

THE DYNAMICS OF COMMUNITY COMPOSITION AND FATTY ACID PROFILES OF SESTON AND ZOOPLANKTON IN CONTRASTING ESTUARINE SYSTEMS

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**Abstract:**

Estuaries are important nursery habitat for commercially important species, and zooplankton is a critical food source. We investigated how environmental variability shaped the dietary options for zooplankton in two North Carolina, USA estuaries. The Tar-Pamlico River is a partially-mixed estuary with a pronounced salinity gradient and the Chowan River is a primarily freshwater estuary. We measured physical and chemical variables and correlated these with components of the seston (phytoplankton abundance and pigment composition and microzooplankton abundance). In the Tar-Pamlico River, we found that the seston and zooplankton community changed along the salinity gradient, as expected. We also found that light attenuation data were correlated with seston composition, whereas nutrient data showed no correlation. In order to link the seston to the zooplankton, we also quantified the fatty acid composition of both the seston and the zooplankton community. In the Chowan River, seston fatty acid profiles closely matched those of the zooplankton. Fatty acid profiles indicated a possible terrestrial input in the zooplankton and a saltwater intrusion event correlated to a change in fatty acid composition of the zooplankton. The fatty acid profiles showed a higher proportion of marine derived fatty acids during the saltwater intrusion. The ratio of n-3/n-6 and EPA/DHA ratios demonstrated a separation of zooplankton by taxonomic groups. A comparison of these two estuaries suggests that the link between seston and zooplankton dynamics is influenced more by light in eutrophic systems than nutrients.

Keywords: Fatty acids, estuary, zooplankton, seston

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