posterior margins are flattened, and the central part of the shell is moderately convex. The sculpture is represented by small tetragonal or pentagonal cells and spines of different orders located at intersections of edges at angles of the cells. The anterior also bears spines, directed ventrally.

The pore-canal zone is wide, with sparse simple pore canals. The hinge of the right valve is represented by the anterior tooth with three striae, the socket behind it also with three striae, fine groove, and posterior tooth with five striae.

Measurements, mm:

Specimen KP MGU, no.	L	H
328-M3-31 (Holotype)	0.46	0.21
328-B1-56	0.28	0.15
328-B1-111	0.29	0.15
328-B1-58	0.27	0.15
328-P1-75	0.37	0.17
328-M1-77	0.3	0.14

Variation. The new species varies in the size and length of spines on the surface of the valves, from quite small to large, clearly visible. The ratio of the height at the anterior end to that at the posterior can also vary, making the outline of the shell either rounded triangular or elongate.

Comparison. The new species differs from the similar species *E. mamillata* Triebel, 1938 from the Hauterivian of Germany (Sylvester-Bradley et al., 1961, text-fig. 270.5) in the lower posterior margin and spines of different orders.

Material. Twelve satisfactorily preserved valves from the Lower Cretaceous, Upper Barremian, *Patruliusiceras uhligi* ammonite zone, nannoplankton zones NC5E and NC5D, and from the Lower Aptian, zone NC6A of the Verkhorech'e section; 17 valves of good preservation from the Upper Aptian, *?Nolaniceras nolani* ammonite zone, nannoplankton zone NC7, and Albian, *Pervinqueria inflata* ammonite zone, beds with foraminifers *Hedbergella infracretacea–H. globigerinellinoides*, Mar'ino section.

ACKNOWLEDGMENTS

We are grateful to E.A. Shcherbinina and Yu.O. Gavrilov for organizing fieldwork and help in collecting the material, to E.A. Brovina for cleaning some of the samples, to E.V. Guseva for help in making photographs of the ostracodes, and especially to E.Yu. Baraboshkin for his help in correlating the ostracodes with ammonite zones and to L.M. Mel'nikova and P.Yu. Parkhaev for valuable remarks and advice.

This study was supported by the Russian Foundation for Basic Research, project nos. 12-05-31114 and 12-05-00380.

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Translated by P. Petrov