

JRC organises symposium on Soil Biodiversity at AAAS 2009

Life beneath our feet: research on biodiversity in our soils

The European Commission's Joint Research Centre (JRC) will host a symposium on soil biodiversity at the annual meeting of the American Association for the Advancement of Science (AAAS) in Chicago on 15 February 2009. The session will present an overview of current understanding in the field and attempt to explain the various pressures 'life in our soils' is currently under, with an analysis of recent developments that have enhanced our understanding of this crucial, yet unknown ecosystem. The challenges faced by the research community in its support for the sustainable use of this critical, non-renewable natural resource will also be addressed.

The session will be moderated by Professor Diana H. Wall from Colorado State University and contains presentations by Professor Karl Ritz from Cranfield University (UK) on the role of soil biodiversity as the biological engine of the Earth. Professor Volkmar Wolters from the Institute for General and Special Zoology in Giessen, Germany, will discuss the implications of land use and climate change on soil biodiversity and Professor Ciro Gardi from the University of Parma in Italy will discuss novel methods to assess the loss of soil biodiversity, upon which she is currently working at the European Commission's Joint Research Centre in Ispra, Italy.

There are often more organisms in one handful of soil than human beings on the entire planet¹. However, our understanding of these complex communities is limited. In order to overcome the challenges associated with investigating soil biodiversity the JRC, the European Commission's in-house scientific service, in close cooperation with some of the world's leading soil biologists, is exploring new ways of understanding the crucial role played by living organisms in sustaining life on the planet.

Despite increasing awareness of soil biota's role in agriculture, hydrology and greenhouse gas fluxes, soil biodiversity is increasingly under threat. Virtually all key ecosystem functions provided by soil are controlled by biological drivers and are now at risk due to climate change, pollution and poor land use practices. The JRC's 'SOIL' research action at the Institute of Environment and Sustainability (IES) in Ispra, Italy, is at the forefront of research into developing new insight into soil biodiversity and the ecosystem services it provides.

¹ Lavelle et Spain, 2001

Soil: an underappreciated ecosystem.

Soil is a major habitat for plants and animals. Billions of organisms can be present in just one handful. 200g of healthy, arable soil can contain 0.5g of living matter, mostly bacterial. This can equate to five tonnes per hectare. The values for soil under natural grasslands can be 20 times greater, equivalent to 2000 sheep per hectare. In reality soil provides living matter with the necessary resources (food, air and water) and living space for life.

Within the soil, fungi, bacteria, nematodes, arthropods, earthworms and mammals form a complex food web that is still only partially understood. The danger is that climate change together with the increasing use of agro-chemicals and the rapid decline in organic matter content due to land use change and intensive arable farming are threatening the diversity of organisms in soil.

Little is known of the consequence of climatic changes on the drivers of the major nutrient cycles or the impact of genetically modified crops on the gene pool in soil. Moreover, we have no full list of species that live beneath our feet. Protecting soil habitats against the negative impacts of human activities that could threaten biodiversity is as important as the safeguarding of natural habitats above ground but this is often ignored. Legislators and policy makers require relevant information from the research community in order to change this.

United Nations Convention on Biodiversity

In the framework of the Convention on Biodiversity (CBD), an international treaty aimed at sustaining the diversity of life on Earth, and in cooperation with the United Nations Food and Agriculture Organisation (FAO), the JRC is acting to raise awareness of soil biodiversity and to ensure its place on the policy agenda. In Europe, increasing attention is being paid to soil, as demonstrated by the European Community Biodiversity Strategy (Halting biodiversity loss by 2010) and the Thematic Strategy for Soil Protection (EU COM(2006)231). Alongside further research, these steps are of fundamental importance to the future sustainable management of soil.

Additional information

<http://eusoils.jrc.ec.europa.eu/library/themes/biodiversity/>

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More on AAAS 2009

This year's edition of the AAAS annual meeting takes place in Chicago from 12-16 February 2009. The conference theme is "Our Planet and Its Life: Origins and Futures", in recognition of the 200th anniversary of Charles Darwin's birth and the 150th anniversary of the publication of his book, *On the Origin of Species by Means of Natural Selection*. The JRC is contributing to the event with five sessions:

- New approaches to the therapy of infectious diseases (topical lecture)
- Keeping the lights on: the revival of nuclear energy for our future
- Life beneath our feet: research challenges in soil biodiversity
- Preimplantation genetic diagnosis: beyond natural selection?
- Nanofood for Healthier Living?

<http://www.aaas.org/>