healthy leaves collected from a total of 50 seedlings of *A. africana* from three naturally growing populations in Southwestern Nigeria. The extracted DNA were tested using different microsatellite markers. The amplified products were visualized in a 3% super fine resolution agarose gel and photographed for further analysis. The microsatellite markers were applied on duplicate samples from each individual tested, and only the clear, unambiguous and reproducible bands amplified in both cases were considered for scoring the data to get a binary data matrix. The number of polymorphic and monomorphic amplification products was determined for each primer and all the individuals. Cluster analysis was used to generate a Principal component analysis (PCA) and dendrogram showing relatedness/diversity in the samples using R studio. A total of 28 potential microsatellite loci were tested for amplification and polymorphism, and 8 successfully amplified. Result obtained was used to compare the efficiency of primers and to estimate the overall utility of each marker system. Level of similarity among individuals was established as a percentage of polymorphic bands. The 8 microsatellite loci can be used for further genetic studies of *A. africana*, to determine its conservation status.

Variation in early characters for genetic improvement of *Virola surinamensis* (Rol. Rottb ex.) Warb. (Myristicaceae), a multipurpose tree species of Amazonian floodplains

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Classified as endangered due to its intense logging, Virola surinamensis has high silvicultural commercial value due to its diversity of products (bark, fruit, seeds, wood, etc.). The use of phenotypic characters for early selection is an important improvement tool, due to the ease of obtaining data to be evaluated. Seeds and seedlings of 95 mother-trees were sampled throughout Brazilian Amazon. We measured length (L, mm) and width (W, mm) of seeds; diameter of neck height (DNH, mm), total height (HT, cm), epicotyl height (EHT, cm) and hypocotyl height (HHT) from seedlings at six months aged. We used the completely randomized design in "y = u + g + e" model, by maximum likelihood restricted and selection for best unbiased linear prediction methods (REML/BLUP), in a joint analysis for the characters evaluated. The likelihood ratio test (LRT, α (1%) = 6.63) showed that the analyzed characters can be used for the selection, since they present high variation among the matrices, either for seeds (LRTL = 1988,57; LRTW = 1615.28) and for seedlings (LRTHT = 1050.37, LRTDNH = 162.67, LRTEHT = 1341.49, LRTHHT = 1037.04). Early vegetative traits in this case will not only help to anticipate the selection processes of the best genetic material before going to the field, but also to anticipate stages of cycle production and reduce implementation costs in long term.

Flowering and fruiting patterns, seed characteristics and germination of indigenous forest trees in Mount Makiling Forest Reserve, Philippines: implications to sustainable germplasm conservation

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Genetic resources of a country are important assets. Their conservation must be established and is fundamental to the sustainable and productive management of the forest ecosystem in which they occur. This presentation summarizes our recent three-year observation on flowering and fruiting patterns, seed calendar, seed characteristics, including dormancy and germination, seed technology and other activities on germplasm conservation of indigenous forest trees in Mount Makiling Forest Reserve in Luzon, Philippines. MMFR is a protected and key biodiversity area, with an extremely high biodiversity conservation priority, and one of the country's key ecotourism sites. The number of candidate mother trees varied widely across target species. Of 29 species, with a total of 312 candidate mother trees selected and geo-tagged, 17 species showed widely varied phenological patterns across mother trees within and among species. There are general trends observed for flowering and fruiting, to wit: synchronous flowering and fruiting among mother trees within species at defined periods annually; asynchronous flowering among mother trees within species or at irregular intervals within species during the observation period, and the rest have not flowered within the period. This resulted to varied periodicity and intensity of seed fall within and among species. Significant number of species had short seed dormancy and produced less fruits, making seed availability for seed technology and seedling production activities for *in situ* and *ex situ* conservation a crucial concern. Flowering, fruiting and seed fall patterns, dormancy, and other seed characteristics, therefore, should be well-understood in order to achieve sustainable germplasm conservation.

Application of artificial neural networks for ecological niches modelling in *Araucaria angustifolia* and *Ilex paraguariensis*

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Nowadays, discussions about the conservation of natural populations around the world is focused on the risks of global climate change. In trees, adaptive selection processes occur slower than the actual pace of climatic changes. So cold-adapted species such as *Araucaria angustifolia* and *Ilex paraguariensis* may suffer a range reduction and even extinction of entire populations in some regions. In the context of the adaptation of climate change, an interesting strategy regarding breeding and genetic conservation programs is developing to select genotypes potentially able to cope with future climate change. Ecological Niche Modelling (ENM) methods are helpful to identify geographic regions where species grow better. Artificial Neural Network is an ENM method that results in niche models with high accuracy and efficiency. This study used the Artificial Neural Network to model regions where *A. angustifolia* and *I. paraguariensis* might grow better, considering the present and future climate scenarios. Two phenotypic variables (total height and diameter at breast height) measured in trees from six natural locations and several climate and edaphic data were used for the ANNs. These were constructed using the technique Multilayer Perceptron, in software R, where the number of neurons and layers were tested. We presented the best ANN architecture for each species, based on different accuracy metrics, and discuss differences between current and future range based on ANNs models. We, then, will discuss how these results would be applied in specific conservation and breeding strategies.