2024年 第24期 总437期

茶学研究专题

本期导读

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会议论文

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2024年06月10日

前沿资讯

1. The World Tea Expo Protégé Training Program is Returning in 2025!（2025年世界茶博会Protégé培训项目回归！）

简介：2024年，世界茶博会推出了新的Protégé培训项目，为那些新进入茶行业的人提供了一个独特的机会，让他们了解茶业市场，与同行建立联系。免费项目还包括参加Tea Primer课程，并将获得结业证书。除了Tea Primer课程外，还可以在会议期间参加其他常规课程。该项目在2024年取得了巨大成功，并将计划在2025年继续实施该项目，以帮助培训未来的茶行业员工。

来源：World Tea News 网站

发布日期:2024-05-20

全文链接:http://agri.nais.net.cn/file1/M00/10/41/Csgk0GZgIsqAKIPrAAXg80sjCSY485.pdf

学术文献

1．Elevated Ozone Reduces the Quality of Tea Leaves but May Improve the Resistance of Tea Plants（臭氧浓度升高会降低茶叶品质，但可能提高茶树的抗性）

简介：Tropospheric ozone (O_3) pollution can affect plant nutritional quality and secondary metabolites by altering plant biochemistry and physiology, which may lead to unpredictable effects on crop quality and resistance to pests and diseases. Here, we investigated the effects of O_3 (ambient air, Am; ambient air +80 ppb of O_3, EO_3) on the quality compounds and chemical defenses of a widely cultivated tea variety in China (*Camellia sinensis* cv. 'Baiye 1 Hao') using open-top chamber (OTC). We found that elevated O_3 increased the ratio of total polyphenols to free amino acids while decreasing the value of the catechin quality index, indicating a reduction in leaf quality for green tea. Specifically, elevated O_3 reduced concentrations of amino acids and caffeine but shows no impact on the concentrations of total polyphenols in tea leaves. Within individual catechins, elevated O_3 increased the concentrations of ester catechins but not non-ester catechins, resulting in a slight increase in total catechins. Moreover, elevated O_3 increased the emission of biogenic volatile organic compounds involved in plant defense against herbivores and parasites, including green leaf volatiles, aromatics, and terpenes. Additionally, concentrations of main chemical defenses, represented as condensed tannins and lignin, in tea leaves also increased in response to elevated O_3. In conclusion, our results suggest that elevated ground-level O_3 may reduce the quality of tea leaves but could potentially enhance the resistance of tea plants to biotic stresses.

来源：Plants-Basel 期刊

发布日期:2024-04-16

全文链接:http://agri.nais.net.cn/file1/M00/10/41/Csgk0EIIGCaAJ6zMABagmJlKtbI956.pdf

2． CsAFS2 Gene from the Tea Plant Intercropped with Chinese

Chestnut Plays an Important Role in Insect Resistance and Cold Resistance（与板栗间作的茶树CsAFS2基因在抗虫抗寒中起重要作用）

简介：α-Farnesene, a crucial secondary metabolite in sesquiterpenes, is crucial for plant biotic and abiotic stress resistance. In this study, we screened an AFS gene from transcriptome data of tea plants (*Camellia sinensis*) intercropped with Chinese chestnut (*Castanea mollissima*), resulting in the cloning of *CsAFS2*. *CsAFS2* expression increased following treatment with MJ (Methyl jasmonate), SA (Salicylic acid), GA_3 (Gibberellin A3), and various plant growth regulators, as well as under high-salt, drought, and low-temperature conditions. The heterologous genetic transformation of tobacco with *CsAFS2* led to an enhanced resistance to low-temperature stress and aphid feeding, evident from elevated levels of osmotic regulatory substances, increased protective enzyme activity, and the upregulation of cold and insect resistance-related genes. Trichomes, crucial in cold and insect resistance, exhibited significantly greater length and density in transgenic tobacco as compared to control plants. These results confirm the vital role of *CsAFS2* in enhancing cold and insect resistance, providing comprehensive insights into stress regulation mechanisms in tea plants and advancing stress-resistant tea plant breeding.

来源：Forests 期刊

发布日期:2024-02-18

全文链接:http://agri.nais.net.cn/file1/M00/10/41/Csgk0EIIIvSARG3FAHApu-NkUqI652.pdf

3. Association between chemistry and taste of tea: A review（化学与茶味的关系研究综述）

简介：Background：Taste is an important factor in evaluating the quality of tea. The sweet and umami tastes are usually well-accepted for consumers, whereas the bitter and astringent tastes are usually undesired, but they are important for providing the complex sensory perceptions of Camellia teas. The compounds responsible for the bitterness and astringency in tea leaves can be modified by processing, and subsequently endowed different taste of various tea types. Therefore, the taste of tea is closely related to the chemical constituents, and the taste mechanism is critical for improving tea quality.

Scope and approach：The aim of this review is to review and discuss the association between chemical composition of Camellia teas and their effects on bitterness, astringency, sweetness aftertaste and umami.

Key findings and conclusions: In the tea infusion, flavonol-O-glycosides, tannins and galloylated catechins are the main astringent compounds, caffeine and non-galloylated catechins enhance the tea bitterness. Furthermore, l-theanine, succinic acid, gallic acid and theogallin contribute to the umami taste. Sweetness aftertaste is a unique perception of green tea, which is attributed to the hydrolysis of galloylated catechins. T1R2 and T1R3 have been identified as sweet and umami taste receptors, while T2Rs functionas the bitter taste receptor.

来源：Trends in Food Science & Technology 期刊

发布日期:2020-07-10

全文链接:http://agri.nais.net.cn/file1/M00/03/6F/Csgk0WZezd-Afc1SABYOxJe6DMY253.pdf

4. Nucleopolyhedrovirus infection enhances plant defences by increasing

plant volatile diversity（核型多角体病毒感染通过增加植物挥发物多样性来增强植物防御）

简介：Plant-herbivore-entomopathogen tri-trophic interactions and biodiversity are relatively understudied topics in ecology. Particularly, the effects of entomopathogens on herbivore-induced plant volatiles and plant volatile diversity on the defensive function of plants have not been studied in detail. We used soybean (*Glycine max*), beet armyworm larvae (*Spodoptera exigua*), and nucleopolyhedrovirus (NPV) as a tri-trophic system to determine whether NPV infection can promote the emission and diversity of volatiles from plants. We also investigated whether NPV infection affects the attraction of *Microplitis pallidipes*, an important endoparasitoid of larval *S. exigua*. Uninfested soybean plants released 7 detectable volatile compounds while plants fed upon by healthy and NPV-infected *S. exigua* larvae released 12 and 15 volatiles, respectively. Female parasitoids were more attracted to the volatiles from plants that were fed upon by NPV-infected larvae than healthy larvae, and more attracted to the volatiles from plants that were fed upon by healthy larvae than no larvae. The selective responses of parasitoids to plant odours increased as plant volatile diversity increased. Our study suggests that the NPV infection facilitates the release of plant volatiles and enhances the defensive function of plants by increasing plant volatile diversity which in turn attracts more parasitoids. Also, this work reveals that plants might accrue two indirect benefits from NPV infection, cessation of herbivore feeding and more parasitisation.

来源：Biocontrol Science and Technology 期刊

发布日期:2017-10-24

全文链接:http://agri.nais.net.cn/file1/M00/03/6F/Csgk0WZf1YqAKaDzACJKSJTTceU726.pdf

会议论文

1．Exploring multi-trophic plant-herbivore interactions for new crop protection methods（探索多营养植物-草食动物交互作用的新作物保护方法）

简介：Biological control of arthropod herbivores in agricultural crops depends on antagonists or enemies of the pest organisms. To minimise damage to a crop, it is crucial that the biological control agents are able to find their prey efficiently. Here we discuss the finding that when herbivores feed, plants produce volatiles that are attractive to the predators. The effects of biotic, abiotic and genetic factors on volatile formation and the biochemical and molecular regulation of this indirect defence mechanism are reviewed. The opportunities to use genetically modified plants to further understanding this complex interaction and the possibilities of using our knowledge to improve biological control in agricultural crops are discussed.

来源：BCPC INTERNATIONAL CONGRESS CROP SCIENCE & TECHNOLOGY 2003

发布日期:2003-11-10

全文链接:http://agri.nais.net.cn/file1/M00/03/6F/Csgk0WZgFdeAF3omAAOj6L4x9e8451.pdf