2023年第43期 总404期

茶学研究专题

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相关专利

1．具有低挥发性有机化合物的分离植物蛋白组合物

科技图书

1．昆虫消化系统的分子生理学和进化

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学术文献

1. Involvement of Holotrichia parallela odorant-binding protein 3 in the localization of oviposition sites（暗黑鳃金龟气味结合蛋白3参与产卵位点的定位）

简 介： Organic fertilizers-derived volatiles attract *Holotrichia parallela* during oviposition. However, the mechanisms underlying the perception of oviposition cues in *H. parallela* remain unclear. Here, *H. parallela* odorant-binding protein 3 (HparOBP3) was identified as a key OBP. Bioinformatics analysis showed that *HparOBP3* clustered together with *Holotrichia oblita* OBP8. *HparOBP3* was mainly expressed in the antennae of both sexes. Recombinant HparOBP3 exhibited distinct binding affinities towards 22 compounds released by organic fertilizers. After 48 h of RNA interference (RNAi), the expression of *HparOBP3* in male and female antennae was decreased by 90.77 % and 82.30 %, respectively. In addition, silencing of *HparOBP3* significantly reduced the electrophysiological responses and tropism of males to *cis*-3-hexen-1-ol, 1-hexanol, and (*Z*)-*β*-ocimene as well as females to *cis*-3-hexen-1-ol, 1-hexanol, benzaldehyde, and (*Z*)-*β*-ocimene. Molecular docking indicated that hydrophobic residues Leu-83, Leu-87, Phe-108, and Ile-120 of HparOBP3 were important amino acids for interacting with ligands. Mutation of the key residue, Leu-83, significantly diminished the binding ability of HparOBP3. Furthermore, acrylic plastic arena bioassays showed that the attraction and oviposition indexes of organic fertilizers to *H. parallela* were reduced by 55.78 % and 60.11 %, respectively, after silencing *HparOBP3*. These results suggest that HparOBP3 is essential in mediating the oviposition behavior of *H. parallela*.

来源： International Journal of Biological Macromolecules 期刊

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全文链接: http://agri.nais.net.cn/file1/M00/03/5F/Csgk0Yl-W8-Ac8U_AIvvqpLaFs0697.pdf

2. Dynamic distress calls: volatile info chemicals induce and regulate defense responses during herbivory（动态求救：挥发性信息化学物质诱导和调节草食期间的防御反应）

简介： Volatile organic compounds (VOCs) are a class of specialized metabolites that are naturally emitted by plants and play an important role in plant communication and signaling. During herbivory and mechanical damage, plants also emit an exclusive blend of volatiles often referred to as herbivore-induced plant volatiles (HIPVs). The composition of this unique aroma bouquet is dependent upon the plant species, developmental stage, environment, and herbivore species. HIPVs emitted from infested and non-infested plant parts can prime plant defense responses by various mechanisms such as redox, systemic and jasmonate signaling, activation of mitogen-activated protein (MAP) kinases, and transcription factors; mediate histone modifications; and can also modulate the interactions with natural enemies *via* direct and indirect mechanisms. These specific volatile cues mediate allelopathic interactions leading to altered transcription of defense-related genes, *viz*., proteinase inhibitors, amylase inhibitors in neighboring plants, and enhanced levels of defense-related secondary metabolites like terpenoids and phenolic compounds. These factors act as

deterrents to feeding insects, attract parasitoids, and provoke behavioral changes in plants and their neighboring species. This review presents an overview of the plasticity identified in HIPVs and their role as regulators of plant defense in Solanaceous plants. The selective emission of green leaf volatiles (GLVs) including hexanal and its derivatives, terpenes, methyl salicylate, and methyl jasmonate (MeJa) inducing direct and indirect defense responses during an attack from phloem-sucking and leaf-chewing pests is discussed. Furthermore, we also focus on the recent developments in the field of metabolic engineering focused on modulation of the volatile bouquet to improve plant defenses.

来源： Frontiers in Plant Science 期刊

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3. *Spodoptera litura* larvae are attracted by HvAV-3h-infected *S. litura* larvae-damaged pepper leaves（斜纹夜蛾幼虫被HvAV-3h感染的夜蛾幼虫损坏的辣椒叶所吸引）

简介： **Background** Herbivore-induced plant volatiles (HIPVs) are important self-defense outputs of pepper plants to resist insect pests. Ascoviruses are pathogenic to the larvae of most lepidopteran vegetable pests. However, whether *Heliothis virescens* ascovirus 3h (HvAV-3h)-infected *Spodoptera litura* larvae can change pepper leaf HIPVs is not well understood.

Results *Spodoptera litura* larvae preferred *S. litura*-infested leaves, and this preference was stronger with longer duration of *S. litura* infestation. In addition, *S. litura* larvae significantly chose pepper leaves damaged by HvAV-3h-infected *S. litura* over the healthy pepper leaves. Results also showed that *S. litura* larvae preferred leaves mechanically damaged and treated with oral secretions from HvAV-3h infected-*S. litura* larvae in a simulation test. We captured the volatiles emitted by leaves under six treatments. Results showed that the volatile profile changed with the different treatments. Testing of volatile blends, prepared to the proportion released showed that the blend from simulated HvAV-3h-infected *S. litura* larvae-damaged plants was the most attractive to *S. litura* larvae. Further, we also found that some of the compounds significantly attracted *S. litura* larvae at specific concentrations.

Conclusion HvAV-3h-infected *S. litura* can alter the release of HIPVs in pepper plants and thus become more attractive to *S. litura* larvae. We speculate that this may be due to alterations in the concentration of some compounds (such as geranylacetone and prohydrojasmon) affecting the behavior of *S. litura* larvae.

来源： Pest Management Science 期刊

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全文链接: http://agri.nais.net.cn/file1/M00/10/31/Csgk0GUnpRSAaRUQACT8TCghg8s039.pdf

4. Microbe-induced plant volatiles（微生物诱导的植物挥发物）

简介： Plants emit a plethora of volatile organic compounds in response to biotic and abiotic stresses. These compounds act as infochemicals for ecological communication in the phytobiome. This study reviews the role of microbe-induced plant volatiles (MIPVs) in plant-microbe interactions. MIPVs are affected by the taxonomic position of the microbe, the identity of the plant and the type

of interaction. Plants also emit exclusive blends of volatiles in response to nonhost and host interactions, as well as to beneficial microbes and necrotrophic/biotrophic pathogens. These MIPVs directly inhibit pathogen growth and indirectly promote resistance/susceptibility to subsequent plant pathogen attack. Viruses and phloem-limiting bacteria modify plant volatiles to attract insect vectors. Susceptible plants can respond to MIPVs from resistant plants and become resistant. Recent advances in our understanding of the molecular mechanisms of MIPV synthesis in plants and how plant pathogen effectors manipulate their biosynthesis are discussed. This knowledge will help broaden our understanding of plant-microbe interactions and should facilitate the development of new emerging techniques for sustainable plant disease management.

来源： New Phytologist 期刊

发布日期: 2017-12-19

全文链接: http://agri.nais.net.cn/file1/M00/10/31/Csgk0GUnncyAPnqSABO5pJnjJeI186.pdf

相关专利

1．Isolated plant protein compositions with lowered volatile organic compounds（具有低挥发性有机化合物的分离植物蛋白组合物）

简介： Plant protein isolates obtained from wet-milled pulse, wet-milled pulse flour and methods of producing wet-milled pulse flour are provided. Volatile organic compounds that are present in plant protein isolates prepared from the wet-milled pulse are decreased as compared the plant protein isolates prepared from a dry-milled pulse. Food compositions containing the plant protein isolates are disclosed.

来源： 美国专利

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全文链接: http://agri.nais.net.cn/file1/M00/03/5F/Csgk0Yl_XziAUWQNACmoSDmnesw480.pdf

科技图书

1．Molecular Physiology and Evolution of Insect Digestive Systems（昆虫消化系统的分子生理学和进化）

简介： 本书提供了关于昆虫寿命、生理学、酶学和其他与消化和营养吸收相关的分子特征的独特数据，并为开发新的昆虫防控技术和改进昆虫饲养程序提供了假定的分子目标，以用作食物和饲料。因此，本书概述了昆虫所食用的饮食类型，描述了其需要消化的化学成分，并讨论了与喂养有关的昆虫进化选择压力。消化酶是根据其在底物上的活性及其进化蛋白家族进行分类和详细介绍。讨论了如何获得可靠的酶学参数的技术细节。回顾了与昆虫适应新饮食和避免天然植物抑制剂有关的酶结构变化。介绍了昆虫在进化过程中提高消化和营养吸收效率的中肠特征及其潜在的分子机制，并讨论了昆虫消化和营养吸收机制的发展趋势。

来源： SpringerLinK 网站

发布日期: 2023-09-04

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