

Buoyancy control and ventilation in turtles

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All turtles possess dorsal, multichambered lungs, which are separated from the remaining viscera by a post-pulmonary septum (PPS). The PPS shows considerable variation among the different taxa of Testudines, covering the ventral surface of the lungs partly or entirely. The lungs of turtles show considerable variation in the number of chambers present and in the extension of non-respiratory caudo-lateral air sacs. This morphological variation gets further complicated by the presence of muscles in the cranial body cavity of some turtles, possibly playing an important role regulating the distribution of air inside the lungs.

Aquatic and semi-aquatic turtles use their respiratory system not only for gas exchange but also for buoyancy control, being able to adjust lung and bladder volume according to their specific gravity. Breathing frequency has been shown to correlate inversely with lung volume changes, a detailed study of ventilation associated with buoyancy control, however, is lacking.

We summarize what is currently known about the morphology of the respiratory system of turtles, how this relates to buoyancy control and present new data on ventilation of *Trachemys s. elegans* and *Podocnemis unifilis* which had their specific gravity manipulated.

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