Geophysical Research Abstracts,
Vol. 10, EGU2008-A-10097, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-10097
EGU General Assembly 2008

Plasticity mechanisms and monitoring of the bacterial population within gill filaments of the shallow water lucinid *Codakia orbiculata*, (Montagu, 1808) after an environmental stress.

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Codakia orbiculata (Montagu, 1802) is a lucinid species inhabiting low sulfide sediments in shallow-water seagrasses of *Thalassia testudinum.* Because of such sulphidic environment, its gill filaments are colonized by endosymbionts which are sulphur-oxydizing bacteria. This study was aimed at investigating the time course of bacterial population, stress markers expression (HSP70 and 90α), and cell organization within gill filaments, during an environmental stress (3 month period of host stabulation, $i.e.$ no food and no sulfur added). Technical approaches were made by hybridizations (CARD-FISH and imunoshistochemistry), and by histology.

During this stress period, ciliated and intermediary zones presented no HSP-like immunoreactivity while the lateral zone of each gill filament has progressively lost a large amount of its gill-endosymbionts, and has developed a HSP-like immunoreactivity, only located within the bacteriocytes. These latter cells have been partially replaced by granule cells (which do not harbor bacteria) becoming the predominant cell in the lateral zone. When the individuals were put back to their natural habitat, the lateral zone gradually regained its full endosymbionts in few days while bacteriocytes still displayed HSP labeling, at 2 weeks delay, and then represented the predominant cells.

To conclude, the infection process, or its inverse, are cell stress inducible and are powerful stimulations to underly structural and cellular reorganization of the lateral zone.