Analysis of stable nitrogen and carbon isotopes in horse mackerel (*T. capensis*) in the Benguela region.

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Introduction

Horse mackerel (*Trachurus capensis*) is one of the important pelagic fish species in the Benguela ecosystem. Energy transfer efficiencies to high tropic levels changed over time, more so for northern Benguela, with changes from sardine to horse mackerel dominance (Heymans *et al.,* 2004). Changes in dominance alter the structure of the ecosystem and are attributed mainly to environmental variability and anthropogenic impacts (van der Lingen *et al.*, 2006).

Diet of horse mackerel is predominantly euphausiids and the species is mainly feeding at higher trophic levesl (Heymans *et al.*, 2004), although juvenile horse mackerel diet is more similar to other small pelagic species (Crawford *et al.*, 1987). This poster presents the stable nitrogen and carbon isotope findings as inference of horse mackerel trophic role in the Benguela region.

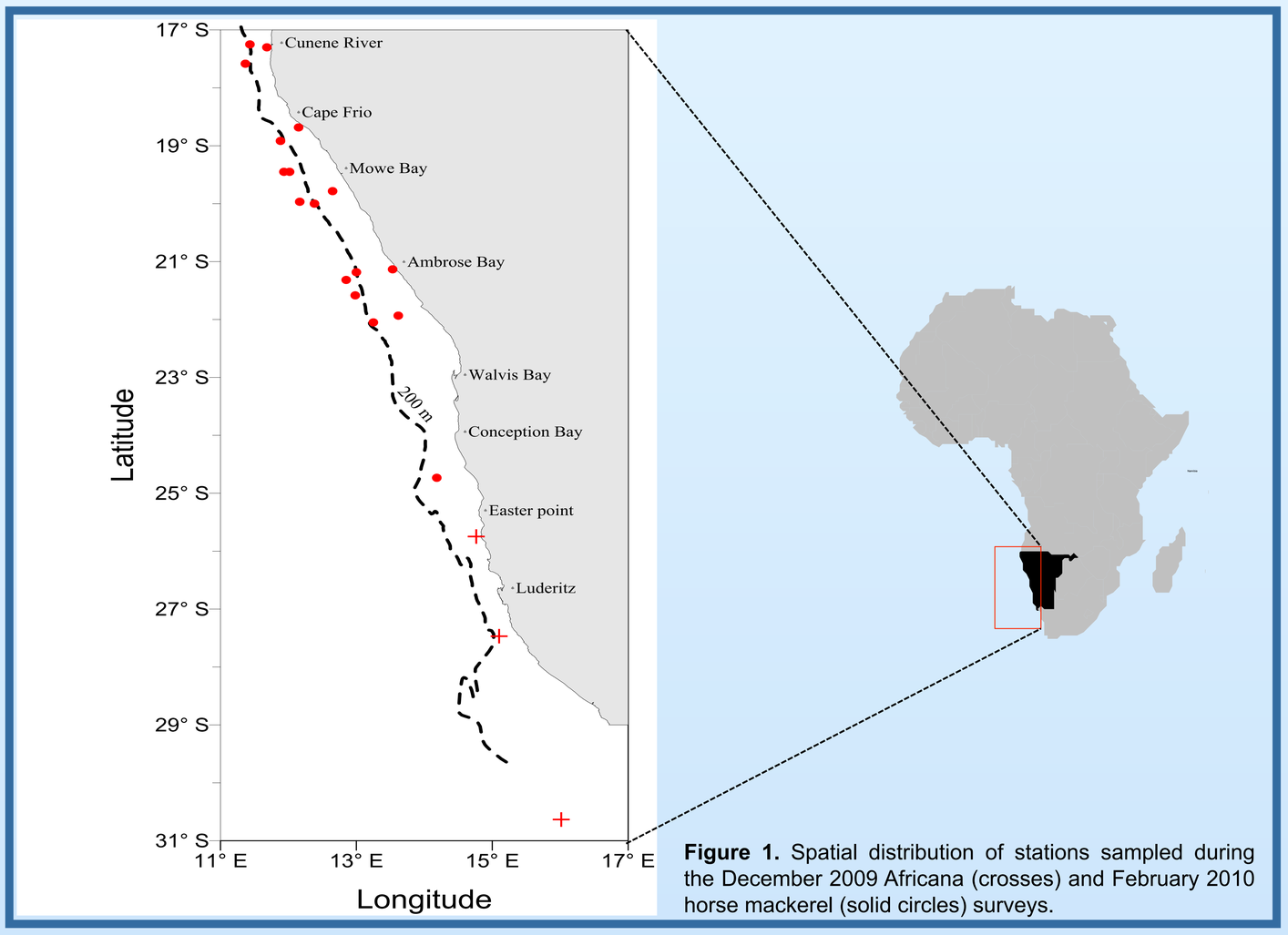

Figure 1. Spatial distribution of stations sampled during the December 2009 Africana (crosses) and February 2010 horse mackerel (solid circles) surveys.

Results

Horse mackerel tissues were sampled from two independent surveys (Fig. 1) conducted in the Benguela region between December 2009 and February 2010. Preliminary stable isotope results show that $\delta^{15}N$ and $\delta^{13}C$ values increased with increase in total length of fish (Fig. 2). Fish of total length between 23 and 33 cm had $\delta^{15}N$ and $\delta^{13}C$ values from 11.7‰ to 14.1‰ and -17.7‰ to -16.4‰, respectively. The increase in isotopic values is not significant ($\delta^{15}N$; r_s = 0.20 and $\delta^{13}C$; r_s = 0.14) as fish > 21 cm total length (i.e. adults) are considered to feed on the same matter (Crawford *et al.*, 1987).

Stable nitrogen and carbon isotope ratios in these ranges are considered to be from the pelagic and demersal food-web component (Le Loc'h and Hily 2005). Horse mackerel is known to occupy the pelagic zone and then shifting to the demersal zone as they grow older. These results therefore show that horse mackerel is a secondary consumer feeding mainly on zooplankton and other vertebrates (Crawford *et al.*, 1987).

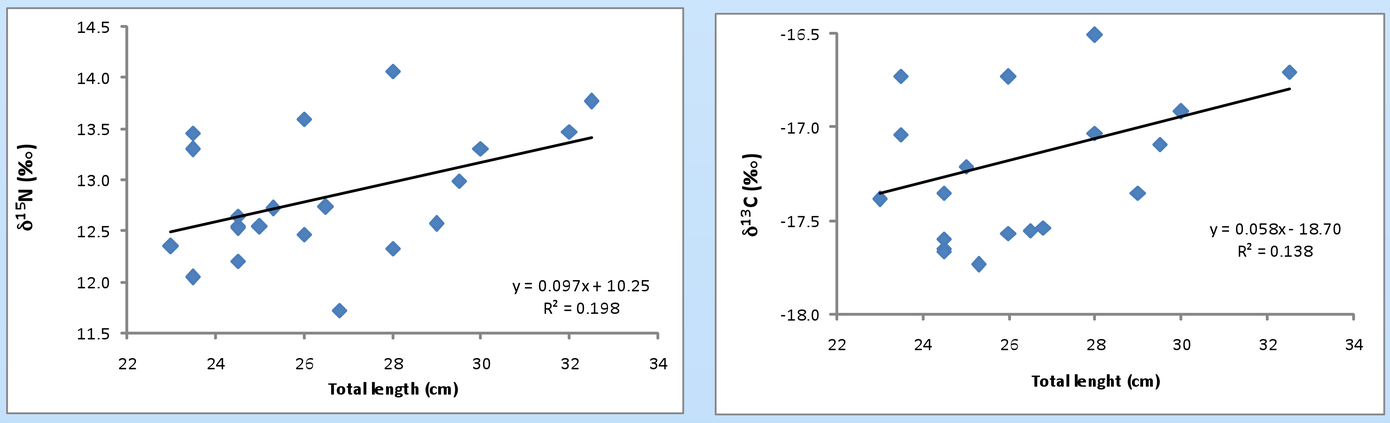

Fig. 2: Stable nitrogen and carbon isotope ratio depending on Total Length

Conclusion

In the Benguela region, horse mackerel can be an important energy transferer to high trophic levels. However, a higher domonince of horse mackerel will alter the functioning of the ecosystem as it feeds at higher trophic level than other small pelagic species (e.g. sardine).

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