



THE NAUTILUS

Vol. 56

October, 1942

No. 2

A NEW GENUS OF MEXICAN HELICIDS

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This is the 9th paper on the inland Mexican mollusks collected in 1926 for Dr. Bryant Walker. In the plate, the scales represent lengths of one millimeter, except those for figure 4 (.01 mm.) and 4-T (.1 mm.). Abbreviations not explained in the text are tabulated in Bishop Museum Bulletin 166, p. 337 (1941).

BUNNYA BERNADINAE, new genus and species. Plate 5.

The single type specimen (University of Michigan Museum) was collected Sept. 3, on the wall of the old monastery at El Desierto de los Leones (C, II, 11, b), altitude 9800 ft., D. F. *B. bernadinae*, named for my wife, is the type of the genus *Bunnya*, which agrees so closely with *Xanthonyx*, in shell, mantle reflection, form of body, tail "horn" and arrangement of pallial complex, that the two genera must be closely related. But, *Bunnya* differs markedly in its 3 double dart-sacs, producing 6 darts, and in the sharply differentiated sculpture on the embryonic whorls of its shell. In fact, in its genitalia, *Bunnya* appears to approach *Humboldtiana*, which occurs with it in the temperate zone, although the tropical *Xanthonyx* has more in common with *Averellia*. From the description, *Xanthonyx potosiana* Dall (1905, *Smithson. Misc. Coll.* 48: 190) from the Alvarez Mts., San Luis Potosí, seems to have similar embryonic whorls and may be a *Bunnya*, but is a larger rimate shell, with more rapid whorl increase, longer columellar callus and apparently with its later growth-wrinkles somewhat stronger.

Shell (figs. 1-2) imperforate but with foveola deep and narrow (although half open inside aperture); whorls rapidly increasing, depressed but well rounded; thin and translucent, slightly glossy, light brownish buff colored, somewhat darker at apex, with irides-

cent interior when fresh. Embryonic whorls $1\frac{1}{4}$, with first quarter whorl sunken, soon assuming quite sharp and regular but low, closely spaced (14 per mm. on last) and arcuate growth-wrinkles, crossed by microscopic spiral ones; suture deep. Later whorls immediately assuming more widely spaced but much more irregular, weakly rounded and arcuate growth-wrinkles; spirals obsolescent and broken (major ones absent); suture more broadly but fairly well impressed. Aperture large, transversely ovoid in plane about 45° to shell-axis; peristome arcuate above, sharp and thin. Parietal callus only indicated by obsolescence of growth-wrinkles. Columella sharp, scarcely thickened, with short adnate callus.

Shell altitude 9.9 mm., major diameter 129 (12.8 mm.) [at 2 whorls 6.75 mm., $2\frac{1}{4}$ wh. 8.2 mm., 2.5 wh. 11.05 mm., $2\frac{3}{4}$ wh. 17 mm.?], min. diam. 96 (9.45 mm.); aperture altitude 81 (8.05 mm.), diam. 117 (9.45 mm.); 2.6 + whorls [over $2\frac{3}{4}$ to parietal angle].

Living animal softer and less vigorous than *X. cordovanus*; tail "horn" very prominent and constantly wiggling; foot yellowish with irregular black blotches, which are larger anteriad and tend to form 2 longitudinal bands, separated by about $\frac{1}{3}$ top of head; tentacles black. Shell-lap continuous, without shell-lobes, reflected about 5 mm. over shell on right side, and with irregularly radial black marks.

Preserved animal with tail rounded above; middorsal groove weak and irregular; "horn" about twice as long as its base and papillate. Shell-lap narrowest anteriorly over head; over twice as extensive caudad, where it is coarsely papillate (elsewhere smoothish). Mantle collar (fig. 3; only .6 perimeter shown and viewed from inside so shell-lap hidden) with prominent parietal mantle-lappet (MR) and small angulopalatal one (MA), which is widely separated, across neck, from basopalatal (MP; less than half shown) that is short but extensive (about .4 perimeter) and lies on left side. Lung 1.5 length of kidney (K) which is about twice pericardium (H), much shortened along hindgut (HG) side and bent abruptly at anterior end of pericardium; ureter (KD) complete; urinary sinus (LK) narrow; minor venation (mainly omitted) very evident over kidney and on right side of animal but almost absent to the left. Ovotestis (G, fig. 6; spermoviduct much straightened) a biconic mass of irregularly clavate alveoli, almost completely buried in basal $\frac{2}{3}$ of apical liver lobe; talon (uncovered at GT) much as in *Humboldtiana*; albumen gland (GG) with apical lobe above and basal one below posterior end of diaphragm. Uterus (UT) widely convoluted and folded to fit in short body cavity. Spermatheca longer than

body cavity, with sac (S) above aorta and near albumen gland; diverticulum (SD) and junction inflated by flocculent material but with no traces of horny spermatophore. Dart-glands (WG) 3, compound alveolar, loosely bound by connective tissue into a ring, and with short ducts (WD, f. 9; viewed from ventral side) running in vaginal wall to between openings of dart-sacs. Dart-sacs (WS) 3; each basally with 2 fusiform muscular dart-papilla sacs (WPS), which open either side of dart-papilla; internally (fig. 8; very diagrammatic longitudinal section) double at apex and secreting 2 darts (WB); dart-papilla (WP) single and short; vaginal entrance surrounded by a fold which is higher on either side, so as to form 2 lips. Darts (5 found in dart-sacs) decalcified by alcohol, but evidently very like those of *Humboldtiana*. Vagina (V) below dart apparatus longitudinally plicate internally, with a short ventral diverticulum (VD), which contained a shed dart. Prostate (DG) attached full length of uterus. Epiphallus (E) large with short flagellum (EF); internally (transverse section at E, fig. 6) with 4 large pilasters. Penial retractor (PR) arising near apical end of diaphragm and inserting around penial apex. Penis (P) too small to contain large, externally wrinkled and papillate, cylindric verge (PV, fig. 7; half of penial wall removed), with epiphallic opening (EP) between 3 flattened papillae at tip. Atrium (Y) opening just behind right inferior tentacle. Jaw (fig. 5) with 10 flat ribs or plaits, of which only outer edges are sharply marked; growth-lines prominent. Buccal mass ovoid; salivary glands about as long, lanceolate and separated. Radula (fig. 4): central with triangular mesocone and weak ectoconal notches; laterals 12-13, mainly bicuspid (right 2nd has 2 ectocones), with obtusely pointed to abruptly rounded mesocone; marginals 19-18, usually tricuspid, but outermost irregularly dividing side cusps; 115 rows (T) counted. Oesophagus slender only to nerve ring; remainder enlarged and continuous with stomach; intestinal S-loops as usual; anus external, below and shortly behind pneumostome. Cerebral commissure short but distinct; penial nerve from right cerebral ganglion; buccal commissure as long as each ganglion; pleural connectives shorter than each cerebral ganglion; visceral ring ganglia almost fused. Lateral pedal retractors apparently fused to tail fan. Right tentacular muscle almost free; right ommatophoral retractor in penioviducal angle; retractors of inferior tentacles with short branches to region around corner of mouth. Very slender buccal retractor arising from left tentacular muscle.

XANTHONYX CORDOVANUS (Pfeiffer). Strebel und Pfeffer, Beitrag 4: 37, anatomy. Cf. *X. sumichrasti* (Brot),

Fischer et Crosse, Miss. Mex. 1: 192, and *X. salleanus* (Pfr.), Pils., Proc. Malac. Soc. London 4: 28.

My one specimen, from a tree-trunk in the creek valley below Sumidero (D, II, c, 6), near Córdoba, was so firmly muscular and wiggled so furiously that I was startled into dropping it. The embryonic whorls of its shell are as in *X. cordovanus* but the later whorls approach those of *X. salleanus* and are much more glossy than those of *Bunnya*. Although its male organs are quite large, its female genitalia are still immature, and possibly the spermathecal diverticulum becomes less conspicuous when fully adult. [S. & P. found none.]

Living animal like *Bunnya*, but: Foot pallid, mottled with brown; tail with brown middorsal stripe; ommatophores dark; edge of shell-lap brown.

Preserved animal also similar but: Shell-lap about twice as broad and coarsely pebbled throughout. [In S. & P., figs. 7, A-B, appearance of shell-lobes and short tail "horn" evidently due to contraction.] Lung considerably smaller, with brownish bands; kidney with much more shortened hindgut margin so that shape appears more oblong [Cf. S. & P., f. 7-C] Spermatheca very slender but with distinct cylindric diverticulum [like in *X. sumichrasti*]. Dart-glands 2, with few tubules [probably more in adult], with ducts entering vaginal wall above still rudimentary dart-sac. [Cf. S. & P., f. 7-F; gm₁ = dart-glands; gm = dart-sac, placed like vaginal diverticulum of *Bunnya*.] Epiphallus proper very much shorter than flagellum [like Pils., f. 14]; penial retractor inserting around junction with penis, which is relatively larger; vergic papilla flattened ovoid [like S. & P., f. 7-G], with epiphallic opening near its base but continued to apex by deep groove [somewhat as in *Averellia*]. Jaw with 11-13, higher ribs, of which both edges are sharply marked [see S. & P.] about 14 teeth bicuspid and 20 with some trace of entocone [S. & P. give 22 bicuspid and 10 tricuspid]; outer teeth more commonly dividing entocones and ectocones; 131 rows counted. Buccal retractor even slenderer, but with similar origin [Cf. Pils.].

A NEW GENUS OF CHINESE MICROCYSTINAE

BY H. BURRINGTON BAKER

Through the generosity of Mr. Teng-chien Yen, the anatomy (Plate 6) of a specimen of *Hyalina rathouisii* Heude (1882, Moll.



Baker, H. Burrington. 1942. "A new genus of Mexican helicids." *The Nautilus* 56, 37-40.

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