

Landscape mediation of insect biodiversity patterns and processes

Teja Tscharntke

Agroecology, Georg-August University Göttingen, Germany

Understanding local biodiversity patterns and processes under global environmental change needs a landscape perspective. In this review, we suggest seven hypotheses (and a few sub-hypotheses) to encourage more systematic research efforts on the role of landscape composition and configuration in determining ecological communities and ecosystem functioning and services.

(1) *The dominance of beta diversity hypothesis*: dissimilarity of local communities determines landscape-wide biodiversity much more than the fragmentation level of habitat.

(2) *The intermediate landscape complexity hypothesis*: effectiveness of conservation management is highest in structurally simple, not cleared (extremely simplified) or complex, landscapes.

(3) *The landscape species pool hypothesis*: local biodiversity is largely influenced by the landscape-wide species pool.

(4) *The landscape-mediated insurance hypothesis*: structurally complex landscapes provide spatio-temporal insurance, i.e. higher resilience and stability of patterns and processes in changing environments.

(5) *The across-habitat spillover hypothesis*: spillover across habitats, including managed systems and natural habitat, contributes to landscape-wide community structure and associated processes.

(6) *The landscape-mediated concentration and dilution hypothesis*: spatio-temporal changes in landscape composition can cause transient concentration or dilution of populations.

(7) *The landscape-mediated trait and functional-group selection hypothesis*: landscape structure drives the selection of particular species traits and functional groups.

Broadening the view from local to landscape-mediated effects will help generate solutions for future biodiversity and ecosystem service management.