Effect of different ovule isolation times on the embryo development of *Campanula* hybrids

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CONCLUSION
- Ovule isolation time is an important factor for a successful embryo rescue
- Ovule isolation time affected both the number of germinating embryos and the rate of their development in vitro
- Successful interspecific hybridisation: here obtained hybrids in vitro might not be prevented through prefertilisation or postfertilisation barriers

OBJECTIVES
In this study cultivars of three *Campanula* species from southeastern Europe have been selected:
- To develop new interspecific hybrids
- To investigate the number of ovules and their subsequent germination rates in vitro from intra- and interspecific hybrids
- To determine the optimal ovule harvest period after in vivo pollination

RESULTS
Isolation of ovules
The number of isolated ovules varied between the intraspecific cross and the interspecific reciprocal crosses and depended on the ovule isolation time after pollination.

<table>
<thead>
<tr>
<th>Cross</th>
<th>Number of ovules</th>
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<tbody>
<tr>
<td><strong>1 week</strong></td>
<td><strong>2 weeks</strong></td>
</tr>
<tr>
<td><em>C. carpatica</em> 'White' (Intraspecific cross)</td>
<td>372</td>
</tr>
<tr>
<td><em>C. medium</em> 'Pink' (Self-pollination)</td>
<td>75</td>
</tr>
<tr>
<td><em>C. medium</em> 'Pink' x <em>C. formanekiana</em></td>
<td>1</td>
</tr>
</tbody>
</table>

- A later isolation time after pollination from the intraspecific cross did not result in an increased number of isolated ovules (Table 1)
- An increased number of ovules as an effect of a longer in vivo ovule development from self-pollination and the reciprocal interspecific crosses was observed (Table 1)
- The highest number of ovules was isolated when *C. formanekiana* was used as maternal parent

Germination
- Germination rate for ovules from *C. formanekiana* x *C. medium* 'Pink' increased from week 2 to week 3 (Figure 1)
- Ovules isolated 3 weeks after pollination germinated faster than 2 weeks

MATERIALS AND METHODS
For the experiment two *Campanula* species with difficulties to hybridise were selected. Intraspecific cross and self-pollination were used as controls. The ovules were allowed to mature in vivo for 1-4 weeks after pollination, sterilised and placed on a half strength MS medium.

Analyses
Number of collectable ovules were recorded each week. The germination was monitored for 80 days and defined as emergence of the first visible root (> 1 mm).

<table>
<thead>
<tr>
<th>Days</th>
<th>Germination (%)</th>
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<tbody>
<tr>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>20</td>
<td>0.0</td>
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<tr>
<td>40</td>
<td>0.0</td>
</tr>
<tr>
<td>60</td>
<td>0.0</td>
</tr>
<tr>
<td>80</td>
<td>1.0</td>
</tr>
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Statistical analysed as time to event data (Ritz et al., 2010) by using the statistic software program R (R Development Core Team, 2011).

References