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Trade-offs of the copepod Eurytemora affinis in mega-tidal estuaries. Insights from high frequency sampling in the Seine Estuary

D. Devreker (1,2), S. Souissi (1), J.C. Molinero (1,3), F. Nkubito (1)

(1) Université des Sciences et Technologies de Lille- Lille 1, Laboratoire d'Océanologie et de Géosciences, UMR CNRS 8187 LOG, Station Marine de Wimereux, 28 avenue Foch, 62930 Wimereux, France, Tel: +33-3 21 99 29 26; Fax: +33-3 21 99 29 01, Email : sami.souissi@univ-lille1.fr; (2) Laboratoire d'Ecotoxicologie - Milieux Aquatique (LEMA), Faculté des Sciences et Techniques, Université du Havre - 76058 Le Havre Cedex - BP 540 ; (3) Leibniz-Institut für Meereswissenschaften, IFM-GEOMAR,FB3 - Marine Ecology/Experimental Ecology, Düsternbrooker Weg 20, 24105 Kiel, Germany.

The trade-offs species face to maximize their fitness in highly dynamic environments (e.g. estuaries) has been a long-running topic of debate and is of central importance to understanding the ecology and evolution of estuarine populations. Behavioural strategy of organisms to maintain in their optimal habitat take a main part in this trade-off. We present here the first comprehensive data set on the population dynamics of E. affinis obtained from a 50-hour high frequency Eulerian sampling in the Seine Estuary during spring. The variation of copepod density and population structure was investigated through a resolution of 15 minutes at 2 different depths. Results showed that the developmental stages were not randomly distributed during a tidal cycle but correspond to a distribution through specific salinity habitat in adequation to their respective salinity tolerance. The higher abundances of copepods that occur near the bottom seem a strategy of the species to avoid the surface current, although it may incur a cost due to the greater presence of predators in bottom waters. We proposed a general scheme of this maintenance strategy.