

NEW MARINE MOLLUSKS FROM THE WEST COAST OF AMERICA.

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The present paper embraces diagnoses^a of new mollusks from the Oregonian faunal area, belonging to the genera *Seila*, *Bittium*, *Cerithiopsis*, and *Metaxia*. Figures of these will appear when the monograph of these forms in course of preparation is published.

SEILA MONTEREYENSIS, new species.

Shell large, robust, brown. (Extreme apex lost in all our specimens.) One of the cotypes has two and a half nuclear whorls remaining. These are rather inflated, evenly rounded, marked by many slender obliquely retractive axial riblets. The transition of the nuclear sculpture to the post-nuclear is very abrupt. The sculpture of the post-nuclear turn consists of three very strong, equal, and equally spaced lamellar spiral keels between the sutures. Channels separating the spiral keels well rounded, a little wider than the keels, crossed by many subequal and subequally spaced slender riblets, of which about 40-50 appear on the whorls. Periphery of the last whorl marked by a fourth spiral keel not quite as strong as the keels of the spire and a little more closely placed to the keel posterior to it than that is to its neighbor above it. Base marked by a spiral keel which equals the peripheral keel in strength, separated from it by a channel a little narrower than the supraperipheral groove. Both of these channels are crossed by the axial riblets. The remaining portion of the base slopes somewhat concavely toward the stout columella. Under the microscope the

^a In the preparation of the present diagnoses the following terminology is used: *Spiral sculpture*, the markings following the direction of the coils of the whorls. *Axial sculpture*, the markings which extend from the summit of the whorls toward the umbilicus.

The axial sculpture may be—

Vertical, when the markings are in general parallelism with the axis of the shell.

Protractive, when the markings slant forward from the preceding suture.

Retractive, when the markings slant backward from the suture.

entire surface of the spire and base appears marked by fine lines of growth and spiral striations. Aperture subquadrate, decidedly channeled anteriorly; outer lip rendered sinuous by the spiral keels, parietal wall and edge of columella covered by a moderately strong callus. The nuclear structures were described from a young specimen, Cat. No. 195206, U.S.N.M., which has 10 whorls (the first two nuclear whorls probably being lost), and measures: Length 3.6 mm.; diameter 1.4 mm. The other cotype (Cat. No. 32290, U.S.N.M.) is an adult shell in which the last 11 whorls remain, and measures: Length 12.4 mm.; diameter 4.1 mm.

This species has been known from the west coast under the name of *Cerithiopsis assimolata* C. B. Adams, a Panamic species, which is a pygmy in size compared with the present form.

Specimens examined.

Specimens.	Locality.	Collector.	Museum number.
			<i>Cat. No.</i>
2	Monterey, California	Stearns collection	32290 (1 cotype).
1	Monterey, California, (off Del Monte, 12 fathoms).	S. S. Berry	195206 (cotype).
1	Monterey, California.	W. H. Dall	56009.
2	do	Caufield	23738.
1	do	W. H. Dall	160892.
1	Santa Barbara Islands.	Cooper	15731.
6	San Pedro, California	Mrs. Oldroyd	195207.
1	do	do	195209.
4	San Pedro (Whites Point).	do	195208.
1	San Pedro (Terminal Island).	Mrs. Eshnaur	109514.
1	San Diego, California	Stearns collection	32397.
4	San Diego (Ocean Beach).	F. W. Kelsey	153046.
2	San Diego (Ash street).	Mrs. Oldroyd	195210.
1	Off Point Loma light (71 to 75 fathoms).	U. S. F. C. Station 4310.	195211.
3	Todos Santos, Lower California.	H. Hemphill.	32393.

BITTIUM (STYLIDIUM) *ESCHRICHTI* ICELUM, new subspecies.

In *B. eschrichti* only the early whorls show axial ribs. In the present form they are well developed on all the turns, weakening only on the last. The type, Cat. No. 15209*a*, U.S.N.M., was collected by J. G. Swan at Neah Bay, Washington. It has 9 whorls (the nucleus being lost), and measures: Length 15 mm.; diameter 5.5 mm. Another specimen, Cat. No. 32209, U.S.N.M., belongs to the Stearns collection and comes from Monterey, California.

BITTIUM (STYLIDIUM) *ESCHRICHTI* MONTEREYENSIS, new subspecies.

This form is the southern race of *B. eschrichti*. It differs from the typical form in being less strongly spirally keeled, much more smooth, more slender, and in every way more elegant than *eschrichti*. The typical form varies in color from brown to white, and is very rarely

^aThe name *Stylidium* is proposed by W. H. Dall, with *B. eschrichti* Middendorff, as type, in a publication now in press.

spotted. In *montereyensis* the variegated forms predominate; that is, the shells are whitish mottled with rust brown. The type, Cat. No. 32221, U.S.N.M., has 10 whorls, and measures: Length 13.8 mm.; diameter 5 mm.

BITTIUM ESURIENS MULTIFILOSUM, new subspecies.

Shell similar to *B. esuriens*, but having 7 spiral keels between the sutures on the whorls of the spire instead of 4.

The type, Cat. No. 127051, U.S.N.M., was collected by Mrs. Oldroyd at Whites Point, San Pedro, California. It has 10 whorls, and measures: Length 9.2 mm.; diameter 3 mm.

Specimens examined.

Specimens.	Locality.	Collector.	Museum number.
			<i>Cat. No.</i>
1	Monterey, California	W. H. Dall	56002.
3	do	Stearns collection	32235.
1	Whites Point, San Pedro	Mrs. Oldroyd	127051 (type).
7	do	do	195125.
7	Catalina Island	W. H. Dall	56907b.
1	do	do	56908.
1	San Pedro (50 fathoms)	Mrs. Oldroyd	195126.

BITTIUM TUMIDUM, new species.

Shell of medium size, light yellowish-brown, shining. Nuclear whorls decollated. Post-nuclear whorls somewhat inflated, well rounded, separated by constricted sutures and ornamented with strong tuberculate axial ribs, of which there are 18 upon the second of the remaining whorls and 22 upon the penultimate turn. In addition to the axial ribs there are four unequally broad, low, spiral ridges between the sutures, which are much wider than the spaces which separate them, the latter appearing as strongly incised lines. The intersection of these ridges and the ribs form the tubercles. The whorls slope gently from the second spiral ridge toward the summit, and the first row of tubercles which is only feebly developed is located on the sloping shoulder. The second set of tubercles are rounded while the third and fourth rows are decidedly elongated. Periphery of the last turn marked by a strong smooth spiral keel, which is separated from the suprapерipheral keel by a mere constriction. Base rather short without keel, marked only by lines of growth. Aperture suboval, decidedly channeled anteriorly; outer lip rendered sinuous by the external sculpture; columella short, very broad, and slightly expanded at the insertion, a little lighter in color than the rest of the shell; provided with a strong callus on its inner edge which is reflected over the parietal wall.

The type, Cat. No. 74001, U.S.N.M., was collected by Canfield at Monterey, California. It has 8 postnuclear whorls and measures:

Length 4.2 mm., diameter 1.7 mm. A second immature specimen, Cat. No. 23261, U.S.N.M., is in the Stearns collection, also from Monterey, California.

BITTIUM QUADRIFILATUM INGENS, new subspecies.

Shell similar to *B. quadrifilatum* but in every way stronger and larger and of white color. The spiral bands in *B. quadrifilatum* do not form strong cusps at their intersections with the axial ribs, but simple nodes, while in the present form these intersections are decidedly cusped.

The type, Cat. No. 32213, U.S.N.M., from Monterey, California, has lost its nucleus; the ten remaining turns measure: Length 12.2 mm.; diameter 4.5 mm. Another specimen, Cat. No. 195159, U.S.N.M., was dredged by the U. S. Fisheries steamer *Albatross* at station 4475, 10 miles off Point Pinos Light, California, in 142 to 158 fathoms.

CERITHIOPSIS COSMIA, new species.

Shell elongate-conic, variegated with various shades of brown, white, and wax yellow. Nuclear whorls $3\frac{1}{2}$, slender, lending the apex a mucronate appearance. First nuclear whorl smooth, second crossed by feeble axial riblets. The riblets increase considerably in size in the remaining turns, where they are very regularly developed and evenly spaced. They are strongly protractive as they pass from suture to suture, the extremity at the lower suture being considerably in advance of the extremity at the summit. In addition to the vertical riblets microscopic crinkly lines appear on the intercostal spaces which intersect the riblets in oblique even curves at right angles. The transition from the nuclear to the post-nuclear sculpture is abrupt, the three chief tuberculate spiral keels being present from the very beginning of the postnuclear turn. On the first four post-nuclear turns the posterior spiral keel is less developed than the rest, but it increases with each succeeding turn and finally becomes the strongest of the three. The tubercles are the early whorls, are almost round and slope abruptly, concavely posteriorly and gently well rounded anteriorly. On the later whorls they are oblong, with their long axis vertical. Channels separating the spiral keels about as wide as the keels on the early whorls, less so in the later turns, curved by the low, broad, strong, backward slanting axial riblets. The spaces between these ribs and the spiral keels appear as rounded pits. Sutures well impressed. Periphery of the last whorl marked by a strong spiral keel. Base well rounded, marked by three equal and equally spaced spiral keels separated by equally wide and strong channels. The entire surface of the spire and base keels, tubercles, and channels are marked by microscopic lines of growth and spiral striations. Aperture subquadrate, posterior angle obtuse, decidedly chan-

neled at the junction of the short, thick, somewhat twisted columella and outer lip.

This description is based upon two specimens, cotypes, Cat. No. 195196, U.S.N.M. One has the nucleus and 11 postnuclear whorls, and has furnished the description of the nucleus. This measures: Length 7.3 mm.; diameter 2.3 mm. The other has lost its nucleus and probably the first two postnuclear turns, and measures: Length 9 mm.; diameter 2.9 mm.

Specimens in the U. S. National Museum.

Specimens.	Locality.	Collector.	Museum number.
			<i>Cat. No.</i>
1	Monterey, California	W. H. Dall	160870.
1	do	do	56012.
3	do	do	56008.
2	Catalina Island		160077.
33	Whites Point, San Pedro	Mrs. Oldroyd	195196 (2 cotypes).
5	San Pedro Bay	do	195197.
3	Government jetty, San Diego	F. W. Kelsey	153057a.
2	San Diego	H. Hemphill	109365.
3	Todos Santos Bay	Stearns	32392.

CERITHIOPSIS PEDROANA, new species.

Shell small, slender, dark brown. Nuclear whorls three, yellowish-white, smooth. Post-nuclear whorls strongly differentiated from the nuclear ones, showing the sculpture characteristic of the adult shell from the very beginning. This sculpture consists of three equally spaced tuberculate spiral keels between the sutures, the posterior one of which is slightly smaller than the other two. These keels are separated by deep rounded channels almost as wide as the keel. In addition there are many low, rather broad axial ribs, the intersections of which with the keel form the tubercles. About 20 of them occur upon the first, 22 upon the fifth, and 30 upon the penultimate post-nuclear turn. The connection between the tubercles, both spiral and axial, are about equal, inclosing deep, squarish pits. In addition to the above sculpture the entire surface is marked by fine spiral lines and lines of growth. Sutures strongly marked, constricted, showing the peripheral keel in the later whorl. Periphery marked by a broad, low, rounded keel. Another of equal width is located upon the middle of the base. The sulcus which separates these keels and the supra-peripheral sulcus are of equal width; both are crossed by the weak continuations of the axial ribs, which gradually weaken as they pass toward the columella. The basal keel is separated from the columella by broad, shallow grooves. Aperture irregularly oval, decidedly channeled anteriorly, outer lip thin, rendered sinuous by the external keel; columella stout and somewhat twisted, with a strong callus on its inner edge that extends over the parietal wall.

The two cotypes, Cat. No. 109512, U.S.N.M., were collected by Mrs. W. H. Eshnaur at Terminal Island, San Pedro, California. The one has the nucleus and 3 post-nuclear whorls; the other has lost the nucleus and has 9 post-nuclear turns and measures: Length 5.2 mm., diameter 1.8 mm.

Specimens in the U. S. National Museum.

Specimens.	Locality.	Collector.	Museum number.
			<i>Cat. No.</i>
350	Terminal Island, California.....	Mrs. W. H. Eshnaur.....	109512 (cotypes).
1	Catalina Island, California.....	W. H. Dall.....	56751.
3	San Pedro, California.....	T. Oldroyd.....	195179.
1	do.....	J. G. Cooper.....	14825.
1	San Pedro (Whites Point), California.....	T. S. Oldroyd.....	195180.
1	do.....	Branan.....	7372 <i>a</i> .
9	San Diego, California.....	J. M. Cooke.....	130581.
40	do.....	Stearns collection.....	32287 <i>a</i> .
13	do.....	do.....	32220 <i>b</i> .
3	do.....	W. H. Dall.....	56006 <i>a</i> .
6	do.....	T. S. Oldroyd.....	123401.
1	do.....	H. Hemphill.....	109364.
7	San Diego (Government jetty), California.....	F. W. Kelsey.....	153058.
1	Point Abrejos, Lower California.....	H. Hemphill.....	106504.
1	Todos Santos Bay, Lower California.....	Stearns collection.....	32292.

METAXIA DIADEMA, new species.

Shell slender, decidedly turritid, brown. Nuclear whorls four, the first smooth, the others marked by two spiral threads, the posterior one of which falls on the middle of the whorls between the sutures, while the anterior one is about halfway between it and the basal suture. In addition to this sculpture there are slender equal and equally spaced axial riblets, of which about 28 occur upon the third and 30 upon the fourth whorl. The nuclear whorls are slopingly shouldered from the posterior keel to the summit and well rounded anterior to it. The demarcation between the sculpture of the nuclear turns and the post-nuclear turns is abrupt. Post-nuclear turns inflated, marked by four strong spiral tuberculate keels and axial ribs. These four keels are equally spaced, but not equally strong. The third excels all the others in development, the fourth or basal one comes next, the second next, while the one at the summit is the weakest of the four. The axial ribs are broad and strong and rather distantly spaced, forming decided nodes at their intersection with the spiral keels. There are about 14 of these ribs upon the first, 15 upon the fifth, and 22 upon the penultimate turn. The spiral keels connecting the tubercles are only about one-fourth as strong as the axial ribs; the areas inclosed by the two are quadrangular, the vertical diameter being the shorter. On the last whorl, where the ribs are a little more crowded, these areas become squarish. Sutures strongly constricted. Periphery of the last whorl marked by a strong keel, separated from the supra-peripheral keel by a strong channel, which is crossed by the continuations of its axial

ribs. Base rather short, sloping somewhat concavely from the peripheral keel to the insertion of the broad columella, marked by a weak spiral thread at the base of the columella and the continuation of the axial ribs which extend well up on the columella. Aperture suboval, decidedly channeled at the junction of the lip and columella with the posterior angle obtuse.

The smaller of the two cotypes, Cat. No. 195203, U.S.N.M., has the nucleus complete and 8 post-nuclear whorls and measures: Length 3.8 mm.; diameter 1.3 mm. The other, Cat. No. 153045, U.S.N.M., has 8 post-nuclear whorls, having lost the nuclear and probably two of the post-nuclear turns; it measures: Length 4.6 mm.; diameter 1.5 mm.

This species has been confounded with the European *Metaxia metaxae*, under which name it has appeared in many lists.

Specimens examined.

Specimens.	Locality.	Collector.	Museum number.
			<i>Cat. No.</i>
1	Monterey Harbor.....	R. E. C. Stearns.....	74012.
1	.....do.....	W. H. Dall.....	56011.
1	Monterey (Del Monte), 12 fathoms.....	S. S. Berry.....	101 Berry collection.
1	Monterey (Del Monte), 28 fathoms.....	.....do.....	
2	Monterey (Pacific Grove).....	.....do.....	195223 (1 cotype).
6	San Pedro.....	Mrs. Oldroyd.....	130569.
1	.....do.....	.....do.....	195204.
1	.....do.....	Miss Johnston.....	152172.
1	.....do.....	S. S. Berry.....	39 Berry collection.
1	Ocean Beach.....	F. W. Kelsey.....	153045 (cotype).
2	Off Point Loma, 10 fathoms.....	.....do.....	152338.
1	West coast.....	Stearns collection.....	32304.