

Thanks for the feedback! [Undo](#)
We'll use your feedback to review ads on this site.



NEW: Find **great deals** on the latest gadgets and more in the **ScienceDaily Store!**



Health Tech Enviro Society Quirky Store

A- A A+

Search



Science News

from research organizations

Print Email Share

Temperature drives biodiversity

Date: December 22, 2016

Source: University of Würzburg

Summary: Why is the diversity of animals and plants so unevenly distributed on our planet? An international research team of researchers has provided new data on this core issue of ecology. They found biodiversity to be driven by temperature.

Share:

RELATED TOPICS

FULL STORY

Plants & Animals

- > Nature
- > New Species
- > Endangered Plants

Earth & Climate

- > Biodiversity
- > Rainforests
- > Earth Science

Elabscience® Antibody

Antibody

Primary, Secondary and Flow Cytometry Antibody

20000+ Antibodies Application in ELISA, WB, IHC, IF.

Check Now

RELATED TERMS

- > Biodiversity
- > Unified neutral theory of biodiversity
- > Zoo
- > Biodiversity hotspot
- > Herbivore
- > Ocean current



The diversity of plants and animals decreases as temperatures fall. This photo was taken on Mount Kilimanjaro at an altitude of around 3,800 meters.

Credit: Andreas Ensslin

The diversity of plants and animals in Earth's arctic regions is moderate. Tropical latitudes in contrast are teeming with different species where new organisms are being discovered all the time.

What is the cause of this uneven distribution? Why are the tropics home to more species than higher latitudes? "This question has intrigued ecologists for some time," says Professor Ingolf Steffan-Dewenter from the University of Würzburg's Biocenter. "Already about ten years ago, the publishers of *Science* declared this to be one of the 25 most important questions of science to be answered yet."

Several hypotheses circulating

To date, this core question has been subject to controversy. One hypothesis, for instance, is that the primary productivity of a habitat is ultimately decisive for the number of species living there. Simply put: "A larger cake can sustain more species than a small one," explains Würzburg ecologist Dr. Marcell Peters. Another hypothesis assumes that the rate of evolution and speciation depend on temperature. According to this assumption, more species thrive in a warmer climate than in a cold one.

So far, these hypotheses have been examined usually by focusing on selected groups of species: For example, the studies observed only birds, bees, ants or ferns and analysed their diversity in different regions of the world, e.g. in North America, Europe or along elevational gradients in the Alps. "Some studies supported one hypothesis, whereas others backed another assumption," Peters says and states that it is still a long way from establishing a "general rule" which ecologists are aiming for.

Unique study conducted at Mount Kilimanjaro

In the journal "*Nature Communications*" Peters and the team of the Research Unit "FOR1246" funded by the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG) now present a new study which is unique so far and is the synthesis of four years of working: "On Mount Kilimanjaro, one of Earth's largest climatic gradients, we observed so many animal and plant groups in parallel as never before," the researcher says.

Overall, the team examined eight groups of plants and 17 groups of animals, from bees to bats. 38 scientists from Germany, Tanzania and other countries participated in the large-scale study; they were supported by around 50 local drivers, carriers and other assistants. "We had to climb in mountainous areas for several days to reach the highest study sites," Peters says.

The area of study stretched from the savannahs at the foot of the mountain to the habitats at an altitude of 4,550 metres that barely sustain plants. The data across all groups were collected over the same areas and in the same period of time, respectively. "This approach allowed us to not only analyse the biodiversity of each individual group, but also that of whole communities."

Diversity increases with temperature

The study revealed that biodiversity in communities is mainly determined by temperature. The warmer it is, the greater the diversity. "The more groups of animals and plants you investigate in parallel, the greater the significance of temperature for explaining biodiversity, whereas the importance of all other variables decreases accordingly."

The scientists believe that this is strong evidence supporting the assumption that temperature is actually more decisive for distribution patterns of overall biodiversity than productivity or size of habitats.

Story Source:

Materials provided by **University of Würzburg**. Original written by Robert Emmerich. *Note: Content may be edited for style and length.*

Journal Reference:

- Marcell K. Peters, Andreas Hemp, Tim Appelhans, Christina Behler, Alice Classen, Florian Detsch, Andreas Ensslin, Stefan W. Ferger, Sara B. Frederiksen, Friederike Gebert, Michael Haas, Maria Helbig-Bonitz, Claudia Hemp, William J. Kindeketa, Ephraim Mwangomo, Christine Ngeresa, Insa Otte, Juliane Röder, Gemma Rutten, David Schellenberger Costa, Joseph Tardanco, Giulia Zancoli, Jürgen Deckert, Connal D. Eardley, Ralph S. Peters, Mark-Oliver Rödel, Matthias Schleuning, Axel Ssymank, Victor Kakengi, Jie Zhang, Katrin Böhning-Gaese, Roland Brandl, Elisabeth K.V. Kalko, Michael Kleyer, Thomas Nauss, Marco Tschapka, Markus Fischer, Ingolf Steffan-Dewenter. **Predictors of elevational biodiversity gradients change from single taxa to the multi-taxa community level.** *Nature Communications*, 2016; 7: 13736 DOI: 10.1038/ncomms13736

Cite This Page:

MLA APA Chicago

University of Würzburg. "Temperature drives biodiversity." ScienceDaily. ScienceDaily, 22 December 2016. <www.sciencedaily.com/releases/2016/12/161222095844.htm>.

facebook

Create a Facebook profile
Sign up for free and connect to the world

Sign Up

Related Stories

- Biodiversity Protects Fish from Climate Change**

May 16, 2016 — Fish provide protein to billions of people and are an especially critical food source in the developing world. Today marine biologists confirmed a key factor that could help them thrive through the ... [read more »](#)
- Biodiversity Helps Grassland Resist Extreme Weather**

Oct. 16, 2015 — Using data from 46 experiments on grassland plant diversity, an international team of researchers has shown that high biodiversity increases the resistance of such ecosystems to a wide range of ... [read more »](#)
- Species Richness and Genetic Diversity Do Not Go Hand in Hand in Alpine Plants**

Sep. 25, 2012 — Researchers have demonstrated for the first time that a high level of species diversity in alpine plants does not necessarily go hand in hand with a high level of genetic diversity. This finding ... [read more »](#)
- Research Reveals Contrasting Consequences of a Warmer Earth**

Sep. 3, 2012 — A new study involving analysis of fossil and geological records going back 540 million years suggests that biodiversity on Earth generally increases as the planet warms. But the research says that ... [read more »](#)

Strange & Offbeat

PLANTS & ANIMALS

- Mass Insect Migrations in UK Skies**
- Artificial Leaf as Mini-Factory for Drugs**
- 'Glue' That Makes Plant Cell Walls Strong Could Hold the Key to Wooden Skyscrapers**
- Giant Cell Blob Can Learn and Teach, Study Shows**

EARTH & CLIMATE

- Exciting New Creatures Discovered on Ocean Floor**
- New, Complex Call Recorded in Mariana Trench Believed to Be from Baleen Whale**
- Reindeer Left Hungry, Shrinking in Warming World**
- Against the Tide: A Fish Adapts Quickly to Lethal Levels of Pollution**

FOSSILS & RUINS

- Ancient Rocks Hold Evidence for Life Before Oxygen**
- Molasses Creates a Sticky Situation**
- Herbivorous Mammals Have Bigger Bellies**
- Early Humans Used Innovative Heating Techniques to Make Stone Blades**

Osmometer made in Germany

Fast and effective measuring - competent after sales service!

gonotec.com



Powered by Google

Algae Harvesting

Ad evodos.eu

Men who buy sex have much in...

sciencedaily.com

Professional Bio Reagents

Ad elabscience.com

Mammal-like reptile survived...

sciencedaily.com

ISO14001:2015 EMS Manuals ...

Ad globalqualityvillage.com

World's Oldest Living Tree ...

sciencedaily.com

It's all in the eyes: Women and men...

sciencedaily.com

Small-scale nuclear fusion...

sciencedaily.com

Recommended Articles

- Coffee growing: More biodiversity, better harvest

Senckenberg Research Institute and Natural History Museum, ScienceDaily , 2014
- Mountain ranges may act as 'safe haven' for species facing climate change

Wiley-Blackwell, ScienceDaily , 2011
- Impact of climate change on microbial biodiversity

University of Helsinki, ScienceDaily , 2016
- Where have all the flowers gone? High-mountain wildflower season reduced, affecting pollinators like bees, hummingbirds

National Science Foundation, ScienceDaily , 2011
- Climate change models may underestimate extinctions: Animals and plants could be on a collision course created by climate change

University of Connecticut, ScienceDaily , 2012

- Breast Cancer Risk No Higher in Transgender Patients [↗](#)

Endocrinology Advisor , 2015
- Review: Hypogonadism Guidelines Require Updating [↗](#)

Natasha Persaud, Endocrinology Advisor , 2015
- Cancer Clusters (Fact Sheet) [↗](#)

Oncology Nurse Advisor , 2015
- Pressures Mount for Cancer Care Providers, ASCO Report Warns [↗](#)

Bryant Furlow, Cancer Therapy Advisor , 2015
- Plant-Based Diet May Cut Cardiovascular Risk in Obese Children [↗](#)

Endocrinology Advisor , 2015

Powered by Trend MD

Free Subscriptions

Get the latest science news with ScienceDaily's free email newsletters, updated daily and weekly. Or view hourly updated newsfeeds in your RSS reader:

- Email Newsletters
- RSS Feeds

Follow Us

Keep up to date with the latest news from ScienceDaily via social networks:

- Facebook
- Twitter
- Google+
- LinkedIn

Mobile Apps

Get the latest news from ScienceDaily via our free mobile apps, available for download on the following platforms:

- iPhone/iPad
- Android

Have Feedback?

Tell us what you think of ScienceDaily -- we welcome both positive and negative comments. Have any problems using the site? Questions?

- Leave Feedback
- Contact Us