

**Brief Communication**

**INFECTIOUS PANCREATIC NECROSIS  
FIRST ISOLATION OF VIRUS FROM FISH IN NORWAY**

Infectious pancreatic necrosis (IPN) is a disease of salmonid fishes. It has been reported in many countries throughout the world (*M'Gonigle* 1940, *Wood et al.* 1955, *Besse & Kinkelin* 1965, *Vestergård Jørgensen & Bregnballe* 1969, *Sano* 1971, *Ball et al.* 1971, *Ljungberg & Vestergård Jørgensen* 1972, *Schlotfeldt et al.* 1975). Outbreaks of the disease can cause serious losses in populations of hatchery reared salmonids, the mortality rate varying between 10 and 90 % (*Vestergård Jørgensen & Kehlet* 1971). There are at least four different serotypes of the virus distinguished by neutralization tests (*Wolf et al.* 1968). Twenty-five isolates of IPN virus in Denmark proved to represent only two serotypes (Sp and Ab) (*Vestergård Jørgensen & Kehlet*). The present paper reports the first isolation of IPN virus from the stock at a fish farm in Norway.

A routine investigation was carried out in March 1975 on the health situation of the brood stock and the yearlings of rainbow trout (*Salmo gairdneri*) of a recently started fish farm on the west coast of Norway. The study was done for the issue of a health certificate needed for the export of eggs. The procedure followed was in accordance with the Food and Agriculture Organization recommendations (1974) for the detection of viral diseases. No mortality was observed in the farm, and the fish seemed to be in good condition at the time examination. During the previous summer, however, some mortality had been recorded in the fish population, but examinations then had not revealed any bacterial or viral disease. The eyed eggs, from which the rainbow trout had been hatched, originated from three different fish farms with no history of disease.

Samples of ovarian fluid were taken from the brood stock, and liver, spleen and kidney were collected from the yearlings. A cytopathogenic agent was isolated in cultures of RTG-2 cells (*Wolf & Quimby* 1962) from all samples of the yearlings, but not from the ovarian fluid. In a later series of tests of samples

collected from the yearlings, nine out of 30 samples gave typical cytopathogenic effect.

Identification of the cytopathogenic agent was carried out by constant serum—varying virus neutralization test with antisera against IPN virus and viral hemorrhagic septicemia (VHS) virus. From the results the following log. indices were calculated:

Anti IPN, subtype Sp serum:	0.6
Anti IPN, subtype Ab serum:	6.0
Anti VHS serum:	0.0

The isolated agent thus proved antigenically closely related to the IPN virus, subtype Ab. The virus could also be identified as IPN-virus, subtype Ab, by immunofluorescence.

The apathogenic course of the infection in the farm is in agreement with the observation of *Vestergård Jørgensen & Kehlet* that Ab virus strains often cause subclinical or low pathogenic infections.

Measures were taken to find the source of infection and the infection route. Rainbow trout from the three farms supplying the eggs from which the infected fish were hatched, 50 char (*Salvelinus alpinus*) from the water supply as well as young Atlantic salmon from the fish farm were tested for the presence of virus, but with negative result. Therefore no information on the origin and spread of virus is available.

As IPN is a notifiable disease according to Norwegian Fish Disease Legislation, steps have been taken to eliminate the infection. All the rainbow trout were destroyed and the young Atlantic salmon was fenced in and is tested for the presence of virus every three months. If no virus will be isolated within a year, the quarantine measures will be cancelled and the fish will be sold for stocking into sea water cages.

#### ACKNOWLEDGEMENT

The authors wish to thank Dr. P. E. Vestergård Jørgensen for supplying the specific antisera against IPN and VHS viruses and for examining the virus by fluorescent antibody technique.

*Tore Håstein and Johan Krogsrud*  
The National Veterinary Institute,  
Oslo, Norway.

## REFERENCES

- Ball, H. J., A. L. Munro, A. Ellis, K. G. R. Elson, W. Hodgkiss & I. S. McFarlane: Infectious pancreatic necrosis in rainbow trout in Scotland. *Nature (Lond.)* 1971, 234, 417.
- Besse, P. & P. Kinkelin: Sur l'existence en France de la nécrose pancréatique de la truite arc-en-ciel (*Salmo gairdneri*). (The existence of infectious pancreatic necrosis in rainbow trout (*Salmo gairdneri*) in France). *Bull. Acad. vét. Fr.* 1965, 38, 185—190.
- Food and Agriculture Organization of the United Nations 1974: Draft international convention for the control and spread of major communicable diseases.
- Ljungberg, O. & P. E. Vestergård Jørgensen: Infectious pancreatic necrosis of salmonids in Swedish fish farms. Report No. 14. FAO/EIFAC 72/SC II symp. 1972.
- M'Gonigle, R. H.: Acute catarrhal enteritis of salmonid fingerlings. *Trans. Amer. Fish. Soc.* 1940, 70, 279—303.
- Sano, T.: Studies on viral diseases of Japanese fishes. I. Infectious pancreatic necrosis of rainbow trout: First isolation from epizootics in Japan. *Bull. Jap. Soc. Sci. Fish* 1971, 37, 495—498.
- Schlotfeldt, H. J., B. Liess & J. W. Frost: Erstisolierung und Identifizierung des Virus der infektiösen Pankreasnekrose (IPN) der Salmoniden in der Bundesrepublik Deutschland. (The first isolation and identification of the virus of infectious pancreatic necrosis (IPN) of salmonids in the Federal Republic of Germany). *Berl. Münch. tierärztl. Wschr.* 1975, 88, 109—111.
- Vestergård Jørgensen, P. E. & F. Bregnballe: Infectious pancreatic necrosis in rainbow trout (*Salmo gairdneri*) in Denmark. *Nord. Vet.-Med.* 1969, 21, 142—148.
- Vestergård Jørgensen, P. E. & N. P. Kehlet: Infectious pancreatic necrosis (IPN) virus in Danish rainbow trout. Their serological and pathogenic properties. *Nord. Vet.-Med.* 1971, 23, 568—575.
- Wolf, K. & M. C. Quimby: Established eurythermic line of fish cells in vitro. *Science* 1962, 135, 1065—1066.
- Wolf, K., G. L. Bullock, C. E. Dunbar & M. C. Quimby: Viral diseases of freshwater fishes and other lower vertebrates (General). *Progr. Sport Fish. Res., U.S. Dept. Int.* 1968, 136—141.
- Wood, E. M., S. F. Snieszko & W. T. Yasutake: Infectious pancreatic necrosis in brook trout. *Arch. Path.* 1955, 60, 26—28.

(Received January 20, 1976).

Reprints may be requested from: The National Veterinary Institute, Postbox 8156, Oslo Dep., Oslo 1, Norway.

