

WATERING POT SHELL, *BRECHITES PENIS* (LINNAEUS, 1758), A NEW RECORD TO INDIA (MOLLUSCA: BIVALVIA: ANOMALODESMATA)

Deepak Samuel Vijay Kumar¹, Thangaiyan Anbalagan², Manickam Nithyanandan³ & Naveen Namboothri⁴

¹Energy & Environment Unit, United Nations Development Programme, GoMBRT, 102/26, Jawan Bhawan, Devipattinam Road, Kenikarai, Ramanathapuram, Tamil Nadu 623504, India

²Gulf of Mannar Biosphere Reserve Trust (GoMBRT), 102/26, Jawan Bhawan, Devipattinam Road, Kenikarai, Ramanathapuram, Tamil Nadu 623504, India

³Environmental Department, "Sabah Al Ahmad Sea City", La Ala Al Kuwait Real Estate Co. K.S.C., Souk Al Kuwait, 6th Floor, Office No. 613, P.O. Box 22964, Kuwait 13090.

⁴Centre for Ecological Sciences, Indian Institute of Science, Bengaluru, Karnataka 560012, India

¹deepakocean@gmail.com (corresponding author), ²anbutj@gmail.com,

³nandan.ocean@gmail.com, ⁴naveen.namboo@gmail.com

The watering pot shells and pepper pot shells are rare and interesting bivalves under the Family Clavagellidae, typical filter-feeder encased in a tube of its own secretion. Beginning life as a tiny bivalve, the shell develops into a calcareous tube with the embryonic valves attached to its outer surface and its base is a perforated, raised disc, fringed with small tubes (Dance 1992). Another species of this family, *Brechites dichotomus* was recorded by Gravely (1941), Hornell (1921) from Madras and by Sathyamurthi (1956) from the Gulf of Mannar, which is available in the museum collection of Central Marine Fisheries Research Institute (CMFRI), Mandapam. Palk bay lies on the southeastern coast of India extending from Point Calimere in the north to Rameswaram Island in the south, it has diversified habitats like seagrass, mangroves and coral reefs. Bottom trawling an important fishing method practiced by the fisher folk in this region brings ashore enormous quantities of benthic molluscs as bycatch. The present

record of the rare bivalve, *B. penis* from Palk Bay (Image 1) is new to the molluscan fauna of India.

Materials and Methods: We collected unusual bivalve shells from bycatch of bottom trawls operated in the Palk Bay region. A single individual of *Brechites penis* collected was preserved in 70% alcohol and identified, based on Sathyamurthy (1956) and Morton (2006b). The collected specimen was deposited in the museum of Zoological Survey of India (ZSI), Marine Biology Regional Centre (MBRC). Another species of genus *Brechites* available in the collection of Central Marine Fisheries Research Institute (CMFRI), Mandapam was examined for comparison.



ISSN
Online 0974-7907
Print 0974-7893

OPEN ACCESS

Systematics

Bivalvia Linnaeus, 1758

Heterodontia Neumayr, 1884

Anomalodesmata Dall, 1889

Family Clavagellidae d' Orbigny, 1843

Genus *Brechites* Röding, 1798

***Brechites penis* (Linnaeus, 1758) (Image 2A)**

Material examined: ZSI/MBRC M542, 28.iii.2011, Palk Bay landing centre at Mandapam (9°17'9.50"N & 79°9'19.80"E), one specimen, true shell 4mm and adventitious tube length 74mm, collected at 5–15 m depth from trawl net bycatch by Dr. V. Deepak Samuel; Single specimen, *Brechites dichotomus* (Chenu) reg. no. M.333 (Image 3 A), shell on display at the CMFRI museum, Mandapam, collection details unknown, true shell 6mm and adventitious tube length 78mm.

Description: Both the left and right shell valve measured 4mm (Table 1), whereas in species like the

DOI: <http://dx.doi.org/10.11609/JoTT.o3479.4679-81> | ZooBank: urn:lsid:zoobank.org:pub:E8E39481-8C3F-4C39-99FF-8879D50B6FF3

Editor: S. Arularasan, Annamalai University, Parangipettai, India.

Date of publication: 26 August 2013 (online & print)

Manuscript details: Ms # o3479 | Received 09 January 2013 | Final received 10 June 2013 | Finally accepted 21 July 2013

Citation: Kumar, D.S.V., T. Anbalagan, M. Nithyanandan & N. Namboothri (2013). Watering Pot Shell, *Brechites penis* (Linnaeus, 1758), a new record to India (Mollusca: Bivalvia: Anomalodesmata). *Journal of Threatened Taxa* 5(12): 4679–4681; <http://dx.doi.org/10.11609/JoTT.o3479.4679-81>

Copyright: © Kumar et al. 2013. Creative Commons Attribution 3.0 Unported License. JoTT allows unrestricted use of this article in any medium, reproduction and distribution by providing adequate credit to the authors and the source of publication.

Funding: This study was an independent study carried out by authors.

Competing Interest: Authors declare no competing interest.

Acknowledgements: The authors wish to thank Mr. S. Balaji, Chief Conservator of Forests and Trust Director, Gulf of Mannar Biosphere Reserve Trust, Ramanathapuram, Tamil Nadu, for his interest and constant encouragement.





Image 1. Map showing collection locality of *Brechites penis* (Linnaeus, 1758).



Image 2A. *Brechites penis* (Linnaeus, 1758) collected from Palk Bay, India (ZSI/MBRC M 542).



Image 2B. *Brechites penis* (Linnaeus, 1758), basal disc with tubular perforations.

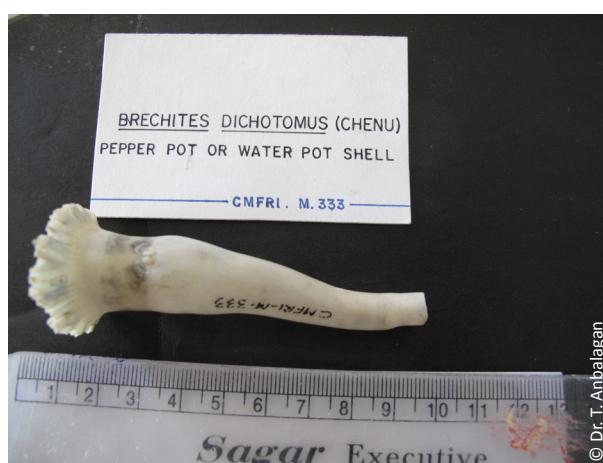


Image 3A. *Brechites dichotomus* (Chenu) shell on display at the CMFRI museum, Mandapam (reg.no. M.333).



Image 3B. *Brechites dichotomus* (Chenu), basal disc with tubular perforations.

Japanese Watering Pot Shell, *Stripulina ramosa* the right valve is 16mm in size and the left valve is 9mm in size (Morton 2006a). In *B. dichotomous*, the true shell measured 6mm for both valves. Tubules arising from the periphery of the disc were 44 in total while eight tubules were forked and further branched to form a single radiating branch (Image 2B). A marked difference was noted in the case of pore distribution at the basal disc (37 in *B. penis* and 114 in *B. dichotomous*). In *B. penis* pores were concentrated more on the periphery but hardly any in the centre. Absence of forked tubules (biramus tubules) was noticed in *B. dichotomous*, while *B. penis* had eight forked tubules. Adventitious tube of *B. penis* was almost straight when compared to the small curvature at the anterior end for *B. dichotomous*.

In *B. dichotomous*, the tube had a perforated anterior end, with a slightly elevated margin leaving a convex appearance in the middle, bearing a fringe of tubules (Sathyamurthi 1956). The sample of *Verpa* (=*Brechites*) *penis* collected from Shangi had a tube length of 120mm (Tan et al. 2011) whereas the basic tube length for this species is not more than 100mm. *Penicillus philippinensis* has a varying tube length between 66–99 mm (Morton 2006b) while for *B. attrahens*, the tube length is 213mm with 18mm width (Gab-Alla 1999).

Distribution: Indo-Pacific.

Remarks: A new record to India. We understood from interaction with fishermen that the specimen of *B. penis* was collected from trawl net operated in seagrass beds of Palk Bay. The habitat is supposedly similar to that of *B. attrahens* from the Red Sea (Gab-Alla 1999).

The presence of embryonic shell valves on the side of the tube represents the mature form of this aberrant bivalve (Morton 2002b). A pedal gape aids in pumping of water into the mantle cavity as an ancestral feeding mechanism (hence the name watering pot shell). The life history of these curious, warm-water molluscs is almost

completely unknown except for the biology carried out by Purchon (1956). However, reports on functional morphology of *Humphreyia strangei* and *Stripulina ramosa* by Morton (2002a, 2006a) and certain new records from the Miocene period (Yates 2011) widens our understanding of this rare family of bivalve molluscs. Status of *B. penis* is unclear throughout the Indo-Pacific region. In Singapore, *B. penis* is listed as “presumed nationally extinct” on the Red List of threatened animals (Tan et al. 2011). In India, there is enough scope to collect scientific data to understand the diversity, distribution, biology, ecology and population characteristics of this rare bivalve mollusc for efficient management.

REFERENCES

Gab-Alla, A.A. (1999). *Brechites attrahens* (Lightfoot, 1786) (Mollusca: Bivalvia, Clavagellidae), a new record from the Gulf of Suez. *Egyptian Journal of Biology* 1: 138–141.

Dance, S.P. (1992). *Shells, The Visual Guide to Over 500 Species of Seashell from Around The World - Eyewitness Handbook*. DK Publishing, 156pp.

Purchon, R.D. (1956). A note on the biology of *Brechites penis* (L.) (Lamellibranchia). *Journal of the Linnean Society of London (Zoology)* 43(289): 43–54; <http://dx.doi.org/10.1111/j.1096-3642.1956.tb02506.x>

Gravely, F.B. (1941). Shells and other animal remains found on the Madras Beach. *Bulletin of the Madras Government Museum, New Series, Natural History Section* 5: 66.

Hornell, J. (1921). Common molluscs of India. *Madras Fishery Bulletin* 14: 197.

Morton, B. (2002a). The biology and functional morphology of *Humphreyia strangei* (Bivalvia: Anomalodesmata: Clavagellidae): an Australian Cement Watering Pot Shell. *Journal of Zoology* 258(1): 11–25; <http://dx.doi.org/10.1017/S0952836902001164>

Morton, B. (2002b). Biology and functional morphology of the watering pot shell *Brechites vaginiferus* (Bivalvia: Anomalodesmata: Clavagelloidea). *Journal of Zoology* 257(4): 545–562; <http://dx.doi.org/10.1017/S0952836902001139>

Morton, B. (2006a). Structure and formation of the adventitious tube of the Japanese watering-pot shell *Stripulina ramosa* (Bivalvia, Anomalodesmata, Clavagellidae) and a comparison with that of the Penicillidae. *Invertebrate Biology* 125(3): 233–249; <http://dx.doi.org/10.1111/j.1744-7410.2006.00056.x>

Morton, B. (2006b). The functional morphology of *Penicillus philippinensis* (Anomalodesmata: Clavagelloidea: Penicillidae) and the evolution of a unique muscular system in the Bivalvia. *Records of the Western Australian Museum* 23: 175–192.

Sathyamurthi, S.T. (1956). The Mollusca of Krusadai island II (Gulf of Mannar) - Scaphopoda, Pelecypoda and Cephalopoda. *Bulletin Madras Government Museum New Series, Natural History Section 1, Part 7*: 1–202.

Tan, S.K., S.H. Tan & M.E.Y. Low (2011). A reassessment of *Verpa penis* (Linnaeus, 1758) (Mollusca: Bivalvia: Clavagelloidea), a species presumed nationally extinct. *Nature in Singapore* 4: 5–8.

Yates, A.M. (2011). A new species of Watering Pot Shell (Bivalvia: Anomalodesmata: Clavagelloidea) from the Miocene of the Murray Basin, South Australia. *Palaeontology* 54: 373–384.



Table 1. Morphometric and meristic characters of *Brechites penis* (Linnaeus, 1758) collected from Palk Bay compared with *B. dichotomous*, available at CMFRI museum, Mandapam.

Character	Measurements (mm)	
	<i>Brechites penis</i>	<i>Brechites dichotomous</i>
True shell (both left and right shell valves)	4	6
Adventitious tube length	74	78
Diameter of the perforated plate	24	21
Diameter of the opening in the anterior end	5	8
Maximum width at the posterior end	43	38
Number of perforations in the disc	37	114