



Toxicity of dinitrophenyl derivatives used as pesticides and their environmental impact

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Several dinitrophenyl ethers such as 2,4-dinitroanisol, 2,4-dinitrophenetol, 2,4-dinitro-1-(octadecyloxy)benzene, 3-(2,4-dinitrophenoxy)propane-1,2-diol, as well as peptidoconjugates like 2,4-dinitro-glutathione or other similar compounds have been synthesized and tested within the germination experiments comparatively to the classical dinitrophenols, dinitrophenol pesticides, and sodium azide. Low concentrations (as low as 10^{-4} M) of both ethers and phenol derivatives inhibited seed germination, most probably by blocking oxidative phosphorylation. The toxicity mechanism of these pesticides, pesticide-like compounds and metabolic inhibitors was discussed in direct relationship with their infrared absorbance and fluorescence quenching. Thus, all of them have a significant absorbance at about 6000 cm^{-1} in IR, corresponding to \square G of ATP formation and quench the fluorescence of tryptophan and other biological compounds.