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Termites in Cow Pies: A Study of Symbiosis

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Termites are a complex group of social insects, which have been associated mainly with damage, however less than 10% of the species are actually pests. The hind gut of lower termites contains a high concentration of flagellated protozoa mixed in with bacteria, archaebacteria and fungi (primarily yeast). The termite hindgut and its symbionts form a microaerophilic ecosystem. A unique characteristic of the symbiotic protozoa is their ability to synthesize a group of enzymes (cellulases) which catalyze the digestion of cellulose. Although small amounts of cellulases are produced by the termite gut, the termites are highly dependent on the protozoa for the production of large enough quantities of the products of this digestion to sustain the termites. The end products of this digestion are used as nutrients by the termite as well as the other micoroganisms in the gut. Termites will be collected from cow dung (cow pies) imported from Western Nebraska. Wet mount squashes of the hind gut of the termites will be examined to identify the protozoa and the other symbionts living in the gut. An open ended discussion will follow the lab exercise focusing on the finer points of the termite-microorganism relationship. This lab exercise was initially used in a majors biology course taught at our field station. Variations of the exercise have been used in both majors and non-majors introductory biology courses on campus;employing both traditional and directed investigative approaches.

Mission, Review Process & Disclaimer

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