

ORIGIN AND EVOLUTION OF AMPHIBIDES

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Annotation

This article provides information on the origin and evolution of amphibides.

Keywords: membranes provide, mammal, vertebral, embryology

Аннотация

В данной статье представлена информация о происхождении и эволюции амфибид.

Ключевые слова: мембраны обеспечивают млекопитающие, позвонки, эмбриология

Reptiles, birds and mammals make up a group of higher vertebrates that lead a terrestrial lifestyle. Although a number of cases of higher vertebrates living in water are known, they all represent examples of secondary adaptation to the aquatic environment. This is evidenced by many data from paleontology, embryology and ecology.

All higher vertebrates have internal fertilization. Their reproduction occurs on land, and only a few viviparous species (for example, cetaceans) reproduce in water. During the embryonic development of higher vertebrates, the appearance of special embryonic membranes is extremely characteristic. In species that lay eggs, the embryonic membranes provide the opportunity for the development of the embryo in the air.

In higher mammals, the embryonic membranes take part in the formation of the child's place, or placenta, a formation that ensures the organic connection of developing embryos with the maternal body.

However, reptiles still represent the most poorly organized higher vertebrates. Thus, due to the two systemic arches of the aorta, the blood in the arteries of the trunk is mixed. The ability for thermoregulation is low.



Compared to amphibians, reptiles are a much more numerous, diverse and widespread class. The total number of modern species is approximately 6000.

The spine of most lizards is composed of procoelous vertebrae. In lower forms the vertebral bodies are amphicoelous. The vertebral column is more articulated and mobile than that of amphibians. It consists of four sections: cervical, thoracolumbar, sacral and caudal.

A feature of this section of the axial skeleton is not only the significantly larger number of vertebrae than in amphibians, but also the unique structure (as in other higher vertebrates) of the first two cervical vertebrae. The first cervical vertebra, called the atlas, or atlas, is a bony ring divided by a ligament into lower and upper halves. The upper opening serves to connect the brain with the spinal cord; the odontoid process (processus odontoideus) of the second cervical vertebra, the epistropheus, enters the lower opening. The atlas rotates around the odontoid process of the epistropheus.

Data from embryonic development show that the odontoid process is the body of the first cervical vertebra, articulated (but not fused in reptiles) with the body of the second cervical vertebra (epistropheus). This feature of the cervical spine provides greater mobility of the head.

The thoracolumbar region of the lizard consists of 22 vertebrae. They all bear ribs, but only the ribs of the first five vertebrae are attached to the sternum. Thus, a real rib cage appears, characteristic of most reptiles (there is no full rib cage, for example, in snakes, which do not even have a sternum). The sternum of lizards is cartilaginous, embryonically resulting from the fusion of the thoracic ends of the ribs. The sacral section consists of two vertebrae. The pelvis (iliac bones) is attached to their transverse processes.

The caudal region consists of several dozen vertebrae. The anterior ones bear spinous and transverse processes and rudimentary ribs. Towards the posterior part of the tail, the vertebrae lose their processes and take on the appearance of rod-shaped bones. The bodies of almost all caudal vertebrae are divided by a thin non-ossifying layer into anterior and posterior sections. In the well-known phenomenon of breaking off the tail, the rupture occurs not between two vertebrae, but in the middle of a vertebra, in the area of the above-mentioned layer. The rupture is caused by the contraction of special muscles of the tail, which look like cones inserted into each other, the tops of which are facing the root of the tail.



From all of the above, it is clear that the spinal column of reptiles is characterized by greater differentiation, which determines better mobility of the head and more durable attachment of the limb girdles to the axial skeleton. In addition, the appearance of the chest makes possible a different, more advanced breathing mechanism than that of amphibians.

Skull. A common feature of the skull is the almost complete ossification of the primary cartilaginous skull and the development of a large number of dermal bones that form the roof, sides and bottom of the skull.

The occipital region consists of four bones of chondral origin: the superoccipital, the basioccipital and two lateral occipitals. All these bones border the foramen occipital, below which lies the only occipital condyle. Both lateral occipital bones and the main occipital bone take part in its formation. In front of the main occipital bone lies the main sphenoid bone (basisphenoideum), which takes part in the formation of the bottom of the skull.

Three ear bones develop in the area of the auditory capsules. One of them - the non-red ear - remains independent for life, the other two grow together: the back ear - with the lateral occipital bone, and the superior ear - with the superoccipital bone.

In the olfactory region, chondral ossifications do not develop, and it remains cartilaginous. The sides of the skull are also formed by numerous overhead bones: unpaired premaxillary, paired maxillary, supraorbital, zygomatic, squamosal. Under the roof of the skull, in the temporal region, the lizard has a large depression - the lateral temporal fossa.

All these bones participate in the formation of the floor of the skull. In addition, transverse bones (transversum) of cutaneous origin are formed, connecting the pterygoid bones with the maxillary bones, and in lizards and tuataria, columnar bones (epipterygoideum) are also of chondral origin, connecting the pterygoid bones with the parietal bones.

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