

عنوان مقاله:

Use of otolithic morphometrics and ultrastructure for comparing between three goatfish species (family: Mullidae) from the northern Red Sea, Hurghada, Egypt

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نویسندگان:

(A.G.M. Osman - Al-Azhar University (Assiut branch

(M.M. Farrag - Al-Azhar University (Assiut branch

S.F. Mehanna - National Institute of Oceanography and Fisheries

Y.A. Osman - National Institute of Oceanography and Fisheries

خلاصه مقاله:

This work highlights the role of otolithic morphometrics, shape indices and ultrastructure in the identification of three Mullidae species from the Red Sea. Differences in otolithic measurements were detectable in all three-goatfish species. The statistical analysis of otolithic morphometric parameters showed that otolithic measurements are good indicators of fish size. For all three species, the correlation between fish length and different otolithic variables was statistically significant. The coefficient of determination (r^2) ranged from 0.83 to 0.92 in the three species, being higher for *M. vanicolensis* in all cases. The otolith area of *M. vanicolensis* was most strongly related to fish length, with a high correlation between otolith area and fish length ($r^2=0.92$) being observed in this species. The mean values of the six examined shape indices of the otoliths were considerably different among the three species, and the high degree of differentiation of these indices among species makes them useful for other researchers who wish to use otoliths in fish identification and classification. Remarkable variations in the morphological characteristics of fish otoliths were recorded among the studied species via scanning electron microscopy, including variations in the ornamentation of the ostium, cauda, and column of the otolith. These differences in otolithic characteristics and morphology might be useful for fisheries, biologists, archaeologists and geologists in discriminating *Mullus barbatus*, *M. vanicolensis*, and *Parupeneus forsskali*. This work contributes to the bioecological knowledge regarding commercially important fishes and provides key information for studying the trophic ecology of fish-eating species and fishery management.

کلمات کلیدی:

Goatfish species, Otoliths, Morphometrics, Scanning electron microscope, Red Sea

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