Light and Electron Microscopic Study of Rickettsia-Like Organisms Causing Systemic Granulomas in Farmed Sea Bass (Dicentrarchus labrax)

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Abstract

Systemic granulomas caused by rickettsia-like organisms in farmed sea bass (Dicentrarchus labrax) are described. In general, infected fish were anorexic and lethargic, and mortality was high. Affected fish (150-250 g) had skin lesions ranging from small patches to shallow hemorrhagic ulcers and abdominal dropsy. One or two pathogenic gram-negative bacteria were cultured from the liver, kidney, or spleen of affected fish, following incubation at 22°C for 72 h. The bacteria, Vibrio spp. and motile aeromonads, were isolated and identified as secondary fish pathogens. A parasite, Lernanthropus kroyeri, was also present in the gills. Internally, most of the affected fish exhibited white to yellow multifocal nodules on the kidney and spleen. Blood smears, stained with May Grünwald-Giemsa, showed that most peripheral blood monocytes contained a few to many basophilic rickettsia-like organisms within the cytoplasm. Histological sections (5-µm), stained with hematoxylen & eosin, tissue gram, Ziehl-Nielson, and periodic acid-Schiff, showed multifocal necrogranulomatous inflammation in the liver, spleen, kidney, and skeletal muscle. Pericarditis, epicarditis, and myocarditis were present in the heart, in addition to epithelial cell hyperplasia in the gills, hyperemia in brain tissue, and mild inflammation in the pancreas and adipose tissue. Granulomatous lesions contained coccoid bacteria that were gram and acid-fast negative. Ultrathin sections of blood samples were examined under transmission electron microscopy. Rickettsia-like organisms (0.1-0.5 µm) were most frequently observed within the cytoplasm of phagocytic blood cells.

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