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The largest known flying organisms are the azhdarchid pterosaurs, a pterodactyloid clade previously diagnosed by the characters of their extremely elongate middle-series cervical vertebrae. The named species of the Azhdarchidae are from the Late Cretaceous. However, isolated mid-cervical vertebrae with similar dimensions and characters have been referred to this group that date back to the Late Jurassic, implying an almost 60 million year gap in the fossil record of this group and an unrecorded radiation in the Jurassic of all the major clades of the Pterodactyloidea. A new pterosaur from the Early Cretaceous of Liaoning Province of China, *Elanodactylus prolatus* gen. et sp. nov., is described with mid-cervical vertebrae that bear these azhdarchid characters but has other postcranial material that are distinct from the members of this group. Phylogenetic analysis of the new species and the Pterodactyloidea places it with the Late Jurassic vertebrae in the Late Jurassic-Early Cretaceous Ctenochasmatidae and reveals that the characters of the elongate azhdarchid vertebrae appeared independently in both groups. These results are realized though the large taxon sampling in the analysis demonstrating that the homoplastic character states present in these two taxa were acquired in a different order in their respective lineages. Some of these homoplastic characters were previously thought to appear once in the history of pterosaurs and may be correlated to the extension of the neck regions in both groups. Because the homoplastic character states in the Azhdarchidae and Ctenochasmatidae are limited to the mid-cervical vertebrae, these states are termed convergent based on a definition of the term in a phylogenetic context. A number of novel results from the analysis presented produce a reorganization in the different species and taxa of the Pterodactyloidea.