

## **sDiv working group meeting summary**

### **“sANDES - Tree Diversity, Composition and Carbon Storage in Andean Tropical Montane Forests”**

The focal areas of discussion of the first sANDES working group were: i) theoretical framework and main hypothesis to be addressed related to the identification of biogeographical units across the Andes, and statistical methods commonly used for biotic regionalization; and ii) ecological and evolutionary processes shaping plant diversity and composition across the Andes, and statistical methods to separate the latitudinal and altitudinal effects on plant diversity and composition. For the first discussion topic, we agreed on to: 1) identify bioregions with the highest plant diversity and endemism; 2) investigate the origin of tropical montane forest plant taxa; 3) quantify phylogenetic diversity within and among bioregions; and 4) explore correlation between taxonomic and phylogenetic diversity. To achieve these goals, we aim to use hierarchical clustering and multivariate analysis (e.g. DCA) to relate clusters with environmental predictors and project these clusters back onto space. We will use the sANDES plot data plus all available DRYFLOR Andean plots (<http://www.dryflor.info/>). In addition, we intend to explore the use of GBIF data for a complementary approach to bioregionalization using infoMap (<http://bioregions.mapequation.org/>). For the second topic, we defined the following research questions: 1) What is the relative contribution of latitude and elevation to species turnover?; 2) What is the effect of seasonality on species turnover along the elevational gradient? To address these questions, we planned to use Mantel tests and partition of variance on a particular selection (8-10) of elevational transects spread across the Andes, as well as CHELSA climate data (<http://chelsa-climate.org/>).

Besides brief presentations by the working group members, we had four 45 minutes long presentations about topics related to the research questions to be addressed by this working group. The first one was about scientific collaborations investigating plant diversity, dynamics, and climate change in the Andes, by Selene Báez (Escuela Nacional Politécnica del Ecuador, Ecuador). The second presentation, by Jens Mutke (Nees-Institut für Biodiversität der Pflanzen, Germany), was about mesoscale patterns of plant diversity in Andean South America. A third presentation, by Christine Bacon (University of Gothenburg, Sweden), addressed macroevolutionary patterns and Andean diversity. Finally, Hanna Tuomisto (University of Turku, Finland) provided an excellent review on the different definitions and methods to estimate beta diversity. In addition, two people from the iDiv provided brief talks -not initially planned- about the sPlot initiative (Francesco M. Sabatini), and new methods to conduct biotic

regionalization (Alexander Zizka), respectively. The PI was also invited to give a seminar open to the iDiv Center about the topic of the project.

Out of the discussion, we outlined two draft proposals (target journal yet to be defined), identified methodological procedures to address the research questions, and defined the data needed, the expected results and the timeline for making progress on manuscripts before the next meeting. We also planned to release a new version of the R package 'Taxonstand' including automatic procedures for plant names standardization based on the Leipzig System, in collaboration with Alessandro Gentile (iDiv).

There was a good balance between work on outputs (ca. 30%), general brainstorming/information exchange (45%) and participant presentations (25%). The meeting was truly inspiring and motivating, and it was the intention of some of the working group participants (including the PIs) to apply for further funding to different European and non-European funding agencies in order to foster collaboration and research on related topics to those addressed in this proposal. The general atmosphere at the sDiv center was superb and the sDiv staff provided continuous support and assistance during all the meeting. We found the entire experience really enjoyable and productive.

At present, we are preparing and curating the datasets to address the different goals and are planning some scientific exchange between some of the working group members to work on some particular objectives. In addition, some of the members of this working group (Selene Baez, Jonathan Myers) are leading another working group on Andean diversity funded by the Living Earth Collaborative (<https://livingearthcollaborative.wustl.edu/>), and some of us will meet in St. Louis (USA) in September this year.