



2018年第49期 总149期

茶学研究专题

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► 学术文献

1. Olfactory response of four aphidophagous insects to aphid- and caterpillar-induced plant volatiles (四种食蚜昆虫对蚜虫和毛虫诱导的植物挥发物的嗅觉反应)

简介: Plants damaged by herbivores emit blends of volatile organic compounds (VOCs) that attract the herbivore's natural enemies. Most work has focussed on systems involving one plant, one herbivore and one natural enemy, though, in nature, plants support multiple herbivores and multiple natural enemies of these herbivores. Our study aimed to understand how different aphid natural enemies respond to aphid-induced VOCs, and whether attraction of the natural enemies that responded to aphid-induced VOCs was altered by simultaneous damage by a chewing herbivore. We used a model system based on *Brassica juncea* (Brassicaceae), *Myzus persicae* (Hemiptera: Aphididae) and *Plutella xylostella* (Lepidoptera: Plutellidae). *Ceraeochrysa cubana* (Neuroptera: Chrysopidae) did not show preferences for any plant odour, while *Cycloneda sanguinea* (Coleoptera: Coccinellidae) responded to undamaged plants over air but not to aphid-damaged plants over undamaged plants. Therefore, no further tests were carried out with these two species. *Chrysoperla externa* (Neuroptera: Chrysopidae) preferred aphid-damaged plants, but not caterpillar-damaged plants, over undamaged plants, and preferred plants damaged by both herbivores over both undamaged plants and aphid-damaged plants. When tested for responses against undamaged plants, *Aphidius colemani* (Hymenoptera: Braconidae) preferred aphid-damaged plants but not plants damaged by caterpillars. Plants damaged by both herbivores attracted more parasitoids than undamaged plants, but not more than aphid-damaged plants. Thus, multiply damaged plants were equally attractive to *A. colemani* and more attractive to *C. externa* than aphid-damaged plants, while *C. cubana* and *C. sanguinea* did not respond to aphid-induced VOCs, highlighting how different natural enemies can have different responses to herbivore-damaged plants.

来源: Arthropod-Plant Interactions 期刊

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全文链接: <http://agri.ckcest.cn/file1/M00/02/9D/Csgk0Fv8m62AM-KyAAvqW8GJvUo508.pdf>

2. Herbivory-induced changes in the olfactory and visual display of flowers and extrafloral nectaries affect pollinator behavior (草食诱导的花和花外蜜腺的嗅觉和视觉显示变化影响传粉昆虫的行为)

简介: Plants communicate with animals by means of multimodal displays and reward mutualistic partners with resources such as nectar. Floral nectar is a key resource for pollinators, whereas extrafloral nectaries (EFNs) support indirect plant defense. Animal-pollinated flowers advertise their rewards using modalities such as scent, color and morphology. In EFNs the role of olfactory and visual traits is less well understood. Herbivory has been shown to induce changes in the multimodal display and in resource related characteristics of flowers and EFNs. This may consequently affect the behavior of nectar consumers such as pollinators that occasionally feed on extrafloral nectar in addition to floral nectar. We tested the effect of herbivory (simulated by

jasmonic acid treatment) on olfactory, visual and resource related floral and EFN traits in *Vicia faba*, tracked alterations in bumblebee (*Bombus terrestris*) preference and evaluated potential outcomes for plant reproduction. In control plants, flowers and EFNs differed in olfactory and visual cues and also in nectar quantity and quality and pollinators clearly preferred to forage on flowers. After jasmonic acid treatment (JA), linalool emissions of EFNs increased in a large proportion of plants, the visual display of EFNs became more salient and nectar volumes increased. In flowers of JA-treated plants we found lower emissions of cinnamic aldehyde and lower sugar concentration in nectar, however visual cues were unaffected. Potentially because of these phenotypic changes bumblebees no longer preferred flowers over EFNs in JA-treated plants. Consequently, this may negatively affect reproductive success in *V. faba*, which is highly dependent on floral visitation for fruit set. Our study adds another aspect to the complexity of plant-pollinator interactions and reveals how herbivory may interfere with plant-pollinator communication. Our findings emphasize that the foraging behavior of pollinators not only depends on floral traits, but is affected by the whole plants' multimodal phenotype.

来源: Evolutionary Ecology 期刊

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全文链接:<http://agri.ckcest.cn/file1/M00/02/9D/Csgk0Fv7zU6ACxwwABLGZDDAGnQ797.pdf>

3. Chemical Ecology and Sociality in Aphids: Opportunities and Directions (蚜虫的化学生态与社会性: 机遇与方向)

简介: Aphids have long been recognized as good phytochemists. They are small sap-feeding plant herbivores with complex life cycles that can involve cyclical parthenogenesis and seasonal host plant alternation, and most are plant specialists. Aphids have distinctive traits for identifying and exploiting their host plants, including the expression of polyphenisms, a form of discrete phenotypic plasticity characteristic of insects, but taken to extreme in aphids. In a relatively small number of species, a social polyphenism occurs, involving sub-adult “soldiers” that are behaviorally or morphologically specialized to defend their nestmates from predators. Soldiers are sterile in many species, constituting a form of eusociality and reproductive division of labor that bears striking resemblances with other social insects. Despite a wealth of knowledge about the chemical ecology of non-social aphids and their phytophagous lifestyles, the molecular and chemoecological mechanisms involved in social polyphenisms in aphids are poorly understood. We provide a brief primer on aspects of aphid life cycles and chemical ecology for the non-specialists, and an overview of the social biology of aphids, with special attention to chemoecological perspectives. We discuss some of our own efforts to characterize how host plant chemistry may shape social traits in aphids. As good phytochemists, social aphids provide a bridge between the study of insect social evolution sociality, and the chemical ecology of plant-insect interactions. Aphids provide many promising opportunities for the study of sociality in insects, and to understand both the convergent and novel traits that characterize complex sociality on plants.

来源: Journal of Chemical Ecology 期刊

发布日期:2018-09-10

全文链接:http://agri.ckcest.cn/file1/M00/02/9D/Csgk0Fv7wTeAGaFOAA6gZA09_mk863.pdf

4. Sex pheromone of the tea aphid, *Toxoptera aurantii* (Boyer de Fonscolombe) (Hemiptera: Aphididae) (茶树蚜虫 (半翅目: 蚜科) 的性信息素)

简介: The tea aphid, *Toxoptera aurantii*, also called the “black citrus aphid”, is one of the most destructive insect pests in commercial tea plantations and gardens in southern China. In autumn, declining day length triggers production of winged *T. aurantii* sexuparae, which produce both winged males and wingless oviparae. Oviparous females then release sex pheromone that attracts potential mates. GCMS analysis of volatile headspace extracts of *T. aurantii* oviparae revealed that they emit (4aS,7S,7aR)-nepetalactone (I) and (1R,4aS,7S,7aR)-nepetalactol (II) in a ratio of 4.34.9:1. Field-trapping experiments with synthetic I and II singly or as two-component blends of different doses and ratios showed significant attraction of *T. aurantii* males, as well as weak attraction of sexuparae. Identification of the *T. aurantii* sex pheromone provides a new opportunity for developing a pheromone-based monitoring and management strategy for the sexual phase of tea aphids and, possibly, the alate sexuparous generation in late summer and fall.

来源: Chemoecology 期刊

发布日期:2014-10-20

全文链接:<http://agri.ckcest.cn/file1/M00/02/9D/Csgk0Fv7vzKABRUmAAjByQWpZYk058.pdf>

➤ 相关专利

1. Composition for growth inhibition of cancer cell comprising methylated catechin as effective component (以甲基化儿茶素为有效成分的组合物抑制癌细胞生长)

简介: The present invention refers to methyl [...] containing active ingredient composition for number billion relates to growth of cancer cells, more particularly of the present invention included in methyl [...] (eGCG-a 3Me) induced by protein expression of mMP-a 1 billion (Matrix receptor superfamily-a 1) and number, and can inhibit the proliferation of cancer cells, in particular, methyl [...] skin cancer, prostate cancer or breast cancer proliferation of billion by covering a number, growth of cancer cells in non-food or pharmaceutical composition can be useful billion number.

来源: 韩国专利

发布日期:2016-11-07

全文链接:<http://agri.ckcest.cn/file1/M00/02/9D/Csgk0Fv7tRWAcFxAWAac3awyZZRI657.PDF>

2. Green tea contains a cosmetic composition (绿茶含有化妆品组分)

简介: 本专利提供含有选自绿茶皂苷和绿茶多酚中的一种或多种作为活性成分的化妆品组合物。本发明的化妆品组合物对皮肤非常安全, 并且可以极大地增强皮肤中的生物机能, 因此可以用作抗衰老化妆品组合物。

来源: 日本专利

发布日期:2017-10-18

全文链接:<http://agri.ckcest.cn/file1/M00/02/9D/Csgk0Fv7sTCACodeAAU63n9R1Qs638.pdf>