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2024年06月03日

前沿资讯

1. Brewing Change: The Vital Role of Small Tea Growers in the Specialty Tea Industry（酿造变革：小茶农在特色茶产业中的重要作用）

简介：The global tea market is a large and diverse sector strongly embedded in the culture of many countries around the world. Small tea growers are a very important part of the tea industry. One of the most popular beverages worldwide and only second to water, tea is shared among many cultures and preferences. Robust black teas dominate the general trends in Europe and North America, while delicate green teas and oolongs are preferred in East Asia. The market interest has been growing in recent years due to increased awareness of the healthy properties of tea and the rising interest in diverse and better-quality tea products. Among them, there is a significant trend towards specialty teas. The benefits are the quality and unique flavors and, more often, the story of the small grower and the origin. Unlike mass-produced teas from large producers, specialty teas aim to focus on the authenticity and trackability of the leaf used, which include single-origin plants or those cared for with sustainable and organic farming.

来源：World Tea News 网站

发布日期:2024-05-21

全文链接:http://agri.nais.net.cn/file1/M00/03/6E/Csgk0WZX1GyAMeMVAAO_rDR3JsI664.pdf

学术文献

1. Wearable Volatile Organic Compound Sensors for Plant Health Monitoring（用于植物健康监测的可穿戴挥发性有机化合物传感器）

简介：Volatile organic compounds (VOCs) are utilized as essential biomarkers for plant health and the surrounding environmental conditions in light of global imperatives surrounding food security and sustainable agriculture. However, conventional VOC detection methods have inherent limitations related to operational costs, portability, in situ monitoring, and accessibility. Wearable electronic systems have garnered significant attention as an alternative method because of their capability to detect, identify, and quantify VOCs quickly and cost-effectively. This article presents a comprehensive perspective of recently developed wearable VOC monitoring sensors. It highlights various detection methods for VOCs related to plant metabolism, hormones, and environmental conditions and then multi-VOC sensing based on data-driven analysis. Emerging wearable sensor devices are comprehensively examined from the perspectives of material, structural, sensing mechanisms, and plant monitoring demonstration. The principal issues inherent in recently developed VOC monitoring techniques are discussed, and potential avenues for future research and development are identified.

来源：Advanced Sustainable Systems 期刊

发布日期:2024-05-21

全文链接:http://agri.nais.net.cn/file1/M00/10/41/Csgk0EIARIiALFg0AMXvvzLFILg882.pdf

2．Tritrophic Interactions Mediated by Zoophytophagous Predator Induced Host Plant Volatiles（动植性捕食者诱导的寄主植物挥发物介导的三营养相互作用）

简介：The zoophytophagous mirid predator *Nesidiocoris tenuis* and the ectoparasitoid *Stenomesius japonicus* are important biological control agents for several agricultural pests including the invasive leafminer, *Phthorimaea absoluta*, a destructive pest of Solanaceous crops especially tomato in sub-Saharan Africa. However, little is known about how feeding by *N. tenuis* can influence the tritrophic interactions in the tomato plant. Here, we tested the hypothesis that *N. tenuis* phytophagy would influence the tritrophic olfactory interactions between the host plant tomato and pest, predator, and parasitoid. In olfactometer assays, *P. absoluta* females and *N. tenuis* adults were both attracted to constitutive volatiles released by the tomato plant. Whereas females of *P. absoluta* avoided volatiles released by *N. tenuis*-infested plants, *S. japonicus* females and *N. tenuis* adults were attracted to the induced volatiles. In coupled gas chromatography-electroantennographic detection (GC-EAD) recordings of intact and *N. tenuis*-infested plant volatiles, antennae of *P. absoluta* and *S. japonicus* females both detected eight components, whereas *N. tenuis* adults detected seven components which were identified by GC-mass spectrometry (GC-MS) as terpenes and green leaf volatiles (GLVs). Dose-response olfactometer bioassays revealed that the responses of *P. absoluta*, *N. tenuis*, and *S. japonicus* varied with the composition and concentration of blends and individual compounds tested from *N tenuis*-induced volatiles. Females of *P. absoluta* showed no preference for an eight-component blend formulated from the individual repellents including hexanal, (*Z*)-3-hexenyl butanoate, and δ-elemene identified in the volatiles. On the other hand, *S. japonicus* females were attracted to an eight-component blend including the attractants (*E*)-2-hexenal, (*Z*)-3-hexenol, methyl salicylate, β-phellandrene, and (*E*)-caryophyllene. Likewise, *N. tenuis* adults were attracted to a seven-component blend including the attractants β-phellandrene, δ-elemene, and (*E*)-caryophyllene identified in the volatiles. Our findings suggest that there is potential for the use of terpenes and GLVs to manage the insects in the tritrophic interaction.

来源：Journal of Chemical Ecology 期刊

发布日期:2024-05-09

全文链接:http://agri.nais.net.cn/file1/M00/03/6E/Csgk0WZW-YuAJ0hVAD-OkSuBVgg779.pdf

3．Impact of Volatile Mediated Indirect Defense Response of Plant and Herbivore Refuge in Tritrophic Cascade（挥发物介导的植物和草食动物避难所对三级营养级Cascade间接防御反应的影响）

简介：Plants emit volatile secondary metabolites in response to the attacks from herbivorous insects and send signals to carnivorous enemies as reinforcement against the herbivores. Presence of higher carnivores, attracted by the released volatile blends, increases predation pressure on the herbivores. To reduce predation pressure, the herbivore adopts a refuge mechanism. Two natural phenomena are combined by proposing a volatile mediated model-based tritrophic system among the plants, herbivorous insects, and the natural carnivorous enemy, emphasizing the role of plant volatiles and herbivore refuge. In particular, we have highlighted the role of volatile mediated plant's indirect defense mechanism on its fitness improvement under different ecological consequences, for

example, considering different functional responses for herbivores (Holling type II) and carnivorous enemies (Holling type III) associating hiding behavior of herbivores (herbivore refuge) in a tritrophic interaction model. Numerical simulations and analytical treatments are conducted to validate our proposed hypothesis on the tritrophic interaction. Using Isocline method, we show the existence of the interior equilibriums. We illustrate sensitivity analysis of system parameters through Global Sensitivity Analysis using Latin Hypercube Sampling and Partial Ranked Correlation Coefficient. The high-dimensional Bendixson criterion is applied to show global stability of positive equilibrium. We observed two types of alternative states, transcritical bifurcation of limit cycle, and saddle-node bifurcation. High emission of volatiles promotes more stabilized dynamical behaviors, when all three species coexist, thus sustaining the ecological balance in the tritrophic interaction.

来源：Differential Equations and Dynamical Systems 期刊

发布日期:2024-03-25

全文链接:http://agri.nais.net.cn/file1/M00/10/41/Csgk0EIAS9eAGKLOACvIp0fEo1E668.pdf

4. Recent advances in plant insect monitoring using volatile profiling strategy（利用挥发物图谱策略监测植物昆虫的研究进展）

简介：Insect attacks in crops or forests are now a global concern, they have reduced agricultural production and caused forest degradation for a long time, leading to great economic and ecological damage. However, conventional visual and molecular technology-based approaches can hardly apply to the early or large-scale detection of insect infestation in plants, especially those plants with internal damage. Plants always make metabonomic responses to insect damage, and herbivore-induced plant volatiles (HIPVs) generally change significantly among the plant metabolites. In addition, the insect can also release volatiles, especially during certain biological activities. For instance, male and female adults secrete pheromones to attract the opposite sex before mating. The volatile profiling strategy has been extensively used in plant insect monitoring, this paper reviews their applications in the plant-produced HIPVs and insect-produced pheromones. In addition, different chemometrics methods applied to plant damage discrimination are summarized.

来源：TrAC Trends in Analytical Chemistry 期刊

发布日期:2023-12-20

全文链接:http://agri.nais.net.cn/file1/M00/03/6E/Csgk0WZXAk-AJJ0IAEHCm8aLH_E051.pdf

会议论文

1. Phenotyping volatile organic compounds (VOCs) emitted by plants（植物释放的挥发性有机化合物(VOCs)的表型分析）

简介：气候变化、人口增长和资源短缺正在给农业带来越来越大的压力。从这个角度来看，已经在用高通量、省时和高效的表型技术取代传统的植物表型分析方法方面取得了进展，这些方法具有破坏性、耗时、低效和高成本，能够评估复杂的植物性状，评估植物对应力的反应，并筛选出理想的新基因型。挥发性有机化合物（VOCs）作为高通量植物表型的有前途的

标志物，目前正在深入研究。概述了当前最先进的技术，以在叶片、整株植物和植物群落（生态系统）水平上表现VOC排放。

来源： Proceedings OF 2023 IEEE MetroAgriFor
发布日期: 2023-11-08
全文链接:
http://agri.nais.net.cn/file1/M00/10/41/Csgk0EIBHV2AD8tZAAbhDeAauvQ437.pdf