
**Detection of *Ceratomyxa shasta* in Alaskan Chum Salmon,
*Oncorhynchus keta***

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Spores of *Ceratomyxa shasta* (Noble 1950), have been found in adult chum salmon *Oncorhynchus keta* from the Sushana River, Alaska (Figure 1), which is the first finding of this parasite in Alaska. *C. shasta* is a myxosporean parasite found throughout the Pacific northwest of the United States and Canada. It can cause substantial mortality in juvenile salmonids. Examination of the adult chum salmon reported here was a requirement for use of their gametes in a fisheries enhancement program.

Wet mounts of hindgut contents from 150 chum salmon, each diluted with 2 ml PBS, showed the presence of spores characteristic of *C. shasta* in 9 of the specimens. No inflammation of the hindguts was noted. All positive fish appeared to be lightly infected. The spores were stained with methylene blue or Ziehl-Nielsen stain for further examination. Spores averaged $17.8 \pm 1.6 \mu\text{m}$ in length by $7.2 \pm 0.5 \mu\text{m}$ in width, whereas polar capsules had a mean diameter of $2.3 \pm 0.1 \mu\text{m}$.

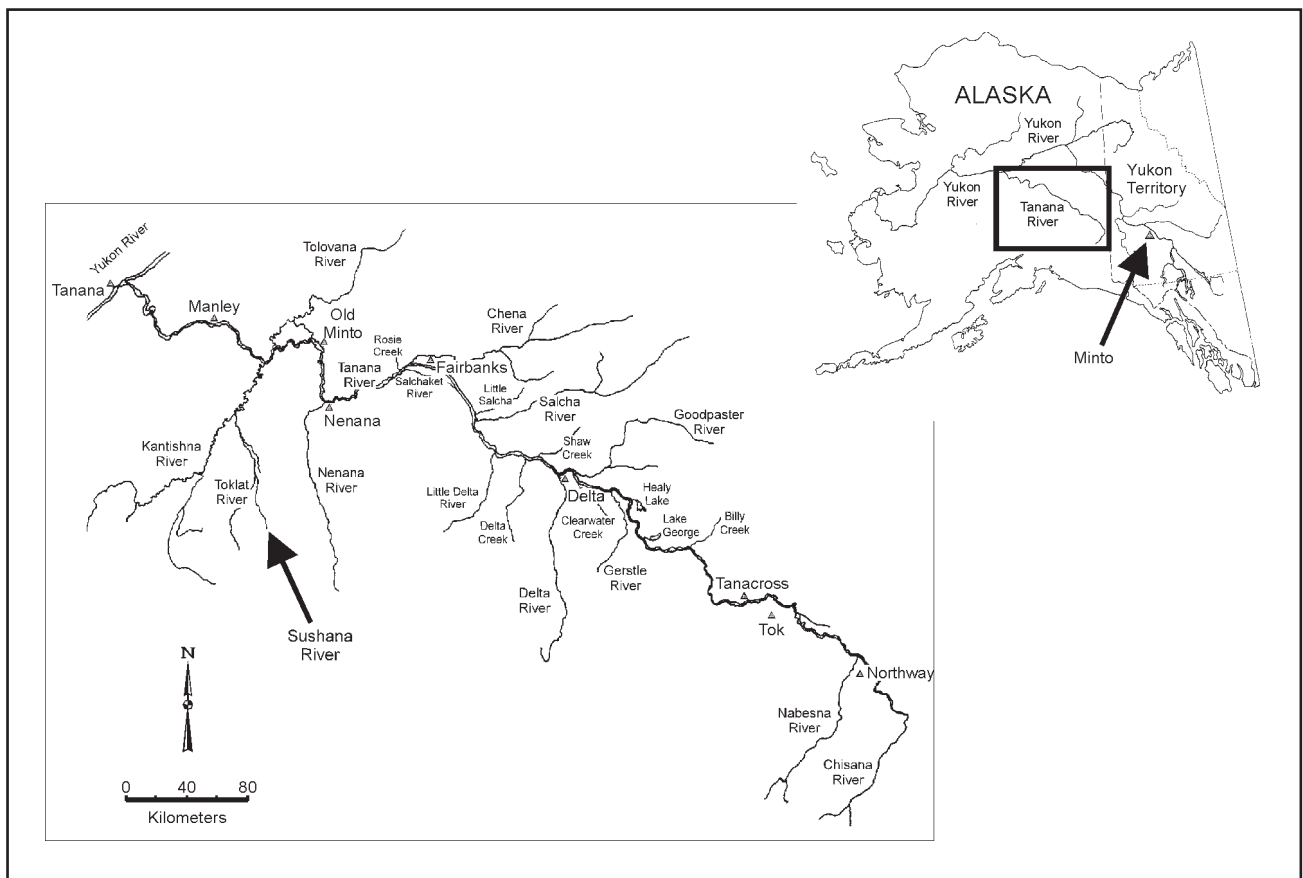


Figure 1. Locations of *Ceratomyxa shasta* parasite findings in Alaska and Yukon Territory, Canada.

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The Sushana River is a tributary of the Toklat River that flows into the Kantishna River before joining the lower Yukon River. The parasite had been reported previously from the upper Yukon River near Minto (Figure 1), in the Yukon Territory, Canada (McDonald 1984). Our finding is additional confirmation of the presence of *C. shasta* in the Yukon River system but within Alaska boundaries. The infectious stage is most likely present in the lower part of the river. However, prior examinations of fish from Alaskan rivers, including 150 chum salmon adults from this same site in 1992 have not detected spores of *C. shasta*. Screening of other stocks in the lower Yukon River has not been done.

The life cycle of *C. shasta* is not well understood but is suspected to involve an intermediate host (Bartholomew et al. 1989; Heckmann 1993). The spores are not infective, but infective stages are probably present in the sediments or water. The Yukon River water temperatures vary from 10–17 °C during the chum salmon migration, and adult fish have been

in fresh water for at least 40–45 d upon reaching the spawning beds in the Sushana River (Louis Barton, Alaska Department of Fish and Game, Fairbanks, personal communication). This is adequate time for *C. shasta* infection to have occurred upon re-entry to fresh water. The low level of the infection would indicate that either the fish were not in contact with the infectious stage for an extended period, the disease had not progressed, or this stock was somewhat refractory to the parasite. Progress of the disease is reported to be temperature dependent (Bartholomew et al. 1989; Lom and Dykova 1992).

The enhancement of the Sushana chum salmon stock involves transfer of fertilized eggs to a hatchery where they are incubated and reared before being planted back into the river as fry. Because only gametes are transferred, this positive finding should not adversely affect the enhancement program as long as the eggs are thoroughly surface-disinfected and contaminated water or sediments are not transferred to the facility.

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