**CYCLOTELLA GRACILIS SP. NOV. FROM PLEISTOCENE MATERIAL OF LAKE BAIKAL, RUSSIA**

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Cyclorella gracilis sp. nov. is described from Pleistocene deposits of Lake Baikal. Valves are small (2-7 μm in diameter) and round. The similarity to other Cyclorella species (C. gordoniensis and C. sibirica) is discussed and the differences from other common species in Lake Baikal (C. baikalensis and C. minuta) are shown.

**INTRODUCTION**

The study of diatoms from core material of the world’s deepest and oldest lake, Lake Baikal, is of great interest. Diatoms in sediment material from Lake Baikal have been investigated for several years (Kozhova 1959; Fedorova 1969, Chernyaya 1970, Logina & Khursevich 1986, 1990). The dominating diatom species of Lake Baikal are, and have always been endemic. In particular, the extinct fossil Stephanodiscus grundei Khurs. & Log. dominated in the Pleistocene. The genus Cyclorella (Kütz.) dc. Brébisson is represented by several species in the sediments. Especially abundant are the endemic species C. baikalensis Skvortzov and C. minuta (Skv.) Antipova and their varieties (Fedorova 1969, 1975, Chernyaya 1970, Flower 1993). Specimens of some other taxa are occasionally found: C. kazingiana var. planetophora Pricke, C. planconica Brunhaler (Chernyaya 1970), C. temperata Peragallo & Heribaut (Fedorova 1975).

This paper describes a new species: a small Cyclorella, from the Pleistocene deposits in Lake Baikal.

**MATERIAL AND METHODS**

Samples at a depth of 4.92-4.96 m from core 287 k-2 were taken from the underwater Academic Ridge in Lake Baikal in 1989 during the expedition of G.S. Goldirev and E.B. Karabanov (Limnological Institute). To remove organic material the samples were treated with 30% hydrogen peroxide for 2 hours at 75°C, washed with distilled water, put on SEM stubs, sputtered with gold and observed with a Philips 525M scanning electron microscope.

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RESULTS

Frustules of this very small Cyclotella (Figs 2-9) can be observed in the material, which is dominated by a group of extinct Stephanodiscus species (S. grandis, S. carneoforms, S. bellus), together with Cyclotella baculensis and C. minuta (Fig. 1).

DESCRIPTION

Cyclotella gracilis Nikiteeva & Likhostoyev sp. nov. (Figs 2-9)

Diagnosis:

Valvae rotundate 2-7 μm diameter. Pars centralis valvum parva plana vel radiato-cribata. Anulus aequalis parvulus in aspectu granularum in costis positorum in flexu valvum neomollarum haberet. Zona marginalis angusta, utiae breves, 18-20 per 10 μm, ex diuorum serierum pororum costae, costae tuta aequales. Fuaportalis centralis una, cum poris satelliticis duabus vel (rarius) tenuis. Rinomorula una fissiformis ad basam costae prope marginem valvae posta.

Fig. 1. 4.92-4.96 m horizon. General view. SEM. Figs 2-9. C. gracilis, found in Pliocene deposits of Lake Baikal. SEM. Fig. 2. Arrow shows a frustule of C. gracilis lying on a valve of C. minuta. Figs 3-5. Internal side of frustules. Fig. 4. Marginal (m) and central (c1) fuaportalis with two tracts. Fig. 5. Rinomorula at the base of one of the costae. Fig. 6. The smallest of the frustules measured the central fuaportalis is missing. Figs 8-9. External side of frustule. External openings of central (c1) and marginal (m) fuaportalis are shown. Scale bars: Fig. 1: 50 μm; Fig. 2: 10 μm; Figs 3-9: 1 μm.
The valves are round with a diameter of 2 to 7 μm (Figs 5, 6). The central part of the valve face is nearly flat (Fig. 9) or radially-folded (Fig. 7). Small spinules or granules can be found around the valve face/valve mantle junction (Fig. 8). The marginal area consists of striae and interstriae, which are short and of equal length, 18–20 in 10 μm. The striae have two rows of areolae. At every second to every fourth interstria are the mantle furloporets with two satellite pores (Figs 3–7). All costae are similar. A single furloporet with two σ (occasionally) one satellite pore are in the central area of the valve face (Figs 3–5, 7). One slit-like rimoporet is located at the base of one of the costae (Figs 5–7).

Holotype: the sample resides in SEM stubs 72 and 541 in the SEM samples archive of Limnological Institute.

Type locality: underwater Academic Ridge of Lake Baikal (56° 26' ON; 107° 44' SE), Russia.

DISCUSSION

This small Cyclotella gracilis differs greatly from C. baicalensis and C. minuta, not only in size, but also in the position of rimoporets and in the morphology of the marginal area, where the mantle furloporets are located on nearly every second recessed costae (Fig. 2). In C. gracilis, the frustules are not undulated off-centre as they are in C. baicalensis and C. minuta.

There is, however, a great similarity with C. sibirica, which was found in the plankton of Lake Baikal by Skal'chewsky (1967). Unfortunately there is only a small and simple light micrograph published, which gives not enough detailed information to be sure if our species is conspecific with C. sibirica. We have been unable to examine the original material.

We compared our species also with C. gordonensis Kling & Håkansson (Kling & Håkansson 1988). Also we found that these very small species are often overlooked and difficult to identify using only light microscopy. The mantle furloporets as well as the position of the rimoporets are very difficult to discern. When only considering the single valve face furloporet, this species can easily be misidentified as C. axinguentoides Hustoch (Håkansson 1989) or C. chanaica Genkal & Kuzmina (Genkal & Kuzmina 1989). However, detailed study with the SEM shows the differences. We found that C. gordonensis has only two mantle furloporets, and it seems that the chambers extend further into the valve face than in our species. C. gracilis differs from C. chanaica not only in size, but also in the position of the rimoporet (in C. gracilis it is situated directly on the costa). We are not sure if the valve face ornamentation, which is slightly different between the species discussed here is of taxonomic value, but we think the morphological characters of the margin and the position of the rimoporet are important. On that basis, we think C. gracilis is not conspecific with either C. gordonensis or C. chanaica.

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REFERENCES


