ORAL PRESENTATION

METACOMMUNITY DYNAMICS OF LAKE DIATOMS IN TROPICAL SOUTH AMERICA

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Patterns that maintain and generate biodiversity of macro-organisms in the Neotropics are widely discussed in the scientific literature, yet the spatial ecology of microorganisms is largely unknown. The tropical Andes and adjacent Amazon lowlands span a wide gradient of climatic, topographic, and aquatic habitat conditions that present an opportunity to test biogeographic and metacommunity concepts for exploring drivers on diatom diversity and community assembly processes at different spatial scales. We assembled a database of 200 lakes with associated predictors that describe local (limnological) and regional (geo-climatic) environmental gradients to examine diatom metacommunity patterns at two different levels: taxon and functional (deconstructed species matrix by ecological guilds). We also derived spatial variables that simultaneously assessed the relative role of overland and topographic distances as proxies of dispersal limitation. We used complementary multivariate statistical techniques to analyze i) regionalization of lakes (Principal Component Analysis, cluster analysis and non-metric multidimensional scaling), and ii) diatom metacommunity structuring (variance partitioning). Lakes were grouped according to geo-climatic variability and landscape configuration. Six clusters were identified as functional metacommunity units for diatom communities arranged along a latitudinal gradient. Both diatom species composition and guilds differed sharply among lake clusters. Variance partitioning revealed that different latitudinal patterns emerged when analyzing diatom species and guilds separately. Latitudinal differences in environmental and spatial influences on species composition were not detected in the analysis of all taxa together, whereas spatial influences showed decreased importance with increasing latitude in guilds with lower dispersal abilities. Topographic heterogeneity played an important role in structuring diatom metacommunities, particularly in guilds with high dispersal abilities. However, diatom metacommunity structure was highly context-dependent in certain lake clusters of the Andean Altiplano, with no clear relationships among spatial extent, environmental heterogeneity, and dispersal ability. Our results indicate that a combination of environmental and landscape variables influence diatom metacommunity structure in lakes of tropical Andes and adjacent lowlands. In these physically dominated lake clusters, diatoms showed biogeographic patterns driven by spatial variables, whereas environmental factors were likely to be less important. We emphasize the value of both

taxon and functional approaches for elucidating patterns of spatial ecology in aquatic microorganisms.