Do different host species and distinct habitats alter the olfactory host search of the ectoparasitoid *Holepyris sylvanidis*?

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Previous studies showed that the larval ectoparasitoid *Holepyris sylvanidis* uses volatiles emitted by larval feces and host larval cuticular hydrocarbons (CHC) to locate its preferred host, *Tribolium confusum*. Two components, (*E*)-2-nonenal and 1-penta-decene, from the fecal odor of *T. confusum* feeding on wheat grist, are probably key components. Furthermore, host larval CHC mediate host recognition in the parasitoid. However, *H. sylvanidis* attacks larvae of different pest beetle species, infesting diverse stored products. So far, it is unknown whether these behaviorally active compounds are ubiquitously present in the fecal odor blend and on the cuticle of other possible host species living in different host habitats (here: feeding substrates).

Therefore, we studied: (a) the larval CHC composition of four stored product pest beetles (*Oryzaephilus surinamensis*, *Tribolium castaneum*, *T. confusum* and *T. destructor*) and the behavioral response of *H. sylvanidis* towards these possible host species and

(b) the influence of three different feeding substrates (millet, rice or wheat grist) on the fecal odor of *T. confusum* and its effects on the olfactory host search of *H. sylvanidis*.

(a) In contact bioassays *H. sylvanidis* showed typical host recognition behavior when encountering dead and live larvae of the three *Tribolium* species whereas *O. surinamensis* larvae elicited no response. *O. surinamensis* was only attractive when *T. confusum* larval CHC extract was applied onto dead, in *n*-hexane extracted larvae. GC-MS analysis of the larval extracts revealed that CHC profiles of all tested *Tribolium* species were almost identical. The CHC pattern of *O. surinamensis* larvae differed qualitatively and quantitatively, e. g. in the absence of methyl-branched (Me-) alkanes. Since dead and extracted *T. confusum* treated with a fraction of Me-alkanes were recognized by *H. sylvanidis* we suggest that these compounds serve as contact kairomones for host recognition.

(b) In a static four-field-olfactometer we tested the behavioral response of *H. sylvanidis* to larval faces of *T. confusum* feeding on millet, rice or wheat grist. First results indicate that female parasitoids are highly attracted to all feces samples regardless of the feeding substrates. Whether this attraction is mediated by the two key components, (*E*)-2-nonenal and 1-pentadecene, or by other substrate-specific compounds still needs to be analyzed.

Our results might not only enhance the understanding of a parasitoid's host search regarding different host species and host habitat but may also improve the prospective use of *H. sylvanidis* in Integrated Pest Management.