

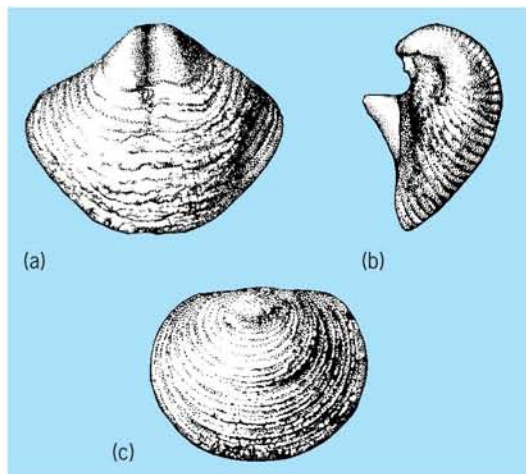
Kutorginata

A small extinct class and one of the most primitive types of rhynchonelliformean brachiopods. The kutorginates were widely distributed from the Early Cambrian and became extinct at the end of the Middle Cambrian. See BRACHIOPODA; RHYNCHONELLIFORMEA.

Classification. The Kutorginata appear in the classification scheme as follows:

- Phylum Brachiopoda
 - Subphylum Rhynchonelliformea [Articulata]
 - Class Kutorginata
 - Order Kutorginida
 - Superfamily Kutorginoidea
 - Family Kutorginidae
 - 5 genera (Early to Middle Cambrian)
 - Superfamily Nisusioidea
 - Family Nisusiidae
 - 5 genera (Early to Middle Cambrian)

Morphology. Kutorginates have a biconvex, fibrous, impunctate (lacking holes) shell (see **illustration**). On the posterior margin of the shell, the pedicle (a tough but flexible stalklike appendage used for attachment) protrudes through a large median opening (delthyrium and notothyrium) located between the valves. In the ventral valve (formerly named pedicle valve), this opening is partly covered by a triangular convex plate (pseudodeltidium) bounded laterally by furrows, acting in the shell articulation. The pedicle appears at least as strong as that of the coeval (contemporary) lingulids. The putative coelomic cavity is similar anatomically to those of the Cambrian linguliformeans. See LINGULIDA.



Kutorgina, showing (a) exterior of pedicle (ventral) valve; (b) lateral view of shell; (c) exterior of brachial (dorsal) valve. (After C. D. Walcott, *Cambrian Brachiopoda*, USGS Monogr., vol. 51, 1912)

The articulation of the shell consists of edges of the interareas without teeth and dental sockets: the valves rotate on simple hinge mechanisms that are different from those of other rhynchonelliformean brachiopods. A small apical foramen (opening) may occur on the ventral valve.

The visceral cavity is in a posteromedian position and extends anteriorly over one-third of the shell length. The muscle arrangement is very similar to that of other rhynchonelliformean brachiopods with adductor and diductor muscle systems (that is, muscles used to close and open the shell, respectively). The complete alimentary canal consists of the mouth located at the base of the lophophore (a food-gathering organ), a posterodorsal esophagus, an enlarged pouch representing the stomach, a narrow intestine, and a dorsoposterior anus located near the proximal end of the pedicle. The adult lophophore development attains an early spirolophore (a lophophore with spiraled appendages) stage.

The main mantle canals known as *vascula lateralia* are exclusively disposed radially (pinnate type) in both valves. On the dorsal side, the *vascula media* are bifurcate.

Members of this group were sessile, but the epifaunal (surface-attaching) position remains questionable.

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