



2024年第11期 总424期

茶学研究专题

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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

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学术文献

1. Plant protection and biotremology: fundamental and applied aspects (植物保护与生物震颤学：基础与应用)

简介: There is overwhelming evidence that synthetic pesticides have a negative impact on the environment and human health, emphasizing the need for novel and sustainable methods for plant protection. A growing body of literature reports that plants interact through substrate-borne vibrations with arthropod pests and mutualistic arthropods that provide biological control and pollination services. Here, we propose a new theoretical framework that integrates insights from biological control, the ecology of fear, and plant-borne vibrations, to address plant-insect interactions and explore new, sustainable opportunities to improve plant health and productivity.

来源: Trends in Plant Science 期刊

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全文链接: <http://agri.nais.net.cn/file1/M00/10/3D/Csgk0EGG3myAfqEOABr003v235o081.pdf>

2. On the function of a female-like signal type in the vibrational repertoire of *Enchenopa* male treehoppers (Hemiptera: Membracidae) (关于类雌性信号类型在*Enchenopa* male treehoppers (半翅目: 膜翅目) 振动谱中的作用)

简介: Animals often mimic the behaviours or signals of conspecifics of the opposite sex while courting. We explored the potential functions of a novel female-like signal type in the courtship displays of male *Enchenopa* treehoppers. In these plant-feeding insects, males produce plant-borne vibrational advertisement signals, to which females respond with their own duetting signals. Males also produce a signal type that resembles the female duetting responses. We experimentally tested whether this signal modifies the behaviour of receivers. First, we tested whether the female-like signal would increase the likelihood of a female response. However, females were as likely to respond to playbacks with or without them. Second, we tested whether the female-like signal would inhibit competing males, but males were as likely to produce displays after playbacks with or without them. Hence, we found no evidence that this signal has an adaptive function, despite its presence in the courtship display, where sexual selection affects signal features. Given these findings, we also explored whether the behavioural and morphological factors of the males were associated with the production of the female-like signal. Males that produced this signal had higher signalling effort (longer and more frequent signals) than males that did not produce it, despite being in worse body condition. Lastly, most males were consistent over time in producing the female-like signal or not. These findings suggest that condition-dependent or motivational factors explain the presence of the female-like signal. Alternatively, this signal might not bear an adaptive function, and it could be a way for males to warm up or practice signalling, or even be a by-product of how signals are transmitted through the plant. We suggest further work that might explain our puzzling finding that a signal in the reproductive context might not have an adaptive function.

来源: Journal of Evolutionary Biology 期刊

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3. Host Plant Effects on Sexual Selection Dynamics in Phytophagous Insects (寄主植物对植食性昆虫性选择动力学的影响)

简介: Natural selection is notoriously dynamic in nature, and so, too, is sexual selection. The interactions between phytophagous insects and their host plants have provided valuable insights into the many ways in which ecological factors can influence sexual selection. In this review, we highlight recent discoveries and provide guidance for future work in this area. Importantly, host plants can affect both the agents of sexual selection (e.g., mate choice and male-male competition) and the traits under selection (e.g., ornaments and weapons). Furthermore, in our rapidly changing world, insects now routinely encounter new potential host plants. The process of adaptation to a new host may be hindered or accelerated by sexual selection, and the unexplored evolutionary trajectories that emerge from these dynamics are relevant to pest management and insect conservation strategies. Examining the effects of host plants on sexual selection has the potential to advance our fundamental understanding of sexual conflict, host range evolution, and speciation, with relevance across taxa.

来源: Annual Review of Entomology 期刊

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全文链接:<http://agri.nais.net.cn/file1/M00/03/6A/Csgk0WXdUrOAXaPhAAT4DBOMFml895.pdf>

4. Soluble proteins in insect chemical communication (昆虫化学通讯中的可溶性蛋白质)

简介: Our understanding of the biochemical mechanisms that mediate chemoreception in insects has been greatly improved after the discovery of olfactory and taste receptor proteins. However, the presence of soluble polypeptides in high concentration around the dendrites of sensory neurons still poses unanswered questions. More than 2 decades after their discovery and despite the wealth of structural information available, the physiological function of odorant-binding proteins is not well understood. More recently, members of a second family of soluble polypeptides, the chemosensory proteins, were also discovered in the lymph of chemosensilla. Here we review the structural properties of both classes of soluble proteins, their affinity to small ligands, and their expression in the different parts of the insect body and subcellular localisation. Finally, we discuss current ideas and models of the role of such proteins in insect chemoreception.

来源: Cellular and Molecular Life Sciences 期刊

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全文链接:<http://agri.nais.net.cn/file1/M00/03/6A/Csgk0WXdTpiAduQHABu4Ftpu4YI721.pdf>

会议论文

1. Acoustic Interruption on The Imago of Brown Planthopper and The Number of Offspring Produced (褐飞虱成虫及后代数量的声学干扰)

简介: 褐飞虱 (BPH) 是热带和干旱地区重要的害虫之一。本研究旨在中断BPH交配过程并减

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少其后代。BPH交配过程始于雄性和雌性之间的声音信号交换。这些信号通过雄性和雌性排列的水稻茎传播。原理是通过暴露声波形式的声音信号来干扰BPH雄性和雌性之间的交流。声波以不同的频率 (0 Hz、100 Hz、200 Hz、300 Hz和200+300 Hz) 传播。声波暴露调整为BPH的潜在交配时间(08.00-11.00, 12.00-15.00, 18.00-21.00)。结果表明: 0 Hz、100 Hz、200 Hz、300 Hz 和200+300 Hz声波对BPH子代有影响, 计数分别为39, 4; 10, 64; 11, 4; 22, 4 ; 2, 2。暴露在声波中可能会扰乱BPH的交配过程, 减少其后代的数量。

来源: AIP Conference Proceedings

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全文链接:<http://agri.nais.net.cn/file1/M00/10/3D/Csgk0EGG8vuAchkxAAqeaCXn-pl646.pdf>

2. Biomimetic insect infochemical communication system (仿生昆虫信息化学通讯系统)

简介: By exploiting recent advances in both our understanding of pheromone biosynthesis pathways and the detection of molecules in the insect nervous system, we are developing a novel communication system based on functional equivalents of the cellular, sub-cellular and molecular biological machinery. This will form the basis of a new branch of information technology employing infochemical ligands for communication over space and time. In order to achieve this objective, both chemical signal generation and reception are replicated by taking a systematic approach that implements reaction steps as biosynthetic modules, which are then hierarchically integrated as a technological solution towards realising 'infochemical communication'.

来源: IEEE SENSORS

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