



# An Insecticide Further Enhances Experience-Dependent Increased Behavioural Responses to Sex Pheromone in a Pest Insect

Submitted by Delphine Goven on Tue, 09/05/2017 - 14:09

**Titre** An Insecticide Further Enhances Experience-Dependent Increased Behavioural Responses to Sex Pheromone in a Pest Insect

**Type de publication** Article de revue

**Auteur** Abrieux, Antoine [1], Mhamdi, Amel [2], Rabhi, Kaouther K [3], Egon, Julie [4], Debernard, Stéphane [5], Duportets, Line [6], Tricoire-Leignel, Hélène [7], Anton, Sylvia [8], Gadenne, Christophe [9]

**Editeur** Public Library of Science

**Type** Article scientifique dans une revue à comité de lecture

**Année** 2016

**Langue** Anglais

**Date** 2016

**Pagination** e0167469

**Volume** 11

**Titre de la revue** PLoS One

**ISSN** 1932-6203

**Mots-clés** Animals [10], Drug Synergism [11], Guanidines [12], Insecticides [13], Male [14], Moths [15], Pest Control, Biological [16], Sex Attractants [17], Sexual Behavior, Animal [18], Thiazoles [19], Time Factors [20]

Neonicotinoid insecticides are widely used to protect plants against pest insects, and insecticide residues remaining in the environment affect both target and non-target organisms. Whereas low doses of neonicotinoids have been shown to disturb the behaviour of pollinating insects, recent studies have revealed that a low dose of the neonicotinoid clothianidin can improve behavioural and neuronal sex pheromone responses in a pest insect, the male moth *Agrotis ipsilon*, and thus potentially improve reproduction. As male moth behaviour depends also on its physiological state and previous experience with sensory signals, we wondered if insecticide effects would be dependent on plasticity of olfactory-guided behaviour. We investigated, using wind tunnel experiments, whether a brief pre-exposure to the sex pheromone could enhance the behavioural response to this important signal in the moth *A. ipsilon* at different ages (sexually immature and mature males) and after different delays (2 h and 24 h), and if the insecticide clothianidin would interfere with age effects or the potential pre-exposure-effects. Brief pre-exposure to the pheromone induced an age-independent significant increase of sex pheromone responses 24 h later, whereas sex pheromone responses did not increase significantly 2 h after exposure. However, response delays were significantly shorter compared to naïve males already two hours after exposure. Oral treatment with clothianidin increased sex pheromone responses in sexually mature males, confirming previous results, but did not influence responses in young immature males. Males treated with clothianidin after pre-exposure at day 4 responded significantly more to the sex pheromone at day 5 than males treated with clothianidin only and than males pre-exposed only, revealing an additive effect of experience and the insecticide. Plasticity of sensory systems has thus to be taken into account when investigating the effects of sublethal doses of insecticides on behaviour.

Résumé en anglais

URL de la notice <http://okina.univ-angers.fr/publications/ua16174> [21]

DOI [10.1371/journal.pone.0167469](https://doi.org/10.1371/journal.pone.0167469) [22]

Lien vers le document <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0167469> [23]

Autre titre PLoS ONE

Identifiant (ID) 27902778 [24]

PubMed

---

## Liens

- [1] <http://okina.univ-angers.fr/a.abrieux/publications>
- [2] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=27112>
- [3] <http://okina.univ-angers.fr/k.rabhi/publications>
- [4] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=27113>
- [5] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=11372>
- [6] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=11368>
- [7] <http://okina.univ-angers.fr/h.tricoire/publications>
- [8] <http://okina.univ-angers.fr/sylvia.anton/publications>
- [9] <http://okina.univ-angers.fr/christophe.gadanne/publications>
- [10] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=964>
- [11] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=13257>
- [12] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=9158>
- [13] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=9160>
- [14] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=968>
- [15] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=11445>
- [16] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=11278>

- [17] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=23378>
- [18] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=11418>
- [19] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=9166>
- [20] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=6070>
- [21] <http://okina.univ-angers.fr/publications/ua16174>
- [22] <http://dx.doi.org/10.1371/journal.pone.0167469>
- [23] <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0167469>
- [24] <http://www.ncbi.nlm.nih.gov/pubmed/27902778?dopt=Abstract>

Publié sur *Okina* (<http://okina.univ-angers.fr>)