

An outstanding paper describing plant adaptation in an ecosystem context appears in *Ecology*, Vol. 64, No. 2, 1983, pp. 307-318. S.J. McNaughton and colleagues discuss their research on *Kyllinga* in a semi-arid location, Serengeti region, Tanzania. Doug Houston, who called the paper to our attention, terms it "a splendid example of using lab studies in support of extensive field work."

The principal objectives were (1) to evaluate the importance of interaction among environmental factors as regulators of plant growth and yield, and (2) to determine how adaptations of a native forage plant might regulate primary production and energy flow in a natural grassland ecosystem. (Nitrogen, water, and defoliation intensity were chosen as environmental variables.)

It was found that "(1) factor interaction, in the statistical sense, was less important to the performance of *Kyllinga* than was the multifactoral nature of environmental regulation . . . (2) principal adaptations of *Kyllinga* to the severe grazing that it experiences in nature and that characterized this experiment were an ability to sustain active leaf tissue by a proliferation of active meristems, more rapid rates of leaf growth in defoliated plants, and a reduced rate of leaf senescence in the defoliated plants. It was also capable of maintaining a constant allocation of biomass to various organs, largely independent of environmental control."

In summation, the authors state: "We believe the result of this experiment that is most important for understanding ecosystem organization in grasslands where herbivory is intense and involves a long coexistence with native plants and animals, is that the trophic web based on grazing may be sustained with no net loss to the plant. That is, destroying the animal fauna of the Serengeti would not result in

greater residual plant biomass in regions where plants like *Kyllinga* dominate the foliage layer. Rather, it would result in a net diminution of total energy and nutrient flow through the system. Plants capable of compensating for herbage removal may support a dense and complex trophic web with no cost to themselves. In fact, such a web is likely essential to their existence."

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