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茶学研究专题

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► 学术文献

1. Male-male interactions and male mating success in the leafhopper *Aphrodes makarovi* (叶蝉 (*Aphrodes makarovi*) 的雄性-雄性间交互作用及雄性的交配成功)

简介: In mating systems based on substrate-borne vibrations, sexual communication often involves a reciprocal exchange of species- and sex-specific vibrational signals and male is searching for a stationary female. In the leafhopper *Aphrodes makarovi*, female reply is essential for successful location of the female and its variable duration directly affects male's costs associated with signalling and searching. We studied male and female behaviour in a trio situation (two males and one female), and our results show that male-male competition had important effects on male mating success. Females replied equally to advertisement calls emitted by the winning and losing males and mated with the first male that located them, regardless of his investment in calling effort. Males eavesdropped to male-female duet maintained by the rival, and the winners were better at exploiting female replies to the rival's advertisement calls by silently approaching the female. To interfere with the ongoing male-female duet, males also emitted masking signals overlapping the latter part of the female reply. More overlapped female replies were registered in response to the losers and masking signals most likely delay the rival in reaching the female. Our study shows that a comprehensive understanding of male mating success and female preferences in vibrational duetting systems requires also investigations in more complex settings that more realistically represent the situation in nature.

来源: Ethology 期刊

发布日期: 2017-05-12

全文链接: <http://agri.ckcest.cn/file1/M00/06/5F/Csgk0Fx95KSAcvoAAAoLbWnyQac819.pdf>

2. An autonomous system of detecting and attracting leafhopper males using species- and sex-specific substrate borne vibrational signals (利用特定物种与性别的底物传播振动信号探测和吸引雄性叶蝉的自主系统)

简介: In leafhoppers that are among the most important vectors of plant diseases, mate recognition and location are mediated exclusively by species- and sex-specific vibrational signals exchanged in precisely coordinated duets. These pests are currently managed primarily by insecticide treatments, however, current legislation and consumers' concerns and demands require that the risks and impacts of pesticides be reduced. We present a proof-of-concept low-cost autonomous digital processing system (AS), capable of recognizing the male calls of the leafhopper *Aphrodes bicincta* "Dragonja" and generating female replies. Such a device could be used as a vibrational trap. We chose this species since its duet structure is complex, with the female replies having to appear in short (47175 ms) intervals between continuously repeated elements in the male call in order to trigger male searching behaviour. The AS male call recognition algorithm is based on linear prediction cepstral coefficient (LPCC) feature vectors

and a multilayer perceptron classifier (MLP). To prevent the noise-based feature vectors from feeding into the classifier, a bandwidth-limited linear prediction call activity detector based on spectrum peak tracking was designed. We tested the efficiency of the AS in behavioural experiments with live males. The MLP classification method successfully classified vibrational calls of male *A. bicincta* “Dragonja” from background noise. The fast real time identification enabled a synchronized playback of female vibrational reply with latencies as short as 130 ms. This mimicking of a duetting female by autonomous system also attracted the males to the source of the female reply. The AS is also a useful tool to enable further studies of vibrational duets that are needed to develop effective alternative control strategies.

来源: Computers and Electronics in Agriculture 期刊

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3. Feeding behaviour of a virus-vector leafhopper on host and non-host plants characterised by electrical penetration graphs (病毒载体叶蝉对以电穿透图为特征的寄主和非寄主植物的取食行为)

简介: Many sap-feeders are vectors of plant diseases, acquiring and inoculating pathogens at various stages of the feeding process. In oligophagous species, certain aspects of probing behaviour on hosts and non-hosts may have implications for the range of both pathogens and plants that can be inoculated. We addressed the question of which probing phases (including ingestion) occur on non-host plants in the case of the common leafhopper *Psammotettix alienus* (Dahlbom) (Hemiptera: Cicadellidae). This species is a pest on cereals, a vector of the Wheat dwarf virus, and possible carrier of other pathogens. It is regarded as oligophagous on grasses, but has been reported also on other plant families. In a combined electrical penetration graph (EPG) video observation study, we aimed to give a description of the waveforms during the probing process. EPG recordings were made on a suitable host, barley, *Hordeum vulgare* L. (Poaceae), and on two non-host plants, the sedge *Carex tomentosa* L. (Cyperaceae) and the ragweed *Ambrosia artemisiifolia* L. (Asteraceae). We demonstrated that *P. alienus* probes on plants other than Poaceae, including dicotyledons. Univariate and multivariate analyses of general probing variables revealed that total and maximal probe durations were shorter and probing progress less advanced on non-host plants. Waveforms of the pathway phase were stereotypical and statistically not different between the host and non-host plants. On sedge, the waveform signifying insertion through the plant epidermis was shortened but much more frequent, indicating penetration difficulties and retrials. Most importantly, waveforms indicating phloem ingestion were not present on either of the non-host plants. Non-host probing events terminating during the pathway phase suggested that rejection occurred when the stylets were in the mesophyllum. Overall, the EPG signals reflected the unsuitability of *A. artemisiifolia* and *C. tomentosa* compared to barley, but the occurrence of probing and the demonstrated level of probing progress imply that pathogen transmission cannot be excluded in the case of many non-host plants and non-specific pathogens.

来源: Entomologia Experimentalis et Applicata 期刊

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全文链接:<http://agri.ckcest.cn/file1/M00/06/5F/Csgk0Fx96uSADw6hAAkmzSr7t9I925.pdf>

4. Vibration and Animal Communication: A Review (振动与动物信息传播: 综述)

简介: Vibration through the substrate has likely been important to animals as a channel of communication for millions of years, but our awareness of vibration as biologically relevant information has a history of only the last 30 yr. Morphologists know that the jaw mechanism of early amphibians allowed them to perceive vibration through the substrate as their large heads lay on the ground. Although the exact mechanism of vibration production and the precise nature of the wave produced are not always understood, recent technical advances have given answers to increasingly sophisticated questions about how animals send and receive signals through the substrate. Some of us have been forced to explore the use of vibration when all other attempts to manipulate animals in the field have failed, while others began to think about vibration to explain some of the puzzling behaviors of species they were studying in other contexts. It has thus become clear that the use of vibration in animal communication is much more widespread than previously thought. We now know that vibration provides information used in predator-prey interactions, recruitment to food, mate choice, intrasexual competition and maternal/brood social interactions in a range of animals from insects to elephants.

来源: Integrative and Comparative Biology 期刊

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全文链接:<http://agri.ckcest.cn/file1/M00/06/5F/Csgk0Fx-EHuAPn9LAAFdVQwHtPo319.pdf>

➤ 相关专利

1. PEST, INSECT AND MITE AVERTER COMPOSITION

(害虫、昆虫和螨类防治组合物)

简介: 本发明提供了一种具有防虫活性的无毒组合物,该组合物对包括红螨、粉虱、蚜虫、白蛉、蓟马、茶蚊和软体害虫在内的昆虫和害虫均具有有效的防治作用。该专利的虫害防治组合物包括至少一种植物提取物、一种作为皮肤刺激物的酸性化合物、一种植物或动物源的蛋白水解酶和一种溶剂。该组合物无毒、不昂贵,并且非常容易制造。公开(公告)号 WO2016174686A1; 申请日期: 2016-04-25; 专利状态: 世界知识产权组织已通知EPO, 在本申请中指定了EP, 未发生转让; 申请来源: 申请人直接申请; 专利类型: 实用新型专利。

来源: 世界知识产权组织

发布日期:2016-11-03

全文链接:<http://agri.ckcest.cn/file1/M00/06/60/Csgk0FyK-nOAFIExAAj-qwZfvWc258.pdf>

2. Moth Attractant Composition (蛾引诱剂的组成)

简介: The invention is directed to the use of a moth attractant composition comprising phenylacetaldehyde for trapping moths. The composition may include salicylaldehyde and

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optionally at least one of : methyl-2-methoxybenzoate, linalool and limonene. Preferably, the moths are of the order *Diaphania indica* or *Helicoverpa armigera*. Alternatively, the composition can be used in the capture of Lepidopterous moth families Noctuidae and/or Pyralidae. In another aspect, a moth attractant composition comprises phenylacetaldehyde and salicylaldehyde, wherein phenylacetaldehyde comprises between 40 and 97% of the total weight of the composition. Suitably, the salicylaldehyde comprises between 3 and 60% of the total weight of the composition. The composition can further comprise one or more of : peppermint, tea tree oil, cinnamon, bitter almond, lemon oil, vanilla or citronella. An insect lure comprising the composition is also claimed. There is also disclosed a method of controlling moth pests amongst a crop, which comprises capturing said moths within said crop using the compositions. The crop can be selected from chickpea, lablab bean or tomato crops. 公开(公告)号: GB2492272A; 申请日期: 2012-09-17; 专利状态: 专利权失效; 根据第16(1)条公布后, 申请撤回, 撤销或拒绝; 申请来源: 申请人直接申请; 专利类型: 实用新型专利。

来源: 德国专利

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