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Morphological adaptations for gut microbiota partitioning in the ant Cephalotes rohweri

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Separating the crop and the midgut of ants there is a complex and beautiful small valve called the proventriculus. This valve regulates the flow of food between the crop or 'social stomach' and the midgut or 'individual stomach', an important division for the regulation of nutrient flow at the colony level. Ants in the genus *Cephalotes* have a proventriculus that exhibits a particularly complex form, the purpose of which is not clearly understood. We experimentally determined that the proventricular valve in the ant *Cephalotes rohweri* functions as a filter, playing a key role in partitioning of the bacterial microbiome between regions of the gut. We discuss the role of microscopic morphological adaptations for separating and maintaining distinct microbial communities within the ant gut, and the importance of the proventriculus as a pump, filter, and potentially also a substrate for symbiotic biofilms.