Charles Darwin (1975) described the study of geographic ranges as ‘a grand game of chess with the world for a board’. The game is not a simple one. The pieces (the species) occupy different numbers of squares on the board at different times, they appear and then disappear, and many species may occupy the same square at the same time. Moreover, we can only gain glimpses of the past moves. The pattern of moves has resulted in the patterns of biodiversity that we observe today (Gaston 1998).

The appearing of species (speciation) and their evolution is studied in evolutionary biology. However, the species composition of ecological communities that we observe today is also dependent on disappearance (extinction), which can be affected by evolved traits. When several trait values would be close to optimal in an optimization model, you expect to find more species with trait values that also promote long-term survival in a stochastic environment. This type of group-selection arguments form an interesting extension of evolutionary biology, with implications for comparative work (Orzack 2003). The rapid loss of populations from many regions represents an opportunity to illuminate patterns of species extinction susceptibility and their consequences for ecosystem function and human well-being and perhaps to slow the decay of biodiversity in the future (Daily and Ehrlich 1996).

All of the above is taking place in an ecological context, in other words species are not independent, but interact with each other at different levels. Despite extreme geographical variation in species composition, some similarities in patterns of biodiversity can be found in similar habitats on different continents. This indicates that ecological processes have substantial effects on patterns of biodiversity. However, it is still poorly understood to what extent and how biotic interactions determine community patterns. All these aspects come together in biodiversity research (e.g. Goldberg et al. 2005; Orme et al. 2005; Ostling 2005; Storch et al. 2005).