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1. 一种便携式植物挥发物电化学检测系统

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▶ 前沿资讯

1. The Fruit and Herbal Tea Market is Growing (果茶和凉茶市场正在增长)

简介：根据Fairfield Market Research最新发布的一份报告，预计到2030年底，全球果茶和凉茶市场的估值将从2023年的38亿美元增至65亿美元。预计在2023年至2033年的预测期内，该市场的复合年增长率为7.8%。果茶由水果（新鲜或干的）与茶叶冲泡而成，因其天然的甜味和清爽的味道而吸引消费者。凉茶由草药、香料、鲜花等混合而成，其受欢迎程度继续上升，这要归功于消费者对天然和健康导向饮料的偏好。亚太市场也出现了显著的扩张。中国是果茶和凉茶发展最快的市场。由于该地区有着悠久的饮茶传统，尤其是在中国和印度等国家，对创意混合茶和功能茶的需求正在上升。不断增长的可支配收入和对整体健康的关注是推动亚太地区果茶和凉茶市场爆炸式增长的关键因素。

来源：World Tea News 网站

发布日期：2024-04-04

全文链接：<http://agri.nais.net.cn/file1/M00/10/3F/Csgk0EHCQ0iAfn3AATLOwxiQFE273.pdf>

▶ 学术文献

1. Wearable electrochemical sensors for plant small-molecule detection (用于植物小分子检测的可穿戴电化学传感器)

简介：Small molecules in plants such as metabolites, phytohormones, reactive oxygen species (ROS), and inorganic ions participate in the processes of plant growth and development, physiological metabolism, and stress response. Wearable electrochemical sensors, known for their fast response, high sensitivity, and minimal plant damage, serve as ideal tools for dynamically tracking these small molecules. Such sensors provide producers or agricultural researchers with noninvasive or minimally invasive means of obtaining plant signals. In this review we explore the applications of wearable electrochemical sensors in detecting plant small molecules, enabling scientific assessment of plant conditions, quantification of environmental stresses, and facilitation of plant health monitoring and disease prediction.

来源：Trends in Plant Science 期刊

发布日期：2024-02-20

全文链接：<http://agri.nais.net.cn/file1/M00/10/3F/Csgk0EHB4cCAD0mZADSntGPjTR8124.pdf>

2. The role of *Streptomyces* species in controlling plant diseases: a comprehensive review (链霉菌属在植物病害控制中的作用综述)

简介：Numerous factors contribute to the decline in crop yields, including plant diseases caused by bacteria, fungi, and viruses. The management of these diseases with chemical fertilizers is not a sustainable approach. This review briefly summarizes the role, mechanisms, advantages, and disadvantages of using *Streptomyces* species in plant disease management as an alternative method is needed to address the problems of using chemicals. One promising alternative is to use

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microbes to manage plant diseases. *Streptomyces*, a gram-positive saprophytic bacterium, is particularly effective at combating plant diseases. They produce bioactive-rich antimicrobial metabolites and enzymes that can kill or inhibit the growth of plant pathogens. *Streptomyces* species are widely distributed in nature but are especially abundant in the rhizosphere, the soil region surrounding plant roots. *Streptomyces* can be used as bioinoculants to protect plants from diseases. In addition to their disease-fighting abilities, they can promote plant growth in many ways. They produce plant growth-promoting substances, such as indole-3-acetic acid (IAA), cytokinin, and siderophores. They also suppress diseases through antibiosis, mycoparasitism, and nutrient competition. *Streptomyces* can also supply plants with essential minerals, i.e., iron, copper, phosphorus, and sulfur. Therefore, it concluded that *Streptomyces* species can be used as an alternative to chemicals to control plant diseases.

来源: Australasian Plant Pathology 期刊

发布日期:2023-12-12

全文链接:<http://agri.nais.net.cn/file1/M00/03/6D/Csgk0WYY3NOAGvYBAbpubJa-6gs645.pdf>

3. *Bacillus* species: factories of plant protective volatile organic compounds (芽孢杆菌属: 植物保护性挥发物的工厂)

简介: Several studies have described the potential use of volatile organic compounds (VOCs) emitted by soil microorganisms, specifically of the genus *Bacillus*, as a sustainable solution for disease management in plants. The *Bacillus* species have been extensively studied as biocontrol agents (BCAs) due to their ability to inhibit pathogens, trigger induced systemic resistance (ISR) in plants, and enhance plant growth. The ability of the *Bacillus* species to produce long-lasting resting structures, such as endospores, makes them particularly appealing as BCAs. In recent years, there has been a growing body of research on the effects of *Bacillus*-emitted VOCs on plant pathogen growth and the triggering of ISR. This review aims to highlight recent advances in the understanding of the biological activities of *Bacillus*-emitted VOCs, identify new subjects for VOCs research, and stimulate interest in the academic and agri-business sectors for developing pre- and post-harvest application methods.

来源: Journal of Applied Microbiology 期刊

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4. Biogenic Volatile Compounds for Plant Disease Diagnosis and Health Improvement (用于植物疾病诊断和健康改善的生物源性挥发性化合物)

简介: Plants and microorganisms (microbes) use information from chemicals such as volatile compounds to understand their environments. Proficiency in sensing and responding to these infochemicals increases an organism's ecological competence and ability to survive in competitive environments, particularly with regard to plant-pathogen interactions. Plants and microbes acquired the ability to sense and respond to biogenic volatiles during their evolutionary history. However, these signals can only be interpreted by humans through the use of state-of-the-art technologies. Newly-developed tools allow microbe-induced plant volatiles to be detected in a

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rapid, precise, and non-invasive manner to diagnose plant diseases. Beside disease diagnosis, volatile compounds may also be valuable in improving crop productivity in sustainable agriculture. Bacterial volatile compounds (BVCs) have potential for use as a novel plant growth stimulant or as improver of fertilizer efficiency. BVCs can also elicit plant innate immunity against insect pests and microbial pathogens. Research is needed to expand our knowledge of BVCs and to produce BVC-based formulations that can be used practically in the field. Formulation possibilities include encapsulation and sol-gel matrices, which can be used in attract and kill formulations, chemigation, and seed priming. Exploitation of biogenic volatiles will facilitate the development of smart integrated plant management systems for disease control and productivity improvement.

来源: Plant Pathology Journal 期刊

发布日期: 2018-12-01

全文链接: <http://agri.nais.net.cn/file1/M00/03/6D/Csgk0WYYj2eAHITbABeDNTnVipE169.pdf>

➤ 会议论文

1. A Portable Electrochemical System for Plant Volatile Detection (一种便携式植物挥发物电化学检测系统)

简介: Methyl salicylate has been identified as one of the most important biomarker for biotic stresses in plants. Advanced detection of methyl salicylate released by plants has a profound significance for agriculture to maintain effective use for disease management practices. In this work, esterase, salicylate hydroxylase and tyrosinase were used to develop a tri-enzymatic biosensor using screen-printed electrodes for direct detection of methyl salicylate. The sensitivity and limit of detection were determined to be $3.1 \pm 0.2 \mu\text{A}\cdot\text{cm}^{-2}\cdot\mu\text{M}^{-1}$ and $0.8 \pm 0.2 \mu\text{M}$ respectively. An open source computer hardware Arduino Uno was used for fabricating the computer-controlled automated system for collection of volatile organic compound from plant head space and for pre-concentrating the compound. A prototype of portable system for methyl salicylate collection and electrochemical detection was developed in this work.

来源: SELECTED PROCEEDINGS FROM THE 233RD ECS MEETING

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全文链接: <http://agri.nais.net.cn/file1/M00/03/6D/Csgk0WYY7naAIKYLAC-5Cv3bhSI712.pdf>