Additions to the Molluscan Fauna of Clipperton Island

BY

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Mollusks collected by the junior author and his colleagues during two cruises of the Scripps Institution of Oceanography Research Vessel *Spencer F. Baird* to Clipperton Island (1956 and 1958) have been reported in preliminary form in three previous notes in The Veliger (Allison, 1959; Hertlein & Allison, 1960a; Hertlein & Allison, 1960b). Species identified in the collections of earlier expeditions and a review of pertinent literature concerning that island are discussed by the senior author in collaboration with William K. Emerson (Hertlein & Emerson, 1958). More comprehensive discussions of Clipperton Island natural history appear in the works of Sachet (1960, 1962a, 1962b, 1962c, 1963). The species reported in the present paper represent all other mollusks recognized in currently available Clipperton Island collections, including those recently dredged from the *Baird* during the expedition CARROUSEL (11 August, 1964).

The unique combination of Eastern Pacific and Indo-Pacific elements in the Clipperton Island biota has required the aid of authorities and collections other than those immediately available to the authors. We gratefully acknowledge aid received from Dr. E. Alison Kay, General Science Department, University of Hawaii, who generously gave of her time to check the identifications of several specimens with similar ones in the Bernice P. Bishop Museum. Dr. A. Myra Keen, Department of Geology, Stanford University, furnished information concerning the vermetid forms in Clipperton Island collections; Dr. Ruth Turner, Museum of Comparative Zoology, Harvard University, furnished identifications of species of *Lithophaga* and *Martesia*; and Dr. Hendryk Stenzel, Shell Development Corporation, Houston, Texas, contributed useful comments concerning the species of *Ostrea*; as did A. G. Smith, California Academy of Sciences, concerning the species of *Ischnochiton*.

PELECYPODA

Arcidae

Arca mutabilis (Sowerby, 1833)

One left valve from beach drift; 23 mm long; one juvenile valve comparable to this species was dredged at depth of 92 m off southeastern side of island.

Barbatia reeveana (d'Orbigny, 1846)

One specimen, 24.4 mm long, from beach drift.

Barbatia reeveana (d'Orbigny, 1846) (form *velataformis* Sheldon & Maury, 1922)

Two somewhat worn valves, both about 41 mm long, from beach drift.

Acar cf. *A. laysana* Dall, Bartsch & Rehder, 1938

One small specimen, about 5 mm long, found living in live colony of coral *Pocillopora* at about 15 m depth on north side of island.

Mytilidae

Lithophaga hancocki Soot-Ryen, 1955

Living in coral along outer edge of "10 fathom" terrace (depth 10 to 16 m).

Lithophaga plumula Hanley, 1843

Commonly living in coral rock along outer part of reef flat.

Lithophaga (Stumpiella) calyculata (Carpenter, 1856)

One well preserved specimen dredged at depth of 92 m off southeastern side of island.

Pinnidae

Pinna species

Dead specimens seen *in situ* in sediment patches in lagoon at depth of 8 to 10 m.

PTERIIDAE

Pinctada mazatlanica (HANLEY, 1856)
Living specimens immediately below outer edge of "10 fathom terrace," at depths of 30 to 35 m, on north side of island; dead specimens with ligament in place collected in 1958 on northern portion of island surface which was then strewn with shells and coral debris deposited by recent storm waves; dead specimens in lagoon and on beaches of island.

ISOGNOMONIDAE

Isognomon chemnitzianum (D'ORBIGNY, 1853)
Dead valves from beach.

Isognomon janus CARPENTER, 1856
Living specimens commonly attached to dead coral blocks on reef flat; dead specimens on beaches around island.

SPONDYLIDAE

Spondylus gloriosus DALL, BARTSCH & REHDER, 1938
Living near outer edge of "10 fathom terrace" at depths greater than 15 m and observed downward to about 45 m, the maximum depth reached during collecting dives; robust dead specimens occur commonly in coarse coral debris of beaches around island; specimens with delicate spines occur with fossil coral reef assemblages of shallow areas in lagoon.

Figures of specimens apparently identical with those from Clipperton Island appear in *Hawaiian Shell News* (Vol. 11, no. 5, new ser., no. 39, p. 1, figs. 1, 2) for March, 1963. The Hawaiian specimens were collected by SCUBA divers off Maui.

OSTREIDAE

Ostrea hyotis LINNAEUS, 1758
Small specimens commonly living off shore near limit of deepest dives (40 to 45 m); large specimens found living only off outer edge of "10 fathom terrace;" large dead specimens found *in situ* among fossil coral reefs of lagoon, commonly at depths greater than 10 m below present water level of lagoon; isolated dead valves on beach but large examples common only among fresh debris deposited on north side of island by storm waves preceding 1958 expedition.

LUCINIDAE

Codakia distinguenda (TRYON, 1872)
Several valves, reaching a maximum length of 91 mm, from fossil assemblages in lagoon and from beach drift around perimeter of island.

Codakia thaanumi PILSBRY, 1918
Valves, up to 64 mm long, common in sediment (containing fossils) in lagoon.

Ctena clippertonensis BARTSCH & REHDER, 1939
Living among sand and dead coral debris on reef flat and off shore to depths of about 15 m; largest specimen 15.6 mm long.

CHAMIDAE

Chama squamuligera rubropicta BARTSCH & REHDER, 1939
Numerous isolated valves mostly about 16 mm long, from beach drift around island; living specimens from below "10 fathom terrace" to depths of deepest dives (40 to 45 m); one eroded lower valve attached to coral with specimen of *Codakia thaanumi* which evidently came from lagoon; several valves dredged at a depth of 92 m off southeastern side of island.

GASTROCHAENIDAE

Gastrochaena (Rocellaria) ovata SOWERBY, 1834
A number of living specimens were dredged at a depth of 92 m off southeastern side of island.

PHOLADIDAE

Martesia striata (LINNAEUS, 1758)
Dead specimens with valves together from coral debris at depth of 10 to 12 m off north side of island; valves common in beach debris.

GASTROPODA

FISSURELLIDAE

Diodora granifera (PEASE, 1861)
Commonly living under boulders on reef flat areas strewn with loose blocks of dead coral but free from exposed sand, particularly evident near middle of reef flat on north side of island; dead shells rare on beaches; juvenile shell, probably referable to this species, dredged at depth of 92 m off southeastern side of island.

CYCLOSTREMATIDAE

Cyclostrema cingulifera A. ADAMS, 1850
Commonly living in protection of algae and tubeworms on outer edge of reef flat.

EULIMIDAE

Balcis cf. *B. cumingi medipacifica* (PILSBRY, 1917)
Dead shell from reef flat on south side of island.

Balcis thaanumi (PILSBRY, 1917)
Common among boulders in reef flat tide pools on west side of island; none living, but many shells occupied by hermit crabs.

Balcis vafra (PILSBRY, 1917)
Dead specimen from tide pool near shore, on west side of island.

ARCHITECTONICIDAE

Heliacus infundibulum strigata (HANLEY, 1863)
One dead specimen from beach drift on northeast side of island.

VERMETIDAE

Petaloconchus (Macrophragma) species
Dead shells in beach drift.

Spiroglyphus cf. *S. platypus* (MÖRCH, 1861)
Dead shells in beach drift.

CERITHIIDAE

Cerithium nesioticum PILSBRY & VANATTA, 1906
Dead shells from beach drift on all sides of island; particularly common (dead) in tide pools on west side of island.

COLUBRARIIDAE

Colubraria species
No living specimens found; dead shells fairly common in beach drift and in tide pools on west side of island; specimens occupied by hermit crabs found on north side of island at depths from 10 to 15 m.

MURICIDAE

Ocenebra cf. *O. vittata* (BRODERIP, 1833)
Juvenile specimen comparable to BRODERIP's species dredged at depth of 92 m off southeastern side of island.

GALEODIDAE [VOLEMIDAE]

Pugilina lactea (REEVE, 1847)
A single specimen in the University of California Museum of Paleontology collection, with the locality "No. 7191, Clipperton Island." It agrees well with REEVE's illustration of *Pyrula lactea* REEVE which was originally described from the Philippine Islands. No examples or fragments were recovered during recent expeditions to Clipperton Island. Confirmation of this record of occurrence is desirable.

FASCIOLARIIDAE

Fasciolaria princeps SOWERBY, 1825
One dead specimen from beach drift on west side of island.

Latirus aff. *L. socorroensis* HERTLEIN & STRONG, 1951
Represented by a single dead specimen from beach drift on northwestern side of island; sculpture more rugose than on the typical form.

Peristernia thaanumi PILSBRY & BRYAN, 1918
Living specimens collected from north side of island near outer edge of "10 fathom terrace," at depths of from 10 to 20 m; dead specimens common in beach drift of north and west sides of island.

ACHATINIDAE

Opeas oparanum (PFEIFFER, 1846)
Living commonly in protection of rock and plant debris on island.

AMPHINEURA

ISCHNOCHITONIDAE

Ischnochiton species
Specimens of small, as yet unidentified, *Ischnochiton* from beneath boulders on outer part of reef flat along north side of island.

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