Oecologia
DOI 10.1007/s00442-011-2140-8

COMMUNITY ECOLOGY - METHODS PAPER

Disturbance and diversity at two spatial scales

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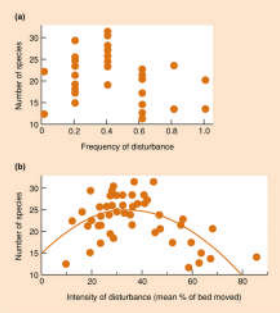
- **Intermediate Disturbance Hypothesis** (IDH) – diversity should be maximized at intermediate levels of disturbance (Ch. 14).
  - Too frequent or intense = not enough species can tolerate conditions
  - Too infrequent or stable = competitive exclusion by a small number of species

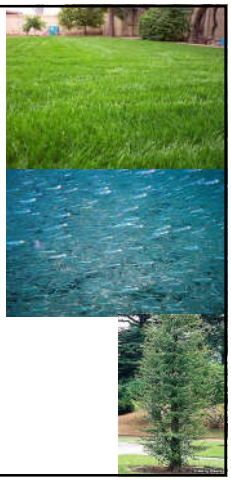


Key points

- Evolution: natural selection, modern synthesis, polymorphism, plasticity, population, community
- Gradients and patchiness of the environment
- Niche theory, optima, fitness, Gauss's principle, predictions regarding coexistence, niche metrics (d and w), generalist-specialist, guilds, Hutchisonian ratios, limiting similarity, paradox of the plankton (scale)
- Clemntsion, Hutchisonian and Null predictions of community structure and biodiversity. Measures of diversity (α,β and γ), equitability, similarity indices
- Explaining patterns in diversity. Global (Null model, habitat stability, energetics, time and area, rates of diversification). Local (species area relationships, equilibrium theory, colonization, extinction, saturation, link back to niche theory)
- Community emergent properties and their relationship with diversity. Stability: Resistance, resistance, biomass and productivity relationships with diversity. Stability and connectivity - predictions of models. Niche Complementarity, portfolio effect, link back to niche theory.
- Limberger and Wickham – disturbance, colonization and extinction at different scales.

Life history

- Unitary vs modular organisms
- What do you measure?
  - Genet
  - Ramet
  - module
  - Individual
- Life cycles
  - Deterministic
  - Iteroparous
  - Semelparous



How do you count individuals?

- Modular species – count modules, measure biomass…
- Sessile unitary organism – individuals per unit area, sampling bias…
- Mobile unitary organism – mark, release, recapture (resight)
  - Assumptions
    - No change in the ratio of marked/unmarked (mortality, recruitment, movement)
    - No sampling bias
    - Marked individuals distribute themselves randomly

$$N_c = \frac{(M+1)(n+1)}{R+1} - 1$$

- Where M=# marked, n=total in second sample, R=recapture