



Radiolaria and Global Oceanic Anoxic Event-2 in the Upper Cretaceous sections of Western Caucasus

Liubov Bragina and Nikita Bragin

Russian Academy of Sciences, Geological Institute, Moscow, Russia (bragin.n@mail.ru)

The Tethyan Upper Cretaceous deposits rich in organic carbon are currently regarded as indications of anoxic condition. Such sediments (predominantly black bituminous shales) are common in the Cenomanian-Turonian boundary and reflect worldwide episode of anomalous environmental conditions that has been called “Global Oceanic Anoxic Event 2” (OAE-2) (Schlanger et al., 1987). Various groups of marine organisms were influenced by this event and displayed different changes related with oxygen-poor environment. The aim of this report is to analyse changes of radiolarian assemblages during late Cenomanian – early Turonian in various Tethyan regions. Micropalaeontological investigation was carried out on a number of samples from the western part of Great Caucasus. Upper Cenomanian to lower Turonian sediments are studied in southern slope of Great Caucasus in the vicinity of Sochi and Novorossiisk. They are represented by deep-water thin-graded flysh composed of clastics and carbonates. The radiolarian assemblages of Caucasian sequences were compared to the findings of O’Dogherty (1994) from the coeval Bonarelli horizon in the Umbra-Marche Apennines, Italy. These two different palaeogeographical regions (O’Dogherty, 1994; Bragina et al., 2007) are characterized by similar radiolarian assemblages.

Upper Cenomanian to lower Turonian deposits related with OAE-2 have rich content of organic matter and therefore may be recognized as important regional markers. Such marker named “Bonarelli horizon” is known in the Umbria section of central Italy (Marcucci et al., 1991). It is characterized by black bituminous shales deposited in deep-water pelagic environment together with cherts and pelagic limestones. Lithologically similar regional marker is situated in the flysh deposits of Western Caucasus (Keller, 1940; Afanasyev, 2004) and represents black shales named as “Ananur horizon”. This horizon was observed in 4 sections: Volkonka and Mamedova Schel’ near Sochi, and Andreevsky Mountain Pass and Zhane River near Novorossiisk. Radiolarians are present throughout the Cenomanian – Turonian in all studied regions. Radiolarian evolution in this time is very remarkable. Sections of Italy and Spain display enrichment of radiolarian assemblages in the earliest Turonian (O’Dogherty, 1994). Radiolarian assemblages of Caucasian OAE-2 deposits are similar to coeval from Italy and Spain, moreover, numerous taxa that appear in Caucasus in earliest Turonian, are common for the same stratigraphic interval of Western Mediterranean, for example: *Acanthocircus tympanum* O’Dogherty, *Alievium superbum* (Squinabol), *Cavaspongia antelopensis* Pessagno, *Crucella irwini* Pessagno, *Paronaella pseudoaulophacoides* O’Dogherty, *Quadrigastrum insulsum* O’Dogherty. The analysis of radiolarian assemblages before OAE-2 and after this event allow to conclude that anoxic event did not make any depressive influence to this group of plankton. Boundary deposits of Cenomanian-Turonian of Caucasus did not display any crisis in radiolarian assemblages, moreover almost all late Cenomanian species continue their existence in the early Turonian. For example, these species characterize Late Cenomanian - Early Turonian: *Acaeniotyle diaphorogona* Foreman, *Alievium sculptus* (Squinabol), *Archaeocenosphaera ? mellifera* O’Dogherty, *Cavaspongia contracta* O’Dogherty, *Crucella messinae* Pessagno, *Dactyliodiscus lenticulatus* (Jud), *Pyramispongia glascockensis* Pessagno, *Diacanthocapsa fossilis* (Squinabol), *Pseudodictyomitra pseudomacrocephala* (Squinabol). Same situation can be observed in the Cenomanian-Turonian boundary deposits of Crimea (Bragina, 2004).

Conclusions.

1. Anoxic events like OAE-2 did not make any depressive influence to radiolarians. Bloom of radiolarian taxonomic diversity after anoxic event can be related with extinction of other planktonic group (especially, foraminifers).

2. Radiolaria display similar evolutionary trends in different parts of Tethys: from deep-water to relatively shallow water. This similarity confirm the influence of OAE-2 to the biota of shelf and epibatial basins.