

Opinion on algal toxins

On 10/11th april 2003, the commission passed the following opinion
(shortened version)

Dinophyceae (dinoflagellates), Cyanophyceae (blue algae) *also known as Cyanobacteria because of their similarity to bacteria*, Bacillariophyceae and Pymnesiophyceae are included among the toxin-producing algae.

In Germany residues of algal toxins in mussels are controlled at present under the regulations of the Fischhygiene-Verordnung (Order) of 8th June 2000. This Order requires the testing of mussels for the presence of algal toxins by means of animal tests (so-called mouse bioassays) or by chemical analytical procedures. Limits for water-soluble algal toxins PSP (paralytic shellfish poisoning), fat-soluble algal toxins DSR (diarrhoetic shellfish poisoning) and ASP (amnesic shellfish poisoning) are set forth in this Order.

The residue limits and analytical methods for the marine biotoxins of the DSP group, i.e. azaspiracid (AZA), yessotoxins (YTX) and pectenotoxins (PTX), are listed in the Council Directive 91/492/EWG since March 2002. The Commission of the European Communities has expressly requested the development of alternative detection methods to the presently employed biological methods [1].

Little information is available on the frequency and severity of human intoxications with algal toxins other than PSP and DSP. Presumably mild intoxications are frequently not recognised because their symptomatology hardly differs from that appearing as a consequence of the consumption of microbially spoiled foodstuffs.

For some time now products based on algae have found increasing use as foodstuffs or as food supplements. The Commission expresses its concern that the risk of a critical serious exposure to algal toxins may become associated with this practice, because the products involved are often consumed in larger quantities. Investigations of food supplements based on algae have shown a significant degree of contamination with microcystins in those products made from blue-green algae [2].

Whenever surface waters are used for the production of drinking water, there is a need to ensure the absence of algal toxins. The example of microcystins has provided evidence that adequate ozone treatment combined with appropriate filtration techniques is suitable for this purpose. It is important, however, to ensure constant supervision of the effectiveness of the measures taken for the removal of toxins [3]. The WHO has recommended a limit of 1 µg/L of microcystin in drinking water, based on microcystin-LR [4]. This value is being enforced in Germany at present.

Research needs exist especially for:

- the development of screening methods as replacement for the so-called mouse bioassays;
- the development of sensitive and structure-selective methods for the detection and the determination of those algal toxins capable of causing serious adverse health effects;
- the collection of data on the toxicity and the explanation of the basic mechanisms of action;
- the identification of the chemical structural elements relevant for toxicity;
- the elucidation of the exposure taking into account both algal food products as well as food supplements.

The provision of the data set out above will permit the necessary risk assessments to be undertaken.

Conclusion

The SKLM considers the data base on algal toxins to be generally inadequate. Adequate toxicological data are not available for many algal toxins, particularly those data related to long-term effects. Similarly, hardly any data exist on the residues in foodstuffs and on what would enable reliable estimates to be made of the exposure of the consumer. In the view of the SKLM it is impossible to carry out a properly based risk assessment at present.

- [1] Amtsblatt der Europäischen Gemeinschaft; Entscheidung der Kommission vom 15. März 2002 mit Durchführungsbestimmungen zur Richtlinie 91/492/EWG des Rates hinsichtlich der Grenzwerte und der Analysemethoden für bestimmte marine Biotoxine in lebenden Muscheln, Stachelhäutern, Manteltieren und Meeresschnecken (2002/225/EG).
- [2] Gilroy DJ, Kauffmann KW, Hall RA, Huang X, Chu FS (2000) Assessing Potential Health Risks from Microcystin Toxins in Blue-Green Algae Dietary Supplements. *Environmental Health Perspectives* 108, 435-439.
- [3] Hoeger SJ, Dietrich DR, Hitzfeld BC (2002) Effect of Ozonation on the Removal of Cyanobacterial Toxins during Drinking Water Treatment. *Environ Health Perspect* 110 (11), 1127-1132.
- [4] Guidelines for drinking-water quality, 2nd ed. Addendum to Vol. 1. Recommendations. Geneva, World Health Organization, 1998.

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