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Studies on mating disruption to control incursions of box tree moth, *Cydalima perspectalis* (Walker, 1859) (Lepidoptera: Crambidae), in the Royal Gardens of Herrenhausen (Hanover, Germany)

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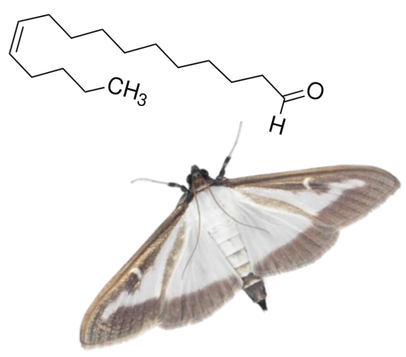

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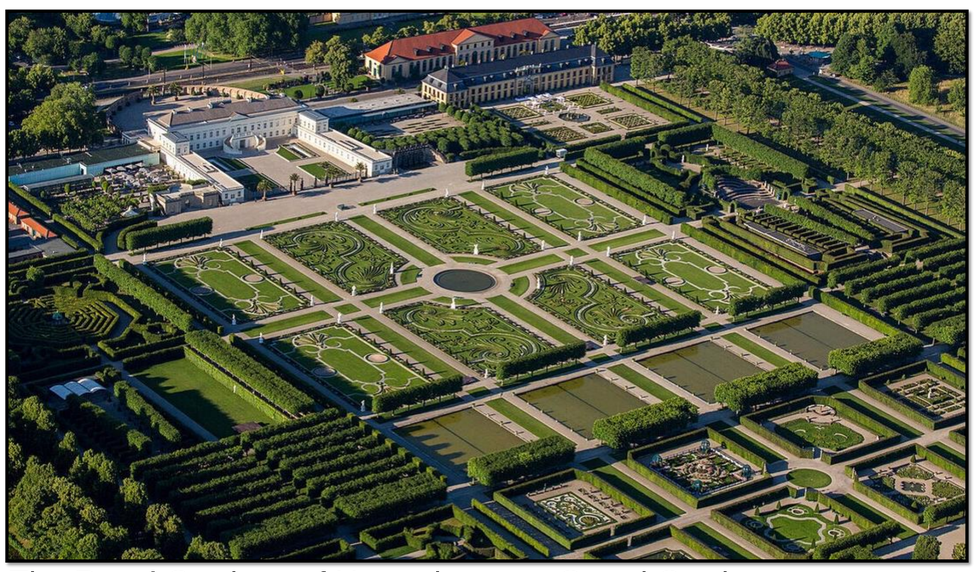
BACKGROUND

The box tree moth (BTM, *Cydalima perspectalis*, Lepidoptera: Crambidae) is an invasive pest to box tree (*Buxus sempervirens*). European Baroque gardens harbour kilometres of box hedges, that have suffered severe damage and total loss of plantations caused by BTM incursions. *Bacillus thuringiensis* is effective in controlling BTM, however, its use is cost-intensive and difficult to apply to large box tree plantings, requiring precise scheduling and monitoring throughout the season. Pheromone-mediated mating disruption is thought to be a useful alternative management tool, however, there is virtually no experience of its use against BTM in Germany.


The Royal Gardens of Herrenhausen, Grand Garden


Orangery, 2013…


2024

PHEROMONE APPLICATION

Grand Parterre

Special gardens

● control area ● treatment area

Box T Pro Press®

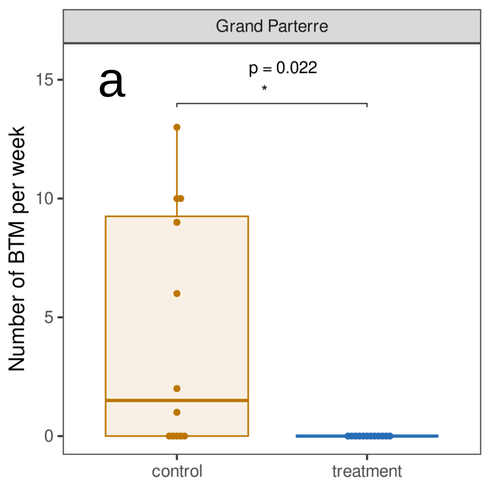
- 70 g/L (Z)-11-Hexadecenal (main component of the BTM sex pheromone)
- gel formulation, pouch in pump applicator
- 4.5 bar air to be supplied

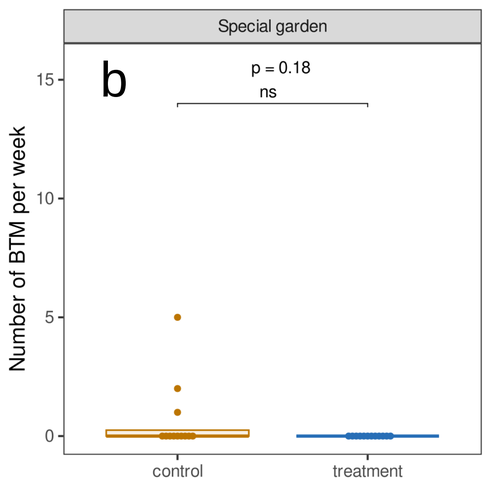
treatment: 1cm³ droplet every 2 m box hedge
- Grand Parterre: 272 application points
- Special garden: 78 application points

RESULTS

Flight monitoring

1 pheromone trap per area, equipped with 5 g/L (Z)-11-Hexadecenal dispensers, placed for 12 weeks (August to November)



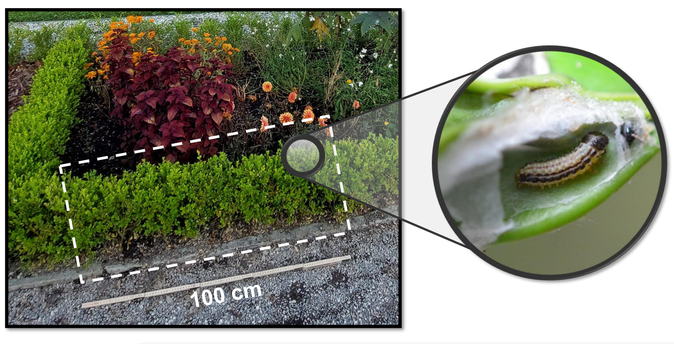


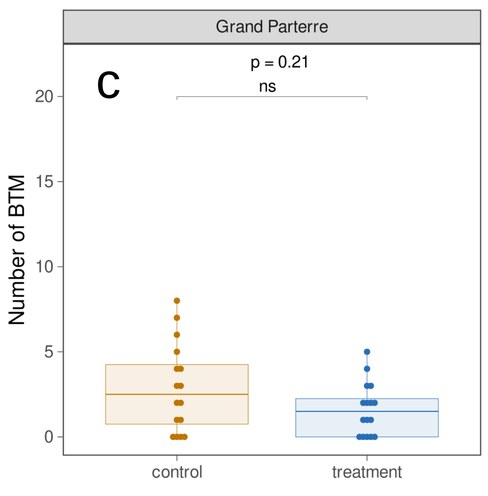
total shutdown!

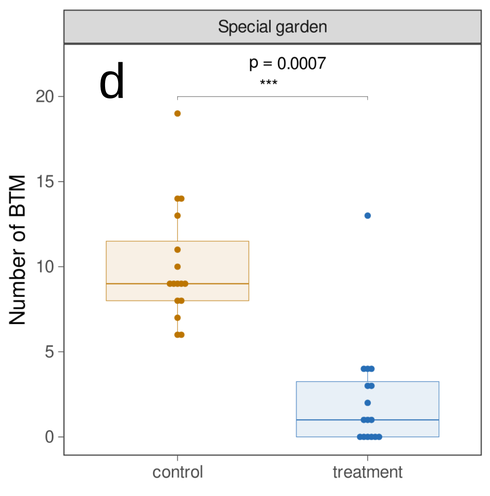
Monitoring of BTM flight activity after pheromone application: In both the Grand Parterre **(a)** and the Special garden **(b)**, no moth was captured in the treated areas over 12 weeks, showing a **100% shutdown** compared to the control areas with 40 and 8 captured moths, respectively.

Larval stages

counting of overwintering cocoons in 16 hedge segments per area, each 100 cm long, randomly chosen (November ‘24)







Overwintering cocoons: In the Grand Parterre **(c)**, 43% less cocoons (26 vs. 46) were counted in the treated area compared to the control. Even a highly significant reduction of cocoons (78%, 36 vs. 161) was found in the Special garden **(d)**.

CONCLUSION

A pheromone-mediated mating disruption system to control BTM infestations was tested in a public Baroque garden in Germany for the first time. We observed 100% “shutdown” of installed monitoring traps and up to 70% larval reduction compared to control areas. These results suggest mating disruption techniques to be a promising tool in addition to *Bacillus thuringiensis* to controll BTM tree moth infestations in urban green spaces with extensive box tree plantations.

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