



Operculina from the northwestern Pacific (Sesoko Island, Japan) Species Differentiation, Population Dynamics, Growth and Development

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During the last decades larger benthic foraminifera have gained importance as indicator species and are used in a variety of applications, from ecological monitoring, studying the effects of ocean acidification, or reconstructing paleoenvironments. They significantly contribute to the carbonate budget of coastal areas and are invaluable tools in biostratigraphy. Even before their advancement as bioindicators, laboratory experiments have been conducted to investigate the effects of various ecological parameters on community composition, biology of single species, or investigating the effects of salinity and temperature on stable isotope composition of the foraminiferal test, to name only a few. The natural laboratory approach (continuous sampling over a period of more than one year) was conducted at the island of Sesoko (Okinawa, Japan). In combination with μ -CT scanning was used to reveal population dynamics of 3 different morphotypes of *Operculina*. The clarification of reproductive cycles as well as generation and size abundances were used to calculate natural growth models. Best fit was achieved using Bertalanffy and Michaelis-Menten functions. Exponential-, logistic-, generalized logistic-, Gompertz-function yielded weaker fits, when compared by coefficient of determination as well as Akaike Information criterion. The resulting growth curves and inferred growth rates were in turn used to evaluate the quality of a laboratory cultivation experiment carried out simultaneously over a period of 15 months. Culturing parameters such as temperature, light intensities, salinity and pH and light-dark duration were continuously adapted to measurements in the field. The average investigation time in culture was 77 days. 13 Individuals lived more than 200 days, 3 reproduced asexually and one sexually. 14% of 186 Individuals were lost, while 22% could not be kept alive for more than one month. Growth curves also represent an instrumental source of information for the various applications of larger benthic foraminifera, especially with regard to paleontological use.