Supplementary Material

# Supplementary Figures and Tables

## Supplementary Tables

**Supplementary Table S1** List of recorded shredder species, frequency of their occurrence in studied ponds (freq) and functional traits (BL –maximum body length, G – number of generations per year). Sources of trait information are listed below the table.

|  |  |  |  |
| --- | --- | --- | --- |
| Taxa | Freq | BL (mm) | G |
| Crustacea |  |  |  |
| *Gammarus balcanicus* Schäferna, 1922 | 2 | 18.0f | 1c |
| Coleoptera |  |  |  |
| *Anacaena globulus* (Paykull, 1798) | 2 | 3.5a | 1j |
| *Anacaena limbate* (Fabricius, 1792) | 1 | 3.2a | 1j |
| *Anacaena lutescens* (Stephens, 1829) | 4 | 3.2i | 1j |
| *Bagous longitarsis* Thomson, 1868 | 1 | 2.9h | 1j |
| *Berosus luridus* (Linnaeus, 1761) | 1 | 4.6a | 1j |
| *Dryops anglicanus* Edwards, 1909 | 1 | 5.0b | <1j |
| *Enochrus bicolor* (Fabricius, 1792) | 1 | 6.5a | 1j |
| *Enochrus coarctatus* (Gredler, 1863) | 1 | 4.0a | 1j |
| *Enochrus fuscipennis* (Thomson, 1884) | 2 | 5.6d | 1j |
| *Enochrus melanocephalus* (Olivier, 1792) | 1 | 4.8a | 1j |
| *Enochrus quadripunctatus* (Herbst, 1797) | 1 | 5.7a | 1j |
| *Enochrus ochropterus* (Marsham, 1802) | 1 | 5.5a | 1j |
| *Helophorus aquaticus* (Linnaeus, 1758) | 1 | 6.0a | 1j |
| *Helophorus flavipes* Fabricius, 1792 | 2 | 4.2a | 1j |
| *Helophorus granularis* (Linnaeus, 1761) | 1 | 3.0a | 1j |
| *Helophorus griseus* Herbst, 1793 | 1 | 3.6a | 1j |
| *Hydrochara caraboides* (Linnaeus, 1758) | 2 | 19.0a | 1j |
| *Laccobius minutus* (Linnaeus, 1758) | 2 | 3.4a | 1j |
| *Microcara testacea* (Linnaeus, 1767) | 2 | 10.0g | 1e |
| Trichoptera |  |  |  |
| *Oligotricha striata* (Linnaeus, 1758) | 2 | 22.0g | 1j |
| *Anabolia furcata* (Brauer, 1857) | 1 | 23.0g | 1j |
| *Chaetopteryx* sp. | 1 | 15.0g | 1j |
| *Limnephilus* cf. *auricula* (Curtis 1834) | 1 | 12.0g | 1j |
| *Limnephilus ignavus* (Mclachlan, 1865) | 1 | 16.0g | 1j |
| *Limnephilus lunatus* (Curtis, 1834) | 1 | 17.0g | 1j |
| *Limnephilus rhombicus* (Linnaeus, 1758) | 1 | 25.0g | 1j |
| *Leptocerus tineiformis* (Curtis, 1834) | 1 | 8.0g | 1j |
| Diptera |  |  |  |
| *Cricotopus sylvestris* gr. | 1 | 8.0g | (>)2j |
| Tipulidae indet. | 1 | 60.0g | 1j |

Sources:

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**Supplementary Table S2** Breakdown rates (*k*) calculated for eight studied ponds as exponential decay per degree-day and day. Standard errors of the rates are given in brackets.

|  |  |  |
| --- | --- | --- |
| Pond | *k* (degree-day-1) | *k* (day-1) |
| Banská Belá | 0.00097 [0.00014] | 0.01273 [0.00303] |
| Detvianska Huta | 0.00078 [0.00018] | 0.00976 [0.00222] |
| Dvory nad Žitavou | 0.00123 [0.00017] | 0.02146 [0.00389] |
| Horný Badín | 0.00103 [0.00010] | 0.01410 [0.00149] |
| Koš | 0.00080 [0.00012] | 0.00918 [0.00173] |
| Kunerád 1 | 0.00094 [0.00022] | 0.01032 [0.00254] |
| Kunerád 3 | 0.00099 [0.00037] | 0.01106 [0.00521] |
| Poltár | 0.00085 [0.00019] | 0.01257 [0.00404] |

**Supplementary Table S3** Diversity characteristics of shredder communities in studied ponds.

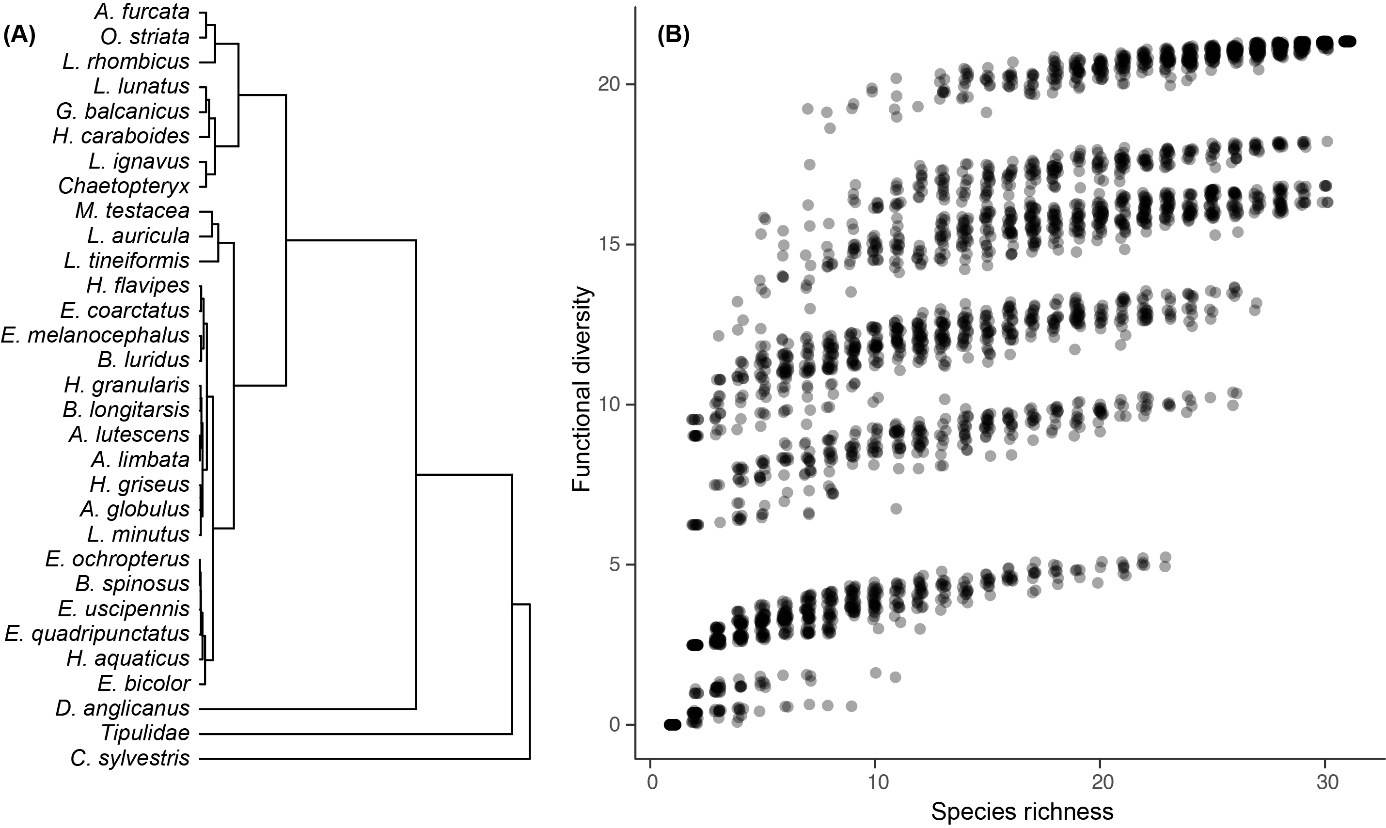
|  |  |  |  |
| --- | --- | --- | --- |
| Pond | Abundance  (ind/sample) | Speciesrichness  (number of species) | Functional diversity  (length of dendrogram branches) |
| Banská Belá | 4.13 | 9 | 4.07 |
| Detvianska Huta | 0.67 | 2 | 0.96 |
| Dvory nad Žitavou | 2.63 | 7 | 9.31 |
| Horný Badín | 1.17 | 5 | 3.20 |
| Koš | 1.25 | 2 | 2.44 |
| Kunerád 1 | 4.20 | 7 | 3.48 |
| Kunerád 3 | 2.17 | 2 | 2.44 |
| Poltár | 2.00 | 6 | 12.75 |

## Supplementary Figures

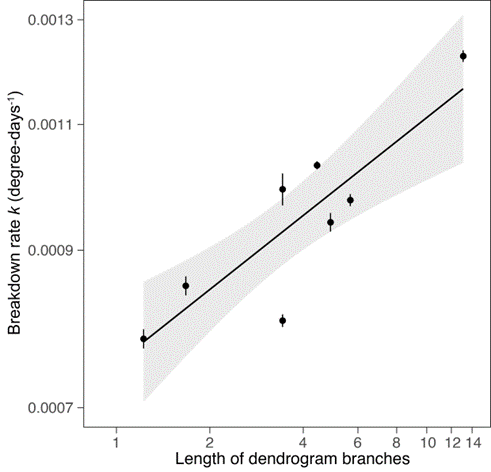
Obrázok, na ktorom je kruh, náčrt, dizajn, ilustrácia

Automaticky generovaný popis

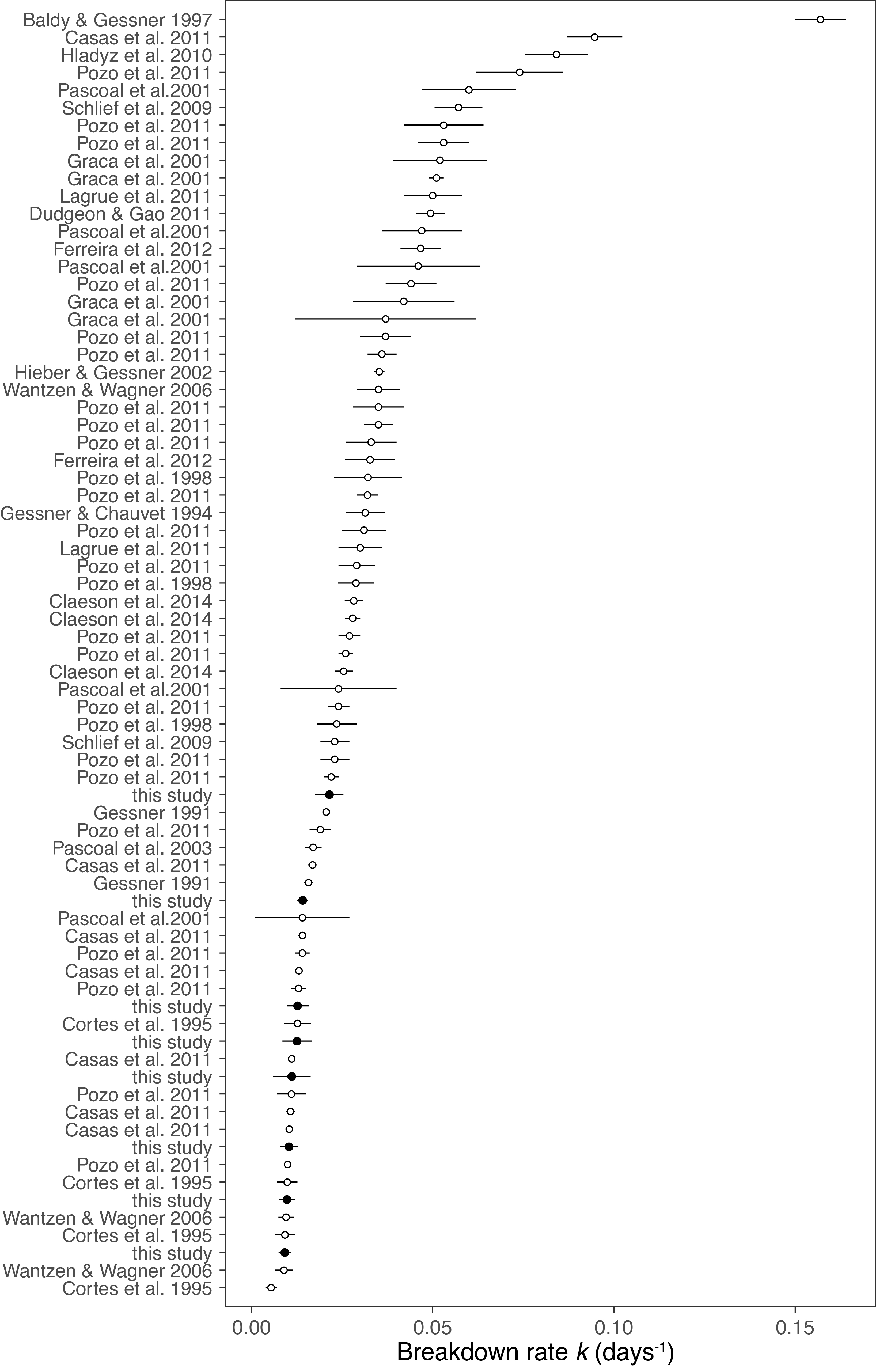
**Supplementary Figure S1**. Schematic comparison of a heavily shaded small pond with allochthonous leaf litter as a dominant energy source (left) and a well-insolated large lake with autochthonous primary production as a dominant source of energy (right).



**Supplementary Figure** **S2** Functional dendrogram of species traits based on standardized Euclidean distances and the UPGMA method (A). Simulated relationship between species richness and functional diversity based on 100 unrestricted random samples of species at each richness level from the same functional dendrogram (B). Details on trait values are given in Table S1.



**Supplementary Figure** **S3** Relationship between black alder leaf litter breakdown rates in ponds and shredder functional diversity based on maximum body size. Expected breakdown rates based on the GLS models (line ± 95% conf. intervals in grey) are displayed along with observed values (circles ± 95% CI error bars). Note that even when excluding the pond with the highest functional diversity, the relationship remains significant (GLS: F = 9.28, p = 0.029).



**Supplementary Figure S4** Comparison of black alder breakdown rates (*k*) recorded in coarse-mesh litter bags in headwater streams (open circles) and ponds examined in this study (full circles). Error bars represent standard errors of *k* estimates. The studies involved in the comparison reported exponential breakdown rates, measures of variance, stream order and litter bag mesh size ≥ 5 mm. References to the studies are given below.

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