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## **The Late Cretaceous genus *Omphalocyclus* from Turkey: New stratigraphical data for the Mediterranean Tethys**

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*Omphalocyclus* is an orbitoidal benthic foraminifera, known from the relatively shallow-water paleoenvironments located in the outer parts of the Late Cretaceous Tethyan platforms. It is a relatively common taxon with a geographic distribution from Europe to north Africa, India and as far as Indonesia in the east, and to Caribbean in the west. Apart from its debatable diagnosis only in the (late) Maastrichtian of western Tethys, the genus has been discovered in Turkey in further much older beds in association with *Orbitoides* and *Lepidorbitoides* having rather primitive developmental stages. The morphometric analysis of A-forms in successive assemblages (based on seventeen populations in seven sections located in Sakarya, Eurasian and Arabian plates), ranging in age from (late) Campanian to terminal Maastrichtian, enables the documentation of phylogenetic changes for the first time. Since these horizons contain a rather rich assemblage of accompanying specimens of *Orbitoides* and *Lepidorbitoides*, a correlation of the phylogenetic changes of the genus to that of *Orbitoides* and *Lepidorbitoides*, rather well-known in Europe, can also be made.

The most conspicuous phylogenetic change in the equatorial layer of *Omphalocyclus* is found to be the general increase in the size of embryo, which on average doubles by the end of the Maastrichtian. This trend is followed by the increase in the number of epi-embryonic chamberlets, which is however not as significant as the former parameter. *Omphalocyclus* in the stratigraphically lowermost populations has mainly three to four primary epi-embryonic and no accessory epi-embryonic chamberlets. With the introduction of radial stolons, which seems to have taken place in horizons referable to the *Gansserina gansseri* Zone, only several accessory epi-embryonic chamberlets arise from the tritoconch. Instead, epi-embryonic chamberlets become rather larger in size and also they cover a wider portion of embryo along its thick outer wall. Considering the suitable changes in embryo size, and also some other morphologic features in successive populations, two new species, *O. anatoliensis* sp. nov. and *O. cideensis* sp. nov. have been erected in late

Campanian and late Campanian-early Maastrichtian populations, respectively. The most advanced specimens in late Maastrichtian are attributed to the long-known species *O. macroporus* (Lamarck, 1816). Thus, a tentative subdivision scheme comprising three successive species, *O. anatoliensis*-*O. cideensis*-*O. macroporus*, is proposed.

This evolution is supported by different assemblages of the co-occurring foraminifera. *O. anatoliensis* n. sp. is associated with *Lepidorbitoides bisambergensis*, *Orbitoides media*-*O. megaliformis*, *Siderolites calcitrapoides* and *Loftusia* spp. *Omphalocyclus cideensis* sp. nov. co-occurs with advanced developmental stage of *Lepidorbitoides minor*, primitive *L. socialis*, *Orbitoides megaliformis* (mainly advanced developmental stages), *O. gruenbachensis*, *Siderolites calcitrapoides*, *S. denticulatus* and *Pseudomphalocyclus blumenthali*. *Omphalocyclus macroporus*, on the other hand, associates with *Lepidorbitoides socialis*, *Orbitoides gruenbachensis*, *O. apiculata*, *Siderolites calcitrapoides*, *S. denticulatus*, *Clypeorbis mamillata*, *Hellenocyclina beotica* and *Cideina sözerii*. Some *Omphalocyclus* specimens are observed to develop rather weak lateral chamberlets. These specimens, first recorded in the *Omphalocyclus cideensis* sp. nov. phylogenetic level, are attributed to *Pseudomphalocyclus* (Meriç, 1980).