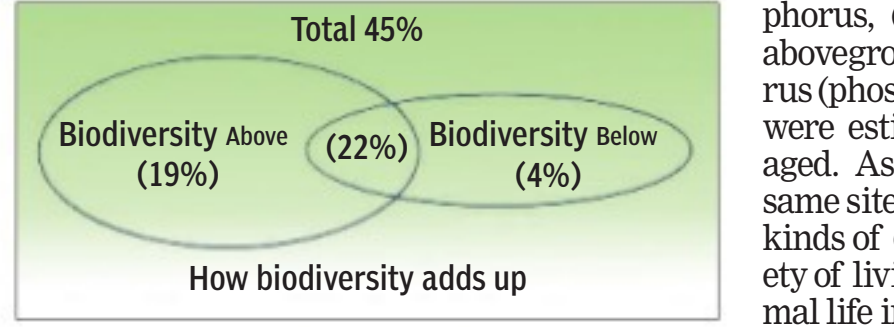


Conducting an ecological choir

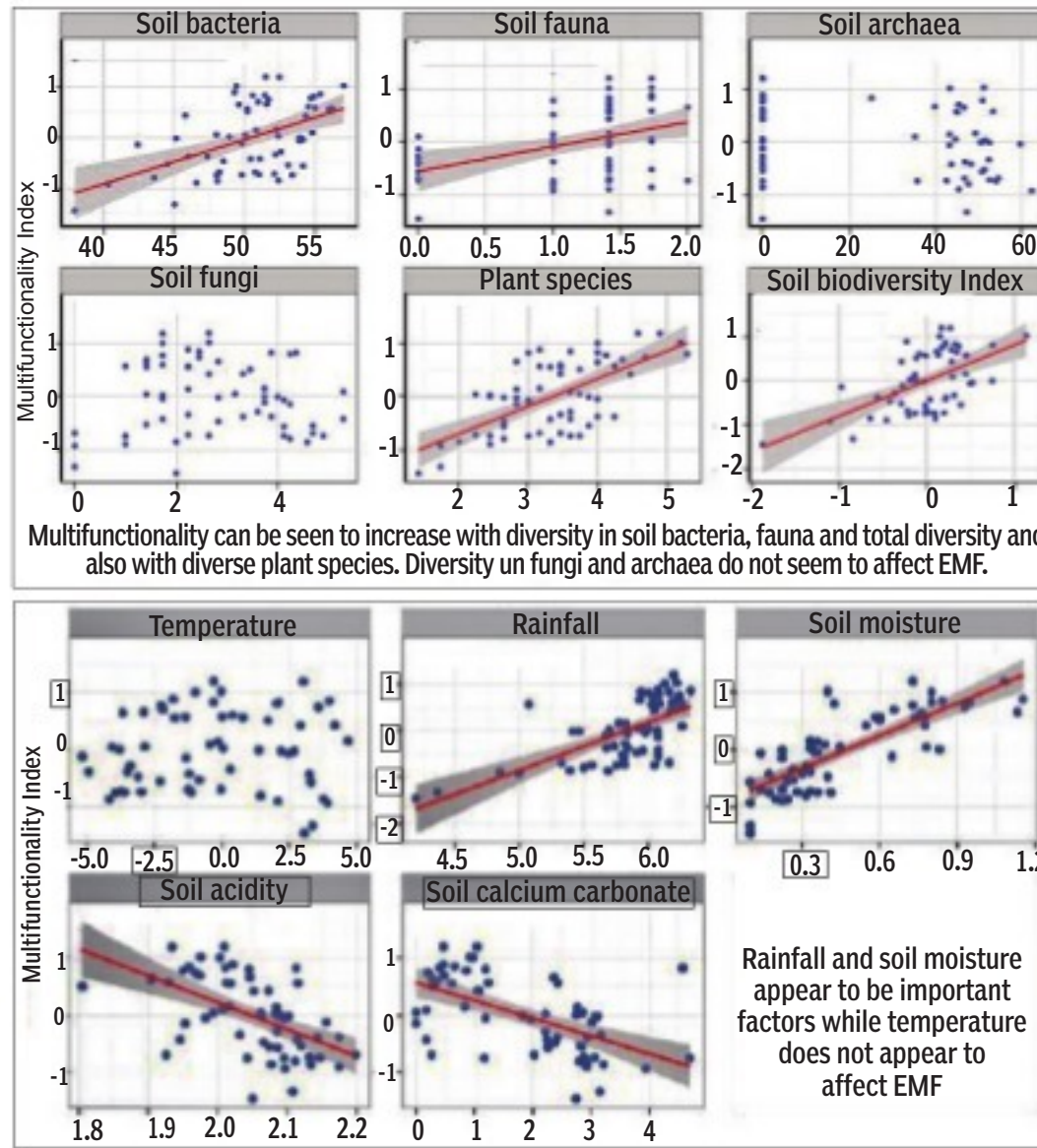
UNDERGROUND BIODIVERSITY HAS BEEN FOUND TO BE IMPORTANT IN HOW THE ECOLOGY RESPONDS TO CLIMATE CHANGE, WRITES S ANANTHANARAYANAN

Biodiversity is now recognised as a vital factor in the resilience of the environment...

group of plants when grown either together or separately in small plots to demonstrate the value of diversity...



phorus, (7) plant nitrogen (nitrogen pools in aboveground biomass), and (8) plant phosphorus...



Nathan J Sanders and Aimee T Classen, University of Copenhagen.



The Peking University team

underground and within the soil. Xin Jing, Yu Shi, Haiyan Chu, Ke Zhao, Litong Chen, Yue Shi, Youxu Jiang and Jin-Sheng He from the University of Peking and the Chinese Academy of Sciences at Nanjing, Xining and Beijing...

the paper in Nature Communications says, perhaps because of the great complexity and variability underground...

hence, the composition of biotic communities. There have even been studies that combine variations of climate with different levels of biodiversity to see how these affect different things...

Non-biotic influences were also assessed by relating EMF levels with rainfall, temperature and the soil content of moisture, acidity and calcium carbonate...

Plant species' richness and below-ground biodiversity are seen to have about an equal effect and the two factors, taken together, accounted for a large fraction, about 45 per cent, of the variation in EMF across sites.

The study represents investigation into how different conditions affect the way an ecosystem responds to climate change...

A significant finding, for instance, was that soil biodiversity may have stronger effects on the ecosystem in areas of higher rainfall...



Soil Biodiversity regulates a suite of functions in ecosystems.



The Tibetan plateau in China where the study was carried out at 60 different sites

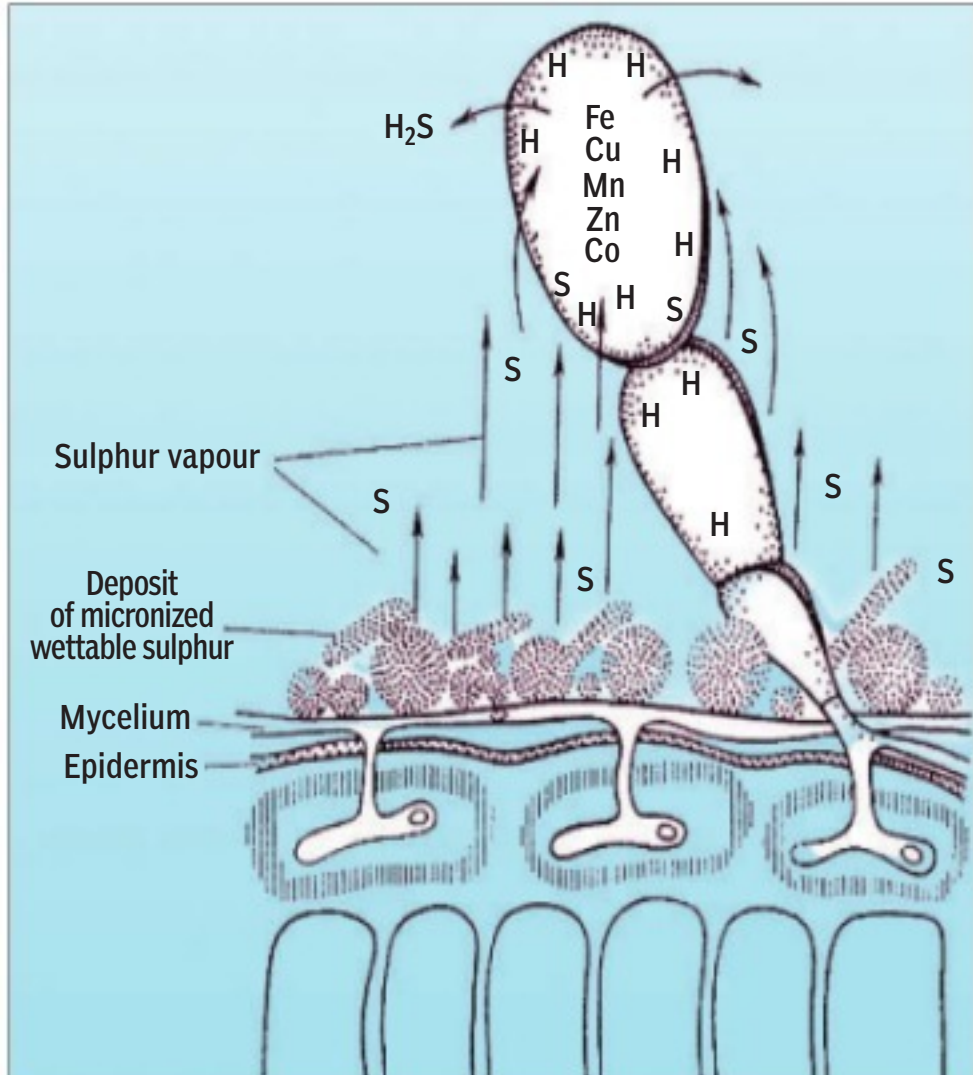
CONTROLLING DISEASES

TAPAN KUMAR MAITRA EXPLAINS THE ANTI-FUNGAL ACTIONS OF SULPHUR AND ITS COMPOUNDS ON PLANTS

Sulphur formulations are highly effective fungicides against powdery mildew fungi and various spots and blights...

The fungicidal activity of sulphur formulations is explained by their ability to liberate a vapour of elementary sulphur that penetrates into spores or mycelia of a fungus...

Consequently, the formation of hydrogen sulphide can be considered as detoxification of the elementary sulphur. But hydrogen sulphide is fungi-toxic and rendered



Mechanism of action of sulphur fungicide (micronised wettable sulphur) on powdery mildew.

ders vitally important enzymes inactive like catalase, cytochrome oxidase, and lactase. Elementary sulphur can also bind the metals (iron, copper, manganese, zinc) contained in the enzymes and form sulphides. All this upsets the normal metabolism of fungi and causes them to perish.

It is presumed that the specific nature of the action of sulphur formulations is explained by the different ability of spores to absorb the sulphur and detoxify it with the formation of hydrogen sulphide.

In view of the above notions on the nature of the fungicidal action of sulphur for the successful control of diseases, it is essential that the formulations gradually (during a long time) evolve an amount of sulphur vapour sufficient for action in a region as close as possible to the mycelium and conidia of a fungus.

Ground sulphur formulations consisting of coarse particles are retained poorly on the surface of plants, and have a smaller and non-uniform evaporation surface. Colloidal sulphur formulations have the largest surface area and intensity of evaporation owing to their structure containing very minute particles...

The fungicidal action of lime sulphur is also associated with the evolution of elementary sulphur. The action of sulphur formulations is greatly affected by the ambient temperature. At a temperature below 20 °C, they are only slightly effective, while above 35 °C they harm plants.

Sulphur formulations are generally used from the moment of a disease's appearance and treatments are repeated every week or so. The proper application of sulphur formulations facilitates an increase in the yield of crops and an improvement in their quality.

Sulphur formulations have a low toxicity to human beings and other warm blooded animals. The prolonged inhalation of sulphur dust may lead to an ailment of the lungs, therefore when working with formulations of elementary sulphur, one must use anti-dust respirators.

Formulations of elementary sulphur may be used without any restrictions. The harvest time for all crops except medicinal ones is one day and cucumbers in greenhouses must be washed before harvesting them. No tolerance levels have been established for the sulphur content in food products though.

THE WRITER IS ASSOCIATE PROFESSOR, HEAD, DEPARTMENT OF BOTANY, ANANDA MOHAN COLLEGE, KOLKATA, AND ALSO FELLOW, BOTANICAL SOCIETY OF BENGAL, AND CAN BE CONTACTED AT tapanmaitra59@yahoo.co.in

Paving the Fast track

THE SEARCH FOR ALIEN LIFE HAS GOTTEN BIGGER WITH CHINA BUILDING THE BIGGEST EVER RADIO TELESCOPE FOR THE PURPOSE, WRITES DOUG BOLTON

Chinese scientists are constructing the world's biggest radio telescope that will be more effective than any other at picking up weak messages from outer space...

The wider the dish, the more effective the telescope becomes at picking up weak messages from outer space. Nan Rendong, the chief scientist of the Fast project, told Xinhua news agency...



The FAST telescope in Pingtang, China, shortly after assembly began.

messages from white noise in the universe. It is like identifying the sound of cicadas in a thunderstorm. Rather than sitting above ground, the telescope's dish is sunken into a natural bowl-shaped valley in China's Guizhou province.

The Search for Extraterrestrial Intelligence or Seti Institute, which leads humanity's search for extraterrestrial life, has never picked up any message that conclusively comes from an alien civilisation...

However, even if aliens don't make contact, radio telescopes smaller than Fast have been used in the discoveries of new planets, comets and pulsars. The construction of the telescope also represents a huge advance for China's native space programme.

Wu Xiangping, director-general of the Chinese Astronomical Society, told Xinhua, "Having a more sensitive telescope, we can receive weaker and more distant radio messages. It will help us to search for intelligent life outside the galaxy and explore the origins of the universe.

PLUS POINTS



'Delete' tourists

Adobe has revealed a new camera app that can delete unwanted tourists from photographs, easily and automatically. The new app works by using an algorithm to look at a scene and analyse what is moving and what isn't.

ANDREW GRIFFIN/THE INDEPENDENT

Inflatable incubator

Last week, James Roberts, a 23-year-old Briton, designed a cheap, inflatable incubator that could save premature



babies in remote locations and won a prize that boosts the chances of the device reaching the market. Built in the course of his engineering degree to assist Syrian refugees...

The incubator is designed to be easy to carry and operate in isolated locations such as refugee camps and hospitals in developing countries. "Conventional incubators are incredibly cumbersome and difficult to transport and also difficult to use."

SCIDEV.NET

Fighting disease

Chytridiomycosis, a skin disease caused by the chytrid fungus Batrachochytrium dendrobatidis, currently threatens approximately 500 amphibian species worldwide.



They collected 60 juvenile bullfrogs (Lithobates catesbeianus) from a pond in Virginia where the fungus had previously been detected and sampled the frogs' naturally occurring skin microbes...

When the researchers analysed the resulting microbial communities on the frogs, they discovered that simply augmenting or reducing the skin microbiome did not affect the intensity of the fungal infection...

KAREN ZUSI/THE SCIENTIST