Ber. Inst. Geol. Paläont. K.-F.-Univ. Graz	ISSN 1608-8166	Volume 7	Graz 2003

DENSITY BANDING IN THE CORAL *MONTASTRAEA FAVEOLATA* (SCLERACTINIA) FROM LOOE KEY, FLORIDA

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SEM study of *Montastraea faveolata*, part of the *Montastraea annularis* species complex of Knowlton, et al. (1997), provides new data on annual density banding, some which reinforce earlier work and some which allow modification of a model for skeletogenesis in the genus and the variations in it which lead to recognized density banding. Ma (1934) identified density banding, showing that it is temperature-related. Studies of *Montastraea* by Macintyre and Smith (1974) and Dodge et al. (1994) indicate that this banding is best developed in exothecal areas. Ogilvie (1896) described sequential steps in skeletogenesis, most recently recognized in the model of Barnes and Lough (1993), which identifies three stages of skeleton formation in *Porites*. This model is here modified to accommodate the presence of organic matrix around and within skeletal biocrystals, as illustrated by Cuif and Dauphin (1998). Three developmental stages for skeleton are also seen in *Montastraea*, 1) extensional, 2) thickening, and 3) formation of transverse elements (dissepiments). The first-formed layer within endothecal dissepiments develops from the thickening layer of septa; growth lines indicate that formation of this primary layer is a three to four day process. The extensional and thickening processes of skeletogenesis result in density banding in *Montastraea*, although to date we cannot discriminate rate variations between the two. Differences are present in the microarchitecture of septal and costal flanks and of upper and lower surfaces of dissepiments which allow recognition of their position within light or dense bands. In dense bands, the upper surfaces of exothecal dissepiments show luxurious crystal growth, while those in light bands are less well-developed. Septa are characterized by fasciculi (crystal clusters) forming new growth at their growth edges, with flanks then infilled to be smooth. In dense bands, these flanks are overgrown by abundant aragonite infilling around septal granulations. In light bands, carbonate thickening septal flanks commonly has crystals with incomplete terminations. Similar to septa, costal flanks have luxurious overgrowths of aragonite in dense bands, while costal flanks in light bands have sparse acicular crystal growths, with inorganic cements also present at some levels within the skeleton.