Simultaneous demonstration of infectious pancreatic necrosis virus (IPNV) and Flavobacterium psychrophilum in paraffin-embedded specimens of rainbow trout Oncorhynchus mykiss fry by use of paired immunohistochemistry

The Gram-negative bacterium Flavobacterium psychrophilum, which is the causative agent of rainbow trout fry syndrome (RTFS), and infectious pancreatic necrosis virus (IPNV), the causative agent of infectious pancreatic necrosis (IPN), are both highly pathogenic for rainbow trout fry. Several 'persistent' cases of RTFS have been observed concomitant with IPNV. Cultivation alone might not be sufficient for evaluation of the disease situation as both pathogens can be cultivated from fish that do not show any clinical signs of disease. In such cases it may be difficult to decide which pathogen should be considered the primary cause of the mortality observed. Further, it may be difficult to cultivate the bacterium in later stages of the disease or from dead fish that have been transported without cooling. In the case of (suspected) double infections it is therefore suggested that immunohistochemistry be included as a supplementary diagnostic tool, allowing correlation of the presence of either pathogen with pathological lesions. In the present study, fry representing different stages of RTFS from 3 clinical outbreaks were shown to suffer from ongoing double infections as demonstrated by immunohistochemistry and supported by cultivation of the 2 pathogens. The general finding was that single cells of the exocrine pancreas were positive for the virus, whereas bacteria were mainly demonstrated in the interstitial tissue surrounding the pancreatic islets. In some endothelial cells of the head kidney, both pathogens were detected in the same cell. These findings as well as various protocols in relation to the methodology are discussed.