

# Dual Roles of DEET in Repelling the Common Bed Bug, *Cimex lectularius*

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## Supplement Information

### Figure legend

**Figure S1.** Behavior bioassay of bed bugs in response to terpenes/terpenoids. A) Olfactometer bioassay of bed bugs to three doses of (+)-menthone (1%, 5%, 10%); B) Olfactometer bioassay of bed bugs to two doses of citral (1%, 5%, 10%); C) Olfactometer bioassay of bed bugs to two doses of 1S-(+)-3-carene (1%, 5%, 10%); D) Olfactometer bioassay of male bed bugs to three doses of geranyl acetate (1%, 5%, 10%). For each experiment, an asterisk indicates a significant response to the treatment stimulus;  $\chi^2$  test with Yates correction for continuity; \* $P < 0.05$ ; \*\* $P < 0.01$  (Siljander et al., 2008). 50  $\mu$ l treatment stimulus of different doses was applied in each test. The value of n indicates the replicates for the two-choice olfactometer bioassay of individual bed bugs. DMSO was used as the control solvent for each replicate. Numbers in parentheses indicate the number of bed bugs not responding to either test stimulus.

**Figure S2. Modulation of DEET on the neuronal responses of bed bug  $D\gamma$  sensilla to aromatic/aliphatic odorants.** A) Dose–response curves of ORNs in  $D\gamma$  sensilla to toluene (1:10<sup>2</sup> v/v) with (solid line) or without (dashed line) DEET; B) Dose–response curves of ORNs in  $D\gamma$  sensilla to xylene (1:10<sup>2</sup> v/v) with (solid line) or without (dashed line) DEET; C) Dose–

response curves of ORNs in D $\gamma$  sensilla to styrene (1:10<sup>2</sup> v/v) (solid line) or without (dashed line) DEET; D) Dose–response curves of ORNs in D $\gamma$  sensilla to propylbenzene (1:10<sup>2</sup> v/v) (solid line) or without (dashed line) DEET; E) Dose–response curves of ORNs in D $\gamma$  sensilla to ethylbenzene (1:10<sup>2</sup> v/v) (solid line) or without (dashed line) DEET; F) Dose–response curves of ORNs in D $\gamma$  sensilla to 2,4-dimethylhexane (1:10<sup>2</sup> v/v) (solid line) or without (dashed line) DEET. (F-test with Bonferroni correction; mean $\pm$ SEM., n=6–10; NS, no significance; \*P<0.05; \*\*P<0.01; \*\*\*P<0.001). The dose-response curve was fitted with the Sigmoidal dose-response model with variable slope using Graphpad Prism 5.

**Figure S3.** No impact of DEET on the neuronal responses of bed bug D $\gamma$  sensilla to amine odorants. A) Dose–response curves of ORNs in C sensilla to propylamine (1:10<sup>2</sup> v/v) with (solid line) or without (dashed line) DEET; B) Dose–response curves of ORNs in C sensilla to butylamine (1:10<sup>2</sup> v/v) with (solid line) or without (dashed line) DEET. F-test with Bonferroni correction; mean $\pm$ SEM., n=6–10; NS, no significance; \*P<0.05; \*\*P<0.01; \*\*\*P<0.001). The dose-response curve was fitted with the Sigmoidal dose-response model with variable slope using Graphpad Prism 5.

**Figure S1**

