

h18 Pterosaurs (flying reptiles) < wing finger >

The pterosaurs were batlike winged reptiles.¹ They became extinct at the end of the Mesozoic.

Bats, which “see” with their sonar-like hearing, can fly in the dark from dusk to dawn. Pterosaurs, with the relatively poor hearing of reptiles (one bone in the middle ear), perforce would have shared the day sky with birds of the Mesozoic era. Pterosaur flight adaptations were: wing membranes supported by elongated fourth fingers, light hollow bones, and brain enlargement in those areas associated with sight and muscular coordination. Also, for reptiles, their sternum was disproportionately large and had a keel (as in flighted birds) to brace attached flight muscles. Distinctive trackways with impressions of the fourth finger knuckle are pterosaur trace-fossils that cannot be mistaken for those left by any other quadruped. Pterosaurs’ body skin had a felt of “hair” tufts that, unlike mammalian hair, were protofeathers akin to the natal down of ground birds.²

Cretaceous pterosaurs had no tail. They are called **pterodactyloids** (or **pterodactyls**) for the name given to the first of the group found, *Pterodactylus antiquus*, or “antique wing finger.” Some were tiny with peglike teeth (conceivably good only for eating insects), some became enormous and had an elongated toothless bill counterbalanced by a rear-pointing bony head crest, and some, as *Pterodaustro* “wing of the south,” evolved comblike teeth (conceivably good only for filter-feeding).

Pterodaustro fossils are found, along with their foot prints and clam-shrimps, in what must have been the shallow-water wading environment of their choice. Adapted for straining were their baleenlike mid-dentary teeth. Transverse sections of these have revealed that were true teeth; each a sleeve of enamel around a pulp core.³

Perching birds have claw curvatures intermediate to that of the strongly curved claws of climbers (as woodpeckers and nuthatches) and the relatively straight claws of walkers (as herons). In more than 100 museum pterodactyloid specimens, David A. Krauss has found that, on average, their wing-claws curve as in perching birds and their feet-claws curve as in birds that walk on the ground. The implication is that these pterosaurs walked upright. Their curved wing-claws, Krauss speculates, held prey being consumed steady to prevent wriggling that could snap off the pterosaur’s delicate teeth. Just so.

Pterosaurs, those revealed to be fish eaters by their fossils with fish bones interior to their rib cages, occupied ecological niches that now house terns, skimmers, and albatrosses.

A 120 million year old fossil site with thousands of pterosaur bones, found by Mike Bell in Cerro la Isla Mountain, Chile, is now silent evidence that pterosaurs congregated in ground colonies.⁴

Skimmer birds as those found along coasts in the Western Hemisphere, have narrow beaks that look like the blades of scissors, and powerful neck muscles that allow the lower beak to plow the water for fish while the bird remains out of the water—the similarly fashioned jaw and neck of a Brazilian pterosaur (whose wingspan is estimated at more than 4 meters) indicates to Alexander W. A. Kellner and Diogenes de Almeida Campos that it was a skimmer.⁵

Albatrosses with 3 m wing spans, sleep while flying, and clumsily land, only to breed, once every two years. A similar life style is imagined for the toothless pteranodon seagoing giants with wing spans of 7 m to 12 m in giraffe-sized ⁶ *Quetzalcoatlus* (named for the Aztec winged serpent god).

The pterosaur diversity heyday belonged to the Cretaceous pterodactyloids (advanced fliers).

Jurassic pterosaurs were not greatly diverse. None exceeded a half meter in wingspan or nose-to-tail length. They were distinctive in having a reptilian tail and teeth. Pterosaurs with those primitive features are referred to as **rhamphorhynchoids**.⁷

The pterosaurs presumably evolved in the Triassic from a thecodont. The thecodonts are the likely ancestor candidates as the tendency of that group was selection for bipedalism that would have freed their arms to evolve into wings. □