

Citronellol Disrupts Membrane Integrity by Inducing Free Radical Generation

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Z. Naturforsch. **66c**, 260–266 (2011); received September 6/December 17, 2010

Citronellol, an oxygenated monoterpene, is found naturally in the essential oils of several aromatic plants and has been reported to exhibit growth inhibitory and pesticidal activities. However, its mechanism of action is largely unexplored. We investigated the effect of citronellol, which is lipophilic in nature on membrane integrity in terms of lipid peroxidation, conjugated dienes content, membrane permeability, cell death, and activity of the enzyme lipoxygenase in roots of hydroponically grown wheat. Citronellol (50–250 μM) caused a significant inhibition of root and shoot growth. Furthermore, exposure to citronellol enhanced the solute leakage, increased the malondialdehyde content and lipoxygenase activity, and decreased the conjugated diene content. This indicates that citronellol induces generation of reactive oxygen species (ROS) resulting in lipid peroxidation and membrane damage. This was confirmed by *in situ* histochemical studies indicating cell death and disruption of membrane integrity. We conclude from this study that citronellol inhibits the root growth by ROS-mediated membrane disruption.

Key words: Lipid Peroxidation, Electrolyte Leakage, Cell Death