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Original article

New Protocytherines (Ostracods) from the Lower Cretaceous sequences of the Crimean Peninsula

Nouveaux Protocytherines (Ostracodes) du Crétacé inférieur de la péninsule de Crimée

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Abstract

One new genus of Ostracoda, *Protobrachycythere* nov. gen. (Protocytherinae, Lyubimova), and two new species, *P. taurica* nov. sp. and *P. aptica* nov. sp., are described from the Barremian and Aptian of the Crimea. Based on the ontogeny of the hinge, *Protobrachycythere* is considered as an ancestor of the *Brachycythere* Alexander, 1933 (Brachycytherinae Puri, 1954). The higher taxonomy of the Subfamily Brachycytherinae is reviewed. It is suggested to assign Brachycytherinae to the Family Brachycytheridae Puri.

Keywords: Ostracoda; Protocytherinae; Brachycytherinae; Barremian; Aptian; Crimea

Résumé

Un nouveau genre d'Ostracodes, *Protobrachycythere* nov. gen. et deux nouvelles espèces, *P. taurica* nov. sp. and *P. aptica* nov. sp., du Barrémien et de l'Aptien de la Crimée sont décrits. Suite à l'étude de l'ontogenèse de la jointure du genre *Protobrachycythere* nov. gen., ce dernier est considéré comme l'ancêtre du genre *Brachycythere* Alexander, 1933 (Brachycytherinae Puri, 1954). La taxonomie supérieure de la sous-famille Brachicytherinae est discutée. On propose d'attribuer la sous-famille des Brachicytherines à la Famille des Brachicytéridès.

Mots clés : Ostracodes ; Protocytherinae ; Brachycytherinae ; Barrémien ; Aptien ; La Crimée

1. Introduction

Although Cretaceous ostracods of the Crimean peninsula (Fig. 1) have been studied for nearly 50 years, additional attention is still required as the various Cretaceous assemblages are studied to different degrees. Berriasian ostracods are studied best (Neale, 1966; Tesakova and Rachenskaya, 1996a, b; Tesakova and Savelieva, 2005; Arkadiev et al., 2006, 2015; Savelieva, 2012, 2014; Savelieva et al., 2014). Berriasian-Valanginian ostracods were published by Rachenskaya (in Druschitz et al., 1968) and Hauterivian ostracods by Savelieva and Shurekova (2014). Papers about Barremian-Albian ostracods include Nemirovskaya (1972) and Karpuk and Tesakova (2013, 2014). There are only two papers about Maastrichtian ostracods of the Crimea (Savelieva, 2000, 2001).

The Subfamily Brachycytherinae is studied quite well, although its higher taxonomy is still uncertain. There are several publications that describe the Brachycytherines (Hartmann and Puri, 1974; Liebau, 1975) and descriptions of the genus *Brachycythere* include Grekoff (1956), Howe (1961a), Van Morkhoven (1962), Kogbe and Me'hes (1986) and Guernet and Bellier (2000). Descriptions of other Brachycytherin genera are provided by Babinot (1973), Gruendel (1977) and Morsi et al. (2011). Species of *Brachycythere* are redescribed by Hazel (1968), Damotte (1988), Rosenfeld and Honigstein (1988), Andreu (1996), Andreu and Tronchetti (1996), Okosun (1992), Morsi (2000) and Morsi et al. (2003). Many other publications

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0035-1598/

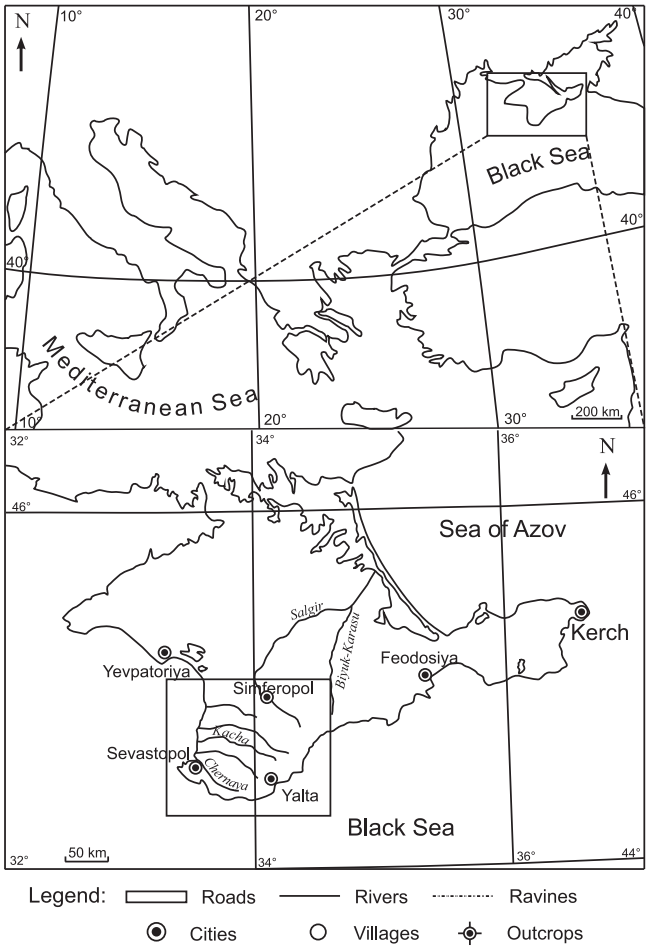

Fig. 1. Location of the studied area.

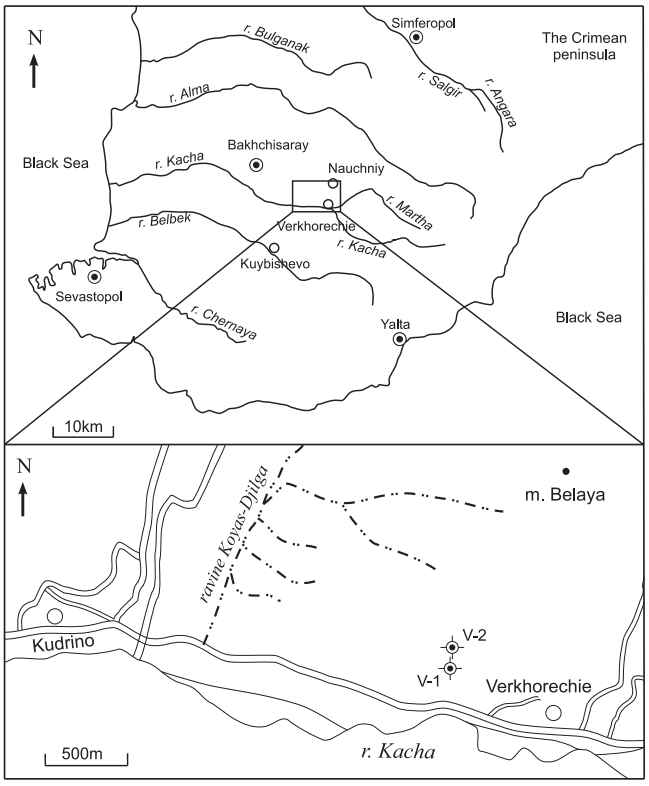

Fig. 2. Location of the studied outcrop. See legend on Fig. 1.

describe new species of *Brachycythere* (Alexander, 1933; Puri, 1953; Krommelbein, 1964; Al-Furaih, 1985; Emami, 1989; Puckett, 2002; Puckett et al., 2012; Piovesan et al., 2013). Hazel (1967) developed the taxonomic framework of brachycytherines.

Brachycytherines in the Crimea have not been found so far; however ostracods that are remarkably similar externally with *Brachycythere* Alexander, 1933 have been found in Barremian and Aptian. These Ostracods are described here under a new genus, *Protobrachycythere*.

2. Material and methods

2.1. Material

The "Verkhorechie" section was studied in this occasion (Figs. 2, 3). It consists of two distinct intervals (V-1 and V-2), which are displayed in their stratigraphic order: V-1 = N 44°41′58″ and E 33°58′36″, V-2 = N 44°42′06″ E 33°58′36″. Both of them consist of gray bioturbated clays. Based on the Calcareous Nannoplankton identified, the lower part of V-1 is assigned to the NC5D subzone (Late Barremian), the upper part of the V-1 and the base V-2 are assigned to the subzone NC5E (Late Barremian) and the upper part of V-2 is assigned to the zone NC6 (Late Barremian and Early Aptian) (Shcherbinina and Loginov, 2012).

2.2. Sample preparation

Sample preparation evolved from the technique described by Sohn (1961). Each sample of clay was dessicated and approximately 500 g were boiled with sodium bicarbonate, washed over 1 mm and 0.1 mm sieves and dried at 25 °C. Two hundred ostracod specimens from the 0.1–1 mm fraction were picked in samples with abundant ostracods, and all specimens were picked in samples with rarer ostracods. Specimens were imaged using the Scanning microscope CamScan from the Paleontological Institute of Russian Academy of Sciences. Morphometric measurements were based on the illustrations.

3. Systematic paleontology

The suprageneric taxonomy adopted in this work follows Horne (2005) and Nikolaeva et al. (1999). The morphological terminology follows Scott (1961). All figured and type material is deposited at the Geological Institute of RAS, Moscow, Russia under the curatorial numbers GIN 4802-V1, GIN 4802-V3, GIN 4802-V3-1.

Class Ostracoda Latreille, 1802
Subclass Podocopa Sars, 1866
Order Podocopida Sars, 1866
Suborder Cytherocopina Gruendel, 1967
Superfamily Cytheroidea Baird, 1850.