A NEW SPECIES OF *DICATHAIS* (GASTROPODA:MURICIDAE) FROM THE PLIOCENE TAMIAMI FORMATION OF SOUTHERN FLORIDA

ROGER W. PORTELL
FLORIDA MUSEUM OF NATURAL HISTORY
GAINESVILLE, FLORIDA
and
EMILY H. VOKES
TULANE UNIVERSITY
NEW ORLEANS, LOUISIANA

Dicathais, a thaidine gastropod genus presently restricted to the Recent of Australia, New Zealand, Norfolk, Lord Howe, and Kermadec Islands (Phillips *et al.*, 1973), is herein reported from the Pliocene Tamiami Formation of southern Florida. *Dicathais handgenae*, n. sp., represents the first record of the genus outside Australasia and only the second known fossil occurrence of the genus. Suter (1913) and Beu and Maxwell (1990) have listed *Thais orbita* (Gmelin, 1791), the type species of *Dicathais*, as ranging from early Pliocene to Recent in New Zealand. To date, no other references to fossil *Dicathais* have been found.

Almost seventy specimens of *Dicathais handgenae*, n. sp., are known to exist and the majority are reposited in the Florida Museum of Natural History at the University of Florida (UF). The best preserved specimens were collected between 1987 and 1991 from two UF localities in Charlotte County, CH003 (type locality) and CH026. At UF locality CH003 most specimens were adults and were tan in color, but at UF locality CH026 most specimens were juveniles and were dark brown in color.

Specimens from both localities were collected from a sandy-clay matrix, which was devoid of all aragonitic-shelled mollusks. Only calcitic-shelled invertebrates typically associated with the Tamiami Formation were found. Examples of these include the gastropods *Ecphora quadricostata* (Say, 1824), *Pterorytis fluviana* Dall, 1903, and *Vokesinotus lepidotus* (Dall, 1890), and the echinoids *Encope tamiamiensis* Mansfield, 1932, *Mellita aclinensis* Kier, 1963, and *Rhyncholampas evergladensis* (Mansfield, 1932). The shell of *Dicathais*, like all thaidines, consists of a calcitic outer layer and an aragonitic inner layer (Kool, 1989). All the fossil specimens used in this study have only the calcitic outer layer remaining.

Specimens of *D. handgenae*, n. sp., were recognized from ten additional localities (six in Charlotte County, two in Hendry County, and one each in De Soto and Collier Counties; see text-figure 1) in two collections (the McGinty and Hunter Collections) recently acquired by the University of Florida and from materials donated by Tulane University for this study.

The disjunct distribution of *Dicathais* during the Pliocene probably represents a relict population, which once had a much wider distribution. Thaidines, in general, are rarely preserved in the fossil record because of their preferred habitat of hard substrates in mostly intertidal to subtidal, epifaunal environments (Vokes, 1989, p. 87). This may account for the lack of additional fossil occurrences of *Dicathais*.

ACKNOWLEDGMENTS

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SYSTEMATIC PALEONTOLOGY

Class GASTROPODA
Order NEOGASTROPODA
Superfamily MURICACEA

Family MURICIDAE Rafinesque, 1815
Subfamily THAIDINAE Jousseaume, 1888
Genus DICATHAIS Iredale, 1936

Dicathais IREDALE, 1936, Rec. Australian Mus., v. 19, no. 5, p. 325.

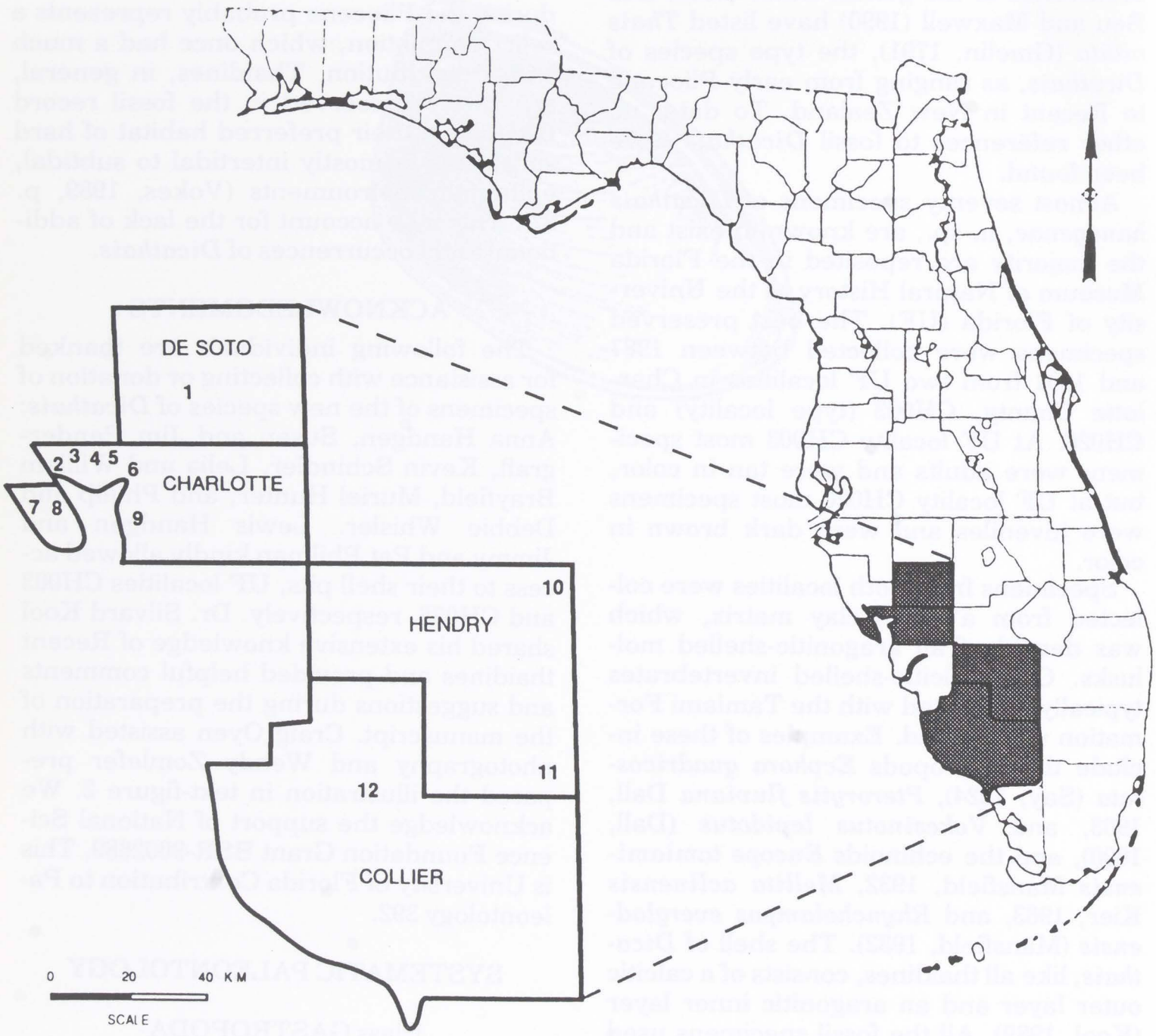
Type species: *Buccinum orbita* Gmelin, 1791, by original designation.

DICATHAIS HANDGENAE
Portell and Vokes, n. sp.
Plate 1, figures 1, 2; text-figure 2

Description: Shell inflated, reaching a maximum height of about 76 mm and diameter about 54 mm; oval in outline, comprising 4+ whorls (protoconch and early whorls absent or obscured by hardened matrix on most specimens). Shell spire low, body whorl greater than three-fourths of shell height. Teleoconch whorls sculptured with 7 to 9 occasionally nodose, primary spiral ridges; secondary cords of varying strength and fine tertiary cords between each. Area between anterior-most major cord and anal fasciole with only tertiary threads. Suture incised, crossed by axial laminae. Aperture wide, elliptical, outer lip thin, crenulated and lirate within. Siphonal canal short, forming a curved fasciole.

Holotype: UF 21367; height 71.4 mm, diameter 48.3 mm (Plate 1, figs. 1a, 1b).

Type locality: UF locality CH003, Tamiami Formation; shell pit 1.9 kilometers south of Al-



Text-figure 1. Map showing position of all known UF localities for *Dicathais handgenae* n. sp. (1. DE006, 2. CH020, 3. CH030, 4. CH029, 5. CH031, 6. CH032, 7. CH025, 8. CH026, 9. CH003, 10. 3736, 11. 3737, 12. CR001).

ligator Creek along US 41, approximately 1.2 kilometers southeast of Acline, Charlotte County, Florida (SW 1/4, SE 1/4, Sec. 28, T41S, R23E; Punta Gorda Quadrangle, USGS 7.5 minute series).

Paratype A: UF 32295; height 79.0 mm, diameter 48.3 mm; UF locality CH026.

Paratype B: UF 24516; height 63.6 mm, diameter 43.2 mm; UF locality CH003.

Paratype C: UF 29327; height 62.1 mm, diameter 44.1 mm; UF locality CH003.

Paratype D: UF 29330; height 65.7 mm, diameter 46.1 mm; UF locality CH003.

Paratype E: UF 29334; diameter 75.6 mm, width 54.4 mm; UF locality CH003.

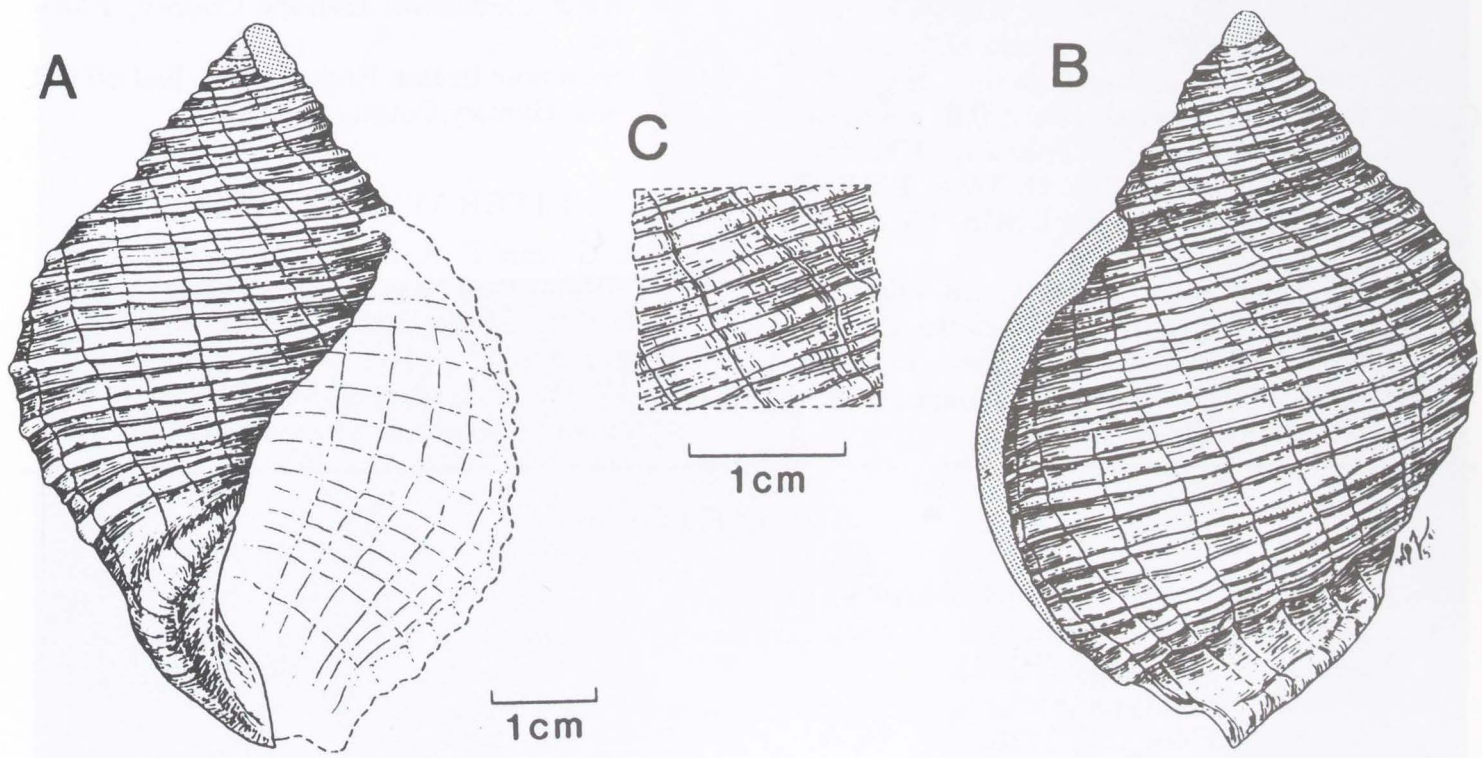
Paratype F: UF 40562; juvenile, height 37.3 mm, diameter 25.6 mm; UF locality 3736 (Plate 1, fig. 2).

Occurrence: Tamiami Formation, southern Florida; Pliocene.

Etymology: Named for Mrs. Anna Handgen of Punta Gorda, Florida, who collected and unselfishly donated most of the best specimens from UF locality CH003.

Discussion: Comparisons of the fossil material made with Recent specimens of *Dicathais* from the collections of Tulane University and the Division of Malacology, Florida Museum of Natural History show that *D. handgenae* closely resembles the Recent Australian species *D. orbita* (Gmelin, 1791) in overall size and shape. The shells of the extant *Dicathais* represent extreme degrees of variability in shell sculpture and most of the described species [i.e., *D. aegrota* (Reeve, 1846), *D. textilosa* (Lamarck, 1816), *D. scalaris* (Menke, 1829)] appear to represent ecologically determined forms of *D. orbita,* a single highly variable species (Phillips *et al.,* 1973). Like the living *D. orbita, D. handgenae* also exhibits a high degree of variation. Some examples are noticably nodose, some are much more elongate than the type material. The strength of the spiral cords is also variable with certain of the secondary cords approaching the strength of the major cords.

Given the variability of the living *Dicathais orbita,* it is extremely difficult to arrive at any particular characteristic that separates *D. handgenae.* From the typical "Cart-Rut" form of *D. orbita* there is no problem with differences, *D. handgenae* never (so far as we know!) develops the deeply incised spiral cords. But the less ornamented *D. textilosa, D. scalaris* (see pl. 1, fig. 3), and the nodose *D. aegrota* forms are strikingly similar to various examples of *D. handgenae.* The only constant difference is the development in *D. handgenae* of a "blank" area between the anterior-most spiral cord and the anal fasciole. In the Recent species the spiral cords extend all the way to the fasciole, but in *D. handgenae* there is an unornamented band between



Text-figure 2. *Dicathais handgenae* Portell and Vokes, n. sp. Sketch of UF 21367 (holotype): a) ventral view of shell if hardened matrix could be removed from aperture; b) dorsal view; c) details of sculpture on body whorl.

the two (see text-fig. 2B). Unfortunately, there are no specimens with preserved protoconchs yet known of *D. handgenae*. However, the protoconch is probably like that of *D. orbita*, with four large whorls, indicating planktotrophic development, which would be consistent with the disjunct distribution.

Other than the fossil occurrence of *D. orbita* in New Zealand, no other fossil representatives of this genus are known. In Florida the only other Pliocene thaidine is *Thais (Stramonita) haemastoma floridana* (Conrad, 1837), which is easily distinguished by the smoother shell surface, the appressed suture, and the presence of knobs or an angulation at the shoulder.

Dicathais handgenae was also compared to the other living thaidines from the western Atlantic but does not resemble any of those.

LOCALITY DATA

The following are collecting localities of the Invertebrate Paleontology Division, Florida Museum of Natural History, University of Florida (UF). All are in the Tamiami Formation.

CH003 Shell pit 1.9 kilometers south of Alligator Creek along US 41, approximately 1.2 kilometers southeast of Acline, Charlotte County, Florida (SW 1/4, SE 1/4, Sec. 28, T41S, R23E; Punta Gorda Quadrangle, USGS 7.5 minute series).

CH020 Shell pit approximately 0.8 kilometer northwest of El Jobean, Charlotte County, Florida (Sec. 21, T40S, R21E; El Jobean Quadrangle, USGS 7.5 minute series).

CH025 Shell pit approximately 0.8 kilometer east of Grove City, Charlotte County, Florida (NW 1/4, NE 1/4, Sec. 16, T41S, R20E; Englewood Quadrangle, USGS 7.5 minute series).

CH026 Shell pit approximately 1.2 kilometers east of Grove City, Charlotte County, Florida (NE 1/4, NE 1/4, Sec. 16, T41S, R20E; Englewood Quadrangle, USGS 7.5 minute series).

CH029 Banks of Jupiter Waterway north of US 41, approximately 5.3 kilometers west of Murdock, Charlotte County, Florida (NE 1/4, Sec. 3, T40S, R21E; Murdock Quadrangle, USGS 7.5 minute series).

CH030 Banks of Jupiter Waterway south of US 41, approximately 5.3 kilometers west of Murdock, Charlotte County, Florida (S 1/2, Sec. 3, T40S, R21E; Murdock Quadrangle, USGS 7.5 minute series).

CH031 Banks of Pellam Waterway near intersection with US 41, approximately 0.8 kilometer east of Murdock, Charlotte County, Florida (W 1/2, Sec. 8, T40S, R22E; Murdock Quadrangle, USGS 7.5 minute series).

CH032 Exposure near west side of SR 776 bridge over Myakka River, El Jobean, Charlotte County, Florida (Sec. 28, T40S, R21E; El Jobean Quadrangle, USGS 7.5 minute series).

CR001 Quarry on west side of SR 29, Sunniland, Collier County, Florida (W 1/2, Sec. 29, T48S, R30E; Sunniland Quadrangle, USGS 7.5 minute series).

DE006 Shell pit 2.6 kilometers east of junction of US 17 and SR 760, Nocatee, De Soto County, Florida (NE 1/4, SE 1/4, Sec. 24, T38S, R24E; Arcadia Quadrangle, USGS 7.5 minute series).

3736 Near Clewiston, Hendry County, Florida.

3737 Seminole Indian Reservation, just off CR 833, Hendry County, Florida.

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PLATE 1

Figures

1-2. *Dicathais handgenae* Portell and Vokes, n. sp.
1. UF 21367 (holotype); height 71.4 mm, diameter 48.3 mm.
Locality: UF locality CH003.
2. UF 40562 (paratype F); height 37.3 mm, diameter 25.6 mm.
Locality: UF locality 3736.

3. *Dicathais orbita* (Gmelin, 1791)
UF 193522; height 78.7 mm, diameter 50.4 mm.
Locality: Murawai, New Zealand; Recent.

(All specimens X 1)

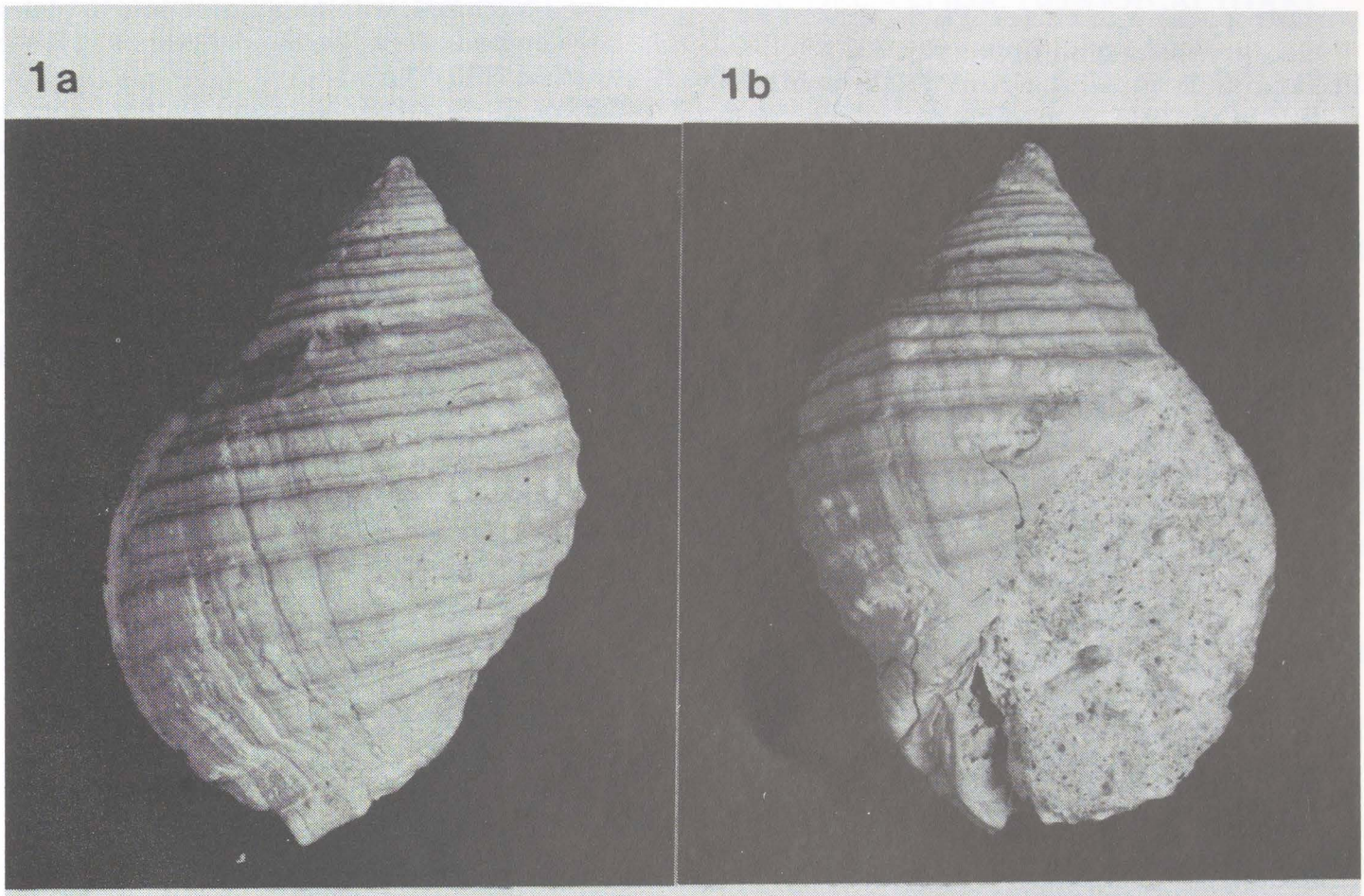

PLATE 1

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