

## A new aquatic snail of the family Amnicolidae from Costa Rica

by

Fred G. Thompson\*

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During June and July, 1963, specimens representing an undescribed genus and species of brackish water snail were collected from near the mouths of two large rivers along the Pacific Coast of Costa Rica. Although the species is represented only by a few specimens, its features are distinct enough to warrant its taxonomic recognition at this time.

### *Rachipteron* n. gen.

This neotropical genus of the family Amnicolidae is distinguished as follows: the shell is ovate-conical, consists of about five whorls, is imperforate, and has  $1\frac{1}{2}$  depressed embryonic whorls. The initial whorl is about 0.12 mm in diameter. The surface is sculptured with strong spiral chords, which are crossed by strong incremental striations. The length of the aperture is about equal to the length of the spire. The peristome is incomplete, not continuous across parietal margin. The operculum is paucispiral, with about  $2\frac{1}{2}$  whorls. Its nucleus is large and is located at about one third of the distances from the left and the basal margins to the opposite sides. It is thin, fragile, chitinous, and is sculptured with very delicate incremental striations. The pallial organs are typically amnicoloid. The verge originates on the middle of the back behind the tentacles, and is dorso-ventrally compressed and bifurcate at the end. The right terminal lobe of the verge bears a depression out of which projects a chitinous corrugated spine. The vas deferens is simple and discharges through the spine. The verge lacks accessory ducts. The sole of the foot is elongate and narrow, bilobed anteriorly and lanceolate posteriorly. The posterior one half of the foot has two triangular extensions of the operculigerous lobe projecting over the sides of the sole, supporting the operculum. The radula is taenioglossid. The central tooth is trapezoidal in shape and bears two pairs of basal denticles on its anterior surface. The den-

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\* Dept. of Zoology, University of Miami, Coral Gables, Florida.

ticle formula is  $\frac{3 \cdot 1 \cdot 3}{2 \cdot 2}$ . The lateral tooth is clavate, with a large mesocone and a smaller entocone. The marginal teeth are elongate, with about 12 cusps on each tooth, and a flange-like projection on the shafts. Type species:

*Rachipteron philopelum* n. sp.

**SHELL:** Stout, ovate-conical, imperforate, thick, opaque, light brown with a dull surface, frequently encrusted with a black brittle deposit. Spire about as long as or slightly longer than the aperture, straight sided. Suture moderately impressed, whorls moderately rounded, early whorls shouldered. 4.8-5.0 whorls. Diameter of first whorl measured perpendicular to initial suture, 0.12 mm.  $1\frac{1}{2}$  smooth embryonic whorls that are depressed to the same plane. Remaining whorls regularly descending. Sculpture consisting of about 10 strong spiral chords between the suture and the insertion of the lip, and about as many between the lip and the columellar margin. The chords are rounded and are equal in diameter to their intervals. Superimposed on the chords and their interspaces are strong axial striations and occasional broken riblets.

The striations give the chords a beaded appearance, and the riblets tend to form a weak cancellate pattern, particularly with the first three or four chords along the suture. Aperture irregularly ovate, white. Plane of aperture lying at an angle to axis of shell due to forward extension of lip at its insertion. Upper corner of aperture angulate. Internal thickening of peristome incomplete, not continuous across the parietal wall. Outer lip and basal lip rounded; columellar margin and parietal margin nearly straight. Lip sharp, a thick calloused deposit lying behind the margin of the lip and extending from the suture to the columella, causing a prominent thickening on both the outer and inner surfaces.

Length of shell, 2.5-2.8 mm.; diameter of shell, 1.75-2.05 mm.; height of aperture, 1.25-1.45 mm.; width of aperture, 0.90-1.08 mm.; length/diameter, 1.38-1.60; length/aperture, 1.95-2.25. The measurements are based on three mature shells. The largest dimensions given are those of the type, which has 4.8 whorls.

**OPERCULUM:** Paucispiral, consisting of about  $2\frac{1}{2}$  whorls. Nucleus large, located at about one third of the distance from the left and basal margins to the opposite sides. Very thin and chitinous. Smooth on both surfaces; very fine incremental striations may be distinguished on the outer surface with reflected light.

**ANIMAL:** The sole is elongate and narrow, broadly indented anteriorly, and lanceolate posteriorly. The posterior half behind the pedicel bears two triangular flaps that extend laterally over the sides of the sole and support the operculum. The tentacles are moderately long, extending beyond the tip of the snout in relaxed specimens. The left tentacle bears about 20 bands of cilia that encircle the basal two thirds of the tentacle, and are interrupted midventrally. Much finer cilia occur between the bands and elsewhere over the surface, as

they also do on the right tentacle. The snout is bilobed, and extends beyond the margin of the sole. The mantle is typically amnicoloid, pallial tentacles are lacking, and the gill is arranged in a long straight series extending to the mantle collar. The gill consists of about 35 lamellae that are most strongly developed in the middle of the series, and become much reduced posteriorly. A very large bilobed verge originates middorsally at a distance behind the tentacles equal to the distance from the tentacles to the tip of the snout. The base of the verge has a bulge followed by a constriction on the left side. The tip of the verge is bifurcate, and ends with two subequal lobes. The right lobe is the larger of the two, and has a terminal indentation out of which projects a truncate, hollow, chitinous spine. The spine is about 100 microns long, and is strongly corrugated with parallel crests and alae. The vas deferens enters the verge near the center of the base and extends to the tip of the right lobe where it enters the base of the spine. At the point where the vas deferens enters the base of the verge it is about 100 microns thick, and becomes progressively narrower.

The tip of the snout has a large white patch, behind which lies a heavily pigmented dark band that is discontinuous ventrally. The sides of the snout are moderately pigmented to a point slightly behind the base of the tentacles. The tip of each tentacle bears a heavily pigmented band, which is discontinuous on the ventral surface. Slight amounts of pigmentation may occur elsewhere over the surface of the tentacles, particularly along the lateral margins. The verge has a large dark blotch in the mid-dorsal region and a smaller darker spot on the dorsal surface at the base of the right terminal lobe.

**RADULA:** Taenioglosiid. Denticle formula of central tooth  $\frac{3-1-3}{2-2}$ . Central tooth trapezoidal in shape, about 35 microns wide by 20 microns high, with a midventral projection. Lateral tooth clavate, with a single large mesocone, and a smaller entocone which is about one half the size of the mesocone; no ectocones observed in the two radulae examined. Inner marginal tooth with 12-13 cusps (most distal cusp not evident in illustration); base of shaft with a long flange-like projection. Outer marginal tooth with 12 cusps; base of shaft also with a flange-like projection.

**TYPE:** UMMZ 216478; Costa Rica, Puntarenas Prov., seepage pool along the south bank of the Río Grande de Tárcoles by the ferry-crossing, about  $\frac{1}{4}$  mile above the mouth of the river ( $9^{\circ} 44' N$ ,  $84^{\circ} 37' W$ ); collected July 10, 1963 by Fred G. Thompson. Paratypes: UMMZ 216479 (2 immature specimens), USNM 635743 (1 mature specimen); same data as the type.

**DISTRIBUTION AND HABITAT:** This species was collected only at the type locality and near the mouth of the Río Barranca in the Quebrada Bomba Vieja at Boca de Barranca, Puntarenas Prov., Costa Rica ( $9^{\circ} 58' N$ ,  $84^{\circ} 44' 30'' W$ ) (MCZ 233799). At both localities specimens were found on a soft mud substrate barren of vegetation and in turbid water in which visibility was limited to only two or three centimeters. Both stations were below outlets for domestic

sewage. Both stations were also close enough to the coast so that they were subject to tidal fluctuations, and alternately covered with fresh and brackish water.

At Boca de Barranca *R. philopelum* was associated with *Cochliopina minor* (Pilsbry), and at the Río Grande de Tárcoles it was found with an undescribed species of *Littoridina*.

Apparently the optimal habitat was not encountered for *R. philopelum*, for only five specimens were found at the type locality, and only one at Boca de Barranca. The species is probably not as restricted as is known, and its presence may be anticipated near the brackish water zone of most of the larger streams along the Pacific Coast of Costa Rica.

RELATIONSHIPS: *Rachipteron* resembles some marine rissoids by the sculpture and structure of the shell, but is placed in the family Amnicolidae because it lacks pallial tentacles, and possesses basocones on the central tooth of the radula. Members of the family Rissoidae that have been studied anatomically are known to have tentacles originating from the mantle collar and occasionally the foot, and lack basocones on the central tooth. The fleshy lobes extending over the sides of the foot in *Rachipteron* are extensions of the operculigerous lobe, and have no resemblance to tentacles.

*Rachipteron* belongs in the subfamily Hydrobiinae as defined by MORRISON (2: 14) because of its simple vas deferens and the lack of other ducts in the verge. It is unique among American genera of amnicolids because of its conical, imperforate shell with strong spiral chords, and its simple bifurcate verge which bears a terminal chitinous spine. The presence of ciliary bands on the left tentacle is a feature that has not been mentioned by authors dealing with other genera of American amnicolids, but it is a character that I have observed in *Littoridina*, *Littoridinops* and *Pyrgophorus*.

No close relationship with other American genera of amnicolids is apparent. If the left terminal lobe of the verge is interpreted as an enlarged, modified flagellum, this in combination with the spiral sculpture of the shell and the paucispiral operculum could be used to suggest an alliance with *Cochliopina*. Spiral sculpture and a flagellate verge are characters that appear to have evolved independently in several generic lines within the family, and a paucispiral operculum is a generalized feature. Thus no reliance may be placed on relationships suggested by the use of these characters. Furthermore, the conical imperforate shell of *Rachipteron* is quite unlike the depressed-helicoid shell of *Cochliopina*.

The shape of the shell and the spiral sculpture of *Rachipteron* resemble shell features of *Lyrodes* and *Pyrgophorus*. It differs from these two genera by being imperforate, and by having much stronger spiral sculpture. It differs further in that the aperture is proportionally larger. Anatomically, *Rachipteron* is very different. *Lyrodes* has a verge similar to *Heleobia* and allied genera, by having large raised glands along its margin (Morrison, personal communication). *Pyrgophorus* is ovoviviparous, and has multiple appendages on the verge (BAKER, 1: 31).

The generic name is derived from the Greek *Rachis*, meaning spine, and *Pterón*, meaning wing, and alludes to the presence of the chitinous spine in the tip of the large winglike verge. The generic name is neuter. The specific name refers to its association with the muddy substrate of the habitats from which it was collected.

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### SUMMARY

*Rachipteron philopelum*, a new genus and species of brackish water snail of the family Amnicolidae, is described from the Pacific Coast of Costa Rica. Its relationship within the family is obscure, although it apparently belongs in the sub-family Hydrobiinae.

### RESUMEN

Se describe *Rachipteron philopelum*, n. gen., n. sp., caracol de agua salobre, de la familia Amnicolidae, hallado en la costa del Pacífico de Costa Rica. Sus afinidades dentro de la familia no están claras, aunque aparentemente pertenece a la subfamilia Hydrobiinae.

### LITERATURE CITED

1. BAKER, H. B.  
1930. *The Mollusca collected by the University of Michigan - Williamson Expedition in Venezuela. Occ. Pap. Mus. Zool. Univ. Mich.*, (210): 1-95.
2. MORRISON, J. P. E.  
1949. The Cave Snails of Eastern North America. *Ann. Rept. Amer. Malac. Union for 1948*: 13-15.

Fig. 1. Anatomical characters of the type specimen of *Rachipteron philopelum* new species.

- A. Intact animal - dorsal view.
- B. Intact animal - ventral view.
- C. Operculum.
- D. Dorsal view of verge.
- E. Terminal, chitinous spine from verge.
- F. Radular teeth.

Scales for A, C and D equal 1 mm.; scale for E equals 50 microns; scale for F equal 10 microns.

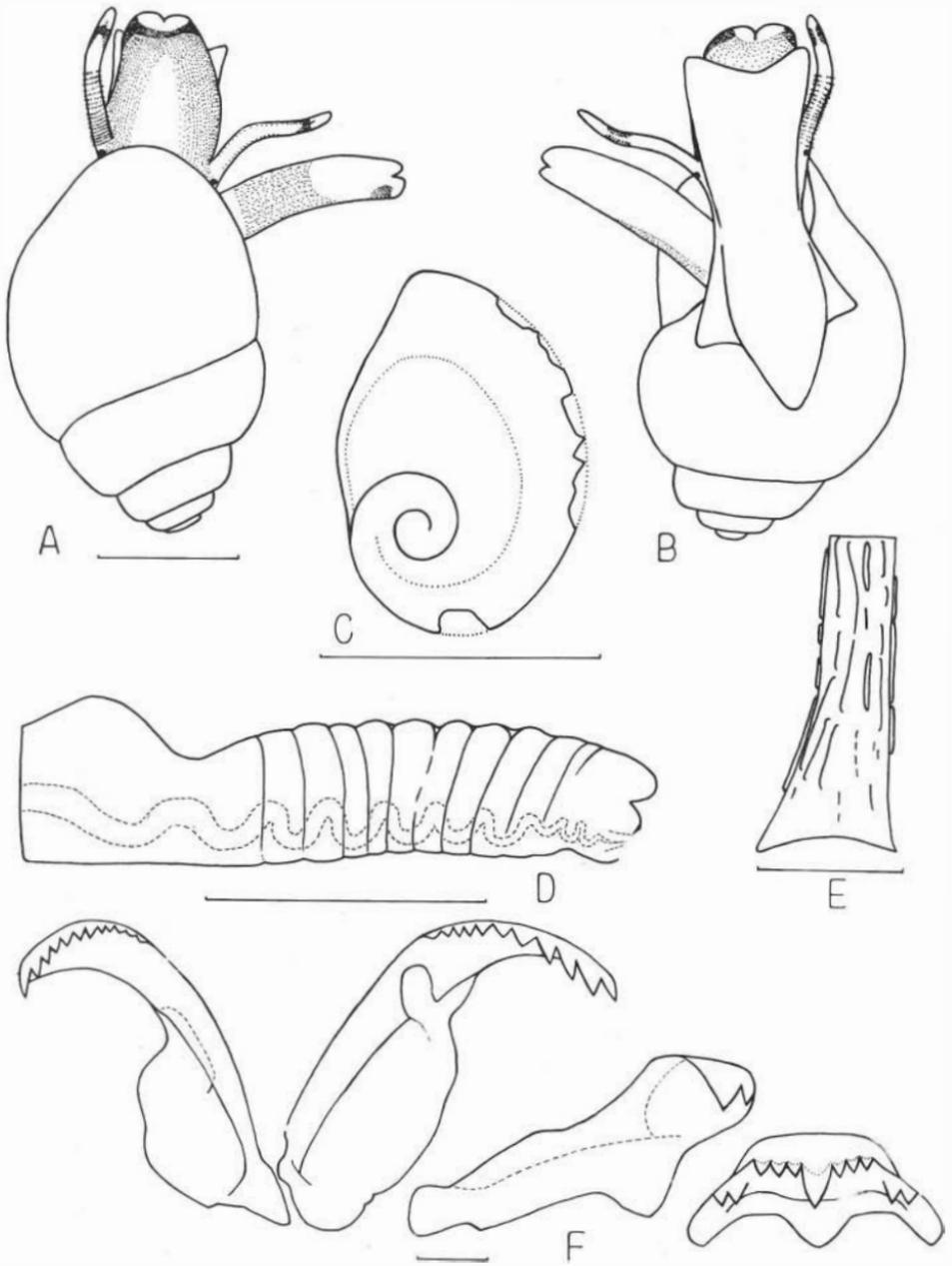


Fig. 2. *Rachipteron philopelum* new species. Photograph of type specimen.

2

