Crangon alaskensis

Alaskan bay shrimp,
salt-and-pepper shrimp

Phylum: Arthropoda, Crustacea

Class: Multicrustacea, Malacostraca, Eumalacostraca

Order: Eucarida, Decapoda, Pleocyemata, Caridea

Family: Crangonoidea, Crangonidae

Taxonomy: Schmitt (1921) described many shrimp in the genus *Crago* (e.g. *Crago alaskensis*) and reserved the genus *Crangon* for the snapping shrimp (now in the genus *Alpheus*). In 1955–56, the International Commission on Zoological Nomenclature formally reserved the genus *Crangon* for the sand shrimps. The subgeneric name *C. alaskensis elongata* was used briefly based on Alaskan specimens bearing shorter rostrums (Rathbun 1902), but this was not corroborated with data from Butler (1980) and Wicksten (2011) and is not widely used (e.g. Kuris et al. 2007; Wicksten 2011).

Description

Size: Type specimen was 76 mm (Carlton and Kuris 1975) and a female specimen from South Slough (of Coos Bay) was 65 mm. Average length is 52 mm for males and 65 mm for females (Wicksten 2011).

Color: White, mottled with small black spots, giving gray appearance, hence the common name: the salt-and-pepper shrimp. Body color rather dull and is camouflaged with chromatophores (Wicksten 2011).

General Morphology: The body of decapod crustaceans can be divided into the **cephalothorax** (fused head and thorax) and **abdomen**. They have a large plate-like carapace dorsally, beneath which are five pairs of thoracic appendages (see **chelipeds** and **pereopods**) and three pairs of maxillipeds (see **mouthparts**). The body is laterally compressed and shrimp-like in the Caridea. The abdomen and associated appendages are outstretched and the abdomen usually has a sharp bend (Kuris et al. 2007).

Cephalothorax:

Eyes: Salmon in color, free and not covered by the carapace (*Crangon* and *Lissocrangon*).

Antenna: Antennal scale (scaphocerite) narrow, with spine longer than blade, and more than 2/3 carapace length with blade broad and rounded (Fig. 2) (Plate 319B, Kuris et al. 2007). Stylocerite (basal, lateral spine on antennule) almost as long as first antennule peduncle segment (Wicksten 2011). Antennae 2/3 body length (Kuris et al. 2007).

Mouthparts: The mouth of decapod crustaceans is comprised of six pairs of appendages including one pair of mandibles (on either side of the mouth), two pairs of maxillae and three pairs of maxillipeds. The maxillae and maxillipeds attach posterior to the mouth and extend to cover the mandibles (Ruppert et al. 2004). Third maxilliped setose and with exopod in *C. alaskensis* and *C. franciscorum* (Wicksten 2011).

Carapace: Thin and smooth, with a single medial spine (compare to *Lissocrangon* with no gastric spines). Also lateral (Schmitt 1921), hepatic, branchiostegal and pterygostomian spines (Wicksten 2011).

Rostrum: Rostrum straight and upturned (*Crangon*, Kuris and Carlton 1977). Short, flattened, rounded (Fig. 2) and unornamented. Rostrum length reaching or exceeding the cornea of the eye (Wicksten 2011).

Teeth:

Pereopods: First pereopod subchelate, with inner spine. Merus with strong distal spine, broad propodus and dactyl that closes obliquely or horizontally across propodus (Wicksten 2011). Second to fifth pereopod

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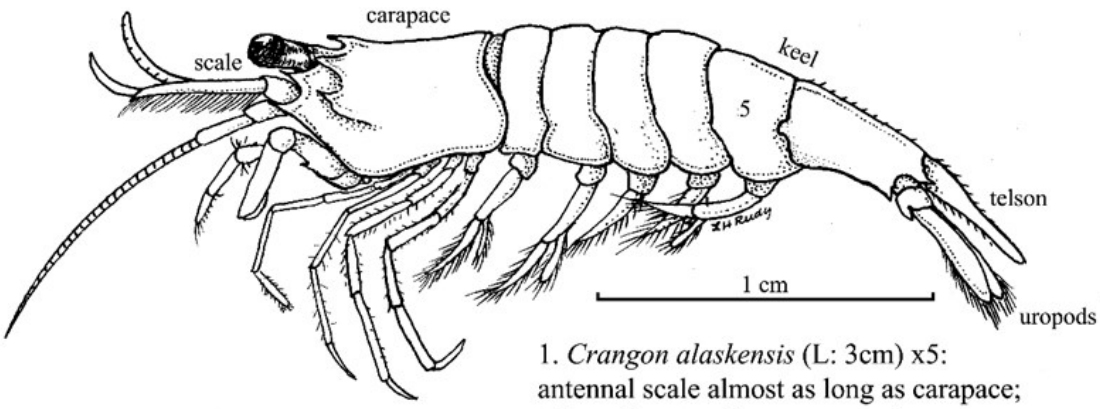
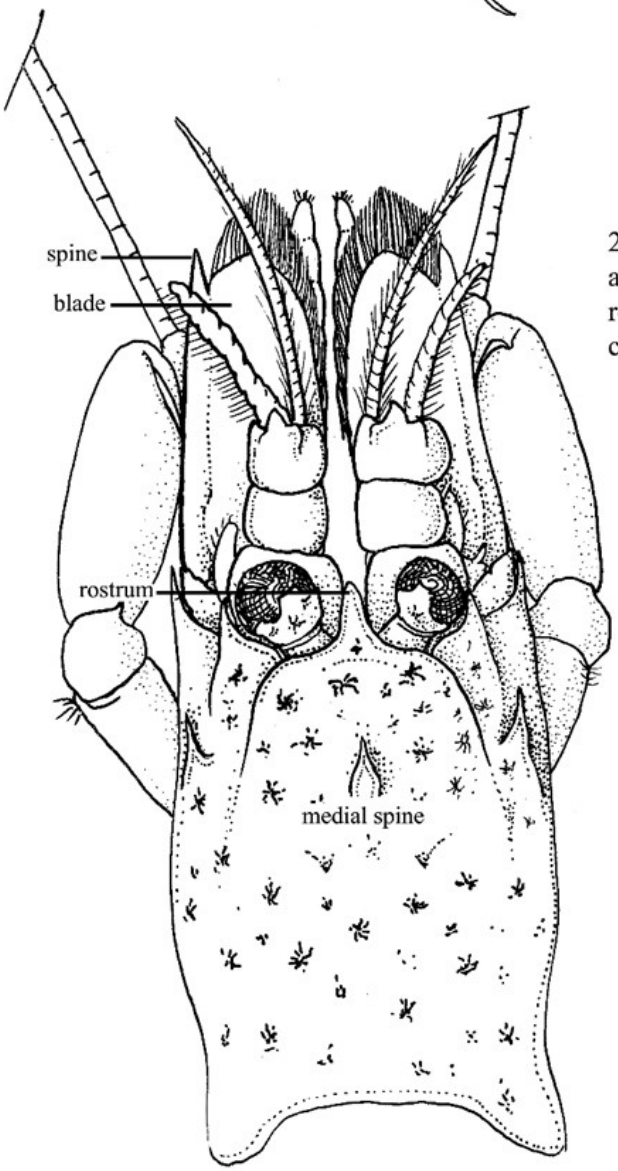
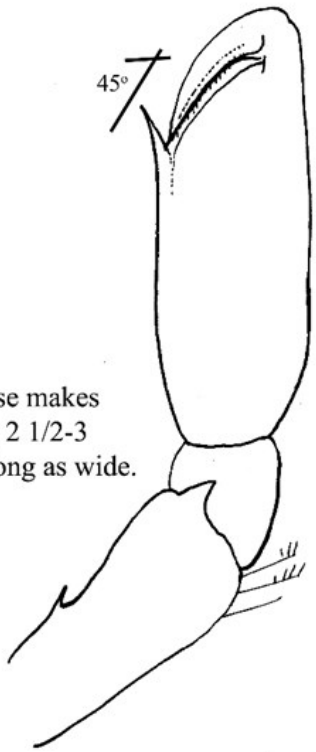


1. *Crangon alaskensis* (L: 3cm) x5:
antennal scale almost as long as carapace;
telson almost as long as uropods;
hands of first legs subchelate; eyes free.



2. Frontal region (dorsal view):
antennal spine larger than blade;
rostrum slender;
carapace: one medial spine.



3. Hand:
finger close makes
45° angle; 2 1/2-3
times as long as wide.

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morphology as follows: second pereopods slender, chelate and of equal size; third slender with simple dactyl; fourth and fifth longer than third and larger, also with simple dactyls.

Chelipeds: Subchelate. Chela dactyl at a 45˚ angle to the hand (Plate 319A, Kuris et al. 2007) (Fig. 3).

Abdomen (Pleon): Shrimp-like, with typical caridean bend, the second segment overlaps the first (Fig. 1). Male abdomen narrow (see **Sexual Dimorphism**). Morphology of the sixth abdominal segment bears taxonomic significance. In *C. alaskensis*, it lacks dorsal carinae and the ventral side is sulcate and thesomite is with posterolateral spine and ventral groove (Kuris and Carlton 1977; Wicksten 2011).

Telson & Uropods: Telson nearly equal to or longer in length than uropods (*Crangon*, Kuris and Carlton 1977). Telson has two pair dorso-lateral spines (Wicksten 2011).

Sexual Dimorphism: Females often have broader and larger bodies than males, which have compressed and squat bodies (Wicksten 2011).

Possible Misidentifications

The family Crangonidae is characterized by first pereopods that are subchelate and second pereopods (if present) that are slender and equal in size, each with unsegmented carpus. Other characters include chela dactyls that close horizontally across the end of the propodus ("like the blade of a pocket knife" Wicksten 2011), a rostrum that is small and without spines and a body that is squat and somewhat depressed (although it can be broad in ovigerous females) (Wicksten 2011).

Three crangonid genera were revised in 1977 by Kuris and Carlton: *Lissocrangon*, *Crangon* and *Neocrangon*. Members of the two former genera are found locally. These genera can be differentiated by carapace spination: *Lissocrangon* lacks gastric spines; *Crangon* has one median gastric spine; and *Neocrangon* (*Mesocrangon, M. munitella,* locally) has two gastric spines.

Besides lacking gastric spines, *Lissocrangon* species have a long narrow and sharply recurved rostrum, a telson that is shorter than the uropods and a sixth abdominal segment without a pair of dorsal carinae (keel-like ridges). This genus is monotypic, the only known member is *L. stylirostris* (Kuris and Carlton 1977; Kuris et al. 2007).

Crangon species have a straight and upturned rostrum and a telson that is of equal length or longer than uropods. The genus is divided into groups (i.e. subgenera, Kuris and Carlton 1977) based on characters of the sixth abdominal segment. In the first group, the sixth abdominal segment is smooth and lacks dorsal carinae (instead of two distal carinae). This group is further split based on a sulcate or convex sixth abdominal segment ventrum. The so-called "smooth, sulcate species group" (Kuris and Carlton 1977) includes all local *Crangon* species, *C. alaskensis*, *C. franciscorum*, *C. handi*, *C. nigricauda* and *C. nigromaculata*.

Crangon nigricauda, the black tailed shrimp, has an antennal blade and spine of nearly equal length and cheliped fingers that close almost transversely. *Crangon nigromaculata* has a striking round marking on the side of the sixth abdominal segment, its fingers also close transversely, and its range may not extend north to Oregon. *Crangon handi*, from the outer coast, has a very short, stout antennal scale, and a short sixth abdominal segment (Kuris and Cartlon 1977). *Crangon alaskensis* is a small shrimp, with a slender rostrum, and lacks *C. franciscorum*'s very long propodus. *Crangon alaskensis* can further be differentiated by the chela dactyl that is at a 45˚ angle to the hand (Plate 319A, Kuris et al. 2007) rather than nearly parallel as in *C. franciscorum*.

Furthermore, *C. franciscorum* has a spine on the postero-dorsal corner of the fifth abdominal segment and the inner flagellum of the first antenna is more than two times as long as the outer (Plate 316A, Kuris et al. 2007). The rostrum length is variable in *C. alaskensis,* and Rathbun (1902) distinguished *C. alaskensis elongata* as a southern form, with longer rostrum than Alaskan forms (Wicksten 2011). However, data from specimens collected from British Columbia, Canada (Butler 1980) and San Diego, California (Wicksten 2011) dismissed any distinct latitudinal difference in morphology.

Ecological Information

Range: Type locality is Mutiny Bay, Alaska. Known range includes Bering Sea to Todos Santos Bay, Baja California (Wicksten 2011).

Local Distribution: Oregon estuaries and bays including Yaquina Bay (Rathbun 1902) and Coos Bay sites at Collver Point (South Slough) and the Charleston channel.

Habitat: Shallow water in bays and estuaries with soft, fine sand. Also in bay channel with muddy and rocky substrate.

Salinity: Euryhaline (Wicksten 2011). Collected at 30 (Rathbun 1902).

Temperature: Great toleration of temperature variation and prefers warmer water than *C. nigricauda*.

Tidal Level: Intertidal to 275 m (Wicksten 1984; Wicksten 2011).

Associates: Collected in a trawl with *Cancer jordani*, *Hermissenda* sp., *Rostanga pulchra*, and other sponges. Trematode metacercariae can also be found within the nervous system of *C. alaskensis* (Morado and Sparks 1983). Can be infested with Bopyrid isopod *Argeia pugettensis* (Butler 1980). This isopod is found next to the branchial chamber in many crangonids and forms a conspicuous bulge in the carapace (see Plate 19, Kozloff 1993; Wicksten 2011).

Abundance: Common and co-occurs with, the larger, *C. nigricauda.* Together, these species comprise the major decapod shrimp epifauna in Yaquina Bay, Oregon (Rathbun 1902).

Life-History Information

Reproduction: Many crangonid shrimp species are considered gonochoristic, but evidence suggests that some species exhibit protandry (Bauer 2004). Identifying ovigerous females is easy as female crangonid shrimp carry eggs, which are attached between the joints and rami of the inner pleopods under the abdomen (Siegfried 1989). Ovigerous females collected from May–August and October (Butler 1980; Nyblade 1987) and spawning reported from December to August (Yaquina Bay, Oregon, Rathbun 1902).

Larva: In caridean shrimp species, development proceeds through several zoea larval stages (Konishi and Kim 2000; Guerao and Cuesta 2014). Crangonid zoea are characterized by a wide rostrum, hemispherical eyestalks, antennule bases that touch, unsegmented antennule scales with inner flagellum having a setose spine, an exopod present on pereopod one (not 3–5), which is subchelate and a telson that widens posteriorly (see Fig. 48.1, Guerao and Cuesta 2014; Puls 2001).

Juvenile:

Longevity:

Growth Rate: Growth occurs in conjunction with molting. In pre-molting periods the epidermis separates from the old cuticle and a dramatic increase in epidermal cell growth occurs. Post-molt individuals will have soft shells until a thin membranous layer is deposited and the cuticle gradually hardens. During a molt decapods have the ability to regenerate limbs that were previously autotomized (Kuris et al. 2007). Differential growth rate in *C. alaskensis* is large between females and males.

Food: Individuals feed on small invertebrates (Wicksten 2011).
Predators: Demersal fishes (e.g. *Hexagrammos decagrammus*, Nemeth 1997), Dungeness crabs and harbor seals (Wicksten 2011). Significant food source for young Striped Bass in upper Coos Bay (Rathbun 1902).
Behavior: Benthic shrimp that dig in the sand and remain hidden with only their eyes and antennae visible (Wicksten 2011).

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