**RESULTS**

[SOME DESCRIPTIVE STATISTICS OF THE DATA]

[MCMC CONVERGENCE]. The MCMC convergence of the HMSC models was satisfactory: the potential scale reduction factors for the -parameters (that measure the responses of the species to environmental covariates; Ovaskainen et al. 2017 ELE) were on average 1.02 (maximum 1.07) for the presence-absence model and 1.06 (maximum 1.12) for the abundance COP model (see Supporting Information for details).

[MODEL FIT]. The presence-absence model showed a good fit to the data, the mean Tjur R2 (AUC) being on average 0.35 (0.87) for explanatory power and 0.28 (0.84) for the predictive power. The abundance COP model showed satisfactory model fit, the mean R2 being 0.45 for explanatory power and 0.27 predictive power.

[WHAT EXPLAINS VARIATION]. Variance partitioning over the explanatory variables included in the models showed that none of the fixed effects explained a substantial amount of variation in the presence-absence model (Fig. 1A), whereas the survey time explained 13.5% of all variation in the abundance COP model (Fig. 1B). Accounting only for responses that were positive or negative with at least 95% posterior probability, in the presence-absence model 40% of the species showed a negative response and 5% of the species showed a positive response to altitude (Figure 2A). Survey time influenced only a minority of the species: 10% of the species had a higher occurrence probability in the old survey time than in the new survey time, whereas 5% of the species showed the opposite pattern (Fig. 2A). This result is in great contrast with that of the abundance COP model, in which 90% of the species showed higher abundance in the old survey period than the new survey period. Thus, while species richness depended only little on survey time, species abundances showed a major decline between the study periods.

[PHYLOGENETIC SIGNAL]. The species responses to environmental covariates showed a moderate phylogenetic signal in the presence absence model () and a very strong signal in the abundance COP model (). This reflects the result that the abundances COP declined especially strongly over the study period in some particular genera, such as xxx and zzz (see Supporting Information for details).

**Figure 1.** Variance partitioning among the explanatory variables included in the models. Panel A shows the results for the presence-absence model and panel B for the abundance COP model. In both panels, the heights of the bares correspond to the explanatory power achieved for each species, measured by Tjur R2 for the presence-absence and R2 for the abundance COP model. The species have been ordered according to decreasing explanatory power. The legends give the mean variance proportions averaged over the species.

**Figure 2.** The responses of the species to environmental covariates. Panel A shows the results for the presence-absence model and panel B for the abundance COP model. In both panels, responses that are positive with at least 95% posterior probability are shown by red, responses that are negative with at least 95% posterior probability are shown by blue, and responses that did not gain strong statistical support are shown by white. The species are ordered according to their phylogeny as illustrated by the phylogenetic tree shown in the panels.