NEWS BULLETIN

Plants and Pollution
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CSIR-NATIONAL BOTANICAL RESEARCH INSTITUTE, LUCKNOW

Everest-Area Plant Life Spreads

Environmental News Network, 13 January 2022

In 2017, while exploring rock glaciers in the Himalaya, eco-hydrologist Karen Anderson couldn't help but wonder about the plants. Shrubs and grasses seemed to be thriving across many of the high-altitude mountain slopes.

The landscape made her wonder: "Is there more plant coverage now than in the past?" The question seems simple, but the answer has complex and important implications for the region's water cycle. Research in other parts of the world has shown that changes in the type and expanse of vegetation can lead to changes in the flows and stores of water. So, an expansion of plants in the Himalaya—not just the retreat of glaciers—could affect the water supply for one fifth of Earth's human population.

But how this plant-water relationship will play out remains unclear. "There is such a lack of information about Himalayan ecology in this high-altitude zone, at least in western science, that we don't really understand what the impacts of changing vegetation will be," Anderson said. "Most of the scientific expeditions to the Himalaya have been to the glaciers, which have been an area of major concern as they retreat under climate change."

Anderson and colleagues set out to evaluate how plant life has changed in the Hindu Kush Himalaya over the span of 26 years. They focused on elevations above the tree line but below permanent snow and ice. In this area, known as the subnival or alpine zone, you can find shrubby plants and seasonal snow. In the Himalaya, the zone generally includes altitudes between 4,100 to 6,000 meters (13,000 to 20,000 feet) above sea level.

The high altitude and the remoteness of the region add to the challenge of studying its plants,……..

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Rising Atmospheric CO_2 Concentrations Globally Affect Photosynthesis of Peat-Forming Mosses

Environmental News Network, 17 January 2022

Scientists at Umea University and Swedish University of Agricultural Sciences have developed ways to decipher effects of the CO_2 rise during the past 100 years on metabolic fluxes of the key plant species in peatlands, mosses. Analyses of cellulose in peat cores collected by collaborating scientists working in five continents indicate that a CO_2-driven increase in photosynthesis of mosses is strongly dependent on the water table, which may change the species composition of peat moss communities.

As human CO_2 emissions continue, it is increasingly important to capture CO_2 to mitigate the associated climate change. Peatlands are the largest soil carbon stores globally, but the impact of climate change on peatlands is still unknown. During the 20th century, global atmospheric CO_2 concentrations have increased by nearly 50 per cent and further increases are inevitable according to the Intergovernmental Panel on Climate Change, IPCC, with severe consequences for humanity. So far, uptake of CO_2 by the land biosphere has dampened the CO_2 rise and prevented even more severe effects.

Although peatlands cover only three per cent of the global land surface, they store a third of the global soil carbon. Thus, uptake of CO_2 by peat mosses is important, but little is known about how their physiology is affected by rising CO_2 levels.To understand if peatlands will keep storing carbon and mitigate climate change in the future, the scientists investigated.……

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Under the Hood: How Environment and Genomes Interact in Plant Development

Environmental News Network, 24 January 2022

Iowa State University scientists have harnessed data analytics to look "under the hood" of the mechanisms that determine how genetics and changing environmental conditions interact during crucial developmental stages of plants.

A new study published in the academic scientific journal New Phytologist focuses on how changes in temperature affect the height of sorghum plants, and the scientists who conducted the experiments said the research could help to breed more resilient crops as well as shed light on mechanisms that play a critical role in plant growth. The research revolves around the concept of phenotypic plasticity, or how a given trait can differ as a result of environmental conditions. For instance, a plant may grow to a different height in a dry environment than a plant with identical genetics that grows in a wet environment.

Understanding plasticity can help plant breeders design crop varieties that will perform well under a range of environmental conditions, said Jianming Yu, a professor of agronomy and the Pioneer Distinguished Chair in Maize Breeding at Iowa State University and corresponding author of the study. But looking only at the final mature traits of plants paints an incomplete picture of plasticity. Instead, the new study examines the growth rate of sorghum during a critical stage of development, between 40 and 53 days after planting. Zeroing in on that rapid-growth phase in the plant's life cycle allowed the researchers to examine the mechanisms that govern sorghum's phenotypic plasticity in greater detail.

"Looking at the developmental phase allows us to look under the hood to see what causes,…... **Read More...**

Green Backyards Help Increase Urban Climate Resilience: Here Is How

Environmental News Network, 26 January 2022

Green spaces in cities have a number of positive effects: they're good for our physical and mental health, they're good for the environment, and they can even help fight off the effects of climate change.

To explore the impact of additional green structures in cities, Katja Schmidt and Ariane Walz, affiliated with the University of Potsdam, Germany, quantified their effects on different aspects such as thermal comfort, biodiversity, carbon storage and social interaction. Their study, published in the open-access, peer-reviewed journal One Ecosystem, combines knowledge from health research, ecology and socio-ecological research, and shows how the better we know a particular type of ecosystem, the better we can adapt to climate change.

Pursuing a multi-method approach that ranged from local climate measurements to habitat and tree mapping, the authors compared four green residential courtyards in Potsdam. The spaces were similarly built, but had different ratios and sizes of features (lawns, flowerbeds, paths, playgrounds and allotments), as well as different tree and shrub population.

While doing their research, Schmidt and Walz saw how even small differences in the green structure affect the provision of benefits, but one thing was clear: the greener courtyards yielded more benefits. Trees have the vital ability to cool down the environment and increase thermal comfort. Remarkably,…….. **Read More....**