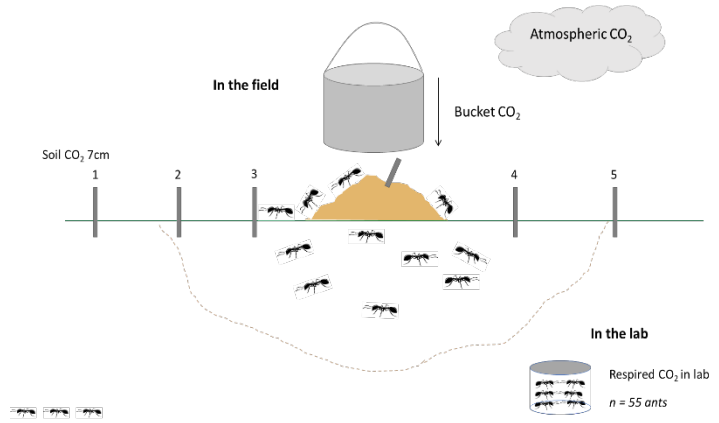


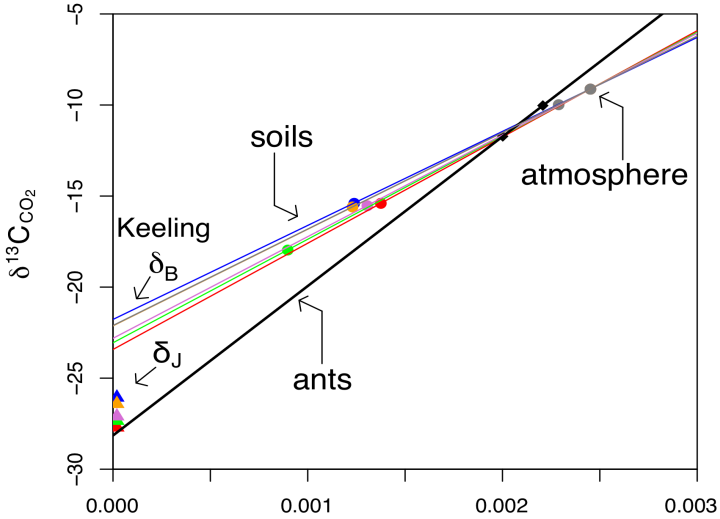
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Gathering Arthropod Soil Signatures on Yonder Anthill Nests To Highlights Isotopic Levels Leaving Soils

Project Overview.
 Team *Gassy Anthills* was interested in seeing how $\delta^{13}\text{C}$ of soil CO_2 changed with increasing distance from an anthill housing Western Harvester Ants (*Pogonomyrmex occidentalis*). We extracted soil CO_2 using gas wells and flasks and measured the $\delta^{13}\text{C}$ of respired CO_2 of the ants. Our hypothesis was that the influence $\delta^{13}\text{C}$ of ant respiration on the overall soil $\delta^{13}\text{C}$ will decrease with distance from the ant hill.



Results and Discussion



CO_2 respired from ants had a $\delta^{13}\text{C}$ of -28.2 . The $\delta^{13}\text{C}$ of soil CO_2 was similar to the ant's respiration, ranging from -26.1 to -27.7 with no discernable pattern with distance from the anthill. These results show the $\delta^{13}\text{C}$ of respired CO_2 for the ants, the colony, and the nearby soil are highly related and are not distinct. This similarity may relate to uncertainty in size of the colony (which can be $>5\text{m}$), and the similar isotopic composition of carbon substrates used in animal and soil respiration.

Ants were enriched in $\delta^{15}\text{N}$ relative to potential food source near their colony. Based on $\delta^{15}\text{N}$ of nearby plants and an assumed trophic enrichment factor of $\sim 4\text{‰}$, *P. occidentalis* is closest to $\delta^{15}\text{N}$ of rabbitbrush (*Chrysothamnus* sp.), but the high $\delta^{15}\text{N}$ of the ants ($\sim 9.5\text{‰}$) suggest other food sources. Alternatively, the ants may be nitrogen limited and experiencing high rates of protein catabolism, which could drive ^{15}N enrichment. Also, their colony is enriched relative to nearby soils, indicative ant excreta with a lower $\delta^{15}\text{N}$ than the ant tissues.

