

Southern California Association of
Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731



May 1988

Vol. 7, No. 2

NEXT MEETING: June 13, 1988
TOPIC: Southern California Ostracoda
GUEST SPEAKER: Dr. Anne Cohen, LACMNH
LOCATION: Los Angeles County Museum of Natural
History, Exposition Park, Los Angeles

MINUTES FROM MEETING ON MAY 9, 1988:

A full and productive workshop on species of the montacutid genus, *Mysella*, was led by Paul Scott of the Santa Barbara Museum of Natural History. His participation permitted useful comparative examination of most species routinely encountered in southern California. You will find his set of voucher sheets for *Mysella* specimens included in this newsletter issue. Also, there is an abstract and an introduction on the complexity of the taxonomy of *Mysella*. Finally, there is a sheet prepared by Tony Phillips of Hyperion Treatment Plant which gives a good representation of *Mysella* shell shapes.

Paul Scott has requested that anyone with specimens of *Mysella* sp. E send him some. Very few specimens of this form are known and additional notes are necessary to get a better description of its variability. Paul also would like to receive specimens of the hermit crabs *Isocheles* and *Paguristes*. These crabs serve as either commensal or parasitic hosts for certain *Mysella*. No attempt to separate the clams from the crab should be made as the method of potential attachment has yet to be described.

Ron Velarde of the Point Loma Biology Laboratory would like to receive specimens (about 20 in a lot) of an *Onuphis* which seems to be intermediate to *Onuphis elegans* and *Onuphis*

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CHEVRON USA, AND TEXACO INC.

The SCAMIT newsletter is not deemed to be a valid publication
for formal taxonomic purposes.

iridescens. He would also like to see specimens of other Onuphis reported along the California coast. In addition, Ron would like to be sent any southern California specimens of the genus Rhamphobranchium.

SCAMIT's symposium on "Structure and Change in Marine Communities in Southern California" held at the Southern California Academy of Science meetings was well attended and allowed us all to see many ecological applications of taxonomic data. The topics presented ranged from estuaries to deep ocean waters.

The Xerces Society has recently been given a grant to proceed with a project to create an international register of invertebrate specialists. Enclosed in this issue is a copy of the project they are now working on. They have requested not only the assistance of SCAMIT in helping to enlarge the register, but also the help of members within SCAMIT. After reading the Xerces project paper, please contact them for any assistance or resources you can provide.

Don Cadien of Marine Biological Consultants has recently received a letter requesting information on the locality of wild populations of the polychaete, Neanthes caudata (also known as N. acuminata, N. arenaceodentata and N. arenaceodonta). If anyone can pinpoint such a location or confirm the existence of such populations in the estuaries north of San Diego, please contact:

Dr. James R Weinberg
Assistant Scientist, Biology Dept.
Woods Hole Oceanographic Institute
Woods Hole, MA 02543

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THE XERCES SOCIETY
INTERNATIONAL CONSERVATION REGISTER OF INVERTEBRATE SPECIALISTS
10 S.W. Ash Street
Portland, Oregon 97204
(503) 222-2788

If a given habitat or a specific invertebrate organism were in sudden jeopardy, where could current biological information be obtained rapidly? Information about the leading experts on particular habitat types, taxonomic groups of organisms, or single invertebrate species is not readily available outside the scientific/academic community. A database is needed to facilitate conservation by providing information regarding the experts on the vast array of invertebrate organisms and their habitats to anyone involved in conservation and land use planning. The Xerces Society has joined forces with the Association of Systematics Collections to develop a conservation database which will initially embrace the Western Hemisphere. The database will be designed to interface with existing natural diversity databases as well so that data can be exchanged with relative ease.

Several aspects of invertebrate science make retrieving information difficult: relatively few invertebrate scientists exist, and most are specialists whose life work centers around one order or an even smaller group of organisms. Whole groups of invertebrates are obscure or little studied, and identification of specimens by systematists is backlogged in nearly every institution. Entomologists and invertebrate zoologists usually know those experts in their own disciplinary areas and sometimes they know specialists in related areas. In fact, each scientist is a storehouse of information about what is going on within his niche. But this information is not available to those in the outside world. With the database, the information could be efficiently and effectively utilized by others.

The Xerces Register will be a computerized atlas of the expertise available in both science and conservation. The Register will facilitate liaison between conservation organizations, scientists of various disciplines, government agencies and officials, corporate entities, land developers, and land use planners. It will provide ready access to current biological knowledge through specialists and thereby make possible informed decisions on habitat changes.

The Register could foster the initiation of biological management and conservation planning at the outset of large land development projects, saving inestimable costs in natural resources or in possible mitigation measures.

A computer software database management program called DbaseIII+ will use key words or phrases to retrieve information on invertebrate specialists, whether one is searching for them by institution or by their research specialties in a given taxa, geographic location, habitat type, or organism. In addition, a search would provide a subjective measure of the vulnerability of different species and research sites.

An example: a search for specific aquatic systems in one geographic area would produce a list of sites, flag the highly sensitive or threatened areas and list the relevant aquatic invertebrate specialists and their areas of research. Searching for "Bogs" in any given area would produce bog specialists, regardless of the particular organism; a search would produce information on who the specialists were, as well as the fragility of the system or organism. Also-generated would be lists of bogs

on which research had been conducted, with sensitive sites flagged. A search for "rotifers" would produce the only known specialist in the world.

Databases of this sort become out-of-date--and thus obsolete--very quickly if not maintained, so Xerces will build in as much automatic maintenance as possible by utilizing existing invertebrate databases and developing specialized programming. As an example, the National Museum-housed Melissa database of scientists working on bees in Mexico, which is also in the dBase III+ format, is updated every few months. Melissa has agreed to pass the information on to Xerces on a computer disk, which should make it easy for Xerces to update information on the Melissa scientists in the Conservation Register.

The current goal of the Xerces Society is to accomplish critical, high impact conservation tasks despite the relatively small scale of the organization. By establishing the Register, Xerces will be able to disseminate information and to facilitate conservation action either directly, or through larger organizations.

All requests for information from the database will be screened by Xerces. The database will be established as a service to support conservation and science. This minimizes the possibility of listed scientists being barraged with nuisance requests.

Initially, the database will not be exhaustive and will be heavily focused on the Western Hemisphere. But, as it grows, its scope will expand rapidly. At some point, it will be incorporated into the comprehensive database being assembled by the Association of Systematics Collections. The Xerces Society will eventually seek to house the Conservation Register in an appropriate research institution or major university to facilitate its broader use.

The diversity of invertebrates makes information retrieval a difficult task: there are 990,000 described invertebrate species; a small fraction of the latest estimate of up to 30,000,000 insect species on earth. By contrast, there are 19,056 fish with about 10 percent undiscovered; 9,040 birds, 8,962 reptiles and amphibians together and 4,000 mammals -- of which 95 to 98 percent are known. A total of 250,000 species of plants exclusive of fungi and algae are known, and some tens of thousands are thought to await discovery. Much of the survey work on plants and vertebrates has been done. Botanists and vertebrate biologists abound, and information is relatively abundant and easily obtainable. By comparison, survey work has barely scratched the surface with invertebrates and information tends to be very technical and difficult to obtain.

The Xerces Society has received a \$5,000 grant from Waste Management Inc. Dr. William Y. Brown, director of Environmental Affairs for the company, said as he presented the contribution: "Invertebrates make up 95% of the species inhabiting the earth and are collectively the real backbone of animal ecology."

Dr. E. O. Wilson, Baird Professor of Science at Harvard University and Xerces board member, considers the International Register of Invertebrate Conservation to be "one of the most needed, but hitherto neglected, projects in environmental management."

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

Paul H. Scott

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Santa Barbara Museum of Natural History
Santa Barbara, California 93105

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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- Ockelmann, K.W. & K. Muus. 1978. The biology, ecology and behaviour of the bivalve *Mysella bidentata* (Montagu). *Ophelia* 17(1):1-93.
- Olsson, A.A. 1961. Mollusks of the tropical eastern Pacific particularly from the southern half of the Panamic-Pacific faunal province (Panama to Peru). Panamic-Pacific Pelecypoda. Paleontol. Res. Inst., Ithaca, New York. 574 p.

MYSELLA (BIVALVIA; MONTACUTIDAE) IN SOUTHERN CALIFORNIA

by

Paul H. Scott

Santa Barbara Museum of Natural History

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 dentition 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.

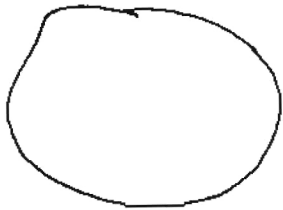
Special thanks are do to Don Cadien, Tony Phillips, and Ron Velarde for their contined support on this long term project. Good luck, and feel free to call on me if you need assistance.

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Common *Mysella* shapes of southern California

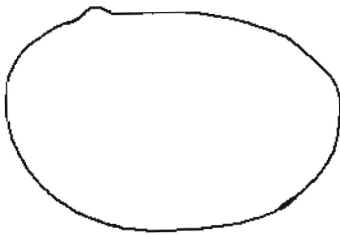
Tony Phillips
Biology Laboratory
Hyperion Treatment Pla
City of Los Angeles



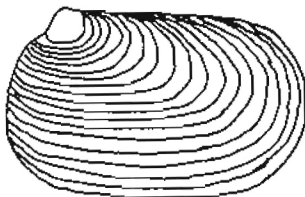
Mysella tumida



Mysella grippi



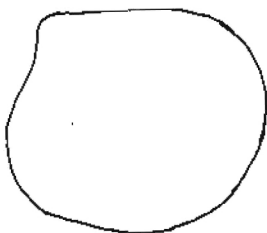
Mysella sp A



Mysella sp B



Mysella sp C



Mysella sp D

SCAMIT Code: PL 33

Date Examined: 9 May 1988
Voucher by: Paul Scott (SBMNH)

Synonymy: None

Literature: Dall, W.H. 1899.
Dall, W.H. 1912.
Scott, P.H. 1987.

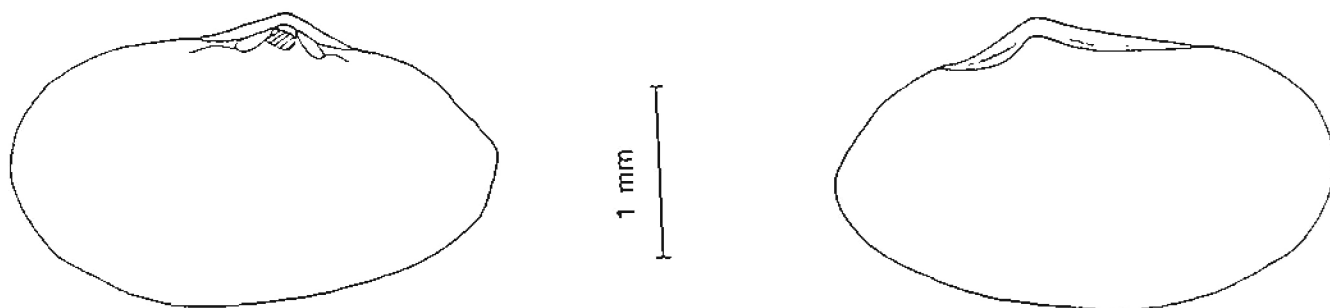
Diagnostic Characters:

1. Shell small (4 mm length), thin, without external sculpture.
2. Shell ovate/elongate, anterior and posterior margins evenly rounded, moderately inflated, equilateral.
3. Beaks prominent, midway between anterior and posterior margins.
4. Cardinal teeth small, equal in size.

Comparisons:

This is the most easily identifiable Mysella species in California. The equilateral shell with evenly rounded anterior and posterior margins are unique to this species.

Distribution: San Diego, California to Coos Bay, Oregon (30 to 260 ft).



SCAMIT Code: MBC 17

Date Examined: 9 May 1988
Voucher by: Paul Scott (SBMNH)

Synonymy: Mysella sp. A (MBC, Scott, and others)

Literature: Dall, W.H. 1899.
Scott, P.H. 1987.

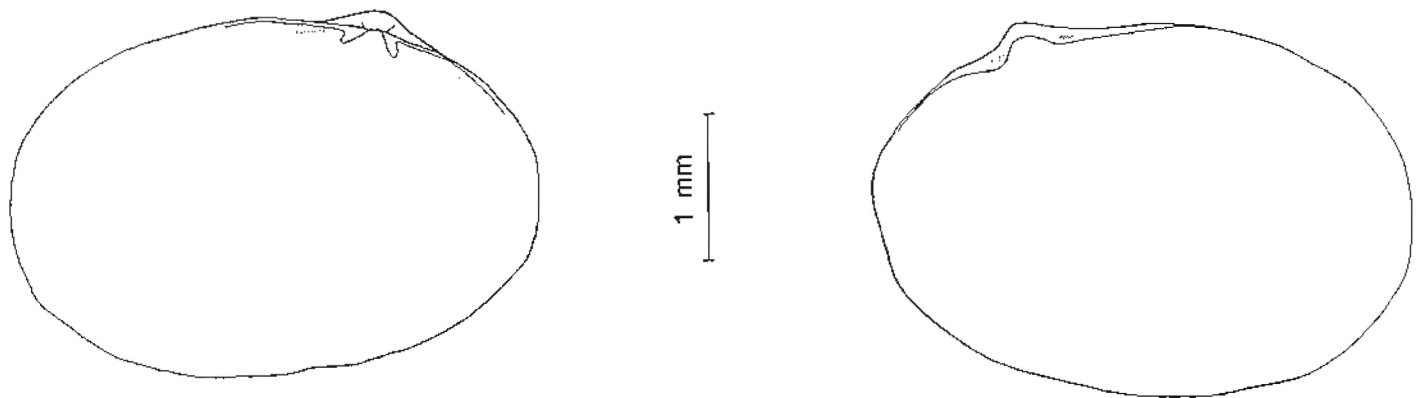
Diagnostic Characters:

1. Shell small (5 mm length), very thin, fragile, and without external sculpture.
2. Shape ovoid and compressed, inequilateral with anterior end longer.
3. Beaks weak, opistogyrate.
4. Cardinal teeth very reduced, equal in size.

Comparisons:

The closest related species is Mysella compressa Dall, 1913 which is possibly distributed as far north as southern California. M. compressa differs by a subtrigonal outline and much heavier teeth.

Distribution: San Diego, California to Coos Bay, Oregon (26-120 ft).



SCAMIT Code: HYP 76

Date Examined: 9 May 1988
Voucher by: Paul Scott (SBMNH)

Synonymy: Mysella sp. B (MBC, Hyperion, Scott, and others)
Montacutidae Genus A, species A (Pt. Loma, MBC, and others)

Literature: Dall, W.H. 1899.
Scott, P.H. 1987.

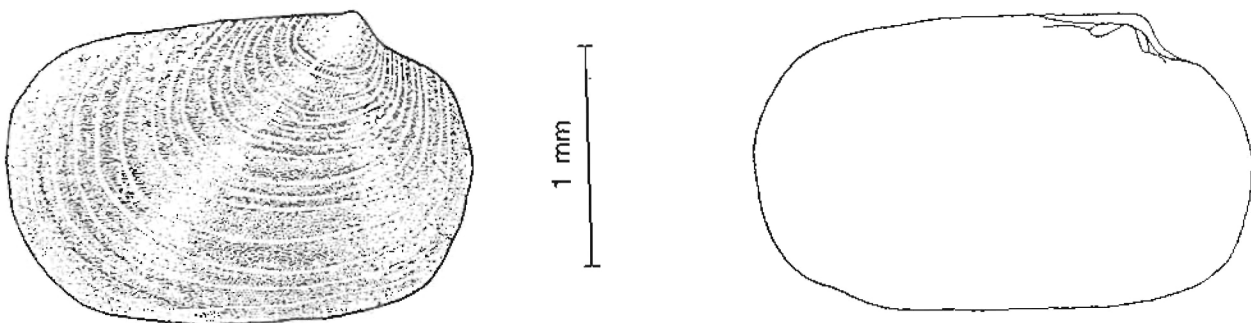
Diagnostic Characters:

1. Shell small (5 mm length), thin, fragile, and with strong, widely spaced concentric sculpture.
2. Shape subquadrate, compressed, with an abruptly truncate posterior margin; inequilateral with anterior longer.
3. Beaks moderately prominent, opistogyrate.
4. Cardinal teeth small, equal in size.

Comparisons:

The regular concentric sculpture of this species easily separates it from all other northeastern Pacific Mysella.

Distribution: San Diego, California to Santa Maria, California (145-490 ft).



SCAMIT Code: MBC 69

Date Examined: 9 May 1988
Voucher by: Paul Scott (SBMNH)

Synonymy: Mysella golischi Dall, 1916

Literature: Dall, W.H. 1899.
Dall, W.H. 1916.
Scott, P.H. 1987.

Diagnostic Characters:

1. Shell large for genus (13 mm length), thin, with irregular growth striae.
2. Shell subquadrate to ovate, highly inflated, inequilateral with anterior much longer.
3. Beaks prominent, almost to posterior margin, opistogyrate.
4. Cardinal teeth unequal, anterior cardinal large and elongate, posterior cardinal very reduced.

Comparisons:

The elongate anterior tooth and posterior beaks differentiate this species from other southern California species (fig. 1). Mysella golischi is a juvenile form of M. pedroana and has a more equilateral shell (fig. 2).

Remarks:

M. pedroana lives commensally with the mole crab, Blepharipoda occidentalis. As with most commensals, the shape of the shell can be quite variable.

Distribution: San Diego, California to Monterey Bay, California (intertidal to 80 ft).

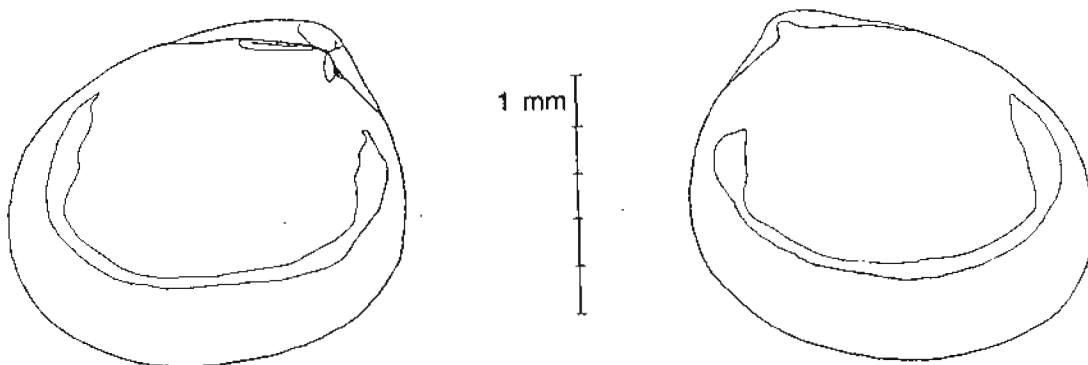


Figure 1
Drawings by Laurie Marx (SBMNH)

(over)

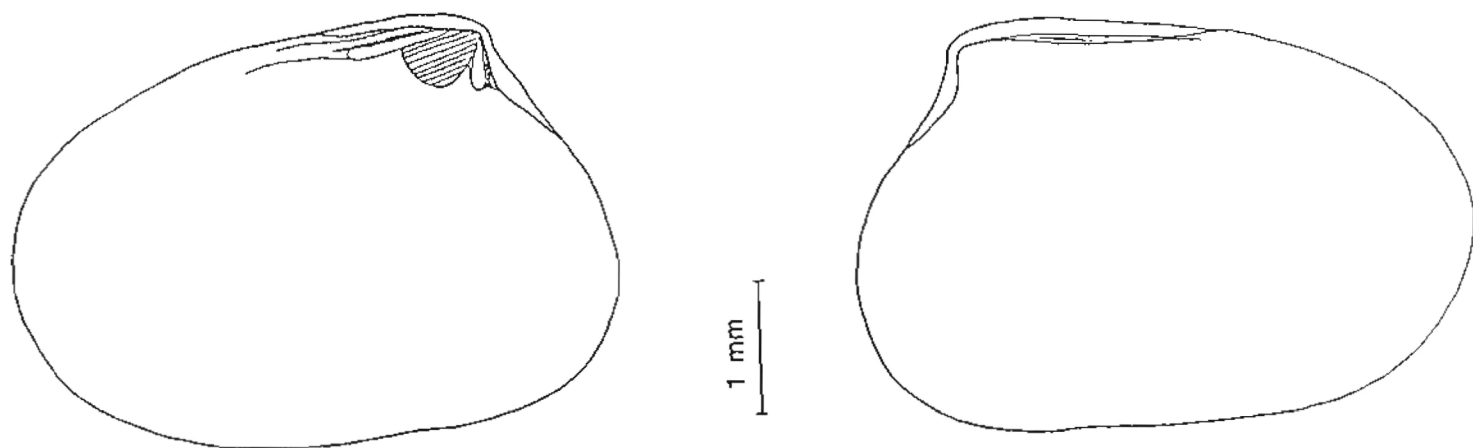


Figure 2

Mysella pedroana

SCAMIT Code: PL 77

Date Examined: 9 May 1988
Voucher by: Paul Scott (SBMNH)

Synonymy: Mysella aleutica Dall, 1899
Mysella cf. aleutica (LACO, Hyperion, MBC, Scott, and others)
Mysella ferruginosa Dall, 1916
Tellimya tumida Carpenter, 1864

Literature: Carpenter, P. 1864.
Dall, W.H. 1899.
Dall, W.H. 1916.
Scott, P.H. 1987.

Diagnostic Characters:

1. Shell small (4 mm length), thick for genus, with only irregular growth striae.
2. Shape subtrigonal to subquadrate, moderately inflated, inequilateral with longer anterior.
3. Beaks prominent, extending near the posterior margin, opistogyrate.
4. Cardinal teeth stout to small, anterior tooth larger.

Comparisons:

The thick, moderately inflated shell with subtrigonal to subquadrate shape separates this from other southern California species of Mysella. M. tumida is extremely variable in shell shape. The most common southern California form is subquadrate with the beaks forward of the posterior margin (fig. 1); whereas some forms may be much more truncate, have beaks on the posterior margin and have very stout teeth (Fig. 2).

Distribution: San Diego, California to arctic Alaska (intertidal - 400 ft).

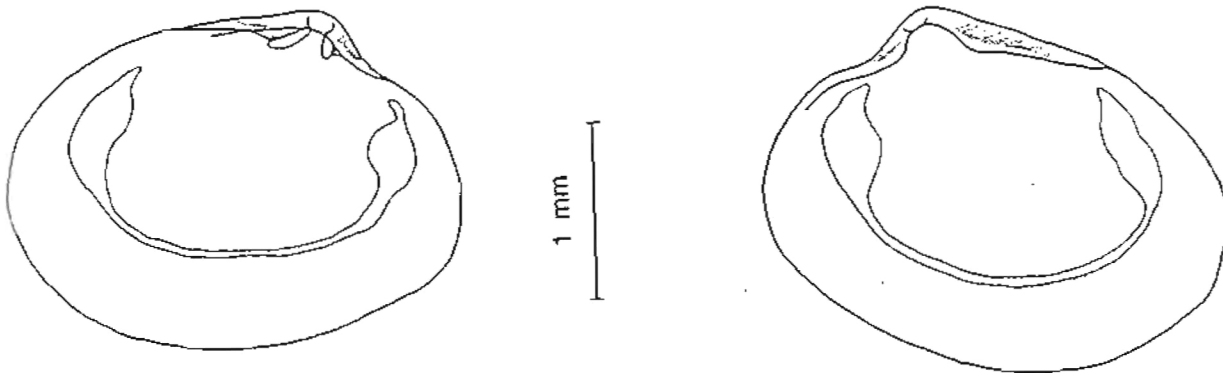


Figure 1
Drawings by Laurie Marx (SBMNH)

Mysella tumida (Carpenter, 1864)
Bivalvia, Montacutidae

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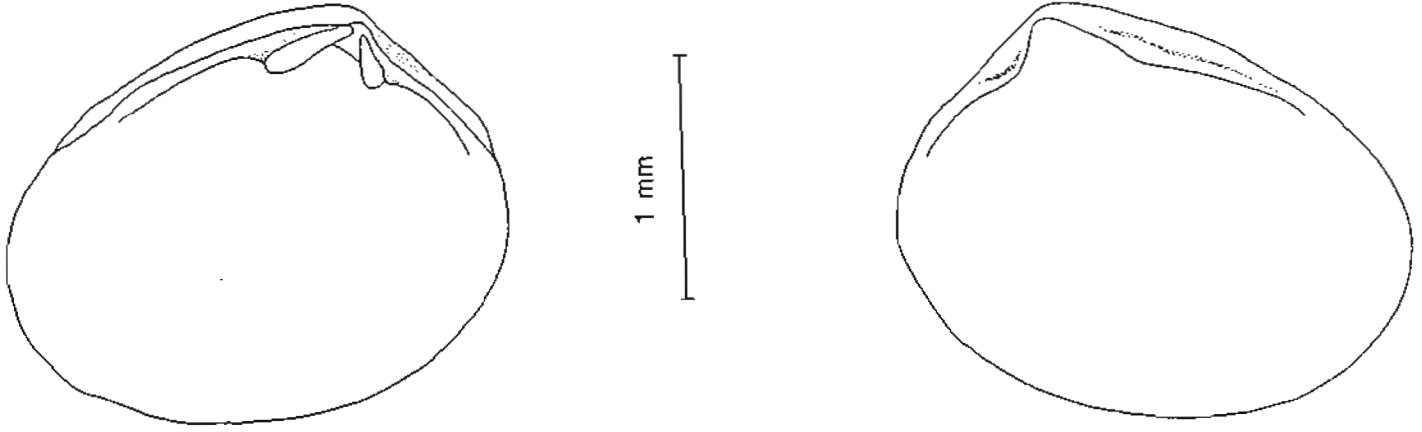


Figure 2

Mysella tumida

SCAMIT Code: MBC 18

Date Examined: 9 May 1988
Voucher by: Paul Scott (SBMNH)

Synonymy: Mysella sp. C (MBC, Hyperion, Scott)

Literature: Dall, W.H. 1899.
Scott, P.H. 1987.

Diagnostic Characters:

1. Shell small (4 mm length), thin, juveniles less than 1.5 mm length without external sculpture, specimens greater than 2 mm with closely spaced concentric sculpture.
2. Shape ellipsoid, moderately inflated, inequilateral with anterior much longer.
3. Beaks prominent, almost to posterior margin, opistogyrate.
4. Cardinal teeth small; anterior tooth longer than posterior.

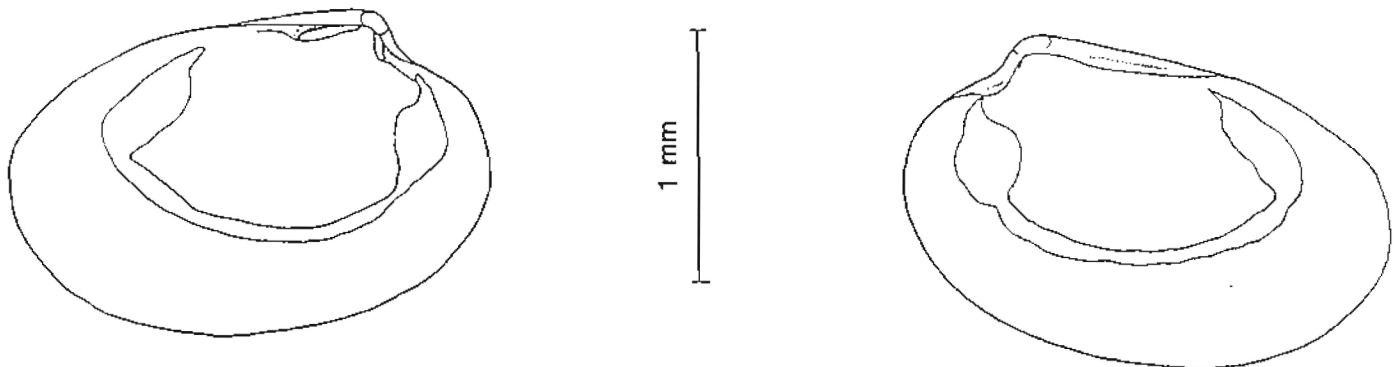
Comparisons:

Mysella sp. C is closest to Mysella tumida (Carpenter, 1864). The ellipsoid, inflated shape, and posterior beaks of the former differentiate the two species.

Distribution: Santa Barbara Channel, Santa Maria Basin, California (150-360 ft); Gulf of California, Mexico; possibly Los Angeles Harbor.

Remarks:

Only specimens less than 2 mm in length have been collected in southern California.



Drawings by Laurie Marx (SBMNH)

SCAMIT Code: HYP 77

Date Examined: 9 May 1988
Voucher by: Paul Scott (SBMNH)

Synonymy: Mysella sp. D (MBC, Scott)
Mysella sp. F (MBC, Hyperion, Pt. Loma, Scott, and others)

Literature: Dall, W.H. 1899.
Scott, P.H. 1987.

Diagnostic Characters:

1. Shell small (3 mm length), thin, with very fine regular growth striae.
2. Shape subquadrate, moderately inflated, inequilateral with the anterior longer.
3. Beaks prominent, opistogyrate
4. Antero-dorsal margin straight, anterior margin broadly flared, postero-dorsal margin with steep slope (fig. 1).
5. Cardinal teeth small, equal in size.

Comparisons:

Juveniles (fig. 2) of this species could be confused with juvenile Mysella tumida, however, the straight antero-dorsal margin, and flared anterior of Mysella sp. D differentiate this species.

Distribution: San Diego, California to Santa Maria, California (30-800 f); Gulf of California, Mexico.

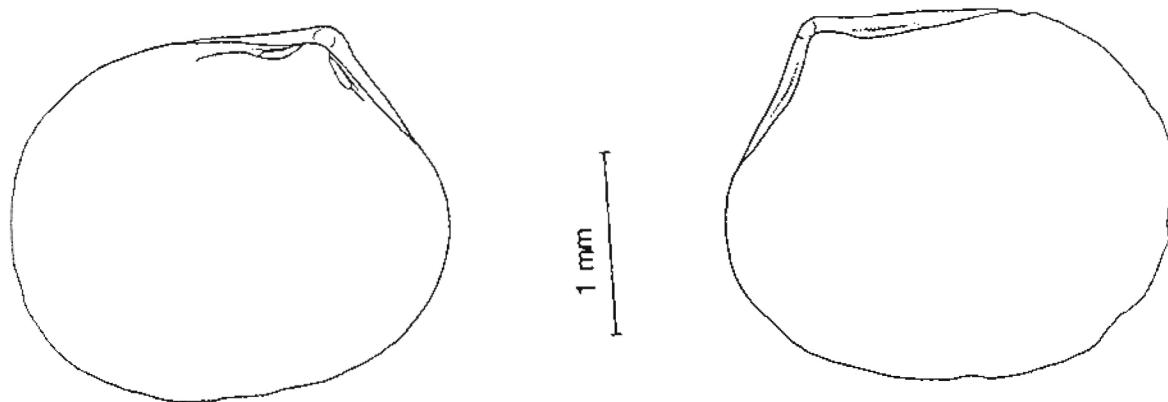


Figure 1
Drawings by Laurie Marx (SBMNH)

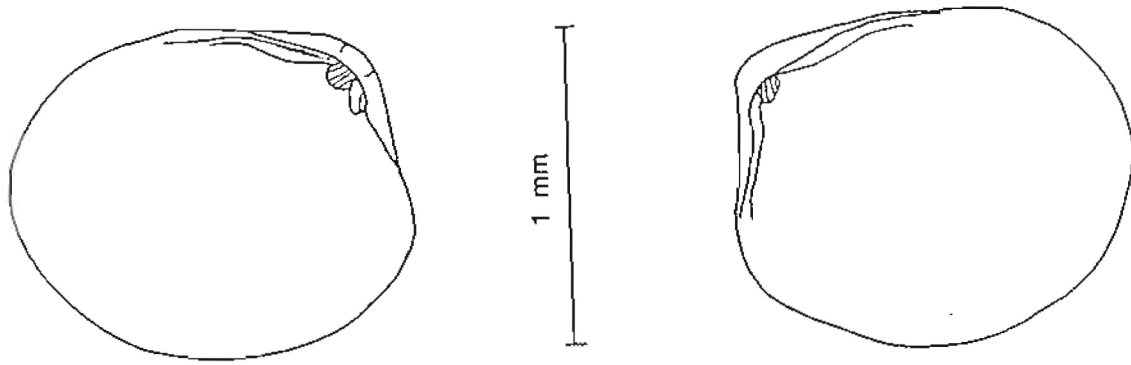


Figure 2
Mysella sp. D

SCAMIT Code: SBMNH 1

Date Examined: 9 May 1988
Voucher by: Paul Scott (SBMNH)

Synonymy: Mysella sp. E (MBC, Scott)

Literature: Dall, W.H. 1899.
Scott, P.H. 1987.

Diagnostic Characters:

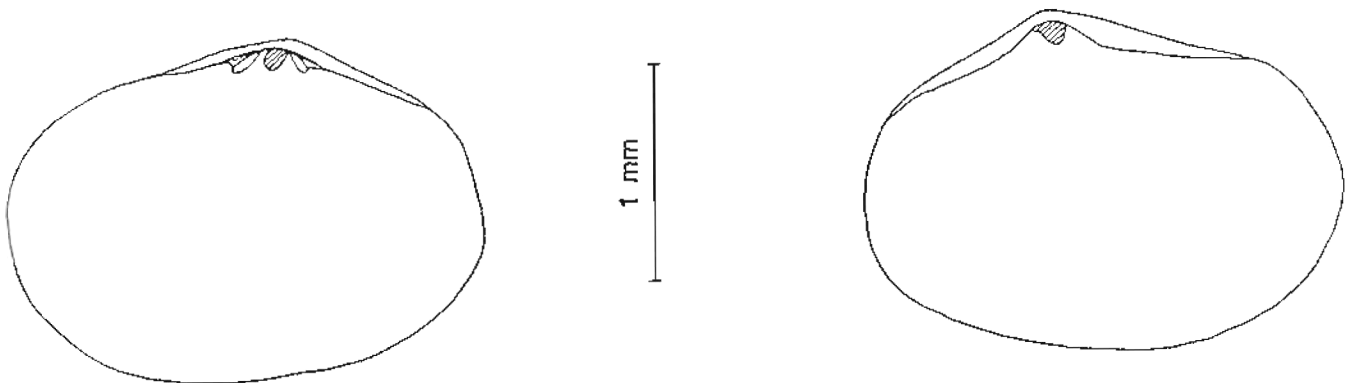
1. Shell small (2.5 mm length), thick for size, with only irregular growth striae.
2. Shape subquadrate, moderately inflated around beaks, slightly inequilateral with anterior longer.
3. Beaks prominent, with large prodissoconch.
4. Cardinal teeth very small, equal in size.

Comparisons:

1. In outline, Mysella sp. E is closest to Mysella sp. B SCAMIT, 1988, however the latter is more compressed, has more posterior beaks, and has regular concentric sculpture.
2. Mysella sp. E has a slightly inequilateral shell, similar to Mysella grippi, however the former has a large prodissoconch and has a truncate rather than rounded posterior margin.

Distribution: Santa Maria Basin, California (400-660 ft).

Remarks: Only two lots of this species have been collected. This material will remain vouchered at the Santa Barbara Museum of Natural History rather than the Cabrillo Marine Museum until the species is described.



Drawings by Laurie Marx (SBMNH)