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Floral evolution and Bee avoidance in *Mutisia* L.f. (Mutisieae, Asteraceae)

June 21
12:00 PM
Session 5

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The morphological variation of floral traits were selected for fitting different types of interactions, such as pollinator attraction or antagonists misleading. These traits include floral morphology, size, color, and they produce complex signals which are decoded differently by each visiting group due the variation in their cognitive abilities. It is expected a strong selection pressure for highly exclusive communication channels that advertise the effective pollinators and avoid less effective interactors. The bee avoidance hypothesis states that "hummingbirds flowers" prevent the access to the resources by bees. One prediction of it is that flowers with narrow and long tubes will avoid nectar robbing by bees and keep these resources available only to hummingbirds; and red (yellow and orange) flowers will be less visible to bees, not attracting these pollinators. *Mutisia* is a South American genus of vines and shrubs with ca. 60 species. The capitula of *Mutisia* is remarkable, it is big, and has long ray-colored flowers. Several species of *Mutisia* have red, orange or yellow flowers, called in the literature as hummingbird-coloured "flowers" and some of them are indeed visited by hummingbirds. In this sense, we aim to investigate the presence of niche exclusiveness for hummingbird pollination in *Mutisia*. We used the most complete phylogenetic tree of *Mutisia* and coded the color of the flowers and measured its floral traits. We conducted comparative analysis of ancestral trait reconstructions, phylogenetic signal, and evolutionary correlations. We found the ancestral reconstructions of traits related to hummingbird pollination in *Mutisia* have different tempo and mode of evolution. Our results support the bee avoidance hypothesis in *Mutisia*, with traits being more restricted than others. These results show a complex pollinator driven evolutionary scenario with niche exclusiveness for hummingbird pollination based on bee avoidance.

Gains and losses of anemochory in the daisy family

June 21
12:00 PM
Session 5

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Dispersal of individuals far from progenitors is a key life cycle process which entails benefits and costs that might result in adaptations and eventually promote speciation. However, owing to the difficulty to estimate the dispersion ability in speciose plant lineages, our knowledge on the role of this key process in evolution remains limited. One of the most widespread dispersal modes in Angiosperms and

supposedly predominant among daisies is the use of wind as a seed vector (anemochory). It has been reported that around 70% of the daisy family carry on the dispersal units, presumably structures associated with anemochory such as setose pappi (modified calyxes) and wings. A number of functional parameters have been studied on these traits and it appears that morphological variation within them is correlated with wind dispersal ability. An important role has been given to the pappus in diversification of the daisy family and anemochory possibly has a significant bearing in the ecological and evolutionary success of the family. However, to the best of our knowledge no comparative studies have been carried out on the evolution of dispersal in the family. A comparative study appears opportune since knowledge of the relationships among daisy species is now very robust, at least at tribe level. Thus, the present study aimed to estimate dispersion ability and to assess the role of the papus in the evolution of the dispersal in the family. The published knowledge on the morpho-functional association of dispersal units among a subset of daisy species representative of the whole family allowed us through predictive models to extrapolate dispersion ability to a larger set of species included in the latest published phylogeny. Subsequently, we reconstructed character evolution of wind dispersal and wind dispersal ability as discrete and continuous characters, respectively. Finally, we reconstructed the evolution of morphological pappus characters not utilized in the estimation of dispersion ability to explore for possible associations with dispersal mode. We found multiple events of reduction and loss of wind dispersal ability, mainly concentrated in the tribes Anthemideae, Arcotideae and Heliantheae. In addition, several more restricted losses also occur across the family. Finally we found evolutionary associations between pappus morphology and dispersion mode. In conclusion, we suggest that pappus morphology could play an important role in the evolution of dispersal in the daisy family and that constraints in the evolution of the dispersion probably exist due to changes in the pappus traits. Future work should concentrate in identifying drivers of such transitions in pappus traits.

Livestock can affect the evolutionary potential of native plant species in Monte Desert

June 21
12:00 PM
Session 5

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Understanding how anthropogenic disturbances affect genetic, ecological and evolutionary processes aids the development of sustainable management and conservation strategies, particularly in drylands threatened by desertification. Introduction of domestic livestock in natural areas of arid environments affects the dynamics and stability of plant communities with unpredictable evolutionary consequences. We hypothesize that livestock grazing exert selective pressures, negatively affecting genetic diversity and fitness of consumed plants, and also of their offspring. We predict lower genetic diversity (heterozygosity and allelic diversity) and fitness (reproductive success and seedling vigor) in rangelands with high stocking levels