

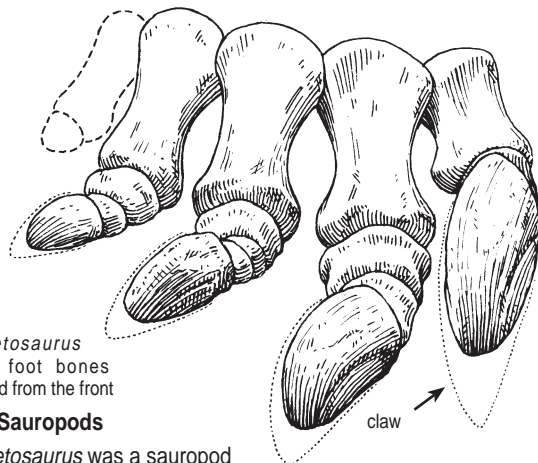
Illustration, Laurie Beirne

One of Australia's largest dinosaurs was *Rhoetosaurus brownei*, a giant plant-eater that lived in Queensland about 190 million years ago, during the Lower Jurassic Period (Toarcian Stage).

Rhoetosaurus is known from a single specimen discovered in 1924. Its fossilised bones were found in a rocky gully on Taloona Station, near Roma in the south of the state.

The dinosaur was named after the station manager, A.J. Browne, who sent some of the bones to the Queensland Museum and later helped recover more of the skeleton, including parts of the neck, back, tail, ischium, ribs and femur.

The lower part of the animal's right hind leg and near complete foot were collected from the same area by Museum scientists in 1976.



Rhoetosaurus
right foot bones
viewed from the front

The Sauropods

Rhoetosaurus was a sauropod dinosaur and its name comes from *Rhoetos*, a mythological Greek giant and *saurus* meaning lizard.

Sauropods were long-necked, big-bodied reptiles that carried their long tails in the air. They were quadrupeds (four-footed) and they existed in many parts of the world, probably from about 210 million years ago (at the start of the Jurassic Period) to 65 million years ago (at the end of the Cretaceous Period).

The sauropod group included the largest land animals of all time. There were two subgroups exemplified by *Seismosaurus* (longest) with long tails and big hindlegs, and *Brachiosaurus* (heaviest) with big necks and forelegs, shorter hind legs and tails.

The hind feet of a sauropod (and in some brachiosaurs, possibly the front feet too) were padded with connective tissue like those of an elephant. This spread the animal's weight over a large area (reduced the pressure on the feet) and cushioned the bones.

So far, sauropod remains have been found on all continents except

Antarctica and fossilised eggs, believed to have come from sauropods, have been found in Europe, North America, and Asia.

Rhoetosaurus is important because it is one of the oldest known sauropods.

Although the *Rhoetosaurus* skeleton is incomplete, by comparing it with sauropods from other parts of the world, scientists have been able to reconstruct the form of the living dinosaur and build up a picture of how it may have lived.

Rhoetosaurus brownei

The fossilised bones of *Rhoetosaurus* are immense. The femur (thigh bone), for example, is 1.5 m long. *Rhoetosaurus* measured 3-4 m tall at the hip, a little shorter at the shoulder and 14 m to 17 m from its snout to the tip of its tail.

Rhoetosaurus may have weighed more than 20 tonnes - as much as four elephants. Large as this is, it is possible that *Brachiosaurus*, a sauropod from Africa, North America and Europe, may have weighed between 60 and 80 tonnes. Two North American sauropods, *Supersaurus* and *Ultrasaurus*, may have been even bigger.

Every large animal has to adapt to the problems of weight and *Rhoetosaurus* was no exception. Its legs had to support the body's weight, and withstand the impact of stepping without the pressure becoming too great for the joint cartilages.

To help overcome this weight problem, sauropods developed light-weight trunk vertebrae. In *Rhoetosaurus* the centres of the trunk vertebrae were apparently made of cartilage, a lighter and more elastic tissue than bone, and had a very thin surface coating of bone. This reduced the weight of the skeleton without significantly reducing its rigidity.

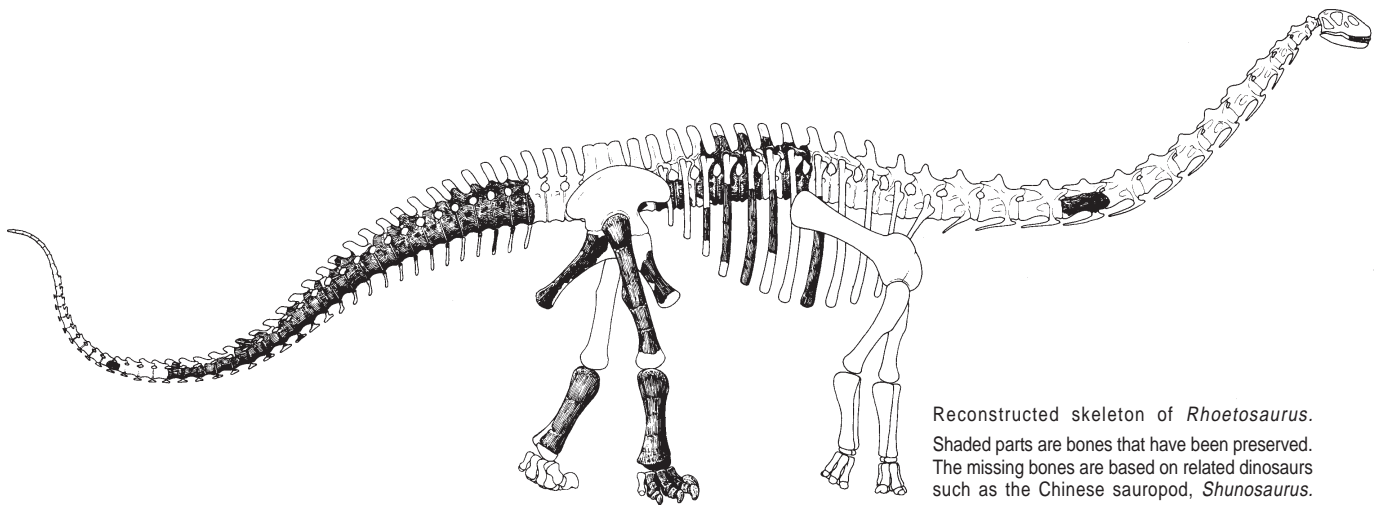
In the fossils from Taloona Station, the cartilage decayed after the animal died and the cavity of each vertebra was filled with sand and twigs which slowly turned to rock.

Like other sauropods, *Rhoetosaurus* had a very long neck which was flexible enough to have allowed the animal to feed at ground level or to have stretched up to the tree-tops for food.

A single vertebra from the neck is about 2 1/2 times as long as a vertebra from the back. The neck vertebrae, as well as those from the animal's tail, were very strong. Although a sauropod could strike fearful blows with its neck, its most powerful defensive weapon was its long supple tail. Massive muscles attached to the tail vertebrae, and more supple joints at the base and tip of the tail, allowed the tail to be swept around with great agility and force.

Some sauropods had long tapering tails with whiplash-like ends.

Even though the end of its tail has not been preserved, scientists believe *Rhoetosaurus* had a whiplash tail because of other modified bones that have been found higher in the tail.



Reconstructed skeleton of *Rhoetosaurus*.
Shaded parts are bones that have been preserved.
The missing bones are based on related dinosaurs
such as the Chinese sauropod, *Shunosaurus*.

Some palaeontologists used to believe that the sauropods were too ponderous to have supported themselves on dry land and that they were obliged to buoy up their massive bodies by living in the shallow waters of lakes and swamps.

However, although *Rhoetosaurus* lived in a tropical climate and, like the hippopotamus today, may have slept in water for safety and coolness during hot weather, plenty of tracks have been found that show herds of sauropods walking on dry land. All the later sauropods were land-dwelling, like elephants.



Fossil remains show a hind foot adapted for hoisting the dinosaur's great weight up steep slopes. The first toe was short and stout with a greatly enlarged claw or mud-hook, which would have enabled the animal to climb river and lake banks or earthy hills by digging into the soft earth.

The structure of the feet and the huge legs also show the animal was able to walk on land but, on account of its great body mass, was probably restricted to walking or ambling gaits.

Sauropods and other dinosaurs laid clutches of eggs in areas apart from the adult browsing areas.

Several series of fossil tracks, like those discovered in Texas, USA, were made by herds of sauropods on the move. The tracks seem to show that half grown animals kept among the larger ones, but were careful not to get close enough to be trodden on, or swiped during a tail-movement.

The sheer size of fully grown sauropods might have rendered them immune from attack by predatory dinosaurs, but small defenceless juveniles would have been easy prey. Their hatchlings were too small to travel safely with the herds. The largest dinosaur eggs, presumably those of sauropods, are about 30 cm long and could have contained hatchlings no bigger than domestic cats. Animals as small as this could easily have been trampled by the adults.

Sauropods probably did not join adult herds until they were half-grown. Trackways of two juvenile animals (1/3 adult size) are the smallest known and at least one of the animals was alone.

It took a long time for the hatchlings to grow to the enormous size of the parents.

Further Information

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