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**Link between complex internal structures and stratigraphy:  
Xradia – ZEISS MicroXCT-400 of genus *Sphaerogypsina* Galloway 1933**

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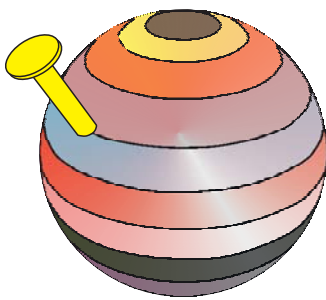
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First, spherical to semi-spherical forms, ranging in diameter from 0.6 to 2 mm with a characteristic chess-board surface and common in Paleogene tropical shallow-water carbonates were described as bryozoans. Later, such forms were classified into the foraminiferal species *Sphaerogypsina globulus*. In a number of studies that followed, morphological variations of tests found in recent sediments and in rocks of different ages were reported (*i.e.* Miocene, Late Eocene and Recent). But, all globular gypsinids have been called *S. globulus sensu lato* because without detailed internal structural characterization, species identification of larger foraminifera is impossible. Without adequate test sections, making a link between *Sphaerogypsina* and stratigraphy was hampered, too. To obtain an oriented test section for the identification of *Sphaerogypsina*, which grows by adding chambers in alternated cycles, is difficult. Application of Xradia – ZEISS MicroXCT-400 on tests ranging from the Late Eocene (Hungary), Miocene (Austria) and Pliocene (Jamaica) to recent (Adriatic Sea, Red Sea and Atlantic) combined with studies of Middle Eocene (Jamaica, Venezuela) specimens performed by cathodoluminescence and transmitted light microscope, document the complexity of test growth. Resolution on a micrometric scale displays the inner character such as the size and position of the embryonic chambers, size and shape of embryonic chambers, juvenile, adult and gerontic chamberlets, size of pores and radial stacked superimposed chamberlets. A biometric analysis of form reveals that: a) recent forms are smaller than fossil ones (Eocene A-forms attained up to 1.85 mm in diameter, Miocene 1.1 mm, recent ones vary from 0.56 to 0.9 mm); b) diameters of embryonic cycles have more or less constant values (Eocene of 0.21 mm, Miocene 0.21 mm and recent 0.19 to 0.28 mm); c) Miocene and Red Sea tests have the same values of protoconch and deutoconch diameters, the Eocene test had the largest and the Adriatic form the smallest values; d) the number of inserted radial stacks, varies according to the diameters of adult cycles. The position of embryonic apparatus wanders, from being at the centre to way off centre (with a different transition off centre). This study proved that differences in internal structures between the examined specimens ranging in age from Eocene, Neogene to Recent are of taxonomic importance and therefore fall within forms known as *S. globulus* more than one species exist (different genera are not excluded, however).



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