Press Releases 2012

18th December 2012

Bringing big data to biodiversity

EU-funded project EU BON will build the European gateway for integrated biodiversity information

On 1st December 2012, a new large scale collaborative research project "EU BON" (Building the European Biodiversity Observation Network) has started. The consortium consists of 30 research institutions from 15 European countries, Brazil, Israel, the Philippines, and more than 30 associated partners. EU BON is supported by the European Commission with ?9 mio and will be coordinated by Dr. Christoph Häuser from the Museum für Naturkunde ? MfN in Berlin, Germany.

On 1st December 2012, 30 research institutions from 15 European countries, Brazil, Israel and the Philippines, and more than 30 associated partners started EU BON - ?Building the European Biodiversity Observation Network?. This ?9 million, EU-funded research project aims to advance biodiversity knowledge by building a European gateway for biodiversity information, which will integrate a wide range of biodiversity data ? both from on ground observations to remote sensing datasets ? and make it accessible for scientists, policy makers, and the public.
The project plans to advance the technological platform for GEO BON (Group on Earth Observations Biodiversity Observation Network) to improve the assessment, analysis, visualisation and publishing of biodiversity information, and to enable better linkages between biodiversity and environmental data. EU BON will ensure a timely provision of integrated biodiversity information needed to meet the global change challenges and to contribute for next generation environmental data management at national and regional levels.
?Global problems arising from rapidly changing environmental conditions and biodiversity loss require internationally coordinated solutions? said the project coordinator Dr. Christoph Häuser from the Museum für Naturkunde ? MfN, in Berlin, Germany. ?Current biodiversity observation systems and environmental data are unbalanced in coverage and not integrated, which limits data analyses and implementation of environmental policies. A solution seems impossible without real integration of biodiversity data across different spatial, temporal, and societal scales?, added Dr Häuser.

EU BON will deliver several important products, including a European integrated biodiversity portal, a roadmap for EU citizen sciences gateway for biodiversity data, an open data publishing and dissemination framework and toolkit, a policy paper on strategies for data mobilisation and use in conservation, a prototype of integrated, scalable, global biodiversity monitoring schemes, strategies for EU-integrated national and regional future biodiversity information infrastructures, and a sustainability plan for regional and global biodiversity information network.
The cooperation for data integration between biodiversity monitoring, ecological research, remote sensing and information users will result in proposing a set of best-practice recommendations and novel approaches with applicability under various environmental and societal conditions. A key task of EU BON is to harmonise future biodiversity monitoring and assessments and to engage wider society groups, such as citizen scientists and other communities of practise.
Although focussing primarily on European biodiversity and collaborating with major EU initiatives (e.g. LifeWatch and others), EU BON will also collaborate closely with worldwide efforts such as GEO BON, GBIF, the Convention on Biological Diversity (CBD), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and others. EU BON will be a valuable European contribution to the Global Earth Observation System of Systems (GEOSS), and be built on the GEO principles of open data sharing.

The kick-off meeting of EU BON will take place on 13-15 February 2013 at the Museum für Naturkunde ? MfN in Berlin, Germany and will be preceded by a symposium "Nature and governance: biodiversity data, science and policy interface? on 11-12 February 2013.

26th October 2012

Discovery of a gigantic fossil turtle accumulation announced

A joint effort of German and Chinese paleontologists discovered a spectacular fossil locality with approximately 1800 Jurassic turtles in northwestern China. The scientific study announcing the find was just published in the interdisciplinary scientific journal `Naturwissenschaften`. Involved are the paleontologists Oliver Wings (visiting scientist at the Museum of Natural History Berlin) and Walter Joyce (University of Tübingen).

?One bone next to the other, we could not believe our eyes? says Dr. Oliver Wings, paleontologist and visiting scientist at the Museum of Natural History Berlin. He speaks of Mesa Chelonia, a spectacular new site of fossil turtles from the Jurassic period just described in the interdisciplinary scientific journal `Naturwissenschaften.` Wings and his colleagues calculated that a total of about 1800 turtles belonging to the genus Annemys were buried at the locality in a remote part of northwestern of China.
"This site probably more than doubles the known number of Jurassic turtles world-wide" says co-leader and co-author Dr. Walter Joyce from the University of Tübingen, "the turtle shells are literally stacked upon each other in the rock." The so-called bone bed consists exclusively of turtle remains.

Wings, Joyce, and colleagues have been working actively in the desert regions of northwestern China since 2007 and have discovered abundant remains of sharks, crocodiles, mammals, and several dinosaur skeletons. What is today one of the driest places on Earth, was once a green river and lake scenery, teeming with life, some 160 million years ago. However, the scientists were able to demonstrate that living conditions were not always ideal, even back then: climate change caused severe episodic droughts that probably led to the formation of the unique fossil turtle assemblage.

The turtles likely gathered during a drought in a receding water hole and waited for the return of rain. Similar behavior is known from today's turtles in semi-tropical settings, such as those found in Australia today. But in this case, the rain came too late: many turtles were already dead, their carcasses disintegrating. When the waters returned, it was with great force: heavy rains caused a mud-flow, carrying turtles and freshly deposited sediment for a short distance. Evidence for this sequence is found in the sediments surrounding the turtles.

The high number of animals at the Mesa Chelonia locality will allow scientists for the first time to draw conclusions about variability, growth, and morphological differences among Asian Jurassic turtles. Future fieldwork will focus on the spectacular dinosaurs discovered so far, although the team is still looking for sponsors.

Publication: http://www.springerlink.com/openurl.asp?genre=article&id=doi:10.1007/s00114-012-0974-5

26th September 2012

Science is future

Special exhibition 3.10. - 31.12.2012

With its collections, its science and facility services, the museum has far more to offer than what visitors normally can see. In this special exhibition, we present the most important, most interesting and most curious projects within the past three years.

Since 2009 the Museum für Naturkunde is one of eight research museums of the Leibniz Association. Its three main objectives are:

- to conduct cutting-edge research on an international level
- to develop its outstanding collections as a globally significant scientific infrastructure
- to be a bridge between science and society, exercise leadership in public engagement in science and to support developments towards a more scientifically literate citizenry

more information (in german)

28th August 2012

Inside the ear of a dinosaur - X-ray computed tomography reveals the lifestyle of the Tendaguru dinosaur Dysalotosaurus

One century ago the Museum für Naturkunde Berlin, Germany, conducted its famous dinosaur excavations in the more than 150 million-year-old Jurassic deposits of the Tendaguru hill, in what is now Tanzania in East Africa. Through the tremendous help of their African field assistants, German scientists discovered beautifully preserved skeletons of many dinosaurs, among those such popular animals as the gigantic plant-eater Brachiosaurus brancai. The Tendaguru dinosaurs have become hallmarks of every paleontology textbook, and some even made it into movies. But despite a century of research, only little is known about the biology of these animals. Especially features that are not preserved as fossils, such as behavior and sensory perception, have remained largely a mystery.

To shed more light on the ancient dinosaur life of Tendaguru, researchers Gabriela Sobral, Christy Hipsley and Johannes Müller from the Museum für Naturkunde Berlin applied an approach that only recently became available to paleontologists: micro-computed tomography, also called CT. This method allows fossilized skulls like that of a dinosaur to be X-rayed and virtually reconstructed in three dimensions, making it possible to visualize internal anatomical structures otherwise obscured by rock. In their study, which will be published on August 28 in the Journal of Vertebrate Paleontology, Gabriela Sobral and colleagues investigated the hind part of the skull of one of the smaller species of the Tendaguru dinosaurs, the plant-eating Dysalotosaurus lettowvorbecki using CT technology. The team was particularly interested in knowing if the structure of the inner ear and the so-called semicircular canals of Dysalotosaurus can tell us anything about the hearing abilities and behavior of this animal.

Their analysis revealed that Dysalotosaurus possessed a mixture of both primitive and modern features in a combination previously unknown for dinosaurs. In the region where the ear had been, the sidewall of the braincase shows two openings instead of one, a feature known to improve hearing since it creates a more efficient mechanism that avoids loss of energy in sound transmission. Also, the cochlea of the inner ear, a structure also important for hearing in humans, was short and did not allow for the fine discrimination between high- and low-frequency sounds. "We were able to estimate the hearing range and average hearing frequency of Dysalotosaurus", says Gabriela Sobral, "and found it somewhat intermediate between that of modern crocodiles and birds, the two closest living relatives of dinosaurs. So it had a hearing capacity similar to those of ostriches and herons.? Another remarkable discovery was that the lateral semicircular canal, a fluid-filled tube in the inner ear, is longer than the other two and was tilted towards the snout. The orientation of these canals has a strong influence on the balance and head posture of vertebrate animals. "The increased

length of this canal suggests that side movements of the head were more important for Dysolotosaurus than moving its head up and down or swinging it from side to side", says Sobral, "And its tilting indicates that the animal had a horizontal head posture when alert, which is known in animals that primarily rely on senses other than vision." Like many of the modern plant-eating mammals, Dysalotosaurus was probably a preferred prey target of its carnivorous relatives, and used its refined hearing senses to escape predattion. "Just a few years ago such a study would have been impossible," says Sobral, "but CT technology has dramatically changed the way we can do paleontology."

17th August 2012

A new perspective on an ?anomalous island?

Björn Stelbrink, Thomas von Rintelen (Museum für Naturkunde Berlin) and colleagues used geological reconstructions and molecular phylogenies to analyze and date the origin and distribution of selected animal groups on the island Sulawesi. They could show that most animal groups such as grasshoppers, frogs, tree squirrels, shrews, macaques and tarsiers came from the Asian mainland. How did they get to Sulawesi? By swimming, flying or just drifting about.

Sulawesi, an odd k-shaped island in the centre of Indonesia, is fascinating for zoologists and biogeographers alike, as it does not only host a diverse endemic fauna, but has a rather unique geological history as well. The geographic relationship of some of the island?s animals like the conspicious babirusa remained enigmatic at first, which more than 150 years ago prompted the famous English naturalist Alfred Russel Wallace to call it an ?anomalous island?. A recently published study by Björn Stelbrink, Thomas von Rintelen (Museum für Naturkunde) and colleagues in the journal Evolution used geological reconstructions and molecular phylogenies to infer and date the origin and distribution of selected animal groups from the island. They could show that the majority of groups studied came from the Asian mainland and found their way to Sulawesi presumably by wind drifting, rafting and swimming, especially when the sea level was (climate-driven) low in the last 10 million years. However, for some animal groups from Sulawesi with an origin in Australia continental fragments may have acted as ?rafts?.

Publication: http://onlinelibrary.wiley.com/doi/10.1111/j.1558-5646.2012.01588.x/abstract

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25th July 2012

Growing threats to biodiversity ?arks?

Many of the world?s tropical protected areas are struggling to sustain their biodiversity.

This has been shown by a study just published in Nature by more than 200 scientists from around the world, including Mark-Oliver Rödel from the Museum für Naturkunde ? Leibniz Institute for Research on Evolution and Biodiversity in Berlin. Mark-Oliver Rödel is a distinguished expert of the amphibians in West Africa.

more information ...

20th April 2012

The Secretariat of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) will be accommodated in Germany

?Germany has shown its impressive role to conserve biological diversity?, Johannes Vogel, general director of the Museum für Naturkunde Berlin, comments happily the decision from Panama to establish the Secretariat of the Intergovernmental Platform on Biodiversity and Ecosystem Services in Bonn, Germany. Germany is trusted due to its engagement for nature and environment. With its successful application Germany demonstrates that research on biodiversity and the dialogue between science and policy are important for human well-being, and that Germany takes responsibility.

IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) will enforce the interface between science and policy and support the implementation of scientific knowledge into political decisions. With this platform, the impact of political decisions will be assessed ex ante in order to serve human welfare and the conservation of biological diversity. Johannes Vogel stresses: ?Germany has a broad scientific expertise; last not least the Leibniz Association with its institutes organized for biodiversity research offers an outstanding surrounding. Bonn as base for the IPBES is an excellent decision. Now it is our responsibility to show how Germany as science and culture nation supports the future of the planet. The Museum für Naturkunde Berlin is happy to contribute to this important challenge.?

At national scale there is already a platform, the Network-Forum on Biodiversity Research Germany, which supports the dialogue between different disciplines as well as between science, policy and praxis. The Museum für Naturkunde Berlin contributes significantly to its performance.

To see, or not to see: that is the question

29th March 2012

It is a fundamental topic in evolution to understand which features of organisms promote long life and high diversity. In a new study, published as a featured article in the journal Paleobiology, paleontologists from the Museum für Naturkunde Berlin in Germany investigate whether the possession of eyes is a key advantage that leads to evolutionary success in the long run.

Rather than most vertebrates such as fish and mammals, for which the importance of eyes is self-evident, Martin Aberhan and colleagues studied fossil invertebrates that inhabited ancient seas over the past 540 million years. Trilobites, ammonoids, some clams and snails, and others used their eyes to orient and navigate in their environment, avoid predators, and locate food and mates.
The proportional diversity of sighted genera was highest in the Middle Cambrian to Middle Ordovician interval, shortly after the first animals with well-developed eyes occurred in the early Cambrian. The most likely explanation suggests that, with the first appearance of large predators in Cambrian seas, the selection pressure to develop eyes changed markedly compared to the paradisical, largely predator-free conditions for animals in late pre-Cambrian times. After this peak the proportion of sighted invertebrates fell to a fairly low and stable level that lasts until today. This pattern seems to contradict the primary hypothesis that eyes offer such a strong evolutionary advantage that their possessors outcompeted their blind comtemporaries.
However, Aberhan and collaborators looked more closely and compared the diversity histories within those clades that contained both blind and sighted genera. "Otherwise we run the risk to compare apples and oranges, because evolutionary rates differ strongly among groups of animals", Aberhan explains. These more refined analyses within trilobites, scallops, snails, and seastars and their relatives revealed preferential diversification of sighted genera. The underlying mechanism were significantly higher extinction rates of blind representatives within these groups, confirming the beneficial effect of eyes in the evolution of marine invertebrates. Thus - in slight modification of a well-known Shakespearean quotation ? to see, or not to see, that is the question.

In the footsteps of prehistoric elephants

22th February 2012

Seven-million-year-old footprints from the Arabian Desert provide the oldest known evidence of how elephant ancestors interacted socially.

The Mleisa 1 site in the United Arab Emirates features exceptionally long trackways of a single herd of at least 13 elephant individuals. The herd walked through mud and left footprints that hardened, were buried, and then re-exposed by erosion. Analysis of trackway stride lengths reveals the herd contained a diversity of sizes, from adults to a young calf, making this the earliest direct evidence of social structure in prehistoric elephants ever discovered.

more information ...