

## **Determination of biotoxins in *Crassostrea madrasensis*: a case study of Puttalam Lagoon in Sri Lanka**

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Shellfish culture is a major sector of aquaculture production worldwide and microalgae have the capacity to produce potent phycotoxins which bioaccumulate through levels of the food chain. There are lack of data on the marine toxins stress on scientific-based risk assessment in Sri Lanka. This study was carried out for the detection and quantification of some selected biotoxins in *Crassostrea madrasensis* collected from five sampling stations in Puttalam Lagoon. Randomly collected 16 samples of oysters (2 samples/month) from January to September excluding April and an algae sample in October, 2017 were analyzed for 4 types of biotoxins namely okadaic acid (OA), domoic acid (DA) saxitoxin (ST) and brevetoxin (BT) which are commonly associated with shellfish poisoning. Samples analysis were done according to competitive Enzyme-linked Immunosorbent Assay (ELISA) testing protocol, using max signal (USA) okadaic acid (DSP), domoic acid (ASP) saxitoxin acid (PSP), beacon brevetoxin (NSP) Plate Kit (Cat.# 20-0200) and Thermo Scientific SKANIT software for Microplate Reader. The maximum permissible levels (MPL) established for DSP (160 ppb) and ASP ( $2 \times 10^4$  ppb), PSP (800 ppb) were not exceeded in any of oyster sample. The DA concentration in *C. Madrasensis* was ranged from  $0.073 \pm 0.012$  ppb to  $0.167 \pm 0.011$  whereas ST was ranged from  $0.141 \pm 0.000$  ppb to  $0.982 \pm 0.181$  ppb and BT from  $1.382 \pm 0$  to  $1.603 \pm 0$  ppb. OA monthly concentrations did not show any significance ( $p > 0.05$ ) in the concentrations and averaged as  $0.179 \pm 0.116$  ppb during the experimental period;. In conclusion, results indicated an existance of DA producing phytoplankton in January was low and high in February. ST producers were low in February and high in July. BT generators were low in June and high in September. But, any of the quantified concentrations of OA, DA, ST and BT in *C. madrasensis* from Puttalam Lagoon were not exceeded their MPL intended to meet export quality criteria and requirements for human consumption.

Keywords: marine biotoxins, phytoplankton, ELISA, okadaic acid, domoic acid, brevetoxin, saxitoxin

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