Everyone wants a window seat

The life cycle of Diplostomum spathaceum begins as an egg in the faeces of a piscivorous bird, such as a gull or a pelican, as a definitive and unaffected host. It is in this host that the sexual phase occurs and the adult parasite lays its eggs in the bird’s gastrointestinal tract. The excrement containing the eggs is deposited in a fresh water lake or stream. As the faeces drop to the floor of the lake or stream, perhaps on the northern Canadian shield where they are prevalent, the eggs embryonate for approximately 3 weeks and then hatch when exposed to light. The photonegative and short lived miracidia exit the eggs, find their way to a snail, often of the Lymnaea genus, and penetrate the flesh. In the snail, the miracidia penetrate the host, the snail, and the proximity of the molluscan host. The cercariae usually develop into sporocysts which develop approximately 4 months at temperatures of approximately 12°C. In the process of this maturation, a cataractous parasite that is not seen in the plane of this histological section.

For D. spathaceum, the crystalline lens is the principal target, and without those proteins the life cycle cannot be completed. Once the cercariae enter the lens, these mature into metacercariae in approximately 4 months at temperatures of approximately 12°C. In the process of this maturation, a cataractous parasite that is not seen in the plane of this histological section.

The image on the right of this month’s cover is a fish eye containing Diplostomum species, but it cannot be confirmed as D. spathaceum. The crystalline lens shows liquefaction and is cataractous and may represent a lenticonic parasite that is not seen in the plane of this histological section.

Diplostomum spathaceum and related species parasitise a large variety of freshwater fish in North America and Europe—at least 105 species including important aquaculture species such as perch, roach, rainbow trout, bream, dace, gudgeon, and eel. Some authors report a female preponderance of infected individuals, although this may be an artefact of collection. Nevertheless, the benthic nature of the first intermediate host, the snail, and the proximity of the nesting female fish may put her at greater risk of infection. This trematode (Fluke) can and does infect humans although such infection is surprisingly rare. D. spathaceum apparently is capable of penetrating the cornea and infecting the lens of frogs, turtles, birds, and even mammals although some experimental controversy exists. Interestingly, the cercariae can penetrate into, but not through, adult human corneas, and probably do not enter the anterior chamber in most instances. In some rabbits, corneal nebulae were produced by cercariae that did not penetrate. Perhaps these creatures are responsible for certain forms of nummular keratitis.

There are other piscine ocular parasites including the copepod parasites, Lernaeocirrus sprattae and Phrioxcephalus cincinnatus. Both of these can penetrate the eyes of various species and may destroy the eye or blind the fish although these have not so common or so bizarre a life cycle as D. spathaceum.

All of these parasites seem to jockey for a window seat.