

Bonga shad (*Ethmalosa fimbriata*) key biological parameters variability under the effects of environmental changes

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Abstract

Ethmalosa fimbriata (Bowdich 1825) is a small, often overexploited, pelagic fish species that occurs off tropical and subtropical coastlines. It constitutes the main catch of artisanal fisheries off the coast of West Africa. We examined growth rates and reproductive characteristics of *E. fimbriata* off The Gambia and other coastal areas to determine how they relate to variations in environmental characteristics of coastal waters. Using fish length-frequency data and a coastal upwelling index, it was found that recruitment of *E. fimbriata* tends to occur during periods of intense upwelling when nutrient-rich water is brought to the surface. The evolutionary trait of peak reproduction corresponds to low sea surface temperature periods. We hypothesize that *E. fimbriata* takes advantage of the higher zooplankton productivity in coastal waters when upwelling brings nutrient-rich water to the surface (i.e., it increases its growth rate and accumulates energy reserves for spawning). Growth performance appears to be intensely dependent on environmental conditions. The timing of spawning seems to occur when food (zooplankton) is most available to supply the energy requirements adults need for spawning and early development of larvae. Environmental changes seem to significantly affect *E. fimbriata* growth and reproduction, which endorses their high phenotypic plasticity.

Keywords: *Ethmalosa fimbriata*, upwelling, West Africa, growth rate