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Sagittae shape analysis of a pelagic and benthic fish species: Ecological implications

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Morphological descriptions and differentiation of the sagittalotolith of *Oreochromis niloticus* (pelagic) (n=87) and *Chrysichthy snigrodigitatus* (benthic) (n=121) samples from the Lagos lagoon was undertaken in this study. Left and right sagittalotolith samples from both species were analyzed using four mathematical shape descriptors (circularity CO, rectangularity RE, roundness RO and compactness CP) and subjected to multivariate discriminate analysis (MDA). The CO, CP and RE of the sagittalotolith showed significant contribution to the discriminant model (Wilk's lambda $p < 0.05$) with the latter descriptor providing the higher discriminant power and an overall classification success of 89.4%. Sagittalotolith of *C. nigrodigitatus* showed higher classification coefficient for rectangularity (425.22) compared to *O. niloticus* (409.27) implying a more narrow-shaped otolith; *O. niloticus* showed a higher coefficient for circularity (-0.312) compared to *C. nigrodigitatus* (-12.50), while both species differed marginally with respect to compactness. The variance in otolith shape may be described as a vestibular adaptation to differential transmission of acoustic signals within the water column. The broader shaped otolith of the pelagic fish may be an adaptation to weaker acoustic signals characteristic of the pelagic realm while the narrower shaped otolith may be adapted to lower frequencies which are stronger and more prevalent at depths with lower temperature, higher pressure and heavier water mass. A further investigation into the use of sagittal otolith shape to discern ecological preferences of species is suggested.

Biography

Chukwuka Azubuiké Victor, born 29th April, 1982 with a BSc in Zoology (CGPA 4.4) and an MSc in Ecology/ Environmental Biology (PhD grade) from the University of Ibadan, Nigeria. He is currently doing a PhD in Ecology/Environmental Biology in the same university with a focus on marine ecotoxicology. His research involvement over the years has entailed toxicological bioassays comparing the relative sensitivity of somatic and otolith growth as early sentinels of toxicity in species of commercial importance i.e. *Oreochromis niloticus* (Nile tilapia) and *Clarias gariepinus* (African catfish). Complementary studies using these species in the wild have also been undertaken using these same end-points. Further works on otolith has entailed the use of otolith shape descriptors as a more sensitive and time-saving index of stress and perturbations in wild fish populations. These studies have been carried out using both marine and freshwater species. Ongoing collaborative research has entailed studies on intersex in both marine and freshwater fish species in the wild and under laboratory conditions. Other collaborative research includes works on oxidative stress and growth relationships in the blue crab *Callinectes amnicola*, a brackish species of commercial and research importance. His conference presentations include West African Society of Toxicology Conference (WASOT) 2012-2014, International Oceanography Conference (IOC) 2013, and Zoology Society of Nigeria (ZSN) Conference 2011. About 23 papers have been presented and published in national and international journals all of which are uploaded on the Researchgate portal.

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