



Influence of gravity on the cardiovascular system of snakes

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Natural selection drives the evolution of the form and function, but many evolutionary pathways are constrained by the biophysical world. Gravity, for example, influences cardiovascular morphology and function in terrestrial vertebrates. Thus, in long-bodied animals, such as snakes where large hydrostatic columns exist, the evolution of the cardiovascular system may have been influenced by organismic features (length of animal), behavior (climbing and non-climbing), and habitat occupied (terrestrial, aquatic). Earlier studies report that the heart of terrestrial and arboreal snakes is located near the head, while the heart of aquatic species is located near the middle of the body. The anterior heart in arboreal species reduces the hydrostatic blood pressure when these animals adopt vertical postures during climbing. Recently Gartner et al. (Physiol Biochem Zool, 2009) analyzed a new data set of 155 species from five major families of snakes, indicating that heart position is influenced both by gravity as well as a strong phylogenetic signal.



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