Assessment of nutritional requirements of the oyster *Pinctada margaritifera* according to the temperature

Gilles Le Moullac, Claude Soyez, Manaarii Sham Koua and Jean-Claude Cochard
Ifremer, Département Aquaculture en Polynésie, Centre du Pacifique – BP 7004, 98719 Taravao, French Polynesia
gilles.le.moullac@ifremer.fr

The reproduction of bivalves is driven by temperature and nutrition. *Pinctada margaritifera* is a very efficient filter feeder. In the objective of conditioning, this study aimed to determine the influence of temperature at different trophic level on clearance rate and absorption efficiency in controlled conditions.

The experiments were carried out at three temperatures: 21, 26 and 30°C in controlled flowthrough tanks where algae (*Isochrysis galbana* (T-Iso) and *Chaetoceros gracilis* (v/v)) were distributed at a constant rate. An automated sampling device allowed to monitor algal fluorescence at a rate of 3 per hour. Since ingestion is a saturating function of algal concentration, clearance was modelled by a hyperbolic function adapted from the Michaelis-Menten function. Assimilation of organic matter was estimated according to the method of Conover.

At 21°C, maximum clearance value was Imax=62.67 10³ cell.h⁻¹.g⁻¹ dw, half-saturation coefficient Xk=4728 algae cell.ml⁻¹; at 26°C Imax=175.42 10³ cell.h⁻¹.g⁻¹ dw and Xk=12732 cell.ml⁻¹; and at 30°C Imax=130.49 10³ cell.h⁻¹.g⁻¹ dw and Xk=23191 cell.ml⁻¹. Absorption efficiency (AE) evaluated by biodeposits analysis appeared to be independent of the trophic level. Average AE were 64 ± 7% at 21°C, 52± 13% at 26°C and 74± 3% at 30°C.

Optimal temperature for clearance rate for *P. margaritifera* appears to be close to 26°C. Estimation of AE should be improved by separated analysis of feces and pseudofeces.