

# Lateinamerika-Symposium Latin America Symposium

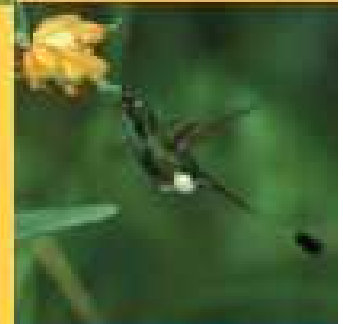
## Biodiversity – Patterns, Processes, Conservation

Bonn, December 11–12, 2009

### Biodiversität – Muster, Prozesse, Erhaltung

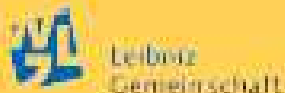
#### Topics

- Tropical Ecology
- Biogeography
- Vegetation Science
- Limnology
- Ornithology
- Mammalogy
- Entomology



For further information

<http://www.ilz.uni-bonn.de/la-symposium/>



**Lateinamerika Symposium**  
**Biodiversität: Muster, Prozesse, Erhaltung**

**Latin America Symposium**  
**Biodiversity: Patterns, Processes and Conservation**

**Veranstalter:**

HANS JÜRGEN BÖHMER

Interdisziplinäres Lateinamerikazentrum (ILZ)  
c/o Zentrum für Entwicklungsforschung (ZEF)  
Rheinische Friedrich-Wilhelms-Universität Bonn  
Walter-Flex-Str. 3  
53113 Bonn  
Tel.: +49 (0)228 73 49 00

KARL-LUDWIG SCHUCHMANN

Zoologisches Forschungsmuseum Alexander Koenig  
Museumsmeile Bonn, Adenauerallee 160  
53113 Bonn, Germany  
Tel.: +49 (0)228 91 22 238

KARL MATTHIAS WANTZEN

Limnologisches Institut  
Universität Konstanz  
Postfach M 659  
78457 Konstanz, Germany  
Tel.: +49 (0)7531-884577

Herausgeber

H. J. Böhmer, K.-L. Schuchmann & K. M. Wantzen

Gestaltung

Laurens Geffert (ILZ)

Bonn im Dezember 2009

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## Programm für Freitag, den 11.12.2009

9:30	Begrüßung K.-L. Schuchmann H. J. Böhmer
10:00	Preisverleih Joachim-Adis-Preis Laudatio: M. Wantzen, Konstanz
10:30	Marinêz Isaac Marques, Life-strategies of terrestrial invertebrates in large seasonal floodplains
11:30	Kaffeepause
	Convener: H. J. Böhmer
12:00	Ulrich Deil, A synopsis of seasonal wetland vegetation in extratropical and orotropical South America
12:30	Peter J. Horchler, Determinants of understorey plant assemblages in an Amazon lowland rainforest
13:00	Mittagspause

## Fortsetzung des Programms für Freitag, den 11.12.2009

	Convener: Wolfgang Junk
14:30	Juana Palma, Erfassung der "Nicht-Holz-Waldprodukte" aus dem Küstenregenwald im Süden Chiles.
15:00	Alexandra Schuh, Feeding preferences cause sexual differences in the bill shape of the White-whiskered Hermit Hummingbird ( <i>Phaethornis yaruqui</i> )
15:30	Kaffeepause
16:00	Thomas Kimmel, On the abundance of large-seeded, bird-dispersed tree species in the Pernambuco Endemism Center
16:30	Rodrigo Vargas, Gap vegetation in the endemic <i>Myrtisilva</i> forest, Robinson Crusoe Island, Chile Vargas
17:00	K.-L. Schuchmann, Hummingbird-moth-mimikry
17:30	Ende
20:00	Dinner unter dem Baobab (Einlass ab 19:30)

## Programm für Samstag, den 12.12.2009

10:00	Miguel Alvarez, Floristic diversity in pristine plant communities of temperate Chile
10:30	Lydia Möcklinghoff, Studying giant anteaters in Brazil - results, aims, and future efforts
11:00	Pia Parolin, Amazonian black- and white-water floodplains: Diversity and productivity in differing two forest ecosystems
11:30	Kaffeepause
12:00	Hentrich, Heiko, High pollinator specificity: A necessity for successful reproduction in widely separated rainforest understorey plants?
12:30	Wolfgang Junk, Habitat-Klassifizierung und Weidemanagement im Pantanal: Nachhaltige Nutzung oder Umweltzerstörung?
13:00	Ende des Symposiums

# Joachim-Adis-Preis für interdisziplinäre Tropenökologie 2009

**Schirmherrschaft  
Dr. h.c. Hannelore Schmidt**

Das Forschungsmuseum Alexander Koenig in Bonn (Leibniz-Institut für terrestrische Biodiversität) und das Interdisziplinäre Lateinamerikazentrum (ILZ) der Rheinischen Friedrich-Wilhelms-Universität Bonn schreiben fortan jährlich den internationalen Joachim-Adis-Preis für interdisziplinäre Tropenökologie aus.

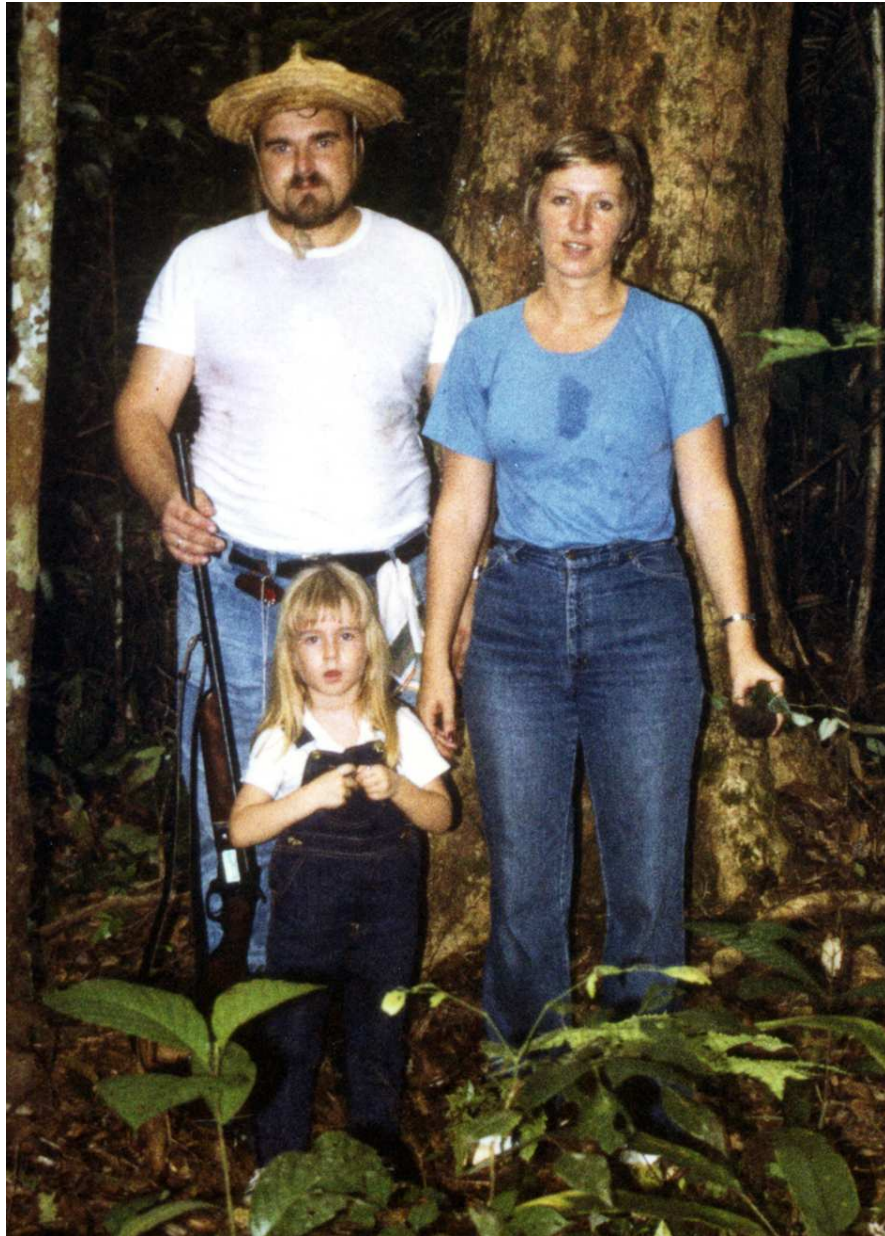
Der 2007 unerwartet verstorbene Ökologe Prof. Dr. Joachim Adis war ein international herausragender Amazonasforscher. Er war langjähriger Mitarbeiter der AG Tropenökologie am Max-Planck-Institut für Limnologie in Plön und kooperierte in dieser Funktion in Brasilien intensiv mit Wissenschaftlern des Nationalen Instituts für Amazonasforschung (INPA) in Manaus und Wissenschaftlern der staatlichen Universität von Mato Grosso, Cuabá im Pantanal. Außerdem wirkte er auch an anderen Forschungseinrichtungen, u.a. dem Smithsonian Institute in Washington und an der Universität von Sao Paulo. Regionaler Schwerpunkt seiner Forschungsarbeit waren die Überschwemmungswälder Brasiliens. Als exzellenter Pädagoge baute er eine deutsch-brasilianische Forschergruppe auf, aus der zahlreiche Diplomanden und Doktoranden hervorgingen. Seine Publikationen gelten als Meilensteine der Grundlagen- und funktionalen Ökosystemforschung zur Biodiversität Amazoniens und des Pantanals

Der Name Joachim Adis steht für erfolgreiche, internationale und interdisziplinäre Forschungszusammenarbeit, leidenschaftliche ökologische Feldforschung und engagierte, innovative Lehre. In diesem Sinne wird der ausgeschriebene Preis für besondere wissenschaftliche Leistungen auf dem Gebiet der ökologischen Feld- und Grundlagenforschung in den Tropen Lateinamerikas an herausragende Forscher verliehen. Bewerbungen und Vorschläge, in 6-facher Ausfertigung, können ganzjährig an Prof. Dr. Karl-L. Schuchmann oder ein anderes Mitglied des Kuratoriums gerichtet werden. Es gilt keine Altersgrenze für Bewerberinnen und Bewerber.

Dem Kuratorium gehören an: Irmgard Adis, Priv.-Doz. Dr. Hans Jürgen Böhmer, Prof. Dr. Wolfgang Junk, Prof. Dr. Dr. h.c. mult. Paul Müller, Prof. Dr. Karl-L. Schuchmann und Priv.-Doz. Dr. Karl-Matthias Wantzen.

Das Kuratorium ist in seiner Entscheidung autark. Die Beschlussfassung erfolgt einstimmig, die Entscheidung über die Auswahl des Preisträgers ist endgültig. Es besteht keine Einspruchsmöglichkeit, der Rechtsweg ist ausgeschlossen.

Die Vergabe des Preises findet jährlich im Rahmen des von Forschungsmuseum Alexander Koenig und ILZ gemeinsam ausgerichteten Lateinamerika-Symposiums in Bonn statt.



**The Adis Family**

# Joachim-Adis-Preis für interdisziplinäre Tropenökologie

Preisträger 2009

**Frau Prof. Dr. Marinêz Isaac Marques**  
Universidade Federal do Mato Grosso, Cuiaba

Abstract 1:

**Marques, Marinêz Isaac<sup>1</sup>**

## **Life-strategies of terrestrial invertebrates in large seasonal floodplains**

<sup>1</sup>Universidade Federal do Mato Grosso, Cuiaba

In flooding ecosystems one of the factors that determine the composition and structure of the invertebrate communities is the pulse of inundation which is considered to be a mechanism of primary control in these systems, as they control the seasonal alterations in the biota.

Different methodologies were used for sampling arthropods in the soil, trunk and canopy in the Pantanal of Mato Grosso, and different strategies of survival including the terricola and arboricola fauna were found. For the terricola fauna, among the migrant arthropods horizontal migrations on the soil following the water line during the inundation (Diplopoda, Chilopoda, Pseudoscorpiones and Araneae) were detected, and also the displacement to trunks and canopies, making the vertical migration evident for *Plusioporus salvadorii* (Diplopoda) and *Acromyrmex lundii carli* and *Solenopsis saevissima*. *Lundii carli* moves its nests to the tree trunks before the floods, where it remains with its colony until the end of the flood. Apart from the vertical migration, *Solenopsis saevissima* forms carpets over the water surface until it finds a substratum to fix on to. From among the nonmigrant animals were recorded those which remained in the egg stage during the inundations (Collembola: Symphyleona), as well as a big quantity of typical organisms of the edaphic fauna, that didn't occur in trunks and canopies.

These results are the preliminary data on some taxons which demonstrated specific behavioural characteristics, however more accurate studies, at specific levels for many groups, must be brought about for a better comprehension of the behaviour of these animals regarding the perodical inundations.

Abstract 2:

**Deil, Ulrich<sup>1</sup>**

**Alvarez, Miguel<sup>2</sup>**

**Ramirez, Carlos<sup>3</sup>**

## **A synopsis of seasonal wetland vegetation in extratropical and orotropical South America**

<sup>1</sup>Department of Geobotany, Faculty of Biology, University of Freiburg, Schaezlestrasse 1, D-79104 Freiburg, Email: ulrich.deil@biologie.uni-freiburg.de

<sup>2</sup>Department of Geobotany and Nature Conservation, INRES, University of Bonn, Karlrobert-Kreiten-Strasse 13, D-53115 Bonn, Email: malvarez@uni-bonn.de

<sup>3</sup>Botanical Institute, Faculty of Biology, Austral University, Casilla 561, Valdivia, Chile, Email: cramirez@uach.cl

Based upon unpublished data from vernal pools in Central Chile and a synopsis of the available geobotanical literature about seasonal wetlands in the extratropical parts of South America, we search for spatial floristic patterns and the ecological factors behind. Floristic links and ecological similarities (occurrence of frost) between the austral-temperate / subantarctic climatic zone and the orotropical biome were the reasons to include the Andean belt.

Such a synthesis is facing problems such as inconsistency of floristic nomenclature, heterogeneity of sampled data, and a strong influence of the vegetation surrounding the small seasonal pool (vicinismus effect). All in all 26 bibliographic resources, documenting 514 published vegetation samples, were used for numerical classification and ordination. The following clusters emerged from this analysis:

1. Páramo-Puna-distribution, including moorland pools and inundated bog hollows in hard cushion mires of the Andean belt and the semi-desert highlands of NW Argentina
2. Steppe-arid-Subantarctic distribution, including fringes and exposed bottoms of freshwater and brackish water lagoons and seasonal inundated turfs in Southern Patagonia
3. Amphibic habitats at lakeshores in the supra-forest belt of the wet tropical Andes and mountainous parts of extratropical temperate South America
4. Seasonal flooded lakeshores in the temperate and subantarctic climate of Chile and Argentine
3. Swamp vegetation in the Paraná basin
4. Vernal pool vegetation in the Mediterranean zone of Central Chile

Finally, some comparison with spatial and floristic pattern in the Western Palearctic and the Neartic areas will be given.

Abstract3:

**Horchler, Peter J.**<sup>1</sup>  
**Kreft, Holger**<sup>2</sup>

## Determinants of understorey plant assemblages in an Amazon lowland rainforest

<sup>1</sup>Federal Institute of Hydrology, Department Ecological Interactions, Am Mainzer Tor 2, 56068 Koblenz, Germany. E-mail: horchler@bafg.de

<sup>2</sup>Biodiversity, Macroecology & Conservation Biogeography Group, Faculty of Forest Sciences and Forest Ecology, University of Göttingen, Büsgenweg 2, 37077 Göttingen, E-mail: hk@uni-bonn.de

Understorey plants are rarely included in tropical vegetation studies because trees form the major component of rainforests. However, they are part of the ecosystem and, they are easy to study as compared to trees or epiphytes. The aim of this study was to quantify to what degree the species composition of different groups of rainforest understorey plants is determined by environmental variables relative to spatial processes. The study site was a lowland rainforest on the upper Orinoco river floodplain in Southern Venezuela (3°10' N, 65°40' W ). Species composition was recorded in 20 plots (each 20 by 20 m). 33 understorey species were encountered and assigned to four different groups according to their life form, dispersal mode, and taxonomy. The groups were ferns (8 species), palms (7 species), Rubiaceae (11 species), and other Angiosperm herbs (7 species).

Potential explanatory variables included indicators for disturbance of the study site such as charcoal in the topsoil, hydrologic indicators (e.g. elevation, distance to the river), soil variables such as texture or rooting depth, and the geographic distance between plots as a proxy for the effect of dispersal limitation. Distance matrices of species composition and the explanatory variables were used to perform multiple regressions to identify the most important predictors of among-plot differences in the species composition of the four plant groups. Non-significant variables were excluded by backward elimination. Significance was tested by 999 Monte-Carlo permutations. Adjusted  $R^2$  values were used to partition how much species turnover among plots was explained by the habitat and spatial variables. Environmentally explained variation ranged from 15-45%. The most important environmental factors for the four plant groups were somewhat different, and the results also differed considerably depending on whether species presence/absence or abundance data were analyzed. For presence/absence data the variation explained by habitat data (hydrologic and soil variables) was generally higher (9 – 38%) than that explained by geographical distance (0 – 7%). In contrast, for abundance data turnover in palm composition was strongly and solely explained by geographical distance, whereas turnover in Rubiaceae, Angiosperm herbs and ferns was mostly explained by habitat variables. In some cases there was also high overlap between habitat and spatial effects. The results suggest (1) significant differences in the degree of dispersal limitation and (2) some degree of niche partitioning between these groups of understorey plants. The main environmental gradients, along which niche partition is likely to take place, are determined by hydrologic and soil variables.

Abstract 4:

**Palma, Juana<sup>1</sup>**

## **Erfassung der Nicht Holz Waldprodukte aus dem Küstenregenwald im Süden Chiles.**

<sup>1</sup>Tennenbacherstr 4, 79085 Freiburg i. Br., palma@biom.uni-freiburg.de

Nicht Holz Waldprodukte (NHWP) sind Güter biologischen Ursprungs, die nicht aus Holz sind und aus dem Naturwald und forstlichen Plantagen stammen (FAO, 1995). Die Nutzung und der Handel von NHWP können zur sozialen und wirtschaftlichen Entwicklung in Lateinamerika beitragen (Statz, 2000)

Bis heute wird in Chile das Wissen um den traditionellen Nutzen vieler Pflanzen von den Ureinwohnern bewahrt, aber es existieren wenige wissenschaftliche Kenntnisse in diesem Bereich. Einige Studien beschreiben die NHWP nur als Etno-Botanische Kenntnisse ohne Information über ihr natürliches Vorkommen.

Im Rahmen einer Doktorarbeit in der Abteilung für forstliche Biometrie der Universität Freiburg wurde eine Forschungsinventur in dem immergrünen Wald an der Küstegebirgskette in Südens Chile (40°S 73°O) durchgeführt um Vorrat und Verbreitung der NHWP von den Pflanzenarten: *Lomatia ferruginea* (Protaceae, Baum, Blätter), *Gevuina avellana* (Protaceae, Baum, Blätter), *Ugni molinae* (Myrtaceae, Strauch, Früchte), *Lycopodium paniculatum* (Lycopodiaceae, Farn, Blätter), *Luzuriaga polyphilla* (Luzuriagaceae, Schlingpflanze, Blätter) und *Capsidium valdivianum* (Bignoniaceae, Schlingpflanze, Stiele) zu erforschen.

Die Anzahl der Aufnahme (105 Plots) richtete sich nach der Größe von drei Beständen, die nach Kriterien Waldstruktur und NHWP-Vorkommen ausgewählt wurden. In den ausgewählten Beständen wurden konzentrische Probekreise mit 10 m, 5,6 m und 2,8 m Radius mit einem Abstand von 60 m in N-S und O-W Richtungen systematisch verteilt. Die sechs Zielpflanzenarten wurden in vier Gruppen nach ihrer Messbarkeit und Lebensformen organisiert: Zählbare Pflanzen, Büsche mit vegetativer Vermehrung, Bodendecker und Kletterpflanzen.

Mit den erfassenden Variablen werden die Bestände beschrieben, in denen die verschiedenen NHWP-Produzenten wachsen, mittels Strukturvariablen, örtlichen Lagemerkmale und Artenzusammensetzung. Die morphologischen und qualitativen Merkmale wurden erfasst, welche die NHWP-Produzenten bestimmen, die biometrischen Variablen für die pflanzlichen Teile, die als NHWP genutzt werden, wurden bestimmt und Methoden für ihre Erfassung wurden entwickelt

Abstract 5:

**Klug, Andrea<sup>1</sup>**  
**Schuh, Alexandra<sup>1</sup>**  
**K.-L. Schuchmann<sup>1</sup>**

## **Feeding Preferences cause sexual differences in the bill shape of the White-Whiskered Hermit Hummingbird (*Phaethornis yaruqui*)**

<sup>1</sup>A. Koenig - Zoological Research Institute and Zoological Museum, Ornithology, Adenauerallee 160, 53113 Bonn

Sexual dimorphism in hummingbirds reflects the interaction between social systems and feeding ecology. However, the only reliable evidence for ecological causation of sexual dimorphism is a modification of feeding structures in a direction which is inconsistent with sexual selection and is greater than expected on the basis of body size differences alone (Selander, R. K., 1972: 180-230, in *Sexual Selection and the Descent of Man*. B. Campbell, ed., Aldine Chicago, Il. ). This criterion is documented in the White-whiskered Hermit (*Phaethornis yaruqui*) due to the bill shape differentiation between males and females. The straight long bills of the males are perfectly adapted to the long tubular straight corollas of *Psammisia pacifica* (Ericaceae) which females, with their pronounced decurved beaks, can't access. Here we discuss that both birds and flowers may be targets of reciprocal selection.

Abstract 6:

**Kimmel Thomas<sup>1</sup>**  
**Gottsberger Gerhard**

## **On the abundance of large-seeded bird-dispersed tree species in the Pernambuco Endemism Center**

<sup>1</sup>Institute of Systematic Botany and Ecology, Ulm University, Albert-Einstein-Allee 11 89081 Ulm, thomaskimmel@gmx.net

Biodiversity hotspots are characterized by their high levels of endemism, species richness and habitat destruction. Ideally, conservation effort should be directed to these regions so that a maximum of biodiversity can be preserved. Many biodiversity hotspots are located where pressure on reserves is high and resources for protection are scarce. Often hunting pressure is so intense that mutual partners of tree species are no more present. The Pernambuco Endemism Center suffered the highest rates of deforestation of the Brazilian Atlantic Forest hotspot and few of its forest remnants can be considered well-preserved. Also many animals which are important as dispersers e.g. toucans, tapirs and capuchin monkeys are either extinct in the whole region or restricted to few forest remnants. Analyzing 27 recently conducted plant surveys, we found that large-seeded bird-dispersed tree species sum up to more than 10% of the number of individuals in three better-preserved fragments, whereas in about 80% of the other fragments they are virtually absent. These values were compared with 18 surveys conducted about 30 years ago, before a biofuel boom led to a severe reduction of forest cover. The results confirm that the considered species were much more frequent and abundant than they are today. Once, especially vulnerable species or guilds are identified, special effort may be invested in reforestation projects or ex-situ collections in order to preserve either whole species from extinction or the gene-pool of local populations.

Abstract 7:

**Vargas, Rodrigo<sup>1</sup>**  
**Reif, Albert**

## **Gap vegetation in the endemic “*Myrtisilva*”-forest, Robinson Crusoe Island, Chile**

<sup>1</sup>Tennenbacher str 4, Freiburg 79106. rodrigo.vargas@waldbau.uni-freiburg.de

Endogen disturbances caused by fallen trees are frequent, and part of the natural dynamics of the Robinson Crusoe Island Forest, (RCI; Juan Fernández Archipelago, Chile). This unique ecosystem (= *Myrtisilva*) is composed by only endemic tree species, and present 61.1% of endemism considering its vascular flora. Currently ca. 75% of the island flora is in verge of extinction, mainly given the action of introduced exotic invasive species of animals and plants. A starting point for habitat loss and fragmentation currently occurs inside endogen gaps, where the invasive plants start to spread. Information about the gap role over the native vegetation is needed in order to propose proper conservation and restoration measures.

We studied the importance of gaps on the vascular species richness, coverage and the variation on solar radiation transmittances within different gap compartments (i.e centre, transition, and below forest condition)

Twenty canopy gaps were selected in a forest study sector of RCI. Ten presented no exotic species (i.e., “natural”), five were invaded by alien plants (i.e., “invaded”) and five were treated (manual cut of weeds; i.e., “treated”). Vascular species were registered inside the opens and through four relevés disposed in compartments. Hemispherical photographs were used to estimate solar radiation transmittance.

Inside gaps and in the bordering sections, the native plant richness was highest. On natural gaps, the richness of vascular species increased gradually while the gap size augmented. The solar radiation transmittance varied significantly within the compartments. These differences today are changed because of alien species invasion.

Abstract 8:

**K.-L. Schuchmann**

## **Hummingbird-moth-mimikry**

Abstract 9:

**Alvarez, Miguel<sup>1</sup>**  
**San Martín, Cristina<sup>2</sup>**  
**Ramírez, Carlos<sup>2</sup>**

## Floristic diversity in pristine plant communities of temperate Chile

<sup>1</sup>INRES, Department of Geobotany and Nature Conservation, University of Bonn, Germany, malvarez@uni-bonn.de

<sup>2</sup>Botanical Institute, Austral University of Valdivia, Chile

The description of pristine plant communities delivers valuable information to understand degradation-regeneration dynamics and to design strategies for restoration and conservation management. However areas suffering low or no human disturbance are scarce. In the year 2004 an expedition to the islands Guamblin, Ipán, Stokes and Kent (Los Chonos Archipelago, South Chile) was carried out to quantify their plant diversity. Since these islands are not permanently inhabited, the human impact on them is very low. The studied islands differ in their geomorphology, exposure to the west winds, and in the human activities, being Guamblin the most exposed and less disturbed. We sampled 14 plant communities, 8 of them woods (forest and shrub communities). No grassland communities are present on the islands. Native species commonly dominate the vegetation, but neophytes are more abundant in the forb communities. They arrive with the people visiting the islands (anthropochory). In some areas that were elevated from under the sea after an earthquake in the year 1960 it is possible to observe early states of a primary succession. Here bushes dominated by *Escallonia rubra* are the characteristic vegetation type. According to the collected data, the plant diversity of the islands is depending on their communities composition and geomorphology. Disturbance is concentrated on the coasts meanwhile the innermost parts are covered by pristine forests and moorlands. More detailed studies are necessary to know the structure and ecology of the plant communities that originally dominated the temperate range of South America.

Abstract 10:

**Möcklinghoff, Lydia<sup>1</sup>**

## **Studying giant anteaters in brazil- results, aims and future efforts**

<sup>1</sup>Zoologisches Forschungsmuseum Koenig, Adenauerallee 160, moecklinghoff.zfmk@uni-bonn.de

The giant anteater (*Myrmecophaga tridactyla*) is an important flagship-species for south-american ecosystems. Due to its charisma it plays a vital role in establishing ecotourism as an alternative for intensified land use. Its high popularity among the brasilian people makes it a possible mascot for sustainable land-management and nature conservation in Brazil.

Listed at the Red List of the IUCN as near threatened, its population is only stable in some parts of the distribution: In acacia- plantations in Northern Brazil giant anteaters are very common. At the same time they experience a population decline in the Cerrado in central Brazil and are already gone extinct in Uruguay and Northernargentina. Reasons are unknown. Generally there are only few studies about the animals. For successful conservation actions in every part of its distribution, there has to be more information.

Therefore I study ecology and behaviour of giant anteaters in Brazil. I want to understand, which factors trigger population densities and how anthropogenic, habitat altering activities have an influence. In my work in acacia-plantations in Roraima, Northern Brazil, giant anteaters were shown to be abundant, with a high preference for the artificial forest habitat. They chose for this environment, because of a better food supply and more balanced climate.

My future work will focus on the Southern Pantanal, Brazil. It is a biodiversity hotspot; economical basis is cattle ranching and, latterly, ecotourism. I'm interested in how giant anteaters cope with natural, seasonal variations in habitat structure and its reactions on human activity, more precisely the influence of cattle ranching and ecotourism on the ecology and behaviour of the animal. Together with Brazilian scientists of the projeto tamanduá, I'm aiming for an effective conservation concept for the animal.

Abstract 11:

**Parolin, Pia<sup>1</sup>**

## **Amazonian black- and white-water floodplains: Diversity and productivity in differing two forest ecosystems**

<sup>1</sup>INRA - French National Institute for Agricultural Research, Agrobiotech, Bureau B100, 400 Route des Chappes, BP 167, F-06903 Sophia-Antipolis, France, Pia.Parolin@sophia.inra.fr

In Amazonia, floodplain forests differ considerably depending on the quality of the flooding waters. Black-water rivers originate in the geologically old Guyana Shields and are poor in sediment load. Their floodplains “igapó” have soils with low nutrient contents and the flooding waters allow photon fluxes up to a depth of 2.5m. White-water rivers originating in the geologically younger Andes carry high sediment loads and the floodplains “várzea” are rich in nutrients, but the sediment load impedes photon fluxes below 0.5m under the water surface. This poses clear constraints for tree seedling survival in the prolonged flooded periods which last up to 290 d y<sup>-1</sup> in igapó and 140-270 d y<sup>-1</sup> in várzea. The two flooded ecosystems are clearly distinct with respect to their floristic composition, successional sequences, zonation, forest structure, plant growth and productivity. Várzeas have higher net productivity than igapós, as shown by mass-production of fast-growing macrophytes and high annual wood increments of the trees. Significant differences in wood specific gravity and annual increments suggest that the type of flooding water and the related nutrient input may directly affect tree growth. Slow growth in blackwater floodplain forests may be a response, or an adaptation to the low nutrient status of the system with an efficient utilization of the available nutrients.

Abstract 12:

**Hentrich, Heiko<sup>1</sup>**  
**Gottsberger, Gerhard<sup>2</sup>**

## **High pollinator specificity: A necessity for successful reproduction in widely separated rainforest understorey plants?**

<sup>1</sup>Institut für Systematische Botanik und Ökologie, Universität Ulm, 89069 Ulm.

heiko.hentrich@uni-ulm.de

<sup>2</sup>Botanischer Garten und Herbarium, Universität Ulm, 89069 Ulm. gerhard.gottsberger@uni-ulm.de

We studied the pollination biology of the understorey plants *Bonafousia disticha*, *Mandevilla rugelosa* (Apocynaceae), *Costus congestiflorus* (Costaceae), *Voyria clavata* (Gentianaceae), *Episcia sphalera* (Gesneriaceae), *Calathea erecta*, and *Ischnosiphon martianus* (Marantaceae) in French Guiana. All species had a “steady state” flowering phenology and were mainly visited by euglossine bees (both sexes), which collected floral nectar or nectar and pollen. The flowers had long nectar tubes, whose length slightly correlated with the tongue length of the visiting bees. Floral nectar was sucrose-dominant and showed average concentrations between 20.9 and 29.7%. Mean daily nectar amounts were large (3.7 - 51.1 µl) and correlated with the body length of the visiting bees. Pollinator specificity of the plants was high. Usually, one bee species or a bee subgenus dominated the visits to one plant species. It appears that differences in the visitor spectrum were due to differing floral morphology and daily floral nectar amounts. Since patches of the plants were generally separated for several hundred meters, a high specificity to reliable pollinators may be decisive for a successful reproduction. In contrast to the plants, each bee species visited a large number of different nectar hosts. This could be related to the small flower number and thus to small nectar amounts offered by each plant species. The behaviour of the observed euglossine species during foraging bouts led to the assumption that the bees learned to discriminate between rewarding and non-rewarding flowers and that they were able to detect odour marks of con- and heterospecifics.

Abstract 13:

**Junk, Wolfgang<sup>1</sup>**

## **Weidemanagement im Pantanal: Nachhaltige Nutzung oder Umweltzerstörung?**

<sup>1</sup>Anschrift, Email: [wjj@evolbio.mpg.de](mailto:wjj@evolbio.mpg.de)

Extensive Rinderhaltung ist im Pantanal eine seit über 200 Jahren praktizierte Nutzungsform, die den Charakter des Gebietes und die Lebensgewohnheiten seiner Bewohner entscheidend geprägt hat. Die Fazendeiros erweiterten allmählich durch gezieltes Weidemanagement die zur Verfügung stehenden Weideflächen, ohne die Habitat- und Artendiversität des Gebietes zu beeinträchtigen.

Die seit etwa 30 Jahren wachsende ökonomische Konkurrenz mit der intensiven Weidewirtschaft auf dem nicht-überschwemmten benachbarten Hochland zwingt die Fazendeiros im Pantanal jetzt zur Intensivierung der Rinderhaltung und zum verstärkten Weidemanagement um Verbuschung der Weideflächen zu vermeiden. Diese Aktivitäten werden von Umweltschützern angegriffen, die eine verstärkte, vom Gesetz verbotene Abholzung der Wälder des Pantanals befürchten. Die rechtliche Lage ist unklar, was zu einer Verunsicherung der Fazendeiros im Pantanal in Bezug auf ihr Weidemanagement führt, aber auch zu einer Verhärtung der Fronten zwischen Umweltschützern und Fazendeiros.

Es werden laufende Untersuchungen zu dieser Fragestellung vorgestellt sowie eine Analyse der ökologischen, ökonomischen, historischen, sozialen und juristischen Fakten. Dieser Ansatz kann zu einer für alle Beteiligten zufriedenstellenden Lösung des Problems führen.

Poster 1:

**Arias-Schreiber, Milena<sup>1</sup>**  
**Áiquen, Miguel<sup>2</sup>**

## **Adaptations of commercial fisheries to extreme climatic events and variability: lessons from the Peruvian anchovy fishery**

<sup>1</sup>Leibniz Center for Tropical Marine Ecology, Fahrenheitstrasse 6, 28359 Bremen, Germany.  
milena@uni-bremen.de

<sup>2</sup> Peruvian Marine Research Institute, Esq. Gamarra y Gral Valle s/n, Chucuito, Callao, Peru.

Models on climate change predict increases in frequency, intensity and duration of extreme events with adverse impacts on socio-ecological systems. The high intensity of the ENSO events in 1972-73, 1982-83 and 1997-98 caused considerable ecological changes and substantial economic damage to the Peruvian fishery sector. This has a history of adapting to climatic, political, social or biological shocks. In this study we examine the impact and response of the Peruvian commercial anchovy fishery to the mentioned ENSO events to determine whether it has resulted in greater resilience of the industry. Results show that the anchovy fishery sector has indeed developed adaptations that allow the reduction of impacts to such events. Some coping strategies were attempted during the first severe ENSO; however an evident reduction of impacts was mainly observed during the 1997-98 event. Adaptations include: economic viability of changes in fishing effort distribution following fish stocks migrations; opportunistic use of invading fish populations; implementation of adaptive management and relaxed formal institutions; achievement of legitimacy towards governmental agencies; and reduction of uncertainties coming from the commodity prices system for fishery products. This list is not exhaustive but clarifies our understanding on the context in which adaptation might occur in the commercial fisheries industry. Climate and subsequently ecological drastic change -due to anthropogenic or natural variability- is an opportunity to change the way scarce resources are currently managed. Change towards more resilient societies will however depend on the actor's constellation and the economic, social and cultural forces acting upon them.

Poster 2:

**Durán Rangel, Cristabel<sup>1</sup>**

**Reif, Albert<sup>1</sup>**

**Hernández, Lionel<sup>2</sup>**

## **Understanding small scale disturbances in Guayanan montane forests: structural gap characterization in Sierra de Lema, Venezuela.**

<sup>1</sup>Institut for Silviculture, University of Freiburg, Germany.

Email: cristabel.duran@waldbau.uni-freiburg.de

<sup>2</sup>Guayanan Center for Ecological Research,  
Universidad Nacional Experimental de Guayana, Venezuela.

Gap formation leads to drastic changes in forest microclimatic conditions and influences its nutrient cycle processes. Gaps are believed to provide microhabitats where plants are specialized. This is supposed to be an important factor behind high plant diversity in the tropics. However, after several studies, the niche differentiation of the species within gaps differs, and still is unknown for many ecosystems in the tropics. Gaps created by small scale disturbances also play an important role in forest carbon pools. The effects of gaps on carbon cycle processes, in relation to the local forest carbon models, are still not well studied.

In order to contribute to the understanding of gaps and their influence on plant diversity and carbon pools, more investigation in different ecosystems in tropical forest is needed.

This explorative research characterizes the structure of gaps in a 53.5 ha forest plot in the montane cloud forest (at 1350 m.a.s.l.) of Sierra de Lema, in the Venezuelan Guayana Shield.

Several questions have been addressed: How gaps are formed?, how large are gaps?, which is the gap shape?, is trunk thickness related with mode of gap formation and gap size?, how much is the tree basal area of the forest stand affected by the formation of gaps?, which is the size of each microhabitat in the gap ground area? which is the disturbance rate for the study area?

Poster 3:

**Durán Rangel, Cristabel<sup>1</sup>**  
**Hernández, Lionel<sup>2</sup>**  
**Sanoja, Elio<sup>2</sup>**

## **Long term research in Venezuelan Guayana forests: ecology and diversity along an altitudinal gradient in Sierra de Lema and Gran Sabana.**

<sup>1</sup>Institut for Silviculture, University of Freiburg, Germany.

Email: cristabel.duran@waldbau.uni-freiburg.de

<sup>2</sup>Guayanan Center for Ecological Research,  
Universidad Nacional Experimental de Guayana, Venezuela.

Forests constitute the biome with the largest surface in the Venezuelan Guayana, besides to be the most important country's ecosystems in terms of biomass, biodiversity, hydroelectric potential and water reserves. Those ecosystems have been affected by climate change, deforestation processes, fragmentation and biological impoverishment.

In spite of the huge importance of these forests ecosystems, the knowledge about their long term dynamics is very limited.

This explorative investigation is the first and unique long term ecological study along an altitudinal gradient in the Guayana Shield. The research focuses on the description of the abiotic and biotic characteristics of the forest ecosystems along an altitudinal gradient in Sierra de Lema and Gran Sabana, and on how such characteristics vary with time in the short-term.

The project monitors 16 different forest communities from 150 to 1.490 m.a.s.l. in 34 permanent plots (3.4 ha). The research area also includes a 53.5 ha plot initially delimited for gap studies. Fields of research, preliminary results, and forthcoming work are presented.

Poster 4:

**Egermann**

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Poster 5:

**Forbriger, Markus<sup>1</sup>**  
**Schittek, Karsten<sup>2</sup>**

## **Cushion peatlands in the western Andes of southern Peru (14°S) - first results from a new geoarchive in the context of multidisciplinary studies**

<sup>1</sup>Department of Geography - Laboratory for Geomorphology and Geoecology, Heidelberg University, Germany, Im Neuenheimer Feld 348, 69120 Heidelberg, markus.forbriger@geog.uni-heidelberg.de

<sup>2</sup>Department of Geography and Geographical Education - Palynological Laboratory, University of Cologne, Gronewaldstr. 2, 50931 Köln, Schittek@uni-koeln.de

The function of high-altitude cushion peatlands as climate archives is becoming more and more important for geoarchaeological/paleoclimatological research in the Andes. Our current research work demonstrates that they are well-suited for high-resolution paleoecological studies. These unique ecosystems, dominated by juncaceous, peat-forming cushion plants, can develop astonishing accumulation rates, depending on the topography and a permanent and balanced water input. They form below spring outlets on slopes or in valley bottoms at altitudes ranging from 4000-5000 m a.s.l. First results of multi-proxy studies on peat cores and profiles from a cushion peatland in the western cordillera of south Peru (Lucanas province) are presented. The first 37 AMS 14C dates provide a continuous chronology for the last 6000 years. Six geoelectrical tomography profiles, verified by selective coring, give detailed information about the peat thickness and the depth of the bedrock. Magnetic susceptibility measurements detect allochthonous sediment input that repeatedly followed increased surface runoff during extreme rainfall events. The results are to support further palynological, geomorphological and archaeological studies within the framework of the multidisciplinary BMBF-funded project “Andes transect - climate sensitivity of pre-Columbian man-environment-systems”.

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Poster 6:

**Francois, Jean-Pierre<sup>1</sup>**

## **Postglacial paleoecology of the forest-steppe ecotone in Patagonia**

<sup>1</sup>Seminar für Geographie und ihre Didaktik, Universität zu Köln, [geofrancois@gmail.com](mailto:geofrancois@gmail.com)

The forest-steppe ecotone is a sensitive vegetation and climate boundary in Patagonia (*sensu lato*) marking the interface between the humid environments in the western Andean slope and the eastern semi-arid areas affected by the rainshadow effect of the Andean Cordillera. Ecological studies developed along this vegetational belt, indicate strong correlations between the structure and vegetational composition with biotic (e.g. competition, herbivory) and abiotic (e.g. soil characteristic, microclimatic conditions) factors. As well, disturbance regimes like landslide, volcanism and fire play a decisive role in the vegetational landscape. Dendroecological studies suggest important linkages between the vegetal landscape and fire occurrence with climatic variability at decadal to centennial timescales, into the forest-steppe ecotone in Patagonia. This work aims show, means new high-resolution pollen records from Northern and Southern Patagonia, how the climate variability played a critical role in controlling the vegetation structure/composition and fire history into the Patagonian forest-steppe ecotone, during the postglacial.

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Poster 7:

**Knörr, Ute C.**<sup>1</sup>

## **Seed rain in northeastern Brazilian Atlantic Forest fragments**

<sup>1</sup>Institut für Systematische Botanik und Ökologie, Universität Ulm knoerru@yahoo.de

We assessed seed rain in forest fragments in order to identify differences in seed abundance, species richness, seed size, and dispersal modes with a gradient of disturbance, isolation, and fragment size. In total we installed 105 seed traps and collected seed rain during a one year period in three large and four small remnants that were surrounded by a sugarcane matrix. Total seed rain between December 2007 and November 2008 included 20,518 seeds of 150 species. Most species and seeds were dispersed by animals and there was no difference in the proportion of dispersal modes between the two categories of fragment size. However, we found a significant difference between small and large remnants in the proportion of seeds within different categories of size ( $G = 15.28$ ,  $df = 4$ ,  $p < 0.01$ ). Small fragments received a significantly higher number of very small-sized seeds (61%) in comparison to large fragments (36%). We registered more large-seeded species in the seed rain of large fragments (9.4%) than in small fragments (1.9%). The percentage of large seeds of all animal dispersed species was also lower in small fragments (33%) than in the large forest fragments (56%). A great part of large seeds was dispersed by wind or gravity (50.6%) in both categories of fragment size. In summary seed rain was biased towards very small and small-sized seeds and we registered almost a disappearance of large-seeded animal dispersed species in the seed rain of this fragmented Atlantic Forest region of Northeast Brazil.

Poster 8:

**Lara, Rubén J.<sup>1</sup>**  
**Cohen, Marcelo C. L.<sup>2</sup>**

## **Palaeolimnological studies and ancient maps confirm secular climate fluctuations in Amazonia**

<sup>1</sup>Leibniz Zentrum für marine Tropenökologie, Fahrenheitstr. 6, 28359 Bremen, Germany, ruben.lara@zmt-bremen.de

<sup>2</sup>Laboratory of Coastal Dynamics, Federal University of Pará, Avda Perimetral 2651, Terra Firme, CEP: 66077-530, Belém (Pa), Brazil, mcohen@ufpa.br

Secular Amazon discharge oscillations were investigated comparing information from ancient cartography, satellite images, palaeovegetation, sediments, anthropology and climate, focusing on the evolution of Marajó Island in the Amazon estuary. Four phases were identified. (I) 800-1200 AD: Amazon discharge increased gradually and eastern Marajó was a vegetation-free tidal plain with energy oscillations. (II) 1200-1350 AD was a dry period with lower river discharges, lower energy, increasing water salinities and maximum mangrove extension, coinciding with the extinction of chiefdoms in Marajó. (III) 1350-1540 AD: Amazon discharge increased rapidly, inducing a dominance of freshwater vegetation, inundation of east Marajó and likely a regional rise of relative sea-level (RSL). (IV) 1540-1750 AD: RSL decreased, coinciding with an El Niño-related intense drought ca. 1600 AD. Emergence of eastern Marajó was rapid and completed in the 18th century, under RSL stabilization to current values. The approach used provided evidence of intermittent large changes in Amazon climate, and can facilitate the prediction of future regional dynamics.

Poster 9:

**Martinez M.**<sup>2</sup>

**Ortega R.**<sup>2</sup>

**Molina M.**<sup>2</sup>

**Angulo J.**<sup>2</sup>

**Janssens M.**<sup>1</sup>

## **Monitoring biochemical quality indicators for compost from residues of the pisco industry in Chile.**

\*INRES -Institut für Nutzpflanzenwissenschaften und Ressourcenschutz INRES, Uni-Bonn Tropical Crop Sciences, Auf dem Hügel 6, D-53121 Bonn. mmmartin07@gmail.com; marc.janssens@uni-bonn.de

<sup>2</sup>Departamento de Industrias, Universidad Técnica Federico Santa María, Av. Santa María 6400, Vitacura. Santiago, Chile. rodrigo.ortega@usm.cl

Properly using solid residues from the pisco industry, namely bunch stems and grape pomace, is a challenge for Chilean producers. The goal is to try to use all the available residues while obtaining a high quality compost material that can be safely applied to the soils that have low organic matter contents.

Seven different mixtures of materials, including bunch stems and pomace, goat manure, and wheat straw, yielding initial C/N ratios ranging between 25-35:1, were prepared. The composting process took place in winter time during a 20-week period at the Varillar location (70.77°; 30.73° south latitude) near the city of Ovalle. The process was monitored weekly, measuring temperature, pH, and EC of each mixture pile. At compost maturity, the humic and fulvic fractions, as well as specific enzyme activity, and some chemical properties of each resulting compost were determined. Enzymes included  $\beta$ -glucosidase, acid and alkaline phosphodiesterases, and urease. Chemical parameters included C, N, P, K, and metals.

The results indicated that even under very low temperature conditions which in some periods reached below zero, it was possible to obtain good quality compost, according to Chilean technical standard Nch2880.

On the other hand, enzymatic activity and the size of the humic and fulvic fractions of the resulting compost were sensitive indicators of its maturation and its final quality, allowing choosing the best mixtures and optimizing the composting process.

Poster 10:

**Montero, Carlos<sup>1</sup>**  
**Wittmann, Florian<sup>2</sup>**  
**Reif, Albert<sup>3</sup>**

## **Floristic and structural variations of black-water inundation forest (igapó) in relation to hydro-chemical gradients, Rio Negro, Central Amazonia**

<sup>1</sup>Institute of Silviculture, University of Freiburg, Germany, National Institute for Research in the Amazon (INPA), Manaus, Brazil. carlos.montero@waldbau.uni-freiburg.de

<sup>2</sup>Max Planck Institute for Chemistry and Biogeochemistry, INPA/Max Planck Project, 69060-001 Manaus, Brazil, f.wittmann@mpic.de

<sup>3</sup>Institute of Silviculture, University of Freiburg, albert.reif@waldbau.uni-freiburg.de

The Negro River drains an area of approximately 700.000 km<sup>2</sup> and is one of the largest rivers on Earth. It seasonally floods large parts of surrounding lowlands, which are covered by forest. Despite its large extent there is little information on tree species composition and diversity of Igapó forest and knowledge about its phytogeography is limited. Most floristic studies concentrated largely on the lower sections of the Negro river. In these areas local floristic patterns are relative well known, but a comprehensive analysis of gradients influencing diversity and composition across the river is still lacking. Variations of the water-level fluctuations which increase from 3.2m (upper Negro) to 9.8 m (lower Negro) corresponding to an inundation period ranging from 50 to 250 days and variations in the nutrient status of alluvial soils influence floristic patterns and structural characteristics of flooded forests. This study is an ongoing research aiming to understand how the height and duration of inundation and the chemistry of alluvial soil determines and condition the flora and structure of the Igapó forest. Three sampling sites in the upper, middle and lower Negro have been selected. In each site three plots (3x1 ha) all trees >10 cm dbh will be registered. Soil samples and data on height (cm) and duration (days) of inundation in each plot will be also collected. Soil samples will be collected, and height (cm) and duration (days year<sup>-1</sup>) of flooding will be monitored in relation to the next water gauge. This study will contribute to increase knowledge about the local flora which might be important for the development of sustainable forest management practices. It will also provide important answers to understand the landscape evolution and ecological interactions between Igapó forest and adjacent floodplain systems and terra firme, especially during younger geologic eras.

Poster 11:

**Verhaagh, Manfred<sup>1</sup>**  
**Rabeling, Christian<sup>2</sup>**

## ***Martialis heureka* Rabeling & Verhaagh, representing a new ant subfamily and the sister lineage to all extant ants.**

<sup>1</sup>Staatl. Museum für Naturkunde Karlsruhe, Erbprinzenstr. 13, D-76133 Karlsruhe, Germany;  
manfred.verhaagh@smnk.de

<sup>2</sup>University of Texas, Austin, USA

A new species of blind, subterranean, predatory ant discovered in the Amazon rainforest is likely a descendant of the early ants to evolve. We named the new ant *Martialis heureka*, which translates roughly to "ant from Mars, we found it", because the ant has a strange combination of morphological characters. The approx. three millimeters long, pale ant has no eyes and long, slender mandibles of a unique form. It dwells apparently in the soil and seems to be a specialized predator of some kind of other small soil animals.

The ant belongs to its own new genus, *Martialis*, and subfamily, *Martialinae*, one of now 21 subfamilies in living ants. This is the first time since 1923 that a new subfamily of ants with a living species has been discovered. Analysis of DNA from a leg of the only known specimen confirmed its phylogenetic position at the very base of the ant evolutionary tree.

As it has been found in the vicinity of Manaus, Brazil, one of the best studied places in the Amazon region, *Martialis* is an example how many interesting and important soil animals in terms of their ecology and phylogeny are still waiting to be discovered in tropical soils.

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Poster 12:

**Rabeling, Christian<sup>1</sup>**  
**Verhaagh, Manfred<sup>2</sup>**

## **Fungus-gardening ants help fertilize nutrient deprived tropical soils**

<sup>1</sup>University of Texas at Austin

<sup>2</sup>Staatl. Museum für Naturkunde Karlsruhe, manfred.verhaagh@smnk.de

Human agricultural activities contribute to the deprivation of nutrients from tropical soils and within a few years time diverse rainforests can turn into barren lands. Non-herbivorous fungus-gardening ants (Formicidae: Attini) seem to counteract this development and may facilitate the regeneration of biochemically impoverished clay soils in the Central Amazon Basin. In forest agroecosystems near Manaus, Brazil, we observed high densities of fungus-gardening ant colonies from the genera *Mycocepurus* and *Trachymyrmex*. To determine the quantitative effect these soil nesting ants have on their environment we mapped the densities of their colonies, identified the underground architecture of their nests, determined the nutrient intake of a colony under controlled conditions and approximated the metabolic rate of the ant's fungal mutualist. With these factors at hand we calculated that lower non-herbivorous attines have a comparable intake of biomass as colonies of leafcutting attines from the genera *Atta* and *Acromyrmex*. In contrast to leafcutter ant colonies, lower attines occur in high densities and the chambers of their nests are evenly distributed in the soil matrix, suggesting that lower attines do not only increase the availability of nutrients, but also disperse nutrients more evenly in the soil matrix than the herbivorous leafcutter ants.

## Teilnehmerliste

Miguel Alvarez	Isaac Marques Marninez
Milena Arias-Schreiber	Maria Martinez
Stephan Blank	Tobias Mika
Hans Jürgen Böhmer	Lydia Moecklinghoff
Sabrina Bucken	Juan Carlos Montero
Ulrich Deil	Juana Palma
Cristabel Durán-Rangel	Pia Parolin
Manuela Egermann	Barbara Ruthsatz
Markus Forbriger	Ulrich Saint-Paul
Jean-Pierre Francois	Karsten Schittek
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Heiko Hentrich	Alexandra Schuh
Peter J. Horchler	Peter Schwalb
Ulrich Irmeler	Mikola Seeliger
Wolfgang Junk	Silke Straßel
Thomas Kimmel	Rodrigo Vargas
Andrea Klug	Manfred Verhaagh
Ute Christiane Knörr	Manfred Verhaagh
Yvonne Kruschinski	Karl Matthias Wantzen
Rubén José Lara	Eike Stefan Wulfmeyer
Lasse Lemm	