Geophysical Research Abstracts
Vol. 14, EGU2012-12275, 2012
EGU General Assembly 2012

Volume quantification of *Cycloclypeus carpenteri* by microCT investigation

W. Fabienke, A. Briguglio, and J. Hohenegger
Institut für Paläontologie, Universität Wien, Vienna, Austria

Complete equatorial oriented sections of larger benthic foraminifera (LBF) with ring-shaped chambers are difficult to obtain due to the common waved geometry of the equatorial plane. Detailed studies on the sequence of the annular chambers, their variation with ontogeny and their size and shape continuum are therefore almost impossible with oriented sections.
The quantitative high-resolution images of a microCT scanner make it possible to create a 3D model of a test and to extract each chamber differentiating chamberlets . To get a quality 3D model several steps have to be done. First the sample has to be scanned and reconstructed and then the obtained images have to be resliced by a reorientation of the three axes. The enhanced images are then converted into greyscale to allow a semiautomatic segmentation of the lumina. Those segmentations are then rendered to create a 3D model which can be quantified.
For this project 13 specimens of *Cycloclypeus carpenteri* have been scanned, their chambers extracted and their volume quantified. Beside the discovery of different specimens with pluriembryonal apparati and two or more orthogonal equatorial layers, the evolution of the chamber height has been studied by means of volume measurements. Several chambers are in fact higher than others and some couplets of larger-shorter chambers have been observed. It is very likely, that those irregularities during the ontogeny derive from various environmental factors which may be cyclic or not (e.g., rain seasons, astronomic cycles). To test this hypothesis from the resulting 3D model, the volume of each chamber (not considering the nepionic and the very first spiral coiled chambers) has been rendered and calculated. With this data, that show the actual growth of the foraminiferal cell, it is possible to search for growth cycles after having standardized the residuals of the volumes along a calculated growth function. It was possible to compare the obtained cycles from these recent specimens with environmental data, (e.g. amount of precipitation, annual light intensity, seasonality) which enables us to estimate the actual lifespan of each single cell investigated.