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## Program Book of Abstracts

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UNDER THE AUSPICES  
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## Abstracts

palaeothermometers.

Our findings indicate that gyrogonites may be formed of calcite, HMC (up to 32 mole %  $\text{MgCO}_3$  in *Lamprothamnium papulosum*), or, less frequently, by mixtures of HMC and aragonite, as in some gyrogonites from *C. globularis*. The mineralogy of stem encrustations varies from monomineralic to variable mixtures of calcite and aragonite, or HMC and aragonite. Contrary to the suggestions of other authors, among the various species of the genus *Chara* studied here, we have found no correlation between the charophyte carbonate mineralogy and the salinity of water where they formed. Our findings clearly indicate that calcite, HMC and aragonite may all be present in charophyte calcifications formed in low-salinity waters. Some *Chara* species always produces the same biominerals (i.e. only calcite in *C. vulgaris*) while other taxa like *C. globularis* may form stem encrustations of calcite, HMC, or even aragonite and HMC within the same salinity range in which *C. vulgaris* mineralizes only calcite. This suggests strong specific differences in the biological mechanisms of mineralization within this group of plants.

We have determined the Mg/Ca and Sr/Ca ratios in gyrogonites and stem encrustations, for diverse charophyte species, and the corresponding cation ratios in waters where they formed. Our results indicate an overall relationship between the Mg/Ca of the water and the mineralogy of the charophyte carbonates. The overlap of the ranges of Mg/Ca of the water in which some species produce encrustations with different mineralogy points to a species-dependent Mg uptake behaviour for charophytes. The Sr content in charophyte calcite and high Mg-calcite reflect directly the Sr/Ca ratio of the host water, whereas Mg content in these carbonates probably depends on the temperature and the Mg/Ca ratio of the water. Our results indicate that charophyte carbonates may be used as paleohydrochemical proxies and imply that special attention must be paid both to the mineralogical control and the diagenetic changes of charophyte carbonates when they are to be used in paleoenvironmental research.

### THE OCCURRENCE OF *BOLBOFORMA*, IN THE LATE MIOCENE METOCHIA SECTION, GAVDOS ISLAND

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*Bolboforma* spp., a group of calcareous microfossils of uncertain origin, but generally accepted to be cysts of photosynthetic origin, have been found in the Metochia section, Gavdos island.

*Bolboforma* are useful index fossils that supplement the standard microfossil zones based on planktonic foraminifers and calcareous nannofossils.

The main characteristics of *Bolboforma* assemblages and the stratigraphic distribution of the taxa are described here in more detail.

The basal part of the approximately 100 m thick section at Metochia (Gavdos island)



consists of a palaeosol followed by estuarine to shallow-marine sands. Deep-marine sediments overlie these near-shore deposits. The main part of the section consists of alternating light grey-blue, homogeneous, hemipelagic marls and brown, organic-rich, laminated beds (sapropels).

The chronology of the deposits is based on a combination of magnetostratigraphic, biostratigraphic (planktonic foraminifera and dinoflagellates), and cyclostratigraphic data, suggesting a time span from 9.7 to 6.6. Ma.

In addition, the Upper Miocene section is also analyzed for *Bolboforma*. Biostratigraphy based on these organisms is relatively new compared with the biostratigraphy based on other microfossil groups. However, their strong resistance to dissolution and their high stratigraphic resolution, especially for the Miocene, make the *Bolboforma* an important microfossil group for interpreting the stratigraphy.

Our taxonomic concept is based on Qvale & Spiegler (1989), Spiegler (1991) and Spiegler & van Daniels (1991).

The *Bolboforma* zonations proposed by Qvale & Spiegler (1989) for the Neogene were used in this study, and were correlated to the planktonic foraminifer zonations.

One *Bolboforma* zone as defined by Qvale & Spiegler (1989) was recognized in the Late Miocene deposits of Metochia section. The nominate species of *Bolboforma intermedia* was found. The beginning of this zone corresponds to  $5.4 \pm 0.4$  Ma, and it ranges into the early Pliocene.

Carbonate dissolution did not affect *Bolboforma* abundances and it can be concluded that these microfossils prefer cooler surface water masses, where the nutrient content is higher than during warmer periods.

#### References

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#### PETROGRAPHICAL, PALYNOLOGICAL AND SEDIMENTOLOGICAL ASPECTS REGARDING THE GENESIS OF PALEOGENE LIGNITES NEAR ALEXANDROUPOLIS, THRACE, GREECE

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Several minor lignite deposits of Paleogene (Eocene to Oligocene) age occur in the vicinity