

First detection of *Sphaerothecum destruens* in salmonids in France

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Abstract

Sphaerothecum destruens is a parasite infecting a wide range of host species. Its pathogenicity has been shown in Chinook salmon (*Oncorhynchus tshawytscha*) and Atlantic salmon (*Salmo salar*) under natural conditions and experimentally in rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*) and a variety of cyprinid fish. This article describes two clinical cases of *S. destruens* infections in rainbow trout and brown trout using symptomatology, histology and PCR amplification of a 18S rRNA gene fragment of the parasite. Recently the role of the topmouth gudgeon (*Pseudorasbora parva*) as an asymptomatic carrier in France has been stated. Here we report two cases of natural infections of salmonids in France. Given the multiple co-infections, the exact impact of *S. destruens* in these cases was difficult to establish. However our results suggest that *S. destruens* represents a potential emerging risk for farmed trout in France.

Introduction

Sphaerothecum destruens, also known as the Rosette agent, is a unicellular fish parasite from the class Mesomycetozoa (order Dermocystida). Besides *Sphaerothecum*, the order Dermocystida also comprises the genus *Dermocystidium*, a genus of fish parasites infecting mostly gills and skin in a wide variety of species such as rainbow trout (*Oncorhynchus mykiss*), roach (*Rutilus rutilus*), pike (*Esox lucius*) and perch (*Perca fluviatilis*) (Kasesalu et al., 2000) as well as the genus *Rhinosporidium*, infecting humans, dogs, horses, mules and birds amongst others, with an oro-respiratory tropism (Berrocal and Lopez, 2007; Kennedy et al., 1995). *S. destruens* was first described in the USA (Harrell et al., 1986; Hedrick et al., 1989), causing acute mortalities in Chinook salmon (*Oncorhyn-*

chus tshawytscha) and chronic mortalities in Atlantic salmon (*Salmo salar*). Other salmonids such as coho salmon (*Oncorhynchus kisutch*), rainbow trout, brown trout (*Salmo trutta*) and brook trout (*Salvelinus fontinalis*) have been described as potential hosts with a decreasing sensitivity (Arkush et al., 1998). However, despite the initial investigations focusing on salmonid species, *S. destruens* host range is wider than the *Salmonidae* family as several cyprinid species have been shown to be susceptible, such as sunbleak (*Leucaspius delineatus*), fathead minnow (*Pimephales promelas*) (Gozlan et al., 2005), bream (*Abramis brama*), carp (*Cyprinus carpio*) and roach (*Rutilus rutilus*) (Gozlan et al., 2009). This pathogen is considered a potential threat to European fish populations due to the

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