THE GENUS *TRAJANA* (MOLLUSCA: GASTROPODA) IN THE NEW WORLD

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CONTENTS

ILLUSTRATIONS

I. ABSTRACT

The nassarioid gastropod genus *Trajana* s.s. includes those species with a closed siphonal canal and a circular aperture, surrounded by a raised peristome. There are but four species in the fossil record of the New World, occurring in the upper Miocene of North Carolina, Florida, Mexico, and Peru, and the Pliocene of Ecuador. One of these four is a new species: *T. veracruzana* E. H. Vokes, from the upper Miocene Agueguexquite Formation of Mexico, and represents the first record of the genus in the "Tertiary Caribbean Province," linking the eastern United States and the western South American occurrences. Another new species, from the middle Miocene Gatun Formation of Panamá, is believed to be ancestral to the *Trajana* s.s. group as it possesses an open siphonal canal and denticulations within the subcircular aperture with a raised peristome like that of *Trajana* s.s. Because of the fundamental differences this new species is made the type of a new subgenus with the name *Trajana* (*Nerva*) *woodringi* E. H. Vokes.

In addition to the fossil species, there are two Recent species of *Trajana* s.s. found off the coast of western Mexico. All species are treated systematically.

II. INTRODUCTION

Those gastropods possessing a short, slightly recurved, closed siphonal canal, a circular aperture surrounded by a raised peristome, and a single terminal varix have presented a problem to writers for many years. Dall (1910, p. 32-33) suggested that they be referred to the genus *Hindsia* A. Adams, 1851, which was a troubled group from the start. Dell (1967, p. 309-310) has summarized the problem nicely, stating: "The name *Hindsia* had an uncertain introduction, and has had a chequered subsequent history in molluscan nomenclature. Almost before it had been properly proposed it had been listed as a synonym of *Nassaria* and its subsequent history has been linked with this latter generic name." Dell presented a resume of the tangled history of the name, which will not be repeated here, but concluded by naming "*Hindsia nivea* Pfeiffer" as the type species of the genus, thus removing it from consideration for the species under discussion.

These species are not left without a name,

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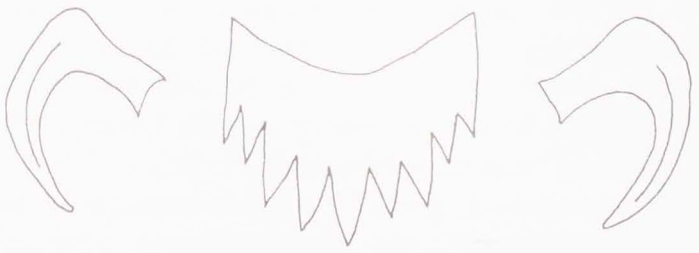
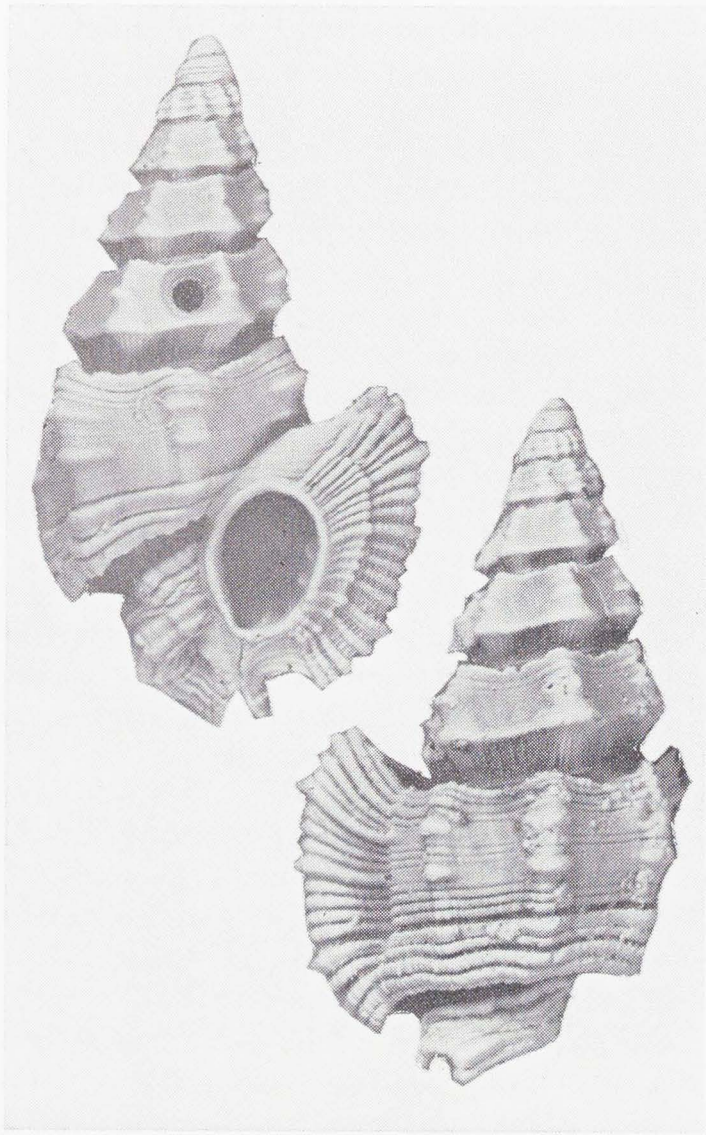


Text figure 1. Radula of *Trajana acapulcana* (Pilsbry and Lowe). Magnification approximately × 150. (From photograph by Myra Keen.)

however, for Gardner (1948, p. 221) proposed the genus *Trajana* for a species of the group from the upper Miocene of North Carolina, with the monotype *Trajana pyta.* She was of the opinion that this new genus was most closely related to the muricid subgenus *Hadriania,* which is placed in the subfamily Tritonaliinae (see Vokes, 1964, p. 20), the name *Trajana* being derived from that of the Roman emperor Trajan, who immediately preceded Hadrian. The writer was originally of the same opinion due to the closed siphonal canal, but additional work proved the group to be most closely related to the Nassariidae. The radula of the Recent species *T. acapulcana* (Pilsbry and Lowe) is nassarioid (see text fig. 1) and the nature of the closure of the canal is different from that in the Tritonaliinae. In the latter group a thin plate extends from the columellar wall over the siphon, meeting the outer lip at the abaxial edge. But in *Trajana* the outer lip folds over and joins the columellar lip at the adaxial edge, so these can truly be said to be analogous structures with no relationship other than function.

Trajana s.s. is a small group, there being only four fossil species and two Recent species known exclusively from the New World. The fossil species are upper Miocene and Pliocene in age, ranging from North Carolina to Peru. The two Recent forms occur on the west coast of Mexico. The shell figured by Reeve (1844, pl. 20, fig. 96) as "*Triton nassoides* Gray," from the Philippines, is not that species but probably is a specimen of one of the West Mexican species of *Trajana.* The shell originally figured as "*Triton*" *nassoides*, in Griffith and Pidgeon (1834, pl. 41, fig. 4), is not a *Trajana* but is probably the species subsequently named "*Triton*" *acuminatus* by Reeve (1844, pl. 14, fig. 59), and is a true *Hindsia.*

Another west coast species was named "*Hindsia*": "*Hindsia*" (*Neoteron*) *ariel* Pilsbry and Lowe, 1932, type of *Neoteron* (text fig. 2). This species is clearly related to the *Trajana* line, but is so completely bizarre that it seems better to separate it as a distinct, though monotypic, genus. *Neoteron ariel* is distinguished from the typical *Trajana* by the expanded wing-like terminal varix and by a conspicuous nassarioid fossa circling the base of the body whorl. The *Trajana* species have only a slight tendency toward this fossa. It may be descended from the Miocene *Trajana veracruzana,* n. sp. The two species share a peculiar channeled suture (see pl. 1, fig. 1b) not seen in any other species of *Trajana.* The spiral ornamentation crossing the terminal varix is markedly similar in *Neoteron* and *Trajana,* suggesting that *Neoteron* is a derivative form. However, there is a peculiar lamellar



Text figure 2. *Neoteron ariel* Pilsbry and Lowe. ANSP 155564 (holotype); height 9.9 mm, diameter 5.6 mm; locality: Corinto, Nicaragua. × 6.

axial sculpture more akin to the Muricidae. This is particularly well developed on the apertural face of the terminal varix, which together with the wing-like expansion of this varix combines to give a muricid aspect to the shell.

The genus *Trajana* is almost certainly descended from a *Nassarius*-like ancestor. In the Gatun Formation of Panamá there is a species that strongly suggests *Trajana* in having marked axial folds, a subcircular aperture surrounded by a raised peristome, a high spire, and a short recurved canal. However, the canal is open and there are typical *Nassarius* denticulations within the aperture, on both inner and outer lips. The genus *Trajana* has a completely smooth aperture. Because of these very basic differences this ancestral form cannot in good conscience be placed in *Trajana* s.s.; therefore, a new subgenus *Nerva,* named for the Roman emperor who preceded Trajan,* is here proposed.

III. Acknowledgments

The writer wishes to express her gratitude to Druid Wilson, U. S. Geological Survey; Myra Keen, Stanford University; and R. K. Dell, Dominion Museum, Wellington, New Zealand, all of whom worked to untangle the *Hindsia* problem. She would also like to thank the following persons who loaned material necessary to the study: Copeland MacClintock, Peabody Museum of Natural History, Yale University; H. G. Richards and R. Tucker Abbott, Academy of Natural Sciences, Philadelphia; and Mrs. R. C. Hoerle, West Palm Beach, Florida. The financial assistance of National Science Foundation Grant no. G.B. 6048 is gratefully acknowledged.

IV. Systematic Descriptions

Phylum Mollusca

Class Gastropoda

Subclass Prosobranchia

Order Neogastropoda

Suborder Stenoglossa

Superfamily Buccinacea

Family Nassariidae

Genus *Trajana* Gardner, 1948

Subgenus *Nerva* E. H. Vokes, n. subgen.

Type species: *Trajana (Nerva) woodringi* E. H. Vokes, n. sp., Gatun Formation, Panamá, middle Miocene.

Etymology: Nerva, a Roman emperor; gender: masculine.

Description: Shell scalariform, high-spired; protoconch multiwhorled, smooth; axial costae strong, separated by relatively smooth interspaces; numerous spiral ribs; a single varix developed at aperture; aperture subcircular, almost entire, surrounded by a slightly raised peristome; on the interior of the outer lip a few elongate denticles and on the columellar wall several weak denticulations, together with a larger tooth at the adaptical end; siphonal canal slightly extended, recurved, open by a narrow slit.

Trajana (Nerva) woodringi E. H. Vokes, n. sp.

Plate 1, figs. 2a, 2b

Description: Shell moderate in size for the genus, high-spired; protoconch of two and one-half smooth whorls; ornamentation beginning gradually with small axial costae, nine on the first two post-nuclear whorls, then diminishing to seven or eight on each succeeding whorl; spiral ornamentation of small ribs, three on early whorls gradually increasing to five on penultimate and eight on body whorl, with two more on siphonal canal; where spiral ribs cross axial costae small nodes are formed, spiral ribs almost completely obsolete between the axial costae; single varix formed at apertural lip, resorbed to form axial costae with each growth-stage; aperture almost circular, surrounded by a raised peristome; interior of outer lip bearing four strong, elongate denticles; columellar wall with several small pustules and one larger tooth at adaptical end; siphonal canal slightly extended, recurved, open by a narrow slit; small siphonal fasciole developed.

Dimensions of holotype: height 14.0 mm, diameter 8.0 mm.

Holotype: USNM 646229.

Type locality: TU 757, roadcut on south side of Boyd-Roosevelt Highway at junction of road to "Refineria Panamá, S. A.," just east of Cativa, Province of Colón, Panamá.

Occurrence: Gatun Formation, Panamá; middle Miocene.

Figured specimen: USNM 646229 (holotype). Other occurrences: TU locality nos. 958, 959.

Discussion: This new species seems to be intermediate between the typical *Trajana* and some *Nassarius*-like ancestor. The nassarioid traits include the denticulations on the inner and outer lips and the short, re-

*Nerva: 96-98 A.D.; Trajan 98-117 A.D.; Hadrian: 117-138 A.D.

curved, open siphonal canal. The *Trajana* characteristics are the strong axial costae, the circular, almost entire aperture, surrounded by a raised peristome, the terminal varix, and the very high spire. There are four specimens in the type lot, all from the same general area, which is approximately locality 138b of Woodring (1959, p. 148).

The geographic position of this ancestral form, in the Panamanian area, is ideal from the standpoint of subsequent distribution both north to Mexico and the United States and south to Peru and Ecuador.

Subgenus TRAJANA s.s.

Trajana GARDNER, 1948, U. S. Geol. Surv. Prof. Paper 199, p. 221.

Type species: *Trajana pyta* Gardner, by original designation.

Description: "Shell more or less scalariform in outline. Spire elevated. Protoconch small, unsculptured. Axial costae prominent and somewhat varicose but not foliated or spinose. Spiral sculpture dense. Anal fasciole strongly arched. Aperture regularly elliptical in outline; inner lining continuous. Outer lip varicose, nonlirate within. Inner lip evenly concave, nonplicate. Anterior canal closed, short, and rather feebly recurved. Umbilical chink closed." (Gardner, 1948)

TRAJANA (TRAJANA) PYTA Gardner
Plate 1, figs. 3a, 3b

Trajana pyta GARDNER, 1948, U. S. Geol. Surv. Prof. Paper 199, p. 221, pl. 29, figs. 10, 11.
Hindsia pyta (Gardner). OLSSON, 1967, Tertiary mollusks south Florida and Caribbean, p. 35, pl. 6, fig. 8.

Description: "Shell scalariform, spire elevated, apex acute, body broad and relatively low, abruptly constricted at the base. Whorls strongly convex, tabulated posteriorly, rapidly increasing in size, approximately 7. Protoconch of 1½ to 2 small, unsculptured coils, the earlier largely immersed. Axial sculpture initiated at the beginning of first turn of conch with obtuse vertical riblets that rapidly develop into broad, rounded, strongly elevated, undulatory costals; 7 or 8 on the whorls of the spire, equal in size and spacing except on the final half turn, most prominent on the periphery of the whorl and tending to alternate in arrangement. Spiral sculpture of sharply elevated lirations that override the costals and are equally prominent on the costal and intercostal areas; spirals initiated simultaneously with the axial sculpture by the appearance of the 2 lirae that crown the periphery of the whorl; first one, and then a second finer threadlet introduced behind the periphery and later either 1 or 2 lirae in front of the periphery, those nearest the sutures the least conspicuous; primaries on the body whorl 8 or 9 including the 2 on the shoulder; finer secondaries commonly introduced midway between the primaries, that at the base of the body approximating in strength the primary behind it. Anterior siphonal canal closely sculptured with 9 or 10 sharply elevated lirae, the 1 or 2 posterior spirals set a little apart from those in front of them. Siphonal canal cut off from the base of the body whorl by a convex area that is strongly rippled by the axial costae but not spirally threaded; delicate filamentary incrementals visible under magnification in the interspiral areas. Suture line distinct, impressed, crenulated by the axials of the preceding whorl. A narrow shoulder in front of the suture strongly defined, persistent almost to the apex; concave near the aperture, sloping and feebly undulated by the axials on the earlier volutions and occasionally threaded with a single fortuitous spiral near the anterior margin. Aperture elliptical, smoothly and evenly glazed within, with no trace of any angularity either anteriorly or posterioly nor of any denticulation or rugosity on either the outer or the inner lip. Labrum strongly varicose, the varix obtuse and prominent, encroaching posteriorly on the preceding whorl. Anterior canal closed, short, and rather feebly recurved. Umbilical chink not visible." (Gardner, 1948.)

Dimensions of holotype: height 17.3 mm, diameter 10.8 mm.

Holotype: USNM 497151.

Type locality: Natural Well, two miles southwest of Magnolia, Duplin County, North Carolina (= TU 376).

Occurrence: Duplin Marl, North Carolina; Jackson Bluff Formation and Pinecrest Beds, Florida; upper Miocene.

Figured specimen: USNM 646230; height 16.4 mm, diameter 9.2 mm; locality TU 730. Other occurrences TU locality nos. 60, 523, 729, 932, 933.

Discussion: Although none of the species of *Trajana* is common, *T. pyta* is the most nearly common and widespread of the group. The species was described from Natural Well, North Carolina, and was said to be based on two specimens. No specimens have been collected by the writer at this locality (= TU 376). A single specimen, in the collection of Mr. Paul Huddleston, of New Orleans, has been found at Jackson Bluff, Ochlochonee River, Florida (= TU 60), type locality of the Jackson Bluff Formation. Another single specimen was collected by the writer at TU 523, which represents the youngest known occurrence of the genus in the United States, for this locality is in the uppermost level

of the Pinecrest Beds, immediately below the overlying Caloosahatchee Formation. This is approximately the same locality where Olsson (1967, p. 35) noted that specimens had been found by Hughes. Only along the Kissimmee River (or Canal), in the vicinity of Fort Basinger, Florida (TU 730 & 932), is the species really abundant, with over 200 specimens collected. A few specimens have been found at the northernmost end of TU 729, in beds correlative to those farther north at Fort Basinger, and a few have been taken at TU 933, which is south of Lake Okeechobee, on "Alligator Alley." All of these occurrences are in the older strata of the Pinecrest Beds.

TRAJANA (TRAJANA) LAQUEORATA (Spieker)

Plate 1, fig. 5

Murex laqueoratus SPIEKER, 1922, Johns Hopkins Stud. Geol., no. 3, p. 51, pl. 2, fig. 4 (spelled *laquoratus* in plate expl.).

Murex laqueoratus Spieker. HANNA AND ISRAELSKY, 1925, California Acad. Sci., Proc., (Ser. 4) v. 14, no. 2, p. 53.

Murex laqueoratus Spieker. OLSSON, 1932, Bulls. Amer. Paleontology, v. 19, no. 68, p. 31.

Description: "Shell small, turreted, fairly stout. Whorls about six in number, the first two smooth, the remainder delicately sculptured and convex. Sculpture of regular longitudinal folds, eight to the whorl, which are negligible at the suture, increasing rapidly to full strength at the mid-line of the whorl, and decreasing again. On the body whorl all except the last two continue over the base as narrow rounded folds; the last two die out just below the shoulder. Spiral sculpture of fine threads, about six to the whorl, with occasional interstitial threads above or below the periphery of the whorls; there the two central threads are prominent, forming a band which heightens the prominence of the nodes on the longitudinal ridges. On the body whorl there are twelve primary threads between the band and the base, with occasional interstitial threads. Aperture almost circular, smooth within, with a raised lip and a fan-like flare bordering the outer lip over which the spiral sculpture continues to the raised peristome. The canal is very narrow, open and short. Columella almost straight." (Spieker, 1922)

Dimension of holotype: height 17.8 mm, diameter 11.3 mm.

Holotype: Yale Peabody Museum no. 502.

Type locality: Near mouth of Quebrada Tucillal, just north of Zorritos schoolhouse, Zorritos, Peru (Olsson, 1932, p. 7).

Occurrence: Tumbes Formation, Peru; upper Miocene.

Figured specimen: YPM 502 (holotype).

Discussion: At the time Spieker redescribed the Nelson Collection of fossils from the vicinity of Zorritos, northern Peru, the exact locality for these specimens was not known and Spieker noted (1922, p. 12-13): "The matrix in which most of the specimens so far collected [by J. T. Singewald, Jr.] occur is far too resistant to permit the extraction by any known means of specimens at all susceptible to injury through moderate violence; . . . Loose matrix on some of the specimens in the Nelson collection indicates that there are probably some localities at which the sands have not been cemented." Olsson subsequently relocated the Nelson locality (1932, p. 7 & 30) and observed that it was actually a down-faulted block of upper Miocene Tumbes Formation that carried Nelson's fossil fauna and not part of the Zorritos Group as supposed by Spieker. Originally spelled "Tumbez" by Olsson, the correct spelling is now "Tumbes" according to the *Lexique Stratigraphique International* (1956, v. 5, fasc. 5b, p. 110).

Although the siphonal canal on the unique type specimen of *T. laqueorata* is open, this seems to be the result of breakage and there is little doubt that in life the canal would have been sealed. The alternating large and small spiral ribs and the smooth aperture indicates a closer alliance with the typical *Trajana* group than with the ancestral *Nerva* form.

TRAJANA (TRAJANA) VERACRUZANA E. H. Vokes, n. sp.

Plate 1, figs. 1a, 1b, 1c

Description: Shell small for the group, high spired; protoconch of two and one-half, smooth, bulbous whorls, seven post-nuclear whorls in adult; cancellate ornamentation beginning gradually and consisting of axial costae and spiral ribs; twelve axial costae on the first post-nuclear whorl, decreasing to about eight on medial whorls then increasing to about twelve again on the penultimate but becoming almost completely obsolete on body whorl; three spiral ribs on first whorl gradually increasing to twelve major ribs with several smaller intercalated riblets on the body whorl and an additional eight riblets on the siphonal canal; on the medial whorls the two ribs at the periphery larger than those above and below, becoming approximately the same on the body whorl; the rib at the shoulder greatly raised causing suture to be deeply set into a narrow channel formed by the rib at the

shoulder and the peripheral rib of the preceding whorl; one terminal varix at aperture with a deep excavation behind it; aperture circular, entire, surrounded by a raised peristome, smooth on the interior; siphonal canal short, recurved, closed.

Dimensions of holotype: height 12.0 mm, diameter 7.2 mm.

Holotype: USNM 646231.

Type locality: TU 638, roadcut and quarry on Mexico Highway 180, 14 miles east of junction with side road into Coatzacoalcos, Veracruz, Mexico.

Occurrence: Agueguexquite Formation, Mexico; Pinecrest Beds, Florida; upper Miocene.

Figured specimen: USNM 646231 (holotype).

Discussion: The type lot of this small species consists of two and one-half specimens from the Agueguexquite Formation of Mexico. The form is unique in having a deeply channeled suture (see pl. 1, fig. 1b), more pronounced than that in any other species of the group. A tendency toward this type of suture is seen in the other species only immediately behind the terminal varix.

In addition to the type lot, in the U. S. Geological Survey collections made by Druid Wilson at Acline, Charlotte County, Florida (= TU 200), there are two specimens of *T. veracruzana*. The fauna at Acline is equivalent to that of the so-called "Brighton Beds" near Lake Okeechobee, and seems to represent the uppermost Pinecrest strata. The appearance of an Agueguexquite fossil in this relative position would suggest that perhaps the Mexican formation is even younger than previously believed. On the basis of the muricine species the writer has considered the Agueguexquite to be early upper Miocene in age. Correlation with the Brighton beds would indicate a late upper Miocene age for the Agueguexquite Formation. According to Mr. Wilson (personal communication) there are also other species in common between the Acline beds and the Agueguexquite.

In a paper on the Panamá land bridge as a sea barrier, Woodring (1966) noted that there are a number of genera originally found in the western Atlantic region now extinct there and surviving only in the eastern Pacific today. The geologic record of migration of these "paciphiles," as he termed them, is often lacking and as an example he stated (1966, p. 429): "Missing records are illustrated by the occurrence in Florida and North Carolina of a paciphile (*Trajana*) that is so far unknown in the western Atlantic part of the Tertiary province, although the only rational explanation is that it migrated through that part." The writer is pleased to be able to fill in one gap in the record.

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PLATE 1

(all figures X 4)

Figures Page

1. *Trajana* (*Trajana*) *veracruzana* E. H. Vokes, n. sp. 79
   USNM 646231 (holotype); height 12.0 mm, diameter 7.2 mm.
   Locality: TU 638. Agueguexquite Fm., upper Miocene.
2. *Trajana* (*Nerva*) *woodringi* E. H. Vokes, n. sp. 77
   USNM 646229 (holotype); height 14.0 mm, diameter 8.0 mm.
   Locality: TU 757. Gatun Fm., middle Miocene.
3. *Trajana* (*Trajana*) *pyta* Gardner 78
   USNM 646230; height 16.4 mm, diameter 9.2 mm.
   Locality: TU 730. Pinecrest Beds, upper Miocene.
4. *Trajana* (*Trajana*) *wheeleri* (Pilsbry and Olsson) 82
   ANSP 14483 (holotype); height 16.5 mm, diameter 9.5 mm.
   Locality: Punta Blanca, Ecuador. Canoa Fm., Pliocene.
5. *Trajana* (*Trajana*) *laqueorata* (Spieker) 79
   Yale Peabody Mus. no. 502 (holotype); height 17.8 mm, diameter 11.3 mm.
   Locality: Zorritos, Peru. Tumbes Fm., upper Miocene.

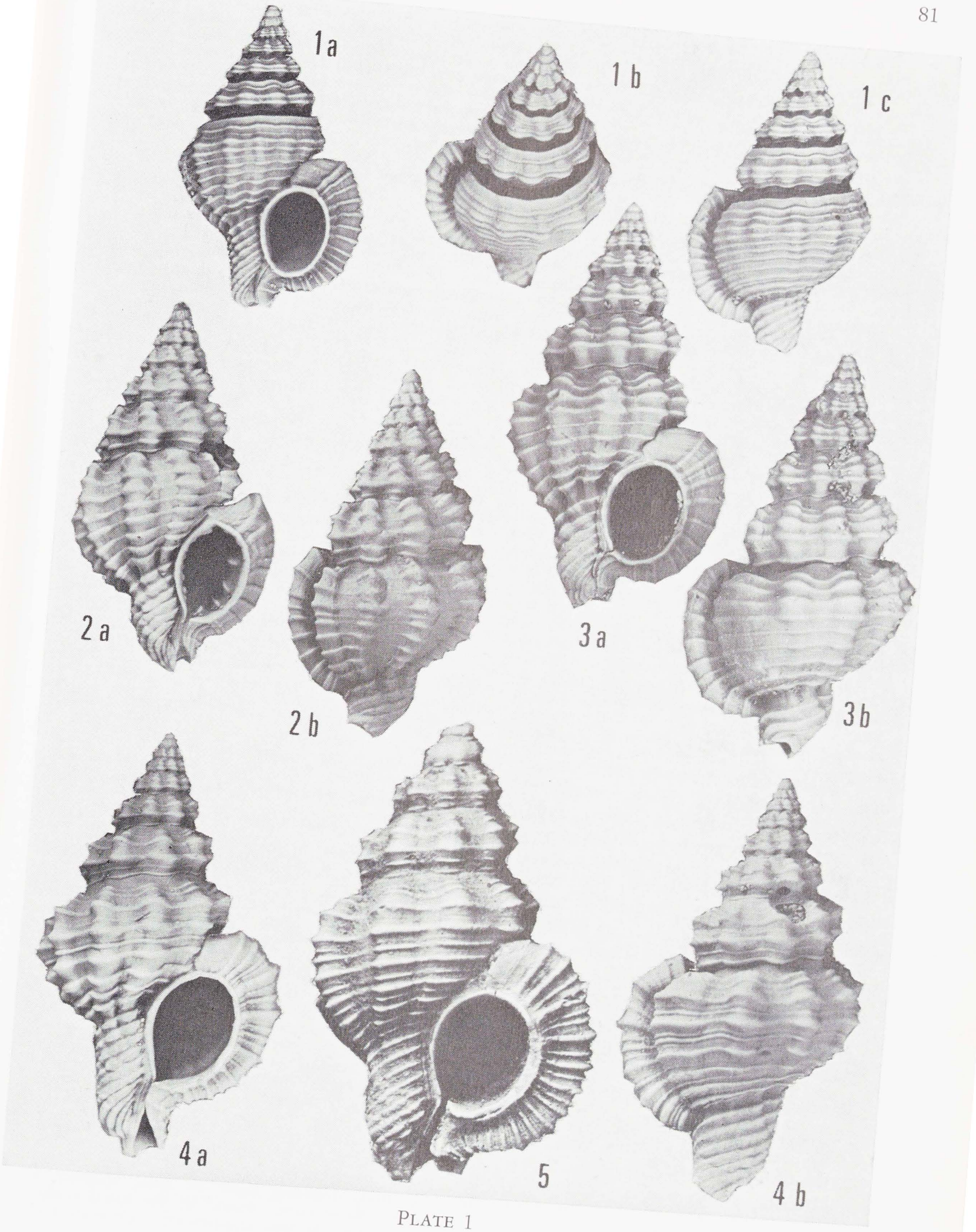

PLATE 1

Trajana (Trajana) wheeleri (Pilsbry and Olsson)

Plate 1, figs. 4a, 4b

Hindsia wheeleri Pilsbry and Olsson, 1941, Acad. Nat. Sci. Phila., Proc., v. 93, p. 29, pl. 5, fig. 10.

Description: "Shell small, solid; whorls about 8 of which the first 2 are nuclear, smooth, except the last quarter turn which has weak spirals; the post-nuclear whorls are strongly sculptured by ribs and spirals; the sculpture of the spire-whorls consists principally of 2 strong spiral cords which form the middle of the whorls, these spirals are crossed, and rendered strongly nodose, by axial ribs; on the shoulder area, there are 2 smaller spirals with 2 others on the area between the lower suture and the lower of the 2 primary middle spiral cords; the sculpture is similar on the body-whorl with 4 spirals on the base and about 8 strong ones on the beak; there are 9 ribs on the last whorl beside the enlarged, thickened lip; on the last whorl the sutural zone becomes a deep, smooth channel which unites with another channel behind the outer lip; aperture is small, ovate, continuous with a raised, inner rim; outer lip doubling back on itself, forming a wide varix, more or less hollow within; beak long, recurved at the tip and carrying the anterior canal." (Pilsbry and Olsson, 1941)

Dimensions of holotype: height 16.5 mm, diameter 9.5 mm.

Holotype: ANSP 14483.

Type locality: Punta Blanca, Ecuador.

Occurrence: Canoa Formation, Ecuador; Pliocene.

Figured specimen: ANSP 14483 (holotype).

Discussion: As noted by Pilsbry and Olsson this species is closely related to *T. acapulcana* (Pilsbry and Lowe) from the Recent fauna of western Mexico. The fossil form differs in having a shorter spire and more inflated body whorl. The other differences cited by the original authors, such as the heavier lip, entire peristome, and closed canal, are due to the fact that the type of *T. acapulcana* is a juvenile specimen with an incomplete aperture.

Trajana (Trajana) perideris (Dall)

Hindsia perideris Dall, 1910, Nautilus, v. 24, no. 3, p. 32.

Hindsia (*Hindsia*) *perideris* Dall. Keen, 1958, Sea shells of tropical West America, p. 404, fig. 554 (holotype).

Description: "Shell of about ten whorls, the nucleus smooth white of about two whorls, the subsequent whorls (except the last) slowly enlarging, forming a slender acute spire, the last whorl suddenly larger; sculpture of about six slightly protractive axial ribs, strong and rounded, following each other up the spire in a gently receding spiral, with much wider interspaces, most prominent at the periphery of the whorls, but traceable to the canal; these are crossed between the sutures by six rounded, subequally spaced spiral threads with much wider interspaces (the space between the posterior thread and the suture widest of all), a little swollen where they override the ribs; on the last whorl finer intercalary threads appear, and on the canal are seven or eight stronger, spirally striated cords; aperture subcircular, not lirate within, with a produced, simple peritreme, and behind it a wide, strong, rounded varix over-ridden by the spiral sculpture; canal short, closed when adult, pointed and strongly recurved. The color of the shell is mostly yellowish-white, with a basal and sometimes a sutural brownish spiral band, which shows more or less in the interior of the aperture." (Dall, 1910)

Dimensions of holotype: height 28.5 mm, diameter 15.0 mm.

Holotype: USNM 96658.

Type locality: off La Paz, Baja California, Mexico, in 21 fms.

Occurrence: Recent only, Gulf of California from La Paz to Guaymas, 20-30 fms.

Discussion: The two Recent species of *Trajana* found on the western coast of Mexico are much alike. *T. perideris* is a lighter color than *T. acapulcana* and has fewer axial ribs. The spiral rib at the periphery is stronger, giving the shell a marked angulation almost exactly at the mid-point. In some specimens there is a white spiral color band that corresponds to this peripheral angulation.

Trajana (Trajana) acapulcana (Pilsbry and Lowe)

Hindsia acapulcana Pilsbry and Lowe, 1932, Acad. Nat. Sci. Phila., Proc., v. 84, p. 66, pl. 7, fig. 11.

Hindsia (*Hindsia*) *acapulcana* Pilsbry and Lowe. Keen, 1958, Sea shells of tropical West America, p. 404, fig. 553.

Description: "Shell of about 9½ strongly convex whorls, of which two are nuclear, smooth and white. Color chestnut brown, with a darker subsutural band, the intervals of ribs and much of base cartridge buff. Axial ribs rounded, crossed on the penultimate whorl by six spiral cords, the two on the periphery being stronger, swollen a little where they cross the axial ribs; on the body whorl may be counted about twenty spiral cords of varying strength, eight of which are on the canal, which is recurved and almost closed. Outer lip thin, doubling back on itself forming a wide hollow varix, crossed by the spiral sculpture, which is here emphasized." (Pilsbry and Lowe, 1932)

Dimensions of holotype: height 17.5 mm, diameter 9.7 mm.

Holotype: ANSP 155334.

Type locality: off Acapulco, Guerrero, Mexico, in 20 fms.

Occurrence: Recent only, off southwestern Mexico, from Acapulco to Gulf of Tehuantepec, 20 to 40 fms.

Discussion: This species was based on a juvenile specimen but adults show that at the same size as *T. perideris* (Dall) the two forms are distinct. *T. acapulcana* is a uniformly dark brown color and has more numerous axial costae. Otherwise the two are very close and undoubtedly both are descended from the Pliocene *T. wheeleri* (Pilsbry and Olsson) of Ecuador.

V. Locality Data

The following are Tulane University fossil locality numbers:

60. Jackson Bluff Fm., borrow pits at Jackson Bluff, Ochlockonee River (NW ¼ Sec. 21, T1S, R4W), Leon Co., Florida.
200. Pinecrest Beds, borrow pits about one mile southwest of Acline (Sec. 29, T41S, R23E), Charlotte Co., Florida.
376. Duplin Marl, "Natural Well," sinkhole on Matthews' farm, on North Carolina Highway 11, two miles southwest of Magnolia, Duplin Co., North Carolina.
523. Pinecrest Beds, Harney Pond Canal spoil banks, six miles northwest of Florida Highway 78, Brighton Indian Reservation (NW ¼ Sec. 22, T39S, R32E), Glades Co., Florida.
638. Agueguexquite Fm., roadcut and quarry on Mexico Highway 180, 14 miles east of junction with side road into Coatzacoalcos, Veracruz, Mexico.
729. Pinecrest Beds, spoil banks on west side of Kissimmee Canal and east side of Kissimmee River, approximately ½ mile south of U. S. Corps of Engineers Structure 65-D (S ½ Sec. 33, T36S, R33E), Okeechobee Co., Florida.
730. Pinecrest Beds, embankment of Seaboard Airline Railroad, just west of Kissimmee River (NW ¼ Sec. 20, T36S, R33E), Highlands Co., Florida.
757. Gatun Fm., roadcut on south side of Boyd-Roosevelt Highway at junction of road to "Refinería Panamá, S. A.," just east of Cativa, Prov. of Colón, Panamá.
932. Pinecrest Beds, east side of Kissimmee River (*i.e.*, canal) and ½ mile south of Seaboard Airline Railroad, south of Fort Basinger (SE ¼ Sec. 20, T36S, R33E), Okeechobee Co., Florida.
933. Pinecrest Beds, material exposed during construction of "Alligator Alley," 21.5 miles east of Florida Highway 29, Collier Co., Florida.
958. Gatun Fm., hillslope on east side of road from Boyd-Roosevelt Highway to "Refinería Panamá, S. A.," about ½ km north of junction, just east of Cativa, Prov. of Colón, Panamá.
959. Gatun Fm., roadcut on road to "Refinería Panamá S. A.," about 100 mts. south of refinery gate, Prov. of Colón, Panamá.

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