

# Preliminary Ecological Risk Assessment of Butylparaben and Benzylparaben —2. Fate and Partitioning in Aquatic Environments

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Butylparaben and benzylparaben, used as preservatives mainly in cosmetic products, have recently been shown to be weakly estrogenic. Batch sunlight photolysis and river water biodegradation experiments were conducted to determine the persistence of these compounds in aquatic environments. As a result, benzylparaben was found to be moderately photodegradable whereas both *n*-butylparaben and *i*-butylparaben were highly stable against sunlight. Both benzylparaben and butylparabens were relatively biodegradable in the river water but the degradability was dependent on the sampling site and time. Batch sorption experiments were also conducted to determine the coefficients of sorption into river sediments and a model soil sample. The determined coefficients were slightly higher for benzylparaben than the two butylparabens and comparable to that of the natural estrogen 17 $\beta$ -estradiol. The coefficients were also higher for sediment/soil with a higher organic content and the organic-carbon-based sorption coefficient ( $\log K_{oc}$ ) shows a moderate linear correlation with the octanol-water partition coefficient ( $\log K_{ow}$ ). These results suggest that hydrophobic interaction plays a predominant role in sorption at neutral pH.