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NOTES ON MEXICAN MOLLUSKS. II

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THIS is the second in a series of papers on non-marine Mexican mollusks in the University of Michigan Museum of Zoology (UMMZ). The first appeared in the Nautilus (Solem, 1954). Instead of reporting on specimens from geographic areas, however, information about particular species or species groups is summarized.

The helminthoglyptid subgenera *Miraverellia* and *Discolepis* are reviewed; several localities are recorded for West Mexican *Orthalicus*; the status of *Drymaeus colimensis* (Rolle) is re-examined; the genus *Polygyra* of Michoacan is discussed and a new species, *Polygyra (Erymodon) pergrandis,* is described; and the West Mexican genus *Tryonigens* is summarized.

These studies were undertaken at the University of Michigan Museum of Zoology (UMMZ), the Academy of Natural Sciences of Philadelphia (ANSP) while I was a Jessup Fellow in the summer of 1955, the United States National Museum (USNM), and the Chicago Natural History Museum (CNHM), in the summer of 1956. I am indebted to the Jessup Fund Committee of the Academy of Natural Sciences of Philadelphia for their financial support, and to Drs. Henry van der Schalie, Henry A. Pilsbry, R. Tucker Abbott, Harald A. Rehder, Fritz Haas, and Mr. Fred G. Thompson for assisting me in many ways.

Miraverellia Baker, 1922, and *Discolepis* Ancey, 1904

Included in the genus *Averellia* Ancey, 1887 (type *Helix macneili* Crosse, 1873), are the subgenera *Trichodiscina* Martens, 1892 (type *Helix coactiliata* Ferussac, 1838), *Discolepis* Ancey, 1904 (type *Helix desidens* Rang, 1834), and *Miraverellia* H. B. Baker, 1922 (type *Helix sumichrasti* Crosse and Fischer, 1872). Baker (1922: Pl. 17) figured the radulae and jaws of *Trichodiscina* and *Miraverellia* and later

(Baker, 1927: 242–243, Pl. 20, Figs. 53–57) the pallial organs and genital anatomy of *Averellia* (*Trichodiscina*) *cordovana* (Pfeiffer). Otherwise the soft parts are unstudied.

Baker (1927: 243) concluded that *Averellia* is related to the other Mexican "helicid" genera, *Leptarionta, Lysinoe,* and *Humboldtiana.* Pilsbry (1939: 24–26) discussed the Helminthoglyptidae and suggested that the fourteen genera be placed in eight subfamilies, only four of which were represented in the United States. *Humboldtiana* was placed in the Humboldtianinae, presumably leaving *Averellia* and *Leptarionta* in the Xanthonycinae (Strebel and Pfeffer, 1879).

Averellia, s. s., has been found in Costa Rica and Panamá; *Trichodiscina* from Venezuela and Trinidad north to Monterey, México; *Discolepis* on Martinique in the Lesser Antilles; and *Miraverellia* in Veracruz, Oaxaca, and Michoacán, in México, and in northern Guatemala. *Averellia* has a strong infolding of the last whorl; *Trichodiscina* is small, banded, and has the body whorl rounded; and *Discolepis* and *Miraverellia* are larger (about 15 mm.), unicolored, and have the body whorl keeled. The latter two taxa are very similar, differing conchologically only by the narrower umbilicus of *Discolepis.*

The conchological similarity of *Discolepis* and *Miraverellia* may be the result of a remarkable convergence or may indicate derivation from the same ancestral stock. Since *Trichodiscina* is so widely distributed, it naturally becomes a possible "Urtypen" from which *Discolepis* and *Miraverellia* have independently evolved. Without dissection of the soft parts, however, relationships remain questionable. Because of the close conchological similarity, it has been thought worthwhile to figure the Mexican and Martinique shells for comparison. No attempt is made to diagnose the supra-specific categories, since no soft parts were available and the previously published data are inadequate.

Averellia (*Miraverellia*) *sargi* (Crosse & Fischer)
(Pl. I, 13–15)

Helix sargi Crosse & Fischer, 1872, Jour. de Conchy., 20: 146–47—Tamahú, Vera Paz, Guatemala (Sarg); von Martens, 1875, Proc. Zool. Soc. London, 1875: 648—Coban, Vera Paz, Guatemala.

Helix (*Aglaia*) *sargi* Crosse & Fischer, 1873, Jour. de Conchy., 21: 277–78, Pl. 9, Fig. 2; Fischer & Crosse, 1902, Miss. Sci. Mexique, Moll., 2: 664, Pl. 71, Figs. 6–6b.

Helix (*Trichodiscina*) *sargi* Crosse & Fischer, von Martens, 1892, Biol. Centrali-Americana, Mollusca, p. 137.

RANGE.—Coban and Tamahú, Vera Paz, Guatemala.

MATERIAL.—Coban (CNHM 39730, Webb, Gude, Hamburg Museum).

REMARKS.—The large size (diameter 25–28 mm.) and weak medial keel separate *sargi* from the Mexican *Miraverellia*.

Averellia (Miraverellia) sumichrasti (Crosse & Fischer)
(Pl. I, 4–9)

Helix sumichrasti Crosse & Fischer, 1872, Jour. de Conchy., 20: 147—La Huallaga, México (Sumichrast).

Helix (Trichia) sumichrasti Crosse & Fischer, 1873, Jour. de Conchy., 21: 265–66, Pl. 9, Figs. 4, 4a; Fischer & Crosse, 1902, Miss. Sci. Mexique, Moll., 2: 664–65, Pl. 71, Figs. 7a–7b.

Helix (Trichodiscina) sumichrasti Crosse & Fischer, von Martens, 1892, Biol. Centrali-Americana, Mollusca, p. 137—Soledad, between Córdoba and Orizaba, Veracruz (Höge).

Epiphragmophora (Trichodiscina) verdensis Dall, 1910, Nautilus, 24 (3): 35–36—Hot Springs near Río Verde, Oaxaca (Orcutt).

Averellia (Miraverellia) sumichrasti (Crosse & Fischer), H. B. Baker, 1922, Occ. Papers, Mus. Zool. Univ. Mich., 106: 58–60, Pl. 17, Figs. 8, 10—Hacienda Cuatotolapam, Acayucan, Veracruz (Baker).

RANGE.—Oaxaca (La Ollaga, Río Verde), Veracruz (Hacienda Cuatotolapam, Soledad), Michoacán (Morelia, San José de la Cumbre).

MATERIAL.—Hacienda Cuatotolapam, Veracruz (UMMZ 31857); Morelia, Michoacán (UMMZ); San José de la Cumbre, Michoacán (UMMZ 195402); Rio Verde, Oaxaca (USNM 212318 cotypes of *verdensis* Dall).

REMARKS.—Numerous problems relate to the identity and relationship of the two named forms. The type locality "La Huallaga" has been taken by von Martens to be a mistake for Laoyaga or Laollaga (La Ollaga on U. S. Air Force map) located at 95° 10′W, 16° 35′N on the Isthmus of Tehuantepec. Sumichrast collected in this region, and, on the basis of evidence from *verdensis* Dall, La Ollaga is here selected as the type locality for *Helix sumichrasti*.

At the same time that he described *Epiphragmophora verdensis*, Dall named *Anisospira orcutti* from the same locality. I have shown (Solem, 1957:6) that the type locality is probably the town, Río Verde (95°W, 16° 38′N) above Tehuantepec, rather than the river in western Oaxaca. The proximity of Río Verde and La Ollaga suggested that the two species might be synonymous.

Comparison of the types of *verdensis* and the description of *sumichrasti* confirmed their probable identity. The original description of *sumichrasti* mentions "une légère dépression au-dessus de la carène" and the types of *verdensis* show a similar supra-peripheral groove. The original measurements given for *verdensis* are inaccurate, and there is no significant size difference (Table I) between *verdensis* and *sumichrasti*. The type of *sumichrasti* is in the collection of the *Journal de Conchyliologique* in Paris (see Jour. de Conchy., 90: 79), but could not be consulted for this study. No differences between *sumichrasti* and *verdensis* could be found and the two are probably synonymous.

TABLE I

COMPARATIVE MEASUREMENTS (MM.) AND RATIOS OF *Averellia sumichrasti*

Specimen	Height	Diameter	H/D ratio	Whorls	Umbilicus	D/U ratio
Holotype of *sumichrasti*	7.0	16.0	0.44	4 1/3	—	—
USNM 212318 (Holotype of *verdensis*)	8.6	18.9	0.45	4 7/8	3.8	4.97
USNM 212318a (Paratypes of *verdensis*)	8.8	18.4	0.48	5 1/8	3.9	4.72
	7.0	16.1	0.42	4 3/4	3.6	4.47
UMMZ 31857	8.6	17.6	0.46	4 5/8	3.4	5.17
UMMZ (Morelia)	7.7	18.0	0.39	4 3/8	4.3	4.18
UMMZ 195402	7.6	16.3	0.47	4 1/4	3.2	5.09

The relationship of the Michoacán and Veracruz populations to the Oaxacan is uncertain. Only six adult shells of *A. sumichrasti* were seen, three cotypes of the Oaxacan *"verdensis,"* one from Veracruz and two from Michoacán. The latter three differ from the Oaxacan shells in not having a supra-periphereal groove. Without more material than is available, recognition of the Veracruz and Michoacán populations as a distinct subspecies is inadvisable. No differences could be found between the Michoacán and Veracruz populations, and the only difference from the Oaxacan shells is the absence of a supra-peripheral groove.

Illustrations (Pl. I, 4–9) are of adults from Veracruz and Michoacán; comparative measurements (Table I) are of the original dimensions of *sumichrasti* and of the six adults examined.

Averellia (Discolepis) desidens (Rang)
(Pl. I, 10–12)

Helix desidens Rang, 1834, Guerin's Revue et Mag. de Zool., 1834: 48—Mt. Pelee, Martinique; Deshayes, 1840, Ferussac's Hist. Nat. Moll. terr. fluv., I: Pl. 69K, Figs. 5–7; Pfeiffer, 1847, Monog. Helic. viv., I: 378; Pfeiffer, 1852, Syst. Conch. Cab., I, 12 (2): 64, Pl. 77, Figs. 10–13; Ancey, 1904, Jour. de Conchy., 52: 297–98.

Helix ancylochila Crosse, 1868, Jour. de Conchy., 16: 176—Locality unknown; Crosse, 1870, *Ibid.*, 18: 101, Pl. 1, Fig. 1.

Cepolis (Eurycampta) desidens (Rang), Pilsbry, 1894, Man. Conch., (2) 9: 181.

Eulota (Plectotropis) ancylochila (Crosse), Pilsbry, 1894, Man. Conch., (2) 9: 209.

RANGE.—Martinique, West Indies.

MATERIAL.—Martinique (CNHM 39880, Webb; UMMZ 92502, Walker); Marne Rouge, Martinique (CNHM 40361, Webb).

REMARKS.—The conchological differences between *A. desidens* and *A. sumichrasti* are very slight. The former (Pl. II, 17) has fewer, more prominent bristles, a narrower umbilicus, and slightly more prominent radial sculpture than the latter (Pl. II, 18). In details of whorl increase, color, aperture, and carination, practically no differences can be seen. Without study of the soft parts, the relationship between the two taxa cannot be established.

Pending study of the soft parts, both *Discolepis* and *Miraverellia* are retained as separate subgenera of *Averellia,* although the conchological differences by themselves are not sufficient to warrant subgeneric separation. Measurements of three specimens of *A. desidens* are given in Table II.

TABLE II
MEASUREMENTS (MM.) AND RATIOS OF *Averellia desidens*

Specimen	Height	Diameter	H/D ratio	Whorls	Umbilicus	D/U ratio
CNHM 39880	8.1	15.8	0.51	4 3/8	1.5	10.5
CNHM 40631	8.0	16.7	0.48	4 1/2	1.8	8.3
UMMZ 92502	7.9	15.7	0.50	4 3/8	1.8	8.7

Ancey (*loc. cit.*) recognized the identity of *desidens* and *ancylochila* after examining the type of the latter in the collection of the *Journal de Conchyliologique,* and his conclusion is accepted.

MEXICAN *Orthalicus*

The following notes concern lots of *Orthalicus* from western México, collected by staff members of the University of Michigan

Museum of Zoology. The most recent monographic survey of the Orthalicinae is by Strebel (1909). In many respects Strebel's ideas of speciation and variation were ahead of his time, but unfortunately he chose to work completely outside the system of binomial nomenclature and ignored priority, type designations, and other aspects of the nomenclatural code and procedures.

Revision of the Mexican Orthalicinae is not possible at the present time. Insufficient material is available and population studies are needed to understand the true importance of certain conchological variations. The present survey attempts only to localize certain morphs and offer a few comments on nomenclature and type localities. Apparently, as in *Liguus,* neighboring colonies of *Orthalicus* may present quite different color patterns and shapes. Particularly in the Tehuantepec region, many colonies have been given specific status, but probably will be found to be local variations.

Orthalicus longus Pfeiffer

Orthalicus longus Pfeiffer, 1865, Malak. Blätt., 12: 39—Mexico.
Oxystyla longa (Pfeiffer), Pilsbry, 1899, Man. Conch., (2) 12: 126–29, Pl. 20, Figs. 20–26, 29; Pl. 21, Figs. 33–36; Pl. 22, all figures; Pl. 23, Figs. 16–18.

The specimens referred to this species vary widely in shape and coloration. In the material examined, however, no clear divisions into named varieties could be made. In the lists below, lots are compared with the illustrations in Strebel (1909) which most closely approximate the specimens.

Relatively short shells with white nuclear whorls and a color pattern of longitudinal streaks are usually placed in var. *boucardi.* The following lots from Oaxaca are referable to this variation: San Geronimo, UMMZ 50233 (Strebel, 1909: Pl. 14, Figs. 220–21); Tehuantepec City, UMMZ 145871 (Strebel, 1909: Pl. 14, Fig. 212); 20 miles west of Tehuantepec City, UMMZ 186141 (Strebel, 1909: Pl. 14, Figs. 208–09).

Some specimens from the same general region in Oaxaca have purple nuclear whorls and a color pattern of both longitudinal streaks and spiral bands. The shells are nearer typical *longa* in shape; the lots are from: 10 miles west of Tehuantepec City, UMMZ 186142 (Strebel, 1909: Pl. 13, Fig. 192, 197, one specimen each); Santa Cruz Bay, UMMZ 130345 (Strebel, 1909: Pl. 13, Fig. 197, but with much broader stripes).

Orthalicus princeps (Broderip)

Bulinus princeps Broderip, Sowerby, 1833, Conchological Illus., *Bulinus,* Fig. 18—Conchagua, El Salvador.

Zebra princeps (Broderip), Strebel, 1909. Rev. Unterfam. Orthalicinen: 19–25, Pl. 1, Figs. 1–3, 5–11, 13–16; Pl. 2, Figs. 21, 25–28, 31–32.

A variety, *fischeri* von Martens, was described from Mazatenango, Guatemala, but shells from Escuintla, Chiapas, Mexico (UMMZ 128938), are the same as Veracruz material of typical *princeps.*

Orthalicus ponderosus Strebel

Orthalicus ponderosus Strebel, 1882, Beitr. Mexik. L.–und Süsswasser Conchyl., 5: 35–36, Pl. 7, Figs. 1, 5–8—Mexico; von Martens, 1893, Biol. Centrali-Americana, Mollusca, p. 190, Pl. 11, Figs. 10, 10a—San Blas, Nayarit; Cualata, Colima; Acapulco, Guerrero.

Zebra mars (Pfeiffer), Strebel, 1909, Rev. Unterfam. Orthalicinen: 59–61, Pl. 11, Figs. 170–72.

Specimens referable to this species were collected by William Duellman in the Sierra de Coalcomán, Michoacán on the trail from Pomare to Maruata (coastal town) at 700 feet elevation (UMMZ 186139) and the trail from Los Pozos to Rancho Quemado at 4500 feet elevation (UMMZ 186140). Both of these localities are on the west side of the Río Cachon and are much closer to the coast than to the town of Coalcomán, where another species was found. The specimens are closest to those from Colima figured by Strebel.

The Acapulco population was named *miles* by Strebel (1909: 64–65, Pl. 12, Figs. 183–84, 186–89). Examination of near topotypic series (UMMZ 130486, 175306) from Puerto Marquez, 17 miles north-northeast of Acapulco, fails to support the specific separation. Possibly the Guerreran shells are subspecifically distinct from those farther north, but the evidence is inconclusive.

Orthalicus zoniferus Strebel

Orthalicus zoniferus Strebel, 1882, Beitr. z. Mexik. L.–und Süsswasser Conchy., 5: 28–29, Pl. 1, Figs. 7a, b—Iguala, Guerrero.

Zebra zoniferus (Strebel), 1909, Rev. Unterfam. Orthalicinen: 51–56, Pl. 8, Figs. 112–15, 118–19.

Specimens were seen from Laguna Coyuca, Guerrero (UMMZ 181542), Tafetan (100° 54′W, 19° 25′N), between Tzítzio and

Heutamo, Michoacán (UMMZ 169568), and 1.2 miles south of Charapéndaro (101° 58′W, 19° 15′N), Michoacán (UMMZ 186137). The shell from Tafetan is nearest var. *major* Strebel (1909: Pl. 8, Figs. 116–17, 124–26), previously reported from Chilpancingo, Guerrero; the shell from Laguna Coyuca is nearest var. *euchrous* Strebel (1909: Pl. 8, Figs. 120–23, 127, Pl. 9, Figs. 128–29), although the color bands are wider in the UMMZ shell; and the Charapéndaro specimen is nearest the type figures.

These are the first records from Michoacán, although its presence in that state is not surprising.

Orthalicus lividus von Martens

Orthalicus lividus von Martens, 1863, Monatsber. Akad. Wiss. Berlin, 1863: 542—Volcán de Jorullo, Michoacán.

Zebra lividus (von Martens), Strebel, 1909, Rev. Unterfam. Orthalicinen: 48–49, Pl. 7, Figs. 101–06.

Topotypic specimens were collected from the north slope of the Volcán Jorullo at 2700–4200 feet elevation (UMMZ 186138). Unfortunately preservation in formalin had leached the color from the shells.

Orthalicus quagga (Strebel)

Zebra quagga Strebel, 1909, Rev. Unterfam. Orthalicinen: 41, Pl. 6, Figs. 92–94, 96—no locality.

Zebra livens, form *aberrans* Strebel, 1909, *Ibid.,* pp. 43–44, Pl. 5, Figs. 74–77, 79–80—Colima.

Specimens (UMMZ 195398) from 3 miles north of Santa Isabel (104° 32′W, 21° 10′N) Nayarit, are intermediate between *quagga* and *aberrans* in that only the tip of the apex is darkened. The major difference between *quagga* and *aberrans* is the apical color—white in *quagga,* purple in *aberrans.* Probably the two are synonymous. The type locality of *quagga* is unknown while *aberrans* is from Colima.

Several lots of shells collected by William Duellman and Fred G. Thompson on the Cerro de Guzman near Coalcomán, Michoacán, are very close to *quagga* (UMMZ 195400, 195401). They differ in having the color streaks wider and more closely spaced, the longitudinal growth lines more prominent and closer together, and the apertural color band wider (Pl. II, 19). Not enough specimens of *quagga* were available to assess the importance of this variation, and, pending study of Colima specimens of *quagga,* the Michoacán material is not taxonomically recognized.

Drymaeus colimensis (Rolle)
(Pl. I, 16)

Otostomus colimensis Rolle, 1895, Nachr.-Bl. d. Malak. Gesell., 1895: 130—Colima; von Martens, 1901, Biol. Centrali-Americana, Mollusca: 630, Pl. 44, Fig. 9.
Drymaeus colimensis (Rolle), Pilsbry, 1899, Man. Conch., (2) 12: 47.

Four paratypes of *colimensis* (UMMZ 124996, Walker, Rolle) were examined. *D. colimensis* is separated from the *serperastrus-attenuatus-fenestrellus* series by its slender spire, purple aperture and widely rimate umbilicus. In shape and umbilical size, *D. colimensis* is perhaps most similar to the Guatemalan *D. liliacinus* (Reeve). The latter has a color pattern of spiral bands and heavier sculpture. The figure in von Martens (*loc. cit.*) is inadequate and the opportunity is taken to refigure *D. colimensis.*

Polygyra from Michoacán

The Jaliscan species of *Polygyra* (*Erymodon*) have been listed elsewhere (Solem, 1957). *Polygyra matermontana* Pilsbry, 1896, comes from Colima, and there are two published records for Michoacán:—*P. plagioglossa* (Pfeiffer) from Pátzcuaro and *P. suprazonata* Pilsbry from Tzintzuntzan. *P. couloni* (Shuttleworth) has been reported from Sayula, Jalisco; Cuernavaca, Morelos; and Omilteme (a cattle ranch 18 miles from Chilpancingo), Guerrero. It probably will be found in central Michoacán. I have not seen specimens of *P. couloni,* but it is easily recognized by its short unbranched parietal lamella, no upwards extension of the outer lip tooth, and very globose shape.

Material from the coastal sierra of Michoacán collected by Fred G. Thompson, William E. Duellman, and L. D. Beatty extends the known range of *P. suprazonata* and adds the largest Mexican *Polygyra* yet discovered.

Polygyra (*Erymodon*) *suprazonata* Pilsbry

Polygyra suprazonata Pilsbry, 1899, Proc. Acad. Nat. Sci. Philadelphia, 1899: 393–94—Tzintzuntzan, Michoacán (UMMZ 113222); Pilsbry, 1903, *Ibid.,* 1903: 763, Pl. 41, Figs. 1, 1a, 1b.

Specimens from the Sierra de Coalcomán, Coalcomán (UMMZ 181391); 1 mile north of San Pedro Damian (UMMZ 198392), Sierra de Coalcomán; 7–8.5 miles north of Uruapan, 6800–7200 ft. (UMMZ 195354); and 9.5 miles north of Carapan, Michoacán 6800 ft. (UMMZ 195414, 195415), were compared with paratypes of *P. suprazonata* (UMMZ 113222). The coastal specimens are identical in shape, colora-

tion, apertural armature, and sculpture, but are only about one-half the size of the paratypes. The latter are 11.5–12.0 mm. in diameter; the former 8.5–9.0 mm. Other than this size difference, there are no distinguishing characteristics.

P. suprazonata is closely related to the *ventrosula* complex of Nayarit and Sinaloa. It differs from the Jaliscan *Erymodon* in being nearly smooth and having a wide, whitish band above the periphery of the body whorl. The Coliman *P. matermontana* differs in being unicolored, less globose, and having a far more open umbilicus.

***Polygyra* (*Erymodon*) *pergrandis*,** new species
(Pl. I, 1–3)

DIAGNOSIS.—*A Polygyra* of the subgenus *Erymodon* characterized by its large size, depressed-conoidal shape, very prominent V-shaped parietal lamella, and close-set radial ribbing.

DESCRIPTION.—Shell large, very depressed-conoidal, spire slightly elevated, but not inflated. Whorl 6 to 6¾, very slowly increasing in size, flattened, sutures lightly impressed. Body whorl obtusely keeled, last 2 mm. sharply descending, aperture deflected about 55 degrees from plane of shell axis, with an indentation behind the lip. Apical whorls 1½, weakly radially ribbed. Remaining whorls with low, close-set, retractive ribs crossed by faint spiral lines. Sculpture weaker on base than above periphery. Aperture elongate-ovate, with prominent dentition. Parietal lamella long, V-shaped, with upper end of V reaching the parietal lip margin, and the lower end the parietal-columellar margin. Lip white, reflected, with one basal denticle (bifurcate in a few specimens) and one outer lip denticle with a long upwards extension. Umbilicus small, contained 6.5 to 9.2 times in the diameter, partially covered by a reflection of the columellar lip. Color greenish-horn, becoming lighter near the umbilicus. Parietal callus thin, transparent. Diameter of holotype, 19.6 mm.; height, 10.8 mm.; 6⅜ whorls.

HOLOTYPE.—UMMZ 191180: Cerro de Barolosa, north of Coalcomán, Sierra de Coalcomán, Michoacán, México, 9000 feet elevation; Fred G. Thompson, July 5, 1955.

PARATYPES.—UMMZ 191181, 191182 (topotypes): Acuaro de las Lleguas, Cerro de Barolosa, 7500 feet elevation, Fred G. Thompson and L. D. Beatty, July 5, 1955; UMMZ 191183, 191184; CNHM 57521; ANSP 209778; and USNM.

COMPARISONS.—The apertural dentition, except for the absence of

a second tooth on the basal lip, allies *P. pergrandis* to the *ventrosula* complex of northwestern México. In no basal lip tooth, *P. pergrandis* is similar to the Jaliscan *P. cantralli* Solem (1957), but that species has a reduced parietal lamella. In the sculpture of ribs crossed by spiral lines, *pergrandis* is related to the *nelsoni-cantralli* complex of Jalisco (Solem, 1957), but differs from that series, as well as from all other Mexican *Polygyra,* by its conoidally depressed shape and large size (diameter 17.7–21.5 mm.). The next largest Mexican *Polygyra* belonging to *Erymodon* is less than 15 mm. in diameter.

REMARKS.—The sixteen type specimens were collected at 7500 and 9000 feet elevation, four from the higher and twelve from the lower site. The specimens from the lower altitude were slightly smaller than the others. The differences between the two populations are shown in Table III. Size variation of this type is common among land mollusks and seems to be usually dependent upon slight differences in moisture supply. In both locations the shells were found under rotting pine logs.

TABLE III

DATA ON TWO POPULATIONS OF *Polygyra*

	9000 Feet		7500 Feet	
	Mean	Range (mm.)	Mean	Range (mm.)
Height	10.5	10.1–10.8	9.85	8.5–11.0
Diameter	20.0	19.3–21.5	19.3	17.7–21.1
H/D ratio	52.6	49.8–55.2	51.2	48.0–57.0
Whorls	6 3/8	6 1/4–6 3/8	6 1/4	6 –6 5/8
Umbilicus	2.6	2.1–3.0	2.4	2.2– 3.0
D/U ratio	7.72	7.17–9.20	7.44	6.53–8.42

The only species of *Erymodon* that was previously dissected is *Polygyra texasiana* (Moricand). Most of the specimens of *P. pergrandis* had been relaxed and preserved in alcohol. It was impossible to extract the entire soft parts, and satisfactory dissections could be obtained only by destruction of the shell. Several specimens had died with the functional genitalia completely everted, so that observation of both the "functional" and "quiescent" aspects could be made. The genitalia of *P. pergrandis* is almost identical to that of *P. texasiana* as figured by Pilsbry (1940: 614, Figs. A, a). The one important difference is that *P. pergrandis* has a distinct "free" oviduct, while in *P. texasiana* the spermatheca is inserted much nearer the base of the spermoviduct. Neither species has any penial appendages.

The internal structure of the penis of *P. pergrandis* is complex. The lower portion has the walls folded and gives the false impression of being sculptured with minute pilasters. Similarly, the "epiphallic" portion of the penis is much contracted and the walls convoluted. The swollen middle part of the penis, when opened, appears to contain two or three large pilasters. In the everted condition, there is a single rugose stimulatory pad which is situated slightly to the front of the functional gonopore. The pad is not tuberculate or papillate as in some Polygyridae, but is only rugose. When everted, the pad has a roughly oval shape and the surface is hard and finely "pebbled." Unlike many Polygyridae, the stimulator is flat, not club-like. In comparison with the mating anatomies of the Polygyridae figured by Glenn R. Webb, that of *P. pergrandis* is perhaps most similar to *Stenotrema hubrichti* Pilsbry (Webb, 1947: 220).

Genus *Tryonigens* Pilsbry, 1927

Pilsbry (1927: 189–91) described a new genus, *Tryonigens,* for the West Mexican *Helix remondi* Tryon, 1863. The shell and some of the anatomical features resemble *Sonorella,* but it is probably more closely related to *Leptarionta.* The single species ranges from Guerrero north to Sonora.

Tryonigens remondi (Tryon)

Helix remondi Tryon, 1863, Proc. Acad. Nat. Sci. Philadelphia, 1863: 281, Pl. 2, Fig. 1—Sinaloa, Mexico; Pilsbry, 1905, *Ibid.,* 1905: 256–57.

Arionta remondi Tryon, 1866, Amer. Journ. Conch., 2: 318, Pl. 5, Fig. 18—near Mazatlán, México.

Helix verrilli Ancey, 1887, Conch. Exch., 2 (5): 63—Ventanas, Durango.

Helix trypanomphala Pfeiffer, var. *remondi* Tryon, von Martens, 1891, Biol. Centrali-Americana, Mollusca, p. 143—Guaymas, Sonora; Tepic, Nayarit; Sayula, Jalisco.

Epiphragmophora remondi (Tryon), Pilsbry, 1895, Nautilus, 9 (6): 72; Ancey, 1904, Jour. de Conchy., 52: 312–14.

Tryonigens remondi (Tryon), Pilsbry, 1927, Proc. Acad. Nat. Sci. Philadelphia, 79: 189–191—Manzanillo, Colima.

RANGE AND MATERIAL.—*Guerrero*: Zihuatanejo (ANSP 195127); Agua del Obispo, 2900 ft. (UMMZ). *Michoacán*: Cerro de Guzman, Coalcomá, 3200 ft. (UMMZ 195399). *Colima*: Manzanillo (ANSP 84388). *Jalisco*: Sayula (von Martens); Puebla de Santa Catarina (USNM 153111). *Nayarit*: 20 km. east of Yago (ANSP 166437); Río Tepec, 5 km. below Tepic (ANSP 166227, 166448); Tepic (USNM). *Sinaloa*: Mazatlán (ANSP 58122, 58123); Rosario (ANSP 73996);

Pánuco, 1800 ft. (ANSP 166233, 166453, 166495). *Durango*: Ventanas (Ancey); "western part" (ANSP 88426). *Sonora*: Guaymas (von Martens). *Chihuahua*: Guasaremos, Río Mayo (ANSP 188915).

REMARKS.—Despite the wide geographic range, no subspecific units can be recognized. Individuals from the northern part of the range are sometimes slightly smaller than those from the south, but this variation will probably be shown to be clinal. The single shell from Zihuatanejo, Guerrero (ANSP 195127), probably is an aberrant individual. The umbilicus is rather widely open (2 mm. wide, contained 7.9 times in the diameter), the body whorl more angulate, and the base more inflated than in the other specimens examined. Since the other Guerreran shell (UMMZ) is typical, it is suspected that the Zihuatanejo shell represents individual variation.

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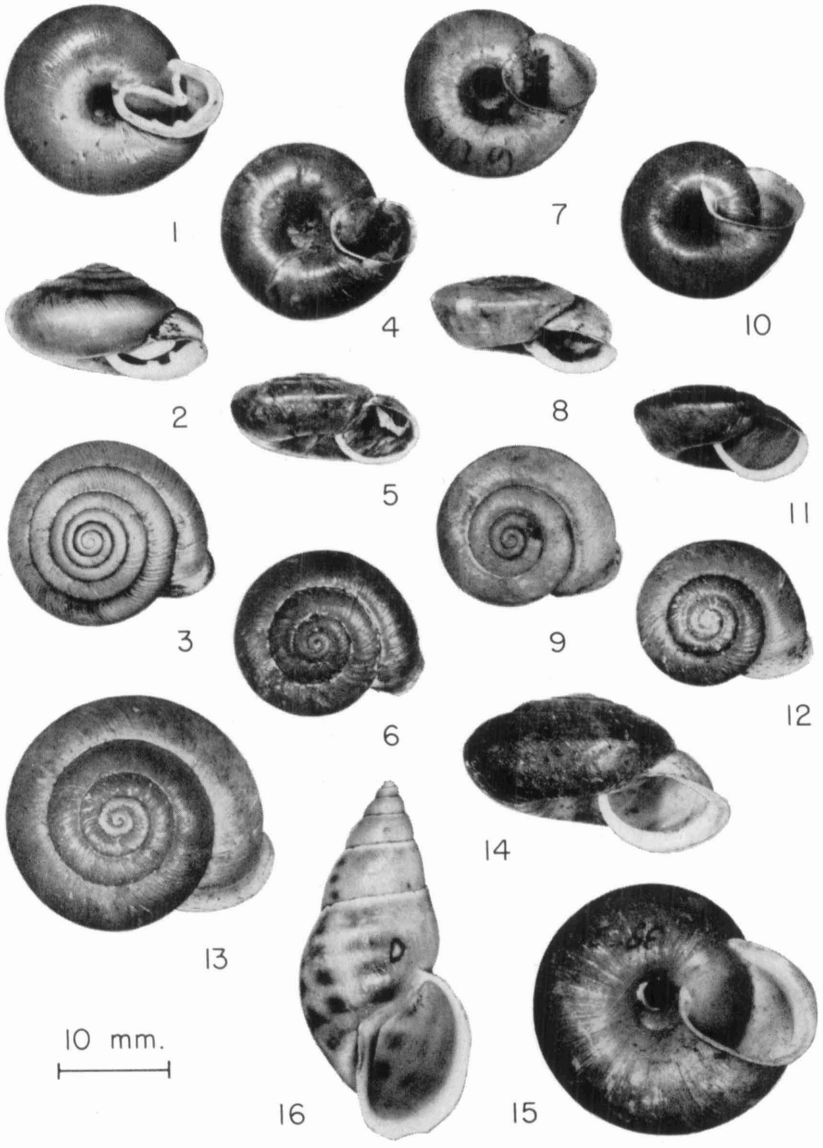

PLATE I

Nos. 1–3. *Polygyra* (*Erymodon*) *pergrandis,* new species. Holotype, UMMZ 191180: Cerro de Barolosa, Coalcomán, Michoacán (9000 ft.). 4–6. *Averellia* (*Miraverellia*) *sumichrasti* (Crosse & Fischer). UMMZ 195402; Morelia, Michoacán; 7–9. UMMZ 31857, Hacienda Cuatotolapam, Veracruz. 10–12. *Averellia* (*Discolepis*) *desidens* (Rang). UMMZ 92502, Martinique, West Indies. 13–15. *Averellia* (*Miraverellia*) *sargi* (Crosse & Fischer). CNHM 39730, Coban, Vera Paz, Guatemala. 16. *Drymaeus colimensis* (Rolle). UMMZ 124996, Colima, México, paratype.

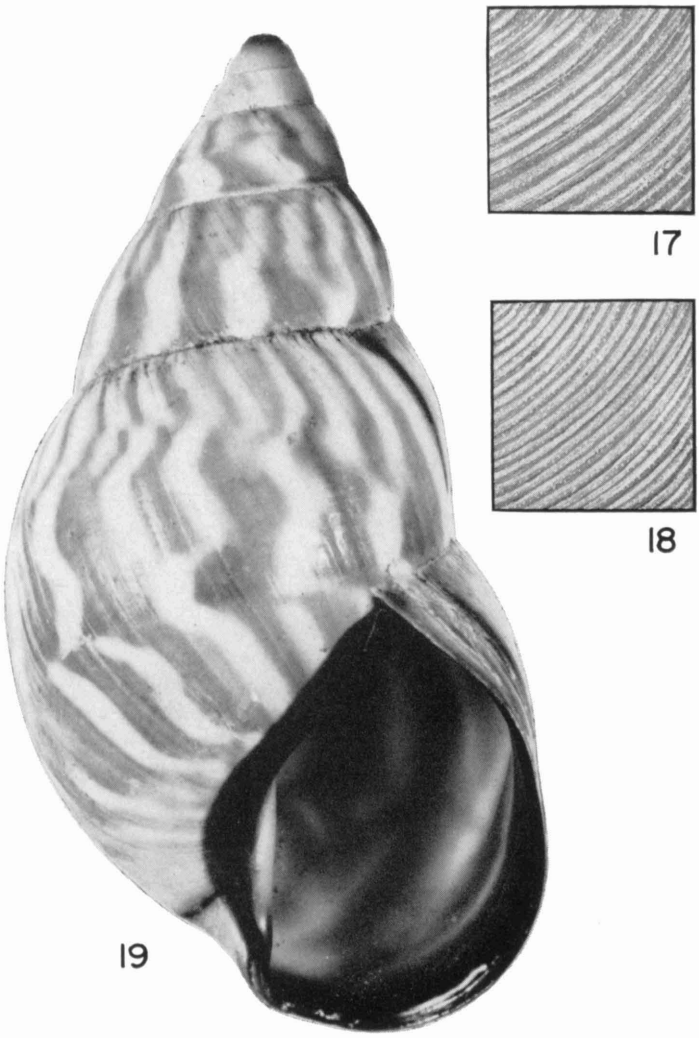

PLATE II

No. 17. Sculpture on body whorl of *Averellia* (*Discolepis*) *desidens* (Rang).

No. 18. Sculpture on body whorl of *Averellia* (*Miraverellia*) *sumichrasti* (Crosse & Fischer).

No. 19. *Orthalicus quagga* (Strebel). UMMZ 195400: Cerro de Guzman, Coalcomán, Michoacán.