Introduction

Anti-eating, sometimes referred to as Myrmecophagy, refers to a behavior where animals have evolved to gain most, or all of their nutrition through ingesting ants or termites. This is a remarkable behavior that involved the selection for exaggerated traits that aid in acquiring abundant amounts of ants and termites. These morphological characteristics include the following: long, slender tongue to allow penetration, strong claws on forelimbs for digging, and a strong, partially fused pelvic girdle to aid in support of forelimb action (Reiss, 2001).

Myrmecophages exist in multiple Mammalian taxa and is a great example of convergent evolution of homologous characteristics. Some myrmecophages have evolved different morphological characteristics used to acquire ants and termites, however, they co-evolved with the other organisms to be able to digest myrmecophily species. This co-evolution is difficult to adequately trace back and there is still disagreement in phylogenetics in this area. Most myrmecophagidous creatures tend to come from the order Xenarthra or Pholidota (Bedford, 1987). We suspected the phylogeny to show very little relation to extant species with the same diet. We wanted to find the common ancestors with these character traits and map how they came to be.

Methods

- We hypothesized that anti-eating as the sole or main source of nutrition was a trait that had diverged somewhere within Mammals, perhaps where certain morphological characteristics that would be advantageous to Myrmecophagy were seen developing.
- Two genes (12S and RAG2) were selected for analysis because they were found in a variety of mammalian taxa, including those of known Myrmecophages.
- FASTA data sets were made from common taxa (34 in total) in the selected genes using NCBI nucleotide database.
- FASTA data sets were uploaded to OneClick analysis on the phylogeny.fr website to compose individual trees of both genes, as well as a combined tree.
- Analysis of the various characteristics for ingesting ranges greatly, such as in the case of the tarsier. Although not fully myrmecophagous, the tarsier is known to ingest many ants, termites and other insects. On the more parsimonious tree in Figure 3, you can see that it is closely related to the lemur but not very closely related to other ant-eating mammals. Its methods of acquiring ants and termites is much different and involves scooping with a finger rather than an overly long, and slender tongue.
- Convergent evolution among mammals takes place creating homologous structures in many different families, having the ability to ingest organisms so numerous such as ants and termites often gives rise to traits favorable in acquisition and ingestion across multiple different taxa.

Results

Myrmecophagous species are found in different orders of Mammals with larger ratios of species being found in orders Xenarthra and Pholidota. However, many species among the Mammalian orders maintain partial or full Myrmecophagous creatures in their ranks, however, as the phylodynamics suggest, certain traits were only selected for after multiple ancestral lineages and only a few of the species are monophyletic.

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Conclusion

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References