ECOLOGY OF THE PEARL OYSTER (Pinctada margaritifera) LARVAE IN A SEMI-ENCLOSED ATOLL LAGOON (AHE, FRENCH POLYNESIA): I. SPATIO-TEMPORAL VARIABILITY OF THE TROPHIC RESOURCE

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Atoll lagoons are usually described as very stable environments. Nevertheless, the space-time variability of pearl oyster spat yield on collectors is very high and pearl farm needs cannot always be satisfied. Thus, since the larvae development and dispersal are respectively depending on the environmental parameters (i.e. trophic and temperature) and meteorology (i.e. wind), it appears essential to evaluate the spatial and temporal variation of these parameters in order to evaluate their influence on larval development. Trophic resources descriptors have been followed in the plankton communities of a semi-enclosed atoll lagoon. The water properties were analysed with an increasing degree of precision from the chlorophyll-a in vivo to the pico and nano-plankton communities using flow cytometry. Three spatial levels were studied: the vertical distribution (0 to 50m), the local structure (100m) and the lagoon scale. The temporal scales were adapted to the spatial levels with a nycthemeral survey at the vertical scale and a daily dynamic at the large scale. Four sampling campaigns were conducted from April 2007 to March 2008 allowing a seasonal approach. The plankton appears dominated by the pico-plankton communities: Synechococcus (62\%), picoeukaryots (14\%) and Prochlorococcus (7\%). Two nanoplanctonic communities have also been identified (8\% and 9\% of the total biomass). These communities represent the main part of the larval food and present the largest variation levels at the three spatial scales (mean variation coefficient of 27\%, 30\% and 23\% at the lagoon, transect and vertical scale respectively). The vertical scale shows a succession of mix and stratification, mainly related to the wind velocity, with a positive gradient of food from the surface towards the bottom. In addition, large scale sampling presents significant variations at a daily time step with some specific spatial patterns.

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