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DESCRIPTIONS OF NEW SPECIES OF MEXICAN LAND AND FRESH-  
WATER MOLLUSKS.

BY HENRY A. PILSBRY.

During February, March and April of this year, Mr. and Mrs. S. N. Rhoads made a journey through parts of eastern and central Mexico, their chief object being zoölogical investigation and collecting. Their researches were mainly confined to the States of Vera Cruz, Mexico, Michoacan and Nuevo Leon.

The mollusks collected, especially those from the State last named, prove to be of considerable interest, and a full report will be prepared later. Meantime the following forms, recognized as new, may be described:

*Schazicheila fragilis* n. sp.

Shell subglobose, about the form of *S. alata* Mke.; thin, rather fragile, reddish; the spire conoidal; whorls 4, the last rounded at the periphery, impressed in the center below. Sculpture of very numerous short cuticular spiral liræ. Aperture semicircular, slightly oblique, with a very slight sinus above; peristome thin, slightly expanded; columellar callus thin and small. Alt. 4.5, diam. 6 mm.

Diente, near Monterey, State of Nuevo Leon, Mexico.

Differs from *S. alata* and *S. pannucea* in the smaller size, more fragile texture, and the very much shallower notch at the upper termination of the outer lip. It is a far smaller species than *S. nicoleti* Shuttl. or *S. hidalgoana* Dall. I do not know of any description of "*S. minima* Pfr.," figured by Strebel on Pl. 3, fig. 6, of the *Beitrag Mex. Land- und Süßwasser-Conchylien*, Heft IV, but the figures, though insufficient for identification in the absence of text or locality, look considerably like *S. fragilis*. About twenty specimens were collected, part of them quite fresh, but without opercula.

*Schazicheila vanattai* n. sp.

Shell thick lens-shaped, rather low conoid above, convex below the strong peripheral carina, reddish brown, rather thin. Whorls

4, the first red or corneous, somewhat projecting, the rest but slightly convex, more or less encrusted, but showing no cuticular fringes, merely very fine spiral lines in well-preserved specimens: the last whorl keeled throughout, somewhat impressed in the center below. Aperture slightly oblique, semioval; peristome thin, slightly expanded, with a small, moderately deep sinus above. Umbilical callus thin. Operculum unknown.

Alt. 5.5, diam. 6.8 mm.

Alt. 4.3, diam. 6 mm.

Diente, near Monterey, with *S. fragilis*.

Distinct by its strong peripheral keel. Named in honor of Mr. E. G. Vanatta, whose assistance in the identification of the present collection is hereby acknowledged.

**Valvata humeralis**, var. *patzcuarensis* n. v.

This name is applied to the form from Lake Patzcuaro, noticed in my paper on the shells of the Academy Expedition, these *Proceedings*, 1891, p. 326. It is larger, far more robust and elevated than *V. humeralis*; there is no angulation or shoulder on the upper surface of the whorls; and the umbilicus is decidedly smaller. *V. strebeli* C. and F., based upon *V. humeralis* Strebel, differs in the less elevated and robust form, larger umbilicus, and judging from Strebel's figures, the greater interruption of the circular aperture by the penultimate whorl. A specimen of var. *patzcuarensis* measures: Alt. 5, diam. 5, length of aperture 2.5, width 2.4 mm.

**Polygyra rhoadsi** n. sp.

Shell depressed, with very low conic, almost flat spire, and small, cylindrical umbilicus which at the last whorl opens widely in an arcuate rimation; last  $1\frac{1}{3}$  whorls rib-striate, the ribs strong, narrow, separated by smooth intervals wider than themselves, continuing on the base; spire smoother, the first  $1\frac{1}{2}$  whorls smooth. Whorls slightly more than 5, moderately convex above, slowly widening, the last whorl decidedly wider, very convex, having the convex periphery situated above the middle of the whorl, convexly slanting below the periphery, subangular at the margin of the umbilicus, within which there is a groove parallel to the rimation. Behind the lip the suture is abruptly and rather deeply deflexed, and the whorl is deeply constricted. Aperture small,

subcircular, nearly closed by the large teeth ; peristome reflexed, continuous in a raised callus across the parietal wall. Teeth: parietal fold a large, sinuous tongue-like process, the lower ramus of which is erect, the upper one rising in a point where it joins the upper termination of the lip, the space between the branches concave; outer lip bearing a strong, concave, callous rib, ending below in a compressed tooth; basal margin bearing a similar compressed tooth, extending outward on the lip, and separated from that on the outer lip by a deep sinus.

Alt. 4, diam. 10 mm. ; greatest width of the umbilicus 3 2 mm.

Topo Chico, near Monterey, State of Nuevo Leon, Mexico.

Closely allied to *P. implicata* Beck, with which it agrees in the general form and the armature of the aperture. It differs from *implicata* in the strongly ribbed surface, less convex base, decidedly narrower central umbilical opening and greater deviation of the last whorl, which differentiates the median opening from the rimation much more sharply than in *P. implicata*.

*P. rhoadsi* differs from *P. oppilata* in being larger, with different sculpture and narrower umbilicus.

***Polygyra suprazonata* n. sp.**

Shell depressed subglobose with low conoid spire and very narrow though deeply perforating umbilicus, somewhat enlarged at its opening; glossy, slightly wrinkle-striate, finely malleated in places; reddish brown, paler around the umbilicus and with a wide whitish band above the periphery. Whorls  $5\frac{1}{2}$ , those of the spire slowly increasing, the last wider, double the width of the preceding whorl, abruptly deflexed in front, rounded at the periphery and beneath, deeply constricted behind the lip. Aperture oblong, very oblique, with reflexed, white peristome; parietal fold a rather small oblique lamina recurved in a very short branch above; outer lip with a small tooth, above which there is a strong concave rib; basal lip bearing a small compressed tubercle and a slight thickening to the left of the tubercle.

Alt. 6.5, diam. 12 mm. ; width of umbilicus 1.5 mm.

Alt. 5.7, diam. 10.2 mm. ; width of umbilicus 1 mm.

Tzintzuntzan, State of Michoacan.

This is one of the largest Mexican species. It is allied to *P. chiapensis* (Pfr.) and *P. matermontana* Pils., differing from the

former in the distinct basal tooth, bi-ramose parietal lamina, coloration, etc., and from *P. matermontana* it differs in being more robust with far less open umbilicus and different coloration. *P. nelsoni* Dall (*Nautilus*, xi, p. 74), of which I have seen the types, is another species of the same group.

***Praticolella strebeliana* n. sp.**

Shell narrowly umbilicated, rather depressed, thin; uniform, pale corneous, having a dull sheen as if frosted, caused by an excessively minute roughening of the surface. Spire low conic; whorls  $4\frac{3}{4}$ , the first one glossy, obtuse, the rest slowly widening until the last, which is decidedly wider, moderately deflexed in front, the periphery obtusely angular on the first half, becoming rounded on the latter portion; scarcely any constriction behind the lip, but opaque there. Aperture oblique, wider than high, shortly elliptical, moderately excised by the parietal wall; peristome expanded, narrowly reflexed, with a slight rib-like thickening within; margins approaching, the basal regularly arcuate, columellar margin a little dilated at the insertion, slightly impinging on the narrow umbilicus.

Alt. 7.5, diam. 12 mm.; aperture, oblique alt. 5.7, width 7.2 mm., including peristome (type).

Alt. 6.5, diam. 10.2 mm. (smallest adult specimen).

Diente, near Monterey, State of Nuevo Leon, Mexico.

*Praticolella ampla* (Pfr.), which is the nearest to this species, differs in being far more globose, with a rounded-lunate aperture and more deeply arcuate basal lip, somewhat as in *Eulota similis*, while this species has a transversely elliptical, smaller aperture, with far less arcuate basal lip, and much more depressed body-whorl. *P. berlandieriana* and *griseola* are not closely allied to the present species.

*Praticolella strebeliana* is named in honor of HERMANN STREBEL, one of the ablest investigators of the Mexican molluscan fauna.

Numerous fresh specimens were collected, but only one was found living.

***Thysanophora proxima* n. sp.**

Similar to *T. conspurcatella* (Morel.), but with more elevated spire, narrower umbilicus and far wider spaced oblique cuticular

riblets. Whorls  $4\frac{1}{2}$ , very convex, the last well rounded. Aperture somewhat oblique, subrotund.

Alt. 2.8, diam. 3.7 mm.

Uruapam, State of Michoacan, Mexico.

About twenty specimens were collected at the above locality by Mr. and Mrs. Rhoads. Several immature shells of the same species were taken at Morelia, Michoacan, and a few occurred at Patzcuaro and Huingo in the same State. In Michoacan it seems to replace *T. conspurcatella* of the more tropical region eastward.

*T. impura* (Pfr.) and *T. hornii* (Gabb) are closely allied species, the former differing in the absence of oblique cuticular laminae.

A *Thysanophora* similar to *T. caeca*, but more elevated, was collected at Morelia, Michoacan. If the high contour is constant, it probably indicates another subspecies at least; but only one specimen was obtained.

***Omphalina montereyensis*** n. sp.

Shell about the size and general contour of *O. inornata*, depressed, umbilicated, the umbilicus about one-twelfth the diameter of the shell. Surface glossy, smooth, with slight growth-wrinkles, but no other sculpture. Whorls  $5\frac{1}{2}$ , rather flattened, and slowly increasing, the last whorl very much wider, more than double the width of the preceding one, rounded at the periphery; rather flattened beneath. Aperture oblique, broadly lunate oval.

Alt. 6, diam. 12; oblique height of aperture 5, width 6 mm.

Diente, near Monterey, State of Nuevo Leon, Mexico.

Numerous specimens were collected. It somewhat resembles *O. paradensis* Pfr., but is much more depressed.

***Glandina rhoadsi*** n. sp.

Shell oblong-fusiform, rather thin, glossy, reddish brown, with some slightly darker longitudinal streaks and whitish lines. Surface weakly and rather unevenly striated longitudinally, the striae stronger near the suture; no spiral sculpture. Spire elongated, with slightly convex outlines; apex obtuse; whorls  $7\frac{1}{2}$  to 8, the earlier ones regularly widening, the later two or three more rapidly increasing; sutures moderately impressed, very slightly crenulated by the fold-striae; not margined. Last whorl somewhat compressed, tapering below. Aperture small, rather narrow, a little less than one-half the total length of the shell, in adult shells; columella only weakly concave.

Alt. 52, diam. 18, length of aperture 24 mm.

Alt. 45, diam.  $16\frac{1}{2}$ , length of aperture 23 mm.

Alt. 42, diam. 14, length of aperture  $21\frac{1}{2}$  mm.

Diente, near Monterey, State of Nuevo Leon, Mexico.

The last measurements are of a specimen not quite mature, with  $7\frac{1}{3}$  whorls.

It is somewhat like *G. longula* or *G. singleyana*, but lacks any trace of spiral striation; the suture is only weakly crenulated, and not marginate. It is smoother than *G. liebmanni* and *G. audebardi*, especially at the sutures, and is of a more slender form.

*Glandina dalli* n. sp.

Shell thin, slender, turreted and slowly tapering above, broadest near the base, which is rather "saccate." Brownish corneous, slightly translucent, smooth and glossy throughout, except for rather separated, very short impressed grooves below the sutures forming a series of very short, low, broad folds there; and there are a few impressed, sinuous, longitudinal grooves, reminiscent of former peristomes, on the last whorl or two. Spire long, with very slightly convex lateral outlines and quite obtuse apex. Whorls  $8\frac{1}{2}$ , slightly convex, the last one compressed laterally and decidedly full below. Aperture small, very narrow above, broad and slightly squarish below, the outer lip thin, vertical, bent forward in the middle, strongly retracted below, giving the basal lip an effuse aspect. Columella short, strongly concave and conspicuously truncated below.

Alt. 20, diam. 6.2, length of aperture 9.5 mm.

Alt. 18, diam. 6.3, length of aperture 9.5 mm.

Alt. 19, diam. 6.2, length of aperture 9.8 mm.

Diente, near Monterey, State of Nuevo Leon, Mexico.

*Glandina dalli* belongs to a small group of Mexican species of small size and smooth, glossy surface, but seems abundantly distinct from any hitherto described. Compared with *G. bellula* C. and F., this species differs in being of narrower form, with longer, narrower aperture, the posterior portion of which is more prolonged and much narrower; also in the comparatively simple suture. It is more lengthened than *G. oblonga* Pfr., and less plaited at the sutures. *G. ambigua* Pfr. is stouter in form; and *G. conularis* Pfr. has a wider aperture and far more arcuate outer lip.

**Glandina michoacanensis** n. sp.

Shell obesely fusiform, rather thin, of a rather dark dull reddish color, with an irregular, pale sutural border. Surface slightly shining, coarsely and irregularly plicate and finely plicatulate longitudinally, the foldlets conspicuously decussated, cut into oblong grains, the spirals becoming obsolete at the extreme base. Spire rather thick, continuing stout above, the apex obtuse. Whorls 7 to  $7\frac{1}{2}$ , the earlier  $2\frac{1}{2}$  smooth, the next one evenly ribstriated, the last whorl oblong, rather obese, tapering below. Suture well impressed, coarsely and irregularly denticulate. Aperture rather small, its length (measured obliquely) a little exceeding half that of the shell; outer lip gently convex; columella quite concave in adult, straighter in immature specimens, strongly truncated at base.

Alt. 48.5, diam. 20.5, longest axis of aperture 25.7, greatest width 9.5 mm.

Uruapam, State of Michoacan, Mexico.

This species belongs to the first (*Plexæ*) of the several sections formed by Dr. von Martens in his excellent account of the genus in the *Biologia Centrali-Americana*. It might reasonably be supposed that so large a species from central Mexico would be known, but a thorough search through the literature, with the considerable collection of the Academy as a basis for comparison, fails to locate the specimens within any of the numerous Mexican species hitherto described. The dark, reddish color and conspicuous sculpture are its more striking features.

**Streptostyla novoleonis** n. sp.

Shell cylindric-oblong, blunt at the ends, dark reddish brown, very glossy, almost smooth, the growth-wrinkles being inconspicuous. Spire short, conic, the apex obtuse. Whorls  $6\frac{1}{2}$ , slowly increasing, the latter half or three-fourths of the last one very rapidly descending, the last whorl generally suddenly deflexed at its termination. Aperture very long and narrow; columella short, rather thin, moderately twisted.

Alt. 17.2, diam. 7, length of aperture 12 mm.

Alt. 16, diam. 6.7, length of aperture 11.8 mm.

Diente, near Monterey, State of Nuevo Leon, Mexico.

Smaller than *S. shuttleworthi* and the varieties subordinated



thereto by Dr. von Martens, short in the spire, markedly cylindrical, with the columella only weakly twisted. The region around Monterey is very different in physical characteristics from that inhabited by *S. shuttleworthi*. It is considerably further north than *Streptostyla* has heretofore been found.

**Salasiella pfeifferi** n. n.

This name is proposed for *Achatina pulchella* Pfr., *P. Z. S.*, 1856, p. 379, not *Achatina pulchella* Spix, 1827.

Dr. E. von Martens has figured the type, *Biologia Centrali-Americana*, Mollusca, p. 83, pl. 5, f. 9.

**Pseudosubulina berendti**, var. **occidentalis** n. v.

Numerous specimens collected at Uruapam, State of Michoacan, represent a variety of the East Mexican *P. berendti*, distinguished by the weaker, less crowded rib-striae and wider aperture. Alt. 15, diam. 3.2, oblique length of aperture 3 mm.; whorls 12. Alt. 12.7, diam. 2.8, oblique length of aperture 2.8 mm.; whorls 11½.

**Pseudosubulina texoloensis** n. sp.

Shell turreted, imperforate, faintly greenish yellow tinted, composed of numerous short, wide whorls, sculptured with close-set rib-striae separated by smooth, slightly wider intervals; outlines of spire decidedly concave above. Whorls 10½, convex, the ribs subobsolete on the base of the last one. Apex obtuse, the first whorl rapidly widening, smooth, the second becoming very finely rib-striate, the next three whorls more coarsely ribbed, scarcely increasing in width or in the diameter of the spire; following whorls gradually widening and increasing the diameter of the spire; last whorl short, moderately convex, abruptly contracting below. Aperture ovate-trapezoidal; columella moderately concave, abruptly truncated, *Achatina*-like, below.

Alt. 9.2, diam. 2.5, length of aperture 2 mm.

Texolo Falls, State of Vera Cruz, Mexico.

The shortness of the whorls and contraction of the upper part of the spire (as in the young of many species of *Urocoptis*), are the more prominent features of this species. The columella is much more strongly truncated than in *P. berendti*. Generic position not verified.

**Spiraxis uruapamensis** n. sp.

Shell turreted-conic, decidedly tapering, the lateral outlines a little concave above; corneous, with white riblets; apex obtuse.

Whorls  $7\frac{1}{2}$ , very convex, separated by deeply impressed sutures; first half whorl smooth, following whorl very finely lamellose-striate; succeeding whorls with numerous, delicate, raised riblets, about 42 in number on the penultimate whorl. Aperture short-oval, somewhat trapezoidal; columella thick, strongly sinuous.

Alt. 5.2, diam. 2 mm.

Uruapam, State of Michoacan, Mexico.

This species is more obtuse than *S. sulciferus* and its variety *berendti*; has more convex whorls than *S. tenuicostatus* Streb., and is stouter than *S. miradorensis* Streb., with closer riblets. *S. tenuis* is an allied form, which should be compared.

**Opeas patzcuarensis** n. sp.

Shell minute, slender, obtuse at the apex, slowly tapering, rather cylindric or rod-shaped. Whitish corneous, glossy and smooth, showing slight, sparse growth wrinkles under a lens. Whorls  $7\frac{1}{2}$ , moderately convex, the last tapering at base. Aperture long, irregularly ovate; columella straight, vertical.

Alt. 3, diam. 0.8 mm.

Patzcuaro, State of Michoacan, Mexico.

A very small species, unlike any other Mexican form known to me. Numerous specimens were collected.

**Opeas odiosum** n. sp.

Shell slender, turreted, completely imperforate, corneous, sufficiently translucent to show the columella faintly through. Surface glossy, irregularly scored by unequally spaced longitudinal grooves and some slight wrinkles. General outlines of the spire straight; apex obtuse. Whorls  $8\frac{1}{2}$ , the earlier strongly convex, the last two slightly flattened. Aperture ovate; outer lip thin, moderately arched forward, columella slightly concave, forming a distinct angle with the parietal wall. Alt. 6.9, diam. 2, longest axis of aperture 1.5 mm.

Patzcuaro, State of Michoacan, Mexico.

The impressed grooves are similar in character to those of *Vitrea indentata* and other species of *Glyphyalinia*. About forty specimens were collected.

**Opeas rhoadsæ** n. sp.

Shell slender, subulate, wholly imperforate, corneous and sufficiently translucent to show the internal axis through the shell in

places. Surface glossy, sculptured with unequally spaced longitudinal grooves, and showing a few slight growth-wrinkles in places. General outlines of the spire straight. Apex obtuse. Whorls 9 to  $9\frac{1}{2}$ , the earlier ones quite convex, the later four or five somewhat flattened. Aperture small, ovate, the outer lip a trifle curved forward in the middle; columella slender, concave.

Alt. 7, diam. 1.9, longest axis of aperture 1.6 mm.

Alt. 7, diam. 1.7, longest axis of aperture 1.6 mm.

Diente, near Monterey, State of Nuevo Leon, Mexico.

Similar in sculpture and color to *Opeas odiosum*, but perceptibly more slender in the spire, with smaller apex. These two species have the general form of *Opeas subula*, but differ totally in sculpture; they are also more brilliant and more transparent. The columella is not at all twisted, and there is no trace of a basal notch or truncation. This species, of which about fifteen specimens were obtained, is named in honor of Mrs. Mary C. Rhoads.

***Bifidaria prototypus* n. sp.**

Shell small, subcylindrical, somewhat tapering above, brownish corneous, thin. Whorls 5, convex; apex obtuse. Aperture truncate-oval; peristome expanded. Teeth: the parietal bifid, composed of two laminae, that on the right running outward to the posterior termination of the outer lip, more or less united at its inner end with the left lamina, which is more deeply seated, and enters deeply; a rather high tooth at the middle of the columella; and a similar but smaller and short denticle moderately remote from the lip-edge, at the junction of the outer with the basal walls of the aperture. Usually there is a minute denticle above the last-described denticle.

Alt. 2.5, diam 1 mm.

Huingo, State of Michoacan, Mexico.

This species has the general appearance of *Pupa rupicola*, but differs markedly in dentition. There are only two denticles within the outer lip, none at the base of the columella. The parietal armature illustrates clearly the origin of the bifid fold of the *Bifidaria* of the United States, retaining the ancestral form more than any American species I have examined. There are two folds, one to the right and more emerging, the other to the left and more deeply entering; the two more or less connected by a callus at the inner termination of the right tooth.

**Succinea tlalpamensis** n. sp.

Shell pointed-oblong fragile, honey yellow or reddish, somewhat translucent; *strongly, finely and rather irregularly, closely wrinkled*. Spire slender, acuminate; whorls  $2\frac{1}{2}$ , very obliquely convoluted, the last scarcely convex above. Aperture very large, ovate, somewhat effuse at the base; columella with a white thread-like edge.

Alt. 15, diam. 8, longest axis of aperture 11.8, greatest width 7 mm.

Alt.  $14\frac{1}{2}$ , diam.  $8\frac{1}{2}$ , longest axis of aperture 12, greatest width  $7\frac{1}{2}$  mm.

Near Tlalpam, State of Mexico, Mexico.

Allied to *S. retusa* Lea (*ovalis* Gld. non Say) and *S. salleana* Pfr. Compared with the former, *S. tlalpamensis* has a decidedly larger aperture in proportion to the last whorl, as viewed from the front. The spire is longer and more slender than in *S. salleana*.

At Lake Cuitseo, near Huingo, State of Michoacan, a much smaller form was collected, in which the aperture is not so ample, and less effuse below. Two specimens measure:

Alt. 10.8, diam. 5.5, longest axis of aperture 8, greatest width 4.7 mm.

Alt. 9.6, diam. 5.8, longest axis of aperture 7.7, greatest width 4.3 mm.

This may be called var. *cuitseana*. It has the same number of whorls as the type.

**Physa osculans rhyssa** n. var.

Smaller than typical *P. osculans*, pale yellow corneous, transparent and fragile, with *numerous slight longitudinal folds* on the last whorl.

Saltillo, State of Coahuila, Mexico.

**Sphærium martensi** n. sp.

A moderately large, thin species, showing no distinct prodissoconch at the beaks; ovate, moderately convex, with median, slightly prominent beaks, the surface lusterless, yellowish corneous, finely and irregularly striated, nearly smooth toward the beaks; anterior end narrower, symmetrically rounded; posterior end wider, obscurely truncated obliquely; hinge line slightly convex; basal margin moderately convex. Interior whitish in clean shells; hinge delicate, the left valve with a small, erect, compressed car-

dinal tooth, with a lower, very thin one above it and slightly more posterior; anterior lateral short, erect, thin and triangular; posterior lateral short and low. Right valve with two subequal, erect, squarish cardinals, one behind the other, separated by a deep V-shaped notch; laterals double, the anterior very short, the posterior longer, low.

Length 15.5, alt. 11, diam. 7.6 mm.

Tzintzuntzan, Lake Patzcuaro, State of Michoacan, Mexico.

This is a rather large species, more fragile than those of the non-calyculate group in the United States. Compared with *S. subtransversum* Prime, which has the same general outline, this species differs in the broader beaks, which do not show the prominent "caps" or prodissoconch of *S. subtransversum*; the cardinal teeth are much thinner, more compressed, and the lateral laminae are less elevated. It does not seem closely allied to any of the American species I have been able to compare with it.