VIBRIOSIS IN BIVALVES : REVIEW OF RECENT MOLECULAR, BIOCHEMICAL, AND PHYSIOLOGICAL STUDIES

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The emergence of new vibriosis in the European Atlantic coasts has been associated with mass mortalities of molluscs causing important economic losses. For examples, *Vibrio carchariae*, a bacteria already isolated from shark, has been associated with a severe Haliotis epizooty in hatchery. In oysters, *Crassostrea gigas*, a strain closely related to *Vibrio splendidus* is suspected to be associated with summer mortalities. Some other pathogenic vibrios have been also isolated few years ago. *Vibrio tapetis* which provokes the Brown Ring Disease in the manila clams *Ruditapes philippinarum*, *Vibrio splendidus* which induces conchyoline deposit in *Pecten maximus* and also *Vibrio pectenicida* which causes larval scallop mortalities in hatchery. The list is not exhaustive.

Several tools have been developed to detect these pathogenic vibrios. They include serological procedures using polyclonal and monoclonal antibodies and ELISA tests, biochemical criteria and molecular methods based on the 16S or 23S rRNA nucleic acid probes hybridization. Molecular identification of *V. tapetis* and *V. pectenicida* has been recently done by dot blot hybridation using specific 16S rDNA probes and a SSP-PCR protocol method has allowed V. tapetis detection in individual diseased and asymptomatic clams. This last method suggests a potential utilization in commercial hatcheries to confirm *V. tapetis* free water and clams.

If the virulence factors of fish pathogenic vibrios have been yet identified, little knowledge exist in mollusc pathogenic vibrios. Bivalve pathogenic vibrios are host specific, excepted *V. splendidus* which presents various variants depending on the host species. In this last vibrio, *V. splendidus*, some common mechanism mediated by molecular factors could be suspected.

The interactions of the vibrios with the clam's tissus or hemocytes have been used to developed in vitro bio-tests to evaluate their pathogenicity. Accordind to these tests, in *V. tapetis*, adherence and hemocyte lysis factors have been yet identified. With this test, a toxin from *Vibrio pectenicida*, responsible of hemocyte lysis, was partially purified. It was a small molecule (< 3Kdal), no-proteinic different to cilio-static toxin described by Nottage and Birkbeck. This molecule is probably common at different pathogenic vibrios. In bacteria, virulence factors are generally carried by plasmids. Two or three plasmids have been yet detected in *V. tapetis*, but the role of these plamids in pathogenicity is still not demonstrated.

In conclusion, studies of these interaction models, vibrio-bivalve, allow to develop original comparative researchs, in particular characterisation of adherence factors and toxins in vibrios but also characterisation of the immune defence mechanisms against vibrios, in particular identification of anti-bacterial substances.