

**OR154***The compartmentalized microbiota of a herbivore ant gut***Pedro A P Rodrigues**, Michele Lanan, Piotr Lukasik, Jacob A Russel, Diana E Wheeler

Herbivores such as cows and rabbits evolved specialized portions of their gut where symbiotic microorganisms are found. These symbionts contribute to their host nutrition, by either digesting plant tissues (e.g. cellulose) or increasing nitrogen availability (e.g. nitrogen fixation). Such a relationship is not as well investigated in insects, with the exception of termites. *Cephalotes* is a diverse genus of herbivorous ants that harbor a mass of bacteria in a pouch-like sac (ileum) in their hindgut. The specific identity and function of these bacteria is still unknown, as only analyses of whole guts of ants have been done to date. In this study we investigated how symbiotic bacteria are distributed along the digestive tube of the Sonoran Desert turtle ant, *Cephalotes rohweri*. Using next-generation technology, we sampled field collected colonies and sequenced morphologically distinct regions of the gut. We found a clear compartmentalization of the microbiota. Opitutales were found to be the dominant bacteria in the midgut, a compartment markedly less diverse than other parts of the gut such as the crop and hindgut. Phylotypes found in each compartment were also consistent with a functional partitioning of the gut: upper gut bacteria are related to bacteria associated with nitrogen fixation and complex carbohydrate degradation, while hindgut dwellers are related to groups able to use simple carbohydrate and amino acids as sources of energy. *C. rohweri*, as other species in this genus, have an unusual feeding behavior and our future work involving enzymatic assays on the different parts of the gut will shed light on the nutritional role of these microorganisms.