FIRST ISOLATIONS OF PLESiomonas SHigelloides FROM SAMPLES OF CULTURED FISH IN GERMANY

BY B.U.KLEIN*, D.W.KLEINGELD** & K.H.BOHN*

In previous publications Plesiomonas shigelloides, classified in the Vibrionaceae family, has been described as a facultative fish pathogenic agent (Machado Cruz et al. 1986, Faisal and Popp 1987).

Vandeputte et al. (1974) presented a complete review discussing isolations and taxonomic changes since the first isolation in 1947. Following Schubert (1977) the systematic status and nomenclature of this species is now established.

Ecological studies by Arul et al. (1980) which describe the spreading of Plesiomonas shigelloides in river water and fresh water fish in the vicinity of Tokyo are supported by studies in central Europe by Schubert (1981). In both studies it was found that increase of water temperature during the summer period leads to more frequent isolations of Plesiomonas shigelloides in fish and water. These investigations lead to the presumption that, amongst others, surface water and contaminated fish are possible sources of infection in humans.

Van Damme and Vandeputte (1980) confirm the potentiality of human infection from tropical fresh water fish in Zaire.


In 1992 Plesiomonas shigelloides was isolated in 5 fish samples sent for microbiological examination by the STATE FISH EPIDEMICS CONTROL SERVICE of Lower Saxony and Fish Health Service. First isolation was from a sample of Heterobranchus bidorsalis fry (an African catfish species), transported from Nigeria to Germany as fertilised eggs and kept in a recirculation system at a water temperature of 28°C. Mortality reached 100% (about 300 fish). Nevertheless rather inadequate holding, hygienic and management conditions as well as a poor health status induced by hatching of almost all fry during transportation from Nigeria to Germany had an important influence on the degree of mortality. Beside a high frequency of Plesiomonas shigelloides, a medium frequency of Aeromonas sobria was found.

The second isolation produced a pure culture of Plesiomonas shigelloides from sturgeon fingerlings (Acipenser sturio) imported from Russia, also kept in a recirculation system at a water temperature of 18-20°C. In contrast to the first case a much lower mortality (about 5%) was observed here. The fish showed apathetic behaviour and lack of appetite which is observed frequently in recirculation systems. A decrease of losses in this case was achieved by improvement of environmental quality.

In the third case a pure culture of Plesiomonas shigelloides was isolated from routine control samples of healthy rainbow trout (Oncorhynchus mykiss) from a pond farm (water temperature =14°C).

In routine control examinations of healthy eel (Anguilla anguilla) from a recirculation system (water temperature =20°C) and gourami (Osphronemus goramyi), imported from Thailand and also farmed in a recirculation system (water temperature =25°C), Plesiomonas shigelloides was isolated in mixed culture. In the eel sample, besides a high frequency of Plesiomonas shigelloides, a high frequency of Aeromonas sobria and non-fluorescent pseudomonads as well as a low frequency of yeast was found. In addition to a high...
taken into consideration by diagnostic bacteriologists.

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Author’s Addresses
*National Veterinary and Food Institute, Oulu Regional Laboratory, Box 517, SF-90101 Oulu, Finland  
**Laboratoire de Virologie-Immunologie Moléculaires, Institut National de la Recherche Agronomique, Centre de Recherches de Jouy-en-Josas, F-78352 Jouy-en-Josas, Cedex, France

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frequency of *Plesiomonas shigelloides* in the gourami-sample, a medium frequency of bacteria classified in the family of *Enterobacteriaceae* was isolated. In this case only low mortality was observed which was also due to insufficient purification conditions and water quality.

Concerning their conventional biochemical properties all isolates in our examinations showed identical characteristics (Table 1). The reactions and morphology were in accordance with the specification of Schubert (1984). At our incubation temperature of 25°C, after 24 h the bacterial colonies were smaller (partially less than 1 mm in diameter) compared to the observations of Schubert (1984). The ADH-reaction was in accordance with Kaznowski et al. (1989) and Vandepitte et al. (1974).

Identification with API 20 NE (BIO MEREUX SA) and evaluation with the APILAB Plus Program (BIO MEREUX SA) led to an excellent classification with ID: 99.9% and T between 0.95 and 0.77, however a uniform profile of the 5 strains could not be obtained.

To the best of our knowledge this is the first isolation of *Plesiomonas shigelloides* from cultured fish in Germany. Based on our observations, *Plesiomonas shigelloides* must be classified as a facultative pathogenic agent. Mortality and disease signs depend on the environmental quality and condition of fish. In this context verification of pathogenicity under poor health and/or environmental conditions would be interesting.

**Summary:**

In 1992 *Plesiomonas shigelloides* was isolated in 5 cases in 5 different fish species. Concerning their conventional biochemical properties all isolates showed identical characteristics. Identification with API 20 NE (BIO MEREUX SA) led to an excellent classification of all strains; however, a uniform profile could not be obtained. To our knowledge this is the first isolation of *Plesiomonas shigelloides* in cultured fish in Germany. Based on our observations, *Plesiomonas shigelloides* must be classified as a facultative pathogenic agent.

**Authors’ Addresses**

*Institute of Microbiology and Epidemiology, School of Veterinary Medicine, Bischofsreuter Damm 15, D-3000 Hannover 1, Germany*

**STATE FISH EPIDEMICS CONTROL SERVICE of Lower Saxony and Fish Health Service, Eintrachtweg 17, 3000 Hannover 1, Germany*

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