

Heavy mineral provinces of the surface sediments in the Russian shelf and Eurasian Basin of the Arctic Ocean

Попова Елена Александровна

Graduate (master)

Санкт-Петербургский государственный университет, Институт наук о Земле,

Санкт-Петербург, Россия

E-mail: lena-popova-l@mail.ru

Heavy minerals coming to the ocean sediments with riverine discharge are quite inert in terms of mobility resulting in their accumulation in proximity to the discharge site. This feature can serve as an indicator of the origin of the sediments. The data acquired during expeditions for mapping of the Russian shelf (more than 15 datasets) were merged with data from PANGAEA resulting in a dataset of more than 3500 data points covering all Eurasian shelf seas and part of the Eurasian Basin. The total amount of the components exceeded 80 so the inevitable generalization of minerals occurred while distinguishing the provinces. For major components, the areas of maximum content were found thus identifying the place of the most intensive input or accumulation. A matching distribution pattern was noted for different minerals, this is how the boundaries of the provinces were determined. The whole area was divided into 25 provinces with various areas and amounts of minerals. A preliminary schematic map of provinces was created (Fig. 1). The Barents Sea (having the densest datapoints coverage) contains 3 large provinces highly influenced by the proximity of the Fennoscandian Shield (it provides for example amphibole and kyanite [3]). Two great areas are seen in the Kara seas, determined by the input of the large rivers: Ob and Yenisei draining geologically different zones. There are also two major provinces in the Laptev Sea, one near the Khatanga River mouth, the other to the east, and there is a smaller one in the immediate vicinity to the Lena River delta. To the north of the sea, a large area with the domination of titanite and orthopyroxene is observed. The East Siberian Sea is mainly divided into two provinces: eastern and western. One great province strongly influenced by the Alaska Peninsula and North American continent dominates in the Chukchi Sea indicated by the presence of dolomite and pyroxene [1, 2]; two large provinces are distinguished further to the north. Apart from the described provinces, there are also small areas of concentration of one or two minerals or groups of minerals near islands, archipelagos, and peninsulas.

References

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- 2) Kosheleva, V. A., and D. S. Yashin. Bottom Sediments of Arctic Seas (in Russian), St. Petersburg, 1999
- 3) Kratz K. O., Mangússon N., Simonen A., Holtedahl O. Baltic shield (in Russian) // Tectonics of Europe. Moscow, 1964.

Illustrations

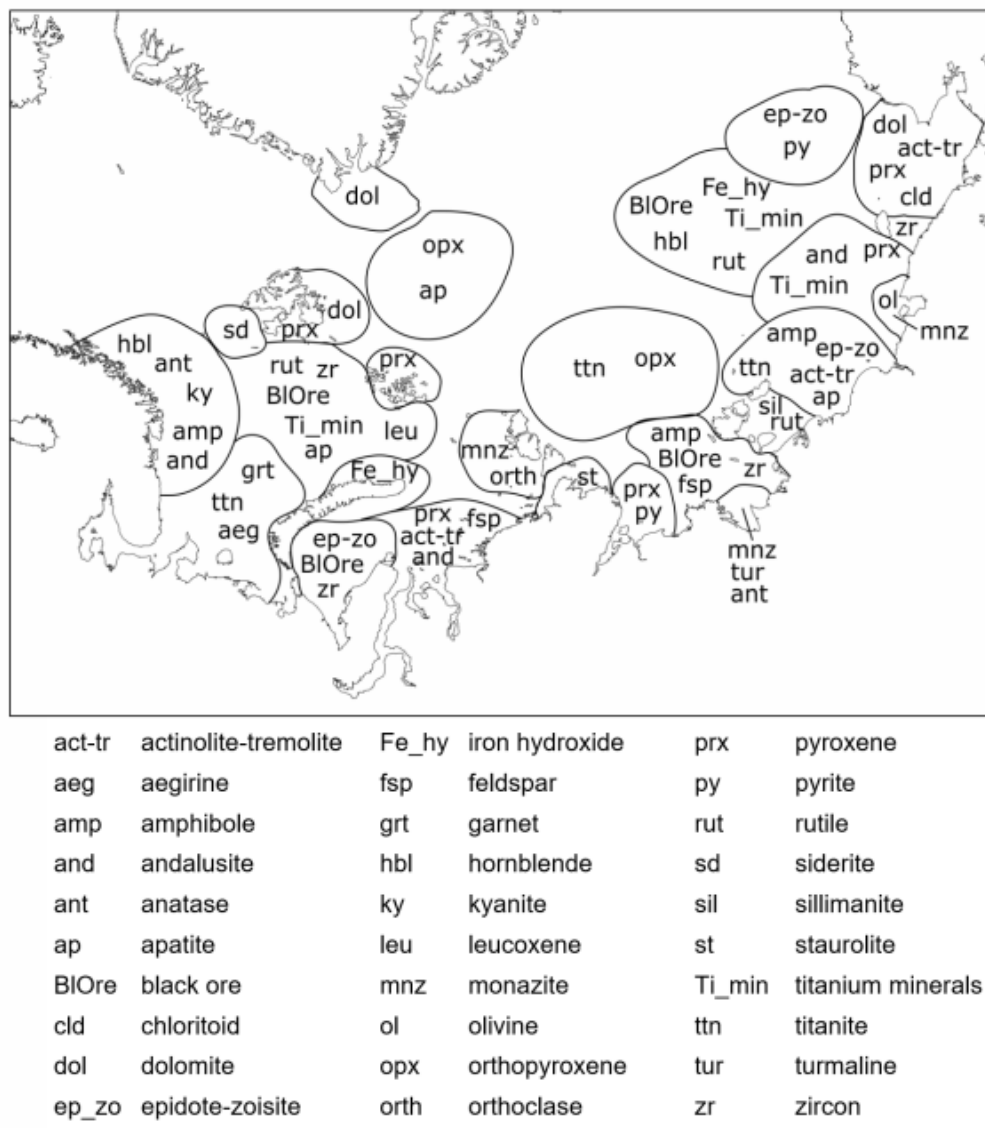


Рис. 1. Figure 1. Preliminary schematic map of heavy mineral provinces