Inhibition of Very-Long-Chain Fatty Acid Formation by Indanofan, 2-[2-(3-Chlorophenyl)oxiran-2-ylmethyl]-2-ethylindan-1,3-dione, and Its Relatives

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Indanofan and its analogs inhibited the elongation of stearoyl- or arachidoyl-CoA by [2-^{14}C]-malonyl-CoA in leek microsomes from *Allium porrum*. Although the precise mode of interaction of indanofan at the *molecular* level is not completely clarified by the present study, it is concluded that indanofan and analogs act as inhibitor of the elongase enzyme involved in *de novo* biosynthesis of fatty acids with an alkyl chain longer than C_{18}, called very-long-chain fatty acids (VLCFAs). For a strong inhibition of VLCFA formation chloro substituents at the benzene ring and the oxirane group were necessary. Furthermore, the greenhouse test showed strong activity for indanofan and its analogs, and the scores coincided with cell-free elongation inhibition. The cell-free assay, however, failed to indicate any activity for an analog having a methylene instead of the oxirane group, while both *Digitaria ciliaris* and *Echinochloa oryzicola* were killed with 1 kg a.i./ha. This finding cannot be discussed because the applied use rate of 1 kg a.i./ha is too high to allow for a score differentiation. For high concentrations of this compound additional unknown inhibitory effects may be involved besides fatty acid elongation.