
Ampithoe lacertosa

Gammarid amphipod

Phylum: Arthropoda, Crustacea
Class: Malacostraca
Order: Amphipoda, Gammaridea
Family: Ampithoidae

Taxonomy: Known synonyms for *A. lacertosa* include *A. japonica*, *A. macrurus*, *A. scitulus*, *A. stimpsoni* and *Dexamine stitulus* (Conlan and Bousfield 1982), but only *A. lacertosa* is found in current literature.

Description

Size: Locally, individuals are 12.5–15 mm in length (South Slough of Coos Bay) (Heller 1968) and reported to 24 mm in length (Chapman 2007).

Color: Pale green to reddish brown (Straude 1987) with large red eyes and small, densely arranged, diffuse black spots. Individuals tend to have a similar color to the dominant algae in which they nest (Chapman 2007).

General Morphology: The body of amphipod crustaceans can be divided into three major regions. The **cephalon** (head) or cephalothorax includes antennules, antennae, mandibles, maxillae and maxillipeds (collectively the **mouthparts**). Posterior to the cephalon is the **pereon** (thorax) with seven pairs of pereopods attached to pereonites followed by the **pleon** (abdomen) with six pairs of pleopods. The first three sets of pleopods are generally used for swimming, while the last three are simpler and surround the telson at the animal posterior. Ampithoid amphipods are in the suborder gammaridea, one of the largest groups of amphipods in marine and estuarine habitats. They have smooth bodies that are only slightly compressed (Conlan and Bousfield 1982). Keys to the Ampithoidae generally refer to male specimens, although sexual dimorphism may be weaker in this group than others (Chapman 2007).

Cephalon:

Rostrum: Lateral lobes present.

Eyes: Eyes oval and red.

Antenna 1: Flagellum of the first antenna, with 42 articles, is twice as long as that of second antenna (Fig. 1) (48–52, Barnard 1954). Total length is about as long

as body (Barnard 1954). No accessory flagellum is present.

Antenna 2: Flagellum of the second antenna is with 16 articles (30, Barnard 1954) (Fig. 1).

Mouthparts: Lower lip has a gap between the sub-lobes of its outer lobes (Fig. 2).

Pereon:

Coxae:

Gnathopod 1: Male gnathopod with article five equal to or smaller than article six and palm angle oblique (Fig. 5). Female gnathopod with article five longer than six in mature, large females but can be shorter in younger ones. Female gnathopod palms are oblique (Fig. 6) (Barnard 1965).

Gnathopod 2: Mature males with transverse, sinuous palm (Fig. 4) and females with oblique palm (Fig. 6).

Pereopods 3 through 7:

Pleon:

Pleonites:

Urosomites: The first uropod is without an interramal tooth (Fig. 1b). Uropod three is with flat, setose inner ramus and two curved hooks on the outer ramus (Fig. 7).

Epimera: Two and three with small point at posterior corner (Fig. 1a).

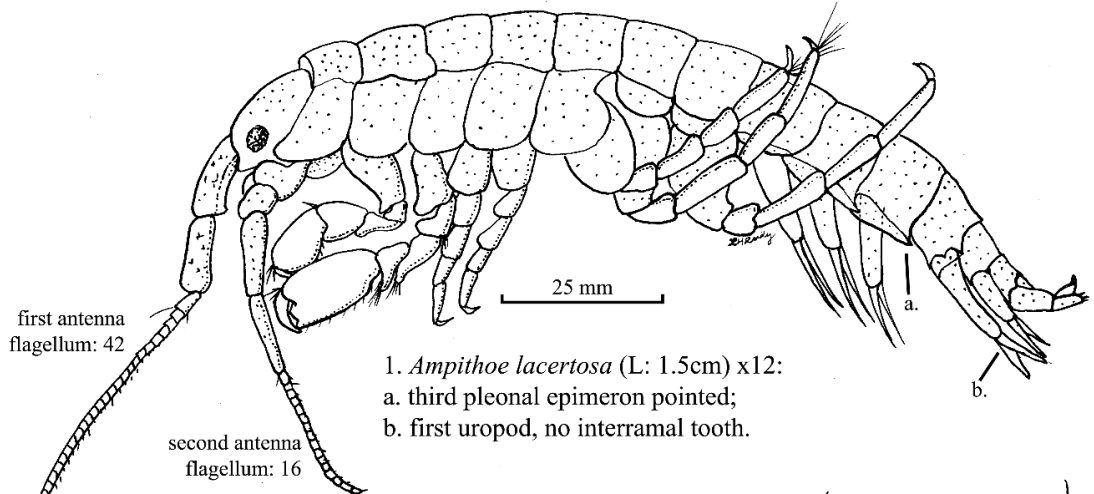
Telson: Fleshy, uncleft, rounded with two small spines laterally (Fig. 7).

Sexual Dimorphism: Among amphipods, males generally have larger eyes, antennae and gnathopods (Straude 1987). Sexual dimorphism in *A. lacertosa* is pronounced in the **gnathopods**.

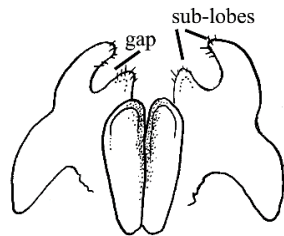
Possible Misidentifications

The Ampithoidae are a family of gammarid amphipods characterized by short third uropods and rami that possess 1–2 distinctive and stout hooks on the outer ramus (Myers and Lowry 2003). They are usually sexually dimorphic and males are

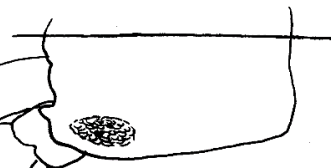
Ampithoe lacertosa



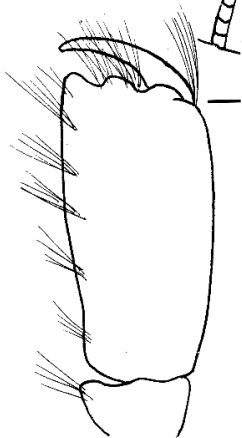
1. *Ampithoe lacertosa* (L: 1.5cm) x12:
 a. third pleonal epimeron pointed;
 b. first uropod, no interramal tooth.



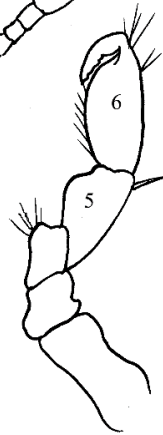
2. Lower lip:
 gap between
 sub-lobes of
 outer lobes.



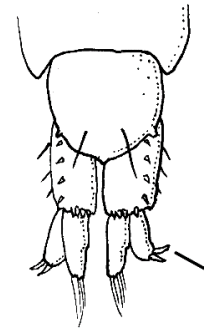
3. Head and antennae:
 no accessory flagellum.



4. Second gnathopod ♂ x32:
 palm angle transverse.



5. First gnathopod ♂:
 palm angle oblique;
 length of article 5 equal to
 or less than article 6.



6. Second gnathopod
 ♀: palm angle oblique
 (and in first gnathopod ♀).

7. Telson: third uropod
 with flat, setose inner
 ramus and two curved
 hooks on outer ramus.

easier to identify than females. They are herbivorous and live in nests they create amongst algal blades or within algae stipes. There are 10–11 local species in the genus *Ampithoe* (*A. corallina* is currently a questionable species, Chapman 2007), which are generally larger than other amphipod genera (Kozloff 1993). See Conlan and Bousfield (1982) for detailed account of *Ampithoe* characters.

Ampithoe simulans is also found in marine intertidal habitats of Coos Bay (Barnard 1965). This species has an oblique and concave article on the second gnathopod, not a transverse one. This article has a large sinus, and a small process on its inner margin (Barnard 1954). This species is primarily found on the open coast and lives within *Phyllospadix* spp. and other types of algae (Chapman 2007). *Ampithoe plumulosa*, as its name suggests, has a very setose second antenna and the first antenna is very long. The lower lips gape and are not compressed as they are in *A. valida*. This likely introduced species is often found in mussel beds (Chapman 2007). *Ampithoe pollex* does have compressed lower lips and its name comes from its large pointed process or thumb which meets the dactyl (the sixth article of the second gnathopod in males). *Ampithoe aptos* has two enlarged lobes on the apex of the telson and the fifth article of pereopod five is less than half as long as the sixth. On the other hand, *Ampithoe sectimanus* has a telson with small knobs and the fifth article of pereopod five is more than half as long as the sixth. *Ampithoe dalli* has plumose setae on the anterior edge of the second article of gnathopod one (in males). *Ampithoe longimana* is North Atlantic species, introduced to southern California and *A. ramondi* is a cosmopolitan species that is currently not reported farther north than Point Conception, California. Neither of these species are found in current local intertidal keys (Chapman 2007).

The most similar species to *A. lacertosa* is *A. valida*, which also has the transverse palm in the second male gnathopod, but which has shorter antennae and compressed lower lips. *Ampithoe*

valida is an important estuarine species, occurring in brackish waters on the alga *Enteromorpha* (E. L. Bousfield, personal communication).

Ecological Information

Range: Known range includes Japan, Alaska, Washington and south to Magdalena Bay, Baja California.

Local Distribution: Coos Bay sites include Cape Arago, North Bay, Charleston and South Slough.

Habitat: Builds tubes or nests in algae (e.g. *Macrocystis*) and in eelgrass on mudflats at South Slough (Barnard 1975; Straude 1987). *Ampithoe lacertosa* was also found as a member of a phytal (drifting seaweeds) community collected from northern Japan (Sano et al. 2003).

Salinity: Collected at salinities of 30.

Temperature:

Tidal Level: Intertidal to +0.15 m and subtidal to 11 meters deep (Chapman 2007).

Associates:

Abundance:

Life-History Information

Reproduction: Most amphipods have separate sexes with some sex determination correlated with environmental conditions (Straude 1987). Females brood embryos in an external thoracic brood chamber made up of oostegites (see Fig. 11, Heller 1968) and irrigate embryos with water flow produced by pleopod movement (fifth pleopods in *A. lacertosa*). Development within this brood chamber is direct and individuals hatch as juveniles that resemble small adults, with no larval stage. Heller (1968) described many aspects of the biology of *A. lacertosa*, including the reproductive biology. Although many amphipod species exhibit an extended coupling period (e.g. *Hyale pugettensis*, Straude 1987), where males and females are physically coupled for several days prior to copulation, this is not necessary in *A. lacertosa* individuals. Instead, males and females inhabit the same nest. Fertilization occurs within the brood chamber and eggs are laid directly into brood pouch from oviducts five hours after fertilization. Eggs are surrounded by a transparent membranous

sac and broods range in number from 10–155 (average 64) embryos that are elliptical in shape and approximately 450–560 µm in diameter. At 8–10°C, individuals hatch at 22 days post fertilization, but remain in the female brood pouch for another 19 days. This timeline increases at warmer temperatures (e.g. 19 and 10 days at 12–15°C) (Heller 1968; Straude 1987).

Larva: Since most amphipods are direct developing, they lack a definite larval stage. Instead, this young developmental stage resembles small adults (e.g. Fig. 39.1, Wolff 2014).

Juvenile: Sexual maturity is reached at four months in water temperatures from 8–12°C. Female oostegites appear after the fifth molt and male genitals are apparent after the second molt. Sexual maturity is reached by the sixth or seventh molt in males and the tenth molt in females (Heller 1968).

Longevity:

Growth Rate: Amphipod growth occurs in conjunction with molting where the exoskeleton is shed and replaced. Post-molt individuals will have soft shells as the cuticle gradually hardens (Ruppert et al. 2004). Time between molts increases with age and averages 49 days in mature female *A. lacertosa* (Heller 1968).

Food: The Ampithoidae are an amphipod group, specialized for herbivorous feeding on algae (Myers and Lowry 2003). Grazing by *Ampithoe* amphipods (e.g. *A. longimana*) can have a significant impact on the structure of algal communities (Duffy and Hay 2000) and experimentally adjusting feeding diversity (rather than phylogenetic diversity) leads to a community with a larger number of species (Best et al. 2013). Grazing studies have shown that *A. lacertosa* grazes macroalgae (e.g. *Ulva* spp.) faster than eelgrasses, while the opposite is true for the grazing habits of the congener, *A. valida*, who consume eelgrasses more readily than macroalgae (Best and Stachowicz 2012). *Ampithoe lacertosa* fed on a wide variety of algae in a recent study (*Ulva lactuca*, *Mazzaella splendens*, *Alaria marginata*, *Desmarestia ligulata*, *Fucus distichus edentatus* and *Saccharina latissima*, McDonald and Bingham 2010).

Predators: The *Ampithoe* congener, *A. longimana*, is preyed upon by the pinfish, *Lagodon rhomboides*, and the grass shrimp, *Palaemonetes vulgaris* (Nelson 1979).

Behavior: A tube-dweller that builds simple, but temporary tubes (McDonald and Bingham 2010).

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