



2023年第37期 总398期

茶学研究专题

本期导读

➤ 学术文献

1. 碳纳米管在茶叶质量安全评价中的应用进展
2. 茶的苦味：农药残留及其对人体健康的影响
3. 通过确定关键的泡茶参数，对茶和花草茶在泡茶过程中的农药转移进行建模
4. (*E*)-松柏醇对桔小实蝇雌成虫的引诱性和安全性评价

➤ 会议论文

1. 高效液相色谱法测定茶叶和土壤中有机磷杀虫剂及其氧化物

➤ 相关专利

1. 农药残留检测方法及试剂盒

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09月11日

更多资讯 尽在农业专业知识服务系统：<http://agri.nais.net.cn/>

► 学术文献

1. Advancements in the application of carbon nanotubes for tea quality and safety assessment (碳纳米管在茶叶质量安全评价中的应用进展)

简介: This review focuses on the advancements in the application of carbon nanotubes (CNTs) for tea quality and safety assessment, aiming to provide a comprehensive understanding of the emerging detection methods. Tea quality and safety are crucial aspects of the industry due to the beverage's popularity and health benefits. Traditional assessment methods have limitations, prompting the need for more rapid, sensitive, and cost-effective alternatives. CNTs offer unique properties, making them a promising tool for developing novel sensing and detection techniques. The review discusses CNT-based sensors for the analysis of key chemical components and contaminants, as well as the integration of CNTs with other advanced materials and technologies. It emphasizes the potential impact of these methods on the tea industry, including real-time analysis and a safer, more transparent supply chain.

来源: Fullerenes, Nanotubes and Carbon Nanostructures 期刊

发布日期: 2023-08-12

全文链接: <http://agri.nais.net.cn/file1/M00/10/30/Csgk0GTwXVKAYGSTACEKujRaJKw667.pdf>

2. The bitter side of teas: Pesticide residues and their impact on human health (茶的苦味: 农药残留及其对人体健康的影响)

简介: Tea (*Camellia sinensis*) is one of the most widely consumed non-alcoholic beverages globally, known for its rich composition of bioactive compounds that offer various health benefits to humans. However, the cultivation of tea plants often faces challenges due to their high vulnerability to pests and diseases, resulting in the heavy use of pesticides. Consequently, pesticide residues can be transferred to tea leaves, compromising their quality and safety and potentially posing risks to human health, including hormonal and reproductive disorders and cancer development. In light of these concerns, this review aims to: (I) present the maximum limits of pesticide residues established by different international regulatory agencies; (II) explore the characteristics of pesticides commonly employed in tea cultivation, encompassing aspects such as digestion, bioaccessibility, and the behavior of pesticide transfer; and (III) discuss the effectiveness of detection and removal methods for pesticides, the impacts of pesticides on both tea plants and human health and investigate emerging alternatives to replace these substances. By addressing these critical aspects, this review provides valuable insights into the management of pesticide residues in tea production, with the goal of ensuring the production of safe, high-quality tea while minimizing adverse effects on human health.

来源: Food and Chemical Toxicology 期刊

发布日期: 2023-07-22

全文链接: <http://agri.nais.net.cn/file1/M00/03/5E/Csgk0YlGtiCAGNmtABgOqIzq7P0561.pdf>

3. Modelling the pesticide transfer during tea and herbal tea infusions by the identification of critical infusion parameters (通过确定关键的泡

更多资讯 尽在农业专业知识服务系统: <http://agri.nais.net.cn/>

茶参数，对茶和花草茶在泡茶过程中的农药转移进行建模)

简介: Pesticide residues in tea and herbal tea often exceed EU maximum residue limits. Consideration of the transfer of pesticides from the leaves (called transfer factors) to the brew is essential to assess the associated risk. This study identified infusion parameters influencing the transfer behaviour of 61 pesticides and elaborated a predictive model for pesticides with unknown transfer factors in black, green, herbal and flavoured teas. Tea type and the presence of flavours were the criteria that most influenced the pesticide transfer. Interestingly, infusion parameters that are individual and area dependent such as infusion time, temperature and water hardness, did not play a significant role. Beta regression models developed to characterise pesticide behaviour during infusion showed good predictions for most pesticides and revealed that log (P) was the main physico-chemical parameter to estimate the pesticide transfer. The transfer factors database and validated models are valuable tools for improving risk assessment.

来源: Food Chemistry 期刊

发布日期:2023-07-17

全文链接:http://agri.nais.net.cn/file1/M00/10/30/Csgk0GTv_r2ADa2PAB3n99SzJAA376.pdf

4. Assessment of attractancy and safeness of (E)-coniferyl alcohol for management of female adults of Oriental fruit fly, *Bactrocera dorsalis* (Hendel) ((E)-松柏醇对桔小实蝇雌成虫的引诱性和安全性评价)

简介: **BACKGROUND:** *Bactrocera dorsalis* is a devastating pest on fruits and vegetables because the adult female is the key factor that determines the population density of offspring and the degree of host damage. Unfortunately, there is still a lack of effective female attractants for behavioral control. Males of *B. dorsalis* fed on methyl eugenol (ME) were shown to be more sexually attracted to females and, therefore, were more successful in mating over ME-deprived males.

RESULTS: In the current study, we demonstrated that (E)-coniferyl alcohol (E-CF), one of the ME metabolites in males, was highly attractive to sexually-mature females in laboratory bioassays. During the dusk courtship period, mature females showed the highest response to E-CF. However, there were no significant differences in olfactory responses to E-CF between virgin and mated mature females. Moreover, no obvious signs and symptoms of toxicity or death were observed in mice during a 14-day acute oral toxicity test. Toxicologically, no significant changes were observed in body weight, water intake, food consumption and absolute and relative organ weights between control and treated groups of healthy-looking mice, implying that E-CF could be regarded as non-toxic. Furthermore, cytotoxicity assessment revealed that E-CF was non-toxic against human fetal lung fibroblast 1 (HFL1), human breast cancer (MDA-MB-231), mouse embryonic hepatocytes (BNL-CL.2) and *Spodoptera frugiperda* ovary (SF-9) cell lines.

CONCLUSIONS: E-CF proved to be an effective, promising and eco-friendly lure to *B. dorsalis* females. Therefore, this study may facilitate the development of novel control strategies against *B. dorsalis* in the field.

来源: Pest Management Science 期刊

发布日期:2021-11-13

全文链接:http://agri.nais.net.cn/file1/M00/03/5E/Csgk0YIHDneAFmQ2ABxS_G36eFw720.pdf

➤ 会议论文

1. Determination of Selected Organophosphorus Insecticides and Their Oxides in Tea and Soil by HPTLC (高效液相色谱法测定茶叶和土壤中有机磷杀虫剂及其氧化物)

简介: A determination method of selected organophosphorus insecticides and their oxides (Parathion- methyl and Dimethyl- paraoxon; Parathion and Paraoxon; Chlorpyrifos and Chlorpyrifos-oxon.) in tea and soil was developed with high performance thin-layer chromatography (HPTLC). The acetonitrile was applied to extract tea sample and the tandem column of solid-phase extraction was to clean samples up. The soil sample was extracted with ethyl acetate and not to be clean-up. The processed samples were directly applied as bands to glass-backed silica gel 60F254 HPTLC plates. The plates were developed by AMD with 7-step for tea samples and 2-step for soil samples. Evaluation of the developed HPTLC plates was performed densitometrically. Three fortification levels of the samples were conducted in the test. In this method, the detection limits of parathion-methyl, dimethyl-paraoxon, parathion, paraoxon and chlorpyrifos-oxon were from 3.0×10^{-9} g to 1.0×10^{-8} g in different development systems. The chlorpyrifos was from 7.0×10^{-9} g to $2.0 \times 10 \times 10^{-8}$ g. Recoveries of the pesticides residues from tea were 68.98-116.73%, and the soil were 69.44 -120.00 % except the chlorpyrifos. The relative standard deviations were 4.02-17.50 % for tea, and 3.11-14.20 % for soil except the chlorpyrifos. The Rf value and the validation data were given. The development by AMD in this method was discussed.

来源: IOP Conference Series-Earth and Environmental Science

发布日期: 2019-12-27

全文链接: <http://agri.nais.net.cn/file1/M00/03/5E/Csgk0YIO6vCAeXluAAib5e3jfCI294.pdf>

➤ 相关专利

1. METHOD FOR DETECTING PESTICIDE RESIDUE, AND KIT (农药残留检测方法及试剂盒)

简介: 一种农药残留检测方法及试剂盒。一种昆虫的头部制剂用于检测。所述昆虫的头部制剂含有可被农药抑制的酶。该方法灵敏度高,假阴性率为0,假阳性率小于5%。经过卡方检验,检测结果与色谱仪的测量方法没有显著差异。

来源: 世界知识产权组织

发布日期: 2021-11-11

全文链接: <http://agri.nais.net.cn/file1/M00/10/30/Csgk0GT4OzqAcWWhAA-LpgkEPr0756.pdf>