Editorial: Diarrhoea associated with consumption of escolar (rudderfish)

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This issue of *Communicable Diseases Intelligence* contains three reports of recent outbreaks of oily diarrhoea associated with consumption of ocean-fish. In each outbreak, the oily diarrhoea was caused by indigestible wax esters contained within the fish. Common names of fish associated with these outbreaks included rudderfish, butterfish, oilfish, ruddercod and escolar.

Information supplied by OzFoodNet epidemiologists[1] and the South Australian Department of Human Services[2] describe outbreaks in Victoria, New South Wales and South Australia. In November 1999, two restaurant outbreaks[3] associated with butterfish were reported in Victoria, the first involving 14 cases. Victoria's most recent incident involved a further 4 cases at a restaurant in August 2001 (Gregory, this issue).[4] The South Australian Department of Human Services' Public and Environmental Health Service conducted an investigation into reports of illness after consumption of rudderfish. Ninety-eight cases of illness reports were received (Givney, this issue).[5] Similarly, at a conference luncheon in New South Wales[6] in October 2001, 20 persons became ill after consuming escolar (Yohannes, this issue).[7]

Another recent outbreak occurred in New South Wales (Marianne Tegel, NSW Health, personal communication, April 2002) when a restaurant served patrons with what the owner believed was 'ruddercod'. Five people were adversely affected. The restaurant received complaints and the owner informed authorities that an alternate source of seafood would be used in future. Information supplied from Sydney Fishmarket Pty Ltd (Bryan Skepper, Sydney Fishmarket Pty Ltd, personal communication, April 2002) also indicates that outbreaks from consumption of escolar have been occurring in the restaurant and catering setting for a number of years.

Based on the size of the annual escolar catch (up to 400 tonnes, Hans Jusseit, East Coast Tuna Boat Owners Association, personal communication, March 2002), it has been assumed that many, if not the majority of people eating these fish species do not develop any illness. However, the attack rates described in these three short reports range from 20/44 (45%) to 10/15 (67%). There is probably a significant under-reporting of illness associated with consumption of these fish as the symptoms can be mild and short-lived. In South Australia, 60 additional cases of oily diarrhoea associated with consumption of escolar/rudderfish were identified by the Department of Human Services, following media reports of the issue.[5] There are little data available to identify people susceptible to oily diarrhoea induced by consumption of fish with a high wax ester content. Yohannes could find no association between the development of illness and body mass index, age or general health status. People with bowel problems, malabsorption or pregnancy may be at increased risk of diarrhoea because of eating escolar. It is also possible that seasonal and geographic differences may influence the level of indigestible wax ester content in fish.

In those who are susceptible, the onset of symptoms occurs with a median of 2.5 hours and a range of 1 to 90 hours after consumption.[7] The symptoms described in the three reports show wide variation. Symptoms range from mild and rapid passage of oily yellow or orange droplets, to severe diarrhoea with nausea and vomiting. The milder symptoms have been referred to as 'keriorrhoea' (literally 'flow of wax').[8]

Data from the CSIRO Marine Research[9] show that two species of fish, *Lepidocybium flavobrunneum* (escolar) and *Ruvettus pretiosus* (oilfish), contain approximately 20 per cent (by weight) of indigestible wax ester oil. Both species are by-catches from tuna longlines on the east and west coasts of Australia,[10] caught in quantities of sufficient size that banning them from sale is not considered an option by the fishing industry.

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Some fish, such as orange roughy, have very high oil content just below the surface of the skin. Removal of skin and superficial flesh ('deep skinning') may remove the offending oil portion, leaving a more palatable fish. At present, it is not known whether the wax ester is evenly distributed throughout the flesh of escolar, or lies just below the surface of the skin. Hence, it is uncertain whether the wax ester can be removed by 'deep skinning' of escolar and/or oilfish.

The above outbreaks were addressed at a meeting of the Technical Advisory Group (TAG), which comprises food and agriculture officers from all States and Territories, and Commonwealth agencies responsible for food safety. A TAG working group which included representatives from the seafood industry and CSIRO Marine Research was formed. The group determined that the main problem was one of species identification. Some fish are landed and marketed incorrectly. Whilst named in the Australian Seafood Handbook, a picture of *L. flavobrunneum* (escolar) was lacking. Many fishermen appeared to be landing and selling this particular fish as 'rudderfish'.

Rudderfish species also contain similar proportions of oil, but not the indigestible wax ester seen in escolar and oilfish. Rudderfish are also landed as a result of trawl operations. Illustrations of rudderfish, escolar and oilfish (provided by Don Nichols of the West Australian Seafood Quality Management Initiative) are shown in Figures 1 to 4. Butterfish (*Scatophagus* sp.) is mistakenly used as a marketing name for rudderfish, or escolar, particularly in Victoria. Unlike escolar and rudderfish, which are caught in deeper waters, butterfish are found in the shallows of northern Australia.

The problem of misidentification and mislabelling occurs throughout the entire supply chain, with businesses and consumers being unaware of the potential problems associated with consumption. The working group agreed that misidentification or mislabelling of fish was the most important aspect which needed to be addressed. The Fish Names Committee was alerted to the importance of this issue from a marketing and food safety perspective. To assist industry and consumers with identification and labelling, the common names of escolar and oilfish were endorsed for *L. flavobrunneum* and *R. pretiosus*, respectively. Industry representatives on the working group indicated that there were good national networks amongst fishermen and processors. These networks could be used as a vehicle for distribution of information, including pictures of rudderfish and those species responsible for wax ester diarrhoea. The Australian Seafood Handbook would also be updated to include a picture of *L. flavobrunneum.*

Figure 1. Oilfish, *Ruvettus pretiosus*

Figure 2. Escolar, *Lepidocybium flavobrunneum*

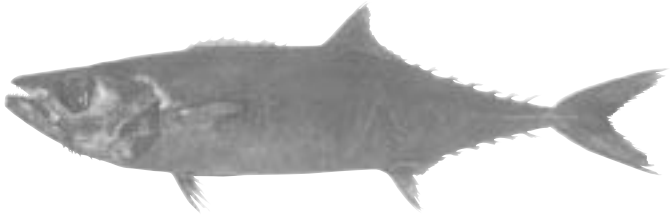


Figure 3. Rudderfish, *Centrolophus niger*

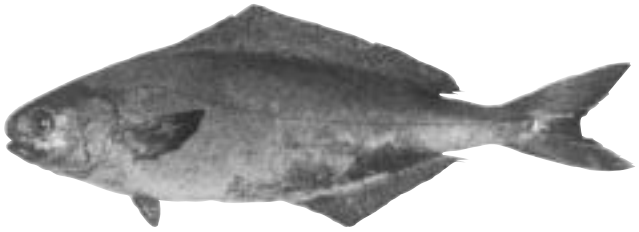
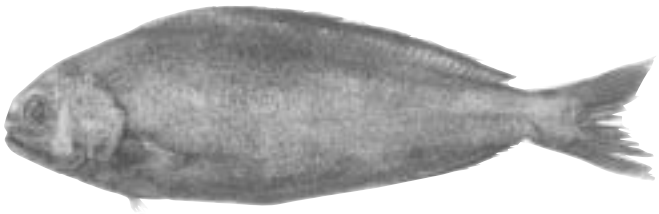


Figure 4. Rudderfish, *Tubbia* sp.



This action allows health authorities to release nationally consistent information on escolar and oilfish. Despite the majority of effects being mild, warnings have been released in some jurisdictions indicating that these fish are not suited to catering, and should be avoided by those with a bowel condition or pregnant women. People eating escolar for the first time are advised to initially consume small portions to determine their susceptibility.

Correct identification of species with a high wax ester content, proper labelling by fish vendors, and appropriate warnings for restaurateurs and the consumer will assist with the reduction of undesirable effects from escolar and oilfish consumption. This will protect the health and safety of consumers, and the image of the food service and seafood industry sectors. More research needs to be done within the public health and seafood industry sectors to identify contributing factors to oily diarrhoea susceptibility, the risks associated with consumption in vulnerable populations and preparation methods which may reduce the risk.

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