



The Latest in Ptychodus

David Lindberg



Ptychodus

Ptychodus are unusual because of their rectangular teeth with rounded crowns that have ridges.

From Greek, ptyche (“fold”) and odus (“teeth”)

Ptychodus are sometimes called “shell-crusher” (durophagous) sharks





Ptychodus History

- First tooth described in 1752
- At first, because only teeth were found, there was uncertainty where to place them. Were they fish? rays? sharks?
- Until recently, only a small number of vertebrate were the only non-teeth fossils found.
- Body shape is still very tentative



References

- The Collector's Guide to Fossil Sharks and Rays From the Cretaceous of Texas, by Welton and Farish
- Shawn Hamm's December 2008 UT Dallas thesis on the *Ptychodus* of the Western Interior Seaway
- This talk will use Shawn's species names and terminology



Western Interior Seaway

- North America about 85 million years ago - upper Cretaceous
- The Western Interior Seaway was a shallow sea inhabited by Mosasaurs, Sharks, Ammonites, Inoceramids, Rudists, and Ptychodus



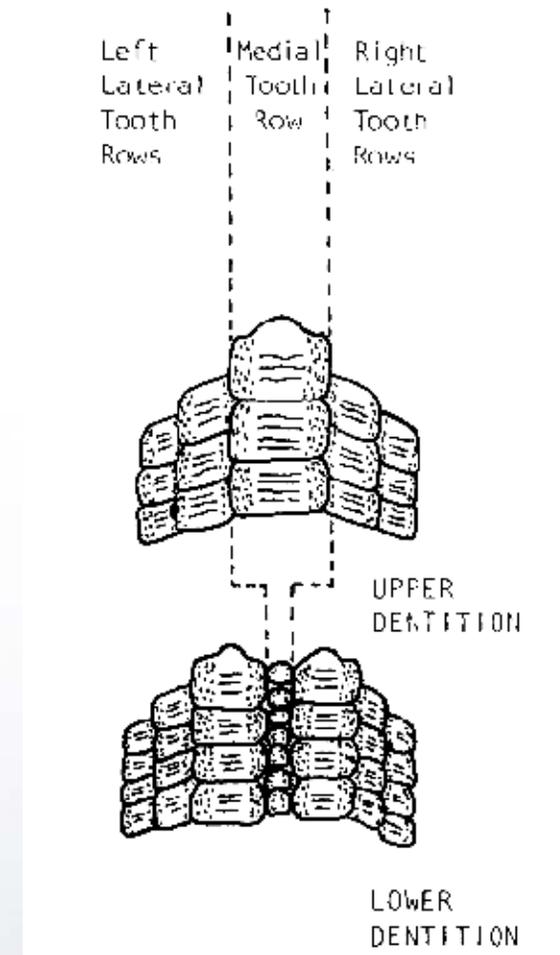


Lower Jaw “Pavement”



Upper versus Lower Jaws

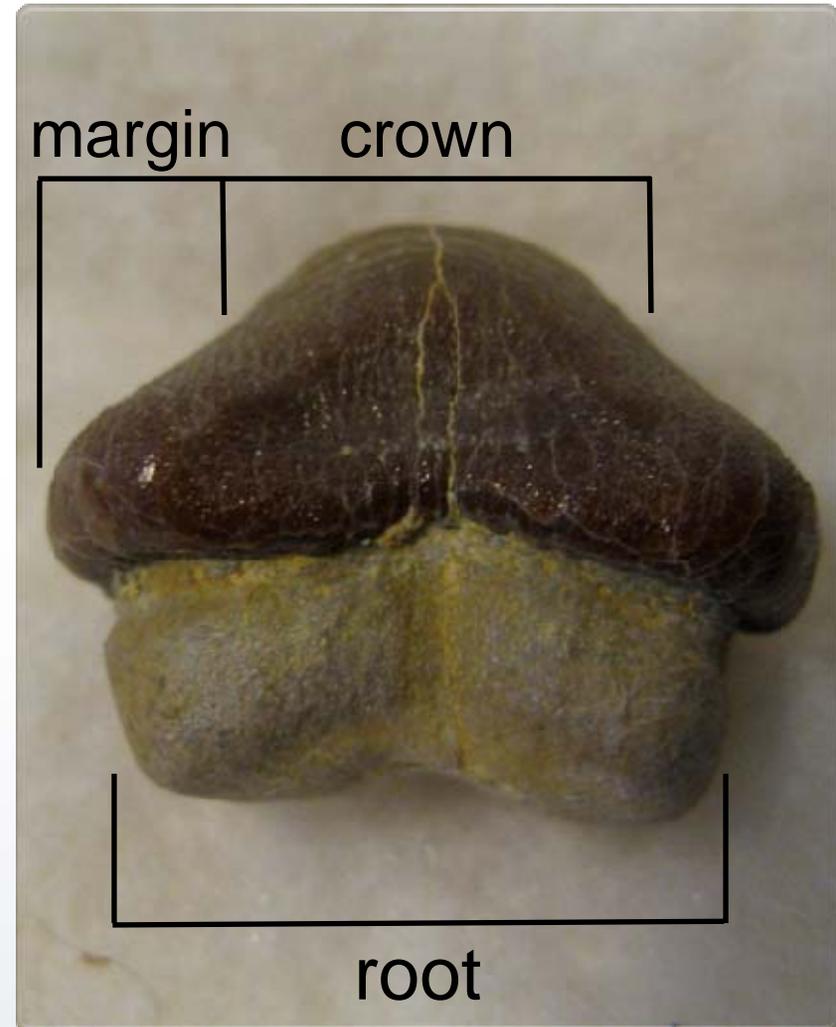
- In the upper jaw, the medial tooth file (row) has the largest and most symmetric teeth
- In the lower jaw, the medial tooth file has small teeth, adjacent to large teeth





Tooth Terminology

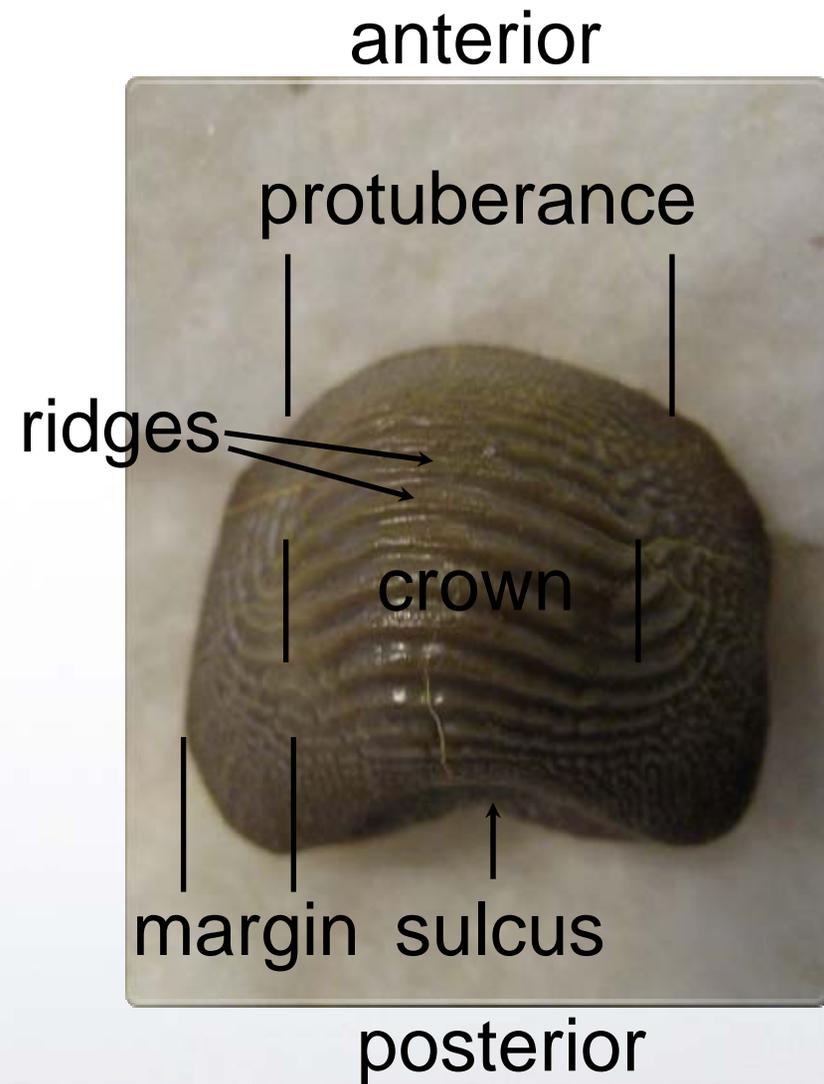
- A few characteristic tooth parts used in describing *Ptychodus* teeth. The differences in these characteristics parts is used to distinguish between different *Ptychodus* species.
- This is a side view





Top view

- Same tooth viewed from above
- The protuberance of one tooth fits into the sulcus of the adjacent tooth in the same file (row)





Ptychodus species subset

- P. whipplei
- P. anonymous
- P. decurrens
- P. marginalis
- P. atcoensis
- P. latissimus
- P. mammillaris



P. whipplei

- Highly elevated, post like crown that is rounded and knob like
- Thin, parallel, and weak transverse ridges
- Fine concentric marginal ornamentation
- Sulcus and protuberance well developed
- Common in Dallas area, not as much so in Austin area





P. anonymous

- Crown is elevated and rounded
- Ridges terminate at margin
- Closely space ridges
- Smaller
- Common in Austin area





P. decurrens

- Low, rounded, and broad crowns
- Ridges bifurcate at margin/crown interface
- Ridges extend to the end of the tooth
- Earliest Ptychodus





P. marginalis

- Rectangular tooth
- Low to moderately inflated crown
- Thick, closely spaced transverse ridges
- Ridges curl and loop
- Narrow marginal area
- Newly named species
- Used to be *P. polygyrus*





P. atcoensis

- Thick ridges form a chevron on crown
- Newly renamed species after Atco Formation of Austin Group

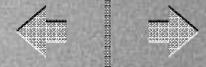




P. latissimus

- Widely spaced, thick, sharp, and parallel transverse ridges
- Low crown
- Crown terminates sharply at the wide marginal area
- Irregular, coarse granulation on margin





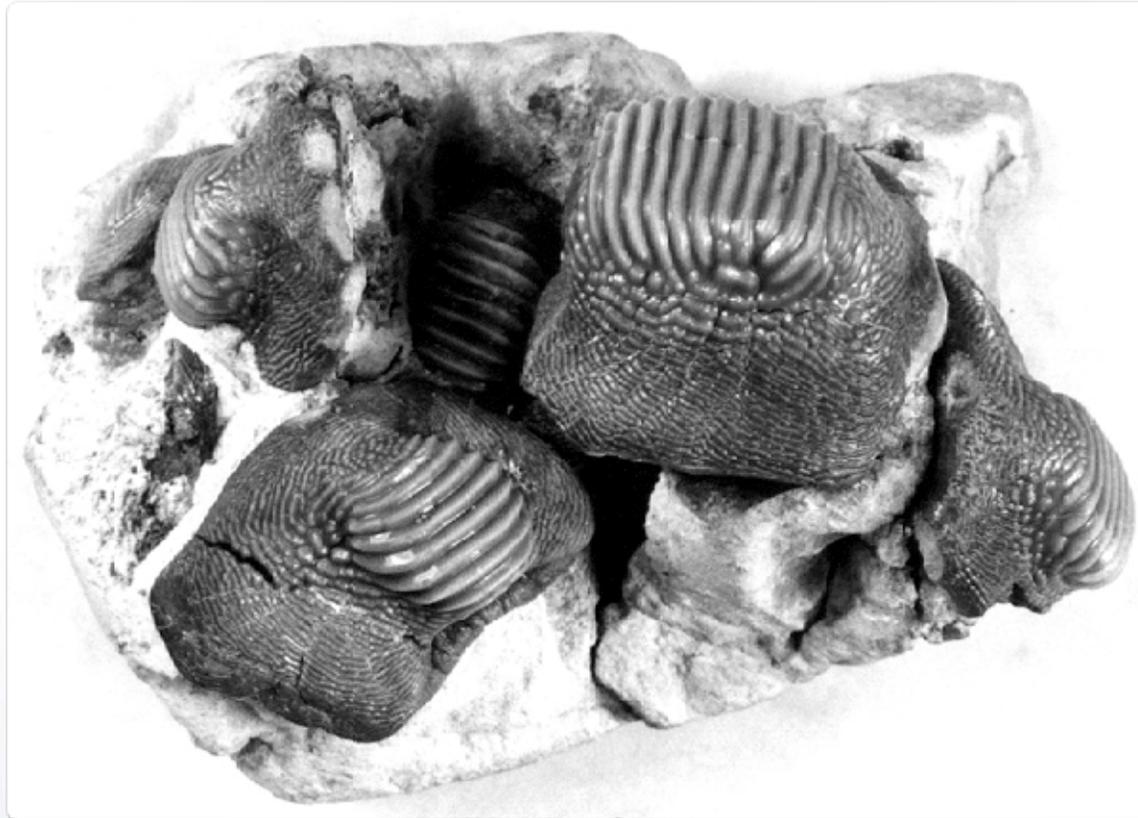
P. mammillaris

- Crown moderately high
- Wide marginal region
- Coarse, concentric marginal ornamentation
- Crown flat
- Sharp marginal to crown transition





Ptychodus slab found in the Trinity River close to downtown Dallas



P. mammillaris slab from England



Recent Discoveries

- Jaw elements
- Dorsal fin
- Pectoral fin
- Denticles
- Ptychodus may be up to 6 meters long
- Tentative body shape