

Chapter 9C7. Focal Taxonomic Collections: Shelled Molluscs

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Methods

Molluscs were collected and identified by N. Foster at sites in Prince William Sound during June 20-28, 1998 and August 8-14, 1999. In 1999 the field survey was expanded to include sites in Homer, Seward, and Hinchinbrook Entrance (see Fig. 9A.2 above). Also, J. Goddard and L. Schickel participated in the second year's field collecting and identification, providing expertise in opisthobranch taxonomy (see Chapt 9C8. Opisthobranch Molluscs).

Site information. Site information was collected by J. Chapman & T. Miller (see Chapt 9B).

Sampling and processing. Presence and relative abundance (recorded as abundant, common, or rare) of the easily identified and abundant species were recorded in the field. Field notes were then transferred to spreadsheets maintained by J. Chapman. Voucher specimens of small or rare, mollusks were collected and or were preserved in 10% formalin. Identifications were made by N. Foster at the University of Alaska Museum Aquatic Collection.

Identifications and distributions. No comprehensive reference is available for Alaskan marine mollusca. Major references used for both identifications and distribution records include Foster (1991), Coan and Scott (unpublished draft), Baxter (1987), Turgeon (1998), Kozloff (1996), and Harbo (1997). Voucher collections from this study will be accessioned into the UAM Aquatic Collection as accession 1998-003 and 1999-001.

Results

Seventy-nine mollusc species were collected or identified from 27 sites in 1998 (Table 9C7.1). Sixty-six species were collected or identified from 16 sites in 1999 (Table 9C7.2). Mollusks were collected from three general types of habitats:

1. Human-made structures, including oyster lantern nets, and associated floats and buoys, and docks. Characteristic mollusks from fouling communities are *Mytilus trossulus*, *Lacuna vincta*, *Hiatella arctica*. This represented the richest habitat for nudibranchs, including 12 new records. Small mytilids were examined, to look for *Musculista stenhousia*.
2. Mudflats. Upper intertidal areas of mudflats, near Cordova and Valdez and Homer were dominated by *Mya arenaria*. A search was made for *Nuttalia obscurata*, *Batillaria cumingi*, *Ilyanassa obsoleta*, and *Nassa fratercula*, but these potential NIS were not found at any site of our surveys.
3. Rocky intertidal zones of beaches, sheltered bays with eelgrass. Fauna of rocky intertidal areas, both in bays and headlands is fairly well documented. It is the habitat that is richest in species, but has fewest NIS candidates or new collecting records.

In combination for the two years, 115 species of molluscs were sampled (Table 9C7.3). Of these species, the soft-shelled clam *Mya arenaria* is an NIS (Strasser 1999) that was widely distributed as a self-sustaining population in intertidal soft sediments of protected bays throughout Prince William Sound. Recently, Foster examined archaeological evidence for

Table 9C7.2. Shelled Molluscs 1999 Survey	Homer			Seward Lowell Pt	Whittier	Shot-gun Cove	Fairmont Bay	Valdez	Cloudman Bay	Busby Is. ^a	Cordov	Windy Bay	Constantine Harbor	Tatitlek
	floats	benthic	homer spit	benthic	floats	float	fouling	benthic	grab	benthic	benthic	floats	floats	benthic
a = abundant c = common r = rare p = present														
Gastropoda														
<i>Alia gauspata</i>										r				
<i>Archidoris montereyensis</i>										r				
<i>Boreotrophon</i>										r				
<i>Buccinum baeri</i>										c				
Cerithiidae										r				
<i>Collisella digitalis</i>				c										
<i>Collisella strigatella</i>				c					c					
<i>Crepidatella dorsata</i>													r	
<i>Cryptobranchia alba</i>		r	r							r			r	
<i>Cryptonatica offinis</i>										r	r			
dorid nudibranch												c	c	
<i>Granulina margaritula</i>														r
<i>Haminoea vesicula</i>									c		r	r	c	
<i>Hermisenda crassicornis</i>												c		
<i>Lacuna vincta</i>	c				c	c	c	c				c		
<i>Littorina sitkana</i>		a		c				c	a	c	r		c	
<i>Littoria scutulata</i>									c				c	
<i>Lottia pelta</i>		a		c					c	c			c	
<i>Lottia strigatella</i>													r	
<i>Margarites pupillis</i>				r						r				
<i>Melibe leonina</i>												c		
<i>Nassarius mendicus</i>									r					
<i>Neptunea lyrata</i>		p												
<i>Nucella lamellosa</i>										c			r	
<i>Nucella lima</i>				c					c				r	
<i>Ocenebrina interfossa</i>										r				
<i>Odostomia</i> sp.	r	r											r	
<i>Oenopota</i> sp.										r				
<i>Olivella baetica</i>				r						r				
<i>Onchidoris bilammelata</i>							c							
<i>Polycera zosteriae</i>												c		
<i>Tectura fenestrata</i>								c						
<i>Tectura persona</i>				c					c					
<i>Tectura scutum</i>		c			c					c				
<i>Trichotropis cancellata</i>	c			r										
<i>Velutina plicatilis</i>	r													
Polyplacophora														
<i>Mopalia</i> cf. <i>M. imporcata</i>	r													
<i>Mopalia</i> cf. <i>M. spectabilis</i>											r			
<i>Moplalia ciliata</i>	r												r	
<i>Schizoplax brandtii</i>													r	
<i>Tonicella lineata</i>	r										r			
<i>Tonicella rubra</i>	r													
Bivalvia														
<i>Bankia setacea</i>	p													
<i>Chlamys rubida</i>	r						r							
<i>Clinocardium californiense</i>		r												
<i>Clinocardium nuttalli</i>		c		c					c	c				
<i>Clinocardium</i> sp.		c		p										
<i>Crassocardia crassidens</i>													r	
<i>Cryptomya californica</i>										r				

Table 9C7.2. (Continued) Shelled Molluscs 1999 Survey	Homer			Seward Lowell Pt	Whittier	Shot-gun Cove	Fairmont Bay	Valdez	Cloudman Bay	Busby Is. a	Cordov	Windy Bay	Constan- tine Harbor	Tatitlek
	floats	benthic	homer spit	benthic	floats	float	fouling	benthic	grab	benthic	benthic	floats	floats	benthic
<i>Cyclocardia</i> sp.			r											r
<i>Hiatella acrtica</i>		c		c	c	c	c		p			c	c	c
<i>Humilaria kennerleyi</i>														r
<i>Macoma balthica</i>		a		c				a		c	a			c
<i>Macoma calcarea</i>									p					
<i>Macoma inquinata</i>		c		c				a		c	c			c
<i>Macoma lama</i>			r											
<i>Macoma obliqua</i>		r	r											
<i>Macoma</i> sp.		p		p										
<i>Modiolus modiolus</i>			r							r				
<i>Mya arenaria</i>									c		a			c
<i>Mya pseudoarenaria</i>		c							c					
<i>Mya</i> sp.									p					
<i>Mya truncata</i>		c	c											r
<i>Mytilus trossulus</i>	a	a		a	a	c	a			a	a	a	a	a
<i>Neaeromya compressa</i>										r				
<i>Pododesmus macroschisma</i>														r
<i>Protothaca staminea</i>		c		c					p		c			
<i>Saxidomus giganteus</i>		c		c					p		c			
<i>Serripes groenlandicus</i>									p	r				
<i>Serripes laperousii</i>			r											
<i>Siliqua patula</i>		p	p											
<i>Spisula polynyma</i>		c									c			c
<i>Tresus capax</i>											c			c
<i>Vilasina vernicosa</i>							c			c				c
<i>Yoldia myalis</i>									p					

Table 9C7.3. All Mollusks from Both 1998 and 1999		
Species	Distribution	NIS status
<i>Acmaea mitra</i>	NE Pac	
<i>Acteocina harpa</i>	NE Pac	
<i>Aglaja ocelligera</i>	NE Pac	new record
<i>Astyris gauspata</i>	NE Pac	
<i>Alvania</i> sp.		
<i>Archidoris montereyensis</i>	NE Pac	
<i>Axinopsida</i> sp.		
<i>Bankia setacea</i>	NE Pac	
<i>Barleeia</i> sp. ?		
<i>Boreotrophon</i>		
<i>Buccinum baeri</i>	NE Pac	
Cerithiidae		
<i>Cerithiopsis?</i>		
<i>Chlamys rubida</i>	NE Pac	
<i>Clinocardium californiense</i>	NE Pac	
<i>Clinocardium nuttallii</i>	NEW Pac	
<i>Clinocardium</i> sp.		
<i>Lottia digitalis</i>	NE Pac	
<i>Lottia strigatella</i>	NE Pac	
<i>Cyclocardia crassidens</i>	NEW Pac	
<i>Crassostrea gigas</i>		introduced
<i>Crepidula</i> sp.		
<i>Crepidatella dorsata</i>	NE Pac	
<i>Cryptobranchia alba</i>	NE Pac	
<i>Cryptobranchia concentrica</i>	NEW Pac	
<i>Cryptomya californica</i>	NEW Pac	
<i>Cryptonatica affinis</i>	arctic circumboreal	
<i>Cyclocardia</i> sp.		
<i>Dendronotus frondosus</i>	northern hemisphere	
<i>Dendronotus</i> sp.		
<i>Diplodonta impolita</i>	NE Pac	
dorid nudibranch		
<i>Acanthodoris?</i>		
<i>Doridella steinbergi</i>	NE Pac	
<i>Eubranchus olivaceous</i>	NE Pac	new record
<i>Fusitriton oregonensis</i>	NE Pac	
<i>Gari californica</i>	NE Pac	
<i>Granulina margaritula</i>	NE Pac	
<i>Haminoea vesicula</i>	NE Pac	
<i>Haminoea virescens</i>	NE Pac	
<i>Hermisenda crassicornis</i>	NE Pac	
<i>Hiatella arctica</i>	northern hemisphere	
<i>Humilaria kennerleyi</i>	NE Pac	
<i>Lacuna marmorata</i>	NE Pac	
<i>Lacuna</i> sp.		
<i>Lacuna vincta</i>	amphiboreal	
<i>Lepidozona interstinica</i>	NE Pac	
Lepetidae?		
<i>Lirularia lirulata</i>	NE Pac	

Table 9C7.3. (Continued) All Mollusks from Both 1998 and 1999		
Species	Distribution	NIS status
<i>Littorina scutulata</i>	NE Pac	
<i>Littorina sitkana</i>	NE Pac	
<i>Lottia pelta</i>	NE Pac	
<i>Lottia</i> sp.		
<i>Lottia strigatella</i>	NE Pac	
<i>Macoma balthica</i>	circumboreal	poss. cryptogenic
<i>Macoma calcarea</i>	ampiboreal	
<i>Macoma inquinata</i>	NE Pac	
<i>Macoma lama</i>	NEW pac	
<i>Macoma nasuta</i>	NE Pac	
<i>Macoma obliqua</i>	NE Pac	
<i>Macoma</i> sp.		
<i>Margarites beringensis</i>	AK	
<i>Margarites helycinus</i>	circumboreal	
<i>Margarites pupillus</i>	NE Pac	
<i>Margarites</i> sp.		
<i>Melebe leonina</i>	NE Pac	
<i>Modiolus modiolus</i>	circumboreal	
Montacutidae		
<i>Mopalia</i> cf. <i>M. imporcata</i>	NE Pac	
<i>Mopalia ciliata</i>	NE Pac	
<i>Mopalia lignosa</i>	NE Pac	
<i>Moplalia</i> cf. <i>M.spectabilis</i>	NE Pac	
<i>Mya arenaria</i>	amphiboreal	introduced
<i>Mya pseudoarenaria</i>	NE Pac	
<i>Mya</i> sp.		
<i>Mya truncata</i>	amphiboreal	
<i>Mysella tumida</i>	NE Pac	
<i>Mytilus trossulus</i>	NE Pac	
<i>Nassarius mendicus</i>	NE Pac	
<i>Neaeromya compressa</i>	NE Pac	
<i>Neptunea lyrata</i>	NE Pac	
<i>Nucella lamellosa</i>	NE Pac	
<i>Nucella lima</i>	NE Pac	
<i>Ocenebrina interfossa</i>	NE Pac	
<i>Odostomia</i> spp.		
<i>Oenopota</i> sp.		
<i>Olivella baetica</i>	NE Pac	
<i>Onchidoris bilamellata</i>	amphiboreal	
<i>Onchidoris</i> sp.?		
<i>Pododesmus macroschisma</i>	NE Pac	
<i>Polycera zosterae</i>	NE Pac	
<i>Protothaca staminea</i>	NE Pac	
<i>Saxidomus giganteus</i>	NE Pac	
<i>Scabrotrophon maltzani</i>	NE Pac	
<i>Schizoplax brandtii</i>	NEW Pac	
<i>Searlesia dira</i>	NE Pac	
<i>Serripes groenlandicus</i>	circumboreal	
<i>Serripes laperousii</i>	circumboreal	
<i>Siliqua patula</i>	NE Pac	

Table 9C7.3. (Continued) All Mollusks from Both 1998 and 1999		
Species	Distribution	NIS status
<i>Spisula polynyma</i>	amphiboreal	
<i>Tectura fenestrata</i>	NE Pac	
<i>Tectura persona</i>	NE Pac	
<i>Tectura scutum</i>	NE Pac	
<i>Tonicella insignis</i>	AK	
<i>Tonicella lineata</i>	NE Pac	
<i>Tonicella rubra</i>	circumboreal	
<i>Tresus capax</i>	NE Pac	
<i>Trichotropis cancellata</i>	NE Pac	
<i>Trichotropis insignis</i>	NEW Pac	
<i>Turtonia minuta</i>	amphiboreal	
<i>Velutina plicatilis</i>	arctic circumboreal	
<i>Velutina rubra</i>	AK	
<i>Vilasina vernicosa</i>	NEW Pac	
<i>Yoldia hyperborea</i>	circumboreal	
<i>Yoldia myalis</i>	amphiboreal	

occurrence of *Mya arenaria* in Alaskan waters before the 1890s. No *M. arenaria* were found in samples from shell middens from Sitka (1070-470 yr BP) (Foster, unpublished data) and S. Hawkins Island (500-200 yr BP and 2150-1380 yr BP) (Yarborough, unpublished data), and faunal lists from two other Prince William Sound sites (ca. 400-200 yr BP) (Yarborough, unpublished data), and from Resurrection Bay and Aialik Bay (1700s –1800s AD) (Yarborough, unpublished data). These negative findings are consistent with *M. arenaria* being an invasive species that was introduced in the late 1880s. In addition, the Asian oyster *Crassostrea gigas* was also widely distributed in protected bays of Prince William Sound and Kachemak Bay, where it is cultured abundantly in nets suspended vertically in the water column. However, it is sustained as an aquaculture species by importation of laboratory produced spat, and is not a self-sustaining population, probably because water temperatures are too cold for gonad development and spawning. The common clam *Macoma balthica* may be viewed as a cryptogenic species that may be introduced from the north Atlantic; but because of its circumboreal distribution and variation in shell morphology, it is difficult to reconstruct the history of this species' biogeography.

References:

- Baxter, R. 1987. Mollusks of Alaska. Shells and Sea Life. Bayside, California, 163pp.
- Behrens, D.W. 1991. Pacific coast nudibranchs. Second edition. Monterey California. 207 pp.
- Coan, E.V. and P.V. Scott. 1999. Personal Communication. (unpublished draft of guide to Pacific coast bivalves.)
- Feder, H.M. and G.E.M. Matheke. 1980. Distribution, abundance, community structure and tropic structure of the infauna of the northeast Gulf of Alaska. Inst. Mar. Sci. Rept. R78-8, Univ. of Alaska, Fairbanks. 209 pp.
- Fisher, W.K. 1930. Asteroidea of the North Pacific and adjacent waters. Part 3. Forcipulata (concluded). Smithsonian Institution. U. S. Nat. Mus. Bull 76. 245 pp.
- Foster, N.R. 1981. A synopsis of the marine prosobranch and bivalve mollusks in Alaskan waters. Univ. Alaska, Institute of Marine Science Technical Rept IMS 81-3, 479 p.
- Foster, N. R. 1991. Intertidal Bivalves: A Guide to the Common Marine Bivalves of Alaska. University of Alaska Press, Fairbanks, Alaska. 152 pp.
- Harbo, R. M. 1997. Shells and Shellfish of the Pacific Northwest A field guide. Harbour Publishing, Madiera Park, BC, Canada. 270 pp.
- Kozloff, E. N. 1996. Marine Invertebrates of the Pacific Northwest. University of Washington Press. 539 pp.
- Strasser, M. 1999. *Mya arenaria*- an ancient invader of the North Sea Coast. Helgolander Meeresuntersuchungen 52: 309-324.

Turgeon , D.A. (ed.) 1998. Common and Scientific Names of Aquatic Invertebrates from the United States and Canada: Mollusks, Second Edition. American Fisheries Society Special Publication 26. 526 pp.