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Behavioural responses of Callosobruchus maculatus to volatiles organic compounds found in the headspace of dried green pea seeds

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There is growing evidence that insects rely on chemical cues to locate food, hosts, predators, and potential mates. The pulse beetle Callosobruchus maculatus has been recognised for decades as the major post-harvest insect pest of legume seeds. In a previous study, we identified five volatile compounds in the headspace of dried green pea seeds as electroantennographically active in C. maculatus antennae: 1-pentanol, 1-octen-3-ol, (E)-2-octenal, nonanal and 3-carene. Volatile compounds are generally perceived by insects as blends, we hypothesized that *C. maculatus* might particularly show attraction to different mixtures of the aforementioned compounds. To test this we examined the behavioural response of *C. maculatus* towards volatile mixtures in a dual choice Y-tube olfactometer. The results showed that females were attracted to five mixtures while males were attracted only to two binary mixtures consisting exclusively of aldehydes. The other mixtures caused *C. maculatus* to move away. Further investigations with the attractive mixtures should be done in real storage conditions with the aim of developing a trap for the pulse beetle, *C. maculatus.*

Investigation on the Species and Distribution of Stored Grain Insects in Northwest China

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Abstract

To understand the diversity of stored grain insects in northwest China, we have fulfilled insect collection in 56 grain storage enterprises, 60 grain, oil and feed processing plants and 65 farmers situated in 26 cities of five provinces (Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang) in northwest China from 2016 to 2017. After systematical identification, totally 83 species of stored grain insects have been found in this investigation, belonging to five orders, namely Class Insecta Order Zygentoma, Order Coleoptera, Order Lepidoptera and Order Hymenoptera, as well as Class Arachnida Order Chelonethida, in which Order Coleoptera owns 74 species in 22 families, Order Lepidoptera owns six species in four families, Order Zygentoma and Order Hymenoptera own one species in one family respectively, and Class Arachnida Order Chelonethida has one species in one family. After the statistics of four insect investigations in northwest China during 1955-2017, this paper has analyzed the results of four insect investigations and the representative stored grain insects in northwest China.

Key Words: northwest China, stored grain insects, species, distribution, investigation

1. Introduction

Located in the hinterland of the Eurasian continent, the northwest region covers the first (high-cold and dry stored grain region), second (low temperature and dry stored grain region) and fourth