Temporal dynamics of orchid communities in Corsica: a study using a Bayesian multispecies site-occupancy model

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Abstract: Monitoring programs are requested to describe population dynamics in order to evaluate biodiversity changes and elaborate relevant conservation strategies. However, imperfect detection can lead to biased estimates of population abundance. Detectability can be affected by factors, such as species traits (e.g. life-state), observer or environmental context. Using a Bayesian multispecies site-occupancy model, we aimed to (i) test effects of covariates on detection probability of orchids and (ii) describe orchid dynamics in Corsica in evaluating impacts of vegetation cover change on species occurrence. We compared the occurrence of 43 orchid species at 62 locations in Corsica between two periods 1982–1984 and 2009–2011. Data were collected by the same observer during these two sampling periods applying the same protocol of species inventories. Our study showed that detection probability differed between orchid species. Population density affects significantly detectability of orchids. Concerning dynamics, no significant difference in occupancy probability was evidenced at community level between both periods. However, survival probability differed between species, with the highest value found for *Serapias lingua* and the lowest for *Dactylorhiza insularis*. In response to vegetation cover increase, *D. insularis* and *D. saccifera* were significantly and negatively affected. We concluded that the use of site-occupancy models is an appropriate way to analyze temporal dynamics of orchids and to investigate ecological processes underlying these dynamics.