Allorchestes angusta

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

Taxonomy: Although current intertidal guides (e.g. Chapman 2007) place *A. angusta* within the family Hyalellidae, Serejo (2004) proposes that this family be combined with the closely related family Hyalidae (Bousfield and Hendrycks 2002) based on a 43-character matrix (and including *A. angusta*) to form the resulting Dogielinotidae. Authors continue to synonymize *A. oculatus* and *A. angusta*, based on the ambiguous description of the former species, until further material can be examined (see Hendrycks and Bousfield 2001).

Description

Size: The illustrated male specimen is 6–8 mm in length (from South Slough of Coos Bay), but females tend to be smaller.
Color: Bright green with dark red eyes and spots, yellow-green antenna. Females are splotchy brown.
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. The genus *Allorchestes* is recognizable with a broad rectangular telson (Barnard 1974).
Cephalon:

Rostrum: Small and with lateral lobes that are broadly subtruncated (Barnard 1952)

Eyes: Eyes large, red and positioned antero-laterally (Fig. 1).

Antenna 1: Shorter than the second antenna in males (Fig. 1). The female's first antenna is subequal.

Antenna 2: Longer than first five body segments (Fig. 1) (Barnard 1952).

Mouthparts: Mandible with well developed rasping surface on molar, 2–3 spines, five teeth and no palps (Fig. 2). The tip of the inner plate of maxilliped with three stout spines, setae and article four developed (Fig. 4). First maxilla is with minute palp (Fig. 3) (Shoemaker 1941).
Pereon:

Coxae: Coxae 1–3 with posterior cusp, coxa four with lower convex margin, coxa five shallow. Gills are medium to large in size, sac-like, with the smallest at pereopod two. Coxal plates 2–4 are deep and broad in females (Hendrycks and Bousfield 2001).

Gnathopod 1: Stout. Article five is elongated (Fig. 1).

Gnathopod 2: Very large, article five elongated and article six is oval, tapering and with palm oblique. The dactyl is large, curved and fits the palm in males (Fig. 5). Article four larger than article three.

Pereopods 3 through 7: Pereopods three and four with short setae and pereopod five is longer than pereopod four.
Pleon:

Pleonites:

Urosomites: Uropod one and two without marginal spines on outer ramus (Hendrycks and Bousfield 2001). Third uropod with one small, flexible ramus and one spine (Fig. 6) (Barnard 1975).

Epimera: Plates two and three with posterior corners acute (Hendrycks and Bousfield 2001).
Telson: Rectangular and with cleft halfway. Telson compressed laterally in cross section (Fig. 7a, b) (Barnard 1975).
Sexual Dimorphism: Among amphipods, males generally have larger eyes, antennae and gnathopods (Straude 1987). Female *A. angusta* are smaller, have subequal antenna, first **gnathopod** palm that is transverse (not oblique) and second **gnathopod** slightly larger than the first (see Hendrycks and Bousfield 2001).

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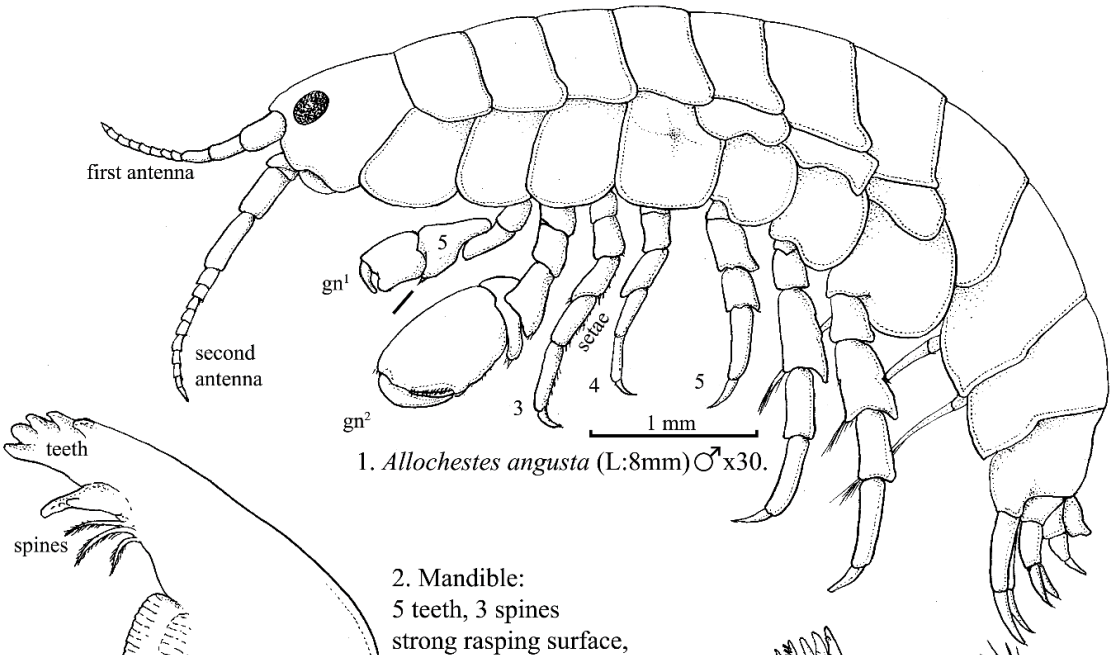
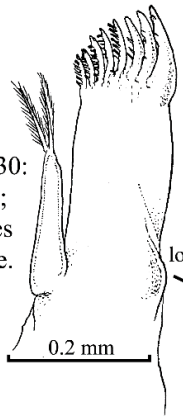
Allorchestes angusta

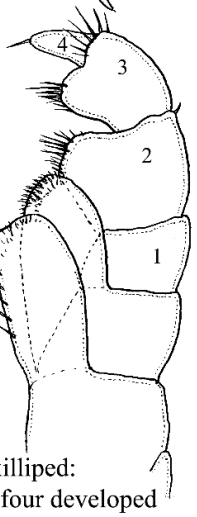


1. *Allochestes angusta* (L:8mm)♂x30.

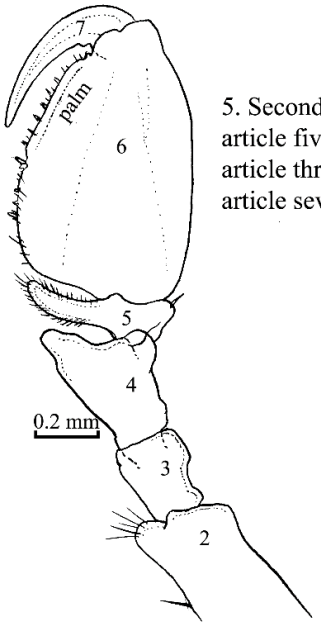
2. Mandible:
5 teeth, 3 spines
strong rasping surface,
no palp.



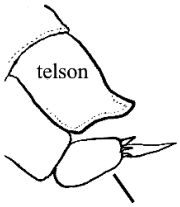
3. First maxilla x130:
inner plate: 2 setae;
outer plate: 3 spines
minute palp or lobe.



4. Maxilliped:
article four developed
(from Hendrycks and Bousfield 2001).



5. Second gnathopod ♂x55:
article five produced;
article three short;
article seven curved.



6. Third uropod:
one ramus, flexible and
rudimentary; no minute
inner ramus.

7a. Urosome: cross-section
urosome compressed laterally.

b. Telson:
rectangular, cleft halfway.

Possible Misidentifications

The Hyalellidae are a family of gammarid amphipods characterized by highly modified first gnathopods in males and correspondingly modified ventral pereonites (pereonite two) and dorsal coxae (coxa two) in females. Four species occur locally, three of which are in the genus *Allorchestes,* which is characterized by a smooth posterior edge of pereopod seven, article two and a habitat that is primarily marine or estuarine. On the other hand, the local species *Hyalella azteca* is mostly found in freshwater and has a serrated posterior edge of pereopod seven on article two.

Allorchestes bellabella has an inflated dactyl on the first gnathopod (males). *Allorchestes rickeri* and *A. angusta* are the most similar species in this genus but can be differentiated by the fourth article of the fifth pereopod. In *A. angusta* the width of the fourth article is 1/2 the length, while in *A rickeri* it is 2/3 the length. Furthermore, the female coxa two has a pre-amplexing notch that is obtuse in *A. angusta* and at a right angle in *A. rickeri* (see plate 272H and 272J in Chapman 2007).

Parallorchestes ochotensis, a similar species in the closely related family Hyalidae, does not have the produced article five on the second gnathopod, and has a small inner ramus on the third uropod. Furthermore, its telson has two triangular lobes.

Ecological Information

Range: Type locality is in California (Barnard 1974; Hendrycks and Bousfield 2001). Known Pacific range includes Japan to Laguna Beach, California, however *A. angusta* is rare south of Monterey (Barnard 1969).

Local Distribution: Coos Bay sites at North Bay of Cape Arago, Bay channel, South Slough and the Metcalf Preserve (Barnard 1969).

Habitat: Algae and eelgrass. Known substrates include mud, wood chips, course sand and cobble although individuals also occur in plankton samples (Barnard 1954). *Allorchestes angusta* was also found as a member of a phytal (drifting seaweeds) community collected from northern Japan (Sano et al. 2003).

Salinity:

Temperature:

Tidal Level: High intermediate (Metcalf Preserve): + 0.6–1.2 meters (Yu et al. 2002).

Associates: Associate species include other tanaid amphipods (e.g. *Leptochelia)* and polychaetes.

Abundance: One of the common amphipods along the outer coast.

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 and irrigate embryos with a flow of water produced by pleopod movement. Development within this brood chamber is direct and individuals hatch as juveniles that resemble small adults, with no larval stage. Little is known about the development of *A. angusta*, however, an ovigerous female was found in July (Barnard 1954). The development of *Apohyale pugettensis* (= *Hyale pugettensis*), a member of the Talitroidea superfamily and closely related family Hyalidae, is described and proceeds as follows: breeding in summer; individuals physically coupled for several days prior to copulation; brood sizes of 30 embryos; embryos 5–600 µm in diameter, hatching after 12 days at room temperature but remain within the female brood pouch for another 3–4 days (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:

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).

Food: Herbivore and detritivore (Yu et al. 2002; Chapman 2007).

Predators:

Behavior:

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