

植物燃烧性测量的展望析

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摘要: 近年来, 全球野火的发生频率逐渐增加, 对全球生态系统和人类社会构成了重大威胁。由于植物是自然环境中的主要燃料, 准确评估植物的可燃性对野火管理和火生态学研究至关重要。植物的可燃性是一个多方面的特性, 受到多种生理、物理和化学特征的影响。目前, 还没有一个普遍接受的标准来量化植物的可燃性。通过分析过去几十年发表的研究, 本研究发现, 17.27%的研究通过测量植物的含水量、叶片大小、树皮厚度、油含量和萜烯含量等与可燃性相关的特征来评估植物的可燃性; 34.55%的研究通过燃烧实验测量点火时间、燃烧持续时间、火焰传播速度等燃烧参数来评估植物的可燃性; 剩余约 50%的研究则结合了燃烧实验和可燃性相关特征的测量方法。本研究概述了当前植物可燃性测量的现状, 讨论了每种测量方法的优缺点, 并提出了改进植物可燃性评估的方法建议, 旨在促进植物可燃性测量的标准化。

Current status and prospects of plant flammability measurement

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Abstract: In recent years, the frequency of wildfires worldwide has been gradually increasing, posing significant threats to global ecosystems and human society. Given that plants serve as the primary fuel in natural environments, accurately assessing the flammability of plants is crucial for wildfire management and fire ecology studies. Plant flammability is a multifaceted trait influenced by various physiological, physical and chemical characteristics of plants. Currently, there is no universally accepted standard for quantifying plant flammability.

By analyzing published research over the past few decades, this study found that 17.27% of studies assessed plant flammability by measuring flammability-related characteristics, such as moisture content, leaf size, bark thickness, oil content, terpene content; 34.55% of studies assessed plant flammability through burning experiments by measuring burning parameters, such as ignition time, duration of combustion, flame spread rate. The remaining studies, approximately 50%, used a combination of burning experiments and flammability-related characteristics measurement to assess plant flammability. This study outlined the current status of plant flammability measurement, discussed the merits of each measurement method, and proposed suggestions for enhancing the assessment of plant flammability, with the aim of contributing to the standardization of plant flammability measurement.

Keywords: Plant Flammability; Wildfires; Measurement Methods