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Ecomorphology of the vertebral column: preliminary study

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Ecomorphology is the study of the relationships between functional design and the environment. One of its aims is to understand how the environmental factors can constraint the performance of an organism or act on its phenotype. Different studies have already showed in different cetaceans that the number and shape of vertebrae can reflect the stiffness of the body and consequently can impact their swimming mode. The aim of this preliminary study is to establish relationships between characteristics of the vertebral column of different cetaceans and their ecology. To this purpose, we have studied meristic and morphometric data on the vertebrae (centrum length, height and width, neural and haemal spine height and the transverse process length) in different species of mysticetes and odontocetes coming from the Aquarium-Museum of Liège and Royal Institute of Natural Sciences of Bruxelles. Preliminary results allowed the distinction of two morphotypes. The first one comprises smaller species that are characterized by a high number of vertebral counts, short centra and an important regionalization of the backbone. The second group contains larger species which possess less vertebral counts, longer centra and without a great column regionalization. These differences should be related to different swimming modes and reflect the different ecological behaviours of the studied cetaceans.