

### The Pterosaur Database

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Monteillet, J., Lappartient, J. R. & Taquet, P. 1982 Un ptérosaure géant dans le Crétacé supérieur de Paki (Sénégal). C. R. Acad. Sci. Paris II 295, 409–414. (27 Septembre 1982)

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PALAEONTOLOGY. - A gigantic Pterosaur in the Upper Cretaceous of Paki (Senegal). Note (\*) by Jacques Monteillet, Jean René Lappartient and Philippe Taquet, presented by Jean Piveteau.

The sandstone quartzites of the Upper Senonian of Paki (Senegal) yielded up the bony remainders of a gigantic Pterosaur. The material is characteristic consisting of a cast of a cervical vertebra anatomically similar to *Quetzalcoatlus* or *Titanopteryx*. The wildlife and the associated flora suggest a coastal environment.

The fossil nature of Paki noted by Tessier [1] is of Later Campanian age to Maastrichtian ([1], [2]) recently revealing an abundant wildlife of invertebrate fossils [2] fruit and seeds of which 7 forms were described [3]. In 1965 a harvest of particularly rich fossils revealed additional forms which were characteristically fossilised bones of Vertebrates. The examination of these pieces allowed us [4] to determine them as being bones of flying Reptile. This important discovery is the object of the presents Notes.

LOCATION AND CONDITION OF PRESERVATION (fig. 1) - quarrymen, to the NE of the village of Paki to about 40 km to the east-south-east is Dakar, exploit a group of sandstone quarzites fossil beds which were up to twenty of meters thick. The exposure in these beds [2] show the alternation of layers of fine and crude quarzites with variable fossil beds with of thin sediments rich in bivalve molluscs corresponding to ancient clams. The bony remainders of Pterosaurs were found towards the summit of the excavation, to the level of upper clam beds, in the quarry no. 4 [2].

The Invertebrate fossils of the sandstone of Paki show that those here conform to a shallow marine deposit. The presence of large amounts of fruit of indicates a proximity to a coastal area. Before the wildlife of molluscs and of echinoderms one can attribute to this locality an Upper Campanian to Maastrichtian age. This formation corresponds to the heart of the dome "faillé of Ndias".

THE SEDIMENT AND THE PALAEOGEOGRAPHY OF THE BASIN OF SENEGAL TO THE UPPER CRETACEOUS. - The basin of Senegal originates from the Jurassic by continuation of the subsidence of the plate linked to the continental fracture. In the Cretaceous it can be seen to the east of the basin that the sedimentary formations are flat and to the west the clay deposits subside. The lateral passage of sedimentary deposits extends alongside an ancient ridge of recognized flexure notably between Dakar and Ndias and this is where of Paki lies. This fracture zone includes intrusive volcanoes which tend to force a vertical constraint forcing the deformation of land surface [[5]. This is as well as the regularity of the subsidence in the western area of the basin has also been able locally to cause disruption and movement such as the slumping of the dome of Ndias to end of the Albian [6]. Thus the given

palaeogeographics show that, during the Cretaceous the extent of the sea sometimes were able to spread themselves to the eastern edge of the Senegalese sedimentary basin, the existence of a Maastrichtian diapers more or less emerging in this sector of Ndias is possible and probable.

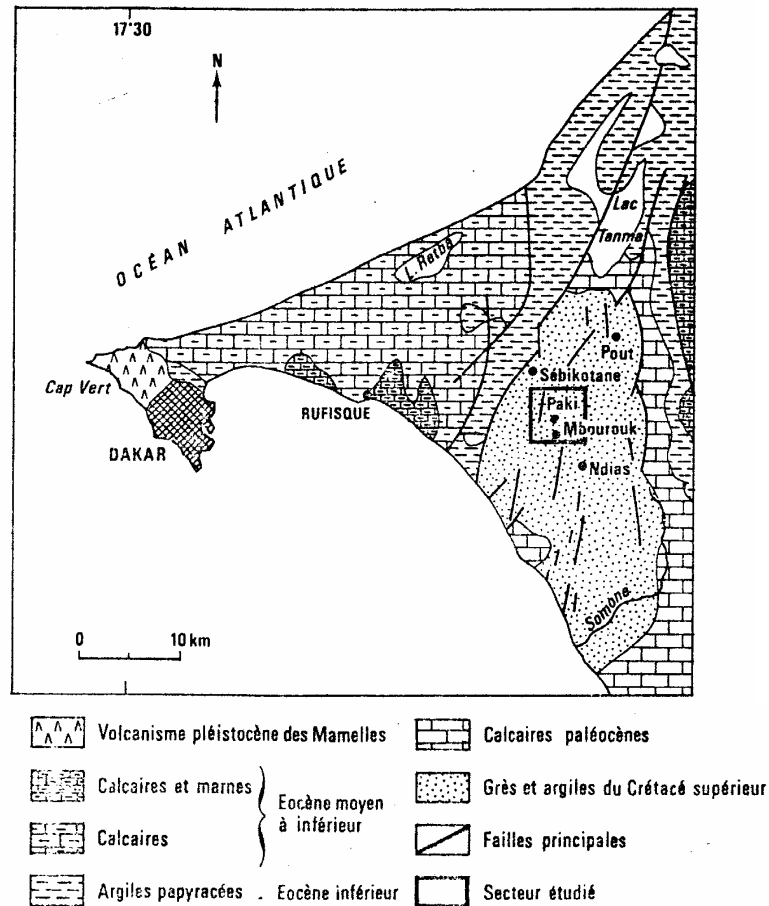
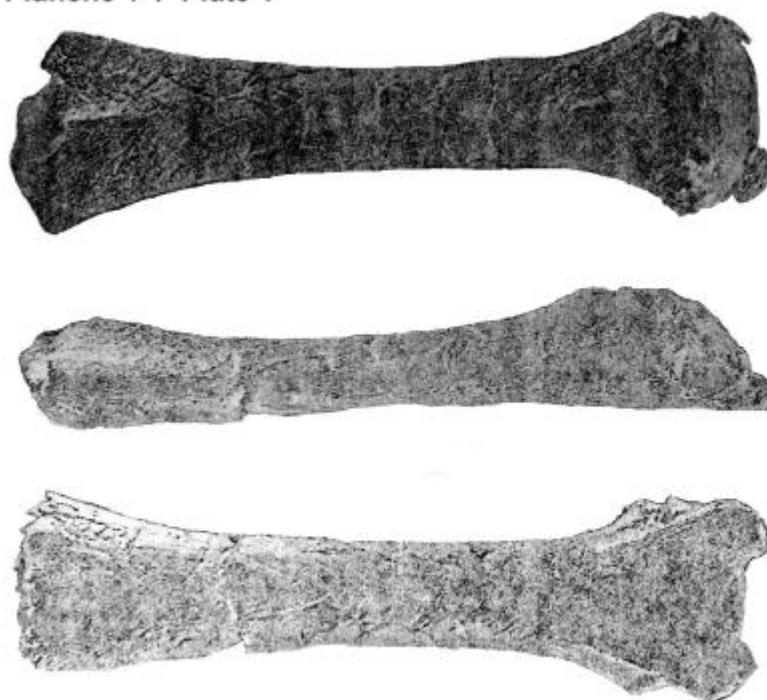


Fig. 1. — Situation du gisement.  
 Fig. 1. — Situation of the locality.

EXPLICATION DE LA PLANCHE

PALAEONTOLOGY (Pl. I). The more interesting piece consists in an internal casting of a very characteristic cervical vertebra: this one is procoele and possesses a body which is a flattened, extremely lengthened cylinder widening itself to its two extremities. The superior face displays two neural crests, an anterior one, and the posterior other. The anterior face shows only the departure of its two prezygapophyses. The neural canal is filled by sediment; his opening is triangular, and is clearly seen just below this opening at the anterior extremity procoele to the centrum under the form of an oval window to main horizontal axis.

Planche 1 / Plate 1



- A, cervical vertebra, Dorsal view
- B, cervical vertebra, Lateral view
- C, cervical vertebra, Ventral view.

The posterior party of this casting of the vertebra is well preserved, even if the back postzygapophyses are broken, they were positioned posteriorly. The flattened bulbous end of the centrum is clearly visible and is framed by the two postzygapophyses. The second piece found in the sediment is more incomplete; it lacks its two extremities; this may be part of a tibia.

COMPARISONS. This vertebra is similar, by his lengthening. to the cervical vertebrae of the big Pterosaurs of the Upper Cretaceous. These gigantic Pterosaurs are very rare and only two forms were described: from western Texas (Maastrichtian of the Big Bend National Park) is *Quetzalcoatlus northropi* ([7], [81]), the other from the Jordan Maastrichtian is *Titanopteryx philadelphiae* [9]. The wing span of the first type is estimated to 12 m [10].

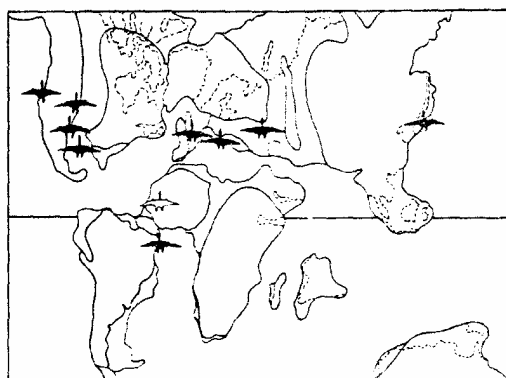


Fig. 2. Distribution map of the Pterosaurs to the Upper Cretaceous, Senonian.

With the specimens from Texas, the dimensions of the cervical vertebrae vary from 16 to 40 cm; the vertebra of the Jordan specimen measures 60 cm. while the one that originates from Senegal has a length of 24.5 cm. The Paki specimen, just as with *Quetzalcoatlus*, does not

show a continuous crests progressing along the back surface of the vertebra, while three crests are present with *Titanopteryx*.

With only two pieces of this gigantic Pterosaur: a cervical vertebra and a portion of tibia, both are internal casts: it does not seem appropriate to create a new taxon for these pieces.

We will attribute therefore these two samples to a Pterosaur of large dimensions and precisely to a Pterosaur: this one being anatomically close to the Pterosaur, *Titanopteryx*

THIS INTERESTING DISCOVERY. This discovery is interesting more than the title: this is first discovery of the remainders of Mesozoic Vertebrates in Senegal. Besides, the bones of flying Reptiles being hollow and fragile, the discoveries of such vertebrae are extremely rare: thus for the Cretaceous the bulk of the remainder of Pterosaurs were discovered in the lands of the northern hemisphere. In the southern, hemisphere only two discoveries of remains of these Reptiles have been found so far.

We recall them being given the relative proximity of these with respect to the site of Paki.

The first one of Maastrichtian age was an anterior extremity of humerus originating from the basin of Paraiba (North eastern Brazil) and described under the name of *Nyctosaurus lamegoi* by Price [11]. The second one is the one of a fragment of metacarpal assigned to *Ornithocheirus*, found in the Upper Cenomanian or Turonian of the Zaïre and describes by Swinton [12].

In the two cases they are different Pterodactyls to the flying Reptiles discovered in Paki.

The reconstruction map of the continental landmasses [13] show that the site of Paki, localized to the neighbourhood of an emerging island on the reconstruction, was separated from America to the South on one hand and Eastern Africa on the other hand [fig. 2]. The discovery of a gigantic Pterosaur in Senegal brings therefore interesting elements on the geographic distribution of these Reptiles. It is necessary to recall that the life style of these animals gives rise to many interpretations. Lawson ([7], [8]) proposed the idea that these large types fed on corpses while Langston [10] thinks that Quetzalcoatlus fed on molluscs and water arthropods. In the case of the flying Reptile of the Senegal no element can accredit these hypotheses. The fact that of very numerous fruit and fossil seeds were found with tests of molluscs and of associated echinoids associated with the bones of the Pterosaur deserves to be noticed even if there is no evidence of associated taphonomy.

(\*) Remittance 5th July 1982.

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