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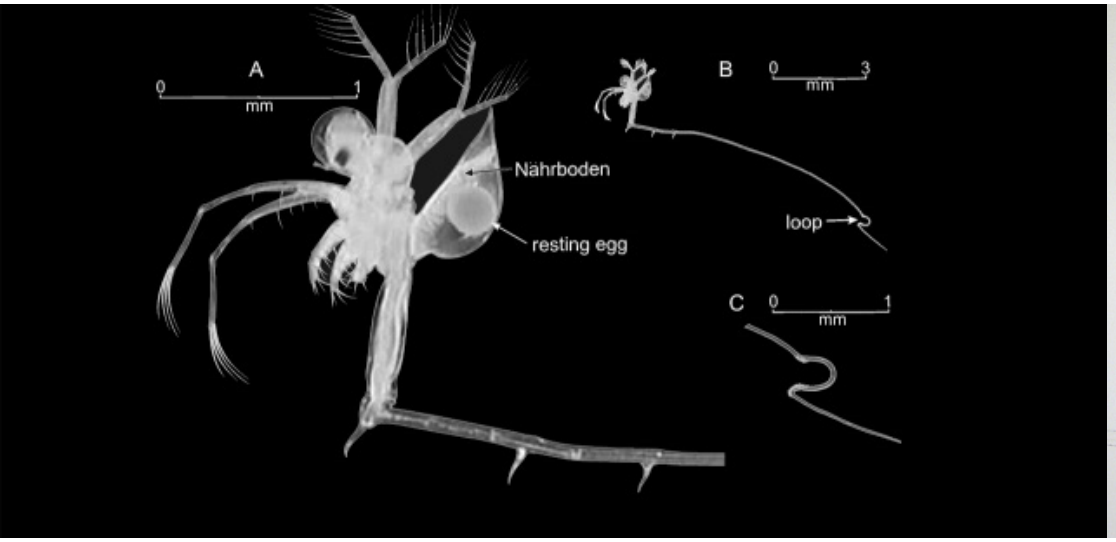
Fishhook Water Flea

Cercopagis Pengoi (Ostroumov, 1891)
syn. *Cercopagis (Apagis) Ossiani*

ALBERTA REGULATION: FISHERIES ACT

Last Updated: February 2018



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Overview:

The fishhook water flea is a predatory cladoceran (tiny, aquatic crustacean) native to Ponto-Aralo-Caspian Basin of Eastern Europe and Asia.[1] They have been introduced to other parts of Europe and the Great Lakes of North America accidentally via ballast water and dispersed through water currents, boat traffic, and fishing equipment.[1] The fishhook water flea is established in Lakes Erie, Ontario and Michigan.[5]

C. pengoi reproduce both asexually and sexually. Asexual, or parthenogenic reproduction dominates during periods of rapid population growth.[4] Sexual reproduction, or gametogenic, dominates during the last stages of population growth or may facilitate establishment in new habitats.[4] Both females and males develop through three instars, which can be identified by the number of spines on the tail.[2]

Fishhook water fleas are generalist feeders of other cladocerans and zooplankton. They capture prey with their thoracic legs, crush it using their mandibles, and then suck out the prey's body contents.[2]

C. pengoi may be confused with the spiny water flea, *Bythotrephes cederstroemi*, but fishhook water flea has a loop in the caudal process (tail) and spiny water flea does not.[1] Often their presence is noted by masses on fishing lines and cables that look and feel like gelatin with tiny black spots.

As of January 1, 2016, the possession, sale, or transport of this species in Alberta is illegal under the Fisheries Act.

Habitat:

C. pengoi inhabits lakes, estuaries and offshore marine environments. It tolerates freshwater and brackish water up to 17% and water temperatures of 3 to 38°C.[1] Highest populations are found at water temperatures 16-26°C and salinities up to 10%. In Lake Ontario, abundance increases with distance from shore.[1] In stratified waters, it stays above the thermocline.[2]

Identification:

Fishhook water fleas are greyish white and almost transparent. The tiny body is 1-2 mm long; the most pronounced parts of the body are the head, second antennae, thoracic legs, abdomen, tail and a brooding pouch in females that ends in a fine point.[1] The head consists of a large compound eye with black pigment covering less than half the diameter of the eye.[1] The second antennae are large appendages composed of two branches.[2] The first pair of thoracic legs are 3-4 times longer than the second pair. Abdomen length is about equal to the rest of the body, excluding the tail.[2] The tail is, on average, 10 mm long with an S-shaped or loop-like curvature at the tip.[1] Spines or barbs are large - about 2-3 times the diameter of the tail.[2]

First-generation, parthenogenic females which hatch from resting eggs have a

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Fishhook Water Flea *(continued)*

short, straight tail - not the characteristic looped tail.[2]

Ecology:

Between instars, the fishhook water flea shed its exoskeleton to the base of the tail.[2] Both sexes, whether parthenogenic or gametogenic, go through three instars. Newborn, parthenogenic, first-instar females have one pair of barbs on the tail and compact oval embryos in the brood pouch without a pointed apex. Second instar females have two pairs of barbs and final instars have a large brood pouch with a pointed apex housing the embryos.[2] Third instar males have paired penes behind the last pair of thoracic legs and a toothed hook on the first pair of legs.[2] Subsequent generations of females only require two molts to reach maturity.[2]

Parthenogenically-produced young develop in the brood pouch, which ruptures to release them. Later in the season parthenogenic females produce eggs that develop into males and gametogenic females, which mate.[2] Gametogenic reproduction produces resting eggs, which are released when the brood pouch ruptures and overwinter in the sediment. Most gametogenic females carry two resting eggs.[5] The following spring development resumes and the eggs hatch to replenish the population.[2]

Sexual females reproduce only at the second and third instars, parthenogenic females produce 1-24 embryos and clutch size decreases gradually from first to final instar.[2] Depending on water temperature, there could be 5-7 generations over a summer.[2]

Economic Impacts:

C. pengoi fouls commercial fishing equipment by attaching to gears, lines, and clogs net and trawls. Costly impacts have occurred in some countries.[1] Infestations of fishhook water flea and fouling of sportfishing gear could have impacts on recreation and tourism.

Environmental Impacts:

C. pengoi may compete directly with other native aquatic organisms, which rely on zooplankton for a food source.[1] It may reduce the density of native, smaller-sized cladocerans by predation. Depletion of zooplankton can result in higher concentrations of phytoplankton, contributing to eutrophication.[1]

Sociological Impacts:

Some fishermen have reported allergic reactions after contact with *C. pengoi* while cleaning nets.[2] The transformation of native aquatic communities results in the intrinsic loss of natural capital and enjoyment of natural areas.

Prevention:

Learn how to identify fishhook water fleas and how to prevent spread. Being a pelagic (free-floating) species, it is dispersed with water currents.[1] Report any sightings.

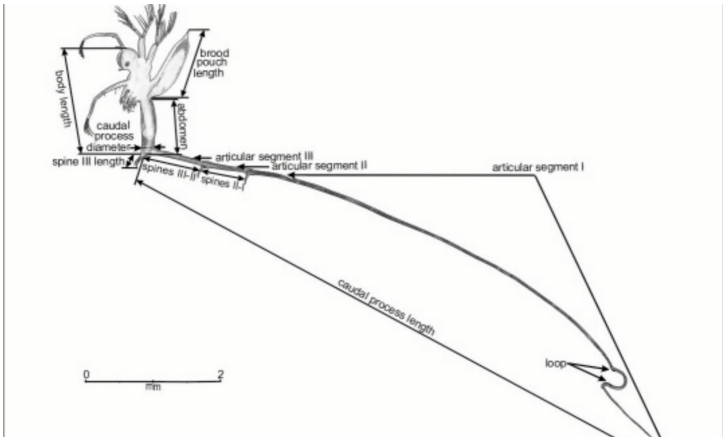
All aquatic recreational and fishing equipment should be inspected after use and cleaned, drained and dried of all mud and plant material. Do not release bait or bait water into a water body or transport from one water body to another.[1] All aquatic equipment should be rinsed with hot water (>40°C) or high pressure spray, or let dry for at least 5 days before re-entering water. *C. pengoi* eggs can survive desiccation and freezing. Thoroughly drain the motor, bilge, transom, live wells, bait buckets, and fishing equipment (lines, nets, etc.).[1]

The Canadian government's Ballast Water Program and The International Convention for the Control and Management of Ships' Ballast Water and Sediments are designed to prevent the introduction of non-native aquatic species.

Control:

No physical, chemical or biological control methods exist to date.[1]

Fishhook Water Flea *(continued)*



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