Lumpy Bumpy the Sea Star

Revisiting an Internal Molluscan Parasite of Sea Stars in the North Pacific

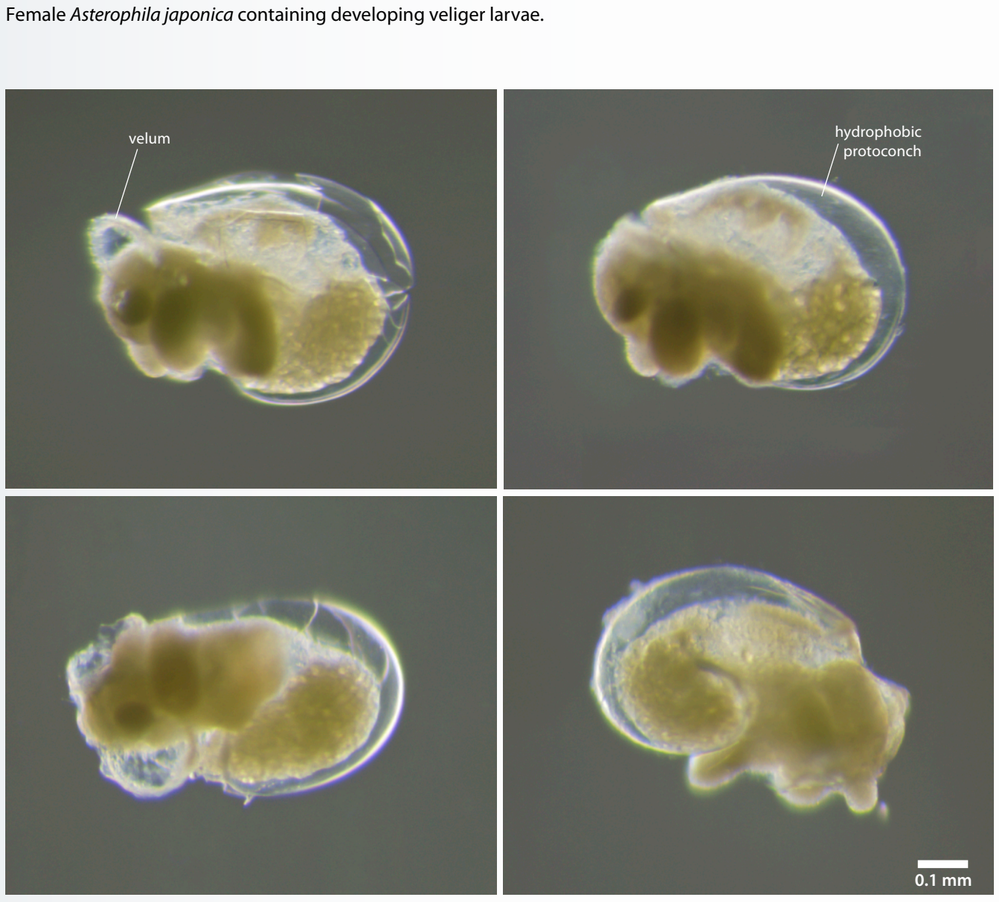
Vanessa Lowe · Alaska Fisheries Science Center, NMFS, NOAA

Introduction

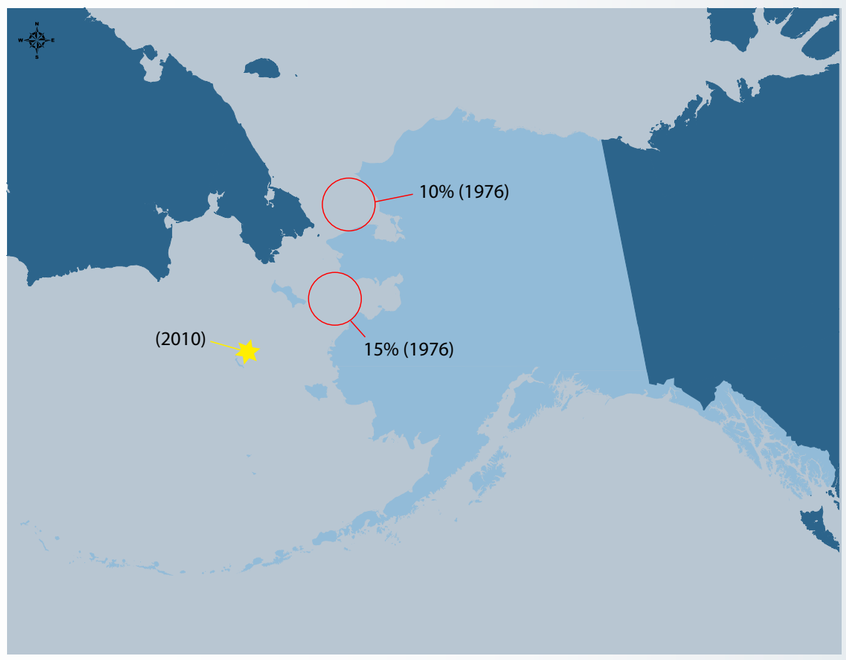
Asterophila japonica is a shell-less parasitic gastropod of sea stars. It is a member of the family Eulimidae, the only known gastropod group to parasitize echinoderms. Eulimid characters vary; members of this group can be shelled or shell-less, may reside superficially on the host, penetrate the host tegument or reside entirely within the host. *A. japonica* is highly modified and lives entirely within the body wall of the sea star host. Organs unrelated to digestion and reproduction are reduced or absent in this species and a specialized epithelium called the pseudopallium, encloses the entire parasite including developing veliger larvae (below). *A. japonica* veliger morphology is typical, including a ciliated velum and protoconch.

Leptasterias polaris with multiple *Asterophila japonica* infections.

Female *Asterophila japonica* containing developing veliger larvae.



Asterophila japonica veliger larvae.



Distribution

A. japonica extends along the Asiatic coast and Pacific Ocean. The complete range of this parasite is unknown, but a 1976 survey of sea stars in northern Alaska revealed the presence of this eulimid in this region at notable prevalence (see red circles on map). Recently, *A. japonica* was found in the sea star *Leptasterias polaris* (left) collected near St. Matthew Island during a NOAA Fisheries survey.

Systematics

The placement of gastropods in the family Eulimidae has been based on morphological traits and the character of echinoderm parasitism. Very few eulimids have been sequenced; a phylogenetic analysis of this family may elucidate different evolutionary classifications. Preliminary sequencing of a 658 bp region of the the mitochondrial COI gene from 2 larvae revealed 0.46% divergence between individuals and 2 variable sites were apparent between clones of one larva. For this region, *A. japonica* shares 73% - 76% identity with other sequenced eulimids.