Session 02

Analysis of zooplankton samples from AWA scientific research on board of R/V Thalassa 2014 using the zooscan approach

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Abstract

Zooplankton organisms are crucial in nutrient cycling and energy transport, as they constitute the largest marine animal biomass and represent the main link between phytoplankton and other secondary consumers. Zooplankton is dominated by copepods and in many cases the Calanoids stand out by the number of species and/or biomass. In 2014 a scientific research was carried out along the coast of West Africa (Mauritania, Senegal and Gambia) on board of R/V Thalassa. Zooplankton samples were collected at day and night at 4 different stations along a coast-to-open ocean transect (station 1 inshore, station 4 offshore from R3) and 5 different depths using a multinet. Samples were analysed at the INDP laboratory using the zooscan approach. In short, the samples were fractionated into three size fractions (small < 500; medium 500-1000; and large > 1000 µm) and imaged using a flatbed scanner. "Vignettes" small thumbnails and image characteristics of all objects were extracted from the image data with ZooProcess and sorted into 39 categories using Plankton Identifier and then manually validated. Copepods represented 91% of the total abundance; gelatinous organisms such as siphonophores, chaetognaths, salps and, appendicularians represented 5%; other crustaceans, such as euphausiids, ostracods, amphipods and decapods 2%; eggs and molluscs 1%. At the copepod level, calanoids were the most dominante group (total abundance percentage 88%), followed by cyclopoid and harpacticoid copepods (6%). Each oithonidae and eucalanidae families were (2%), oncaeaidae (1%) and nauplius copepods were 1%. In general, the total abundance of copepods differed spatially and along the water column. This may have to do with the biotic processes (*e.g* Chla) and abiotic (*e.g* the distance from the coast to the open ocean). The stations 1

and 2, the most inshore were those that presented greater abundances. The highest variations were observed 0 to 100m depth. The vertical distribution was used to detect migration patterns like diel vertical migration (DVM), which was mostly detected in the large fraction. For this fraction, the “normal” DVM (up at night and down during the day) was visible at stations 2 and 3, where the large copepods aggregated at the 25 to 50, and the 0 to 50 m depth level, respectively during nighttime. At station 1, large copepods were found to be almost homogeneously distributed in the water column during daytime, whereas they also aggregated at the 25 to 50 m depth layer during nighttime. Further analysis of the data is ongoing and will resolve particulate and dissolved matter fluxes related to these migrations, but also can inform ecosystem modelling efforts.

Keywords : DVM, West Africa, ZooProcess, copepods, appendicularians, amphipods and decapods, eggs and molluscs.

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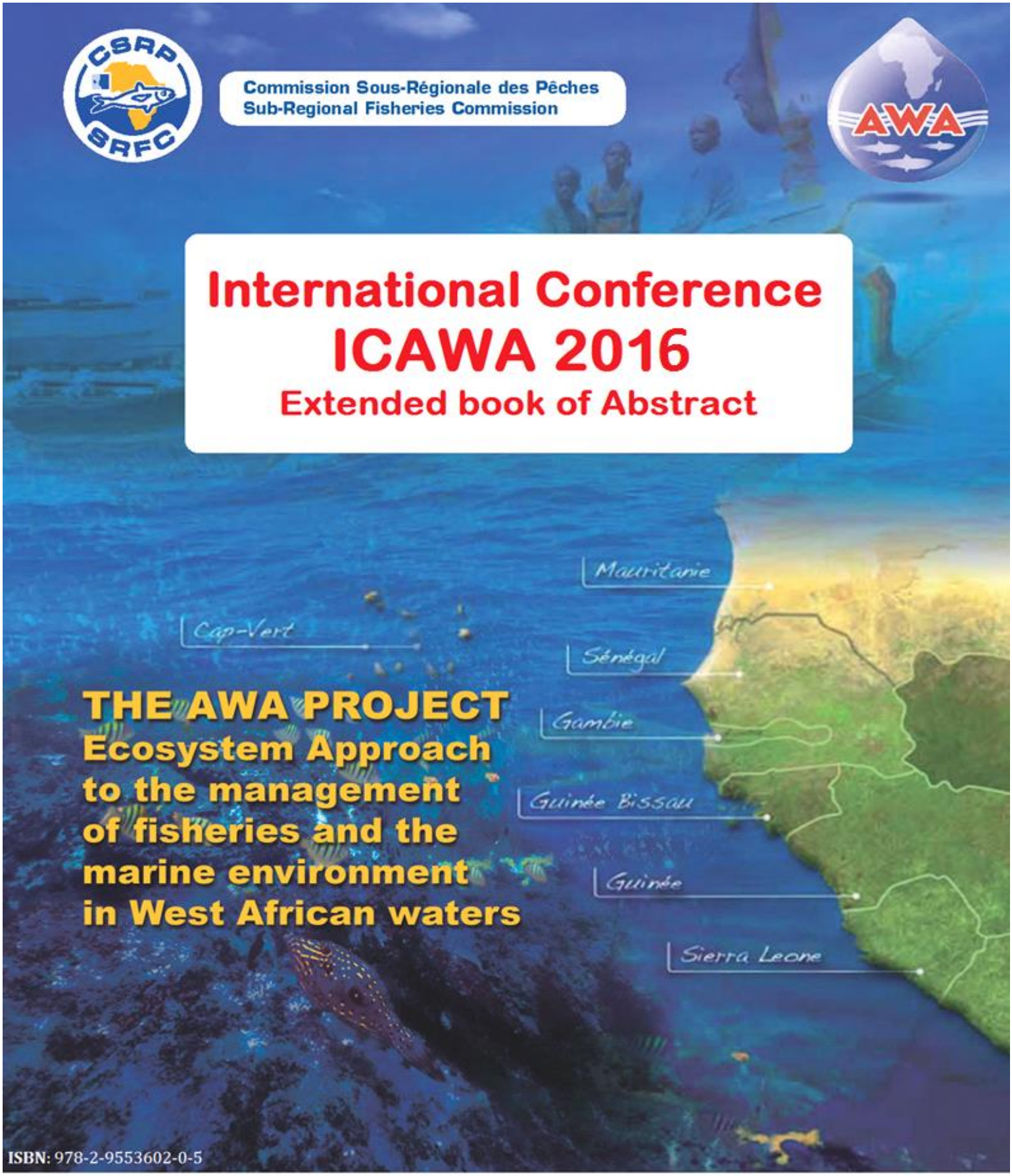

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