

O34-5 The spatial structure of tropical trees: A spatial and phylogenetically explicit approach

Wednesday, 26 June 2013: 17:10

Americas B-C (Herradura San Jose)

Valeria Forni Martins , Ciências da Natureza, Matemática e Educação, UFSCar, Brazil

Guilherme Dubal dos Santos Seger , Programa de Pós-Graduação em Ecologia, UFRGS, Brazil

Leandro da Silva Duarte , Ecology, UFRGS, Brazil

Thorsten Wiegand , Ecological Modelling, Helmholtz Centre for Environmental Research, Germany

Flavio Antonio Maes dos Santos , Plant Biology, UNICAMP, Brazil

The spatial structure of trees can be affected by population size, reproductive system, dispersal mechanism, height of individuals and wood density. Our goal was to determine the contribution of each factor to the spatial structure of trees in 14 1-ha plots of the Atlantic Rainforest in Southeast Brazil. We used the pair-correlation function to quantify neighborhood density, and the Poisson process null model to determine the number and size of clusters for each species (response variables). Because factors affecting spatial structure may be phylogenetically constrained, we also incorporated phylogenetic distances as a predictor variable in our models. By doing this, we were able to evaluate the contribution of the set of predictor variables constrained by phylogeny, the pure effects of phylogeny and the influence of each predictor variable individually on the response variables. Overall, the spatial structure was mainly explained by unconstrained variables, followed by phylogeny and then by the set of predictor variables. The predictor variables that individually contributed more to the spatial structure were dispersal mechanism and maximum species height: bird-dispersed species showed the highest aggregation among animal-dispersed species, and shorter species were more aggregated than taller ones. Variables unconstrained by phylogeny that were not included in the models seem to play a great role in the spatial structuring of trees. These variables may be related to habitat physical structure and post-dispersal interactions. Among the predictor variables explored, only characteristics related to seed dispersal contribute to the spatial structure, which shows the importance of this process to plant demography in tropical forests. This study is the first to unveil the contribution of a set of factors to the spatial structure of tropical trees. Future efforts should aim at determining how habitat structure and interactions shape the distribution of trees as to achieve a better understanding of community organization.