NAEM 2014

Netherlands Annual Ecology Meeting

11 & 12 February 2014

Congrescentrum De Werelt, Lunteren

- ***Programme***
- ***Presentation Abstracts***
- ***Poster titles and numbers***
- ***List of participants***

NAEM 2014

Netherlands Annual Ecology Meeting

11 & 12 February 2014

Congrescentrum De Werelt, Lunteren

- ***Programme***
- ***Presentation Abstracts***
- ***Poster titles and numbers***
- ***List of participants***

NAEM 2014

Presentation Abstracts

4d: Tropical ecology

Conveners: Lourens Poorter (Wageningen University)
Hans ter Steege (Naturalis Biodiversity Center)
Joost Duivenvoorden (University of Amsterdam)

1. The Amazon. Understanding the world's most diverse forest

Hans ter Steege
Naturalis Biodiversity Centre

Recent decades have seen a major international effort to inventory tree communities in the Amazon Basin and Guiana Shield (Amazonia), but the vast extent and record diversity of these forests have hampered an understanding of basin-wide patterns. To overcome this obstacle we compiled and standardized species-level data on more than half a million trees in 1170 plots sampling all major lowland forest types to explore patterns of commonness, rarity, and richness. The ~6 million km2 Amazonian lowlands were divided into 1-degree cells and mean tree density was estimated for each cell using a loess regression model that included no environmental data but was based exclusively on the geographic location of tree plots. A similar model, allied with a bootstrapping exercise to quantify sampling error, was used to generate estimated Amazon-wide abundances of the 4962 valid species in the dataset. We estimated the total number of tree species in the Amazon by fitting the mean rank-abundance data to Fisher's log-series distribution. Our analyses suggest that lowland Amazonia harbors 3.9 x 1011 trees and ~16,000 tree species. We found 227 'hyper-dominant' species (1.4% of the total) to be so common that together they account for half of all trees in Amazonia, while the rarest 11,000 species account for just 0.12% of trees. Most hyper-dominants are habitat specialists that have large geographic ranges but are only dominant in 1 or 2 regions of the basin, and a median 41% of trees in individual plots belong to hyper-dominants. A disproportionate number of hyper-dominants are palms, Myristicaceae, and Lecythidaceae. An appreciation of how thoroughly common species dominate the basin has the potential to simplify research in Amazonian biogeochemistry, ecology, and vegetation mapping. Such advances are urgently needed in light of the >10,000 rare, poorly known, and potentially threatened tree species in the Amazon.

2. Mycota of understudied biodiversity hotspots – deep DNA sequencing reveals hyperdiverse communities and strong habitat partitioning along altitudinal gradients in cloud forest communities in Borneo and in the Andes

József Geml, Nicolás Pastor, Luis N. Morgado, Tatiana A. Semenova, Eduardo R. Nouhra
Naturalis Biodiversity Center

Cloud forests are not only among the world's most biologically important ecosystems with their tremendous biodiversity and high rate of endemism, but they also provide crucial water supplies to human settlements and agricultural areas. Mount Kinabalu in Borneo and the Yungas forest on the eastern slopes of the Andes have been known to be particularly rich in plant and animal species and both have been designated as UNESCO Biosphere Reserves. Based on proportional diversity estimates around the globe, the fungi are at least as diverse (probably even more). Yet, virtually nothing is known about the true diversity and distribution patterns of fungi in these regions. We carried out Ion Torrent sequencing of soil samples taken along multiple altitudinal gradients in the Yungas in Argentina and on Mount Kinabalu and in the Crocker Range in Malaysian Borneo. The samples represent all major altitudinal forest types from ca. 500 to 2500 m in the Yungas and from 300 to 4000 m in Borneo. Our results suggests that the sampled communities are very diverse, harbouring numerous undescribed and/or previously unsequenced taxa. NMDS analyses suggested that fungal community composition correlated strongly with forest type, with many OTUs showing strong preference for a certain elevation zone. Several ecological groups showed similar distributional trends in the two regions, e.g., saprobic fungi were more diverse at lower elevations, while root endophytes were more dominant at higher altitudes. Our data offer an unprecedented insight into the diversity and spatial distribution of fungi in tropical and subtropical cloud forests.

3. Geological change as driver of plant biogeography in Amazonia

Carina Hoorn
University of Amsterdam

The Amazon region harbours a wealth of biodiversity, which was formed by the interaction of macro-scale and micro-scale processes during the Cenozoic era (<65 million years ago (Ma)). Here I will focus on the sedimentary history of western Amazonia (23 Ma). During this period the area came under the spell of the uplifting Andes, a process that caused a plethora of changes in climate, sedimentary environments, bedrock, soil etc. In particular the changes in discharge, sediment composition and depositional environment might have influenced, and changed, the composition of palm taxa. The pollen record in western Amazonia shows that *Mauritia*-type palms were very common during the early Miocene (23-16 Ma), but that after 16 Ma, coinciding with a change in sediment composition and environment, a new pollen type, that shares some notable characteristics with the pollen of the present species of Mauritiinae, emerged and took over the previous niche of