

BARTONIAN TO END-RUPELIAN RETICULATE *NUMMULITES* OF THE WESTERN TETHYS

GYÖRGY LESS

University of Miskolc, Department of Geology and Mineral Resources, H-3515, Miskolc-Egyetemváros, Hungary. E-mail: foldlgy@uni-miskolc.hu

BOTOND KERTÉSZ

University of Miskolc, Department of Geology and Mineral Resources, 3515, Miskolc-Egyetemváros, Hungary

ERCAN ÖZCAN

Department of Geology, Faculty of Mines, Istanbul Technical University, Ayazağa/Istanbul 34469, Turkey

Reticulate *Nummulites* can be found very often in rock-forming quantity in the Bartonian to Rupelian beds of the Western Tethys; however their nomenclature is extremely complicated and rather controversial. Therefore, and since B-forms are quite rare and often missing, in the first phase of the research we have concentrated on the comparative morphometric study of megalospheric forms without prejudicing formerly introduced typological names to particular populations. We used material from twenty-eight localities extending from SW France to Armenia and spanning from the early Bartonian to the Rupelian/Chattian boundary. Twenty-nine populations could be encountered, twenty-eight of which could be arranged safely into the well-known *Nummulites fabianii-fichteli* group. However, in the middle Bartonian locality of Keçili 1 (eastern Turkey) another population of reticulate *Nummulites* bearing about five times larger embryo than that of the population belonging to the *N. fabianii-fichteli*-lineage from the same sample could be observed. This population has been identified with *N. hottingeri* (the end-member of the *N. partschi-lorioli*-lineage) on the one hand but also with the original description of *N. ptukhiani* (later widely accepted as the precursor of *N. fabianii*) on the other. This means that the two names are synonymous and *N. ptukhiani* bearing priority advantage over *N. hottingeri* has to be applied for these forms. On the other hand, it can by no means be used for the precursor forms of *N. fabianii*.

The twenty-seven populations belonging to the *Nummulites fabianii-fichteli* group have been analyzed qualitatively by means of the surface characteristics and quantitatively by means of the internal features observable in the equatorial section of A-forms. In order to distinguish the evolutionary trends from the ecologically or ontogenetically affected phenomena we arranged the twenty-seven populations according to their supposed age based on the accompanying fossils and/or stratigraphical position.

The inner cross-diameter of the proloculus has been proven to be the most reliable evolutionary parameter. Beside, the evolution of surface characteristics (not detailed here) is also usable in this sense, although it shows great intrapopulation variation partly because of the ontogeny. The increase of the average length of chambers (accompanied by general flattening) in the third whorl is of secondary importance in recognizing the evolution of the group because it is affected also by ecological factors. Finally, the tightness/laxity of the spire and the relative width of the spiral cord in the third whorl are clearly the functions of the actual paleoenvironment.

As a result, the *Nummulites fabianii-fichteli* group is proven to form a single but rather variable evolutionary lineage within whose early Bartonian to end-Rupelian development six evolutionary stages (considered as species) could be recognized (we could not study the middle-late Lutetian precursor forms). The safety of identification of these evolutionary stages with particular species names is of different degree. The six species are defined primarily on the basis of the average inner cross-diameter of the proloculus (C_{mean}) and secondarily by the surface characteristics as follows:

- Nummulites bullatus* (basal Bartonian, early SBZ 17 zone) with $C_{\text{mean}}=65-100\ \mu\text{m}$, granules, no reticulation.
- N. garganicus* (early Bartonian, late SBZ 17) with $C_{\text{mean}}=100-140\ \mu\text{m}$, distinct granules and reticulation.
- N. hormoensis* (upper Bartonian, SBZ 18) with $C_{\text{mean}}=140-200\ \mu\text{m}$, distinct granules, polar knob and reticulation.
- N. fabianii* (Priabonian to early Rupelian, SBZ 19–21) with $C_{\text{mean}}=200-320\ \mu\text{m}$, distinct reticulation, optional granules and polar knob.
- N. fichteli* (late Priabonian to early Rupelian, SBZ 20–21) with $C_{\text{mean}}=200-320\ \mu\text{m}$, dissolving reticulation to irregular mesh, no granules.
- N. bormidiensis* (late Rupelian, SBZ 22A) with $C_{\text{mean}}=320-450\ \mu\text{m}$, irregular mesh.

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