

# **Inner Ear Otolith Growth in larval Fish after Development at simulated Microgravity**

U. Baur, R. Hilbig, **R. Anken**

Zoological Institute, University of Stuttgart-Hohenheim, Garbenstr. 30, D-70593 Stuttgart, Germany

It has been shown earlier that hypergravity slows down inner ear otolith growth in developing fish (via a down-regulation of carbonic anhydrase reactivity) as an adaptation towards altered environmental gravity. We were thus prompted to elucidate whether clinorotation would possibly yield opposite effects. Therefore, larval siblings of cichlid fish (*Oreochromis mossambicus*) were housed in a submersed, two-dimensional clinostat. Two tubes with different diameters were used (10.5 mm, “large tube”, LT and 3.5 mm, “small tube”, ST; experimental time-span 10 and 7 days, respectively). After the experiments, otoliths were dissected and their size (area grown during the experiments) was determined planimetrically. In case of the LT-clinorotated fish, both utricular and saccular otoliths (lapilli and sagittae, respectively) were significantly smaller than those of the 1g-controls. In contrast, ST-maintenance resulted in significantly larger otoliths (lapilli only; no statistical significant difference regarding sagittae observed). The results from LT-clinorotation therefore indicate, that the animals had in fact received hypergravity, whereas the ST-data are to be interpreted as being effected by (simulated) microgravity conditions. In conclusion, otolith growth is affected by the gravitational vector in a dose-dependent manner. Acknowledgement: This work was financially supported by the German Aerospace Center (DLR) (FKZ: 50 WB 9997).