

OR202*How do terrestrial ant-plant symbiotic networks change with altitude?***Tom Fayle**, Nichola Plowman, Amelia Hood, Petr Klimes, Conor Redmond, Vojtech Novotny

Mutualistic interactions between ants and plants are widespread, particularly in the tropics. While these interactions, and the costs and benefits for the partners involved, have been reasonably well quantified, the way that the balance of these factors are impacted by changing altitude are very poorly understood. Understanding these shifts is important, as this is expected to shed light on responses of interaction networks to climate change. Here we investigate how the mutualistic interaction network between ants and their host plants changes along an altitudinal gradient (up to 1600m asl) on Mt Wilhelm in Papua New Guinea. We then focus on the most common interaction, that between *Myristica subalulata* and *Anonychomyrma* sp. and quantify how costs and benefits for the host plant change with altitude by conducting patrolling censuses, herbivory assays and experimental exposure of model herbivores. We find that in the lowlands multiple ant and plant species are involved in the mutualistic network, with little apparent specialisation. At higher altitudes, the interaction network becomes simpler, with the highest elevations being dominated by *Anonychomyrma*-inhabited *Myristica subalulata*, before a reduction in the abundance of even this species at 1600m. At higher elevations, the *Anonychomyrma* inhabiting *Myristica* plants patrol less and take longer to find a model herbivore. This seems to have resulted in increased levels of herbivory on plants at higher elevations, and may be the cause of the limitation of this plant species to lower elevations. We speculate that the driver of this pattern is reduced ant activity due to lower temperatures at higher altitudes, thus reducing the benefits for plants of ant inhabitation. We have demonstrated that interaction networks shift with altitude, and also, for one particular interaction, that the corresponding change in temperature may drive a shift in the balance of costs and benefits for one partner.