2023年第40期 总401期

# 茶学研究专题

## 本期导读

### 前沿资讯

1．世界茶博会推出终极茶饮挑战赛，茶业新时代的新竞争

### 学术文献

1．植物发酵介导的生长、信号传导和防御

2．茶小绿叶蝉离子型受体基因EonuIR25a的特性研究

3．细菌挥发性有机化合物作为生物农药、生长促进剂和植物防御诱导剂：目前的认识和未来的范围

4．茶树对茶小绿叶蝉抗性的田间评价

### 科技图书

1．园艺昆虫学发展趋势

中国农业科学院农业信息研究所
联系人：王玉芹
联系电话：010-82109896
邮箱：agri@ckcest.cn
2023年10月02日

## 前沿资讯

### 1. World Tea Expo Unveils the Ultimate Tea Beverage Challenge, a New Competition for the New Era of Tea（世界茶博会推出终极茶饮挑战赛，茶业新时代的新竞争）

**简介：**World Tea Expo is launching a new competition for the new era of tea, called World Tea Expo Beverage Challenge, and submissions for the event will officially open on Oct. 2, 2023. Participants in the competition can showcase the quality of their product across eight categories for 2023/2024. The World Tea Expo Beverage Challenge is the preeminent opportunity to demonstrate the impact that a brand's products make within the international tea industry. The "Grand Champion," "Best Leaf" and "Best Liquor" award winners of the World Tea Expo Beverage Challenge will have their teas sampled live to thousands of attendees at World Tea Expo 2024 in Las Vegas, which takes place March 18-20 at the Las Vegas Convention Center.

**来源：**World Tea News 网站

**发布日期:**2023-09-13

**全文链接:**http://agri.nais.net.cn/file1/M00/10/31/Csgk0GUT8YGAHL1hAAGpeE-emv0141.pdf

## 学术文献

### 1. Fermentation-mediated growth, signaling, and defense in plants（植物发酵介导的生长、信号传导和防御）

**简介：**We review root ethanolic fermentation responses to hypoxia during saturated soil conditions and summarize studies highlighting acetate fermentation under aerobic conditions coupled with respiration during growth and drought responses. Recent work is discussed demonstrating long-distance transport of acetate via the transpiration stream as a respiratory substrate. While maintenance and growth respiration are often modeled separately in terrestrial models, here we propose the concept of ‘Defense Respiration’ fueled by acetate fermentation in which upregulation of acetate fermentation contributes acetate substrate for alternative energy production via aerobic respiration, biosynthesis of primary and secondary metabolites, and the acetylation of proteins involved in defense gene regulation. Finally, we highlight new frontiers in leaf-atmosphere emission measurements as a potential way to study acetate fermentation responses of individual leaves, branches, ecosystems, and regions.

**来源：**New Phytologist 期刊

**发布日期:**2023-06-06

**全文链接:**http://agri.nais.net.cn/file1/M00/03/5F/Csgk0YlqPf-AI_zOACQobWCRS6A439.pdf

### 2. Characterization of Ionotropic Receptor Gene EonuIR25a in the Tea Green Leafhopper, *Empoasca onukii* Matsuda（茶小绿叶蝉离子型受体基因EonuIR25a的特性研究）

**简介：**Ionotropic receptors (IRs) play a central role in detecting chemosensory information from the

environment and guiding insect behaviors and are potential target genes for pest control. *Empoasca onukii* Matsuda is a major pest of the tea plant *Camellia sinensis* (L.) O. Ktze, and seriously influences tea yields and quality. In this study, the ionotropic receptor gene *EonuIR25a* in *E. onukii* was cloned, and the expression pattern of *EonuIR25a* was detected in various tissues. Behavioral responses of *E. onukii* to volatile compounds emitted by tea plants were determined using olfactometer bioassay and field trials. To further explore the function of *EonuIR25a* in olfactory recognition of compounds, RNA interference (RNAi) of *EonuIR25a* was carried out by ingestion of in vitro synthesized dsRNAs. The coding sequence (CDS) length of *EonuIR25a* was 1266 bp and it encoded a 48.87 kD protein. *EonuIR25a* was enriched in the antennae of *E. onukii*. *E. onukii* was more significantly attracted by 1-phenylethanol at a concentration of 100 μL/mL. Feeding with dsEonuIR25a significantly downregulated the expression level of *EonuIR25a*, after 3 h of treatment, which disturbed the behavioral responses of *E. onukii* to 1-phenylethanol at a concentration of 100 μL/mL. The response rate of *E. onukii* to 1-phenylethanol was significantly decreased after dsEonuIR25a treatment for 12 h. In summary, the ionotropic receptor gene *EonuIR25a* was highly expressed in the antennae of *E. onukii* and was involved in olfactory recognition of the tea plant volatile 1-phenylethanol. The present study may help us to use the ionotropic receptor gene as a target for the behavioral manipulation of *E. onukii* in the future.

**来源：**Plants-Basel 期刊

**发布日期:**2023-05-19

**全文链接:**http://agri.nais.net.cn/file1/M00/10/31/Csgk0GUTlGOARLEAAFnZle8irlc194.pdf

## 3．Bacterial volatile organic compounds as biopesticides, growth promoters and plant-defense elicitors: Current understanding and future scope（细菌挥发性有机化合物作为生物农药、生长促进剂和植物防御诱导剂：目前的认识和未来的范围）

**简介：**Bacteria emit a large number of volatile organic compounds (VOCs) into the environment. VOCs are species-specific and their emission depends on environmental conditions, such as growth medium, pH, temperature, incubation time and interaction with other microorganisms. These VOCs can enhance plant growth, suppress pathogens and act as signaling molecules during plant–microorganism interactions. Some bacterial VOCs have been reported to show strong antimicrobial, nematicidal, pesticidal, plant defense, induced tolerance and plant-growth-promoting activities under controlled conditions. Commonly produced antifungal VOCs include dimethyl trisulfide, dimethyl disulfide, benzothiazole, nonane, decanone and 1-butanol. Species of *Bacillus*, *Pseudomonas*, *Arthrobacter*, *Enterobacter* and *Burkholderia* produce plant growth promoting VOCs, such as acetoin and 2,3-butenediol. These VOCs affect expression of genes involved in defense and development in plant species (i.e., *Arabidopsis*, tobacco, tomato, potato, millet and maize). VOCs are also implicated in altering pathogenesis-related genes, inducing systemic resistance, modulating plant metabolic pathways and acquiring nutrients. However, detailed mechanisms of action of VOCs need to be further explored. This review summarizes the bioactive VOCs produced by diverse bacterial species as an alternative to agrochemicals, their mechanism of action and challenges for employment of bacterial VOCs for sustainable agricultural practices. Future studies on technological improvements for bacterial VOCs application under

greenhouse and open field conditions are warranted.
**来源：**Biotechnology Advances 期刊
**发布日期:**2023-03-30
**全文链接:**http://agri.nais.net.cn/file1/M00/10/31/Csgk0GUTiAqAaOz_ACCfBI6oLPg815.pdf

### 4. Field evaluation of resistance to tea green leafhopper, *Empoasca onukii*, in tea plant（茶树对茶小绿叶蝉抗性的田间评价）

**简 介：** The tea green leafhopper, *Empoasca onukii* Matsuda (Hemiptera: Cicadellidae, Typhlocybinae), is a serious pest of tea plants in East Asia. In the laboratory, tea genotypes CA278, Cd19, and Cd289 [*Camellia sinensis* (L.) O. Kuntze (Theaceae)] sustain fewer feeding damage symptoms known as hopperburn than the susceptible cultivar 'Yabukita,' and *E. onukii* excretes less honeydew on them than on Yabukita. Here, we evaluated whether these genotypes have practical and sufficient resistance under field conditions. The densities of *E. onukii* eggs, larvae, and adults on tea shoots and the degree of feeding damage were compared as indicators of resistance. Genotypes Cd19 and Cd289 showed strong resistance and CA278 showed moderate resistance under field conditions. Therefore, Cd19 and Cd289 are favorable materials for breeding tea cultivars with resistance to tea green leafhopper. We propose selection methods for breeding new resistant tea cultivars.
**来源：**Entomologia Experimentalis et Applicata 期刊
**发布日期:**2021-08-07
**全文链接:**http://agri.nais.net.cn/file1/M00/03/5F/Csgk0YlqSnaAK6t5AAeiUyf64M0347.pdf

## 科技图书

### 1. Trends in Horticultural Entomology（园艺昆虫学发展趋势）

**简介：**本书强调了纳米技术、卫星技术和生物技术在害虫管理中应用的最新信息。它涵盖了气候变化和生态学在害虫管理方面的作用及其分子鉴定；其他方法包括有机害虫管理、寄主植物抗性、信息化学和生物防治技术；昆虫传粉媒介，它们在园艺作物生产中对水果起着重要作用。园艺作物的集约化和广泛种植导致了严重的害虫问题。印度和其他地方的气候条件导致新的害虫出现，对园艺作物造成了严重破坏。为了应对这种情况，研究人员开发了新技术来对抗害虫及其对杀虫剂日益增长的耐药性。该书还包括了了园艺作物害虫的特性、生物学、危害、季节发展和害虫管理的最新信息。
**来源：**SpringerLink 网站
**发布日期:**2022-09-16
**全文链接:**http://agri.nais.net.cn/file1/M00/03/5F/Csgk0YlqoYOAQuHZBIM6Ky7N3IM854.pdf