Imprpovement of french polynesian pearls quality: transcriptomic SAGE approach for identification of biomineralization markers in Pinetada margaritifera oyster

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Pearl farming occupies an essential place in French Polynesian economy. Thus, Ifremer’s laboratory collaborates with the "Service de la Periculture" in Tahiti in order to deepen the knowledge concerning molecular mechanisms of biomineralization processes leading to the pearl formation. This research project contributes to a large program aiming at enhancing pearl quality. The goal is to get a global view of transcriptomic events taking place in mineralizing tissues of the oyster Pinetada margaritifera involved in pearl formation. Therefore, a transcriptome analysis by the SAGE method (Serial Analysis of Gene Expression) and the construction of an EST library (Expressed Sequence Tag) were developed in parallel on mantle epithelial cells in order to characterize graft cell genes differentially expressed. Expression profiles of 48.000 genes have been established and more than 280.000 EST have been sequenced allowing the constitution of 47.000 clusters. These results represent an important set of genomic data for this organism, and have allowed the selection of a combination of genes, which characterization was undertaken by real-time PCR. Correlation between the expression level of these potential biomarkers and the quality of pearls is now assessed in the course of experimental graftings. This work will allow the identification of a set of genes in correlation with the nature of calcium carbonate deposits of the pearls. The evidenced biomineralization markers will be used to gain original tools (bio-assays) for the professionals to assess and select donor oysters with higher mineralization capacities. This work is therefore closely linked to the concerns of the professionals, and will contribute to the sustainable development of the aquaculture industry essential to French Polynesia.