

SMITHSONIAN MISCELLANEOUS COLLECTIONS  
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COLLECTED ON THE PRESIDENTIAL  
CRUISE OF 1938

BY  
HELEN C. STUART  
Allan Hancock Foundation  
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(PUBLICATION 3596)



CITY OF WASHINGTON  
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# A NEW CEPHALOPOD MOLLUSK COLLECTED ON THE PRESIDENTIAL CRUISE OF 1938

By HELEN C. STUART

*Allan Hancock Foundation, The University of Southern California*

During President Roosevelt's cruise to the Galápagos Islands in the summer of 1938 aboard the U. S. S. *Houston*, Dr. Waldo L. Schmitt, Naturalist to the expedition, obtained three cephalopods representing a hitherto undescribed species.

The first taken was a small juvenile 17 mm. in length, obtained by means of a dipnet and an electric light lure at 11 o'clock at night off the starboard gangway of the ship while at anchor at South Seymour Island, July 29, 1938 (Station 23a). The other two specimens, a male and a female 623 and 169 mm. in length respectively, were captured among the boulders alongshore by members of the landing party at James Bay, James Island, on the forenoon of July 30, 1938 (Station 25).

The species, of which the large male has been selected as the type, (U.S.N.M. No. 515224) has been named in honor of the President:

## OCTOPUS ROOSEVELTI, n. sp.

*Description.*—Body ovately oblong, width slightly more than one-half the length, thickness about five-sevenths of the width. General body surface rough, dorsally covered with elongated papillae, giving the appearance of a series of longitudinal wrinkles. Along the median longitudinal axis of the body are evidences of elongated tubercles which are prominent in the younger specimen. It is probable that these tubercles have been obliterated in part by pressure against the glass container. Careful scrutiny with a hand lens reveals the quadrilateral pattern of the tubercles on the body proper. Ventral surface of body covered uniformly with regularly spaced papillae forming a rough reticulated surface resembling slightly that of *Octopus cyanea*. Opening of mantle cavity extends to points in line with the ocular aperture, giving this opening approximately 62 percent of the circumference of the head.

Head not particularly prominent, separated from body by a constriction in nuchal region; width slightly less than that of body, length approximately five-sixths of width. Eyes prominent, with small opening on preserved specimen, evidence of a membrane across the entire dorsal half of the eye. Surface of the head covered with irregular-shaped papillae. In the region above the eyes is evidence of several

warted tubercles. Structurally, the eyes become the centers of the surface pattern. The funnel extends slightly less than one-third of the distance to the edge of the umbrella. It is conical-shaped, but blunt at the apex.

Arms long, very stout for about half their length, beyond which they taper rapidly to attenuated ends. First three basal suckers in a single row, comparatively small; beginning with the fourth basal sucker they show a zig-zag position for the entire length of the arm. Suckers enlarge gradually, reaching maximum size at the edge of the umbrella; from this point they diminish in size, becoming minute on the extreme tips of the arms. In the male, at the edge of the um-

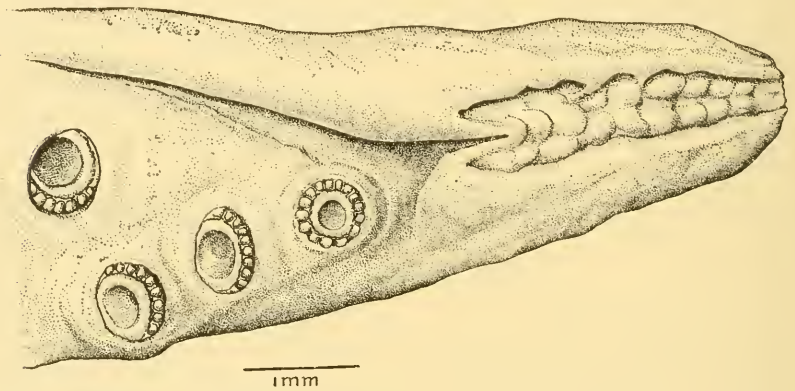


FIG. 1.—*Octopus roosevelti*, hectocotylized portion of third right arm. Drawn by Anker Petersen.

brella four to six suckers on the lateral arms greatly enlarged, varying in size from 13 to 19 mm. in diameter. Both dorsal arms and one ventral arm injured; left dorsal regenerating. Suckers missing in the vicinity of the edge of the umbrella on the right dorsal and left ventral arms. There is a gradual increase and decrease in the diameter of the suckers on all arms. The suckers are deeply cup-shaped; the three largest are 11 mm. in diameter.

Umbrella well developed, being shortest between the dorsal arms and longest between the ventral and third pair of arms. Outer surface of arms and umbrella rough, owing to the presence of papillae. This is particularly true of the umbrella and the proximal portions of the arms, where the papillae are elongated. On the outer distal portions of the arms the papillae become more regular. Smaller papillae cover the inner surface of the umbrella and arms.

Third right arm shorter than third left arm and bears a comparatively minute hectocotylus at its tip (fig. 1). The hectocotylized portion is only 1.7 percent of the length of the entire arm. Seminal

channel pronounced on outer ridge of this arm, beginning at margin of umbrella and ending in the minute, flattened calamus. The ligula narrows to a blunt extremity. Copulatory groove of the ligula shows nine transverse folds made up of irregular nodules.

Color of dorsal surface of body, of outer umbrella, and of outer arms in preserved specimen dull, dusky purple, becoming more intense in

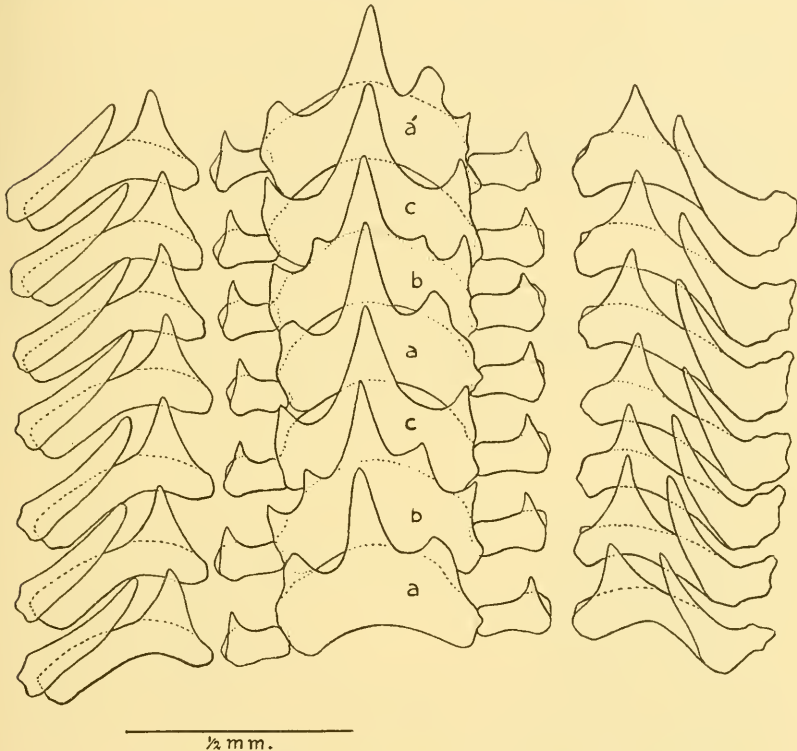


FIG. 2.—*Octopus roosevelti*, rhachidian teeth. Drawn by Anker Petersen.

the folds and wrinkles and on longitudinal papillae and tubercles. When the skin is stretched, a lighter area may be observed between the papillae and the deepest portion of the fold. This lighter area is a stone-gray color. The distribution of light and dark areas gives a reticulated or marbled appearance. The dark color gradually becomes a stone gray on the ventral surface of the body and the inner surface of the umbrella and arms. The stone-gray color is sparsely punctate with purple chromatophores.

The radula contains a multicuspid rhachidian tooth with a strong main cusp, but variations in the minor cusps are noted. The illustration (fig. 2) shows tooth *a* with a blunt cusp on each side of the main cusp. Tooth *b* has two sharply pointed cusps on each side of the

main cusp. Tooth *c*, like tooth *a*, has one cusp on each side of the main cusp, but the minor cusps are sharply pointed. Tooth *a'* is like *a*, but is asymmetrical, having two cusps on one side of the main cusp and only one cusp on the opposite side. These variations of rhachidian tooth are found to be in no particular series or order of sequence. The base of this tooth is slightly wider than the height of the main cusp. The first lateral is twice as wide as it is high, with a sharp cusp on the edge nearest the second lateral. The second lateral has a broad, curved base and a strong, pointed cusp on the portion proximal to the first lateral. The base is almost as wide as that of the rhachidian tooth, but its cusp is only half as high. The third laterals are slender and slightly curved with a heavy base and a sharply pointed cusp. The marginals are indefinite.

*Measurements.*—Of the only three specimens seen:

	♂ mm.	♀ mm.	Juv. mm.
Total length .....	623	169	17
Tip of body to dorsal base of umbrella.....	180	55	11
Length of body (dorsal).....	128	25	8
Width of body.....	70	26	6
Width of neck.....	50	16	6
Width of head.....	60	23	6
Length of			
Right dorsal arm.....	333	117	8
Left dorsal arm.....	220	115	9
Right second arm.....	425	141	11
Left second arm.....	213	142	11
Right third arm.....	378	143	10
Left third arm.....	418	139	10
Right ventral arm.....	442	131	9
Left ventral arm.....	380	123	10
Length of umbrella between dorsal arms.....	62	15	1
Length of umbrella between ventral arms.....	102	17	2
Length of hectocotylus.....	7	..	..
Diameter of largest sucker.....	19	4	..
Length of funnel.....	32	9	1
Width of mantle opening.....	95	27	8
Depth of body.....	50	..	5

*Remarks.*—*O. roosevelti* appears to be most nearly related to *O. bimaculatus* Verrill (1883) and *O. cyanea* Gray (1849). With the latter, as Robson (1929) has shown, *O. horsti* Joubin (1898) and *O. marmoratus* Hoyle (1886) are synonymous. Robson's findings are based upon a detailed examination of the types of these several species.

Of *O. bimaculatus* a wealth of material in all stages of development contained in the collections of the Allan Hancock Foundation has been available for direct comparison. The new species resembles *O. bimacu-*



*latus* in papillate sculpture, but is a dull, dusky purple with stone-gray reticulations, whereas *O. bimaculatus* is a purplish brown or brownish gray.

Of *O. cyanea*, a male originally determined by Dr. S. Stillman Berry (1914) as *O. marmoratus* Hoyle was lent for study by the Stanford [University] Natural History Museum through the courtesy of Dr. George S. Myers. The female of *O. roosevelti* is ornamented on the dorsal mantle with the same elongated tubercles that form the diamond-shaped quadrilateral that is a common marking on *O. cyanea*, but neither the male nor female of *O. roosevelti* has an ocellus or dark coloring in front of or below the eye on either side. In *O. cyanea*, on the other hand, according to Robson (and Hoyle in his description of *O. marmoratus*), although the ocellus may be concealed in the male, it is plainly to be seen in the female.

Most significant, however, are the differences that one finds in the sequence of the rhachidian or median row of teeth of the several species discussed, together with the structure of the first and third lateral teeth. It is believed that these may best be set forth in tabular form. I myself have examined a number of specimens of *O. bimaculatus* and of course the new species; the observations recorded for *O. cyanea* have been taken from Robson:

*O. bimaculatus* Verrill

The rhachidian tooth has a low main cusp and a broad base which is nearly twice the height of the main cusp. Occasionally a tooth in the series may have a minute cusp on the outer edge.

The first lateral has a sharp cusp and an irregular but broad base.

The second lateral has a strong cusp accompanied by a minor cusp on the portion nearest the first lateral.

The third lateral is broad and dull pointed, with a slight curve. The base is decidedly heavy.

*O. cyanea* Gray

The rhachidian has an  $A_{2-3}$  seriation.

The first lateral has a remarkably high cusp and a narrow base.

The second lateral has neither heel nor ectocone.

The third laterals are thick and moderately curved.

*O. roosevelti* new species

The rhachidian tooth has a strong main cusp accompanied by either two or four minor cusps. The three-cusp and five-cusp median teeth do not follow in a definite series. The base of the median tooth is slightly wider than the height of the main cusp.

The first lateral is twice as wide as it is high, with a sharp cusp on the edge nearest the second lateral.

The second lateral has a broad curved base and a strong, pointed cusp on the portion proximal to the first lateral.

The third lateral is slender and slightly curved with a heavy base.

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