O45-12 – S45 *Biodiversity patterns and processes along altitudinal gradients in tropical forests*
Wednesday 22 June / 10:00-15:30 – Antigone3

Trophic ecology of ants and spiders along a wide elevational gradient in Papua New Guinea revealed by stable isotopes

JUSTINE JACQUEMIN[1,2], DOMIR DEBAKKER[1], PETR KLIMES[3], MARK MARAUN[4], YVES ROISIN[2], MAURICE LEPONCE[1]
[1]Aquatic & Terrestrial Ecology, OD Nature, Royal Belgian Institute of Natural Sciences, Brussels, Belgium
[2]Evolutionary Biology & Ecology, Université libre de Bruxelles, Belgium
[3]Institute of Entomology, Biology Centre CAS, University of South Bohemia, Czech Republic
[4]Institute for Zoology and Anthropology, Ecology (AG Scheu), University of Göttingen, Germany

Ants occupy different trophic functions, from primary consumers (e.g. nectarivores) to predators. In tropical mountain forests their biomass and diversity decrease with elevation. With increasing elevation, shifts may be induced in their diet, and predatory ants could also be functionally replaced by other taxa such as spiders and predatory beetles. Direct observation of feeding behavior is difficult in the field and stable isotope analysis is a way to circumvent this issue by indicating the relative trophic position of the investigated taxa in the food web, giving evidence of prey-predator relationships or of resource competition. The aims were 1/ to study the quantitative and qualitative replacement of predatory ants by other predatory taxa along an altitudinal gradient; 2/ to verify whether ant species with wide altitudinal distribution occupy the same trophic position at different elevations.
Plants and arthropods were collected at 8 forest sites from 200 to 3700m on Mount Wilhelm, Papua New Guinea. In 5 plots per elevation, understorey arthropods were collected by beating of vegetation. Ants, spiders and beetles were counted and morphotyped. Their nitrogen and carbon stable isotope signatures were analyzed.
Ants were found up to 2200m and spiders up to 3700m, with abundance peaks at 1200m and 3700m respectively. The highest species richness for both ants and spiders was observed at 1200m. Two-third of ant species were found at a single elevation, 30% at two, and only three species were present at three elevations. Regarding spider species, 64% were found at a single elevation, 22% at two, and a few species were present from 200 to 3200m. The ant Meranoplus astericus was an ubiquitous species known in the literature as nectarivorous. Isotopic signatures revealed a shift of its trophic position with elevation: low at 1200m, corresponding to that of a primary consumer, but higher at 700m, suggesting a predatory diet. On the contrary, other ubiquitous species had similar isotopic signatures at different elevations, suggesting consistent dietary habits. Between 200 and 2700m, spiders were the top predators in the food web. At 3200 and 3700m they shared the top position with predatory beetles.
In conclusion, for some ant species found at different elevations, a shift in diet may occur. With increasing elevation, ants were quantitatively replaced by spiders, and predatory ants were functionally replaced by spiders and predatory beetles at higher elevations.

O46-01 – S46 Free session: Climate change in tropical ecosystems
Wednesday 22 June / 16:00-17:30 – Antigone3

Impacts of climate change on indigenous communities: role of botanic gardens in biocultural conservation

DUNN CHRISTOPHER
Cornell University, Cornell Botanic Gardens, 14850, Ithaca, USA

Global climate change is having a significant, and negative, impact on the biological diversity and, thus, on the integrity of natural systems. What is less well understood, yet just as critical, are the impacts of climate change and of changes in natural systems on indigenous peoples. In other words, as biological diversity is eroding, so too are cultural and linguistic diversity. In fact, of the approximately 7000 extant languages in the world, fully 50% are considered to be at risk of extinction, with the vast majority in the tropics and subtropics. This rate of extinction of languages (and thereby of human cultural diversity) is considerably higher than most estimates of extinction risks to plants and animals. In addition, traditional ecological knowledge and livelihoods are being lost. As an example of the latter, many tropical (and other) indigenous cultures rely on phenological or "ecological calendars" to determine appropriate timing of planting, hunting, harvesting, among other necessary activities. Climate change, and consequent impacts on natural systems and resources, is completely disrupting wellbeing of tropical communities. Thus, it is not enough to consider just the effects of environmental change on plant life within the current context of the global conservation initiatives, such as the Convention on Biological Diversity (e.g., Article 8(j)) and the Global Strategy for Plant Conservation. Botanic gardens are uniquely positioned to actively engage in understanding the broader impacts of environmental change to biocultural diversity to achieve biological, cultural, and economic resilience. Examples of how botanic gardens in several parts of the world are defining key ways to better understand tropical and cultural conservation will be presented.