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Test flattening in the larger foraminifer *Heterostegina depressa*: predicting bathymetry from axial sections

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The cosmopolite foraminifer *Heterostegina depressa* has been a target of studies, describing its internal and external morphology, ecology and biology. During the last decades many researcher concentrated on test morphology and described its maturoevolute shape. Furthermore, a continuously increasing trend of test flattening along water depth has been described multiple times. However, the most common measurements, such as the thickness/diameter ratio, are too dependent on individual size to pose as an accurate tool. /newline Therefore a growth invariant character has been used to describe the change of thickness through the ontogeny of *H. depressa*. To compute this, the thickness at the half-radius, the so-called mediolateral thickness, of five whorls has been measured in 127 axial section of *H. depressa*. Based on this the ontogenetic change in thickness has been computed for specimens from different depth intervals of the slope of Sesoko-Jima, NW-Okinawa. In addition, this has been compared with the actual thickness and the corresponding radii at the same measuring points. The latter describes how thickness would change according to the thickness/diameter ratio./newline Hence, our analysis clearly quantifies a continuous transition of individuals with thicker central parts to individuals with flatter central parts along the water depth gradient. This is most likely controlled by light intensity, since photosymbionts (diatoms) of *H. depressa* are most active at low irradiation levels. Thus, shallower specimens grow thicker tests to reduce light penetration, while deeper specimens increase their surface to reach a better light exposure. Due to its broad water depth distribution *H. depressa* is a perfect model species to calibrate test flattening as bathymetric signal for fossil assemblages. Since similar ecological constraints are assumed for fossil nummulitid taxa, useful palaeobathymetric information might be gathered from studying test flattening in extinct species. This might enable us to better reconstruct palaeonenvironments of fossil larger foraminiferal communities or even give a hint on the degree of transport in allochtonous deposits.