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A COLLECTION OF MOLLUSKS FROM
NORTHERN VENEZUELA

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IN recent years, the University of Michigan Museum of Zoology has received two collections of land and fresh-water mollusks from the vicinity of Rancho Grande, Estado Aragua, Venezuela. This material was collected by Frederick H. Test from June, 1951, through January, 1952, and by Test and Harold Heatwole from June to August, 1956.

Rancho Grande is situated at an elevation of 3,600 feet in the Parque Nacional between Maracay and Turiamo, near Ocumare de la Costa. The area in the immediate vicinity of Rancho Grande is covered with cloud forest; for a detailed map and ecological description of the region see Beebe and Crane (1947). Most of the specimens are dead shells found among the leaf litter and debris on the floor of the cloud forest; some were collected at Turiamo.

With the exception of *Incidostoma nanum* and *Drepanostomella pinchoti*, previously known only from the types, all the species treated in this paper were compared with material of the same species in the collection of the University of Michigan Museum of Zoology. The two species described herein as new were compared with all known closely related forms. Colors used in descriptions are those of Ridgway (1912).

The following 18 species are represented in the collections from Rancho Grande, and they are arranged in a phylogenetic order. All the specimens have been deposited in the collection of the University of Michigan Museum of Zoology (UMMZ) except for two paratypes of *Labyrinthus umbrus*, which are in the collection of the Chicago Natural History Museum (CNHM).

Pachycheilus laevisimus (Sowerby)

Melania laevisimus Sowerby, Zool. Journ., 1 (1824): 60.

Pachycheilus laevisimus, Jousseau, Mem. Soc. Zool., 2 (1889): 258.

Rancho Grande (11)

This species was common on rocks in many of the small mountain streams.

Helicina sp.

Rancho Grande (1).

One specimen of a small *Helicina*, which appears to be close to *H. columbiana* (Philippi), was collected. This specimen was placed in formalin which so corroded the shell that exact determination is uncertain.

Helicina tamsiana appuni (von Martens)

Helicina columbiana appuni von Martens, Die Binnenmollusken Venezuelas. Zeit. Ges. Nat. Fr. (1873): 162, Pl. 1, Fig. 1-2.

Helicina tamsiana appuni, Wagner, in Martini und Chemnitz, System. Conch. Cab., 18 (1911): 80, Pl. 14, Figs. 30-31.

Rancho Grande (4); by road 4 km. below Rancho Grande (1); Parque Nacional (1).

All the specimens appear to be typical and do not indicate gradation into *H. t. tamsiana*, as did specimens reported by Baker (1923: 19-21).

Incidostoma nanum Bartsch and Morrison

Aperostoma nanum Bartsch and Morrison, Bull. U.S. Nat. Mus., No. 181 (1942): 262-63, Pl. 38, Figs. 13-15.

Incidostoma nanum, Morrison. Journ. Wash. Acad. Sci., 45 (5) (1955): 157.

Rancho Grande (21).

All specimens come from a single population. The material shows considerable variation and adds much information to the original description. Of the characters used by Bartsch and Morrison to define this and other species of the genus, the color of the shell is the most variable among the specimens before me. The upper surface of the whorls varies from light horn yellow to light green. Specimens taken alive are the darkest, and often on the upper surface of a fresh shell there is a dark green central zone, which may develop into a distinct band. The periphery of the shell is marked by a dark green band in fresh specimens and brown to black in dead shells. The base of the whorls is the same color as the upper surface, and dark medium basal bands may or may not be present.

Except that the aperture may be round or oval, the other characters of the shell agree fairly closely with the original description. The number of whorls varies from $3\frac{3}{4}$ to $4\frac{3}{4}$ (av. $4\frac{1}{4}$). The range of measurements for the 21 specimens are: height of shell, 10.7–14.6 mm. (av. 12.9); greater diameter, 18.6–25.5 mm. (av. 21.0); lesser diameter, 13.4–19.8 mm. (av. 15.8); height of aperture, 8.9–12.0 mm. (av. 9.7); width of aperture, 8.9–11.8 mm. (av. 9.8).

Strophocheilus oblongus (Muller)

Helix oblonga O. F. Muller, Verm. Terr. Hist., 2 (1774): 86.

Strophocheilus oblongus, Pilsbry, Manual Conch., 10 (1895): 29 and 196, Pl. 14, Figs. 71–73.

Rancho Grande (2).

One shell was found in the leaf litter on the forest floor; the other was taken from under a large rock by the roadside. The animal of the latter specimen was eaten by the collectors and found to be rather tasty.

Auris sinuata (Albers)

Bulimus sinuatus Albers, Malak, Bl., 1 (1854): 32.

Auris sinuata, Pilsbry, Manual Conch., 10 (1895), Pls. 116, 42, Figs. 49–54.

Rancho Grande (52); Turiamo Peak (1).

Auris sinuata was abundant at Rancho Grande. The material most closely resembles the form represented on Plate 42, Fig. 53 in Pilsbry's manual but differs from this illustration in having a more elongated and pointed aperture, a more heavily developed columellar lamella, and the lip at the summit of the aperture is turned back at more of an angle. All the specimens are quite consistent in these characters. The color varies from light tan, without any markings, to a pattern of dark red stipples and irregular bars on a cream background. Measurements of 32 specimens have the following range: height of shell, 47.0–57.5 mm. (av. 52.3); width of shell, 23.1–28.2 mm. (av. 26.0); width of shell divided by height of shell, 45.3–57.6 per cent (av. 49.7); height of aperture, 28.7–33.7 mm. (av. 31.2); width of aperture, 13.6–18.2 mm. (av. 16.7); width of aperture divided by height of aperture, 46.5–61.5 per cent (av. 53.9); height of aperture divided by height of shell, 49.4–62.3 per cent (av. 59.4).

Simpulopsis magnus, new species

(Plate I)

HOLOTYPE.—UMMZ 191736; collected at Rancho Grande, Estado Aragua, Venezuela, October 30, 1951, by Frederick H. Test. The specimen was found in a bromeliad.

DIAGNOSIS.—This species differs from other *Simpulopsis* in its larger size, its very small, raised spiral striations on the body whorl spaced about 0.5 mm. apart, and its color pattern with about 20 Mars brown obliquely spiral bands on a buckthorn brown background.

DESCRIPTION OF HOLOTYPE.—The shell is semioval, higher than wide, exceedingly thin, comprised mostly of cuticle; the irregularly sulcate wrinkles are rather widely and unevenly spaced and not particularly prominent; the sculpture of the body whorl consists of many minute spiral striations, which are slightly raised and rather evenly spaced (about 0.5 mm. apart); surface dull lusterless; columella thin, concave, meeting the basal lip at a salient angle in the middle of the columellar margin; outer lip inserted above the periphery of the penultimate whorl; peristome very thin and sharp.

The buckthorn brown ground color pattern has about 20 Mars brown obliquely spiral bands; the inside of the aperture is glossy white, with the external bands of the cuticle showing through the shell.

The height of the shell is about 30 mm.; the width about 26 mm.

REMARKS.—*S. magnus* is placed in the subgenus *Simpulopsis* because the apical whorls are spirally striated, the shell is short, globose, exceedingly thin, and distinctly wrinkled. It differs from all other species in this subgenus by its larger size, color, and sculpture. With the exception of a small drab form found on Trinidad and two distant forms from Guatemala and Mexico, the other species of this genus are found in southeastern Brazil.

The holotype was unfortunately badly damaged. The early whorls are missing, the penultimate whorl is cracked, and the lip was fractured when the specimen was collected. The distinctive characters of the shell, however, and the isolation of the type locality from the range of other species of the genus warrant specific recognition of this individual.

Plekocheilus b. blainvilleanus (Pfeiffer)

Bulimulus blainvilleanus Pfeiffer, Proc. Zool. Soc., (1847): 230.

Plekocheilus b. blainvilleanus Pilsbry, Manual Conch., 10 (1895): 67, Pl. 31, Figs. Rancho Grande (10).

The measurements of the specimens are: height of shell, 50.4–60.0 mm. (av. 56.8); width of shell, 32.8–41.5 mm. (av. 36.0); width of shell divided by height of shell, 58–66 per cent (av. 63); height of aperture, 30.6–38.2 mm. (av. 35.7); width of aperture, 22.3–27.6 mm. (av. 24.9); width of aperture divided by height of aperture, 65–73 per cent (av. 70); height of aperture divided by height of shell, 59–70 per cent (av. 63).

Plekocheilus marmoratus (Dunker)

Bulimus marmoratus Dunker, in Philippi, Abbild, u. Beschreib., 1 (1844): 157, Pl. 2, Figs. 1–2.

Strophocheilus marmoratus, Pilsbry, Manual Conch., 10 (1895): 40–41, Pl. 20, Fig. 45.

Plekocheilus marmoratus, Baker, 1926, Occ. Pap. Mus. Zool. Univ. Mich., 167 (1926): 30.

Rancho Grande (14).

Nine of the specimens are mature. A close inspection of their sculpture reveals both the minute, dense, zigzag pattern of granulation typical of *P. marmoratus*, and the minute, dense, irregular granulation typical of *P. venezuelensis*. Between these extremes there is every degree of intergradation. Since the only known difference between these two forms is their pattern of granulation, it is probable that more collecting from northern Venezuela will reveal that *P. venezuelensis* is a subspecies or a synonym of *P. marmoratus*. In addition to the sculptural variation this lot has a wide range in the measurements and proportions of the shell. Measurements taken from the nine adults are: height of shell, 89.7–97.0 mm. (av. 93.0); width of shell, 52.6–58.6 mm. (av. 54.9); width of shell divided by height of shell, 55.6–61.5 per cent (av. 58.9); height of aperture, 47.0–53.7 mm. (av. 51.3); width of aperture, 33.1–39.1 mm., (av. 36.9); height of aperture divided by height of shell, 49.8–58.6 per cent (av. 55.2); width of aperture divided by height of aperture, 69.5–80.2 per cent (av. 72.3). •

Labyrinthus plicatus (Born)

Helix plicata Born, Test. Mus. Caes. Vindob., (1780): 368.

Pleurodonie plicata, Baker, Occ. Pap. Mus. Zool. Univ. Mich., 167 (1926): 16–19, Pls. 12–19.

Labyrinthus plicatus, Wurtz, Proc. Acad. Nat. Sci. Phila., 108 (1955): 113–117.

Rancho Grande (2); first peak west of Turiano Pass (2).

At the second locality both specimens were found in the leaf litter on the forest floor.

Labyrinthus umbrus, new species

(Plate II)

HOLOTYPE.—UMMZ 191681, Rancho Grande, Estado Aragua, Venezuela; collected by Harold Heatwole, July, 1956.

PARATYPES.—UMMZ 191682, four specimens, same locality as the holotype, collected by Frederick H. Test, October 14, 1951; CNHM 64340, two specimens, same locality as the holotype, collected by Frederick H. Test, January, 1952; UMMZ 191683, two specimens, same locality as the holotype, collected by Frederick H. Test, January, 1952.

DESCRIPTION OF HOLOTYPE.—Shell perforate, umbilical opening half obscured by reflected lip; depressed, lens-shaped, subcarinate at the periphery; spire slightly dome-shaped; surface weakly striated; small granules on the last $\frac{1}{8}$ of the body whorl near aperture; whorls 5, slightly convex above, more strongly convex below, slowly increasing in size; embryonic whorls $1\frac{3}{4}$, finely striated on last $\frac{3}{4}$ whorl; last body whorl angular at periphery, the angle becoming less distinct near the aperture, which is strongly deflected, and deeply constricted behind the lip, the constriction showing two pits behind the basal lip, and a smaller pit slightly anterior to the periphery; aperture almost horizontal, ear-shaped, the peristome continuous, the lip broadly reflected; parietal wall bearing a strong, elongate, oblique lamella directed between the outer lip tooth; basal lip with two teeth, the inner tooth rounded, tuberculate, the outer tooth high, compressed, strongly laminate; periostracum a burnt umber color, becoming slightly darker near aperture; inner surface of aperture and teeth, white.

Greatest diameter, 23.4 mm.; lesser diameter, 20.2 mm.; altitude, 10.2 mm.

VARIATION OF PARATYPES.—Among the eight paratypes the umbilical opening is more or less obscured by the reflected basal lip. In one specimen the lip covers $\frac{3}{4}$ of the umbilical opening, and in another only $\frac{1}{4}$. In all specimens the shape of the shell, aperture, and the teeth appears to be quite constant. The sculpture varies from fine to moderate striations, and in the two specimens that are not eroded, the striae are finely granulated on the underside of the shell, but on the dorsal surface the granulations run together and are extended into fine ridges running parallel to, or on top of, the striations. The number of whorls varies from $4\frac{7}{8}$ to $5\frac{1}{4}$, averaging 5. In all of the specimens there are $1\frac{3}{4}$ embryonic whorls. The aperture in all of them is strongly deflected, lying almost horizontal. The shape of the aperture varies only slightly from that of the type; in one specimen it is somewhat pear-shaped and in

two others the ear-shaped opening is heavily lobed. The relative size and relationship of the teeth in the aperture is rather constant. In one specimen, which apparently had been injured, the parietal tooth is slightly bifurcate anteriorly, and the outer basal lip tooth is shorter than usual. In another specimen which had also suffered injury, a small, elongate denticle is evident inside the aperture behind the parietal tooth. In all in which the periostracum had not been badly worn by erosion, the shell is burnt umber.

The greatest diameter of the shell varies from 20.5–22.2 mm. (av. 21.2); the lesser diameter, 18.5–19.7 mm. (av. 19.0); the altitude, 9.5–11.5 mm. (av. 10.7); the ratio of the greater diameter to the altitude varies from 1.66–1.96 (av. 1.73).

DISCUSSION.—This species appears to be most closely related to *L. leucodon* (Pfeiffer), but differs from it in a number of details. The periphery of the shell is more strongly angulate in *leucodon* than in *umbrus*. In *leucodon* the parietal callus is less elevated from the whorl than it is in *umbrus*, and the basal lip of the aperture is only slightly reflected over the umbilical opening, compared with that of *umbrus*. Also, the lip and the teeth are more heavily developed in *umbrus* than in *leucodon*, and the shell is much heavier in the former species.

All of the specimens were found in leaf mold and debris on the forest floor within the cloud forest zone.

Lamellaxis pachyspira (Pilsbry)

Leptinaria pachyspira Pilsbry, Manual Conch., 18 (1907): 305, Pl. 46, Figs. 8 and 11.
Leptinaria (Lamellaxis) pachyspira, Baker, Occ. Pap. Mus. Zool. Univ. Mich., 182 (1927): 22.

Lamellaxis pachyspira, Baker, Nautilus, 58 (1945): 87–88.

Rancho Grande (1).

The single individual was found crawling on a leaf of a small living palm.

Systrophia starkei (H. B. Baker)

Scolodonta starkei Baker, Occ. Pap. Mus. Zool. Univ. Mich., No. 156 (1925): 26–29, Pl. 8, Fig. 40; Pl. 9, Fig. 48.

Systrophia starkei, Baker, Nautilus, 41 (1928): 125.

Sistrophia starkei, Richards and Hummelinck, Notulae Naturae, No. 62 (1940): 8.

Rancho Grande (1), adult.

Systrophia sp.

Rancho Grande (1).

One specimen of an apparently undescribed species of *Systrophia* was recovered while cleaning out the aperture of an *Auris sinuata* from Rancho Grande. This species appears to resemble most closely *S. starkei* but differs in having the sutures less deeply impressed and the aperture more rounded. Because it is apparently an immature specimen ($3\frac{3}{4}$ whorls), a new name is not proposed for it.

Drepanostomella pinchoti Pilsbry

Drepanostomella pinchoti Pilsbry, Proc. Acad. Sci. Phila., 82 (1930): 346-47, Fig. 3 a-b.

Rancho Grande (1).

This snail was found while cleaning out the aperture of a large *Plekocheilus marmoratus* from Rancho Grande. In all shell details it fits Pilsbry's description but is somewhat larger than the type, with a diameter of 4.6 mm. (as compared to 3.9 mm.) and $3\frac{3}{4}$ whorls (the type has $3\frac{1}{4}$).

Xenodiscula venezuelensis Pilsbry

Xenodiscula venezuelensis Pilsbry, Proc. Acad. Nat. Sci. Phila., 71 (1919): 206, Fig. 1.

Rancho Grande (1).

This specimen was also recovered while cleaning out a *Plekocheilus marmoratus* shell.

Habroconus cassiquiensis (Pfeiffer)

Helix cassiquiensis Pfeiffer, 1853, Mon. Helic., 3 (1853): 49.

Habroconus cassiquiensis, Baker, 1928, Proc. Acad. Nat. Sci. Phila., 80 (1928): 11-12, Pl. 2, Figs. 1-2.

Rancho Grande (1).

This specimen was found crawling on a small palm tree.

Euglandina plicatula (Pfeiffer)

Glandina plicatula Pfeiffer, Proc. Zool. Soc., (1851): 258.

Oleacina plicatula, Tryon, Manual Conch., ser. I, 1 (1885): 37, Pl. 7, Fig. 96.

Euglandina plicatula, Pilsbry, Manual Conch., ser. II, 19 (1908): 182, Pl. 28, Figs. 63-64.

Rancho Grande (5).

One pair was found mating under a dead palm leaf. The following day in captivity one of the mated individuals laid a large mass of yellow eggs; each egg was about 2 mm. in diameter.

These specimens are intermediate between typical *E. p. plicatula* and *E. p. cinnamomeofusca* (Tryon). In details of size and sculpture they are most like the former subspecies, but they have the more produced spire of the latter form.

This species belongs to the subgenus *Euglandina*, section *Euglandina*, as defined by Baker (1941: 54–55). It agrees with the anatomical characters of these divisions in having the right eye muscle passing within the atrial angle, the penial retractor muscle arising from the diaphragm, the anterior left mantle-lappet overlapping the posterior, and the esophagus forming a crop.

In the preceding list, the three following species are new to the fauna of Venezuela: *Simpulopsis magnus*, *Labyrinthus umbrus*, and *Drepanostomella pinchoti*. It is probable that the above list of 18 species represents only a small part of the molluscan fauna of the Rancho Grande area. Undoubtedly many novelties living there remain to be described. Because the land and fresh-water molluscan fauna of South America is so poorly known, it is not possible to consider the zoogeographic relationships with other areas on the basis of the few species recorded.

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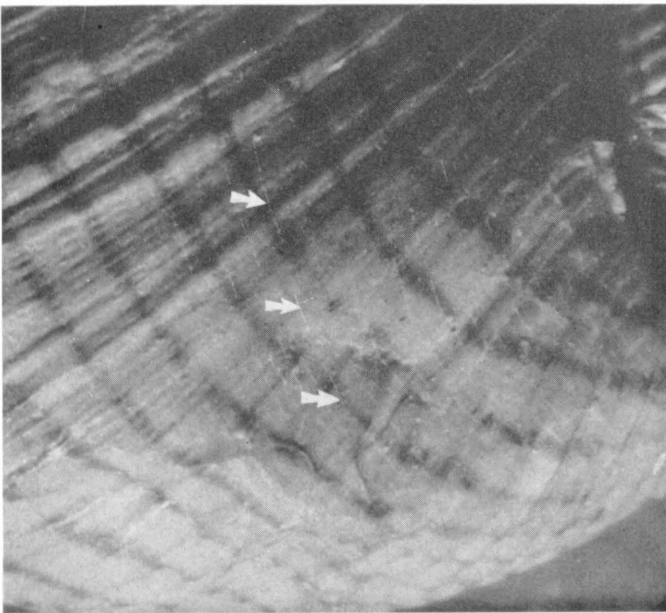
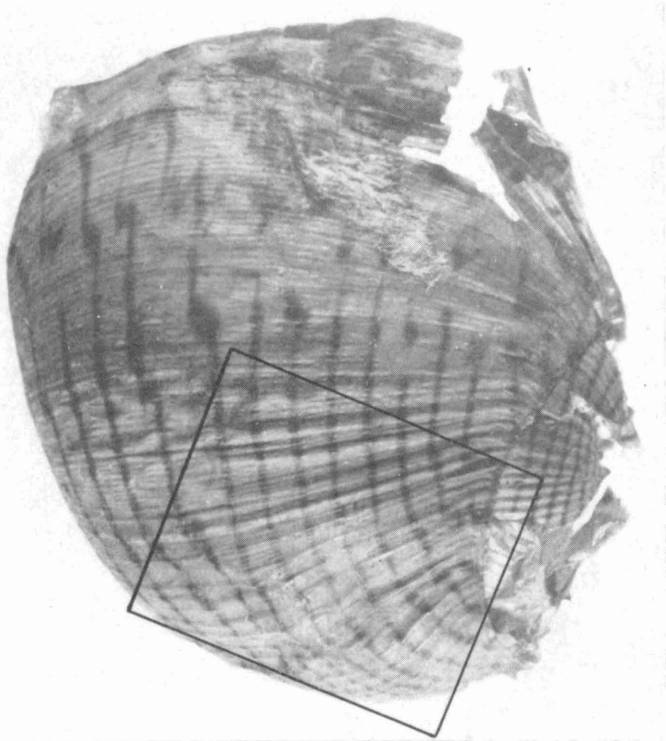
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PLATE I

- Upper figure: Holotype of *Simpulopsis magnus*, new species (UMMZ 191736).
 Lower figure: Enlarged area from upper figure showing spiral striations (indicated by arrows).

PLATE I



Fred G. Thompson

PLATE II

Upper figure: Ventral view of the holotype of *Labyrinthus umbrus*, new species (UMMZ 191681).

Lower figure: Lateral view of the holotype of *Labyrinthus umbrus*, new species, (UMMZ 191681).

PLATE II

