

Anurognathids

The anurognathids are among the most distinctive of all pterosaur lineages. They are characterized by their short, rounded faces and large eyes, making them look a lot like Muppets or Star Wars' Porgs. Many anurognathids are known to have an array of elongate outwardly directed pycnofibers lining the mouth. All anurognathids have short necks and hands, and a long fifth toe like early long-tailed pterosaurs. All species have shortened tails, with many having very short tails like pterodactyloids. Most anurognathids are fairly small, with wingspans under 100 cm (39 inches).

Anurognathids were insectivores, and hunted while flying. Comparison of wing shape shows that they were particularly acrobatic fliers. They filled the same role that many bats and several bird lineages like swallows, swifts, and nightjars fill today. They are particularly similar to the nightjars, whose mouths are lined with long whisker-like feathers. Nightjars use those feathers to help capture flying insects, and anurognathids used the mouth-lining pycnofibers in a similar way.

The anurognathids are found in rocks deposited from the Middle Jurassic through at least the Early Cretaceous. Almost all anurognathid specimens are known from conservation Lagerstätten, which allowed the preservation of their delicate skeletons. It's probable that anurognathids were much more widespread than currently known and possible that anurognathids lasted until the end of the Mesozoic, but no conservation Lagerstätten are known from that time.

Despite their relatively limited fossil record, several anurognathid specimens are preserved in enough detail to show soft tissues, including wing membranes and full-body coverings of pycnofibers. At least some anurognathids had forms of branching pycnofibers. One fossil from the Tiaojishan Formation even preserves melanosomes, indicating a rusty

ginger coloration.

Anurognathids are certainly a natural lineage, but both the internal phylogeny of the group and its relationship to other pterosaurs remain mysterious. “*Dimorphodon*” *weintraubi* is a poorly known species from the Pliensbachian of Tamaulipas, Mexico. It’s recently been found to be the earliest-branching member of the anurognathid lineage. This guide follows Wei and colleagues (2021) in splitting the remaining anurognathids into the batrachognathines including *Batrachognathus volans* and *Sinomacrops bondei*, and the anurognathines including almost all other members of the family.

Paleontologists have found anurognathids to be in different parts of the pterosaur family tree in different analyses. For instance, as the earliest-branching lineage of all pterosaurs, as close kin to dimorphodontids, nested within the scaphognathines, or as the closest kin to the monofenestratans. Their delicate skeletons are often crushed and difficult to interpret—even when preserved in the best of conditions—which frustrates attempts to figure out their relationships.

“Dimorphodon” weintraubi



Genus etymology: Two + form + tooth

Species etymology: Robert L. Weintraub’s

Age: Pliensbachian, Early Jurassic, 185 million years ago.

Range: La Boca Formation, Mexico.

Habitat: Subtropical rift-valley highlands.

Wingspan: 1.8 m (6 feet).

Habits: Poorly known.

Anatomy: Anurognathid characterized by its large size and robust build.



JURASSIC

Tithonian	LATE
Kimmeridgian	
Oxfordian	
Callovian	MIDDLE
Bathonian	
Bajocian	
Aalenian	EARLY
Toarcian	
Pliensbachian	
Sinemurian	
Hettangian	

Batrachognathus volans



Genus etymology: Frog + jaw

Species etymology: Flying

Age: Oxfordian-Kimmeridgian, Late Jurassic, 155 million years ago.

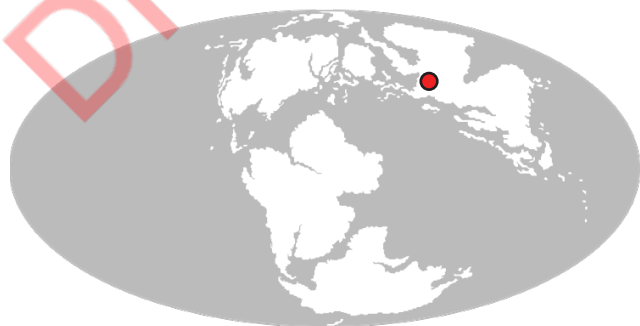
Range: Karabastau Formation, Kazakhstan.

Habitat: Temperate lakes and forests with marked wet and dry seasons.

Wingspan: 75 cm (30 inches).

Habits: Acrobatic flier that hunted insects on the wing in low light conditions such as dawn and dusk.

Anatomy: Batrachognathine characterized by its short and broad skull.



JURASSIC

Tithonian	LATE
Kimmeridgian	
Oxfordian	
Callovian	MIDDLE
Bathonian	
Bajocian	
Aalenian	EARLY
Toarcian	
Pliensbachian	
Sinemurian	
Hettangian	

Sinomacrops bondei



Genus etymology: China + large + face

Species etymology: Niels Bonde's

Age: Callovian, Middle Jurassic, 164 million years ago.

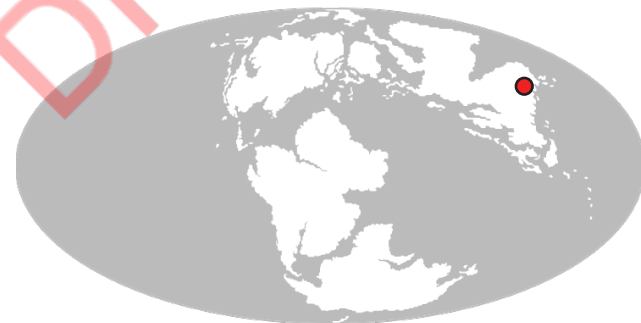
Range: Tiaojishan Formation, China.

Habitat: Well-watered temperate to subtropical forests, habitat includes lakes and swamps.

Wingspan: 33 cm (13 inches).

Habits: Acrobatic aerial hunter of insects in low light conditions.

Anatomy: Batrachognathine characterized by the three pairs of closely packed upper teeth, its relatively short thigh and long lower leg, and its relatively long tail.



JURASSIC

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Callovian	MIDDLE
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Pliensbachian	
Sinemurian	
Hettangian	

Anurognathus ammoni



Genus etymology: Frog + jaw

Species etymology: Ludwig von Ammon's

Age: Tithonian, Late Jurassic, 150 million years ago.

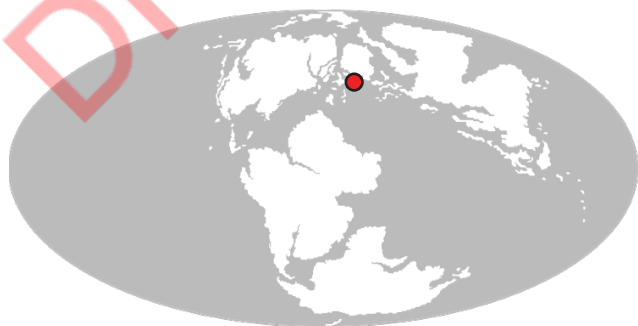
Range: Solnhofen Limestone, Germany.

Habitat: Low lying tropical to subtropical islands dominated by low scrub vegetation, and surrounded by shallow lagoons.

Wingspan: 50 cm (20 inches).

Habits: Acrobatic flier and hunter of insects on the wing in low light conditions.

Anatomy: Anurognathine characterized by a relatively short wing finger.



JURASSIC

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Bathonian	
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Pliensbachian	
Sinemurian	
Hettangian	

Dendrorhynchoides curvidentatus



Genus etymology: Branch + beak + like

Species etymology: Curved + teeth

Age: Barremian-Aptian Early, Cretaceous, 125 million years ago.

Range: Yixian Formation, China.

Habitat: Well-watered temperate forests dominated by conifers and ginkgoes, numerous lakes and swamps.

Wingspan: 50 cm (20 inches).

Habits: Acrobatic aerial hunter of insects in low light conditions.

Anatomy: Anurognathine characterized by its small size and relatively long, curved teeth.



CRETACEOUS

Maastrichtian	LATE
Campanian	
Santonian	
Coniacian	
Turonian	
Cenomanian	EARLY
Albian	
Aptian	
Barremian	
Hauterivian	
Valanginian	
Berriasian	

Luopterus mutoudengensis



Genus etymology: Lü Junchang + wing

Species etymology: From Mutoudeng

Age: Callovian, Middle Jurassic, 164 million years ago.

Range: Tiaojishan Formation, China.

Habitat: Well-watered temperate to subtropical forests, habitat includes lakes and swamps.

Wingspan: 40 cm (16 inches).

Habits: Acrobatic aerial hunter of insects in low light conditions.

Anatomy: Anurognathine characterized by its small size and relatively long tail.



JURASSIC

Tithonian	LATE
Kimmeridgian	
Oxfordian	
Callovian	MIDDLE
Bathonian	
Bajocian	
Aalenian	
Toarcian	EARLY
Pliensbachian	
Sinemurian	
Hettangian	

Jeholopterus ninchengensis



Genus etymology: Jehol Biota + wing

Species etymology: From Nincheng County

Age: Callovian, Middle Jurassic, 164 million years ago.

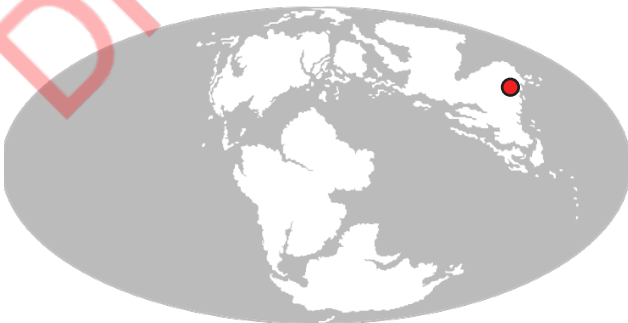
Range: Tiaojishan Formation, China.

Habitat: Well-watered temperate to subtropical forests, habitat includes lakes and swamps.

Wingspan: 90 cm (35 inches).

Habits: Hunted insects on the wing in low light conditions, acrobatic flier.

Anatomy: Anurognathine characterized by its small skull, short neck, robust wings, and large manual claws.



JURASSIC

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Kimmeridgian	
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Pliensbachian	
Sinemurian	
Hettangian	

Mesadactylus ornithosphyos



Genus etymology: Dry Mesa + finger

Species etymology: Bird + lower back

Age: Kimmeridgian-Tithonian, Late Jurassic, 150 million years ago.

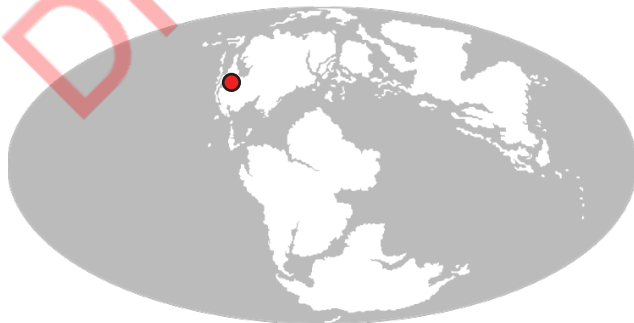
Range: Morrison Formation, USA.

Habitat: Open semi-arid forests dominated by conifers, ginkgoes, and cycads, crossed by large meandering rivers with broad floodplains.

Wingspan: 70 cm (28 inches).

Habits: Poorly known.

Anatomy: Poorly known.



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Aalenian	EARLY
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Pliensbachian	
Sinemurian	
Hettangian	

Sinuiju Anurognathid



Age: Barremian-Aptian, Early Cretaceous, 125 million years ago.

Range: Sinuiju Formation, North Korea.

Habitat: Well-watered temperate forests dominated by conifers and ginkgoes, numerous lakes and swamps.

Wingspan: 80 cm (32 inches).

Habits: Acrobatic hunter of insects on-the-wing, likely hunted at night.

Anatomy: Anurognathine characterized by its especially short neck.



CRETACEOUS	
Maastrichtian	LATE
Campanian	
Santonian	
Coniacian	
Turonian	
Cenomanian	
Albian	EARLY
Aptian	
Barremian	
Hauterivian	
Valanginian	
Berriasian	

Vesperopterylus lamadongensis



Genus etymology: Dusk + wing

Species etymology: From Lamadong

Age: Aptian, Early Cretaceous, 120 million years ago.

Range: Jiufotang Formation, China.

Habitat: Temperate forests dominated by ginkgoes and conifers, abundant lakes and wetlands.

Wingspan: 100 cm (39 inches).

Habits: Aerial hunter of insects in low light conditions.

Anatomy: Anurognathine characterized by its large size, especially short and broad skull with teeth restricted to the middle portion of the jaws, somewhat long neck and torso, and opposable first toe.



CRETACEOUS

Maastrichtian	LATE
Campanian	
Santonian	
Coniacian	
Turonian	
Cenomanian	
Albian	EARLY
Aptian	
Barremian	
Hauterivian	
Valanginian	
Berriasian	