

Differential Calorimetry of Natural Microbial Communities

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A differential calorimeter has been constructed for measuring the heat output of natural microbial communities. Natural biological communities involve relatively large numbers of species with correspondingly diverse metabolic schemes. Monitoring all activity in such communities can be difficult. All metabolic pathways evolve a significant amount of heat; thus, calorimetry is a valid method for examination of complex biological communities. A prototype calorimeter has been constructed, consisting of two matched sample cells, of approximately 20 mL capacity and with temperature monitored by thermistors, in an insulated enclosure surrounded by a water thermostat. The calorimeter follows the thermal activity of a natural bacterial community with excellent resolution and minimal incubation time. It is hoped that this design will be the basis of a new generation of portable calorimeters capable of monitoring biological activity at remote sites.