MONOGENEAN PARASITES OF MARINE FISH AROUND THE UK COASTLINE

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Introduction

A paucity of data remains on the species and geographical distribution of monogeneans on marine fish hosts not only in UK waters, but globally. There are numerous reasons for this deficit, which include the lack of taxonomic expertise, cost implications of vessel time and the methods of capture which can cause the loss of parasites from the host. During the summer of 2003 marine fish were collected in the English Channel and the Irish Sea for the express purpose of providing baseline data on their monogenean fauna.

Materials and methods

Specimens of marine fish were collected from various locations during the summer of 2003 on the RV CEFAS Endeavour. Small fish were fixed whole and for larger fish, gills were removed and fixed in 10% neutral buffered formalin (NBF) or ethanol. On return to CEFAS Weymouth laboratory, the fish were screened for monogenean infections using a stereomicroscope. The NBF-fixed fish were rinsed in distilled water and passed through a 50-micron pore size filter before being transferred to distilled water in a petri dish, where the gills, fins and washings were examined. Monogenean specimens were removed with a Gilson pipette or paintbrush. Gyrodactylid specimens were air-dried onto glass slides, and polyopisthocotyleans were transferred to 70% IMS. The air-dried gyrodactylids were preserved onto the slide using 2.5µl proteinase-k based digest and 1.5 µl stop solution (1 part formaldehyde to 1 part 100% glycerine) and cover-slipped, using clear nail varnish as a sealant. The parasites were studied using a Nikon E800 microscope. Representative images were captured and later measured using a video camera mounted to the microscope and linked to a LUCIA Screen Measurement image analysis system (Nikon UK Ltd).

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Figure 1: *Mazocraes alosae* from the gills of twaite shad caught at Outer Gabbard

Figure 2: *Pseudanthocotyloides heterocotyle* from the gills of herring caught in North Cardigan Bay

Figure 3: *Diclidophora merlangi* from the gills of whiting caught in Celtic Deep

Figure 4: Polyopisthocotylean sp. 1 from the gills of lesser weever caught in Rye Bay

Figure 5: Haptor of *Gyrodactylus* sp. 1 from the skin and gills of poor cod caught in the Celtic Deep

Figure 6: Marginal hooks of *Gyrodactylus* sp. 1 from the skin and gills of poor cod caught in the Celtic Deep

Figure 7: Hamuli of *Gyrodactylus* sp. 2 from the skin and gills of herring caught in North Cardigan Bay. (inset: marginal hook)

Figure 8: Hamuli of *Gyrodactylus* sp. 3 from painted goby caught in Rye Bay

Figure 9: Marginal hooks of *Gyrodactylus* sp. 3 from painted goby caught in Rye Bay

Figure 10: Marginal hooks of *Gyrodactylus* sp. 4 from painted goby caught in Rye Bay

Results

Of 21 samples of fish, only 7 were infected with monogenean parasites (see Table 1). These infections included the polyopisthocotyleans *Mazocraes alosae* on twaite shad (Figure 1), *Pseudanthocotyloides heterocotyle* on herring (Figure 2), *Diclidophora merlangi* on whiting (Figure 3) and a previously unrecorded polyopisthocotylean on lesser weevers (Figure 4). Of the monopisthocotyleans, only examples of *Gyrodactylus* spp. were found, at least one of which appears new to science (Figures 5-9). Whilst *Gyrodactylus* spp were generally low in abundance, *M. alosae* had a mean abundance of 25. In general, lesser weevers and herring harboured less than one polyopisthocotylean per individual.

Monogeneans were not recorded on gadoids from Rye Bay and Inner Sunk, argentine from Celtic Deep, dragonet from Outer Cardigan Bay and Falmouth Bay, gobies from Inner Sunk, Falmouth, Rye Bay and SE Isle of Man, red band fish and snake blennies from Dundrum Bay, Dover sole from Outer Sunk, bullrout from Inner Sunk and Dundrum Bay or from greater weevers from Inner Cardigan Bay.

Table 1: A list of monogenean parasites isolated from marine fish, including site of infection on the host

Host	Location	Monogenean species	Site of infection
Twaite shad (*Alosa fallax*)	Outer Gabbard	*Mazocraes alosae*	Gills
Herring (*Clupea harengus*)	North Cardigan Bay	*Pseudanthocotyloides heterocotyle*	Gills
Whiting (*Merlangius merlangus*)	Celtic Deep	*Diclidophora merlangi*	Gills
Lesser weevers (*Echiichthys vipera*)	Rye Bay	Polyopisthocotylean sp. 1	Gills
Poor cod (*Trisopterus minutus*)	Celtic Deep	*Gyrodactylus* sp. 1	Gills, fins
Herring (*Clupea harengus*)	North Cardigan Bay	*Gyrodactylus* sp. 2	Gills, fins
Painted goby (*Pomatoschistus pictus*)	Rye Bay	*Gyrodactylus* sp. 3 *Gyrodactylus* sp. 4	Gills, fins
Dab (*Limanda limanda*)	SE Isle of Man	*Gyrodactylus* sp. 5	Gills, fins

Discussion

The current study has provided new data on the monogenean fauna of selected marine fish around the UK coastline. Few studies have been carried out on the monogeneans of marine fish, although there is some data regarding polyopisthocotyleans in the literature. Whilst a wide variety of fish species were examined from a number of locations, it is clear that not all species of fish harbour monogeneans nor are monogeneans found at all sites. This may reflect the hydrological conditions of the sites as well as having a biological basis. Since fish were trawled on average for less than 30 minutes and monogeneans were found on at least some of the fish, the lack of parasites is not likely to be due to method of capture.

At least five previously unrecorded *Gyrodactylus* sp. have been found during the current study. Members of this genus appear to have been overlooked in many surveys of marine fish parasites, possibly due to their small size. However, given that the number of species discovered during this small-scale project, it follows that there may well be many more, undiscovered species occurring in marine fish worldwide. It is clear that there is much to be gained from examining the monogenean fauna of marine hosts and that efforts should be directed towards gaining further information on parasite biodiversity of marine fish species.

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