

# BOOK OF ABSTRACTS

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## Tropomyosin variations in the mussel *Mytilus galloprovincialis* exposed to Diarrhetic Shellfish Toxins

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### Abstract

The consumption of seafood contaminated with diarrhetic shellfish toxins (DSTs) represents a food safety threat, being shellfish the main vector for human consumers. Moreover, DSTs can produce significant alterations at the protein level in shellfish and this can affect the content of allergens. Two assays have been developed to study the variations in the tropomyosin (TM) content in mussels (*Mytilus galloprovincialis*) during the accumulation/depuration of DSTs. In both assays, 6 aquaria were used, 3 of control, feed with non-toxic mixture of *Isochrysis* and *Tetraselmis* ( $5.0 \times 10^7$  cells/L (1<sup>st</sup> assay) and  $1.0 \times 10^7$  cells/L (2<sup>nd</sup> assay)) and 3 of treatment, feed with *Prorocentrum lima* ( $2.6 \times 10^8$  cells/L (1<sup>st</sup> assay) and  $1.0 \times 10^6$  cells/L (2<sup>nd</sup> assay)). These assays were established in two phases: intoxication/accumulation (5 days) and depuration (14 days). DSTs were determined by LC-MS and the TM content was determined by using quantitative Elisa KITs (Immunolab).

Regarding the dynamics of DSTs, the results of both assays showed that there was an exponential trend in the accumulation of toxins during the intoxication process, although in the first assay higher concentrations of both okadaic acid (OA) and dinophysistoxin-1 (DTX-1) were registered in mussels (a maximum of  $10648 \mu\text{g OA /kg}$  and  $3659 \mu\text{g DTX-1/kg}$ ), in comparison with the second assay (a maximum of  $2819 \mu\text{g OA /kg}$  and  $1107 \mu\text{g DTX-1/kg}$ ). Considering this pattern of accumulation, it was possible to conclude that 14 days of depuration are not enough to reduce the content of DSTs in mussels to levels below the legal limit ( $160 \mu\text{g}$  of OA equivalent/kg of shellfish), which can be of concern in terms of public health. Concerning the dynamics of TM in mussels, although in the second assay the differences were slighter, there was in both assays a decrease in the TM content corresponding to the maximum content of DSTs in mussels, returning to basal values after the depuration phase. This effect is observed probably because OA acts as a serine/threonine protein phosphatase inhibitor, affecting in particular the phosphorylation patterns of proteins, which may be of relevance in the TM content, which is a fundamental component of cytoskeleton in muscular and non-muscular cells.

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**Keywords** – Diarrhetic Shellfish Toxins; *Mytilus galloprovincialis*; DSTs accumulation; DSTs depuration; allergens; tropomyosin

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