中国土壤学会

Soil Science Society of China

Apr, 2022 | 3

SSSC Newsletter

CONTENTS

Contact Us

SOIL SCIENCE SOCIETY OF CHINA

No. 71 East Beijing Road, Nanjing, China

icdsssc@issas.ac.cn

http://www.csss.org.cn/en/

Wechat QR code
(© SSSC)

China to Start the Third Nationwide Soil Census in 2022

The State Council decided to conduct the third nationwide soil condition census starting in 2022, according to a circular released on February 16th.

The census aims to evaluate soil types and soil distribution around the country, as well as the current status and changing trends of soil resources, while acquiring basic data related to soil quality, properties and utilization status in order to improve the protection and utilization of soil resources. The object of the census is soil under arable land, garden plots, forest land, grasslands and other agricultural land around the country; some unused land is also included.

According to the circular, the census on saline-alkali soil should be completed in 2022. From 2023 to 2024, field survey sampling and interior testing should be completed. In the first half of 2025, data from the third national soil census should be collected; in the second half, a report on national arable land quality and an evaluation report on national soil utilization suitability should be compiled.

A group led by Vice-Premier Chunhua Hu will be assembled to preside over the census. The circular also stressed the importance of involving experts and professionals to ensure a standardized census, with authentic, accurate and complete data. The circular noted that modern technologies like the national soil census platform should also be fully utilized.

Read more: http://english.www.gov.cn/policies/latestreleases/202202/16/content_WS620caf99c6d09c94e48a51cb.html

National Standards for Drinking Water Quality Approved in March

On March 15th, the announcement of the State Administration for Market Regulation (Standardization Administration of China) on approving the release of five mandatory national standards was published. It stipulates that “Standards for drinking water quality (GB 5749-2022)” will replace GB 5749-2006 and come into effect on April 1st, 2023. The National Health Commission is in charge of implementation and governance.

Read more: https://std.sacinfo.org.cn/gnoc/queryInfo?id=1DE0288AD00F2C764FC2D455A0559D98

Opinions of the Central Committee of the CPC and the State Council on Fulfilling the Key Task of Comprehensively Promoting Rural Revitalization in 2022

On February 22nd, "Opinions of the Central Committee of the CPC and the State Council on Fulfilling the Key Task of Comprehensively Promoting Rural Revitalization in 2022" (hereinafter referred to as the Opinions) were officially released by Xinhua News Agency. It is the 19th "No.1 central document" and, since the 21st century, it has guided the work of farmers in agricultural and rural areas. The Opinions include eight parts: engage in grain production and the supply of vital agricultural products, strengthen support of modern agriculture, prevent a large-scale return to poverty, focus on industries to promote rural development, boost rural construction, improve rural governance, enhance policy guarantees and mechanism innovation, and continue the Party's leadership in respect to the work of farmers in agricultural and rural areas.

Compared with previous years, soybean oil planting has, for the first time, become the focus of the Opinions, as noted by Nengchang Chen, a Senior Researcher at the Institute of Eco-Environmental and Soil Sciences, Guangdong Academy of Sciences. Dr. Chen believes that the introduction of this policy means that China attaches great importance to food security under the current severe situation with regard to the epidemic and the grave foreign diplomatic environment. The country firmly grasps the issue of food security, and at the same time, gives full play to regional advantages, scientific layout, and scientific decision-making.

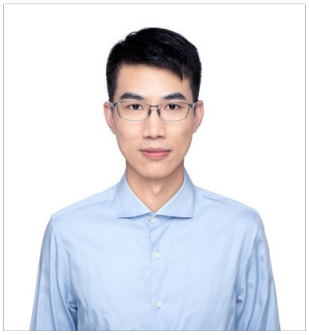
Read more:
http://www.gov.cn/xinwen/2022-02/22/content_5675041.htm
https://www.sohu.com/a/525324987_120900908

The IUSS Dan Yaalon Young Scientist Medal was awarded to Two Chinese Soil Scientists

International Union of Soil Sciences

2022 Dan Yaalon Young Scientist Medal Winner

Yuxin Ma
Landcare Research



Songchao Chen
ZJU-HIC

The winners (© Zhou Shi)

On February 1st, 2022, the website of the International Union of Soil Sciences (IUSS) announced the winners of the second IUSS Dan Yaalon Young Scientist Medal. Two young Chinese soil scientists, Yuxin Ma (Manaaki Whenua-Landcare Research) and Songchao Chen (ZJU-Hangzhou Global Scientific and Technological Center), won this prestigious award. They are expected to present at the 22nd World Congress of Soil Science this coming July at Glasgow. Congratulations to Yuxin and Songchao for demonstrating the Chinese power of young generations in the international scientific community.

The award honors Dan Hardy Yaalon (1924–2014), an exceptional soil scientist with a research career spanning 57 years. It is awarded by the IUSS Division 1 Soils in Space and Time and the IUSS Commission 4.5 History, philosophy and sociology of soil science. The nominee of this medal should be a researcher in the early stages of their scientific career (PhD student or postdoctoral researcher within the initial 5 years after PhD graduation).

Read more:
https://www.iuss.org/about-the-iuss/awards-prizes/dan-yaalon-young-scientist-medal/

Prof. Yongguan Zhu becomes the Winner of the IUSS Von Liebig Award 2022

Professor Yongguan Zhu (© SSSC)

Recommended by the Soil Science Society of China (SSSC), Prof. Yongguan Zhu won the IUSS Liebig Award 2022. It was presented by the President of International Union of Soil Sciences (IUSS) Laura Bertha Reyes Sánchez in February 2022.

Prof. Yongguan Zhu, an academician of the Chinese Academy of Sciences (CAS) and an eco-environmental scientist, has long been engaged in environmental soil science and environmental biology research. He previously won the second prize of the National Natural Science Award and the Agricultural Science Award of the Academy of Sciences for Developing countries. In 2016, Prof. Zhu was selected to serve as a Clarivate Global Highly Cited Scientist for six consecutive years, and he is the first Asian scientist to receive this honor.

Von Liebig award was established in 2006. The award recognizes outstanding contributions to applied soil science research, new discoveries, techniques, and inventions or materials that increase food security, improve environmental quality or conservation, land and water development, and other areas covered by the divisional structure of the IUSS.

Read more: https://www.iuss.org/about-the-iuss/awards-prizes/von-liebig-award/

Contribution of Microbial Necromass to Soil Organic Carbon in Global Ecosystems

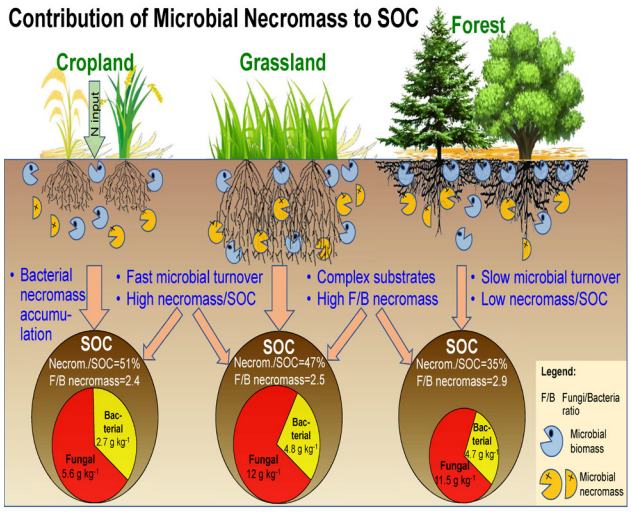


Figure1: Generalization of the main processes (blue text) and contribution of microbial necromass to soil organic carbon (SOC) in croplands, grasslands and forests

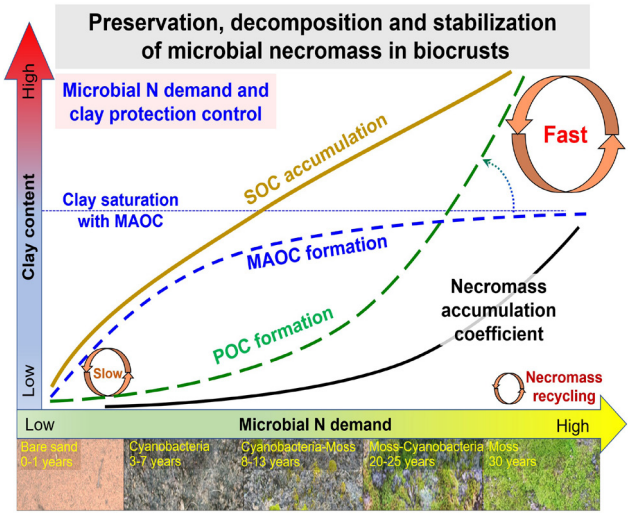


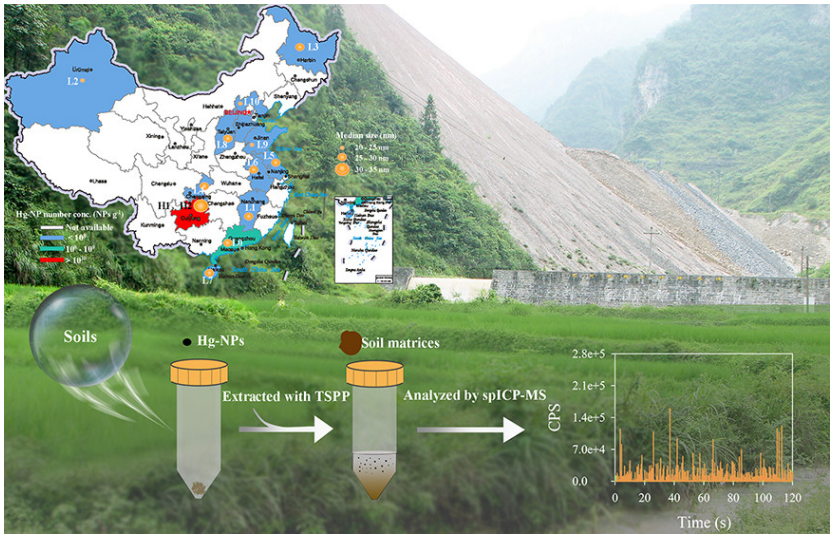
Figure 2: Conceptual framework for the preservation, decomposition and stabilization of microbial necromass in biological crust dominated sandy soils.

Despite the recognized importance of the contribution of microbial necromass to soil organic carbon (SOC) sequestration, there has been no quantification for cropland, grassland, and forest at a global scale as well as in desert ecosystems.

The research group of Prof. Shaoshan An, Chinese Academy of Sciences and Ministry of Water Resources, addressed this knowledge gap through global meta-analysis and field studies. Result showed that microbial necromass as the source of soil organic carbon in global ecosystems. On an average, microbial necromass C contributed 51%, 47%, and 35% to the SOC in cropland, grassland, and forest soils, respectively, in the first 20 cm of topsoil at globally. The contribution of necromass depends on land use, soil depth, mean annual precipitation, mean annual temperature, and soil pH (Wang et al, 2021; Soil Biology and Biochemistry). However, microbial necromass contribution to SOC in desert ecosystems is lower (12-25%) than in fully developed soil (33%-60%, literature data). Nitrogen (N) limitation of microorganisms and limited clay protection, resulted in a low contribution of microbial necromass to SOC in biocrust-covered sandy soil (Wang et al, 2022; Soil Biology and Biochemistry).

Read more:
https://doi.org/10.1016/j.soilbio.2021.108422;
https://doi.org/10.1016/j.soilbio.2022.108607

Extraction and Quantification of Nanoparticulate Mercury in Natural Soils



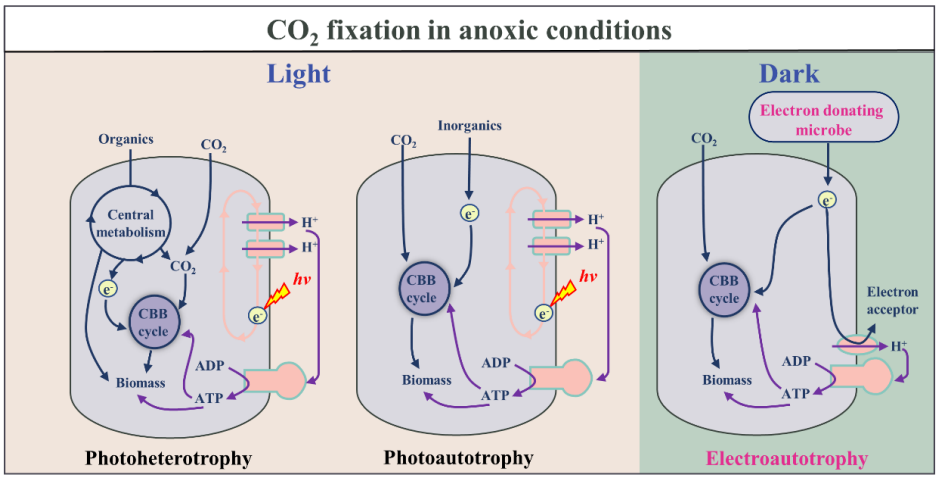
Particulate mercury is one of the most abundant mercury species to which microbial methylators are exposed. Previous studies have shown that nanoparticulate mercury (Hg-NPs) is a potential source of bioavailable mercury for methylation in soils. However, the particle concentration and size of indigenous Hg-NPs in complex soil matrices are largely unknown, which hamper reliable risk assessments of Hg-NPs in environmental relevant scenarios.

In a new study published in Environmental Science & Technology, a research group led by Professor Yujun Wang from Institute of Soil Science, Chinese Academy of Sciences, demonstrates the experimental determinations of indigenous Hg-NPs in natural soils.

Coupled to single particle inductively coupled plasma-mass spectrometry (spICP-MS), the research team developed a standardized protocol for extraction and quantification of Hg-NPs in natural soils with different properties. High particle number-, particle mass-, and total mass-based recoveries were obtained for spiked HgS-NPs (74–120%). Researchers found that indigenous Hg-NPs across soils were within 107–1011 NPs g–1, corresponding to 3–40% of total Hg on a mass basis. Moreover, these indigenous Hg-NPs contributed to 5–65% of the measured methylmercury in soils. Metacinnabar was the primary Hg species in extracted soil samples from the Wanshan mercury mining site, as characterized by X-ray absorption spectroscopy and transmission electron microscopy. This work provides detailed information on Hg-NP number/mass concentrations and size, which will not only strengthen our understanding of mercury methylation processes governing the public exposure to MeHg but also guide further studies focusing on the biogeochemical cycling of Hg-NPs.

Read more: https://doi.org/10.1021/acs.est.1c07039

Syntrophic Interspecies Electron Transfer drives Carbon Fixation and Growth by Rhodopseudomonas Palustris under Dark, Anoxic Conditions



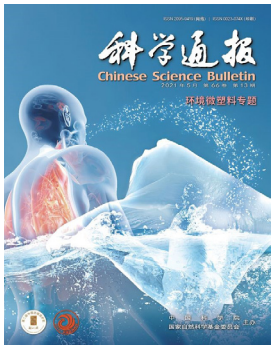
Strategies of CO_2 fixation by R. palustris under anoxic conditions

Soil carbon-fixation plays important roles in alleviating global climate change and improving soil organic carbon content. Photosynthetic bacteria are mainly contributed to the soil carbon-fixation. The generation of reducing power is necessary for the CO_2 reduction by these bacteria. Light and chemical energy are usually used as the power sources to drive the reducing power generation.

Recently, Dr. Shungui Zhou's group from Fujian Agriculture and Forestry University discovered the third power source, namely electric power, in anoxygenic photosynthetic bacteria (APB) growing under dark and anoxic environments. They showed that Rhodopseudomonas palustris, the representative of APB, could formed electrosyntrophic coculture with Geobacter metallireducens by electrosyntrophic interaction. Electrons were transferred either directly or indirectly (via electron shuttles) from G. metallireducens to R. palustris, thereby providing reducing power and energy for the dark CO_2 fixation. So, a new type of microbial carbon fixation, named electroautotrophy (Fig. 1), was proposed. Given that sediments constitute one of the most ubiquitous and abundant niches on Earth and that at depth, most of the sedimentary niche is both anoxic and dark, dark carbon fixation provides a metabolic window for the survival of anoxygenic phototrophs, as well as an as-yet unappreciated contribution to the global carbon cycle.

Read more: http://doi.org/10.1126/sciadv.abh1852

Special Topic of Environmental Microplastics in Chinese Science Bulletin



Editor: Yongming Luo

The special topic of "Environmental Microplastics" introduces the research status and progress of microplastics in multi- media such as soil, water, sediment, air, and organisms. In the future, advanced analysis methods, characterization, distribution and migration processes, surface changes and interaction with pollutants, toxicity, ecological and health risks, control technologies and policies of environmental microplastics should be further studied in a multidisciplinary way.

Read more:
https://www.sciengine.com/CSB/specialTopicDetail?fla=CSB&specialId=abc6d2b9e1374b8b99d37d33bb7851ad © *Chinese Science Bulletin*

Special Issue on Soil Pollution, Control, and Remediation

Toxic pollutants and xenobiotics have increasingly accumulated in the soil system due to intensifying agricultural, industrial, and commercial activities. Soil pollution is a growing global concern, posing significant threats to food security, ecological sustainability, and human health. Research on biogeochemical processes of toxic pollutants is becoming a frontier in areas of soil pollution, control and remediation, and a challenge for scientists. Recently, Prof. Yan He from Zhejiang University and Prof. Peng Cai from Huazhong Agricultural University organized the special issue on “Soil Pollution, Control, and Remediation”.

They invited Prof. Yetao Tang (Sun Yat-sen University, China), Prof. Linchuan Fang (Northwest A&F University, China) and Dr. Songcan Chen (Helmholtz Centre for Environmental Research – UFZ, Germany) as co-guest editors to jointly call for papers to discuss how the knowledge can be used for protecting our ecological environment and improving soil ecosystem services and human health.

Read more:
https://link.springer.com/journal/42832/volumes-and-issues/3-3 © *Soil Ecology Letters*