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Short communication

Pumpkinseed *Lepomis gibbosus* (Linnaeus, 1758) (Centrarchidae) and associated parasites introduced to Norway

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Abstract

The North American freshwater sunfish, *Lepomis gibbosus* (Centrarchidae), was found in a pond outside Oslo, Norway in October 2005. The large number of fish (>100) in the pond suggests successful reproduction. Two monogenean parasites, non-native to Norway, were found on the gill filaments of the fish. The origin of the fish and associated parasites is not known.

Key words: alien, Centrarchidae, Ancyrocephalidae, invasive, Monogenea, introduced

In 2004, "wild sunfish" were reported in an internet discussion forum for Norwegian aquarists. From information provided in a local newspaper article, a pond containing "sunfish" was located outside Oslo (59°49'N, 10°27'E) in October 2005. With the help of anglers, four specimens (90-112 mm total length, 15-24 g wet weight) were brought to the National Veterinary Institute, Oslo and identified as pumpkinseed *Lepomis gibbosus* (Linnaeus, 1758) (Figure 1). Based on subsequent observations of male pumpkinseed guarding nests close to the pond's bank, and angling results, the pond is believed to harbour several hundred fish. Also, the fish have survived at least two winters, and it is therefore highly likely that the species is reproducing successfully in this pond. The pond was originally constructed for ice production purposes in pre electric time. Other fish species in the pond are rudd *Scardinius erythrophthalmus* (Linnaeus, 1758), and tench *Tinca tinca* (Linnaeus, 1758). Both were introduced to the pond at unknown time (probably long time ago). Both are reproducing at a high rate, resulting in dense population of small specimens.

Figure 1. Pumpkinseed (*Lepomis gibbosus*) from a Norwegian pond (59°49' N, 10°27' E) (Photo by E. Sterud)

The pumpkinseed were examined for parasites and their gill filaments were found to be heavily infected (intensity <100) with monogeneans. Two ancyrocephalids, considered non-native to Norway, were observed. By light microscopy, one of the monogenean species was identified as *Onchocleidus dispar* (Müller, 1936) (sensu Wheeler and Beverley-Burton 1989) based on the morphology of sclerotized structures in the holdfast organ, the opisthaptor, and penis complex (Figure 2). The identity of the other species (Figure 3) remains unknown. Whilst the opisthaptoral hard parts resembled those of *Onchocleidus similis* Müller, 1936, which has been found at several occasions in Europe, the penis and associated accessory part did not match the description of *O. similis* given by Wheeler and Beverley-Burton (1989). To confirm the differences in the reproduction organs, *O. similis* from pumpkinseed caught in the River Danube (Slovakia) were compared with the Norwegian specimens (Figure 4). The unidentified species has tentatively been designated *Onchocleidus* sp. Work is in progress to characterize and identify this species by molecular methods.

The pathways by which the fish and its parasites reached Norway are not known. Pumpkinseed is not commonly sold in aquarium shops in Oslo, but the species is occasionally imported by special order. Pet shop owners in Oslo have mentioned the Czech Republic as the most likely origin of the fish. Pumpkinseed was introduced to European waters in the 19th century, but its distribution has been restricted to mostly central and southern European locations (Copp et al. 2004, García-Berthou et al. 2005). The most northerly populations of pumpkinseed have been reported for England (Copp et al. 2004) and Poland (Heese and Przybyszewski 1985). However, reproducing pumpkinseed populations are now known to exist in the north of the Netherlands (G.H. Copp, personal communication) and to the best of our knowledge, the Norwegian population is the northernmost of Europe.

Pumpkinseed are known to be invasive in some southern and central European locations but not in England (Copp et al. 2004, García-Berthou et al. 2005), with climatic conditions identified as probably playing a role in the species' invasiveness potential (Villeneuve et al. 2005). Based on this, the invasive potential in Norway may be low. However, the climatic

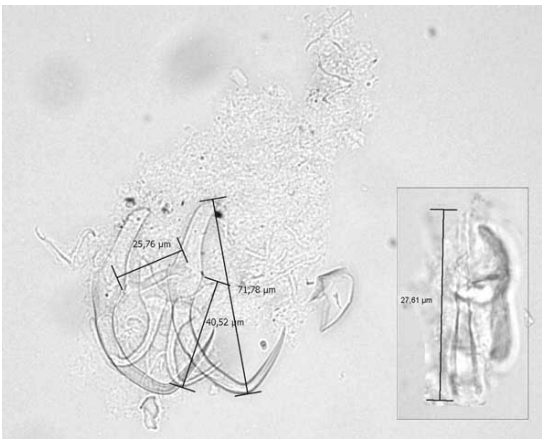

Figure 2. *Onchocleidus dispar* from the gill filaments of pumpkinseed (*Lepomis gibbous*) from Norway. Opisthaptoral hard parts and penis complex (inserted)

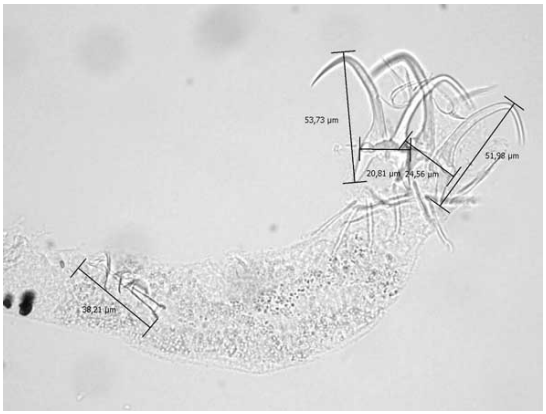

Figure 3. *Onchocleidus* sp. from the gill filaments of pumpkinseed (*Lepomis gibbous*) from Norway. Opisthaptoral hard parts and penis complex. Note the difference from the penis of *O. similis* in Figure 4

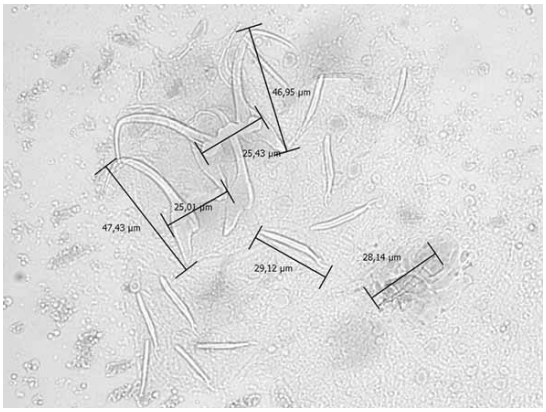

Figure 4. Opisthaptoral parts and penis complex of *Onchocleidus similis* from the gill filaments of pumpkinseed (*Lepomis gibbosus*) from Slovakia

similarities between Scandinavia and Canada should not be ignored. At the same time, the ornamental attractiveness of pumpkinseed suggests that the risk of anthropochor dispersal is high. Pumpkinseed can be easily caught, and this increases the risk for both intentional and unintentional spreading of the species. Indeed, there is increasing evidence that occurrences of ornamental and aquarium fish in the wild is due to human abandonment of these fish (see Copp et al. 2005).

Ancyrocephalids have been reported in pumpkinseed populations introduced elsewhere in Europe, including Bosnia Herzegovina, Bulgaria, France, Hungary, Italy, Slovakia and the Czech Republic (Lambert 1975, Kiskaroly 1977, Molnar 1982, Grupcheva and Nedeva 1999, Galli et al. 2003, Ondračková et al. 2004). The absence of monogeneans on pumpkinseed from the River Oder (Poland) was specifically discussed by Piasecki and Falandysz (1994). The exact identity of the *Onchocleidus* sp. found in the Norwegian pumpkinseed may represent information that can be used to trace the origin of the introduced fish and parasites.

Monogeneans in general are regarded to be quite host specific (Whittington et al. 2000), but *O. similis* has been found on introduced gibel carp *Carassius gibelio* (Bloch, 1782) in Europe (Grupcheva and Nedeva 1999). The introduced parasites of pumpkinseed are not likely to represent a major risk to native freshwater species of Norway, since neither *Onchocleidus* sp. has been reported to infect hosts native to Norway. Nonetheless, the introduction of alien species such as pumpkinseed to the wild should be discouraged. It is both illegal under Norwegian law, and could result in damage to the environment as the potential adverse impacts of this omnivorous fish for native species and ecosystems remain unknown.

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