

A PRELIMINARY REVIEW OF
MYSELLA (BIVALVIA, MONTACUTIDAE)
FROM THE NORTHEASTERN PACIFIC

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Members of the genus *Mysella* Angas, 1877, are small featureless bivalves, possessing only limited sculpture externally. Two species in the northeast Pacific attain a length of about 10 mm, while all others are under 5 mm. Conchologically the genus is characterized by the presence of two diverging cardinal teeth in the left valve, and the absence of cardinal teeth in the right valve. The right valve in most species has lateral teeth which interlock in grooves on either side of the cardinal teeth in the left valve. The ligament is internal, seated in a deep resilifer, directly below the beaks.

Mysella species are a common component of the infauna from Alaska to the equator, frequently reaching densities in excess of 100/m². Members of the genus have been observed as free-living or associated with a variety of burrowing invertebrate hosts. In the Pacific Northwest intertidal, *Mysella tumida* (Carpenter, 1864) has been observed by D.O. Foighil (pers. comm.) in association with polychaetes and holothuroids. In addition, *Mysella pedroana* Dall, 1899, a southern California species, has been found attached by a byssus to the gills of mole crabs.

While the biology of several *Mysella* species is becoming increasingly well understood, the taxonomy of northeastern Pacific species is extremely confused. This confusion is primarily due to three factors: 1) all species are small and superficially featureless; 2) many species are known only from badly damaged type specimens or sketches of juvenile shells (in some cases the type specimen is an edentulous right valve); 3) the shells of several species appear to be exceedingly plastic.

Fourteen species of *Mysella* have been described from the northeast Pacific Ocean. Of these, eight appear to be valid, and the other six are junior synonyms. In addition, I have observed 4 potentially new species.

The most common species is *Mysella tumida*. The type specimen is robust, with strong cardinal teeth. The beaks are anteriorly placed with a truncate anterior margin. The species is distributed from the Alaskan arctic to San Diego, California, at intertidal depths to 120 meters. The type locality is Puget Sound, Washington. *Mysella ferruginosa* Dall, 1916, described from San Francisco Bay, is a synonym. The type of *M. ferruginosa* is a specimen of *M. tumida* which is heavily encrusted with sediment.

Mysella tumida exhibits considerable variation in shell shape depending on habitat and substrate. This shell variation is similar to that of *Mysella bidentata* in the northern Atlantic Ocean (Ockelmann & Muus, 1978). In my observations, the type specimen of *M. tumida* appears to be characteristic of shallow water

specimens which live in a sandy substrate. Specimens from deeper water in muddy substrates are elongate and more compressed with the beaks more centrally placed. Preliminary data suggest *Mysella aleutica* Dall, 1899, is an elongate, compressed form of *M. tumida*, although more data must be collected to support this synonymy.

An easily identified species is *Mysella grippi* Dall, 1912. The shell is ellipsoid and evenly rounded on both ends. The beaks are central and the cardinal teeth are small and equal. It is distributed from Oregon to San Diego, California. Two lots from the Gulf of California, which I attribute to this species, were recently found in the collection of the Los Angeles County Museum. Depth distribution is from 12 to 60 meters. The type locality is San Diego, California.

Mysella pedroana Dall, 1899, is one of the largest species, attaining a length of about 10 mm. The shell is thin, highly inflated, and has anteriorly placed beaks. The anterior cardinal tooth is reduced and the posterior tooth is elongate. The species has been collected from Morro Bay, California, to San Diego, California, and is most commonly found in embayments at depths less than 25 meters. It has been found free-living in the sediment, as well as attached to the gills of the mole crab, *Blepharipoda occidentalis*. The type locality is San Pedro, California. *Mysella golischi* Dall, 1916, is a synonym. The holotype of *M. golischi* is a right valve of a juvenile *M. pedroana*.

Mysella compressa Dall, 1913, has a fragile compressed shell. The beaks are subcentral, and two small, equal cardinal teeth are present. The species is reported by Olsson (1961) to be distributed from Alaska to Peru, however the northern end of the range is questionable. I have studied hundreds of *Mysella* lots from Alaska and Oregon and have not observed *M. compressa*. On the basis of material I have studied, the northern range of the species would be Los Angeles County, California. The depth distribution is from 5 to 64 meters. The type locality is Bahia Concepción, in the Gulf of California.

A northern species, *Mysella planata* (Krause, 1885) has prominent central beaks with a small posterior cardinal and an almost absent anterior cardinal. The shell is heavy and large, reaching up to 10 mm in length. The species is distributed from the Beaufort Sea, Alaska, to the Aleutian Islands, from intertidal depths to 100 m. The type locality is Plover Bay, in the Bering Strait, Alaska. A possible synonym is *Mysella beringensis* Dall, 1916. The type of *M. beringensis* is larger than *M. planata* and slightly more compressed but the dentition of both species is very similar.

The remaining three species were described from Mazatlan by Carpenter (1857). All three species are known only from the type material which is either in poor condition or has been lost.

Mysella clemantina was described from a single damaged juvenile shell, about 1 mm in length. The type has been lost and the description is not

adequate to separate it from other *mysella* species. The camera lucida drawings by Carpenter are all that remain to differentiate the species.

Mysella dionaea is known from a single damaged juvenile valve, 1.8 mm in length, in the British Museum. I have not had the opportunity to study the specimen, but the description indicates the valve is without teeth.

Mysella umbonata is known from four valves, all less than 1 mm in length. I have examined the two valves in the U.S. National Museum and they are in poor condition. Keen (1971) reported that the specimens in the British Museum are also in poor condition.

In addition to the described species, I have studied specimens of four potentially new species and will describe them in a forthcoming publication. The new species are found off Oregon, southern California, and in the Gulf of California.

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MYSELLA (BIVALVIA; MONTACUTIDAE) IN SOUTHERN CALIFORNIA

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Perhaps the most difficult group of infaunal bivalves to identify in the southern California borderland are members of the genus Mysella. Most species are less than 5 mm in length and have limited shell sculpture. Examination of the denition is often difficult, as most shells are fragile and hard to open. Many species have extremely plastic shells with great variation in outline and inflation, even within a single sample. Outlined below are a few hints which should assist in the separation of the species in our region.

Most species of Mysella are **opistogyrate**, with beaks which are pointed towards the posterior margin. This often causes confusion as to which valve is left or right. By definition all local members of the genus Mysella have two cardinal teeth in the **right valve**, and an edentulous **left valve**. Many species are **inequilateral**, that is the section anterior of the beaks and the section posterior of the beaks are unequal. Most of our species have a longer anterior. If you are having difficulty with a particular identification, try looking at the following key characters.

Shell shape - While shell outline can be variable this character is important to check. Is the shell quadrate, trigonal, oval, or elongate? Is it compressed or inflated?

Shell thickness - Is the shell fragile or thick for its size?

Shell sculpture - Most species are smooth or have only irregular growth striae, but one southern California species has prominent sculpture.

Beak placement and prominence - Are the beaks near the posterior margin (inequilateral) or are they midway between the anterior and posterior margins (equilateral)? Do the beaks conform with the shell outline (weak) or are they prominent and distinct?

Cardinal teeth - Are the teeth large and heavy compared to the shell size or are they small? Are the anterior and posterior teeth the same size and shape or are they unequal?

Even after many years of experience identifying Mysella species I still have difficulty with small specimens. I have recently observed that several species become reproductively mature at a very small size (1.5 mm) and continue to grow (5 mm) and change shape during their lifetime. Thus for quantitative surveys it is unadvisable to discard the small specimens as Mysella juveniles (i.e. they are mature!). Probably the best method for dealing with small specimens is to assemble your own size series for each species.

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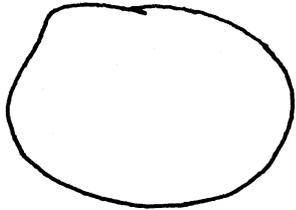
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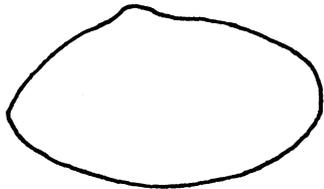
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Common *Mysella* shapes of southern California

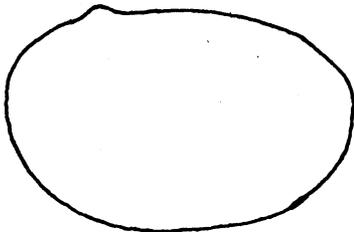
Tony Phillips
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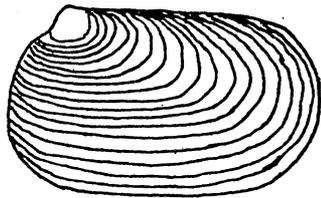
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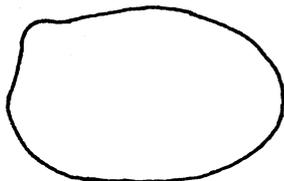
Mysella grippi



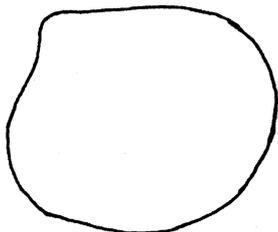
Mysella sp A



Mysella sp B



Mysella sp C



Mysella sp D