

Effect of phytoplankton containing paralytic shellfish and amnesic shellfish toxins on the culture of the king scallop



The impact of toxic outbreaks of *Gymnodinium catenatum*, producer of paralytic shellfish poisoning toxins (PSP toxins) and *Pseudonitzschia* spp., producer of amnesic shellfish poisoning toxins (ASP toxins), was studied throughout the culture cycle of the king scallop *Pecten maximus* (length from 40 to 100 mm). Toxin concentration, in plankton and in the digestive gland of the scallops, other variables that describe the state of the cultured scallops (mortality, growth, length/weight ratio, gonadosomatic index) and the main environmental conditions (temperature and in vivo fluorescence) were determined from December 2001 to April 2003. Temperature ranged from 14 °C during the winter to 22 °C at the end of July. In vivo fluorescence ranged from not detectable to 25 relative units, with a maximum also recorded at the end of July. ASP toxin levels, in both plankton and organisms, were high during the first half of the sampling period (maximum 450 ng domoic acid L⁻¹, in plankton, and 175 µg.g⁻¹ of scallop digestive gland) when the scallops were juvenile. PSP toxins attained larger concentrations in the second half of the sampling period (maximum

of 1.8 nmol L⁻¹ in plankton and 550 nmol g⁻¹ of digestive gland, of gonyautoxins after hydrolysis). Several mortality events took place during the period studied, but none of them coincided neither with an ASP or PSP outbreak nor with long exposure of the scallops to these toxins. One of the recorded mortalities occurred simultaneously with a high concentration of PSP in the scallops, but also with an important spawning. Additionally, it was not coincidental with the bloom of toxic plankton, thus, post-spawning stress seemed to be the main responsible for the mortality. No appreciable effect of ASP or PSP toxins on growth or reproductive state of the cultured scallops was found. Therefore, neither ASP nor PSP toxins appeared to represent a direct threat to the culture of *Pecten maximus* in that case.

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