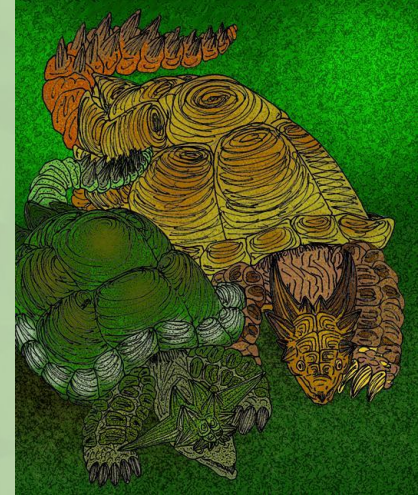




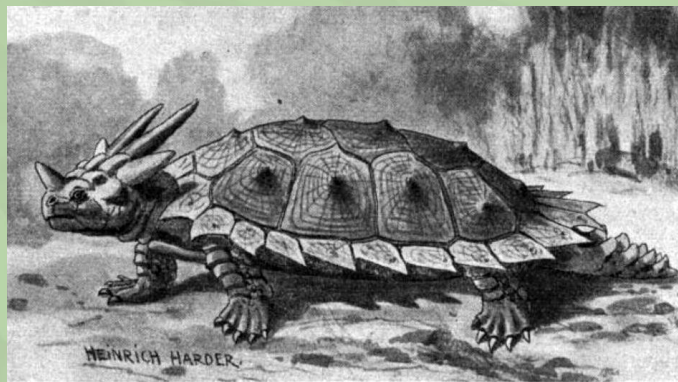
<https://en.wikipedia.org/wiki/Meiolania>

Meiolaniidae

By: Aidan Brant, Akash Schmid, Toni



<https://www.deviantart.com/avancha/art/Meiolania-platycephala-43618923>



<https://www.alamy.com/stock-photo/meiolania.html?sortBy=relevant>

Geological Range: When did they live?

ERA	PERIOD	EPOCH	Date*	AGE
CENOZOIC	QUATERNARY	HOLOCENE PLEISTOCENE	0.01	
			2.6	PLIACENZIAN (Waltonian)
	NEOGENE	MIOCENE	2.6	ZANCLEAN
			5.3	MESSINIAN
			7.2	TORTONIAN
			10	SERRAVALLIAN
			11.6	LANGHIAN
			13.8	BURDIGALIAN
			15.9	AQUITANIAN
			20.4	CHATTIAN
			23.0	RUPELIAN
			PALAEOGENE	EOCENE
	30	BARTONIAN		
	33.9	LUTETIAN		
	37.8	YPRSIAN		
	41.2	THANETIAN		
	47.8	SELANDIAN		
	50	DANIAN		
	56.0			
	59.2			
61.6				
	PALEOCENE			

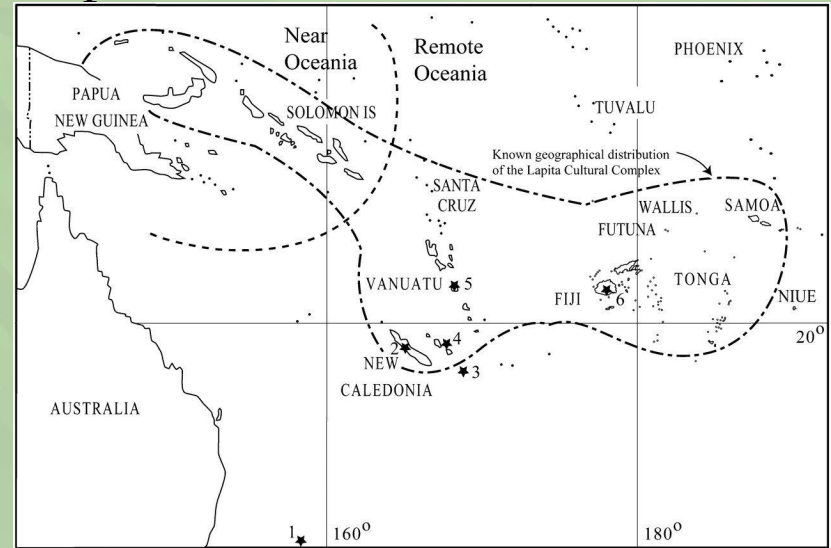
- Group (5 known genera) existed between 48 - 0.003 Ma
- Early Eocene up until today's Holocene
- Possibility that one species, *M. damelipi*, survived through to Holocene
- *M. damelipi* went extinct after human contact
 - Could be from hunting or farm animal introduction

Known Species

- Niolamia argentina:** Middle Eocene Epoch
- Gaffneylandia auricularis:** Middle Eocene Epoch
- Ninjemys oweni:** Pleistocene Epoch
- Warkalania carinaminor:** Oligocene - early Miocene Epoch
- Meiolania platyceps:** Pleistocene Epoch
- Meiolania brevicollis:** Middle - Late Miocene Epoch

Geographic Range: Where did they live?

- **Niolamia, Gaffneylandia:** South America (Patagonia)
- **Ninjemys, Warkalania, Meiolania:** Australia, southwest Pacific
- Ancestors on Gondwana, explains its distribution across Australasia and SA
- Ancient continent Zealandia presence explains distribution across various Pacific Islands
- First fossil in Lord Howe Island



[https://www.pnas.org/doi/10.1073/pnas.1005780107#:~:text=Meiolania%20were%20confined%20to%20the,indeterminate%20Meiolania%20species%20\(7\).](https://www.pnas.org/doi/10.1073/pnas.1005780107#:~:text=Meiolania%20were%20confined%20to%20the,indeterminate%20Meiolania%20species%20(7).)

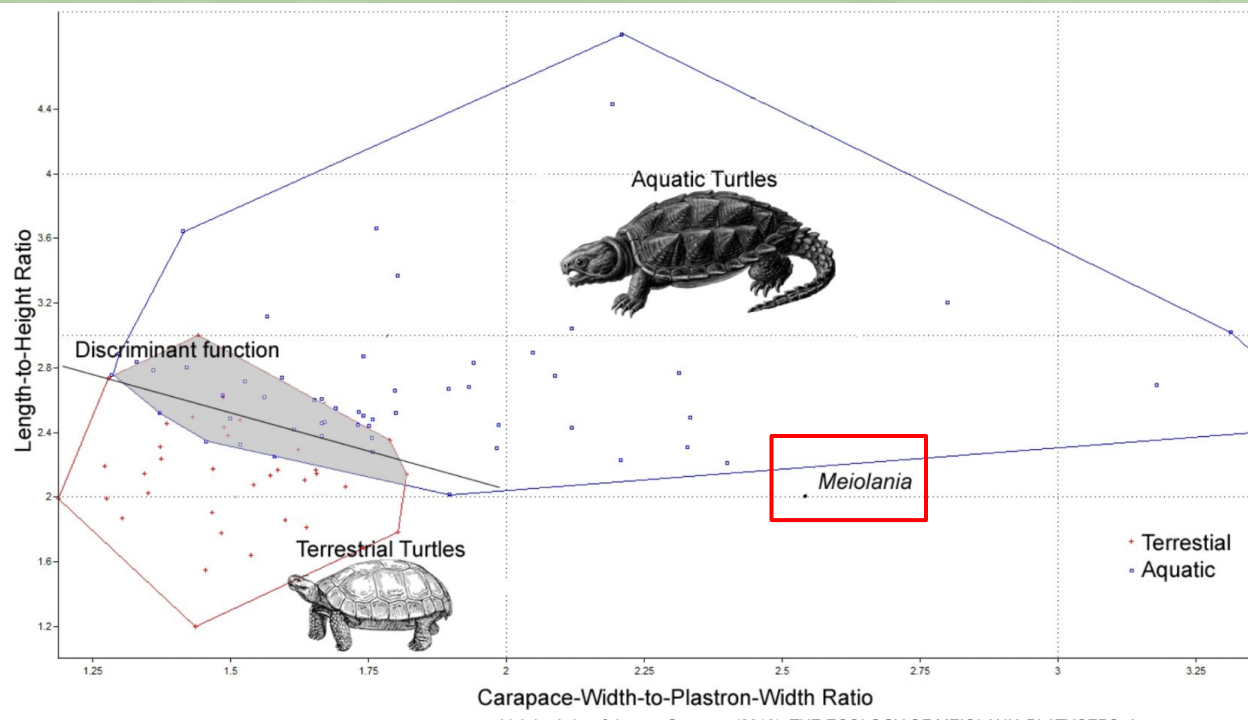
Basic Ecology:

- The Meiolania genus is the most studied of the Meiolaniidae
- Meiolania platyceps was long considered to be an aquatic animal, mostly because of where the specimen were found, on the coast.
- There has been a recent debate between if the Meiolania were aquatic or terrestrial.
- Testudinidae (terrestrial turtles) usually have blunt, very rounded unguals (Hay, 1908), but those of
- Meiolania platyceps come to a well-developed point, giving them a more elongate shape similar to Chelydra (aquatic turtle).
- The dorsal (top) side of the unguals of Meiolania platyceps bears a flexor tubercle that would be associated with walking, either terrestrially or as a subaqueous bottom walker.



Unguals

Basic ecology:



Lichtig, Asher & Lucas, Spencer. (2018). THE ECOLOGY OF MEIOLANIA PLATYCEPS, A PLEISTOCENE TURTLE FROM AUSTRALIA. 79. 363-368.

- The meiolania genus follow body measurements that are closely related to aquatic turtles.
- Because of these measurements, it was recently concluded that Meiolania were aquatic, bottom walkers.
- However, this analysis from Lichtig and Lucas (2018) is highly flawed because a genus should not be defined just from the shape of their shells.

Basic ecology:

- A recent publication by Brown and Moll (2019) tore this analysis apart.
 - Small sample size comprised of mostly incomplete specimen (~60% complete)
 - Not enough evidence to contradict terrestrial behavior.
- They presented previous evidence of the *Meiolania platyceps* to have necks that could not pick their heavy heads up too high, concluding that they were terrestrial grazers, mostly eating floor level plants.
 - This was the majority opinion before Lichtig and Lucas (2018).
 - This evidence also does not support aquatic life, as it would make breathing and seeing in the water much more difficult.
- Similarly structured feet to extant terrestrial testudid tortoises.

★ We can conclude based on the evidence we have today about the *Meiolaniidae* taxon, that they were terrestrial, herbivorous or maybe omnivorous grazers.



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Habits and Habitat:

- *Gaffneyllania auricularis* lived during the Middle Eocene in Patagonia, Argentina
- Fossils were found in soft, fine volcanic ash layers, meaning it lived near freshwater ponds or wetlands
- Likely preferred shallow water environments, but was mostly terrestrial
- Like other earlier Meiolaniids, which date back to the Cretaceous and Eocene, it was heavily armored, suggesting it moved slowly and needed extra protection from predators
- The wet, volcanic landscape provided both food and shelter for the species



Image: Patagonia-Argentina.com, 2024



Image: Clemson University, 2024

Distinctive Features:

- Thick half-moon shaped rim surrounding the cavum tympani (middle ear)
- Skull had three large armored scutes
- Jaw had an open nerve canal (chorda tympani)
- Head had horns and was heavily armored for protection
- Name “auricularis” refers to its unusual ear structure

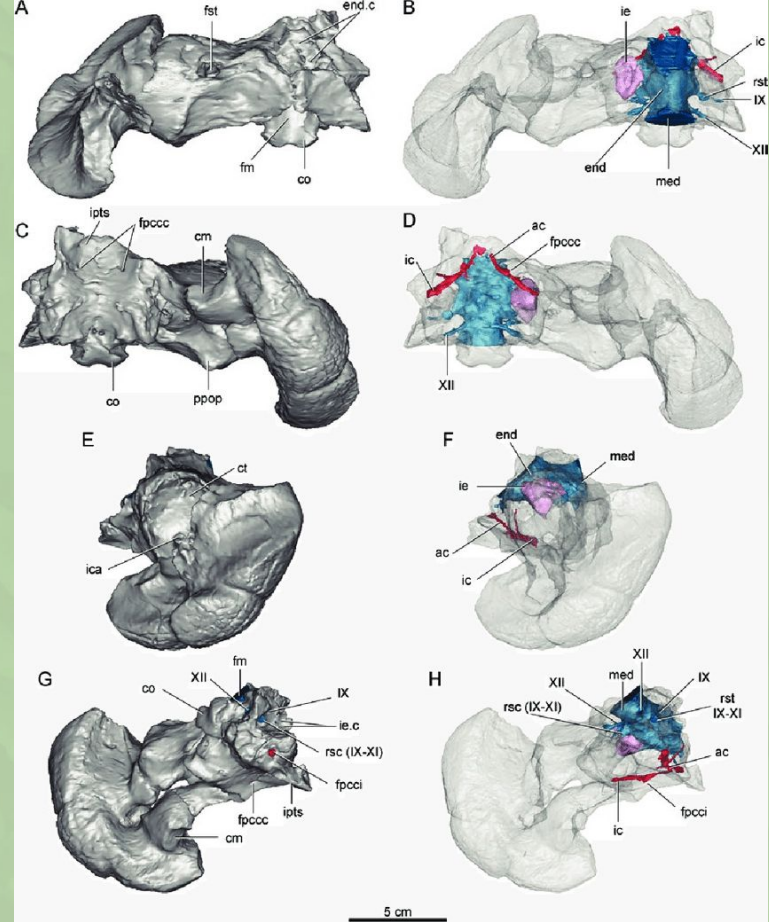


Image: Digital reconstruction of the skull of *Gaffneylandia auricularis* (MPEF-PV 10556), *Journal of Anatomy*, 2021

Similar Taxa/ Common Ancestor

Similar Taxa:

Chubutemys copelloi

- **Location:** Chubut Province, Argentina (Early Cretaceous)
- **Characteristics:** This taxon is one of the earliest members of Meiolaniformes, and its fossil evidence helps bridge the morphological gap between Meiolaniidae and other basal turtles.
- **Significance:** It's a key basal member of Meiolaniformes, closely related to Meiolaniidae in the tree of life.

Common Ancestors:

Meiolaniidae is nested within Meiolaniformes

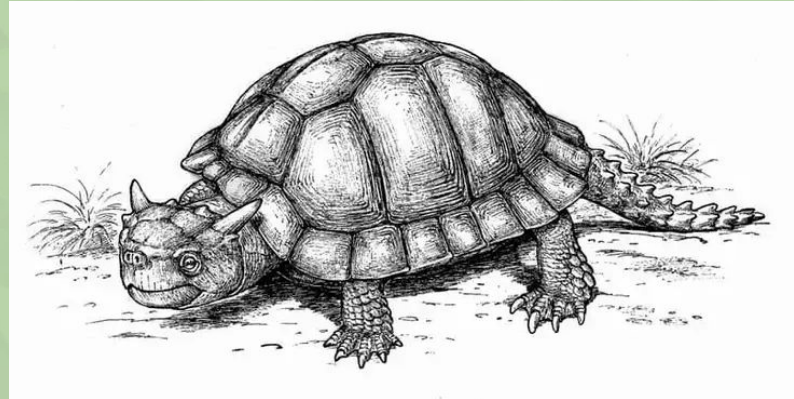
- **Definition:** Meiolaniformes = all turtles more closely related to *Meiolania platyceps* than to modern turtles (Cryptodira and Pleurodira).
- **Implication:**
The common ancestors of Meiolaniidae are early members of Meiolaniformes, not of modern turtles

Fun Facts:

- Meiolania = Small roamer
- It was first discovered in 1886 on Lord Howe Island, Australia.
- It was approximately 8 feet long and weighed around 1,000 pounds (Same as a grand piano).
- When it was first discovered it was mistaken for a prehistoric species of monitor lizard.
- The Meiolania had a massive head that it was unable to put fully inside its shell.



Meiolania (NewDinosaurs.com, n.d.)



Meiolania (NewDinosaurs.com, n.d.)

Works Cited

A-Z Animals. (n.d.). [Photograph of Meiolania platyceps skull]. Retrieved April 28, 2025, from <https://a-z-animals.com/animals/meiolania/>

Brown, L. E., & Moll, D. (2020). The enigmatic palaeoecology and palaeobiogeography of the giant, horned, fossil turtles of Australasia: A review and reanalysis of the Data. *Herpetological Journal*. <https://www.thebhs.org/publications/the-herpetological-journal/volume-29-number-4-october-2019/1979-08-the-enigmatic-palaeoecology-and-palaeobiogeography-of-the-giant-horned-fossil-turtles-of-australasia-a-review-and-reanalysis-of-the-data>

Enchiridion. (2021, May 21). Meiolania - Massive Terrestrial Turtle. YouTube. <https://www.youtube.com/watch?v=eiYOev9UN9c>

Fandom, Inc. (2025, April 28). Meiolania. Dinosaur Wiki. <https://dino.fandom.com/wiki/Meiolania>

Fandom, Inc. (2025, April 28). Meiolania. SciFii Wiki. <https://scifi.fandom.com/wiki/Meiolania>

Hawkins, S., Worthy, T. H., Bedford, S., Spriggs, M., Clark, G., Irwin, G., Best, S., & Kirch, P. (2016, December 6). Ancient tortoise hunting in the Southwest Pacific. *Nature News*. <https://www.nature.com/articles/srep38317>

Lichtig, A. J., & Lucas, S. G. (2018). The ecology of Meiolania Platyceps, a Pleistocene Turtle From Australia. Research Gate. https://www.researchgate.net/profile/Asher_Lichtig/publication/328734180_THE_ECOLOGY_OF_MEIOLANIA_PLATYCEPS_A_PLEISTOCENE_TURTLE_FROM_AUSTRALIA/links/5bdf7408299bf1124fbb7ad2/THE-ECOLOGY-OF-MEIOLANIA-PLATYCEPS-A-PLEISTOCENE-TURTLE-FROM-AUSTRALIA.pdf

Patagonia: The One Place In this world. Patagonia region: the ONE place in this world. (n.d.). <https://www.patagonia-argentina.com/en/patagonia-the-one-place-in-this-world/>

Works Cited (2)

Peters, D. (2016, November 30). More evidence that Meiolania is a basal turtle. The Pterosaur Heresies. <https://pterosaurheresies.wordpress.com/2016/12/01/more-evidence-that-meiolania-is-a-basal-turtle/>

Sterli, J. (2015, June 23). A new turtle from the Palaeogene of Patagonia (Argentina) sheds new light on the diversity and evolution of the bizarre clade of horned turtles (Meiolaniidae, Testudinata). *Zoological Journal*. <https://academic.oup.com/zoolinnean/article/174/3/519/2453127>

Sterli, J. (2015). A review of the fossil record of Gondwanan turtles of the clade Meiolaniformes. *Bulletin of the Peabody Museum of Natural History*, 56(1), 21–45. <https://doi.org/10.3374/014.056.0102>

The luck of testudo, UMD.'s mascot | wusa9.com. (2016, July 13). <https://www.wusa9.com/article/news/local/maryland/the-luck-of-testudo-umds-mascot/65-197018755>

Turner, L. (2014, May 9). Meiolania. Prehistoric-Wildlife. Retrieved from Prehistoric Wildlife NewDinosaurs.com. (n.d.). Meiolania. Retrieved April 28, 2025, from <https://newdinosaurs.com/meiolania/>

Wallover, A. G., & Wallover, C. G. (2022, February 10). Floating wetlands for a healthy pond. Home & Garden Information Center. <https://hgic.clemson.edu/floating-wetlands-for-a-healthy-pond/>

White, A. W., Worthy, T., Hawkins, S., & Spriggs, M. (2010, August 16). Megafaunal meiolaniid horned turtles survived until early human settlement in Vanuatu, Southwest Pacific | PNAS. PNAS. <https://www.pnas.org/doi/10.1073/pnas.1005780107>

Simões, T. R., Sterli, J., & Vinicius, F. (2015). Digital reconstruction of the skull of *Gaffneylandia auricularis* (MPEF-PV 10556) in dorsal, ventral, lateral, and posterolateral views [Figure]. Retrieved from https://www.researchgate.net/figure/Digital-reconstruction-of-the-skull-of-Gaffneylandia-auricularis-MPEF-PV-10556-in-dorsal_fig3_316514774