First results of an inter laboratory ring test with the rooted aquatic macrophyte *Myriophyllum* sp. in a sediment containing test system

*Peter Dohmen*  
May 19, 2011
Background information

- participating laboratories: 15 laboratories

- test species: *M. aquaticum* and *M. spicatum*

- test substances: 3,5-Dichlorphenol, Isoproturon, Trifluralin

- medium: Smart and Barko Medium (1985),

- sediment: Artificial soil (OECD 219)

- exposure: *Via* water column or *via* sediment (spiking sediment)

- duration: 7 days (*M. aquaticum*) or 14 days (*M. spicatum*)

- test parameter: shoot length (total length, main shoot, side shoots), wet weight, dry weight, root development, no. of side shoots)

The following results / data are based on a first evaluation and will need further detailed inspection

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<table>
<thead>
<tr>
<th>Laboratory</th>
<th>3,5-DCP</th>
<th>Isoproturon</th>
<th>Trifluralin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alterra Corporation</td>
<td>x</td>
<td>x</td>
<td>n.a.</td>
</tr>
<tr>
<td>Springborn Smithers Laboratories</td>
<td>x</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>BASF SE</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Eurofins Agroscience Services</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Ibacon GmbH</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Frauenhofer IME</td>
<td>x</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>University of Novi Sad (Serbia)</td>
<td>x</td>
<td>x</td>
<td>n.a.</td>
</tr>
<tr>
<td>Dr. U. Noack Laboratories</td>
<td>n.a.</td>
<td>x</td>
<td>n.a.</td>
</tr>
<tr>
<td>Harlan Laboratories</td>
<td>x (spic.)</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

Further results expected from: UBA, Bayer Crop Science, Biochem Agrar, Nufarm, University Antwerpen (Belgium), FERA, ECT, IPO
Myriophyllum aquaticum

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Total no. of tests</th>
<th>Total no. of single control replicates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length (start data)</td>
<td>15</td>
<td>225</td>
</tr>
<tr>
<td>Total length (DAT 0)</td>
<td>19</td>
<td>342</td>
</tr>
<tr>
<td>Total length (DAT 7)</td>
<td>19</td>
<td>338</td>
</tr>
<tr>
<td>Main shoot length (DAT 7)</td>
<td>15</td>
<td>248</td>
</tr>
<tr>
<td>Wet weight (start data)</td>
<td>16</td>
<td>240</td>
</tr>
<tr>
<td>Wet weight (DAT 7)</td>
<td>19</td>
<td>338</td>
</tr>
<tr>
<td>Dry weight (start data)</td>
<td>15</td>
<td>215</td>
</tr>
<tr>
<td>Dry weight (DAT 7)</td>
<td>18</td>
<td>307</td>
</tr>
<tr>
<td>Root development</td>
<td>14</td>
<td>252</td>
</tr>
<tr>
<td>length of side shoots</td>
<td>16</td>
<td>248</td>
</tr>
<tr>
<td>No. Of Side shoots</td>
<td>16</td>
<td>255</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>182</strong></td>
<td><strong>3008</strong></td>
</tr>
</tbody>
</table>

Remarks: start data = plants from additional pots, harvested before application = DAT 0

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Results: Length data

* identical start data (same plants were used for different test runs) were excluded from calculation of the mean of all control means and the 95% prediction interval

mean of all control means (n = 15) — 95% prediction interval

identical start data (same plants were used for different test runs) were excluded from calculation of the mean of all control means and the 95% prediction interval
Results: Length data

Main shoot length DAT 7

- mean of all control means (n = 15)
- 95% prediction interval

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Results: Length data

Total length (main shoot + side shoots) DAT 0

mean of all control means (n = 19)  95% prediction interval
Results: Length data

Total length (main shoot + side shoots) DAT 7

- Mean of all control means (n = 19)
- 95% prediction interval
Shoot length

Total length increase over 7 days

<table>
<thead>
<tr>
<th>laboratory</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>total length increase (7 d) [%]</td>
<td>200</td>
<td>210</td>
<td>300</td>
<td>210</td>
<td>200</td>
<td>220</td>
<td>300</td>
<td>210</td>
<td>200</td>
</tr>
</tbody>
</table>
Results: Wet weight data

* identical start data (same plants were used for different test runs) were excluded from calculation of the mean of all control means and the 95% prediction interval
Results: Wet weight data

Wet weight - DAT 7

- mean of all control means (n = 19)
- 95% prediction interval
Wet weight increase over 7 days

Wet weight increase (7 d) [%]

laboratory

1 2 3 4 5 6 7 8 9
Results: Dry weight data

* identical start data (same plants were used for different test runs) were excluded from calculation of the mean of all control means and the 95% prediction interval.

Dry weight - start data (DAT 0)

- mean of all control means (n = 15)
- 95% prediction interval

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Results: Dry weight data

Dry weight - DAT 7

- mean of all control means (n = 18)
- 95% prediction interval
Results: Additional data

**Root development - DAT 7**

<table>
<thead>
<tr>
<th>Root development</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>1.0</td>
<td>2</td>
</tr>
<tr>
<td>1.5</td>
<td>3</td>
</tr>
<tr>
<td>2.0</td>
<td>4</td>
</tr>
<tr>
<td>2.5</td>
<td>5</td>
</tr>
<tr>
<td>3.0</td>
<td>6</td>
</tr>
<tr>
<td>3.5</td>
<td>7</td>
</tr>
<tr>
<td>4.0</td>
<td>8</td>
</tr>
</tbody>
</table>

Classification for root assessment:

- 0 = no roots
- 1 = few roots
- 2 = moderate root development
- 3 = very good development

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*mean of all control means (n = 16) --- 95% prediction interval*
Variability

Coefficients of variations (all parameters; n = 14 to 19)

- Length (start data)
- Total length (DAT 0)
- Wet weight (start data)
- Dry weight (start data)
- Total length (DAT 7)
- Main shoot length (DAT 7)
- Wet weight (DAT 7)
- Root development (DAT 7)
- Dry weight (DAT 7)
- Side shoot length
- No. of side shoots

CV [%]
Water parameters

Conductivity at DAT 0 (n = 1)

Conductivity [μS/cm]

Lab 1  Lab 2  Lab 3  Lab 4  Lab 5  Lab 6  Lab 7  Lab 8  Lab 9

n.a.  n.a.  n.a.  n.a.  n.a.  n.a.  n.a.  n.a.  n.a.

n.a. = no data available
**Water parameters**

Oxygen concentration [%]

- DAT 0
- DAT 3
- DAT 5
- DAT 7

**Test duration**

- Lab 2
- Lab 3
- Lab 4
- Lab 5
- Lab 6
- Lab 7
- Lab 8
- Lab 9
Water parameters

Temperature

mean temperature [°C]

DAT 0  DAT 3  DAT 5  DAT 7

test duration

Lab 1
Lab 2
Lab 3
Lab 4
Lab 5
Lab 6
Lab 7
Lab 8
Lab 9
Water parameters

pH values

mean pH

10
9
8
7
6
5
DAT 0
DAT 3
DAT 5
DAT 7
Test duration

Lab 1
Lab 2
Lab 3
Lab 4
Lab 5
Lab 6
Lab 7
Lab 8
Lab 9

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Water parameters

Issues

*Myriophyllum aquaticum*: Sometimes very rapid growth (already during the pre-rooting phase

*Myriophyllum spicatum*: Availability of plants

Ring test is ongoing and further results expected within the next couples of month mainly on *M spicatum*
Method has been submitted to OECD (has got support by members)

OECD TEST GUIDELINES PROGRAMME

Standard Project Submission Form

If you require further information please contact the OECD Secretariat
Return completed forms to:
env.tgcontact@oecd.org

PROJECT TITLE

Aquatic Macrophytes, *Myriophyllum* sp., Growth Inhibition Test