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Key words: heart, ontogenesis, nutria, ventricles, papillary-trabecular apparatus, cardiomyocytes, connective tissue

Received: 26.02.2014
Accepted: 20.03.2014

UDC 611.127:591.4-092.9.

THE MORPHOLOGICAL CHARACTERISTICS OF NUTRIA HEART

ABSTRACT. Background. The work considers morphological features of the nutria heart in postnatal ontogenesis: heart shape, internal relief of the chambers, papillary muscles, their shape, size and histological structure of the ventricular walls. Internal relief provides optimal process of ventricular contraction and relaxation. Formation of cardiac structure and structural features of cells reflect morphological structure and hemodynamic of the mature heart. **Objective.** To reveal the morphological features of the internal structure of a trabecular-papillary apparatus of nutria heart in postnatal ontogenesis. To determine the ratio of connective tissue to cardiomyocytes and structural patterns of internal trabecular-papillary apparatus of nutria heart, including the number, shape and size of papillary muscles in the right and left ventricles. **Methods.** As a material for the study we used 35 nutria hearts. Hearts were isolated and fixed in 10% neutral formalin. Morphometric methods were used: with the help of a ruler and a compass the size of the heart, thickness of the walls of right and left ventricles were measured. Histological sections were prepared in transverse and longitudinal plane with the further staining with hematoxylin. Calculation of cardiac index was performed by the formula: the ratio of the heart weight to the body weight. To determine the shape of the heart the ratio of the heart width to the body length was calculated. In value of the index up to 65% the heart shape was considered as conical, from 65% to 75% - ellipsoid, more than 75% - spherical. **Results.** Morphometric investigation showed that the nutria heart is globe-shaped (82%). The average cardiac index is - 0,4. The size of papillary muscles of a left ventricle prevails over the same parameter in the right ventricle. Nutria heart is characterized by a higher percentage of muscle tissue - 68.9%, while the percentage of connective tissue is - 31.1%. **Conclusion.** The structure and topography of papillary muscles of nutria heart demonstrated significant individual diversity of shape and quantity. The number of papillary muscles and tendon strings reflects the degree of fixation, which also depends on the size of muscles: the more massive papillary muscle – the higher degree of fixing it has. The percentage of muscle tissue in myocardium depends on the activity of the animal.

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Citation:

Nazarova DI, Kramar SB, Zharikov MY, Kuznetsova OV, Kramar GYu, Kozhushko VV. [The morphological characteristics of nutria heart]. *Morphologia*. 2014;8(1):65-8. Ukrainian.

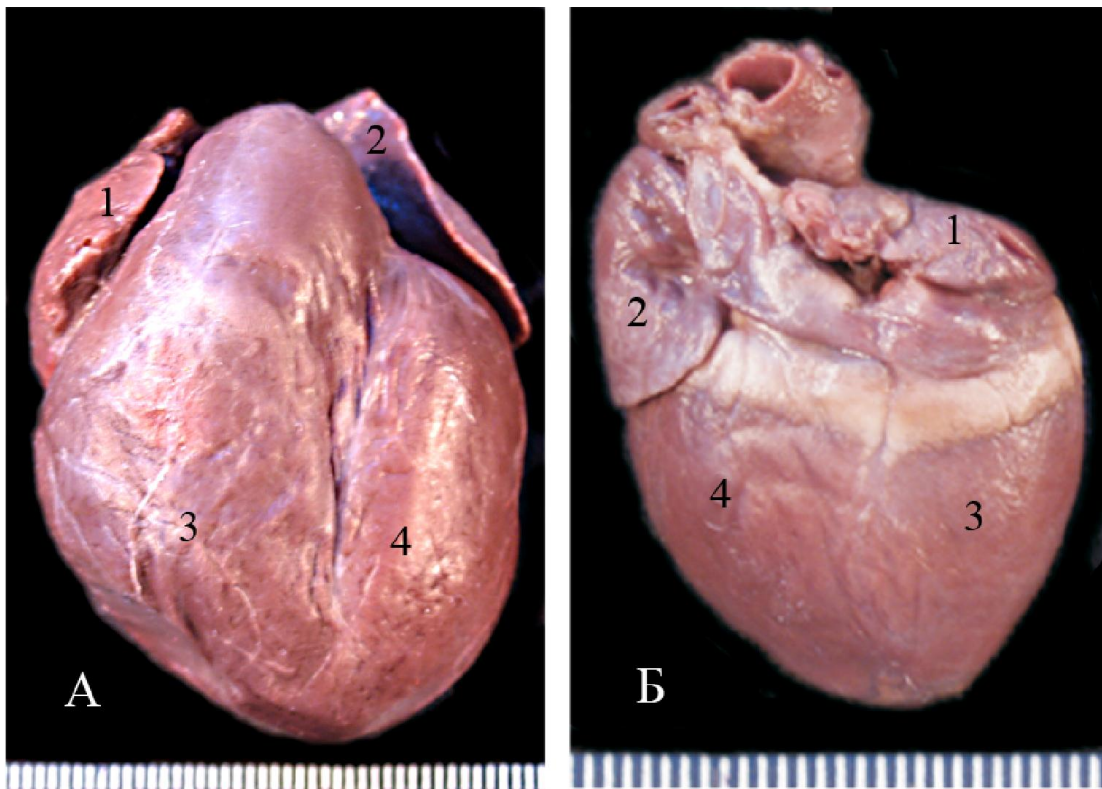


Fig. 1. Macropreparation: nutria heart external form (A – anterior surface; Б – posterior surface): 1 – right auricle; 2 – left auricle; 3 – right ventricle; 4 – left ventricle.

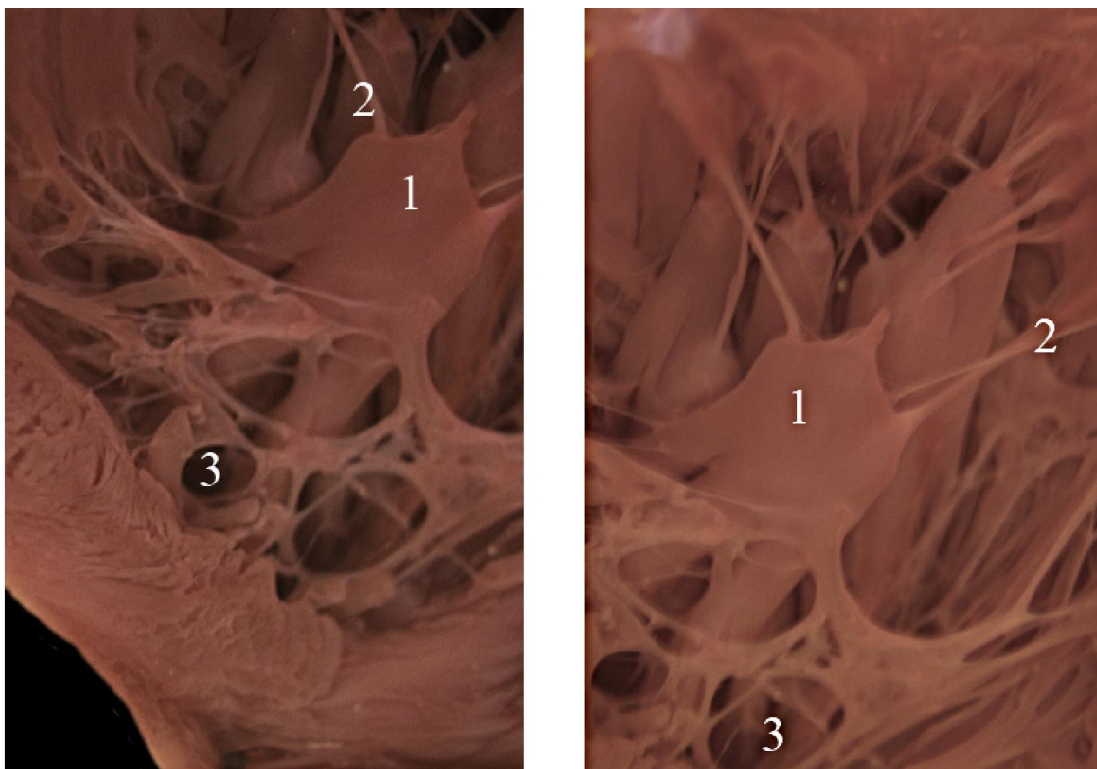


Fig. 2. Macropreparation: internal relief of nutria heart left ventricle: 1 – papillary muscle; 2 – tendinous chords; 3 – ventricle papillary-trabecular apparatus.

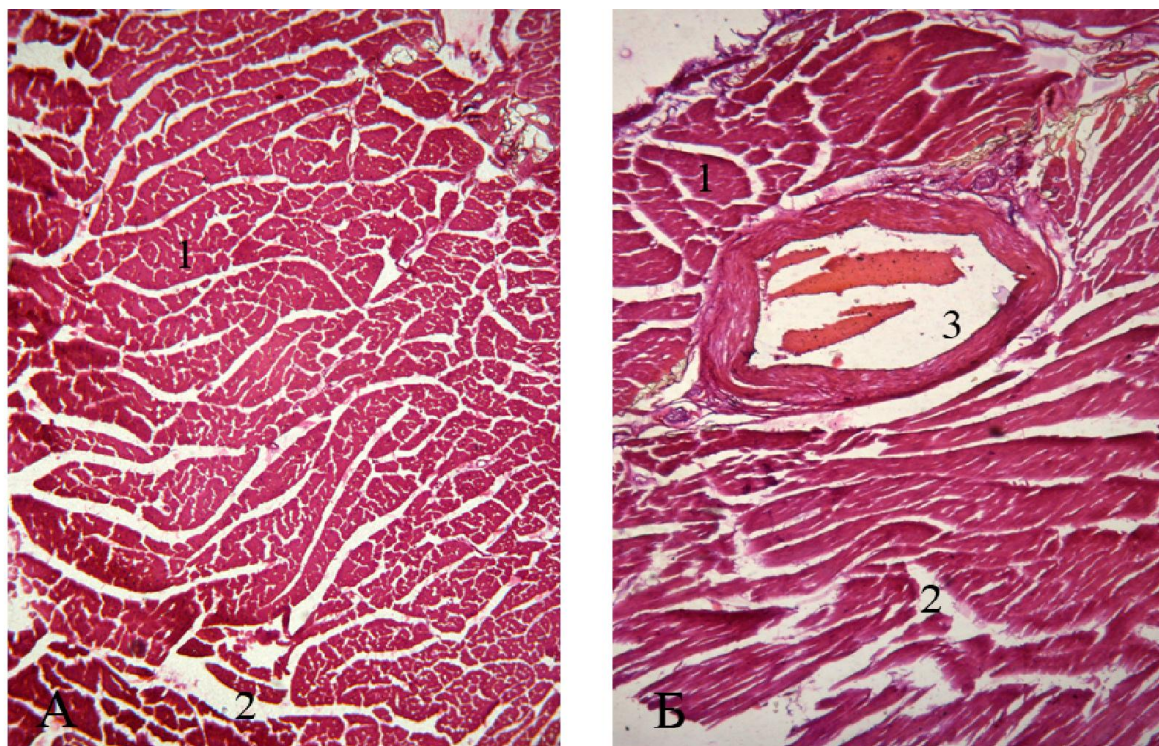


Fig. 3. Muscular fibers and connective tissue in nutria heart wall – (A) and blood vessel of large diameter in nutria myocardium – (Б). Hematoxylin&Eosin staining. Ocular $\times 10$, lens $\times 40$: 1 – muscular fiber; 2 – connective tissue; 3 – blood vessel.

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