**FUNGAL CULTIVARS OF LEAF-CUTTER ATTINI ANTS BACKLOG SUGARS IN PLACE OF MICROBIAL BIOMASS**

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Abstract:

Fungus gardens are microbial communities dominated by leucocoprineaceus fungi symbionts with Attini ants. The symbiosis has been divided into three major groups: lower agriculture, higher agriculture with cultivars derived from the lower attine fungi, and the ecologically dominant leaf-cutter agriculture, a subdivision of higher agriculture with cultivars of *Leucoagaricus gongylophorus*. Despite the advances in other areas of symbiosis biology, major features of fungus garden ecology remain unknown. To address this problem, we analyzed respiration rates (r), microbial biomass (X), specific growth rates (μ) and backlog of enzymatic products (P) by fungus gardens of three representative attine agricultures. 60 fungus gardens between 1 and 2 years old from the lower agriculture cultivars of *Mycetarotes* sp. symbiont, high agriculture cultivar of *Trachymyrmex fuscus* symbiont, and leaf-cutter agriculture cultivars of *Acromyrmex landolti* and *Atta bisphaerica* symbionts were collected from Rio Claro, São Paulo state, Brazil, between February and June 2010 and immediately sampled and incubated into biometers at 25ºC by 15h for measurement of r. X and μ were determined respectively by SIR (Anderson and Domsch 1978, *Arch Microbiol* 93:113-127) and incorporation of [14C]glucose on gardens without ant biomass. P was determined by extraction of soluble reducing sugars from gardens incubated without ants. Gardens with ants were employed as controls. All gardens apparently were in steady-state and responded to winter (June) with reduction of μ and r, but without effects on P. *Mycetarotes* sp. symbiont cultivars showed greater X (148.26±10.27mg/g dry wt garden) and lesser μ (0.14±0.02/day) and r (0.20±0.04mg CO2/mg microbial dry wt) than higher agricultures, while leaf-cutter gardens showed the greatest P (mean of 143.43±54.89 mg reducing sugar/g dry wt garden). Fungus gardens from higher agriculture showed greater μ than leaf-cutter gardens, but this difference canceled during winter. The results suggest that cultivars of leaf-cutting ants have higher turnover rates than cultivars of lower agricultures and evolved for the backlog of soluble reducing sugars in place of biomass. Support: CAPES Reference: ANDERSON, J.P.E.; DOMSCH, K.H. Quantification of bacterial and fungal contributions to soil respiration. *Archives of Microbiology, v. 93, p. 113-127. 1973.*

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