

EFFECT OF PHEROMONE STEREOCHEMISTRY ON ATTRACTION OF *TETROPIUM FUSCUM* (FABR.), *T. CINNAMOPTERUM* KIRBY, AND *T. CASTANEUM* (L.)

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ABSTRACT

Silk et al. (2007) found that *Tetropium fuscum* (Fabr.) (Coleoptera: Cerambycidae) males emit a homoterpenoid alcohol (termed “fuscumol”) and that a racemic mix (50/50) of *S*- and *R*-stereoisomers of fuscumol synergized attraction of both sexes to spruce host volatiles, i.e., acted as an aggregation pheromone. Because *T. fuscum* males produced mainly *S*-fuscumol, we hypothesized that *S*-fuscumol would be more attractive than *R*-fuscumol or the racemic blend and would be a better lure for detection surveys of *T. fuscum*. We tested the attraction of *T. fuscum* and other *Tetropium* species to pure *S*-, pure *R*-, and racemic fuscumol, alone and in combination with host volatile lures, in trapping bioassays in Halifax, NS, and Białowieża, Poland in 2007.

Attraction of *T. fuscum* and related species was significantly affected by fuscumol chirality and the presence of host volatile lures. Addition of *S*-fuscumol or racemic fuscumol to traps baited with host volatile lures synergized attraction of both sexes of *T. fuscum* as well as *T. cinnamopterum* Kirby (a nearctic wood borer of spruce and pine) and *T. castaneum* (L.) (a palearctic species not known to be established in North America).

R-fuscumol did not synergize attraction of any *Tetropium* spp., but its presence in the racemic blend did not deter attraction to *S*-fuscumol. Without host volatiles, fuscumol was not very attractive; only *S*-fuscumol attracted significantly more *T. fuscum* and *T. castaneum* than unbaited traps, and only in Poland. Similar responses of three different *Tetropium* species to fuscumol suggest these species use species-specific contact pheromones for mate recognition and reproductive isolation. Racemic fuscumol is easier to synthesize than pure *S*-fuscumol, so it will be much cheaper to use in operational surveys. In conclusion, *S*-fuscumol, in pure form or racemic blend, synergized attraction of *T. fuscum*, *T. cinnamopterum*, and *T. castaneum* to spruce host volatiles. Traps baited with the combination of racemic fuscumol and host volatile lures will be useful tools for early detection and survey of these species in areas of high risk of introduction.

Literature Cited

- Silk P.; Sweeney J.; Wu J.; Price J.; Gutowski J.M.; Kettela E. 2007. **Evidence for a male produced pheromone in *Tetropium fuscum* (F.) and *Tetropium cinnamopterum* (Kirby) (Coleoptera: Cerambycidae).** *Naturwissenschaften*. 94: 697-701.