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EVOLUTION OF BROWN MUSCLE DISEASE IN MANILA CLAMS (*VENERUPIS PHILIPPINARUM*) OF ARCACHON BAY (2010-12).

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Manila clam (*Venerupis philippinarum*) is the second exploited bivalve in Arcachon Bay, after the Pacific oyster. Among the different causes of its stock decline, the contribution of diseases to explain the deficit of growth and survivorship is suspected. In 2005, a new disease, the Brown Muscle Disease (BMD), was described. Here, we propose to compare the distribution of the disease at the lagoon scale, through 2010 and 2012 sampling campaigns. The disease was only observed in individuals with shell length > 23 mm. In this subpopulation of adults, total prevalence in the Bay decreased from 4.2% to 2.9% between 2010 and 2012. Computing prevalence per station as "the number of infected clams per station/total number of clams in all station", data were processed with ArcGIS software in order to obtain prevalence distribution maps. Considering the spatial distribution and the averaged distance between stations, the Inverse Distance Weighted (IDW) interpolation method with a 100 m grid cell was chosen. This technique allowed mapping disease progression and pointing out the deficit of disease in mudflats under the influence of the main river Leyre (26% of stations). In 2010, the average BMD prevalence per station was similar in stations under Leyre influence and in the rest of Arcachon Bay but, due to involved surface, the total prevalence in this southern basin represented only 24% of the total Arcachon Bay prevalence. In 2012, the average BMD prevalence in stations under Leyre influenced collapsed (-70%) and the total prevalence of this sub-area represented only 10% of the total prevalence of Arcachon Bay. This infection discrepancy between years could be due to higher BMD-related clam mortality. Indeed, the correlation between prevalence decline and clam density decline was significant (R=0.39). Results also suggest that BMD infection dynamics was slower in the area under Leyre river influence.

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SPATIAL VARIABILITY OF OYSTER FECUNDITY IN RELATION WITH FOOD AVAILABILITY IN ARCACHON BAY

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The oyster, *Crassostrea gigas*, was introduced for farming in the 1970s along the French Atlantic coast and represents nowadays 98% of the aquaculture activity. In the 2000s, Arcachon Bay was considered as the first spat-supplying area; it supported 70% of the French oyster production. During the last 20 years, spat collection dealed with high fluctuations, threatening the local economic activity of spat production. This had been attributed to reproductive problems, highlighted by both an oyster spawning delay and a decrease of small larvae abundance since 1995. Long-term evolution of these reproduction indices has been recently related to climate change that might controls the phytoplankton communities of the Bay, suggesting a potential impact of food quality on oyster gametogenesis success in the Arcachon Bay.

Focusing on the potential relation between gametogenesis success and trophic resources, an overall assessment of fecundity status and diet of wild oysters had been conducted at a large spatial scale in Arcachon bay in late June 2013 (68 stations). Biometric characteristics, conditions indices, energetic reserves and gonadal maturation stage were measured on 30 individuals per station to estimate growth and reproductive development of oyster. Carbon and nitrogen stables isotopes analysis were realized on adductor muscles to assess the relative importance of different potential sources in oyster diet.

Condition indices evolved in the same way, flowing a West South-East decreasing gradient. Eastern reefs exhibited a limited reproductive success with a higher percentage of oysters without developed gonad. Carbon and nitrogen isotopic signatures also showed significant spatial gradients. $\delta^{13}C$ of oysters increased from continental to oceanic area (from -18.15 to -20.61), while their $\delta^{15}N$ followed a North-South increasing gradient (from 3.70 to 4.33). Results will be discussed considering the spatial discrimination of food sources (especially phytoplankton and microphytobenthos).