Bull. Eur. Ass. Fish Pathol. 5 (1), 10, 1985

ISOLATION OF *Yersinia ruckeri* TYPE I (HAGERMAN STRAIN) FROM GOLDFISH *Carassius auratus*. (L.)

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Since enteric redmouth disease (ERM) was first described from rainbow trout in the United States (Ross, Rucker and Ewing, 1966; Rucker, 1966) the disease has been observed in a number of European countries including Great Britain, France, Germany, Denmark and Italy (Roberts, 1983; Rodgers and Austin, 1983; Dalsgaard, From and Hørlyck, 1984). The source of infection in these outbreaks remains uncertain. No cases of the disease have occurred in Ireland.

A proportion of each consignment of ornamental fish imported into Ireland is screened for disease. Arising from this work we recently isolated an organism in pure culture from the gut of a goldfish, with the following characteristics; a Gram negative, fermentative, motile rod producing catalase, B-galactosidase and gelatinase but not arginine dihydrolase, indole, oxidase, phosphatase or urease. Neither aesculin nor lecithin was degraded. Citrate was utilized and the methyl red test was positive. The goldfish was apparently healthy and was one of a consignment of goldfish believed to have originated from Singapore.

The serology of the organism was studied using a slide agglutination test and indirect fluorescent antibody test (FAT). In the slide agglutination test, 1 : 10 dilutions of antisera prepared against both *Yersinia ruckeri* types I and II were mixed on a slide with a suspension of the goldfish isolate prepared from a 24h old plate culture suspended in 0.85% saline. Similar agglutination tests using cultures of *Yersinia ruckeri* types I and II were also carried out. The goldfish isolate was strongly positive using *Yersinia ruckeri* type I antiserum, but negative against type II antiserum. The indirect FAT which was most satisfactory, was the method of Bullock and Stuckey, (1975). Rabbit anti-*Yersinia ruckeri* antisera were used at dilutions of 1 : 40 and fluorescein labelled sheep anti-rabbit serum (Wellcome) at a concentration of 1 : 160. Using this test, the goldfish isolate showed strong specific fluorescence with the type I antiserum but none with the type II antiserum.

To investigate the pathogenicity of the organism, twenty five rainbow trout were each challenged with 2.5 x 10^6 cells injected intraperitoneally. Within 24 hours, at a water temperature of 18°C, 23 (92% of the total) fish died. These fish showed severe haemorrhaging particularly in the region of the mouth and fins. The remaining two fish died one day later.

Based on the foregoing results we consider the identity of this organism to be *Yersinia ruckeri,* type I.

Besides providing a further example of a salmonid pathogen occurring in non-salmonid fish, the isolation of *Yersinia ruckeri* from goldfish suggests that ornamental fish could represent an important source of infection for other fish such as salmonids. It could also help explain the sudden appearance of this disease in a number of European

countries as disease controls on the importation of ornamental fish are often few or non-existent compared to those which apply to salmonids.

Summary

Although no cases of enteric redmouth disease have occurred in Ireland, *Yersinia ruckeri* type I was isolated from the gut of an apparently healthy goldfish. This finding indicates that ornamental fish may represent a possible route of introduction of the pathogen.

Acknowledgements

We would like to thank Dr. Brian Austin of the MAFF Fish Diseases Laboratory at Weymouth for confirming the identity of this isolate and for carrying out the pathogenicity experiments. Reagents used were kindly provided by both the Weymouth laboratory and the National Fish Health Laboratory, Leetown, West Virginia, U.S.A.

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