深地科学论坛（第三十九讲）：Exploring role of biochar and vegetation in geotechnical engineering

时间：2022 年 10 月 27 日 10：00-11：30

地点：腾讯会议直播（ID 号：575-748-245

https://meeting.tencent.com/dm/JtXFRs0m4m4j）

报告人	报告人单位	报告题目
Ankit Garg	汕头大学	Exploring role of biochar and vegetation in geotechnical engineering

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深部岩土力学与地下工程国家重点实验室

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《深地科学（英文）》

力学与土木工程学院

江苏省岩土力学与工程学会

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报告人简介：

Ankit Garg 博士，现任汕头大学土木与环境工程系副教授。他在印度理工学院 Guwahati 获得理学学士学位（2006-2010），并在香港博士研究金计划支持下获得了香港科技大学的博士学位。他曾任印度理工学院 Guwahati 助理教授（2015-2017 年）、世界银行兼职顾问（2016-2017 年），期间主持了印度阿萨姆邦的交通基础设施监测项目。他的研究专注于可持续材料（生物炭、纤维）的开发和利用，包括用于土壤修复的植被。他发表了 3 篇排名前 0.1%的 ESI 论文。因为他出色的学术成就，他还被英国土木工程师协会授予“特尔福德特优奖”。卡帕罗斯 • 马丁内斯等人（2020 年）报告称，他的课题组是在绿色基础设施研究是世界顶尖水平（2009-2019 年）。他目前还是《地球物理学报》、《斯普林格》和《智能与模糊系统杂志》等国际期刊的副主编。他曾担任《有害有毒和放射性废物杂志》（ASCE）、《国际损伤力学杂志》（SCI 杂志）中与土壤和水修复生物工程应用相关的特刊特邀编辑。此外，他还获得了教育部广东省青年博士奖，目前主持国家自然科学基金“植被修复土壤”青年项目。在印度理工学院古瓦哈蒂分校任职期间，他还主持了来自塞族印度的快速通道青年科学家项目（2016-2017）。他曾被任命为俄罗斯和哈萨克斯坦大学的客座/兼职教师，并在日本岐阜大学、德国鲁尔大学和英国利兹大学发表演讲。2021，他还联合主持了“一带一路”系列网络研讨会，与会者来自 20 多个国家。他还于 2020 年在岩土工程和地质环境工程领域发起了第一届中国印度网络研讨会。这两个网络研讨会系列的会议记录都由斯普林格出版社发表。

报告摘要：

Exploring role of biochar and vegetation in geotechnical engineering

The research on utilization of bio-engineering techniques such as biochar and vegetation in geo-environmental engineering infrastructure has been done extensively in past decade. Biochar being a carbon negative material have an advantage of porosity and functional groups that can enhance water sorption from soil. Whereas vegetation enhances soil strength through root reinforcement and water uptake. Both seems to have significant impact on unsaturated soil water retention properties, that are essential for conducting seepage and stability analyses. There are still some short comings with respect to application of biochar and vegetation. In this session, two main issues related to such application in soil will be addressed. Firstly, the influence of production process (pyrolysis) of biochar on unsaturated soil water retention will be discussed. The pyrolysis temperature and feedstock type (animal and plant) would be varied to produce in-house biochars. Subsequently, their influence on water retention and cracking would be investigated. The results are

useful for engineers in selecting appropriate biochars for certain application in geo-environmental engineering infrastructure. Such study also helps in promoting commercial production of biochar, that cater to the needs of geo-environmental engineers. Secondly, the plant wilting point, which is one of the key parameters in defining transpiration reduction function would be determined for vegetation species native to South Asia. The new framework to determine wilting point is developed by measuring leaf response (stomatal conductance and photosynthetic parameters) and soil suction under a drought condition in silty sand and clay loam soils. Such framework can be useful for geo-environmental engineers in selecting suitable plant species for particular soil and climate conditions.