

Glaucanitic Bryozoan Shells in Shelf Sediments of Western Kamchatka

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Abstract—Glaucanite segregations in Oligocene–Miocene shelf sediments of Western Kamchatka (Kakert and Gakkha horizons) are studied. Glaucanite occurs in the studied samples as morphologically different grains, finely dispersed cement, and pseudomorphoses after organogenic structures (siliceous sponge spicules, diatom algae frustules, and others). In addition, samples of the clasts of bryozoans, volcanic glass, and terrigenous grains revealed for the first time traces of the boring algae similar to recent species of genus *Hyella* and, possibly, *Dalmatella*, whose tubules are sometimes filled with the finely dispersed glaucanite. Our data based on the detailed petrographic studies and SEM investigations confirm and supplement the opinion of several researchers about an important role of microbiota on the glaucanite formation. The paper discusses different stages of the glaucanite formation in sediments of the Kakert and Gakkha horizons and the possible setting of glaucanite infilling in the algal borer trails and holes.

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INTRODUCTION

The formation of glaucanite in recent and ancient marine sediments is attributed now by most researchers, including authors of the present paper, engaged in the study of volcanoterrigenous sediments of Western Kamchatka to the diagenetic alteration of sediments. We believe that glaucanite globules were formed in situ in friable sediments in the course of partial or complete disintegration of volcanoterrigenous components (Geptner et al., 2008). Important role of the bacterial activity in the disintegration of terrigenous and volcanoterrigenous components of sediments during the glaucanite formation is confirmed by finds of microstructures that are identified as fossilized bacteria. Microstructures, similar to fossilized bacteria, were detected in the glaucanite-containing rocks of different compositions and ages (Baldermann et al., 2012; Geptner and Ivanovskaya, 1998, 2000; Geptner et al., 1994; Ivanovskaya and Geptner, 2004; Pestitschek, 2010).

The present paper reports our new data on the finely dispersed glaucanite grains in Oligocene and Miocene sediments (Gakkha and Kakert horizons, respectively) of Western Kamchatka that were formed in the course of crystallization of the colloidal solution in the activity zone of algal borers.

MATERIALS AND METHODS

The finely dispersed glaucanite was examined in two samples (nos. 86234, 86210) that showed trails and holes of algal borers in the clasts of bryozoan skeletons, volcanic glass, and mineral grains. The samples include petrographically similar glaucanite grains in cavities of siliceous sponge spicules and inside diatom frustules.

The finely dispersed glaucanite was found in the shallow-water Miocene sediments of the Kakert Horizon¹ (coquina bed) in cavities of algal borers in bryozoan clasts along with fragments of feldspar and volcanic glass (sample 86234). We also examined small glaucanite globules located between the terrigenous and organogenic clasts and in large cavities of the bryozoan skeleton. The bryozoan coquina is cemented by calcite with a distinct crustification structure.

In Oligocene sediments of the Gakkha Horizon (sample 86210), sandy siltstones include numerous globular and finely dispersed glaucanite grains. The finely dispersed variety is also common in boring cavities inside mineral grains and volcanic glass clasts. In such sediments, the finely dispersed glaucanite also fills up cavities in the siliceous sponge and diatom algae frustules. It cements the terrigenous fine-

¹ Stratigraphic position of the studied horizons is given after (Resheniya ..., 1998) (Gladenkov et al., 1998).