

Streptococcus suis is a lethal pathogen in snakeskin gourami, *Trichopodus pectoralis*

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Abstract

The objective of this study was to determine the causative agent of an outbreak with clinical signs similar to those of piscine streptococcosis in farmed snakeskin gourami (*Trichopodus pectoralis*). Initial microscopic examination revealed the predominance of a Gram-positive, cocci bacteria in the brain and kidney of the diseased fish. This bacterium was successfully isolated and identified as *Streptococcus suis* based on nucleotide homology of 16S rDNA and species-specific PCR. This isolate tested negative for serotype 2, one of the major zoonotic serotypes. Experimental infection was then performed to investigate the pathogenicity of the bacterium and its histopathological manifestation. Naïve juvenile and adult snakeskin gourami were injected intraperitoneally with a low dose (1.2×10^5 CFU/fish) and a high dose (1.2×10^7 CFU/fish) of *S. suis*. Cumulative mortality appeared to be dose- and size-dependent. Experimentally diseased fish exhibited clinical signs consistent with naturally diseased fish. Severe histopathological changes in multiple organs were observed in both juvenile and adult fish, including meningitis, severe congestion in the brain and eyes, thickened stromal layers of the retina, severe hepatic lipidosis and tissue degeneration. Notably, numerous granulomas containing massive bacterial cells in the necrotic core were observed in the infected fish. Relatively pure colonies of *S. suis* were recovered from tissues of experimentally diseased fish. Taken together, this study fulfilled Koch's postulates, indicating that *S. suis* is a new piscine pathogen. Although this is a case report, public awareness and biosecurity measures should be considered to prevent the spread of the disease. Further surveillance of the pathogen's distribution and research into the underlying causes of fish-host adaptation will provide insights into the genuine impact and appropriate disease control strategies.

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