



TOXICITY TEST FACT SHEET #4 – Freshwater

Chronic Toxicity Test With *Lemna disperma*

The chronic toxicity test using the freshwater duckweed *L. disperma* measures the effect of test materials on growth over a 7 days period. The common duckweed *Lemna sp.* is a small aquatic macrophyte occurring in quiescent fresh waters in both tropical and temperate regions.

In addition to being an ecologically important group, duckweeds are a sensitive and useful test organisms for testing turbid and coloured waters. This gives the duckweed an advantage over algal toxicity tests which may require filtering, compromising the sample integrity.

In summary, this test involves exposing laboratory cultured duckweed to the test material for 7 days. The test is usually undertaken on a range of concentrations of a test material, eg 100, 50, 25, 12.5 and 6.3% effluent. At the end of the exposure period, specific growth rate and frond dry weight are determined.

Statistical analyses are then applied to the test data to determine for example, the concentration of the test material causing 50% inhibition in specific growth rate in the test population (IC50 estimate). The test data can then be used to estimate concentrations of the test material likely to cause chronic toxicity in the environment.

The duckweed growth test may be used to assess the toxicity of:

- Chemicals
- Effluents
- Leachates and groundwater
- Sediments

If toxicity is detected using the chronic duckweed test, a Toxicity Identification Evaluation (TIE) programme can be initiated to identify the cause of the observed toxicity.

Chronic Toxicity Test With the Duckweed <i>L. disperma</i>	
Test type	Chronic static
Test end-point	Specific growth rate and dry weight
Test duration	7 days
Test Temperature	25 ± 1°C
Sample volume required	1 litre for full EC50 determination
Test availability	24hrs notice requested
Test turnaround time	Advice given within 72 hours of test initiation