

European Maritime and Fisheries Funding granted to assess and mitigate against unexpected paralytic shellfish toxins in Eastern England

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In January, the European Maritime and Fisheries Fund (EMFF) granted £248,892.79 of funding to finance a joint project between Eastern IFCA and Cefas that aims to assess and mitigate against the risk of unexpected paralytic shellfish toxins (PST) in eastern England.

The project was established as a consequence of Operation Blake, which was the multi-agency response to dog illnesses and deaths resulting from the ingestion of PST-contaminated marine organisms around the East Coast in early 2018. The project will involve laboratory testing of commercial shellfish samples to detect the presence and concentrations of PST, which will be used to inform the monitoring regime and management of commercial fisheries.

The dog deaths occurred following consumption of marine organisms that washed up on the beaches of eastern England after winter storms in early 2018. Over a two-week period, nine incidents of illnesses in dogs were reported, including two fatalities – one in Holkham, Norfolk, and the second at Felixstowe Ferry Beach, Suffolk. **Since then there have been no further incidences recorded.**

With symptoms that indicated paralytic shellfish poisoning (PSP) intoxication (rapidly developing symptoms including breathing difficulties and paralysis within 1-2 hours), Cefas undertook tests for PST in marine organisms in the area. These were conducted using two chemical detection testing methods, noting that these are only validated and accredited for bivalve shellfish samples. Very high levels of PST were found in starfish from Norfolk and Suffolk, with a toxin profile which had previously not been reported in any shellfish samples. In addition, toxins with the same profile were found in lower levels in crab and flatfish, as well as in post-mortem and vomit samples from one of the dead dogs. This work was published in March 2018 in the journal *Toxins* (Turner et al., 2018, *Toxins*, 10, 94; doi:10.3390/toxins10030094).

The toxins in question are typically associated with bivalve molluscs such as mussels, clams, oysters and scallops. These are filter feeders and can accumulate PST, which are produced naturally by certain species of microscopic algae. Algal blooms do not usually occur during winter months in the UK and the routine testing of bivalve molluscs in early 2018 was negative for PST. As such, the source of the contamination is still unknown and requires continued investigation.

The EMFF funding, administered by the Marine Management Organisation, enables the continuation of this important sampling project, which has the key objectives of:

- validating two independent tests for detecting PST in crustaceans in a UK laboratory so as to maintain consumer confidence in governance.
- reporting regularly on the development of PST-related incidents within the project area and producing a single report at the end of the project detailing the outcomes of the investigation into the source of PST;
- working towards establishing the source of the PST, the occurrence of which is novel given the timing of the initial incidents;
- using the results of the monitoring programme to inform appropriate governance of the industry in relation to paralytic shellfish poisoning; and
- maintaining public confidence in important fisheries with regards to food safety by evidencing an effective monitoring and control programme.

Since the initial incidents were reported, 115 samples of various marine organisms from around the east coast have been collected and tested for PST. Since receiving the funding, Eastern IFCA have continued to collect monthly samples of brown shrimps, common whelks and edible crabs. These samples have been tested for PST by Cefas, with all tests so far indicating no evidence for levels of PST in commercial shellfish that could cause intoxication in consumers. The project will run until August 2021.

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Notes to Editors

The EMFF funded monitoring programme will involve monthly collection of brown shrimp, edible crabs and whelks from around the East coast. Eastern IFCA will be primarily responsible for managing the collection of samples and monitoring results, while Cefas will be primarily responsible for validation of the two testing methods, analysis of samples to detect the presence and concentrations of Paralytic Shellfish Toxins (PST) and a series of investigations to assess the source of PST in these samples if still found to be present.

Paralytic Shellfish Poisoning (PSP) toxins are primarily associated with bivalve molluscs such as mussels, clams, oysters and scallops. These are filter feeders and can accumulate the potent neurotoxins, all related to the parent compound saxitoxin, which are produced naturally by certain species of microscopic algae. Dinoflagellates of the genus *Alexandrium* are the most widespread saxitoxin producers in the United Kingdom. PST-producing algal blooms do not usually occur during winter months in the UK and certainly not at densities expected to result in the accumulation of toxins in shellfish to any harmful levels.

The routine monitoring for the presence of toxin producing plankton in shellfish production and relaying areas, and biotoxins in bivalve molluscs, is a requirement of Regulation (EC) No 854/2004, which sets out official controls on products of animal origin intended for human consumption.

The Food Standards Agency is the body with overall responsibility in England for the official monitoring programmes for marine biotoxins in live bivalve molluscs and toxin producing phytoplankton in water. The monitoring programme involves testing bivalve molluscs and water from classified production and relay areas. Where permitted levels are exceeded, the harvesting area is closed until they are within permitted levels again following two successive assessments.

Cefas is the contracted laboratory responsible for the analysis of both water and flesh samples. Local Authorities (district councils within the Eastern IFCA district) are responsible for collecting water and shellfish samples at the required frequency from the designated sites and for sending these to the testing laboratory.

Water samples are analysed for the presence of potentially harmful algal (phytoplankton) species associated with marine biotoxins which include Amnesic Shellfish Poisoning (ASP) toxins, lipophilic toxins (including Diarrhetic Shellfish Poisons (DSP) and PSP toxins. Bivalve mollusc samples are analysed for these toxins using a range of chemical detection methods.

PST would not ordinarily be expected in species other than filter feeders unless they predate on filter feeders. In such cases toxins can bioaccumulate and in the case of edible crabs and lobsters, toxins generally accumulate in the hepatopancreas. Such cases are relatively rare, although there are reported incidents around the world.

For any inquiries or requests for interview, please contact Adam Aiken on 07710 656797.

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