Assessing diuron short-term effects on biofilms using time-response curves

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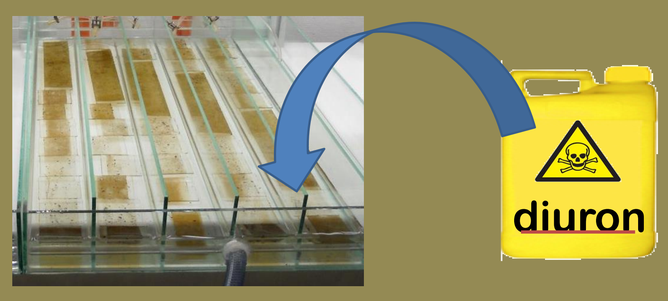
Methods

MICROALGAL BIOFILMS
4-wk old, on glass slides



DIURON–induced inhibition of photosynthetic efficiency (ΦPSII)

In agricultural watersheds, stream pollutions by **ORGANIC PESTICIDES** occur as short-time events.

In the case of rapidly-acting compounds such as the herbicide **DIURON**, pulse exposure may lead to dramatic impacts on biofilm microalgae. Assessing the effects of diuron over short periods of time is therefore necessary.

Here we assess the **DOSE**, **TIME** and **DOSE-TIME RESPONSE** of freshwater **BIOFILMS** to diuron, using photosynthesis inhibition as an endpoint.

Toxicity tests

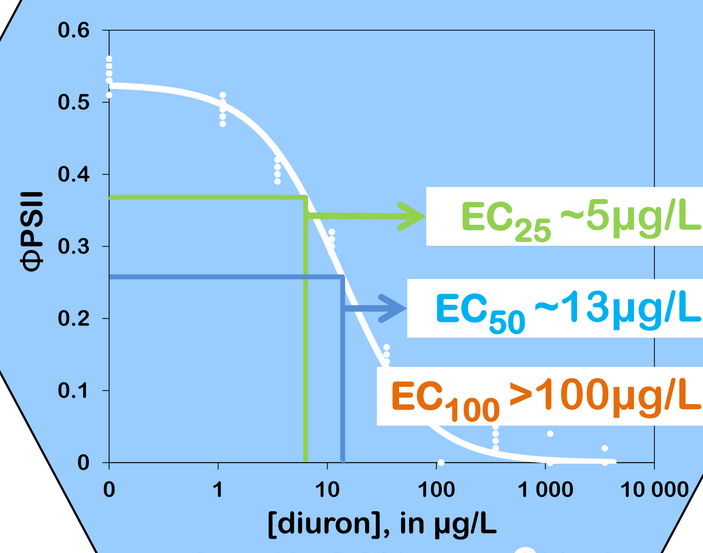
DOSE-RESPONSE CURVES

ΦPSII = f([diuron]), exposure duration = fixed

TIME-RESPONSE CURVES

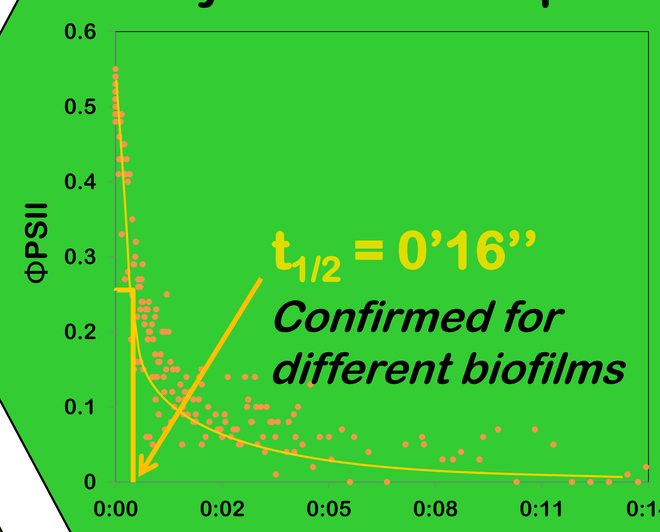
ΦPSII = f(exp. duration), [diuron] = fixed

Increasing diuron concentrations cause photosynthesis inhibition



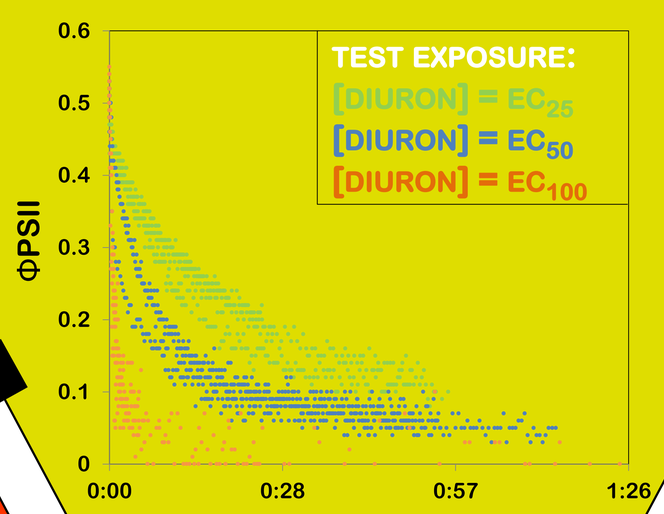
TEST EXPOSURE = 3HRS

Diuron reaches its cellular target in a very short time-span



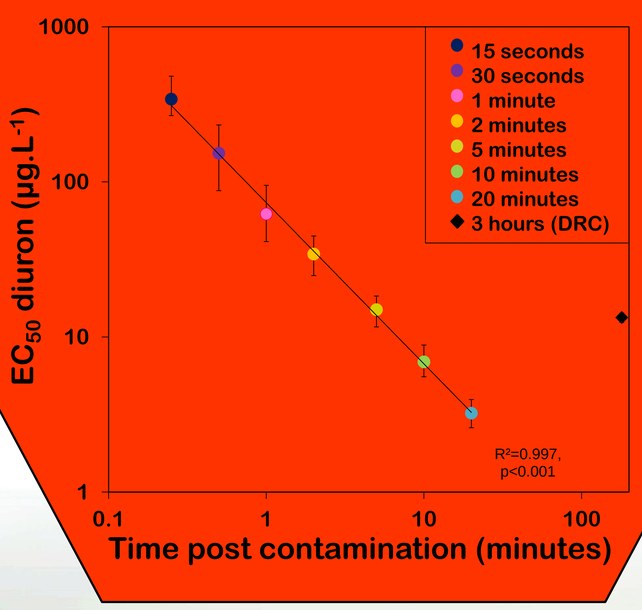
TEST EXPOSURE ~ EC_{100}

The delay ($t_{1/2}$) to halve photosynthesis depends on test [diuron]

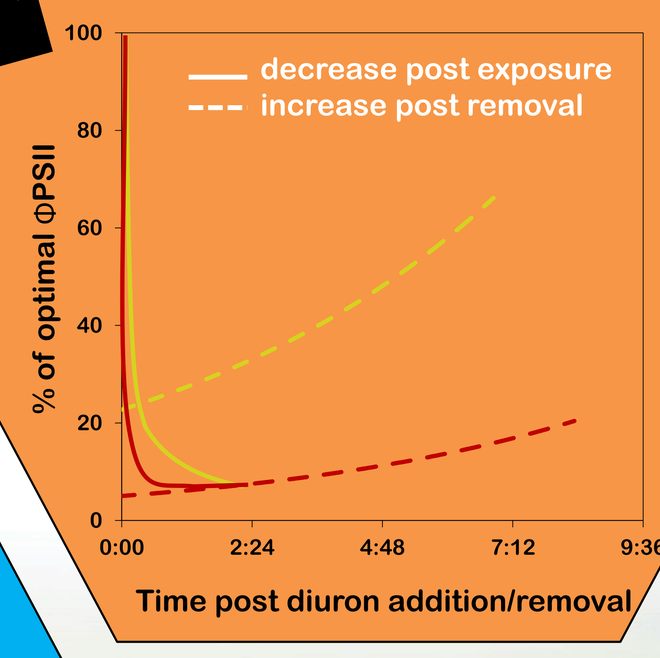


→ $t_{1/2}$ = 0'16'' - 7'20''

But EC_{50} is dependent on exposure duration



Diuron binding is faster than its release



More about diuron bioaccumulation on:

Wed, 10:40

Transfer and distribution of diuron in biofilms and joint toxic effects

by Betty Chaumet

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