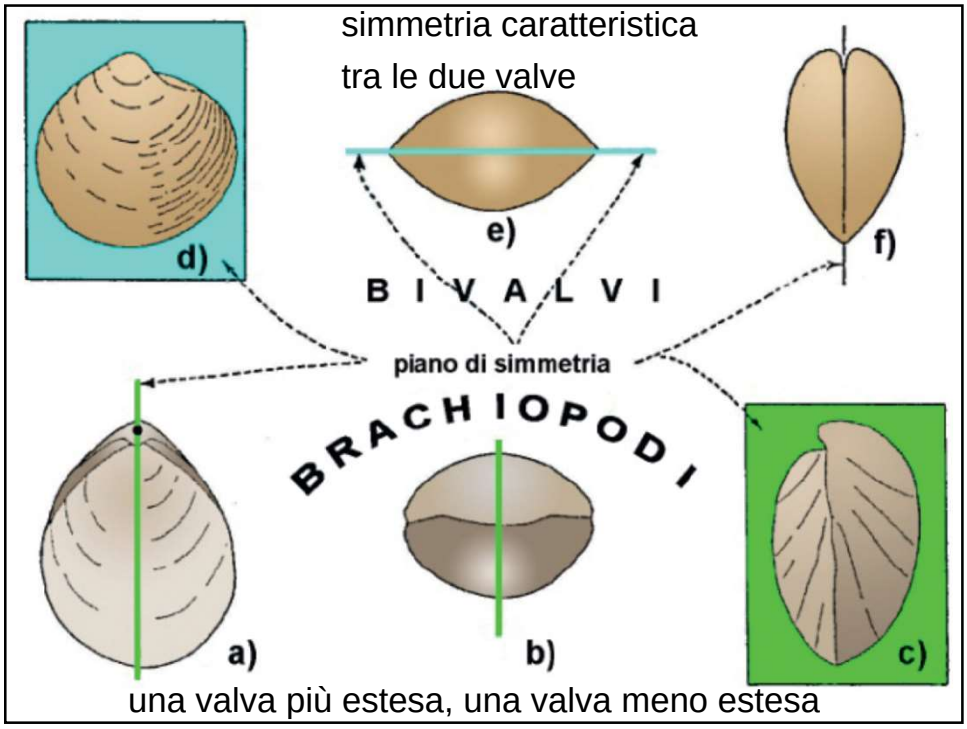
Introduzione

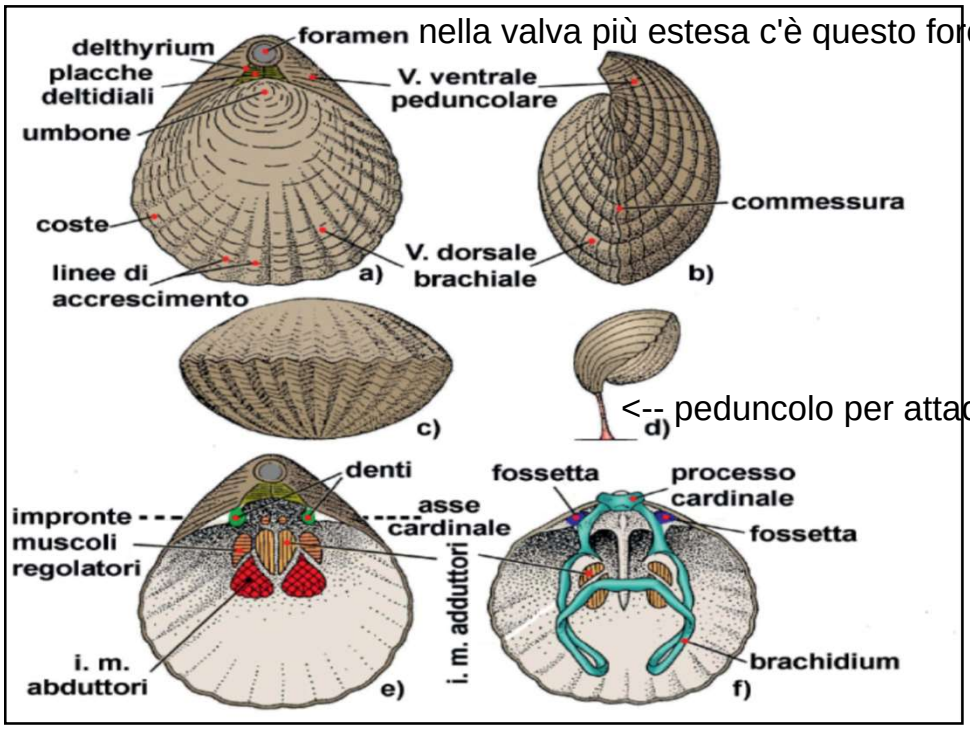
Nonostante abbiano due valve non hanno niente a che fare con i bivalvi.



ATTENZIONE alle RUDISTE e GRIFEE che hanno valve diverse ma sono bivalvi

La linea di simm. corre a metà del brachiopode, trasversalmente

Sono organismi bentonici sessili filtratori, guscio calcitico; raramente fosfatico. Quasi sempre preservati.



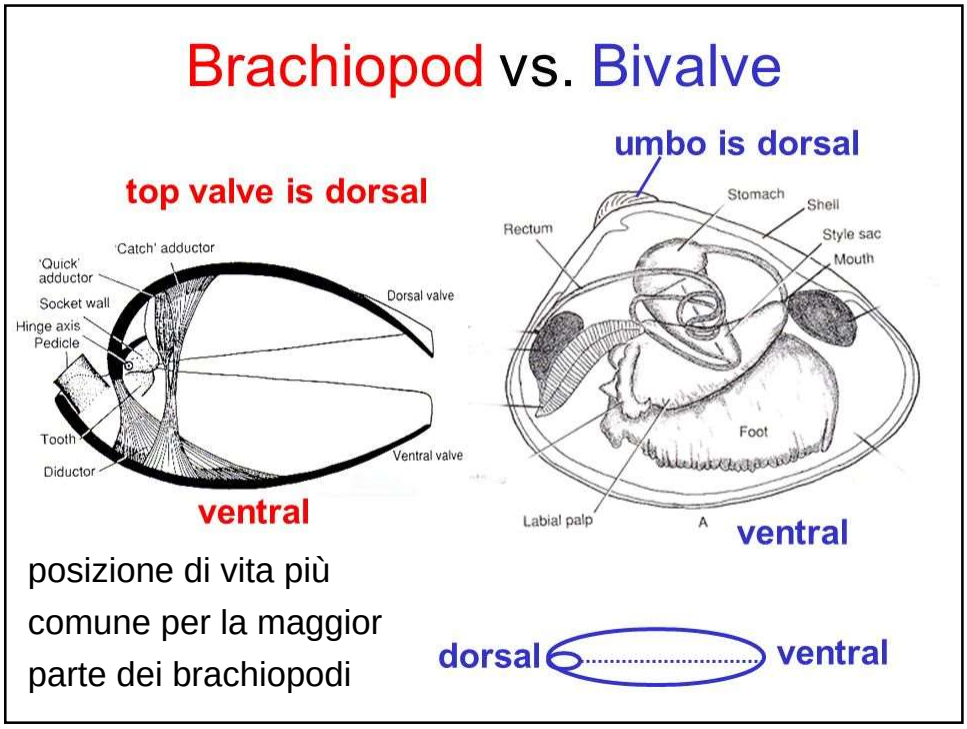
nella valva più estesa c'è questo foro chiamato foramen

<-- peduncolo per attaccarsi al substrato

esce dal foramen

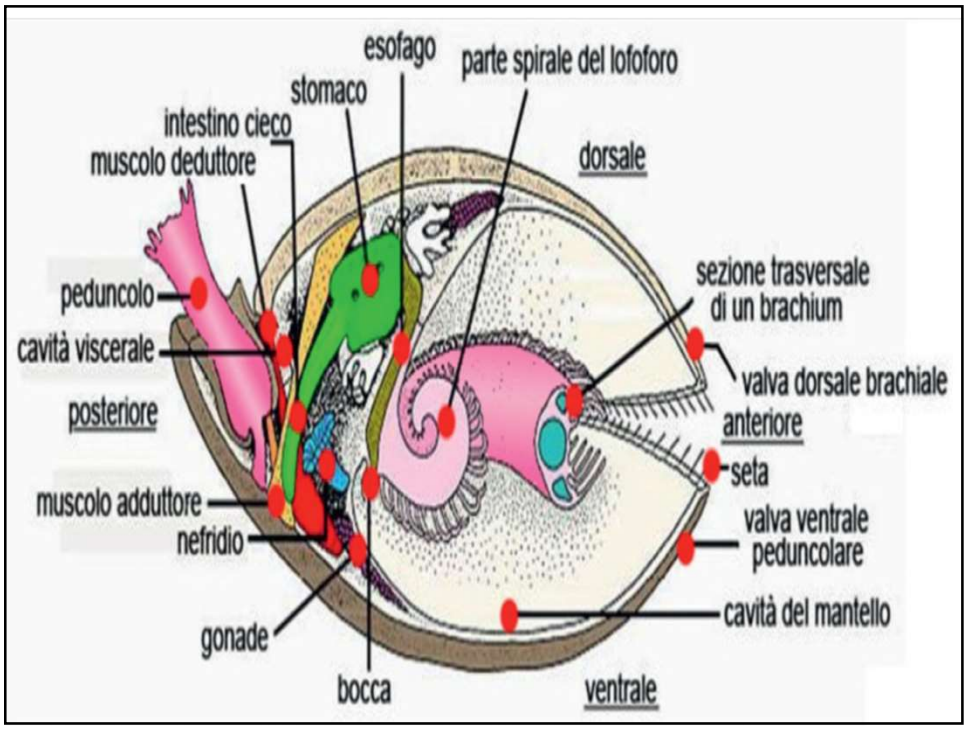
brachidio = struttura mineralizzata, spesso preservata, su cui si appoggia il lofoforo

IL LOFOFORO viene estroflesso fuori dal guscio in molti casi e funziona come la branchia di un pesce



Il bivalve ha UN solo muscolo perché l'apertura è fatta a "molla" con un legamento elastico.

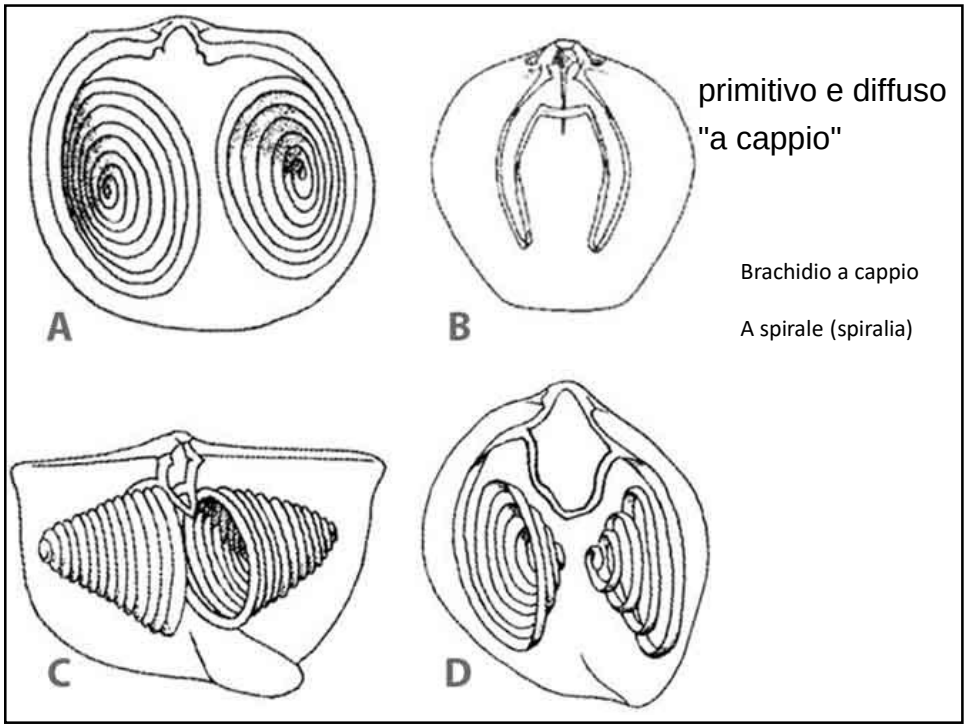
I brachiopodi hanno DUE muscoli/set di muscoli per aprire E chiudere le VALVE



Se si cucina un bivalve, le valve si aprono perché sono "a molla"

Se si cucina un brachiopode, le valve NON SI aprono perché TUTTI E DUE i muscoli si denautrano

Pertanto, nel record fossile i bivalvi sono quasi sempre (eccetto gli infaunali) con UNA valva sola; i brachiopodi vengono preservati quasi sempre con DUE valve CHIUSE, è molto raro trovare brachiopodi aperti.



primitivo e diffuso
"a cappio"

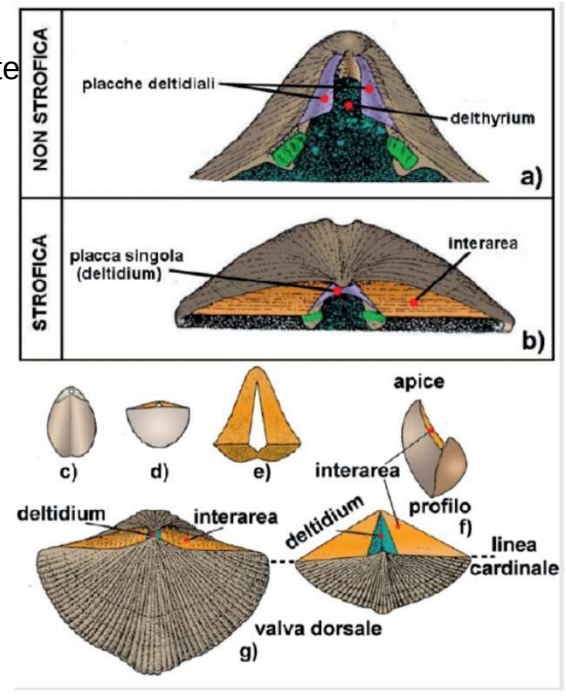
Brachidio a cappio

A spirale (spiralia)

STROFISMO DEL GUSCIO (quanto si allarga la linea di commessura frontale (linea cardinale) congiungendo le due valve)

estremamente ridotta

estensione massima



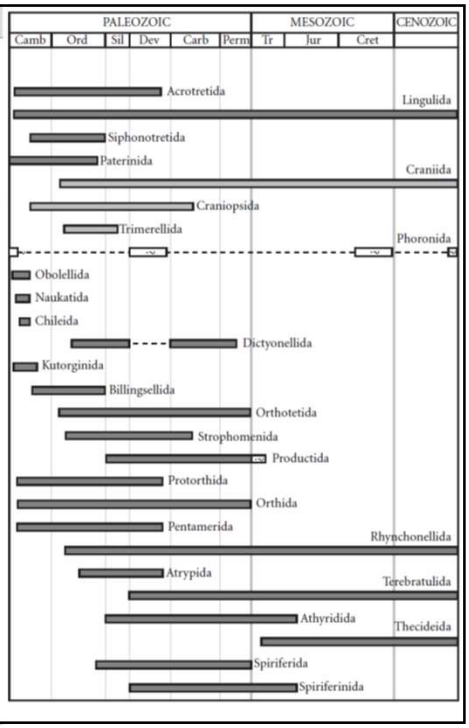
Articulata: cambriano-attuale.Guscio calcareo, presenza di denti e fossette per l'articolazione dell valve
Inarticulata: ordovic.-attuale. Guscio calcareo, assenza di denti; apertura ridotta delle valve

CLASSIFICAZIONE RECENTE

lingulata =====

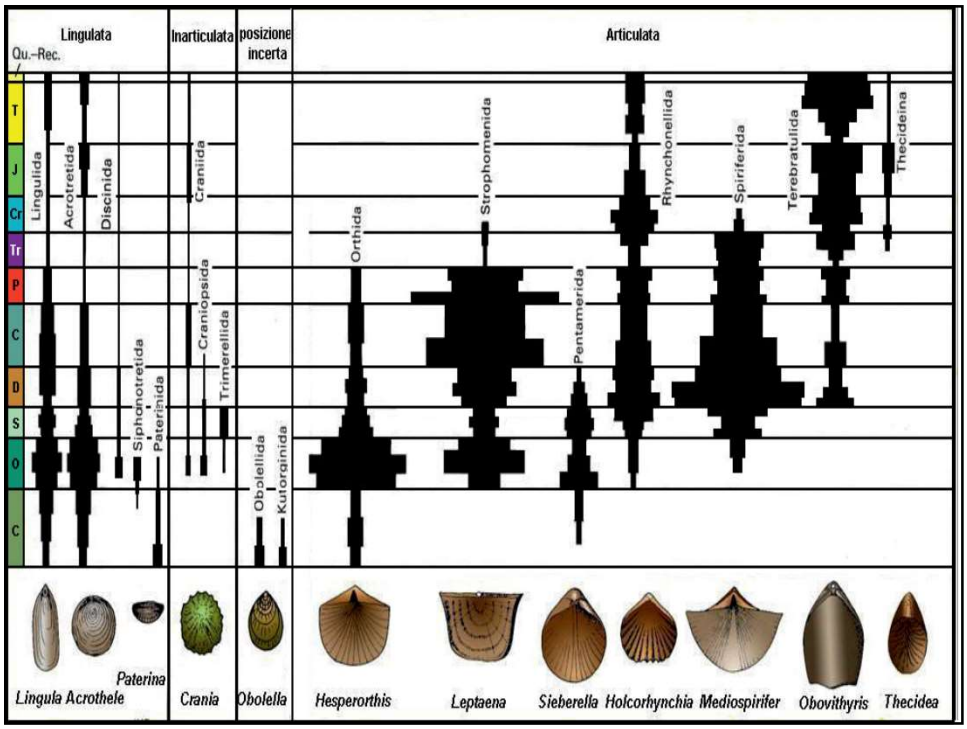
inarticolati ======

Subphylum	Order	Key characteristics	Stratigraphic range
Linguliformea	Lingulida	Spatulate valves with pedicle usually emerging between both shells	Cambrian to Recent
	Acrotretida	Micromorphic forms with conical ventral valve; dorsal valve with platforms	Cambrian to Devonian
	Discinida	Subcircular shells with conical ventral valve and distinctive pedicle foramen	Ordovician to Recent
	Siphonotretida	Subcircular, biconvex valves with spines and elongate pedicle foramen	Cambrian to Ordovician
	Paterinida	Strophic shells with variably developed interareas	Cambrian to Ordovician
Craniiformea	Craniida	Usually attached by ventral valve; dorsal valve with quadripartite muscle scars	Ordovician to Recent
	Craniopsida	Small oval valves with internal platforms and marked concentric growth lines	Ordovician to Carboniferous
	Trimerellida	Commonly gigantic, aragonitic shells, with platforms and umbonal cavities	Ordovician to Silurian
Rhynchonelliformea	Chileida	Strophic shells lacking articulatory structures but with umbonal perforation	Cambrian
	Dictyonellida	Biconvex valves with large umbonal opening commonly covered by a colleplax	Ordovician to Permian
	Naukatida	Biconvex shells with articulatory structures and apical foramen	Cambrian
	Obolellida	Oval valves with primitive articulatory structures	Cambrian
	Kutorginida	Strophic valves with interareas but lacking articulatory structures	Cambrian
	Orthotetida	Biconvex shells, commonly cemented, with bilobed cardinal process	Ordovician to Permian
	Billingsellida	Usually biconvex with transverse teeth and simple cardinal process	Cambrian to Ordovician
	Strophomenida	Concavoconvex, usually with a bilobed cardinal process; recumbent life mode; cross-laminar shell structure with pseudopunctae	Ordovician to Permian
	Productida	Concavoconvex valves with complex cardinalia; recumbent or cemented life mode; often with external spines	Ordovician to Triassic
	Protorthida	Well-developed interareas, primitive articulation and ventral free spondylium	Cambrian to Devonian
	Orthida	Biconvex, usually simple cardinal process; pedunculate; delthyria and notothyria open	Cambrian to Permian
	Pentamerida	Biconvex, rostrate valves with cruralia and spondylia variably developed	Cambrian to Devonian
	Rhynchonellida	Usually biconvex, rostrate valves with variably developed crurae	Ordovician to Recent
	Atrypida	Biconvex valves with dorsally-directed spiralia and variably developed jugum	Ordovician to Devonian
	Athyridida	Usually biconvex valves with short hinge line and posterolaterally-directed spiralia	Ordovician to Jurassic
	Spiriferida	Wide strophic valves with laterally-directed spiralia; both punctate and impunctate taxa	Ordovician to Jurassic
	Thecideida	Small, strophic shells with complex spiralia including brachial ridges and median septum	Triassic to Recent
	Terebratulida	Biconvex valves with variably developed long or short loops	Devonian to Recent



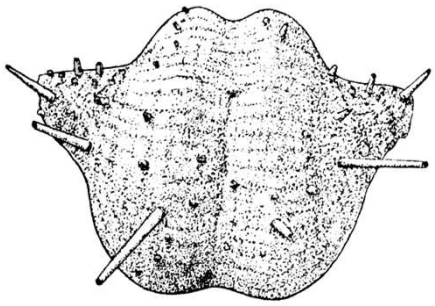
Al passaggio permiano-triassico molte specie vengono decimate /\

i bivalvi invece fioriscono, a scapito dei brachiopodi (per motivo di semplificazione, i bivalvi sono più semplici ed efficienti dei brachiopodi. Ad esempio; guscio aragonitico anziché calcitico-apatitico; no lofoforo etc)



PRODUCTIDI (genere Productus)

Valva brachiale poco ornamentata



Spine sulla valva peduncolare per ancoraggio

Productus (Carboniferous, Permian)

Plicatura (solco) /\

SOLO nella valva peduncolare!!!!

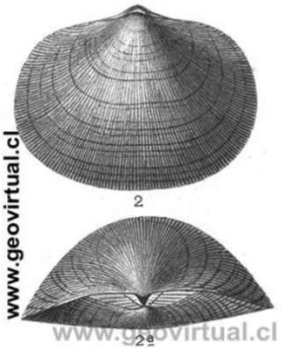
Strophomenida: Ordovician to Jurassic

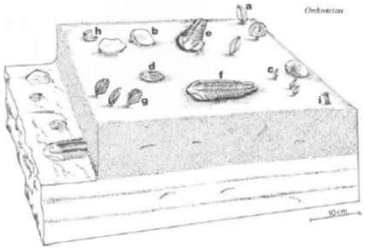
Si trovano spesso in packstone-wackestone quindi ambienti ad ampio idrodinamismo

Linea marginale rettilinea, valve non strofiche

Articulata: Orthida

Molto ornamentate



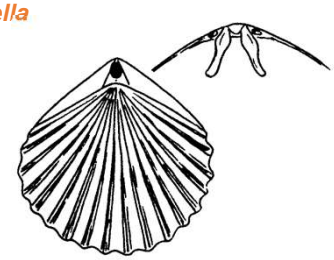


Poca plicatura

Molto ornamentati

Plicatura molto evidente

Rhynchonella



Rhynchonellida: Ordovician to Recent

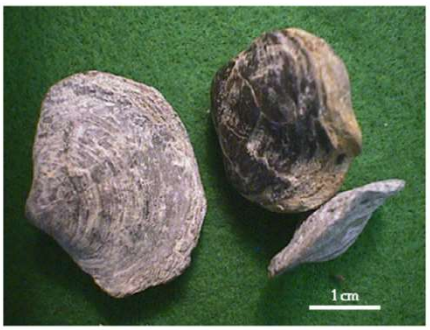
Plicatura molto marcata
visibile su entrambe le valve

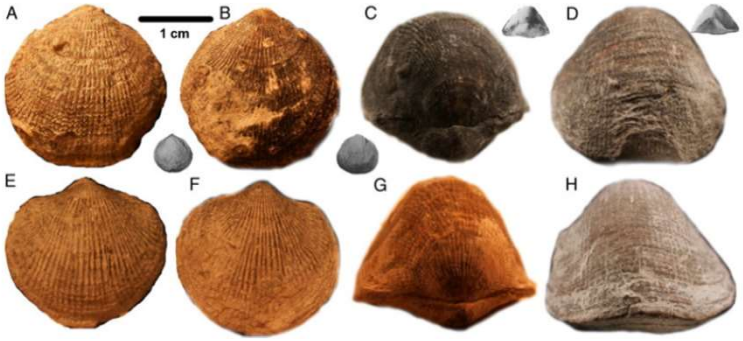
Spirifer

Spiriferida: Ordovician to jurassic

Forme particolari nel gruppo delle spiriferiti dove la plicatura non è sempre ben visibile

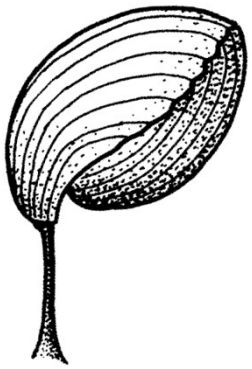
Articulata: Spiriferida astrofici

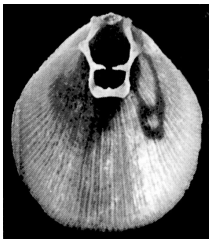


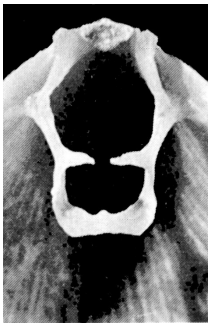


Foramen sempre ben visibile

Terebratula



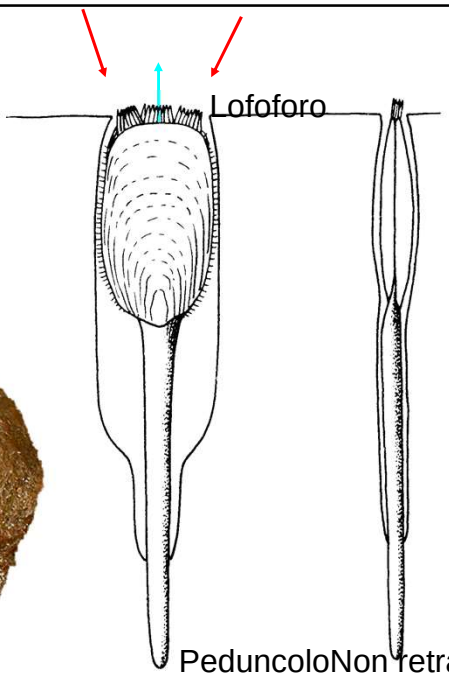




Terebratulida: Devonian to Recent

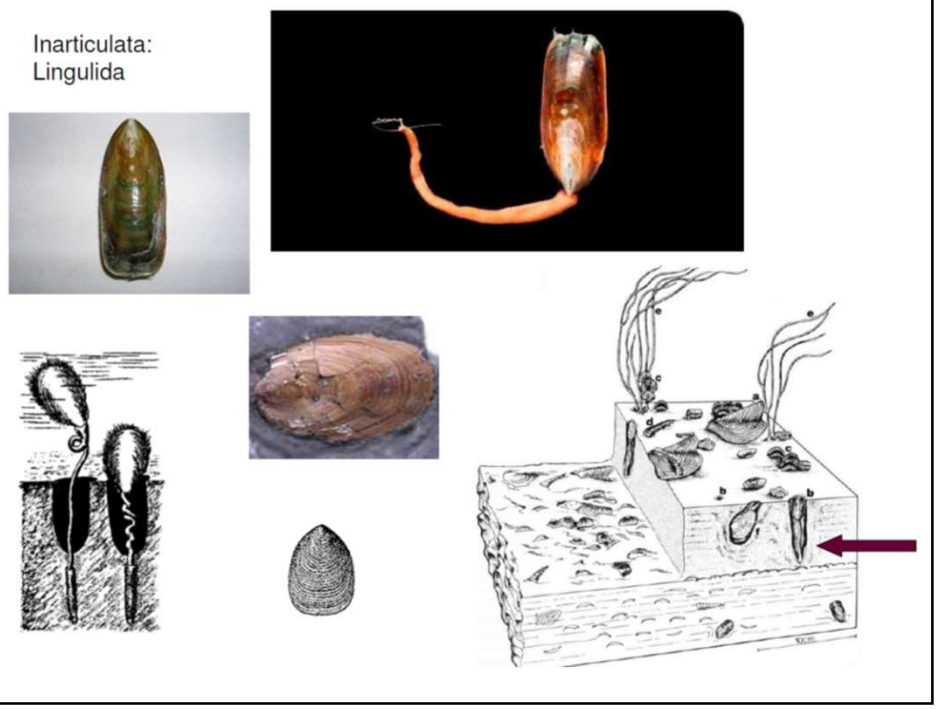
L'unico tra i brachiopodi che è stato trovato in posizione infaunale.

BRUTTO



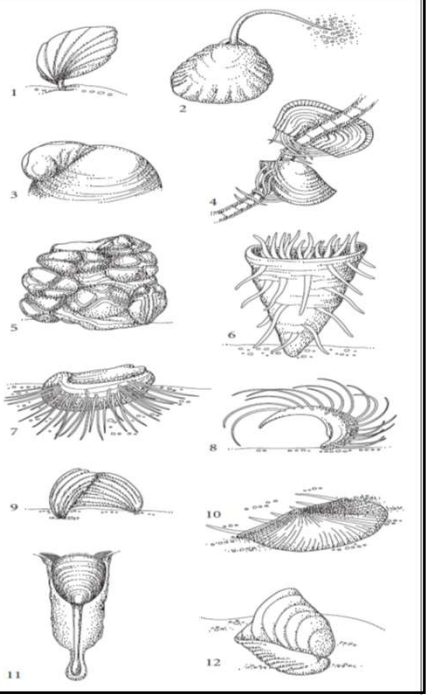
Lingulida: Cambrian to recent

Guscio fosfatico che non cambia nel tempo per cui si usa per analisi chimiche

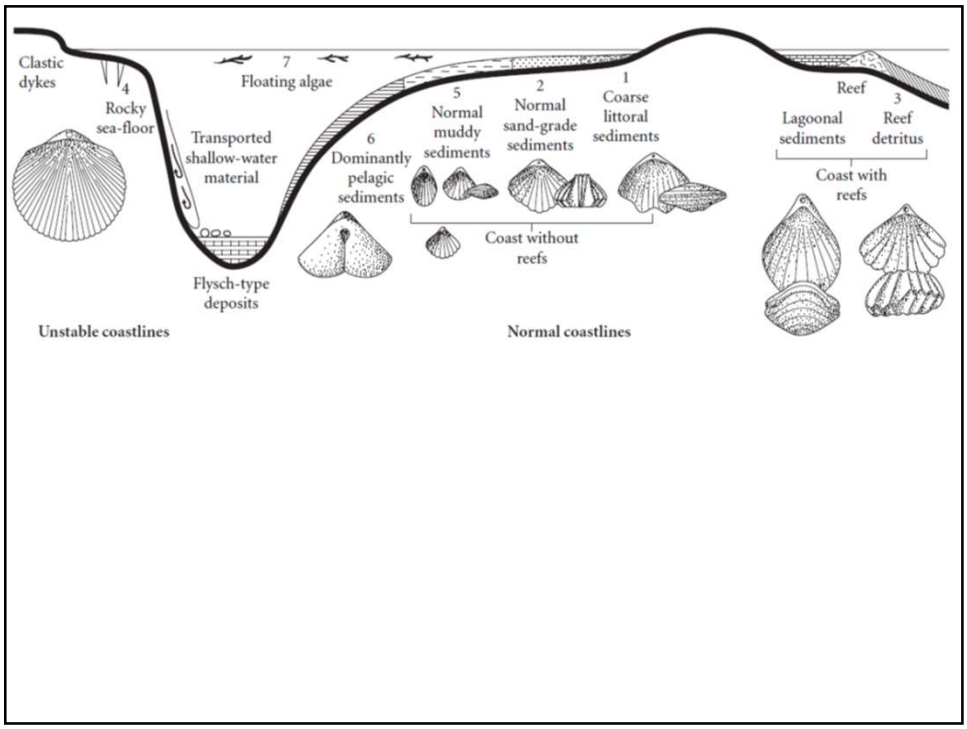


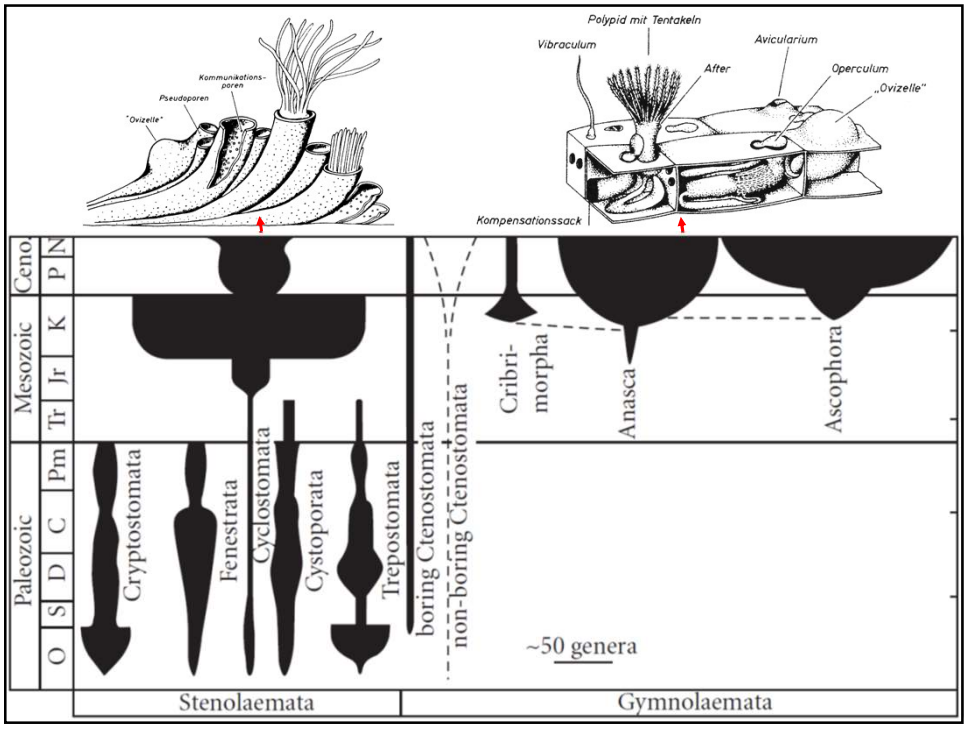
STILI DI VITA DEI BRACHIOPODI

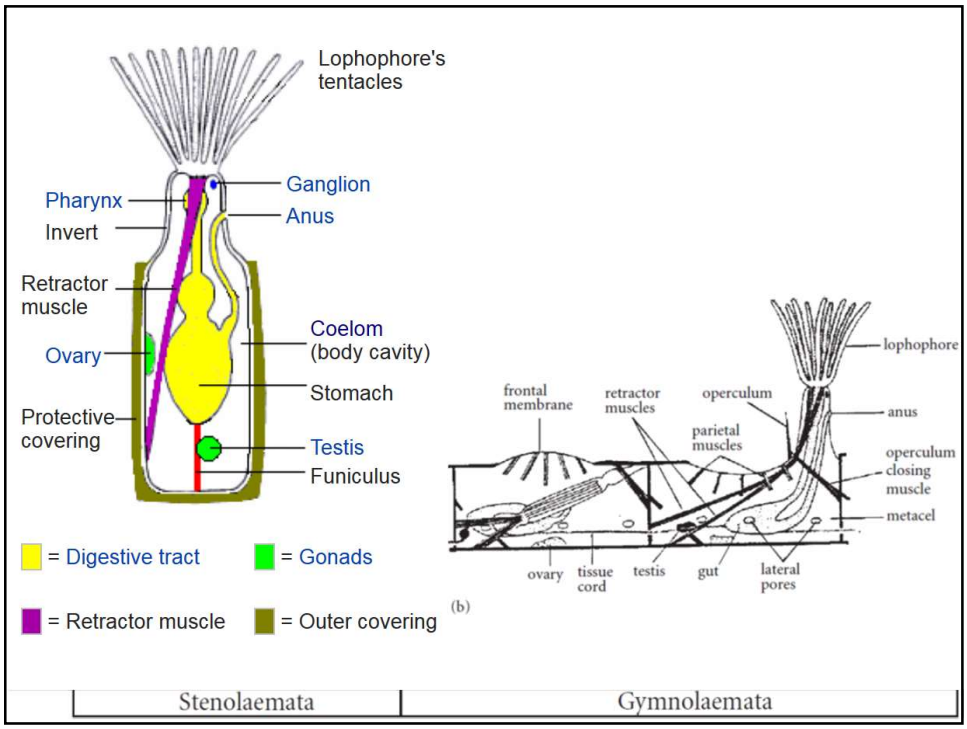
LIFESTYLE	BRACHIOPOD TAXA
Attached by pedicle	
Epifaunal – hard substrate (1) (plenipedunculate)	Orthides, rhynchonellides, spiriferides and terabratulides
Epifaunal – soft substrate (2) (rhizopedunculate)	*Chlidonophora* and *Cryptopora*
Cryptic	*Argyrotheca* and *Terebratulina*
Interstitial	*Acrotretides* and *Gwynia*
Cemented	*Craniops* and *Schuchertella*
Encrusting (3)	Craniids and disciniids
Clasping spines (4)	*Linoproductus* and *Tenaspinus*
Mantle fibers	Orthotetoids
Unattached	
Cosupportive (5)	Pentamerids and trimerellids
Coral-like (6)	Gemmellaroids and richthofeniids
Recumbent	Strophomenides
Pseudofaunal (7) and inverted (8)	*Waagenoconcha* and *Marginifera*
Free-living (9, 10)	*Cyrtia, Chonetes, Neothyris* and *Terebratella*
Mobile	
Infaunal (11)	Linguloids
Semi-infaunal (12)	*Camerisma* and *Magadina*

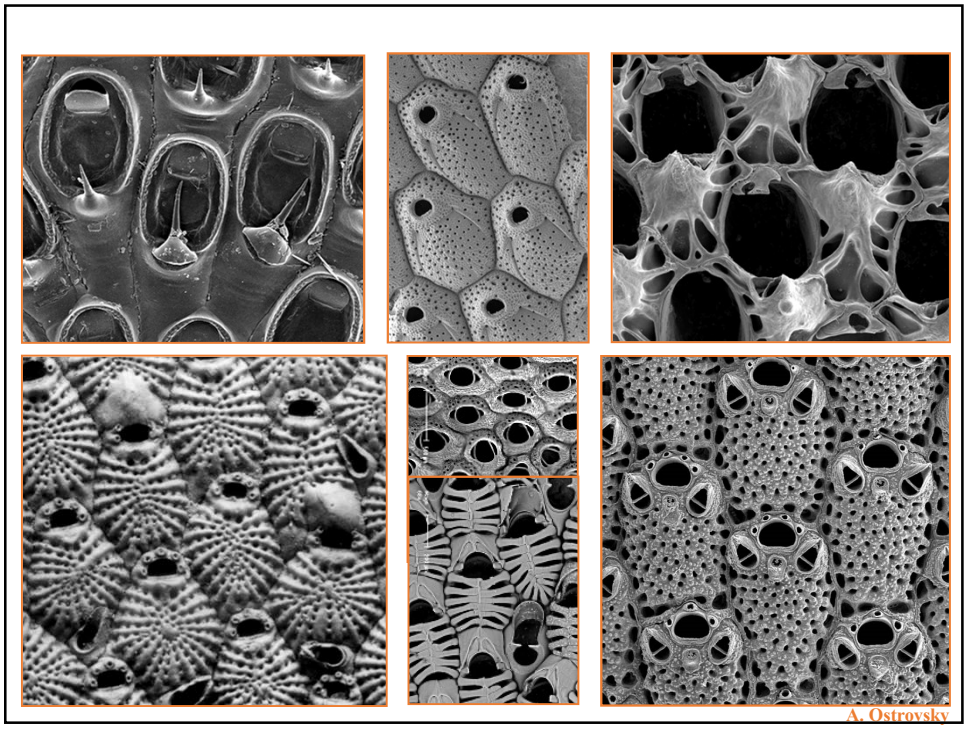


Di solito più è grosso il foramen più è grosso il peduncolo. Se il peduncolo è grosso vuol dire che deve essere più resistente per cui va bene per ambienti idrodinamicamente più stressati, per cui substrato a grana grossa/ roccioso



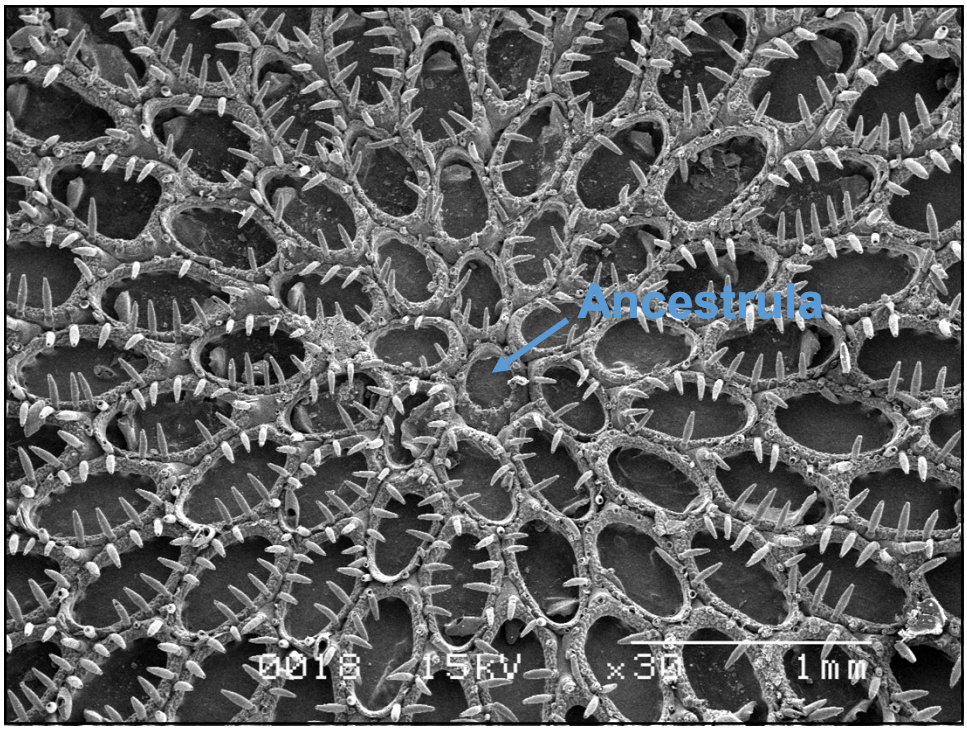

Kommunikations-poren
Pseudoporen
"Ovizelle"
Polypid mit Tentakeln
Vibraculum
Avicularium
After
Operculum
„Ovizelle"
Kompensationssack
Ceno
N
P
Mesozoic
K
Jr
Tr
Paleozoic
Pm
C
D
S
O
Cryptostomata
Fenestrata
Cyclostomata
Cystoporata
Trepostomata
boring Ctenostomata
non-boring Ctenostomata
Cribri-morpha
Anasca
Ascophora
~50 genera
Stenolaemata
Gymnolaemata


Lophophore's tentacles
Pharynx
Invert
Ganglion
Anus
Retractor muscle
Coelom (body cavity)
Ovary
Stomach
Protective covering
Testis
Funiculus
= Digestive tract
= Gonads
= Retractor muscle
= Outer covering
lophophore
frontal membrane
retractor muscles
operculum
anus
parietal muscles
operculum closing muscle
metacel
ovary
tissue cord
testis
gut
lateral pores
(b)
Stenolaemata
Gymnolaemata



Gymnolemata

Zooleci



Organismi molto piccoli serve il microscopio

Bryozoa