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Synthesis of (+)-(S)-isorobinal together with its antipod, a cyclic monoterpene functioning as the sex pheromone of *Rhizoglyphus setosus* and its distribution among Astigmata

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Abstract:

Both compounds, (+)-(S)- and (-)-(R)-4-isopropenyl-3-oxo-1-cyclohexene-1-carbaldehyde [(+)-(S)- and (-)-(R)-isorobinal, (S)- and (R)-**1**, $[\alpha]_D^{28} +51^\circ$ ($c=1.0$, CHCl₃) and $[\alpha]_D^{25} -45^\circ$ ($c=1.3$, CHCl₃), 95% *ee* and 88% *ee*], were synthesized in seven steps starting from (R)- and (S)-perillyl alcohol [(R)- and (S)-**2**] available commercially. Isorobinal (**1**) is distributed among seven species of Astigmata among 61 species examined. (S)-Isorobinal [(S)-**1**], known as the female sex pheromone of *Rhizoglyphus setosus*, was confirmed in two other *Rhizoglyphus* species, while its biological function remained obscure against each species. In the other four species, not only its configuration but also its function has not yet been determined.

Keywords:

mite, Astigmata, *Rhizoglyphus* sp., isorobinal, 4-isopropenyl-3-oxo-1-cyclohexene-1-carbaldehyde

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