

Will the real *Lonchodectes* fly in?

FORD, Tracy Lee

Lonchodectes is a fragmentary and misunderstood pterosaur. In 1914 Hooley named the genus and placed several species of *Ornithocheirus* in it; *L. giganteus*, *L. compressirostris*, *L. platystomus*, *L. sagittirostris*, *L. machaerorhynchus* and *L. microdon*. Plininger (1929) added the following species to Hooley's list; *L. daviesii*, *L. oweni*, *L. scaphorhynchus*, *L. tenuirostris*, and moved *L. platystomus* to *Amblydectes*.

Unwin (2001) pointed out that several authors incorrectly referred *Ornithocheirus compressirostris* as the type species of *Ornithocheirus*; Khozatskii & Yur'ev, 1964, Kuhn, 1967, Wellnhofer, 1978, Kellner, 1990, Olshevsky, 1991, Mader & Kellner, 1999 and Kellner & Tomida, 2000. That and the fact that no complete skull is known, complicates not only its taxonomy, but how it may have looked in life. There are at least three morphotypes, and all possess a long skull; Morphotype A has a long laterally compressed skull. Morphotype B has a broad rostrum, and Morphotype C has a crest on the anterior rostrum, and dentary.

Unwin (2003) is the latest pterosaurologist (a term used by Bennett, 2013) to diagnose *Lonchodectes*: pterosaurs with distinctive, parapet-like alveolar borders to the jaws. Each border bears small, subequal sized, subcircular, well-spaced alveoli with margins raised into a low collar, and containing teeth and constructed bases. There is a prominent, sharply ridged, median keel on the occlusal surface of the rostrum that corresponds with a deep, v-shaped median sulcus on the occlusal surface of the mandibular symphysis. He placed the following species in *Lonchodectes*, *L. compressirostris*, *L. giganteus*, *L. machaerorhynchus*, *L. microdon*, and *L. platystomus*.

The three morphotypes of *Lonchodectes* are all assumed to have had a long skull (Unwin, 2003).

Morphotype A); The jaws are very long, thin, laterally compressed, and

PO Box 1171, Poway, CA 92074



has some indication of a very low crest on either the premaxilla or the dentary (*Lonchodectes compressirostris*, *Lonchodectes platystomus*? *Lonchodectes wiedenrothi* (combination new), *Lonchodectes* sp from Australia). The type *Lonchodectes compressirostris* has the thinnest premaxilla/maxilla of the known *Lonchodectes* specimens (and possibly in all pterosaurs). *Lonchodectes platystomus* is known from the anterior tip of premaxilla (which is missing in the type) and anterior dentary. The preserved material is wider than the type and shows evidence of a rostral and mandibular crest. Wild (1990) coined the species *Ornithocheirus wiedenrothi*, and compared the mandible to the upper jaw of *Ornithocheirus compressirostris* (incorrectly believing it was the type of *Ornithocheirus*). Both show similarities to each other in that the jaw is very narrow, aveoli close to the center of the jaw and very long, with shallow parapet-like alveoli. It is very likely that these two belong to the same genus, though different species. The placement of *Ornithocheirus wiedenrothi* to *Lonchodectes* has been attributed to Unwin (2001, 2003), but as Fletcher & Salisbury, (2010) pointed out, Unwin did not synonymize it with *Lonchodectes*. They state (via Unwin, 2008 pers. comm to Fletcher & Salisbury) that Unwin believes *O. wiedenrothi* is valid, and distinct from *Ornithocheirus*, though not *Lonchodectes*, and a valid taxon of ornithocheirid. The first pair of teeth in the dentary protrude rostradorsally, and the remainder are near perpendicular to the long axis of the jaw (Fletcher & Salisbury, 2010). There is no indication of a mandibular crest, and is here referred to *Lonchodectes wiedenrothi* (combination new).

Molnar & Thulborn (2008) referred an Australian Pterosaur specimen to *Lonchodectes* spp. Fletcher & Salisbury (2010) disagree with Molnar & Thulborn about QM F10613 referral to *Lonchodectes* spp. They cited the absence of 'parapet-like dental margins' (i.e. aveoli) and other dental features, and placed QM F10613 in Ornithocheiridae incertae sedis. The lack of parapet-like dental margins may be more due to preservational bias, than to not having parapet-like margins. Fletcher & Salisbury (2010) mention the first pair of teeth in QM F10613 has a similar tooth orientation as that seen in '*O. wiedenrothi*, with the rest being perpendicular to the jaw line. Kellner, Rodrigues & Costa, 2011 referred the dentary to the new genus *Aussiedraco molnari*.

Morphotype B): The jaws are broader/wider than in morphotype A, but similar to morphotype C; (*Lonchodectes microdon*, *Lonchodectes* sp European Russia).

Lonchodectes microdon is known from the mid(?) section of the rostrum, and the anterior end of a dentary. The mid section shows some indication of a possible short sagittal crest. The dentary has no mandibular crest. It is nearly equal in its width from its anterior tip to preserved posterior end and does not have a wider 'spatulate' tip as in *Anhanguera*, and other pterosaurs. Similarly the mid-section of the rostrum has similar width indicating the jaws had the same width from at least the mid-section of the jaw to the rostral tip. The front teeth point forward and the rest are nearly vertical (as in the other *Lonchodectes* specimens). Averianov & Kurochkin, (2010) refer an anterior dentary fragment from European Russia to *Lonchodectes* sp. It is wide, but has a more pointed rostral tip than *L. microdon* and the aveoli are more horizontal and has an indication of a mandibular crest. The authors believe it more closely related to *L. platystomus*, though it is more slender than the referred specimen and may not be a good analogy.

Morphotype C); This group of Lonchodectids have crested/keeled jaws (*Lonchodectes machaerorhynchus*, *Lonchodectes giganteus*). *L. machaerorhynchus* had a more anteriorly placed crest on the anterior portion of the dentary. The jaw of *L. machaerorhynchus* is of nearly equal width and indicates it had a very long skull with a rounded anterior tip (though the tip is missing), and is similar to morphotype B. If



the dentary follows typical crested pterosaurs, the premaxilla crest would have been larger than the dentary crest and may have been closer to the rostral tip of the jaw. *L. giganteus* width is slightly wider at its preserved posterior end than the anterior end. The preserved upper and lower jaws indicate a crest: lower on the ventral edge of the dentary, than the premaxilla. Like *L. machaerorhynchus* the crest was more toward the anterior end (also similar to other Ornithochierid pterosaurs) and was longer and lower.

Because *L. sagittirostris* is from the posterior portion of the jaw and it isn't known which of the three morphotypes it falls into. *Lonchodectes* has not been considered to be a valid genus and has been a junior synonym of *Ornithocheirus*; Kuhn, (1961, 1967), Romer, (1966), Wellnhofer (1978, 1991), Carroll, (1988), Howse et al., (2001), Kellner (2003), while others believe it is a valid genus; Hooley, (1914), Unwin in Benton, (1933, with *L. sagittirostris* as the youngest species and *L. compressirostris* as the latest), Plieninger (1929), Unwin, et al., (2000), Unwin, (2001, 2003), Martill et al., (2011).

Though these morphotypes belong to the family Lonchodectidae, they do not all belong to *Lonchodectes*, and two new genus names are needed. Morphotype A is *Lonchodectes*, this morphotype had a very elongate, laterally compressed jaws (there are three, possibly four, species in morphotype A; *Lonchodectes compressirostris* [figure A], *Lonchodectes platystomus*? *Lonchodectes wiedenrothi* (combination new), *Lonchodectes* sp from Australia); morphotype B is a new genus, with a flat/wide beak (with two? species; *Lonchodectes microdon* [figure B], *Lonchodectes* sp European Russia); and morphotype C is a new genus (with two species, with a sagittal crest: *Lonchodectes machaerorhynchus* [figure C], *Lonchodectes giganteus* [figure D]).

References

- AVERIANOV AO AND KUROCHKIN EN. 2010. A new pterosaurian record from the Cenomanian of the Volga Region. *Paleontol J* 44: 94-96.
- HOOLEY FGS. 1914. On the Ornithosaurian genus *Ornithocheirus*, with a review of the specimens from the Cambridge Greensand in the Sedgwick Museums, Cambridge. *Ann Mag Nat Hist* 8th series 78: 529-557.
- KELLNER AWA, RODRIGUES T AND COSTA FR. 2011. Short note on a pteranodontoid pterosaur (Pterodactyloidea) from western Queensland, Australia. *Acad Bras Ciênc* 83(1): 301-308.
- MOLNAR RE AND THULBORN RA. 1980. First pterosaur from Australia. *Nature* 288: 361-363.
- PLIENINGER F. 1929. *Fossilium Catalogus, I: Animalia, Pars* 45: 1-84.
- UNWIN DM. 2003. On the phylogeny and evolutionary history of pterosaurs. In BUFFETAUT E, MAZIN J-M (Eds) *Evolution and Palaeobiology of Pterosaurs*, *Geol Soc Spec Publ* 217: 139-190.