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DIADESMIS BREKKAENSOIDES (W. BOCK) MOSER, LANGE-BERTALOT ET METZELTIN: A NEW AEROPHYTIC DIATOM FOR THE HUNGARIAN FLORA

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Diadesmis brekkaensoides (W. Bock) Moser, Lange-Bertalot et Metzeltin, a very rare aerophytic diatom was found in the Kiskőhát shaft in the Bükk Mts. A dense population of algae, perfectly corresponding with the original description of Bock in 1963, was found on a wet rock in the deep shadow. So far, the author could not find more than two other reports of this species; the first one from the Alps, the second one from New Caledonia.

Key words: aerophytic, diatom, Kiskőhát shaft, cave

INTRODUCTION

The algal flora and vegetation of Hungarian caves have been relatively well studied. Several algologists dealt with the subject of algae in caves and their findings have been summarised from time to time (HAJDU 1977, RAJCZY 1989). Recently, however, the study of the flora and vegetation of cave entrances, the lamp-lit flora of show caves has slowed down.

In the 1980s several caves were visited by researches from the Botanical Department of the Hungarian Natural History Museum to collect algological samples and some results have been published (BUCZKÓ and RAJCZY 1989, RAJCZY *et al.* 1986). Kiskőhát shaft was also visited during that period. An interesting diatom was found there in 1986 which was identified only years after its collection.

MATERIAL AND METHODS

Nowadays Kiskőhát shaft is a 117 m deep inactive sinkhole with a total length of 479 m, situated in the Bükk National Park, under the Kiskőhát peak (938 m) at 915 m elevation near Nagymező (Fig. 1). It developed in Triassic limestone and it is one of the strictly protected Hungarian caves, being home for thousands of bats (SZÉKELY 2003).

Algological samples were collected on 22 April 1986. During the sampling procedure the coating was scraped from wet rock, from 5 different locations situated 3, 5, 6.5, 10 and *ca* 16–18 m downwards from the entrance. Sample No. 3 was a blue-green coating on the wall, while sample No. 4 was a brown, curled undulate, gelatinous, thin layer. The samples were preserved with formaldehyde solution (end concentration: 2–4%) and living material was also studied. Permanent diatom slides were made with H_2O_2, treatment and the material was then embedded in Hyrax.

RESULTS

A dense population of *Diadesmis brekkaensoides* (W. Bock) Moser, Lange-Bertalot et Metzeltin was found in the sample collected at 10 m depths on the eastern wall of the shaft (Figs 2–4). At the sampling point higher than 6.5 m only one specimen was found and the species was absent at from 16–18 m downwards.

In the Kiskőhát shaft several other typical aerophytic diatoms were found including *Hantzschia amphioxys* (Ehr.) Grun., *Ortoseira roseana* (Rabenh.) O'Meara, *Diadesmis contenta* (Grun.) Mann, *Luticola nivalis* (Ehr.) Mann, *Nitzschia palea* (Kütz.) W. Smith, *Diadesmis perpusilla* (Grun.) Mann, *Pinnularia borealis* Ehr.

DISCUSSION

Diadesmis brekkaensoides was described in 1963 as *Navicula brekkaensoides* (BOCK 1963). The population found in the Kiskőhát shaft corresponds to Bock's description:

"Valves linear in girdle view, central area compressed, the ends are wedge forming. Valves linear, with triundulate margins. Apices protracted and later rounded, 17–23 µm long, 4–5 µm wide. Raphe straight with terminal nodule. Axial area narrow, linear, central area large, circular. Striae radiate in the middle part, be-



Fig. 1. The location of Kiskőhát shaft in Hungary.

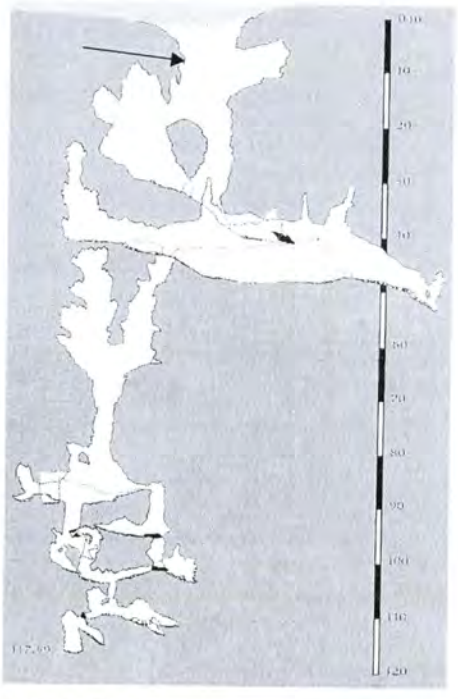


Fig. 2. The sketch map of Kiskőhát shaft. The sampling location where *Diadesmis brekkaensoides* was found is marked with an arrow.

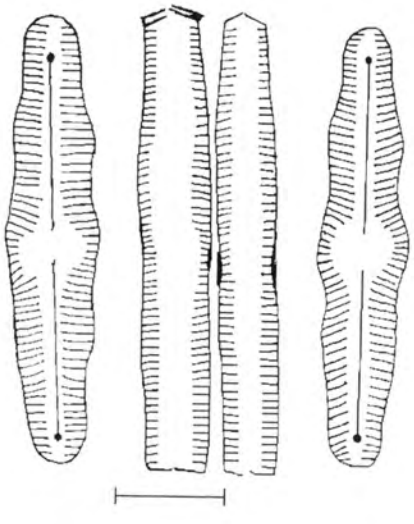


Fig. 3. *Diadesmis brekkaensoides* from Kiskőhát shaft. The bar means 5 μm.

coming parallel at the poles, 30–35 per 10 µm. The frustules form band-like aggregations."

BOCK (1963) did described details about the substrata where he found *Navicula brekkaensoides*: he only mentioned that it was found in the Alps on rock in a thin layer. KRAMMER and LANGE-BERTALOT (1985, 1986) later reduced this taxon to variety level under *Navicula brekkaensis* Petersen as *Navicula brekkaensis* var. *brekkaensoides* (W. Bock) Lange-Bertalot, but he did not provide a plausible argumentation for this taxonomic treatment. He did this in spite that BOCK (1963) had emphasised that *Navicula brekkaensis* cannot be found on limestone since it prefers non-calcareous substrates. This in fact, does not correspond with our sampling location, which is in limestone. Based on the substrate preferences lumping of these taxa seems quite unreasonable. Later *Navicula brekkaensis* var. *brekkaensoides* was transferred as a new species to the genus *Diadesmis* (MOSER *et al.* 1998). According to KUSBER and JAHN (2003) the valid name of this taxon is *Diadesmis brekkaensoides* (W. Bock) Moser, Lange-Bertalot et Metzeltin.

Apart from the original description of the species (BOCK 1963) only one occurrence *D. brekkaensoides* had been known: MOSER *et al.* (1998) have reported it from New Caledonia. Web-sites with diatomological data and checklists

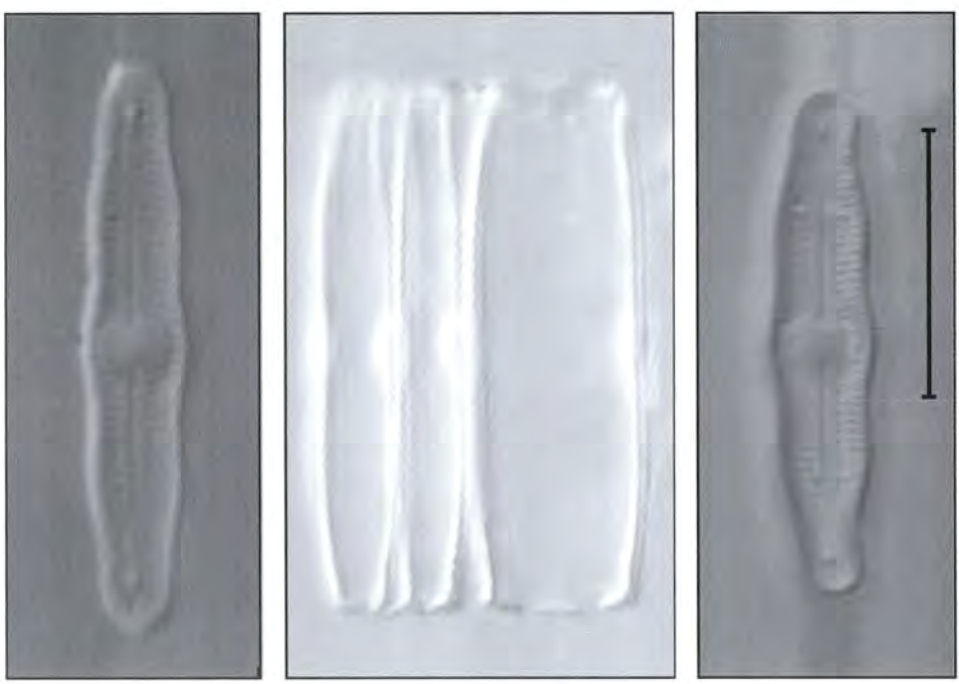


Fig. 4. *Diadesmis brekkaensoides*. Scale 10 µm

(http://www.calacademy.org/research/diatoms/, www.geog.ucl.ac.uk/ecrc/amphora/diatcode/diatcode; http://craticula.ncl.ac.uk; http://diatomwebserver.awi-bremerhaven) do not mention the species. The rarity of the taxon has been justified by the fact that the detailed and comprehensive work of LANGE-BERTALOT (1980) about the chain-forming species of the genera *Fragilaria* and *Navicula*, *D. brekkaensoides* or its synonyms are not mentioned at all.

According to the data available on *Diadesmis brekkaensoides*, the species can be regarded as a rare aerophytic diatom. Throughout the world, it is normally absent from the characteristic flora of cave entrances as well as from the more internal parts of caves ("dark flora" and "lamp lit flora"). Based on the substrate preferences lumping of *D. brekkanesis* and *D. brekkaensoides* seems unreasonable, thus I do agree with keeping them separate entities.

"All caves in Hungary have been protected since 1961 for their natural historical, historical and economic significance. Of the nearly 3700 recorded caves 132 are strictly protected." (SZÉKELY 2003). Fortunately, the Kiskőhát shaft is one of these strictly protected caves, therefore the hereby described population of *Diadesmis brekkaensoides* is protected by the law.

* * *

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