Family-portraits for Daphnids – Scanning living individuals and populations to measure body length

Figure 1: Illustration and explanation of a scanned population of Daphnia magna at a resolution of 1200 dots per inch.
Table 1: Comparison of body size measurements (mm) of Daphnids using microscopy and picture analysis.

|        | Microscopy 720 dpi | Microscopy 1200 dpi | Microscopy 2400 dpi |
|--------|---------------------|----------------------|---------------------|
| Adult  | 2.80                | 2.79 (0.36)          | 2.77 (1.07)         |
| Juvenile | 2.16            | 2.13 (1.39)          | 2.11 (2.31)          |
| Neonate | 1.33             | 1.45 (9.02)          | 1.31 (1.50)          |

* Relative difference to measurements via microscopy (%).

Figure 2: Comparison of growth (a) and reproduction (b) when using either microscopy or picture analysis for data acquisition. * Significant difference at indicated day (Two-way ANOVA, Holm-Sidak method, p< 0.05).
Figure 3: Coefficient of variance for 20 consecutively analysed pictures taken with the scanning method in dependence of the level of experience in picture analysis.

Figure 4: Coefficient of variance for > 200 consecutively analysed (within 10h) pictures taken with the scanning method in dependence of the level of experience in picture analysis.
Figure 5: Measured adult size (mm) of *Daphnia magna* using two variations of the definition of body length.