

Chapter 9C8. Focal Taxonomic Collections: Opisthobranch Molluscs

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Introduction

The Smithsonian Environmental Research Center, in conjunction with the University of Alaska, U.S. Fish and Wildlife Service and Prince William Sound Advisory Council, conducted in August 1999 a survey of Prince William Sound for non-indigenous marine species. Owing to the abundance of opisthobranch molluscs observed in a similar survey the previous summer, I was invited to help identify members of this taxon in the 1999 survey. The following report summarizes the 1999 collection of opisthobranch molluscs and attempts to identify non-indigenous and cyptogenic members of the fauna.

Methods

Specimens were collected by hand from floating docks, intertidal mudflats and rocky shores, jetties, and from settling panels deployed earlier in the year. Observations were made of living animals, either with a dissecting microscope in the laboratory, or with a hand lens while traveling to the next collecting station. Voucher specimens were fixed in either 5 to 10 % formalin or 70 % ethanol. Specimens not identified during the expedition were examined, dissected and identified in the laboratory at UCSB.

Results

Twenty-eight species were found, consisting primarily of dorid nudibranchs. These are listed below with notes on their classification, habitats, and prey; an asterisk marks range extensions. Distributions and abundance in our field collections are summarized in Table 9C8.1 following the list.

Cephalaspidea

Aglaja ocelligera (Bergh, 1894)

Numerous specimens were found on the intertidal mudflats west of the Cordova marina.

Haminoea sp. (either *vesicula* or *virescens*)

Egg masses of this species were abundant on *Zostera* in the Cordova marina, where Nora Foster collected a single specimen.

Melanochlamys diomedea (Bergh, 1894)

Adults and egg masses of this species were abundant on mudflats just west of the Cordova marina.

Sacoglossa

**Alderia modesta* (Loven, 1844)

Adults and their egg masses were abundant on *Vaucheria* sp. on the high intertidal mudflats immediately west of the Cordova marina. Range extension from Vancouver Island, British Columbia (Millen, 1980).

**Olea hansineensis* Agersborg, 1923

One specimen of this opisthobranch egg eating sacoglossan was found on the egg masses of *Melanochlamys diomedea* on the mudflat west of the Cordova marina. Range extension from Sechelt Inlet, British Columbia (Millen, 1980).

Nudibranchia, Doridacea

Acanthodoris nanaimoensis O'Donoghue, 1921

A specimen about 35 mm long was found in the low intertidal on the jetty at the Cordova marina. This species was recently collected from Little Green Island, Prince William Sound (Nora Foster, personal communication, 1999).

Acanthodoris pilosa (Abildgaard, 1789)

Three specimens, 2.2 to 5 mm long, were found on drift pieces of a large, unidentified, fleshy, orange-brown colored ctenostome bryozoan on the mudflats just west of the Cordova marina. Note: unidentified species of cheilostome bryozoans were growing on the above ctenostome and may have been the prey of these specimens of *A. pilosa*. Two additional specimens, 5.5 and 7 mm long, were found on settling panels in the Cordova marina.

**Adalaria jannae* Millen, 1987

This species was abundant, along with its ribbon shaped egg masses, on *Membranipora* sp. growing on *Laminaria* on the docks at Whittier and on the moored buoy at Shotgun Cove. *A. jannae* closely resembles *Onchidoris muricata*, but lacks the medial radular teeth found in the latter; *A. jannae* also has 4 to 6 small lateral teeth on each half row of the radula, as well as a ribbon shaped egg masses (Millen, 1987). The radular formula from an 8 mm long (preserved) specimen from Shotgun Cove was 30 (4.1.0.1.4.). Range extension from Sointula, British Columbia (Millen, 1987).

Adalaria proxima (Alder & Hancock, 1854)

Two specimens, 3 mm long (alive) and 10 mm long (preserved) were found on the unidentified ctenostome bryozoan mentioned above for *Acanthodoris pilosa* and on the jetty, respectively, at Cordova (the above note for the prey of *Acanthodoris pilosa* also applies to this species). The radular formula for these two specimens was 30 (7.1.1.1.7) and 36 (9.1.1.1.9), respectively, and the changes in shape of the teeth with increasing body size match that described for this species by Thompson & Brown (1984). Note: previous Alaskan records of this species can be found under the names *Adalaria albopapillosa*, *A. pacifica*, and *A. virescens* (see Lee & Foster, 1985:444), all three of which Millen (1987) considered junior synonyms of *A. proxima*.

**Adalaria* sp. 1 of Behrens (1991) and Millen (1987:2701)

One specimen, 3.3 mm long (preserved) of this distinctive species was found on the low intertidal rocky shore at Tatitlek. Range extension from Ketchikan, Alaska (Millen, 1989).

Adalaria sp.

Two specimens, 2 and 3 mm long, were found on the same fleshy ctenostome bryozoan that *Acanthodoris pilosa* was found at Cordova (and the same note on prey also applies here). An

additional specimen, 3 mm long, was found on a settlement panel at Valdez. The radular formula (24 x 4.1.0.1.4 in a 3 mm specimen), tooth shape, and bipinnate gills inserted in separate pits place this onchidoridid in the genus *Adalaria*, but the presence of long slender dorsal papillae lacking spicules does not appear to match any described species.

**Ancula pacifica* MacFarland, 1905

A single specimen, lacking orange lines on the body, was found on the floating docks in the Cordova marina. This species (or the color form of *A. pacifica* lacking orange lines on the body) may be a junior synonym of *Ancula gibbosa* (Risso, 1818). Range extension from Grant Island, Ketchikan, Alaska (Millen, 1989).

Archidoris montereyensis (Cooper, 1863)

Two specimens were found eating the sponge *Halichondria panicea* growing on oysters in Fairmont Bay, and two specimens were found in the marina at Cordova.

Doridella steinbergae (Lance, 1962)

This species was found on its prey, *Membranipora* sp., on *Laminaria* on the floating docks at Whittier, and on drift *Laminaria* on the mudflats at Cordova. The range of this species was extended by Foster (1987) northward to Prince William Sound and more recently westward to Mink Island, Katmai National Park (Nora Foster, personal communication, 1999).

**Geitodoris heathi* (MacFarland, 1905)

Four specimens were found on the low intertidal rocky shore at Tatitlek. Range extension from Ketchikan, Alaska (Millen, 1989).

Onchidoris bilamellata (Linnaeus, 1767)

This circumboreal species feeds on *Balanus* spp. and was abundant, along with its egg masses, in the Homer marina, on the settling panels at Fairmont Bay and Tatitlek, and on rocks in and around the Cordova marina.

Onchidoris muricata (Müller, 1776)

A total of five small specimens were found, two on settling panels at Valdez, and three on settling panels at Cordova. Note: previous Alaskan records of this species can be found under the names *O. hystricina* and *O. varians* (see Lee & Foster, 1985:444), which Millen (1985) synonymized with *O. muricata*.

**Palio zosterae* (O'Donoghue, 1924)

Adults and egg masses were abundant on the bryozoan *Membranipora* sp. growing on *Laminaria* on the floating docks at Whittier; a few specimens were also found on the buoy at Shotgun Cove and on the docks at Cordova. *P. zosterae* may be a junior synonym of *P. pallida* Bergh, 1880; if not these specimens represent a small westward range extension from Hawkins Island, Prince William Sound (Nora Foster, personal communication, 1999).

Triopha catalinae (Cooper, 1863)

Three specimens were found under cobbles in the low intertidal at Tatitlek.

Nudibranchia, Dendronotacea

Dendronotus frondosus (Ascanius, 1774)

Specimens were found on *Obelia*-like hydroids on settling panels at Seward, Fairmont Bay, Potato Point in Valdez narrows, and Tatitlek. Adults and egg masses were also common on the docks at Cordova.

Melibe leonina (Gould, 1852)

Specimens were found on *Zostera* in Fairmont Bay, on a settling panel at Tatitlek, and on the docks at Cordova.

Nudibranchia, Arminacea

Dirona albolineata MacFarland in Cockerell & Eliot, 1905

Four small specimens were found on the floating docks in the Cordova marina, an additional juvenile specimen was found on a settling panel at Tatitlek.

**Janolus fuscus* (O'Donoghue, 1924)

Two specimens, 60 to 70 mm long, were found with their egg masses on *Bugula* sp. on docks in the Homer marina. Range extension from Klu Bay, Revillagigedo Island, Alaska (Robilliard & Barr, 1978).

Nudibranchia, Aeolidacea

Aeolidia papillosa (Linnaeus, 1761)

One 70 mm long specimen was found on the docks at Homer.

**Cuthona albocrusta* (MacFarland, 1966)

A single specimen of this distinctive species was found on the docks at Cordova. Range extension from White Rock, southern British Columbia (Millen, 1983).

**Cuthona pustulata* (Alder & Hancock, 1864)

Four specimens, 4 to 5 mm long, were found feeding on the hydroid *Sarsia* sp. on a dock in the marina at Homer. These specimens resembled Gosliner & Millen's (1984) description of *Cuthona pustulata* from British Columbia, especially with regard to overall shape of the body, cerata, and head tentacles. Our specimens differed however by lacking large white spots on the cerata (they did have smaller opaque white flecks) and by having slightly fewer rows of cerata with fewer cerata per row. The radula and shape of the radular teeth of our specimens are virtually identical to that described by Gosliner & Millen (1984) but differed in having 4 to 5 lateral denticles, compared to 5 to 9. Range extension from Galiano Island, British Columbia (Gosliner & Millen, 1984).

**Eubranchius olivaceus* (O'Donoghue, 1922)

This distinctive aeolid was found with its egg masses on *Obelia*-like hydroids on the docks at Homer and at Whittier. Range extension from Prince William Sound (Nora Foster, personal communication, 1999).

Hermissenda crassicornis (Eschscholtz, 1831)

Hermissenda was found at Whittier, Shotgun Cove, Fairmont Bay, Tatitlek, and in the Cordova marina. Specimens were small at all sites except Cordova, where they were up to 35 mm long.

Discussion

Most of the opisthobranchs collected during this survey are cold-temperate species endemic to the northern Pacific Ocean, especially the northeastern Pacific. The remainder are circumboreal species, a few of which (e.g., *Dendronotus frondosus* and *Onchidoris bilamellata*) penetrate the Arctic Ocean (see information on distributions in Marcus, 1961; McDonald, 1983; Thompson & Brown, 1984; Behrens, 1991). To my knowledge, none of the species collected in our survey are non-indigenous in the Prince William Sound region. While native/non-native status can not be assigned with certainty to the unidentified species of *Adalaria* or the tentatively identified specimens of *Cuthona pustulata*, the radiation of both of these genera in boreal waters suggests that both of these species are probably also indigenous to Prince William Sound.

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Table 9C8. 1. Numbers of opisthobranch molluscs collected at 8 sites on the Kenai Peninsula and in Prince William Sound, Alaska, August 1999. A number followed by (S) means those specimens were found on fouling plates only.

Table 9C8.1 Opisthobranch Molluscs 1999 Species	Homer		Seward		Whittier	Shotgun	Fairmont		Tatitlek	Cordova	
	marina	mudflat	marina	Lowell Pt.	marina	Cove	Bay	Valdez	rocky shore	mudflats	marina
<i>Aeolidia papillosa</i>	1										
<i>Eubranchus olivaceus</i>	>10				1						
<i>Cuthona pustulata</i>	4										
<i>Janolus fuscus</i>	2										
<i>Onchidoris bilamellata</i>	>10						>10(S)		3(S)	>10*	>10
<i>Melanochlamys diomedea</i>		1								>100	
<i>Dendronotus frondosus</i>			7(S)				>10	2(S)	>1(S)		>10
<i>Palio zosterae</i>					>100	>1					>1
<i>Adalaria jannae</i>					>100	>10					
<i>Hermisenda crassicornis</i>					5	>10	>10		>1		>10
<i>Doridella steinbergae</i>					2					>10*	
<i>Archidoris montereyensis</i>							1				2
<i>Melibe leonina</i>							1		>1(S)		1
<i>Onchidoris muricata</i>								2(S)			3(S)
<i>Adalaria</i> sp.								1(S)		2*	
<i>Adalaria</i> sp. 1 of Behrens (1991)									1		
<i>Geitodoris heathi</i>									4		
<i>Triopha catalinae</i>									3		
<i>Aglaja ocelligera</i>										>10	
<i>Acanthodoris pilosa</i>										3*	2(S)
<i>Adalaria proxima</i>										1*	1
<i>Alderia modesta</i>										>10	
<i>Olea hansineensis</i>										1	
<i>Haminoea</i> sp.											1
<i>Acanthodoris nanaimoensis</i>											1
<i>Dirona albolineta</i>									1(S)		4
<i>Ancula pacifica</i>											1
<i>Cuthona albocrusta</i>											1
Number of species per site	5	1	1	0	5	3	5	3	8	9	14
* specimens found on cobbles, drift kelp, or drift bryozoans lying on the mudflat.											