

THE MOLLUSCA OF THE CHANNEL ISLANDS OF CALIFORNIA\*

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The so called Channel Islands of California form the southern edge of the Santa Barbara Channel, and represent a peculiar province, in which may be found a greater variety of mollusca than in almost any other region of equal area.

Commencing at the island of San Miguel, off Point Concepcion, we have a coast exposed to the full force of the summer trade winds, which keep that portion of the province under the almost continuous action of the heavy swell from the northwest. This force gradually diminishes as we pass the islands of Santa Rosa and Santa Cruz, until on arriving at the Anacapas, the most easterly of the group, the force of the trade winds is so diminished as to be scarcely noticed. Then, again, the ocean side of these islands is exposed to the full force of the southerly storms of our winter season, while the channel side is protected from all these vicissitudes, and consequently affords convenient and safe habitation to those mollusca which delight in still water.

The character of the shore line at different points varies greatly, thus presenting all the varied requisites for the different requirements of the mollusca found on our coast; hence, these islands form a neutral ground, upon which the mollusca of the northern and southern faunas meet, and, as it were, overlap. They are the northern limit of Luponia spadicea and many other species, and the southern limit of many other genera and species.

The following list includes the species collected by the writer around the shores of Santa Rosa, Santa Cruz, the West, Middle, and East Anacapas. One species only (Argonauta argo) I did not find myself, as it is only at certain times that they are found. The various islands are referred to as follows: R. for Santa Rosa, C. for Santa Cruz, and A. for Anacapas. The list also indicates the species used by the aborigines of the islands, who formerly inhabited them. Those used by the former inhabitants as food are marked +; the species marked \* were used for ornaments or money; those marked ++ were used for paint cups and also as food.

Pholadidea penita, Conr. - R.  
Pholadidea ovoidea, Gld. - R., C.  
Parapholas californica, Conr. - R.  
Saxicava pholadis, L. - R., C.  
Glycimeris generosa, Gld. - R.  
Cryptomya californica, Conr. - R.  
Schizothaerus nuttalli, Conr. - R.  
Thracia curta, Conr. - R.  
Entodesma saxicola, Baird - R.

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*Mytilimeria nuttalli*, Conr. - R.  
*Solen sicarius*, Gld. - R.  
*Macoma yoldiformis*, Cpr. - R.  
*Macoma nasuta*, Conr. - R.  
*Macoma inquinata*, Desh. - R.  
*Tellina bodegensis*, Hds. - R.  
*Tellina bimaculata*, Linn. - A.  
*Lutricola alta*, Conr. - R.  
*Cumingia californica*, Conr. - R., A.  
*Standella planulata*, Conr. - R.  
*\*Tivela crassatelloides*, Conr. - R.  
*Psephis tantilla*, Gld. - R.  
*+Venus simillima*, Sby. - R.  
*+Venus succincta*, Val. - R.  
*+Tapes staminea*, Conr. - R.  
*Tapes staminea*, var. *orbella*, Cpr. - R.  
*\*Saxidomus gracilis*, Gld. - R.  
*Saxidomus nuttalli*, Conr. - R.  
*Rupellaria lamelifera*, Conr. - R.  
*+Petricola carditoides*, Conr. - R.  
*+Chama exogyra*, Conr. - R., A.  
*Chama pellucida*, Sby. - R., A.  
*Chama spinosa*, Sby. - R., A.  
*Cardium corbis*, Mart. - R.  
*+Cardium quadragenarium*, Conr. - R.  
*Cardium blandum*, Gld. - R.  
*\*Liocardium elatum*, Sby. - R.  
*Cardita subquadrata*, Cpr. - R., A.  
*Lucina californica*, Conr. - R., A.  
*Diplodonta orbella*, Gld. - R.  
*Diplodonta orbella*, var. - R.  
*Kellia laperousii*, Desh. - R.  
*Kellia suborbicularis*, Mont. - R.  
*+Mytilus californianus*, Conr. - R., A., C.  
*Mytilus edulis*, Linn. - R., A.  
*Mytilus bifurcatus*, Stearns - R., A.  
*Modiola modiolus*, Linn. - R., A.  
*Adula falcata*, Gld. - R.  
*+Septifer bifurcatus*, Rve. - R.  
*Lithophagus plumula*, Hanl. - R., C., A.  
*Axinaea intermedia*, Brod. - R.  
*Axinaea septentrionalis*, Midd. - R.  
*Pecten hastatus*, Sby. - R.  
*Pecten hastatus*, var. *hindsii*, Cpr. - R.  
*++Pecten aequisulcatus*, Cpr. - R., A.  
*Pecten latiauritus*, Conr. - R.  
*\*Hinnites giganteus*, Gray - R., A.  
*+Ostraea lurida*, Cpr. - R.  
*Succinea rusticana*, Gld. - R.  
*Helix aryesiana*, Newc. - R., -C., A. (This species not heretofore reported from Anacapas.)  
*Physa D'Orbigniana*, Lea - R.  
*\*Dentalium indianorum*, Cpr. - R.

Chiton (Mopalia) muscosa, Gld. - R., A.  
 Chiton (Ischnochiton) scabra, Rve. - R., A.  
 +Chiton (Ischnochiton) magdalensis, Hds. - R.  
 Chitor (Ischnochiton) cooperi, Cpr.? - R., A.  
 Nacella (Acmaea) incesso, Hds. - R.  
 Nacella (Acmaea) paleacea, Gld. - R.  
 Acmaea patina, Esch. - R., A.  
 +Acmaea persona, Esch. - R., A.  
 +Acmaea scabra, Nutt. - R., A.  
 Acmaea spectrum, Nutt. - R.  
 Acmaea asmi, Midd. - A.  
 Acmaea crebrifilatum, Cpr. - R.  
 Acmaea crebrifilatum, var. - R.  
 Acmaea (Scurria) mitra, Esch. - R., C.  
 ++Acmaea (Lottia) gigantea, Gray - R., C., A.  
 Gadenia reticulata, Sby. - R., C., A.  
 +Fissurella volcano, Rve. - R., A.  
 Fissurella (Glyphis) aspera, Esh. - R.  
 \*Lucapina crenulata, Sby. - R., C., A.  
 Fissurellidae (Clypidella) bimaculata, Dall. - R.  
 +Haliotis cracherodii, Leach. - R., C., A.  
 Haliotis corrugata, Gray - R., C., A.  
 Haliotis rufescens, Sw. - R., C., A.  
 Phasianella compta, Gld. - R.  
 Phasianella compta, var. pulloides, Cpr. - R.  
 \*Pomaulax undosus, Wood - R., A., C.  
 Lepthothyra sanguinea, Cpr. - R.  
 Lepthothyra bacula, Cpr. - R., A.  
 Lepthothyra bacula, var. - R.  
 +Trochiscus norrisii, Sby. - R., A.  
 Chlorostoma funebre, Ad. - R., C., A.  
 Chlorostoma funebre, var. subapertum, Cpr. - R., A.  
 +Chlorostoma brunneum, Phil. - R., C., A.  
 Chlorostoma aureo-tinctum, Fbs. - R.  
 Chlorostoma gallina, Fbs. - R., C., A.  
 Calliostoma canaliculatum, Mart. - R.  
 Calliostoma costatum, Mart. - R.  
 Calliostoma annulatum, Mart. - R.  
 Calliostoma gemmulatum, Cpr. - R.  
 Calliostoma splendens, Cpr. - R.  
 Margarita acuticostata, Cpr. - R.  
 Crepidula dorsata, var. lingulata, Gld. - R.  
 Crepidula adunca, Sby. - R., C.  
 Crepidula navicelloides, Nutt. - R.  
 Crepidula navicelloides, var. explanata, Gld. - R.  
 +Hipponyx antiquatus, Linn. - R., A.  
 Hipponyx cranioides, Cpr. - R.  
 Hipponyx tumens, Cpr. - R., A.  
 Serpularbis squamigerus, Cpr. - R., A., C.  
 Bivonia compacta, Cpr. - A.  
 Spiro-glyphus lituella, Morch? - A.  
 +Cerithidea sacrata, Gld. - R.  
 Bittium filosum, Gld. - R.

*Bittium quadrifilatum*, Cpr. - R.  
*Bittium quadrifilatum*, var. - R.  
*Bittium asperum*, Cpr. - R.  
*Littorina planaxis*, Nutt. - R., A.  
*Littorina scutulata*, Gld. - R., C., A.  
*Littorina scutulata*, var. - R.  
*Lacuna variegata*, Cpr. - R.  
*Lacuna unifasciata*, Cpr. - R.  
*Luponia (Cypraea) spadicea*, Sw. - R., C., A.  
*Trivia (Cypraea) californica*, Gray - R., A.  
*Trivia (Cypraea) solandri*, Sby. - R.  
*Erato vitellina*, Hds. - R.  
*Drillia inermis*, Hds. - R.  
*Drillia moesta*, Cpr. - R.  
*Drillia torosa*, Cpr. - R.  
*Drillia torosa*, var. *aurantii*, Cpr. - R.  
*Mangelia variegata*, Cpr. - R.  
*Mangelia interlirata*, Sts. - R.  
*Mitromorpha aspera*, Cpr. - R.  
+*Conus californicus*, Hds. - R., C., A.  
*Odostomia gravaida*, Gld. - R.  
*Chemnitzia tenuicula*, Gld. - R.  
*Scalaria tinctoria*, Cpr. - R., A.  
*Scalaria* sp. - R., A.  
*Scalaria gracilis*, Sby. - R., A., C.  
*Opalia crenatoides*, Cpr. (or nov. sp?) - A., C.  
*Cerithiopsis tuberculata*, Mont. - R., A.  
*Cerithiopsis assimolata*, C. B. Ad. - A.  
+*Lunatia lewisii*, Gld. - R., C.  
*Lamellaria stearnsiana*, Dall. - R.  
*Ranella californica*, Hds. - A.  
\**Mitra maura*, Sw. - R., A.  
*Volvarina varia*, Sby. - R., A.  
\**Olivella biplicata*, Sby. - R., A.  
*Nassa fossata*, Gld. - R.  
*Nassa perpinguis*, Hds. - R.  
*Nassa mendica*, Gld. - R.  
*Nassa cooperi*, Fbs. - R.  
*Columbella carinata*, Hds., var. *Hindsii*, Rve. - A.  
*Amphissa corrugata*, Rve. - R., A.  
*Amphissa corrugata*, var. *vesicolor*, Dall. - R.  
*Purpura canaliculata*, Ducl. - R.  
*Purpura saxicola*, Val. - R.  
*Purpura saxicola*, var. *fuscata*, Fbs. - R.  
*Purpura saxicola*, var. *emarginata*, Desh. - R.  
*Purpura crispata*, var. *septentrionalis*, Rve. - C.  
*Monoceros engonatum*, Conr. - R., A.  
*Monoceros*, var. *spiratum*, Blain. - R.  
*Monoceros lapilloides*, Conr. - R., A.  
*Ocenebra lurida*, Midd. - R., A.  
*Ocenebra lurida*, var. *aspera*, Baird - A.  
*Ocenebra interfossa*, var. *atropurpurea*, Cpr. - R.

Ocinebra interfossa, var. muricata, Coop. - R.  
Ocinebra interfossa, var. clathrata, Cpr. - R.  
Ocinebra intertexta, Sts. - R., A.  
Cerostoma nuttalli, Conr. - A.  
Nitidella gouldii, Cpr. - R.  
Muricidea fasceolata, Hds. - R.  
Muricidea incisa, Brod. - A.  
Fusus cinereus, Rve. - A.  
Anachis penicillata, Cpr. - R.

Cephalopoda.

Argonanta argo, Linn. - C.  
Ommatostrephes gigas, D'Orb. - R.

Doubtless a thorough examination of the shores of these islands would result in the finding of numerous species not included above. Such examinations must necessarily extend over various seasons of the year, and also many years' observations, before a full and complete list of the mollusca could be compiled. Some species appear only at long intervals, and then only under certain conditions, or combinations of favorable circumstances as to the season of the year, and storms coming from certain directions.

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Note.-- Since the above list was compiled Dr. J. Walter Fewkes has published an illustrated description of a new genus of Nudibranchiata discovered at Santa Cruz Island which he has named Cabrilla, from Cabrillo, the discoverer of the islands. The species is Cabrilla occidentalis, Fewkes.