



Variability of round sardinella (*Sardinella aurita*) and flat sardinella (*Sardinella maderensis*) landings in Senegalese waters: insight from the effects of oceanographic conditions

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Abstract

We report the use of generalized linear models (GLM) and generalized additive models (GAM) to evaluate whether the variability of round and flat sardinella abundance is related to physical conditions coastal pelagic habitat. Landing data from 1999 to 2010, considered as abundance index, remotely sensed thermal data and coastal upwelling index (IUC) calculated from SST, sea level anomalies (SLA), wind stress and chlorophyll concentration (Chl-a) were used to construct the GLM and GAMS. Senegalese coast was divided in two zones: southern zone and northern area which get similitude and differences in their physical functioning. These data were averaged from the coast to the 200 m isobaths in each zone. Seasonal decomposition method was used to divide the time series in seasonal component and trend component. Results show that both biological and environmental data strongly vary from one season to another and year to year as well. The models show that variability of round sardinella and flat sardinella are tidily related to upwelling intensity. However, GAM better evaluate the association between sardinella and upwelling intensity than GLM. Our hypothesis is that the interaction between pelagic habitat and the sardinella biology is complex due to the non-linear population dynamics response.

Keywords: Senegal, sardinella, generalized linear model, generalized additive model, IUC, SST.



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