Colonisation of *Gyrodactylus derjavini* (Monogenea: Gyrodactylidae) by fungal-like hyphae

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**Abstract**

Extensive fungal-like hyphae growth on *Gyrodactylus derjavini* from farmed brown trout is reported. The infection would seem accidental rather than a case of hyperparasitism by the fungal spores.

Monitoring programmes conducted under EC regulations are carried out in the UK to examine farmed salmonids reared in freshwater for *Gyrodactylus salaris*. This parasite is a significant pathogen and lethal to naïve salmon populations (Johnsen and Jensen, 1986). *G. salaris* was originally described from the Baltic region, spreading progressively into much of Western Europe with a current distribution from the White Sea in Northern Karelia, Russia to Spain and Portugal (Leshko* et al.* 1995; Johnston* et al.*, 1996). Each year in Scotland approximately 3750 fish are collected from farmed brown trout, rainbow trout and Atlantic salmon farms. A pectoral fin from each fish is placed in ethanol and examined for *Gyrodactylus* spp. The examination of the parasites distinguish *G. salaris* from other similar but non-pathogenic species. In Scotland individual gyrodactylids are identified morphologically using measurements of the marginal hooks and shape of the hamulus (Malmberg, 1970; Shinn* et al.*, 1995). For validation purposes each parasite identified morphologically is then subjected to identification by molecular genetics. This involves amplification of the internal transcribed spacer (ITS) region of ribosomal DNA followed by restriction fragment length polymorphism (RFLP) analysis. Restriction patterns are compared to control restriction patterns (Cunningham, 1997).

During the course of an examination 14 gyrodactylids were removed from the pectoral fin of a 20cm brown trout. Seven of the parasites had a significant number of hyphal spores covering most of the opisthaptor (Fig. 1). In one case the fungal spores dominated the cephalic region. In all cases the number of hyphae declined along the body length. The parasites were attached to the fins and believed to have been living on the host when the fins were collected for examination. Scanning electron micrographs of individual animals confirmed the material as fungal (Fig. 2). A few hyphae were located on the fish-fins suggesting this area as the source of the infection. Morphological identification of these parasites was difficult due to the number of spores, but using molecular methodology the parasites were identified as
Gyrodactylus derjavini. The examination of farm salmonids at the level outlined above has been carried out for several years, but no previous record of fungal spores on these parasites has been noted. Hyperparasitism involving monogenea has been reported by Cable and Tinsley (1992) and Colorni (1994), although in these cases involving a microsporidian and dinoflagellate respectively. Oomycetes are widespread in fresh water and represent an important group affecting wild and cultured fish. In this case the infection of the Monogenea by the fungal spores could be accidental, although with the pattern and spread of hyphal growth hyperparasitism was not ruled out.

References


Figure 1. Scanning electron micrograph (SEM) of Gyrodactylus derjavini from farmed brown trout. The haptor and body surface are covered with fungal-like spores. Haptor width = 85µm.

Figure 2. Scanning electron micrograph (SEM) showing fungal hyphae on body surface of Gyrodactylus derjavini. Spore width = 5 µm.


