# Hadrosaur

**Hadrosaurids**
**Temporal range: Upper Cretaceous**
**86–66 mya**

Mounted skeleton of *Parasaurolophus cyrtocristatus*, Field Museum of Natural History

Mounted skeleton of *Edmontosaurus annectens*, Oxford University Museum of Natural History

## Scientific classification
**Edit this classification**

| | |
|---|---|
| Domain: | Eukaryota |
| Kingdom: | Animalia |
| Phylum: | Chordata |
| *Clade*: | Dinosauria |
| Order: | †Ornithischia |
| Suborder: | †Ornithopoda |
| *Clade*: | †Hadrosauromorpha |
| Family: | †Hadrosauridae<br>Cope, 1869 |

## Type species

†*Hadrosaurus foulkii*
Leidy, 1858

## Subgroups

- †*Aquilarhinus*
- †*Eotrachodon*
- †*Hadrosaurus*
- †*Lapampasaurus*
- †*Latirhinus*?
- †**Euhadrosauria/Saurolophidae**
  - †Lambeosaurinae
  - †Saurolophinae

## Synonyms

- **Trachodontidae** Lydekker, 1888
- **Saurolophidae** Brown, 1914
- **Lambeosauridae** Parks, 1923
- **Cheneosauridae** Lull & Wright, 1942
- **Ornithotarsidae** Cope, 1871

The hadrosaurs

*Edmontosaurus* skull, Oxford University Museum of Natural History

**Hadrosaurs** (meaning "bulky lizards") were the family of duck-billed herbivorous dinosaurs. They were the most common dinosaurs in the long Upper Cretaceous.

Hadrosaurs ranged in size from 10 to 65 ft (3 to 20 m) long.[1] They had horny, toothless beaks and hundreds of cheek teeth in the sides of their jaws. The duck-billed dinosaurs had the most teeth; they had up to about 960 cheek teeth. Hadrosaurs lived during the later Cretaceous, and their fossils have been found in North America, Europe, and Asia.Riff the Hadrosaur on Barney and Friends

# Characteristics

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Hadrosaurs had a stiff tail that was probably used for balance. They had hoof-like nails on their feet, and bumpy skin. They ran on two legs, holding their tail and head in a horizontal position. They may have walked on all four legs while grazing. Hadrosaurs probably lived near bodies of water, migrating to high ground to lay eggs. It used to be thought that they had webbed hands, but this was an artifact of the fossilization process.

It is a very interesting thing that, as Bakker says,[2] the duckbills were so common, yet they had no obvious defence against the large carnivores. Perhaps herd organisation and running speed were sufficient. Their eating apparatus must have been an advantage as compared to other herbivores.

## An exceptional fossil

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One of the most complete hadrosaur specimens was found in 1999 in Hell Creek Formation of North Dakota and is known as "Dakota". This fossil is so well preserved that scientists have been able to calculate its muscle mass and learn that it was more muscular than previously thought, probably giving it the ability to outrun predators such as *Tyrannosaurus rex*.

This mummified hadrosaur fossil comes complete with skin (not merely skin impressions), ligaments, tendons, and possibly some internal organs. It is being analyzed in the world's largest CT scanner, operated by the Boeing Co.[3] The machine usually is used for detecting flaws in space shuttle engines and other large objects, but previously none so large as this. Researchers hope the technology will help them learn more about the fossilized insides of the creature.

They found a gap of about a centimeter between each vertebra, indicating that there may have been a disk or other material between them, allowing more flexibility and meaning the animal was actually longer than shown in a museum.[4] Skin impressions have been found from the following hadrosaurs: *Edmontosaurus annectens*, *Corythosaurus casuarius*, *Brachylophosaurus canadensis*, *Gryposaurus notabilis*, *Parasaurolophus walkeri*, *Lambeosaurus magnicristatus*, *Lambeosaurus lambei*, *Saurolophus osborni*, and *Saurolophus angustirostris*.[5]

## Two clades

[change | change source]

Two clearly different clades can be seen. One, the Hadrosaurines (sometimes called Paralophosurines), had solid crests or no crests, and were larger. The Lambeosaurines had hollow crests and were smaller.

Lambeosaurines had narrower beaks than hadrosaurines, which suggests that *Lambeosaurus* and its relatives could feed more selectively than their broad-beaked, crestless counterparts.[6]

## Examples

[change | change source]

- *Edmontosaurus*
- *Hadrosaurus*
- *Maiasaura*
- *Corythosaurus*
- *Lambeosaurus*
- *Parasaurolophus*
- *Shantungosaurus*

## References

[change | change source]


1. ↑ "Chinese scientists claim discovery of earth's largest dinosaur fossil site". CBC news. 30 December 2008. Retrieved 2008-12-31.
2. ↑ Bakker, Robert T. 1986. *The Dinosaur Heresies: new theories unlocking the mystery of the dinosaurs and their extinction*. New York: William Morrow. ISBN 0-8217-2859-8.
3. ↑ (Reuters News) "Mummified dinosaur reveals surprises: scientists" 3 December 2007.
4. ↑ Schmid, Randolph (2007-12-03). "Mummified dinosaur may have outrun T. Rex". Associated Press. Retrieved 2010-11-10.
5. ↑ Bell P.R. 2012. "Standardized terminology and potential taxonomic utility for hadrosaurid skin impressions: a case study for *Saurolophus* from Canada and Mongolia. *PLoS ONE* **7** (2): [1]

6. ↑ Bakker, Robert T. (1986). *The dinosaur heresies: new theories unlocking the mystery of the dinosaurs and their extinction*. New York: William Morrow. p. 194. ISBN 0-8217-2859-8.