

## *Arca zebra* (Turkey Wing Ark Clam)

Order: Arcoida (Ark Clams)

Class: Bivalvia (Clams, Oysters and Mussels)

Phylum: Mollusca (Molluscs)



**Fig. 1.** Turkey wing ark clam, *Arca zebra*.

[[https://commons.wikimedia.org/wiki/File:Arca\\_zebra\\_\(Interior\\_and\\_Exterior\).jpg](https://commons.wikimedia.org/wiki/File:Arca_zebra_(Interior_and_Exterior).jpg), downloaded 4 February 2017]

**TRAITS.** This two-shelled (bivalve) clam obtained its name from its similarity to the barred colour pattern of a turkey's wing (Fig. 1). The shell is an almost rectangular equivalve (both shells equal in size and shape), twice as long as wide, which can grow to lengths of 10cm. This mollusc is characterised by its external white/yellowish colour with reddish to dark brown wavy stripes. It has 20-30 irregular radial ribs on each shell, with fine concentric lines across them. The byssal gap is narrow, and opposite to the long hinge (Leal, 2003). Along the edge of the mantle, eye spots are present (Fig. 2) (Coulombe, 1990). The hinge line of the shell is usually straight with approximately 50 small teeth protruding from it (Fig. 3). Due to its distinct pattern, it is commonly camouflaged in its natural environment (Carleton University Dept. Earth Sciences, 2017).

**DISTRIBUTION.** The turkey wing ark clam is commonly found in the marine coastal regions of the Caribbean Sea, Gulf of Paria, North Atlantic Ocean, on the South Atlantic coast of South America. It has also been found as an invasive species off the coast of Spain and in the Arabian Sea (Fig. 4) (Global Biodiversity Information Facility, 2017).

**HABITAT AND ACTIVITY.** The turkey wing ark clam is found in marine, coastal waters attached to rocks and corals by its short but thick clump of byssal threads (Coulombe, 1990). However, it occurs in a rather wide depth range of 1-180m. It exists within an optimum temperature range of 21.0-27.7 °C (Encyclopedia of Life, 2017).

**FOOD AND FEEDING.** The mantle of this clam has paired, reduced siphons (as all ark clams have) which are used for filter feeding by inhaling surrounding water through one and exhaling through the other (Coulombe, 1990). It mainly feeds on microscopic organisms including varying type of algae, diatoms and phytoplankton (Encyclopedia of Life, 2017).

**POPULATION ECOLOGY.** These clams exist in clusters, resulting in a sporadic distribution within the population. Approximately 7-10 individuals of different shell sizes may be present in a single cluster. However, its density appears to be greater at lower depths and less at intertidal zones. At depths of 20m and lower, they may form large natural beds on rocky bottoms, for example, on the Araya Peninsula of Venezuela, there is a bed of ark clams covering an area of 70-80 km<sup>2</sup> (Sarkis, 1992; Peralta et al., 2016).

**REPRODUCTION.** Larval and post-larval development of these clams is typical of the Arcidae family, and they share their common protandrous hermaphroditism (individual clams are initially male, changing to female with age) (Lista et al., 2006). Histological analysis suggests that gonadal development is temperature-dependant such that the clam experiences a lapse during the winter season. Furthermore, they experience two distinct spawning periods, specifically during the summer season (June and July) and the autumn season (August and September). Reproduction occurs by means of external fertilization. Males usually spawn first, followed by females which release clumps of eggs with an average of 2,624,000 per female. Within 12 hours of fertilization, development of the free swimming life stage (trochophore larva) occurs. Within 24 hours, the organism begins to bear similarity to a miniature clam in the veliger larva stage. After seven days, eye spots begin to develop on the mantle (Ruppert et al., 2004; Sarkis, 1992).

**BEHAVIOUR.** Due to its sessile nature, the turkey wing ark clam cannot physically escape predation. However, they secrete a thick patterned periostracum layer that allows them to blend in with the environment and camouflage them from predators. They are hunted by a variety of predators including octopi, crabs, grunts, porcupine fish, snappers, nurse sharks, and most abundantly by humans. *Arca zebra* is a host to *Pseudomyicola spinosus*, a common ectoparasite that attaches itself to the shells of bivalves and other molluscs (Encyclopedia of Life, 2017; Humes, 1968).

**APPLIED ECOLOGY.** The IUCN Red list does not have this species listed in their database. However, they are heavily marketed by artisan fishermen in Venezuela and many Caribbean islands. The bed of ark clams located on the eastern coast of Venezuela, has been immensely exploited since the 1940s (Peralta et al., 2016). Human activity influences the distribution of these clams such that its population density is less in intertidal zones and greater at lower depths. This is attributed to the ease of access for capture in shallower waters (Sarkis, 1992).

**REFERENCES**

- Carleton University Dept. Earth Sciences. 2017. *Arca zebra*.  
<http://hoopermuseum.earthsci.carleton.ca/Bermuda/mollusc/BERM11-E.HTML>
- Coulombe, D.A. 1990. Seaside Naturalist. New York: Simon and Schuster.
- Encyclopedia of Life. 2017. *Arca zebra* Turkey Wing Ark Clam. <http://eol.org/pages/452127/overview>
- Global Biodiversity Information Facility. 2017. *Arca zebra* Reeve, 1844. <http://www.gbif.org/species/2286214>
- Humes, A.G. 1968. The cyclopoid copepod *Pseudomyicola spinosus* (Raffaele & Monticelli) from marine pelecypods, chiefly in Bermuda and the West Indies. *Beaufortia* **14**: 203-226.
- Leal, J.H. 2003. Bivalves. Seaweeds, corals, bivalves and gastropods. In The living marine resources of the Western Central Atlantic, edited by Carpenter, K.E, 26-52. FAO Species Identification Guide for Fishery Purposes and American Society of Ichthyologists and Herpetologists Special Publication.
- Lista, M., Lodeiros, C., Prieto, A., Himmelman, J.H., Castañeda, J., Gacía, N. and Velazquez, C. 2006. Relation of Seasonal Changes in the Mass of the Gonad and Somatic Tissues of the Zebra Ark Shell *Arca Zebra* to Environmental Factors. *Journal of Shellfish Research* **25**: 969-973.
- Peralta, C., Miloslavich, P., Bigatti, G. and Carranza, A. 2016. Impact of the clam *Arca zebra* artisanal fishery upon the population of the neogastropod *Voluta musica* in eastern Venezuela. *Latin American Journal of Aquatic Research* **44**: 703-710.
- Ruppert, E.E., Fox, R.S. and Barnes, R.D. 2004. Invertebrate Zoology: A functional evolutionary approach. 7th Ed. California: Brooks/Cole.
- Sarkis, S.C. 1992. The Turkey-Wing Mussel, Area Zebra: Aspects of Its Ecology, Reproduction and Physiology in Bermudan Waters. PhD diss., University of Plymouth.

Author: Damian Clarke

Posted online: 2017



**Fig. 2.** Lens-less compound eye spots of *Arca zebra* on the mantle edge.

[<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3632888/figure/fig5>, downloaded 22 February 2017]



**Fig. 3.** Straight hinge line with small teeth of *Arca zebra*.

[<https://www.inaturalist.org/photos/4142223>, downloaded 25 February 2017]



**Fig. 4.** Turkey wing ark clam geographic distribution.

[<http://www.gbif.org/species/2286214>, downloaded 18 February 2017]