

Very-Long-Chain Fatty Acid Biosynthesis is Inhibited by Cafenstrole, *N,N*-Diethyl-3-mesitylsulfonyl-1*H*-1,2,4-triazole-1-carboxamide and Its Analogs

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Z. Naturforsch. **56c**, 781–786 (2001); received June 22, 2001

Cafenstrole, Rice Herbicide, Very-Long-Chain Fatty Acids

The rice herbicide cafenstrole and its analogs inhibited the incorporation of [1-¹⁴C]-oleate and [2-¹⁴C]-malonate into very-long-chain fatty acids (VLCFAs), using *Scenedesmus* cells and leek microsomes from *Allium porrum*. Although the precise mode of interaction of cafenstrole at the molecular level is not completely clarified by the present study, it is concluded that cafenstrole acts as a specific inhibitor of the microsomal elongase enzyme involved in the biosynthesis of fatty acids with alkyl chains longer than C₁₈. For a strong VLCFA biosynthesis inhibition an -SO₂- linkage of the 1,2,4-triazole-1-carboxamides was required. Furthermore, *N,N*-dialkyl substitution of the carbamoyl nitrogen and electron-donating groups such as methyl at the benzene ring of 1,2,4-triazole-1-carboxamides produced a strong inhibition of VLCFA formation. A correlation was found between the phytotoxic effect against barnyardgrass (*Echinochloa oryzicola*) and impaired VLCFA formation.