LETTER TO THE EDITOR

Orange roughy is rich with indigestible wax esters

To the Editor—An outbreak of over 600 cases of keriorrhoea took place in Hong Kong in late 2006 and early 2007. Patients complained of diarrhoea of orange to brown oil. The aetiology was traced to the consumption of oilfish (*Ruvettus pretiosus*) and escolar (*Lepidocybium flavobrunneum*) which were pushed as codfish or sashimi. These two types of fish have high oil contents, accounting for about 20% of their wet weight.[1] Some 90% of this oil is indigestible wax esters (gempylotoxin), which can cause diarrhoea and other acute gastro-intestinal symptoms, including abdominal cramps, nausea, headaches, and vomiting.[1] Oilfish and escolar also have high histidine levels in their muscles. If they are inadequately refrigerated, bacteria can multiply and convert histidine into histamine (also termed scombrotoxin), commonly found when large numbers of unsold fish steaks have been held in stock over time to avoid food inspection during a keriorrhoea outbreak. So they are also candidates for histamine poisoning, which can be life-threatening.[2] In response to the keriorrhoea outbreak, the Centre for Food Safety issued Guidelines on Identification and Labelling of Oilfish/Cod to regulate the two types of fish.[3]

To facilitate rapid detection of these types of fish, we have developed a thin-layer chromatography method validated with DNA sequencing and gas chromatography with mass spectrometry.[4] Since then, we have continued to monitor the wax esters in the seafood being sold in Hong Kong. Our results showed that a third fish, orange roughy (*Hoplostethus atlanticus*) currently available in some supermarkets, contains high levels of indigestible wax esters. Indeed the fillets of deep-skinned orange roughy contain 5.46% total lipids of which as much as 93% is indigestible wax esters.[5] Physicians and sensitive consumers should be alerted to potential adverse reactions to this fish.

Paul PH But, PhD
E-mail: paulbut@cuhk.edu.hk
KH Ling, BSc
SW Cheng, MPhil
Food and Drug Authentication Laboratory, Department of Biology, and Institute of Chinese Medicine, The Chinese University of Hong Kong, Shatin, Hong Kong

References

1. Berman P, Harley EH, Spark AA. Keriorrhoea—the passage of oil per rectum—after ingestion of marine wax esters. S Afr Med J 1981;59:791-2.
2. Feldman KA, Werner SB, Cronan S, et al. A large outbreak of scombroid fish poisoning associated with eating escolar fish (*Lepidocybium flavobrunneum*). Epidemiol Infect 2005;133:29-33.
3. Working Group on Naming of Codfish/Oilfish. Guidelines on identification and labelling of oilfish/cod. Hong Kong: Centre for Food Safety; 2007.
4. Ling KH, Cheung CW, Cheng SW, et al. Rapid detection of oilfish and escolar in fish steaks: A tool to prevent keriorrhea episodes. Food Chemistry 2008;110:538-46.
5. de Koning AJ. Phospholipids of marine origin: the orange roughy (*Hoplostethus atlanticus*). S Afr J Sci