# Visible Light Induced Photodegradation and Phototoxicity of Phloxine B and Uranine[1]

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**Objective** To determine the visible light-induced photodegradation kinetics of two xanthene photosensitizers, phloxine B and uranine, in solution and on the surface of silica TLC plates, and to examine the phototoxicity of residues of degradation, which could provide valuable safety data on the two photosensitizers and other xanthene chemicals when applied in the environment. **Methods** UV-Vis absorption during photodegradation was monitored with a Unico 2102 spectrophotometer. Organic content of samples was measured with a Shimadzu TOC 4100. Phototoxicity tests were carried out using *Saccharomyces cerevisiae* with the methods modified from Daniels. **Results** When phloxine B and uranine degraded in solution, their apparent rate constant k was 0.0019 and 0.0027 $min^{-1}$, respectively. The total organic carbon (TOC) content decreased by approximately 50% during the 8 h irradiation period, which led to a gradual decrease in phototoxicity of the residues. The photodegradation of photosensitizers on the surface of silica TLC plates was much faster than that in the solution. The apparent rate constant k and the half life of phloxine B were 0.0073 $min^{-1}$ and 95 min, respectively. **Conclusion** Visible light can rapidly induce photodegradation of phloxine B and uranine. The phototoxicity of residues is also decreased. The environmental risk of applications of phloxine B and uranine is minimal.

**Key words:** Phloxine B; Uranine; Photodegradation; *Saccharomyces cerevisiae*; Phototoxicity; TOC

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[1]This research was funded by the National Natural Science Funds with contract No. 30471506 and the "Eleventh Five-Year Programme" Science and Technology Foundation of Forest with contract No. 2006BAD03A15.

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0895-3988/2008
CN 11-2816/Q

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(*Received November* 21, 2007 *Accepted July* 7, 2008)