ARTERIAL VASCULATURE OF THE BOTTLENOSE DOLPHIN HEART

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Whales (*Cetacea*) are adapted to life in water. Their blood volume is 2-3 times larger within their body mass compared to terrestrial mammals, and serves as an oxygen reservoir. Bradycardia, peripheral vasoconstriction and redistribution of oxygenated blood into the brain and heart increase the diving ability of whales. The whale heart, as the central organ of the cardiovascular system, has specific anatomical and functional characteristics that maintain the body balance while diving. We studied the anatomical characteristics of the cardiac arteries (a. coronaria dextra, a coronaria sinistra) of a juvenile male bottlenose dolphin (*Tursiops truncatus*) found dead on Hvar in 2017.

The heart was removed from the specimen and washed with water to remove blood clots. Both coronary arteries where injected with a mixture of polyurethane and red pigment in order to improve the visibility of the arteries. The heart was preserved in 4% formaldehyd water solution for 24 hours. The coronary arteries were dissected and their position, course and branches were studied.

The major cardiac arteries were distributed in the heart grooves and followed the basic mammalian pattern. They gave off numerous branches that ramified into vessels for the cardiac atria and interventricular septum. Subepicardial vessels and a network of underlying branches supplied the ventricles. All branches were notably sinuous, which is a distinct cardiac characteristic of several whale species. The interventricular paraconal branch of the left coronary artery formed an unusual subepicardial vascular network at the heart apex, whose function remains unknown. Macroscopic interarterial anastomoses were not observed.

The sinuosity of the coronary arteries in the bottlenose dolphin heart increases the blood storage capacity of the heart, which is necessary during diving.They serve as oxygen reservoirs for the myocardium and should be considered as an adaptation for diving.

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