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Entomology, Ornithology & Herpetology: Current Research

Commentary

Current Evolutionary Trends in Bird Entomology

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DESCRIPTION

Theropod dinosaurs, from whom the earliest birds descended, are regarded to have been the starting point of bird evolution in the Jurassic Period. A biological class called Aves is where birds fall under. Although *Archaeopteryx lithographica*, from the Late Jurassic period, is the first species of the class Aves, it is not generally accepted that *Archaeopteryx* was a real bird. According to contemporary phylogenies, birds belong to theropod dinosaurs. The Aves and a sister group, the order Crocodilia, are currently thought to be the last surviving members of the *Archosauria*, an unranked "reptile" clade.

Origins of bird entomology

There is strong evidence that birds are descendants of theropod dinosaurs, specifically that they belong to the clade Maniraptora, which also includes dromaeosaurus and oviraptorids. The boundary between non-birds and birds is becoming less obvious as more closely related non-avian theropods are identified. This issue is exacerbated by recent findings in northeast China's Liaoning Province, which show that numerous small theropod dinosaurs had feathers.

Although it is not thought to be a direct ancestor of contemporary birds, the Jurassic-era basal bird *Archaeopteryx* is well known for being one of the first "missing links" to be discovered in favour of evolution in the late 19th century. Another pioneer was *Confuciusornis*, which existed in the Early Cretaceous. *Protoavis* texensis may have predated both, albeit it is highly disputed whether or not this fossilised animal was a bird progenitor due to its fragmentary nature. The *Confuciusornis*, *Enantiornithes*, *Yanornis*, *Ichthyornis*, *Gansus*, and the *Hesperornithiformes*-a family of flightless divers that resembles grebes and loons-are examples of other Mesozoic birds.

Trends in bird entomology

Neornithes, which are considered to have evolved into several fundamental lineages by the end of the Cretaceous period, are the group that includes modern bird. Paleognaths and Neognaths are two subgroups of *Neornithes*.

Paleognathae: The tinamous, which are only found in Central and South America, and the ratites, which are now nearly entirely restricted to the Southern Hemisphere, are examples of paleognaths. Ostriches, cassowaries, kiwis, and emus are among the huge, flightless ratites. In any case, the information that is currently available about their evolutionary history is still very muddled. Some scientists have suggested that the ratites represent an artificial grouping of birds that have independently lost the ability to fly in a number of unrelated lineages.

Neognathae: The *Galloanserae* superorder, which includes the *Anseriformes* (ducks, geese, and swans) and the *Galliformes*, has the basal divergence from the remaining *Neognathes* (the pheasants, grouse, and their allies).

There is a great deal of disagreement among scientists regarding the divides' dates. There are conflicting views on whether the radiation of the remaining neognaths happened before or after the extinction of the other dinosaurs. It is generally accepted that the *Neornithes* evolved during the Cretaceous and that the split between the Galloanserae and the other neognaths—the Neoaves —took place before the K-T extinction event. The data is inconclusive, with molecular dating indicating a Cretaceous radiation, a scant and ambiguous neoavian fossil record from the Cretaceous, and the majority of surviving families emerging during the Paleogene. Conciliating the molecular and fossil evidence has proven contentious.

CONCLUSION

The recently discovered (2002) dromaeosaur *Cryptovolans* (which may be a Microraptor) featured uncinate processes on its ribs, was capable of powered flight, and had a sternal keel. In fact, *Cryptovolans* is a more convincing "bird" than *Archaeopteryx*, which lacked several of these contemporary bird characteristics. Because to this, some palaeontologists have proposed that dromaeosaurs are actually basic birds whose larger members are secondarily flightless, meaning that dromaeosaurs evolved from birds rather than the other way around. Although there is currently no substantial evidence to support this theory, remains of the odd feathered dromaeosaurs are still being discovered, particularly in China.

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