Insect pest monitoring in museums - old and new strategies

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DOI 10.5073/jka.2018.463.056

Abstract

Integrated Pest Management (IPM) is an important part of preventive conservation of museum objects made of wood, textiles, starch, paper, keratin and other organic materials. Long term monitoring data help us to discover new infestations and locate them in the building. Results from over 20 institutions (museums, storages, historic libraries and historic palaces) are presented and discussed how the monitoring can be improved, where active infestations were found, what treatment was done as a response and what new methods are used. What pests are the most abundant, which species are new for the indoor museum environment and when do we actually have active infestation and damage of museum objects? Monitoring and IPM in museums is also compared with the food storage industry. IPM is applied in many museum today, mainly to reduce the application of pesticides, for a long-term protection of the objects and collections and early detection of infestations. In this presentation, long term monitoring data with sticky blunder and pheromone traps for webbing clothes moth Tineola bisselliella is described. The analysis of the data show that in all museums and storages buildings with a monitoring in place different insect pest species are present, but only in few collections damage to museum objects was found. New pests like the grey silverfish Ctenolepisma longicaudata and Ctenolepisma calva - another species of Lepismatidae, are now found in many museums in Vienna, Austria. The odd beetle Thylodrias contractus was found recently in Austria, surprisingly in four different locations.

Remote monitoring of stored grain insect pests

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DOI 10.5073/jka.2018.463.057

Abstract

A number of remote sensing methods were developed and tested in commercial grain warehouses; probe pitfall traps attached to vacuum lines, surface pit fall traps equipped with video cameras and white boards on grain surface monitored with video cameras. These methods were compared with detecting insects using grain samples. Warehouse trials by trapped methods were carried out in bins with 8520 t of wheat from 23 May until 8 August 2016.Grain temperatures were from 22.7 to 31.6℃. Psocids, *Liposcelis bostrychophila* Badonnel, were detected by grain samples, but there were higher number of pscoids trapped with the probe pitfall traps and pitfall traps than found in grain samples. *Plodia interpunctella* (Hübener), *Sitophlius zeamais* Motchulsky and *Cryptolestes ferrugineus* (Stephens) were detected by probe pitfall trap, but not in the grain samples. *S. zeamais* was detected by the pit fall traps. Using the remote controlled video camera in the warehouse head space, we were able to distinguish and count *S. zeamais*, *C. ferrugineus* and psocids on white boards. The video from pitfall traps can be sent to mobile phones. With all these methods, data can be collected remotely, and could be analyzed by imagine analysis allowing for rapid real time monitoring of insect pests.

Keywords: stored grain insect; monitoring; remote; feasibility

1. Introduction

Efficient sampling is a decisive factor for the timely and safe undertaking of measures in the management of stored products and foods (Buchelos and Athanassiou, 1999). Timely monitoring is necessary for pest management of stored grain, especially for wheat and paddy rice which can be stored for three to five years in China. The need for as many samples as possible, as frequently as possible, is a technical problem of conventional sampling methods (Subramanyam and Hagstrum, 1995). Sampling and sieving grain is a current method in stored insect monitoring as recommended in Chinese grain storage regulation. The grade of insect infestation of stored grain is decided by sampling, although this technique is effective primarily for detection of adults and some larvae.