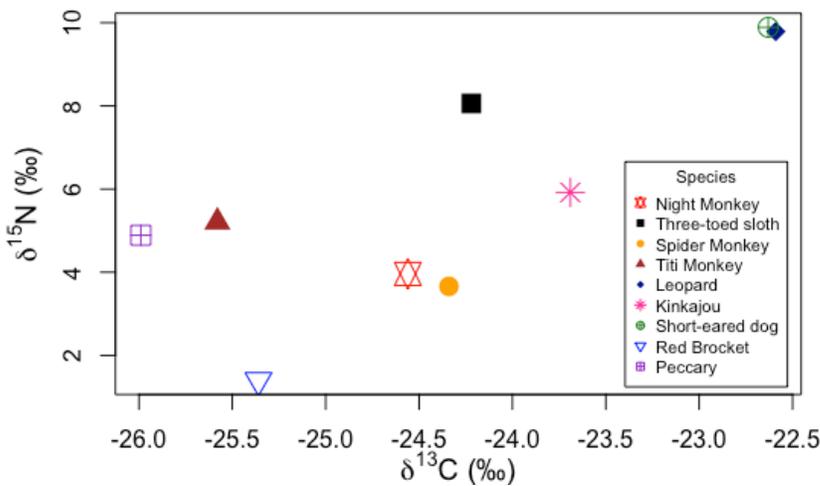


NICHES (Nitrogen Isotopes Characterizing Habitats of Eutherian Species)

Research Question: How are mammals partitioning their niches in the Amazonian basin?

Methods: Stable isotope analysis of $\delta^{13}\text{C}$, $\delta^{15}\text{N}$, and $\delta^{34}\text{S}$ extracted from hair, spines, and fur is a useful tool for reconstructions of diet and trophic levels among different taxa endemic to the Amazon Rainforest and Utah. 16 samples of mammalian hair, spines, and fur representing nine species were analyzed to assess $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values. $\delta^{13}\text{C}$, $\delta^{15}\text{N}$, and $\delta^{34}\text{S}$ values of eight mammalian hair samples representing four separate species were analyzed.

Amazon Mammals



Conclusions: All mammals fall within the range typical of a C_3 diet ($\delta^{13}\text{C}$ -33‰ to -23‰, average -27‰ to -26‰). Together, $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ values indicate that mammals appear to be differentiated into three general diet-based niches: tertiary consumers (predators/carnivores), primary consumers (herbivores), and omnivores (Figure 1). Three-toed sloths are known to feed on leaves of *Cecropia* which is a plant with enriched values of $\delta^{15}\text{N}$ (5.9‰) related to high values in soil in tropical vs. temperate forests (Martinelli *et al.* 1999). Enrichment factor for $\delta^{15}\text{N}$ from diet to hair in mammals can be as high as 3.6‰ (Sponheimer *et al.*, 2003). Night monkeys exhibited a broad range of $\delta^{15}\text{N}$ values (2.6‰ to 5.8‰). Perhaps nocturnal foragers have an advantage over that of diurnal foragers, exhibiting an increase to protein access obtained from invertebrates (e.g. moths, spiders).

Sulfur values were highly variable, with a spread 10‰ for Leopards and Short-eared dogs. Perhaps these values indicate that these mammals are feeding on plants growing in isotopically distinct areas and serve as a proxy for locality. Sulfur gradients in the Amazon Basin are unknown. The Amazon River is very $\delta^{34}\text{S}$ enriched, perhaps due to the anoxic conditions of the sediments. Furthermore, it is possible that Amazonian tributaries pass through salt domes that enrich the river water with sulfur. At this time we cannot definitely state the cause of the sulfur values of these mammals without a baseline sulfur gradient, and is a potentially enriching avenue for future research.

