

Natural laboratory and micro-CT: Breakthroughs in deciphering growth patterns and strategies of larger benthic foraminifera

Wöger, J.¹, Kinoshita, S.¹, Eder, W.¹, Hohenegger, J.¹, Briguglio, A.²

¹Universität Wien, Department of Palaeontology, UZA II Geozentrum, Althanstraße 14, 1090 Vienna, julia.woeger@univie.ac.at, shunichi.kinoshita@univie.ac.at, wolfgang.eder@univie.ac.at, johann.hohenegger@univie.ac.at;

²Universiti Brunei Darussalam, Faculty of Science, Jalan Tungku Link, Gadong BE1410, Brunei Darussalam, antonino.briguglio@ubd.edu.bn

Larger benthic Foraminifera are single celled organisms bearing algal symbionts and are thus restricted to oligotrophic, photic zones of the world's shelf areas. Many taxa of this informal (non-systematic group) have great paleontological relevance as they are not only used as index fossils for large parts of the geological time scale, but are also rock forming (e.g. Cretaceous *Orbitolina* limestones that can also be found in Austria or Palaeogene Nummulite limestones of the Sahara region used in the construction of the Pyramids). It is estimated that they contribute almost 5% of present day annual carbonate production in the world's reef and shelf areas. In the past decades also their importance in the ecology of coral reefs has been recognised and used for monitoring as well as community modelling and forecasting. For all of the above applications a more detailed knowledge of the biology and population dynamics of larger foraminifera is indispensable. Here we present preliminary results of a sampling campaign carried out over a period of 15 months at the subtropical island of Sesoko (Okinawa, Japan). The natural laboratory approach, continuous monthly samplings in combination with high resolution computed tomography, allow for a detailed analyses of distribution changes of different parameters like size, chamber number and chamber volume of the populations of different species of LBF. These shifts in the population distribution can in turn be used for detailed analyses of population dynamics as well as calculating growth rates and estimating longevity for the investigated species. The results are in turn compared to results derived from simultaneously conducted long term cultivation at the Tropical Biosphere Research Station in Sesoko.