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茶学研究专题

本期导读

➤ 学术文献

1. 次生代谢物在植物防御机制中作用：分子和生物技术的见解
2. 有机电子学在昆虫电传感和害虫综合治理中的潜在应用，开发化学杀虫剂的环保替代品
3. 昆虫对映体鉴别：OBPs和ORs的作用
4. 植物相关微生物在昆虫草食动物宿主-植物选择中的作用

➤ 相关专利

1. 害虫防御系统
2. 识别不同作物病害和腐败对应的特定防御机制，并确定触发这些防御机制的独特挥发物特征的过程

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学术文献

1. Role of secondary metabolites in plant defense mechanisms: a molecular and biotechnological insights (次生代谢物在植物防御机制中的作用: 分子和生物技术的见解)

简介: The plants produce secondary metabolites (SMs) as defence compounds against both abiotic and biotic stresses. These stresses instigate the secretion and release of SMs by up or down-regulating the concerned genes involved in their synthesis. This review article gives a molecular insight into the genes and regulatory proteins controlling the synthesis of SMs, which may help decipher the role of the biosynthetic pathway intermediates and thereby scoring genes providing resistance to various stresses. The article comprehensively describes the roles of different SMs in plant defence and their molecular mechanisms of action.

来源: Phytochemistry Reviews 期刊

发布日期: 2024-05-24

全文链接: <http://agri.nais.net.cn/file1/M00/03/6F/Csgk0WZiygiAB-57AC9NtXMCTOg197.pdf>

2. Potential Application of Organic Electronics in Electrical Sensing of Insects and Integrated Pest Management towards Developing Ecofriendly Replacements for Chemical Insecticides (有机电子学在昆虫电传感和害虫综合治理中的潜在应用, 开发化学杀虫剂的环保替代品)

简介: Synthetic insecticides are widely used against plant pest insects to protect the crops. However, many insecticides have poor selectivity and are toxic also to beneficial insects, animals, and humans. In addition, insecticide residues can remain on fruits for many days, jeopardizing food safety. For these reasons, a reusable, low-cost electronic trap that can attract, detect, and identify, but attack only the pest while leaving beneficial insects unharmed could provide a sustainable, nature-friendly replacement. Here, for the first time, research results are presented suggesting the great potential and compatibility of organic electronic devices and technologies with pest management. Electrical characterizations confirm that an insect's body has relatively high dielectric permittivity. Adaptive memcapacitor circuits can track the impedance change for insect detection. Other experiments show that printed polymer piezoelectric transducers on a plastic substrate can collect information about the weight and activity of insects for identification. The breakdown voltage of most insects' integument is measured to be <200 V. Long channel organic transistors easily work at such high voltages while being safe to touch for humans thanks to their inherent low current. This feasibility study paves the way for the future development of organic electronics for physical pest control and biodiversity protection.

来源: Advanced Science 期刊

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全文链接: <http://agri.nais.net.cn/file1/M00/10/41/Csgk0GZi0fuAE5meAEQebiTcb58902.pdf>

3. Enantiomeric Discrimination in Insects: The Role of OBPs and ORs (昆虫对映体鉴别: OBPs和ORs的作用)

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简介: Olfaction is a complex recognition process that is critical for chemical communication in insects. Though some insect species are capable of discrimination between compounds that are structurally similar, little is understood about how this high level of discrimination arises. Some insects rely on discriminating between enantiomers of a compound, demonstrating an ability for highly selective recognition. The role of two major peripheral olfactory proteins in insect olfaction, i.e., odorant-binding proteins (OBPs) and odorant receptors (ORs) has been extensively studied. OBPs and ORs have variable discrimination capabilities, with some found to display highly specialized binding capability, whilst others exhibit promiscuous binding activity. A deeper understanding of how odorant-protein interactions induce a response in an insect relies on further analysis such as structural studies. In this review, we explore the potential role of OBPs and ORs in highly specific recognition, specifically enantiomeric discrimination. We summarize the state of research into OBP and OR function and focus on reported examples in the literature of clear enantiomeric discrimination by these proteins.

来源: Insects 期刊

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4. The Role of Plant-Associated Microbes in Mediating Host-Plant Selection by Insect Herbivores (植物相关微生物在昆虫草食动物宿主-植物选择中的作用)

简介: There is increasing evidence that plant-associated microorganisms play important roles in shaping interactions between plants and insect herbivores. Studies of both pathogenic and beneficial plant microbes have documented wide-ranging effects on herbivore behavior and performance. Some studies, for example, have reported enhanced insect-repellent traits or reduced performance of herbivores on microbe-associated plants, while others have documented increased herbivore attraction or performance. Insect herbivores frequently rely on plant cues during foraging and oviposition, suggesting that plant-associated microbes affecting these cues can indirectly influence herbivore preference. We review and synthesize recent literature to provide new insights into the ways pathogenic and beneficial plant-associated microbes alter visual, olfactory, and gustatory cues of plants that affect host-plant selection by insect herbivores. We discuss the underlying mechanisms, ecological implications, and future directions for studies of plant-microbial symbionts that indirectly influence herbivore behavior by altering plant traits.

来源: Plants-Basel 期刊

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相关专利

1. Pest defense system (害虫防御系统)

简介: 本发明公开了一种用于可持续农业的基于人工智能(AI)的害虫防御系统(1), 包括若干组件, 高分辨率摄像机(2)、图像处理单元(IPU)(3)、数据传输模块(4)、中央服务器(5)和接口

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(6), 其通过使用高分辨率摄像机(2)捕获农田作物的高质量图像进行操作, 然后将这些图像无线传输到中央服务器(5); 其中它们由图像处理单元(IPU)(3)使用图像识别和机器学习方法进行处理。IPU(3)识别图像中的害虫并评估害虫侵扰的严重程度。然后, 中央服务器(5)对处理后的有害生物数据进行分析, 生成实时有害生物信息, 包括有害生物种群趋势、分布模式和潜在爆发。基于这一分析, 中央服务器(5)根据特定的害虫种类、作物类型和当地环境因素, 生成量身定制的有害生物管理建议。然后将这些建议发送到接口(6), 农民可以实时访问这些建议。

来源: 印度专利

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2. A process to identify specific defense mechanism corresponding to different crop diseases and spoilage, and determining the unique volatile profile that triggers these defense mechanisms (识别不同作物病害和腐败对应的特定防御机制, 并确定触发这些防御机制的独特挥发物特征的过程)

简介: This invention is in the field of Agriculture and particularly, about a process to identify the specific defense mechanism corresponding to different crop diseases and spoilage, and to determine the unique volatile profile that triggers these defense mechanisms to reduce spoilage, and retain freshness and quality in the agricultural produces. The process comprises the steps of identifying crop spoilage, mapping biochemistry pathway to crop spoilage, identifying defense pathway, identifying molecular targets that trigger the biochemistry pathway, selecting the active compounds from the repository, and wet-lab testing of screened compounds. The process proves that the ingredient can activate the defense pathways to reduce spoilage and retain freshness/ quality.

来源: 印度专利

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