

on urine patches in ungrazed prairie grassland. However, the abundance of the grass *Andropogon gerardii*, and all grasses combined, decreased on urine patches in grazed prairie. The changed dynamics reflect the fact that bison preferentially graze on urine patches. In addition, grazed areas initiated on urine patches tend to expand well beyond the area of urine deposition, increasing the size and severity of disturbance by grazing.

Finally, just as we can readily see how community dynamics may vary according to the order in which colonizing species happen to appear after a disturbance, it is equally the case that the order in which different kinds of disturbance occur may affect the outcome. Fukami (2001) addressed this issue by introducing two classes of disturbance (drought or the addition of predatory mosquito larvae) in various sequences to laboratory microcosms of protists and small metazoans (analogous to natural communities in water-filled bamboo stumps). Different disturbance sequences drove the microcosms into different successional trajectories, sometimes leading to divergence in final community composition (both in terms of species richness and relative abundance of the component species). This is illustrated graphically by ordination diagrams (see Section 16.3.2) that show the sequence of positions of communities in the same ordination space through experiments where disturbances were imposed in different sequences (Figure 16.22). It may often be the case that a knowledge of the disturbance history will be needed to predict the responses of communities to disturbances imposed in the future (such as global climate change).

... may interact to determine community patterns

Summary

The community is an assemblage of species populations that occur together in space and time. Community ecology seeks to understand the manner in which groupings of species are distributed in nature, and how they are influenced by their abiotic environment and by species interactions.

We begin by explaining how the structure of communities can be measured and described, in terms of species composition, species richness, diversity, equitability (evenness) and rank-abundance diagrams.

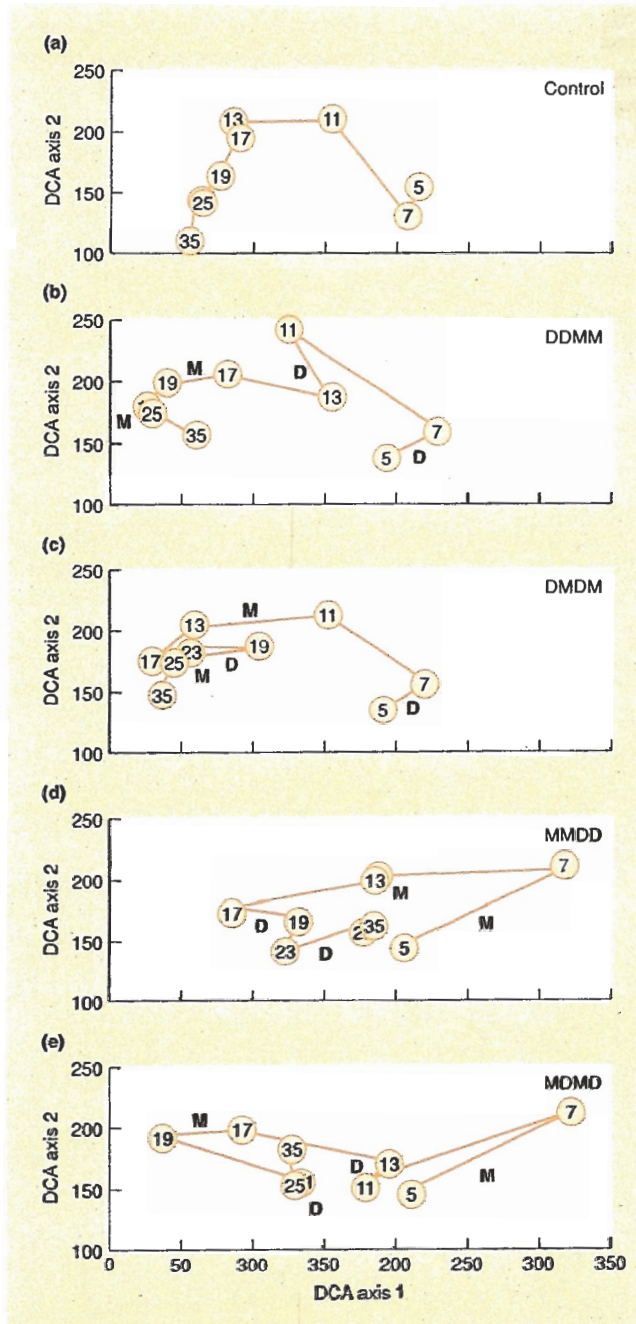


Figure 16.22 (left) Temporal changes in species composition and relative abundance of microcosms composed of a specific mix of protists and metazoans. The change is expressed in ordination plots based on a procedure called detrended correspondence analysis (DCA). (Recall that ordination is a mathematical treatment that allows communities to be organized on a graph so that those that are most similar in species composition and relative abundance appear closest together, whilst communities that differ greatly in the relative importance of a similar set of species, or that possess quite different species, appear far apart.) Data points are the mean ordination scores on different days in the experiment (from day 5 to day 35). The letter D indicates periods of drought disturbance, and the letter M, mosquito disturbance. (a–e) The results of the control and disturbances imposed in different sequences. (After Fukami, 2001.)