

NEW LAND SHELLS FROM THE PHILIPPINE ISLANDS.

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The United States National Museum has recently received an extremely interesting collection of land shells from the Hon. Dean C. Worcester, secretary of the interior of the Philippine Islands. The shells were collected by him on two small and little-visited islands, Calusa, the westernmost of the Cagayanes Islands, and Olanivan, the northern of the Sarangani group off southeastern Mindanao.

The three species in the lot are all new; their affinity will be discussed under each species, descriptions of which follow.

OBBA WORCESTERI, new species.

Plate 43, figs. 1-3.

Shell lenticular, marked by decidedly retractive lines of growth and very fine, closely spaced spiral striations, excepting the first whorl (the nucleus), which is smooth. The following whorl is light horn-yellow; the succeeding turn gradually darkens to chocolate brown. On the third whorl three spiral bands of chocolate brown become apparent, which eventually cover more of the space between the sutures and the periphery than the buff flushed areas that separate them. The middle one of these three bands is the darkest and widest and occupies the middle of the whorls between the sutures. The posterior band is separated from the summit by a very narrow light zone; the spaces separating the median from the anterior and posterior bands are of equal width and as wide as the median dark zone. Periphery strongly keeled. Base moderately broadly umbilicated; marked by two brown bands, the first of which, the narrower, is separated from the periphery by a very narrow light line; the second, which equals the median band of the spire in width, is a little farther anterior to the other band than its own width. The light zone separating these two bands and the rest of the base, yellow with a greenish flush. Aperture suboval, somewhat angulated at the junction of the superior and basal lip; the angle corresponding to the peripheral keel; peristome thickened and reflected; basal lip

without tooth; parietal wall provided with a thick cord which joins the outer and basal lips and practically renders the peristome complete. The peristome is white, excepting at the peripheral angle where the brown band continues over it.

Type.—Cat. No. 252067, U.S.N.M. This and 37 specimens were collected by the Hon. Dean C. Worcester on Olanivan Island (Sarangani group). The type has $4\frac{1}{2}$ whorls and measures: Altitude, 9.5 mm.; greater diameter, 24 mm.; lesser diameter, 20.3 mm.

Ten additional specimens taken at random yield the following data:

Number of whorls.	Altitude.	Greater diameter.	Lesser diameter.
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>
4.3	10	22.5	19
4.5	9.5	23	19
4.6	10.5	24	20
4.3	9.5	23	19.6
4.4	10	22	18.5
4.5	10	22	18.8
4.6	10.2	20.4	17.3
4.5	10	22.7	19.7
4.4	10.3	23.2	19.3
4.3	10	21.3	18

This species is nearest related to *Obbina saranganica* Hidalgo, which comes from Sarangani Island. This is a much larger race, a specimen of 4.3 whorls measuring: Altitude, 13.4 mm.; greater diameter, 36.4 mm.; lesser diameter, 29.7 mm.

COCHLOSTYLA CALUSAENSIS, new species.

Plate 43, figs. 9, 10, 12-14.

Shell depressed, conic to ovate, marked by fine, decidedly retractive lines of growth and very fine, closely spaced spiral striations. Ground color of the first three whorls white, while that of the subsequent whorls is suffused with sage green on the base, with a band of greenish color in front of the suture on the last whorl which leaves a whitish border on both sides of the median brown band, or the whole ground color may be nearly white if slightly weathered. Beginning with the second whorl, a faint broad brown spiral band makes its appearance on the middle of the space between the summit and the periphery of the whorls, increasing steadily in intensity until it acquires a deep chocolate brown on the last turn. A second brown band, equaling the above in width, encircles the whorls immediately anterior to the periphery. Aperture moderately large; columella oblique, white; peristome reflected, white. Color bands within the outer lip as intense as on the exterior.

Six specimens of this species were collected by the Hon. Dean C. Worcester on Caluga Island (Cagayanes).

Type.—Cat. No. 252069, U.S.N.M.

These yield the following measurements:

Number of whorls.	Altitude.	Greater diameter.	Lesser diameter.
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>
5.5	31.8	27	25.5
5.3	25.8	23.6	21
5	25	26.8	23.7
4.6	23	24.4	21.3
4.4	20.7	23.6	20
4.4	20.3	21.8	18.5

This species is nearest related to *Cochlostyla tenera* Sowerby, from Mindoro. The latter is of much more constant form and size and has instead of the green suffusion a narrow green spiral band a little anterior to the summit and a second one of about equal width a little nearer to the subperipheral brown band than to the median. The median brown band also extends to the very tip of the shell.

Three specimens of *C. tenera* Sowerby yield the following data:

Number of whorls.	Altitude.	Greater diameter.	Lesser diameter.
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>
4.9	25.2	27.6	22.4
5	26.7	27.4	23.5
5	24.5	25.2	22

COCHLOSTYLA OLANIVANENSIS, new species.

Plate 43, figs. 4-8, 11.

Shell broadly depressed conic; entire surface marked by fine, decidedly retractive lines of growth and very fine, closely spaced spiral striations. Ground color white, slightly suffused with yellowish, or even white with a suffusion of light russet vinaceous; the dark tint, if present, is usually on the later whorls. In addition to the ground color, the whorls are marked with a deep chestnut band at the periphery; the summit of the succeeding turns leaving this exposed as a suprasutural band. The extreme appressed summit of the whorls is also edged with a very narrow zone of dark chestnut which is usually covered by a hydrophanous yellowish white band that extends over the posterior fourth of the space between the summit and the periphery of the whorls. The rest of this space is covered by several very narrow spiral hydrophanous lines. Base marked by a rather broad hydrophanous band, situated immediately anterior to the periphery; a second one of about half the width of this encircles the base at the posterior extremity of the anterior fourth, while between these two there appear to be several additional slender hydrophanous lines. The base of the columella is encircled by a narrow, dark chestnut zone, which is sometimes interrupted, and in some instances

fades to yellow. The anterior end of the columella is tinged on the inside by this purple zone in those specimens in which this color appears intense; in the weakest colored ones it is almost white. Peristome usually white, or nearly so, in some individuals very slightly suffused with russet vinaceous.

Eleven specimens of this species were collected by Mr. Worcester on Olanivan Island, Philippine Islands, which yield the following data:

Number of whorls.	Altitude.	Greater diameter.	Lesser diameter.
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>
4.3	17.5	25.3	¹ 22
4.3	19	25	21
4.3	17	24.4	21.2
4.4	16.5	24	21
4.5	17.5	25.6	22
4.2	16.2	23.7	21.1
4.5	17	24.5	20.8
4.3	17	23.6	20.5
4.3	16.3	23.5	22.3
4.5	18.3	26.0	22.5
4.4	18	26.2	22.5

¹ Type.

This species is nearest related to *C. saranganica* Möllendorff. It differs from it by its uniformly lesser size and coloration, which is in every way much darker, half of the base about the columella being chestnut brown and the entire peristome being of a light purplish brown color.

Type.—Cat. No. 252068, U.S.N.M.

Six specimens, of *Cochlostyla saranganica* Möllendorff Cat. No. 195405, U.S.N.M., received from the von Möllendorff collection, come from Balut Island, one of the Sarangani group. These yield the following data:

Number of whorls.	Altitude.	Greater diameter.	Lesser diameter.
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>
4.3	19.5	28.5	24
4.4	21.5	29.3	24.3
4.1	19.8	27.5	23.3
4.3	19.8	30	24.4
4.3	18	28	23.5
4.4	19.8	26.5	22.2

Cochlostyla saranganica Möllendorff is not *Cochlostyla indusiata* Pfeiffer, as supposed by Hidalgo. That is quite a different species and comes from Tukan Bessi, an island southeast of Celebes.

EXPLANATION OF PLATE 43.

(All figures are natural size.)

- Fig. 1. *Obba worcesteri*, top view. Type. See page 549.
2. *Obba worcesteri*, profile view. Type.
3. *Obba worcesteri*, basal view. Type.
4. *Cochlostyla olanivanensis*, top view. Type. See page 551.
5. *Cochlostyla olanivanensis*, profile view. Type.
6. *Cochlostyla olanivanensis*, basal view.
7. *Cochlostyla olanivanensis*, profile view.
8. *Cochlostyla olanivanensis*, basal view. Type.
11. *Cochlostyla olanivanensis*, basal view.
 Figures 6, 7, and 11 showing the variations of the dark basal area.
9. *Cochlostyla calusaensis*, profile view. See page 550.
10. *Cochlostyla calusaensis*, profile view.
12. *Cochlostyla calusaensis*, top view. Type.
13. *Cochlostyla calusaensis*, profile view. Type.
14. *Cochlostyla calusaensis*, basal view. Type.

Figures 9, 10, and 13 show variations in size and shape of shell.



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