

Taxonomy and stratigraphy of the Eocene nummulitic deposits of Greece: a biometric analysis approach

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Nummulitid banks and depositional models have been the subject of many studies in Greece already since 19th century (eg., Philippson, 1890). Although numerous studies deal with nummulitid presence mainly in the Greek Thrace basin, the Mesohellenic basin and the external Hellenides, systematic morphometrical analysis has never performed.

This study was undertaken to define biometric and morphological features of Greek nummulitids and to test the relative taxonomic importance of internal and external features for distinguishing biostratigraphically significant species.

Nummulitid assemblages from six different localities in Greece were morphometrically investigated for the first time (Fig. 1). The aforementioned localities belong to alpine (Perivoli Grevena, Manoliasa Ioannina, Dervenakia and Tripoli) and molassic (Kirki Thrace from Thrace basin and Vasiliki Trikala from Mesohellenic basin) formations.

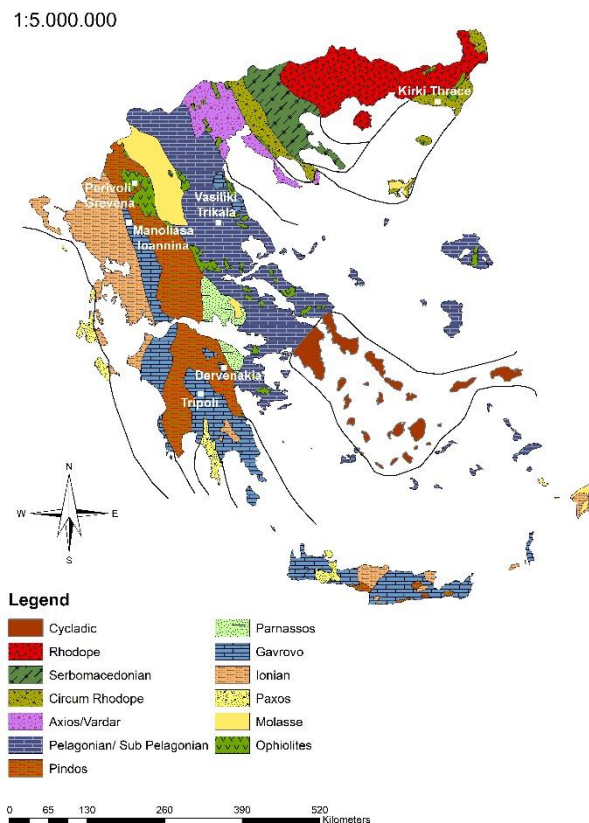


Figure 1. Generalized geological map of Greece and location of the studied sites (modified by IGME, 1983).

The micropaleontological material was examined in thin sections, except for isolated specimens collected within the molassic deposits in the area of Kirki Thrace, which were studied in polished sections and split specimens.

The scheme of identification includes the study of the external morphology of the isolated specimens (the shape of the test, the shape of septa filaments, the presence or the absence of the granules, their type of arrangement and the measurements on diameter and test thickness). Furthermore, the study of the internal morphology in equatorial sections, is including the observations on the shape of septa and the architecture of the chambers.

Biometrical analysis has been performed on the morphological characteristics of both megalospheric and microspheric forms. The conducted measurements refer to thickness, diameter and radius of the whole test and all internal whorls. Specific measurements refer to the dimensions of the protoconch (only for A-form). The scheme for the identification of *Nummulites* is based mainly in Blondeau (1972), Less (1998), Less *et al.* (2011), Less and Özcan (2012), Özcan *et al.* (2009) and Schaub (1981).

Statistical analysis of the biometric data, combined with the established systematic taxonomy, enabled us to identify eight different morphotypes potentially associated with different nummulitid species.

Among them the most commonly identified was *Nummulites perforatus* group, with *N. perforatus* de Montfort (SBZ 17; Serra-Kiel *et al.*, 1998) being its main representative together with *Assilina exponens*, dominating in the molassic sediments of Vasiliki Trikala and Kirki Thrace. Additionally, faunas from Dervenakia and Tripoli present identical species associations pointing to a Bartonian age. Furthermore, three different assemblages have been observed from Perivoli Grevena area, suggesting three distinguished deposits forming a continuous succession spanning Early to Late Eocene time interval. Although Manoliasa Ioannina nummulitic bank corresponds to a redeposited formation, it shows significant similarities to the Early Eocene Perivoli Grevena fauna. Our results contribute to a refined stratigraphic assessment and high resolution local and interregional correlations of studied alpine and post- alpine Eocene carbonate deposits from the Hellenic peninsula.

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