Accepted Manuscript

Assessing the presence of marine toxins in bivalve molluscs from southwest India

Andrew D. Turner, Monika Dhanji-Rapkova, Stephanie Rowland-Pilgrim, Lucy M. Turner, Ashwin Rai, Moleyur N. Venugopal, Indrani Karunasagar, Anna Godhe



DOI: 10.1016/j.toxicon.2017.11.001

Reference: TOXCON 5758

To appear in: *Toxicon*

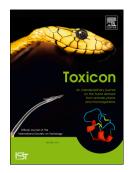
Received Date: 22 September 2017

Revised Date: 1 November 2017

Accepted Date: 3 November 2017

Please cite this article as: Turner, A.D., Dhanji-Rapkova, M., Rowland-Pilgrim, S., Turner, L.M., Rai, A., Venugopal, M.N., Karunasagar, I., Godhe, A., Assessing the presence of marine toxins in bivalve molluscs from southwest India, *Toxicon* (2017), doi: 10.1016/j.toxicon.2017.11.001.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Assessing the presence of marine toxins in bivalve molluscs from southwest India

Andrew D. Turner^{*1}, Monika Dhanji-Rapkova¹, Stephanie Rowland-Pilgrim¹, Lucy M.
Turner^{2,3}, Ashwin Rai⁴, Moleyur N. Venugopal⁴, Indrani Karunasagar⁵ and Anna Godhe²

¹Centre for Environment, Fisheries and Aquaculture Science (Cefas), Barrack Road, The Nothe, Weymouth, Dorset, DT4 8UB, United Kingdom.

²Department of Marine Sciences, University of Gothenburg, Box 461, SE 405 30 Göteborg, Sweden.

 ³Marine Biology and Ecology Research Centre, Plymouth University, Drake Circus, Plymouth, Devon, PL4 8AA, United Kingdom.

⁴Department of Fishery Microbiology, Karnataka Veterinary Animal and Fisheries Sciences
 University, College of Fisheries, Mangalore, 575002, India.

⁵UNESCO-MIRCEN for Medical and Marine Biotechnology, Nitte University Centre for Science
 Education and Research (NUCSER), Nitte University, Mangalore 575018, India.

21 *Corresponding author – Andrew.turner@cefas.co.uk

23 Abstract

3

7 8

9

11

17

22

The south west coast of India has been showing a steady increase in shellfish 24 cultivation both for local consumption and fishery export, over recent years. Perna viridis 25 26 and Crassostrea madrasensis are two species of bivalve molluscs which grow in some selected regions of southern Karnataka, close to the city of Mangalore. In the early 1980s, 27 shellfish consumers in the region were affected by intoxication from Paralytic Shellfish 28 29 Poison present in local bivalves (clams and oysters) resulting in hospitalisation of many, 30 including one fatality. Since then, there have been no further reports of serious shellfish intoxication and there is little awareness of the risks from natural toxins and no routine 31 monitoring programme in place to protect shellfish consumers. This study presents the 32 findings from the first ever systematic assessment of the presence of marine toxins in mussels 33 and oysters grown in four different shellfish harvesting areas in the region. Shellfish were 34 collected and subjected to analysis for ASP, PSP and lipophilic toxins, as well as a suite of 35 non-EU regulated toxins such as tetrodotoxin and selected cyclic imines. Results revealed the 36 presence of low levels of PSP toxins in oysters throughout the study period. Overall, total 37 toxicities reached a maximum of 10% of the EU regulatory limit of 800 µg STX eq/kg. Toxin 38 profiles were similar to those reported from the 1980 outbreak. No evidence was found for 39 significant levels of ASP and lipophilic toxins, although some cyclic imines were detected, 40 including gymnodimine. The results indicated that the risk to shellfish consumers during this 41 specific study period would have been low. However, with historical evidence for extremely 42 high levels of PSP toxins in molluscs, there is a strong need for routine surveillance of 43 shellfish production areas for marine toxins, in order to mitigate against human health 44 45 impacts resulting from unexpected harmful algal blooms, with potentially devastating socioeconomic consequences. 46

47

48 Keywords

Shellfish, India, Lipophilic toxins, Paralytic Shellfish Poisoning, Amnesic Shellfish
Poisoning, LC-FLD, LC-UV, LC-MS/MS

Download English Version:

https://daneshyari.com/en/article/8394937

Download Persian Version:

https://daneshyari.com/article/8394937

Daneshyari.com