Age and growth of a keystone species from the Benguela upwelling ecosystem: of sneaky males that grow smaller

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The bearded goby (*Sufflogobius bibarbatus*) has received considerable attention in the light of recent investigations that demonstrate its ecological importance for the Benguela upwelling ecosystem (Utne-Palm *et al*., 2010). Next to remarkable physiological and behavioural adaptations such as hypoxia tolerance, predator avoidance, and diel vertical migration, the male individuals display alternative reproductive tactics (ARTs). Since for instance territorial behaviour is more likely to be successful in large specimens, the adoption of ARTs has been linked to growth. Here, reproductive tissues were used to identify ARTs of male individuals. Subsequently, otoliths analyses shed light on age and growth differences between females and territorial and sneaker males. Growth was modelled with von Bertalanffy functions and various otolith shape characteristics have been investigated using linear models and principal component analyses (PCA). As preliminary genetic analyses indicate population structure of this endemic species, findings were also compared along a latitudinal gradient. Territorial males grew larger (141.4±13.55mm; modelled L_∞±SE) than both females (109.3±5.84mm) and sneaker males (92.2±7.78mm). Analyses of otolith increments, however, revealed that sneakers grow faster during early life history. They may thus capitalize on reproducing earlier, yet it remains unclear, if they can become territorial males afterwards. Evidence for differences between specimens from different latitudes was sparse, although condition of individuals from the most southern part was highest. The groups differentiated by PCA mainly in relation to size, indicating that otolith characteristics do not vary with ART or latitude. The apparent flexibility in investment in growth and reproduction may contribute to the success of the bearded goby in the Benguela ecosystem.

References

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