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Evaluating these adaptations in taxa whose members vary in cursorial ability often identifies anatomical trends correlated with a 'cursoriality gradient'; this is true of the Lagomorpha, wherein cursoriality is generally high in hares, intermediate in rabbits, and low in pikas. However, the phylogenetic sampling of such investigations has in past been limited to three American species (namely, *Lepus californicus*, *Sylvilagus bachmani*, and *Ochotona princeps*). Here, we expand the phylogenetic sample and body size range by including novel data from Australian samples of the European rabbit (*Oryctolagus cuniculus*) and European hare (*L. europaeus*), alongside unpublished data on the Eastern cottontail (*S. floridanus*). Using X-ray Computed Tomography and digital landmarking to capture appendicular skeletal proportions of ~40 specimens of each European species, we find the previously-identified morphological gradients associated with cursoriality are complicated when evaluated in a larger sample – relative length and joint velocity of limbs was lower than predicted in European rabbits and hares. Additionally, we present a novel assessment of morphological integration in the lagomorph appendicular skeleton, finding between-limb covariation patterns that are generally similar to those of other mammals. Broadly, these results suggest cursoriality is only one of many selective forces driving lagomorph skeletal evolution, potentially alongside body size and fossorial

Title: 33-4: Morphological disparity and integration in the vertebral column of pinnipeds (Mammalia, Carnivora)

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The vertebral column has a very important role in locomotion in aquatic mammals, such as pinnipeds. However, the mode of aquatic locomotion differs between pinniped groups. Otariids generate thrust with their forelimbs (pectoral rowing) while phocids move laterally the pelvic region (pelvic oscillation). Therefore, to explore differences between these groups can provide new clues about the evolution of the land-to-sea transition in pinnipeds. In this study, we explore the disparity and morphological integration of the presacral vertebrae of a set of living and extinct pinnipeds. The results obtained show that vertebral morphological disparity is higher in phocids than in otariids. In addition, disparity through time analyses indicate that, for most vertebrae, otariids subclades tend to explore different regions of the morphospace, whereas phocid lineages overlap within similar regions. Finally, the study of integration between vertebrae in otariids reveals an absence of a modular pattern along the spine, in contrast to the modular pattern found in phocids. These results suggest that adaptation to the aquatic environment in both groups follows two completely different pathways, probably associated with their mode of aquatic locomotion. Future studies on the biomechanics of the pinniped vertebral column may confirm the association of morphology and evolutionary patterns with locomotor performance.