

Piperitone-derived saturated lactones : synthesis and aphid behavior-modifying activity.

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Streszczenie

Two racemic and two enantiomeric pairs of new saturated lactones with the p-menthane system were obtained. The lactones were synthesized from racemic and enantiomerically enriched cis- and trans-piperitols, which were obtained from piperitone. The structures of the compounds were confirmed by spectroscopic data. The antifeedant activity of piperitone to *Myzus persicae* was studied, and the biological consequences of structural modifications of piperitone, that is, lactonization and chiral center configuration, were examined as well. The behavioral responses of *M. persicae* to piperitone and piperitone-derived saturated lactones were investigated to reveal the biological background of their deterrent activity. Piperitone appeared rather neutral or weakly deterrent to aphids. The introduction of a lactone moiety into a piperitone molecule dramatically changed its biological activity. All piperitone-derived lactones evoked negative aphid responses. However, the deterrent activity of individual compounds varied in potency, the time of expression, and the duration of the effect, depending on the spatial structure of the lactone. Lactones (1R,3S,6R)-3-isopropyl-6-methyl-9-oxabicyclo[4.3.0]nonan-8-one and trans-3-isopropyl-6-methyl-9-oxabicyclo[4.3.0]nonan-8-one showed the broadest ranges and the highest potencies and durabilities of deterrent activity to *M. persicae*: they acted immediately after application, caused a cessation of probing before aphids reached phloem elements, and decreased the quality of phloem sap.

Adres publiczny

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<https://www.acs.org/content/acs/en.html>