**Supplementary material**

Table S1. Sampling effort in 2003–2014 and in 1984–1985. Numbers in the columns indicate the number of biological replicates collected in the ponds on each date. Environmental analyses were performed in P1 and in P3 on all dates in which macroinvertebrates were collected in 2003–2004, while in 1984–1985, macroinvertebrates were collected in only three of the 12 campaigns in P1, P2† and P3 and are marked in bold.

|  |  |  |  |
| --- | --- | --- | --- |
|  | P1 | P2† | P3 |
| 10-VII-2003 | 2 |  | 3 |
| 27-VII-2003 |  |  | 3 |
| 23-VIII-2003 |  |  | 3 |
| 22-IX-2003 |  |  | 3 |
| 7-IX-2003 | 2 |  | 3 |
| 13-X-2003 |  |  | 3 |
| 9-V-2004 | 2 |  | 3 |
| 23-V-2004 | 4 |  | 3 |
| 7-VI-2004 | 4 |  | 3 |
| 23-VI-2004 | 4 |  | 3 |
| 7-VII-2004 | 4 |  | 3 |
| 22-VII-2004 | 4 |  | 3 |
| 12 campaigns | 26 |  | 36 |
| **31-X-1984** | 1 | 1 | 1 |
| 14-XI-1984 | 2 | 1 | 1 |
| **16-V-1985** | 3 | 1 | 1 |
| 3-VI-1985 | 2 | 1 | 1 |
| 19-VI-1985 | 1 |  | 1 |
| **2-VII-1985** | 4 | 1 | 1 |
| 28-VII-1985 | 3 |  | 1 |
| 11-VIII-1985 | 1 |  | 1 |
| 29-VIII-1985 | 4 | 1 | 1 |
| 15-IX-1985 | 2 | 1 | 1 |
| 3-X-1985 | 1 | 1 | 1 |
| 4-XI-1985 | 3 | 1 | 1 |
| 12 campaigns | 27 | 9 | 12 |

Table S2. Main environmental variables of the study ponds (P1, P3). Mean values are reported.

\*Water turbidity: 1 = clear, 2 = intermediate, 3 = turbid. \*\*Macrophyte cover as % of sector area. Column 1: variables in bold are significantly (p < 0.05) different between the two ponds. Values in bold: variables that are significantly seasonally different in each pond.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | P1 |  |  | P3 |  |
|  | spring | summer | autumn | spring | summer |
| Water temperature (°C) | **16.2 ± 5.4** | **27.1 ± 5.1** | **7.1 ± 4.4** | **12.9 ± 4.8** | **20.3 ± 4.9** |
| **Conductivity (µS cm-1)** | 90 ± 10 | 80 ± 30 | **355 ± 63.6** | **56.7 ± 60.3** | **430 ± 121.5** |
| pH | 7.3 ± 0.3 | 8.6 ± 1.6 | 8.6 ± 0 | 7.9 ± 0.74 | 8.5 ± 0.39 |
| **TDS (mg L-1)** | 0.04 ± 0.006 | 0.06 ± 0.03 | **0.18 ± 0.04** | **0.03 ± 0.04** | **0.21 ± 0.06** |
| N-NH4 (mg L-1) | 0.19 ± 0 | 1.56 ± 0 | 1.88 ± 0 | 0.17 ± 0 | 1.88 ± 0 |
| N-NO3 (mg L-1) | 0.1 ± 0 | 0.1 ± 0 | **1.10 ± 0** | **0.1 ± 0** | **1.1 ± 0** |
| P-PO4 (mg L-1) | 0.1 ± 0 | 2.6 ± 0 | 2.50 ± 0 | 0.1 ± 1 | 2.5 ± 1 |
| Water turbidity\* | **1 ± 0** | **2 ± 0.5** | **1 ± 0** | **2 ± 0.5** | **3 ± 0.5** |
| Macrophyte cover (%)\*\* | **50 ± 15** | **90 ± 10** | **50 ± 13** | **20 ± 15** | **70 ± 20** |
| Water level (m) | **0.7 ± 0.3** | **0.3 ± 0.3** | 0.5 ± 0.2 | 1 ± 0.5 | 0.7 ± 0.4 |

Table S3. Faunal list of the three ponds sampled in 1984–1985 (a) and in 2003–2004 (b). Abundance (as percentage of total captures) is shown following five ranks of abundance: 1.0−4.9%, 5.0−19.9%, 20−39.9%, 40−59.9%, > 60%. Species names underlined: taxa (N = 21) collected only in 1984–1985. Species names in bold: taxa (N = 21) collected only in 2003–2004. Functional traits assigned to taxa collected at the study ponds: HAB = Habits: BU = Burrowers, SP = Sprawlers, CL = Climbers, SW= Swimmers, DI = Divers, SK = Skaters (DI were grouped with SW in the n-MDS analysis). FFG = Functional feeding groups: CG = Collector gatherers, CF = Collector-filterers, PR= Predators, SH= Shredders, SC = Scrapers. WIG= Groups of Wiggins et al. (1980): 1–4, ? = unknown. Species codes in grey = rare species excluded in the multivariate analyses (2003–2004). Species codes with \* are those excluded from the multivariate analysis of the 1984–1985 and 2003–2004 datasets.

| Order | Family | Species | species code | P1 a | P1 b | P3 a | P3 b | P2 a | HAB | FFG | WIG |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Arhynchobdellida | Erpobdellidae | *Dina apathyi* Johansson, 1913 | Din\_apat |  |  |  |  |  | CL, SP | PR | 1 |
| Arhynchobdellida | Erpobdellidae | ***Dina punctata* Johansson, 1927** | Din\_punc |  |  |  |  |  | CL, SP | PR | 1 |
| Arhynchobdellida | Erpobdellidae | *Erpobdella octoculata* (Linnaeus, 1758) | Erp\_octo |  |  |  |  |  | CL, SP | PR | 1 |
| Arhynchobdellida | Erpobdellidae | ***Erpobdella testacea* (Savigny, 1820)** | Erp\_test\* |  |  |  |  |  | CL, SP | PR | 1 |
| Rhynchobdellida | Glossiphoniidae | *Helobdella stagnalis* (Linnaeus, 1758) | Hel\_stag |  |  |  |  |  | CL, SP | PR | 1 |
| Haplotaxida | Naididae | *Chaetogaster limnaei* Baer, 1827 | Cha\_limn\* |  |  |  |  |  | BU | CG, SC | 1 |
| Haplotaxida | Naididae | *Nais communis* Piguet, 1906/*variabilis* Piguet, 1906 | Nai\_comm |  |  |  |  |  | BU | CG, SC | 1 |
| Haplotaxida | Tubificidae | *Aulodrilus limnobius* Bretscher, 1899 | Aul\_limn |  |  |  |  |  | BU | CG | 1 |
| Haplotaxida | Tubificidae | *Aulodrilus pluriseta* (Piguet, 1906) | Aul\_plur |  |  |  |  |  | BU | CG | 1 |
| Haplotaxida | Tubificidae | *Limnodrilus hoffmeisteri* Claparede, 1862 | Lim\_hoff |  |  |  |  |  | BU | CG | 1 |
| Haplotaxida | Tubificidae | *Limnodrilus udekemianus* Claparede, 1862 | Lim\_udek |  |  |  |  |  | BU | CG | 1 |
| Haplotaxida | Tubificidae | *Tubifex ignotus* (Stolc, 1886) | Tub\_igno |  |  |  |  |  | BU | CG | 1 |
| Haplotaxida | Tubificidae | *Tubifex tubifex* (O.F. Müller, 1774) | Tub\_tubi |  |  |  |  |  | BU | CG | 1 |
| Pulmonata | Lymnaeidae | *Radix labiata* (Rossmässler, 1835) | Rad\_lab |  |  |  |  |  | CL, SP | SC, SH | 1 |
| Veneroida | Sphaeriidae | *Musculium lacustre* (O.F. Müller, 1774) | Mus\_lacu |  |  |  |  |  | BU | CF | 1 |
| Veneroida | Sphaeriidae | *Pisidium casertanum* (Poli, 1791) | Pis\_case |  |  |  |  |  | BU | CF | 1 |
| Coleoptera | Chrysomelidae | *Donacia versicolorea* (Brahms, 1790) | Don\_vers |  |  |  |  |  | CL, SP | SH | 4 |
| Coleoptera | Chrysomelidae | *Plateumaris consimilis* (Schrank, 1781) | Plat\_con |  |  |  |  |  | CL | SH | 2 |
| Coleoptera | Dytiscidae | ***Acilius sulcatus* (Linnaeus, 1758)** | Acil\_sul |  |  |  |  |  | DI, SW | PR | 4 |
| Coleoptera | Dytiscidae | ***Agabus bipustulatus* (Linnaeus, 1767)** | Agab\_bip\* |  |  |  |  |  | DI, SW | PR | 2 |
| Coleoptera | Dytiscidae | *Bidessus unistriatus* (Goeze, 1777) | Bid\_unis |  |  |  |  |  | CL, SW | PR | ? |
| Coleoptera | Dytiscidae | ***Dytiscus* sp.** | Dytiscus |  |  |  |  | , | DI, SW | PR | 4 |
| Coleoptera | Dytiscidae | *Hydroglyphus geminus* (Fabricius 1792) (= *pusillus* (Fabricius 1781)) | Hydr\_gem |  |  |  |  |  | DI, SW | PR | ? |
| Coleoptera | Dytiscidae | ***Hygrotus*** (***Coelambus*) *confluens* (Fabricius, 1787)** | Hygr\_con\* |  |  |  |  |  | CL, SW | PR | 2 |
| Coleoptera | Dytiscidae | *Hygrotus* (*Coelambus*) *impressopunctatus* (Schaller, 1783) | Hygr\_imp |  |  |  |  |  | CL, SW | PR | ? |
| Coleoptera | Dytiscidae | *Hygrotus* (*Hygrotus*) *inaequalis* *inequalis* (Fabricius 1776) | Hygr\_ina |  |  |  |  |  | CL, SW | PR | 2 |
| Coleoptera | Dytiscidae | *Laccophilus minutus* (Linnaues, 1758) | Lacco\_min |  |  |  |  |  | DI, CL, SW | PR | 4 |
| Coleoptera | Dytiscidae | *Rhantus* sp. | Rhantus |  |  |  |  |  | DI, SW | PR | 2, 4 |
| Coleoptera | Haliplidae | *Haliplus ruficollis* (De Geer, 1774) | Hali\_ruf |  |  |  |  |  | CL, SW | SH | 2 |
| Coleoptera | Haliplidae | *Peltodytes caesus* (Duftschmid, 1805) | Pelt\_cae |  |  |  |  |  | CL | PR, SH | 2 |
| Coleoptera | Hydrophilidae | *Coelostoma orbiculare* (Fabricius, 1775) | Coe\_orbi |  |  |  |  |  | CL | PR | 4 |
| Coleoptera | Hydrophilidae | ***Enochrus* sp.** | Enochrus\* |  |  |  |  |  | BU, SP | SC, SH | 4 |
| Coleoptera | Hydrophilidae | ***Helochares lividus* (Herbst, 1797)** | Heloc\_liv |  |  |  |  |  | DI, CL, SW | SC, SH | 4 |
| Diptera | Chironomidae | ***Chironomus anthracinus*  gr.** | Ch\_anthr |  |  |  |  |  | BU | CG, SH | 2 |
| Diptera | Chironomidae | *Chironomus plumosus* gr. | Ch\_plumo |  |  |  |  |  | BU | CG, SH | 2 |
| Diptera | Chironomidae | *Chironomus riparius* gr. | Ch\_ripar |  |  |  |  |  | BU | CG, SH | 2 |
| Diptera | Chironomidae | *Corynoneura* sp. | Corynon\* |  |  |  |  |  | SP | CG | 2 |
| Diptera | Chironomidae | *Cricotopus sylvestris* (Fabricius, 1794) | Cric\_syl |  |  |  |  |  | BU, SP | CG, SC | 2, 4 |
| Diptera | Chironomidae | *Benthalia carbonaria* (Meigen, 1804) | Bent\_car |  |  |  |  |  | BU | CG | 2 |
| Diptera | Chironomidae | *Glyptotendipes* *caulicola* (Kieffer, 1913) | Gly\_caul |  |  |  |  |  | CL, SP | CG, CF | 2 |
| Diptera | Chironomidae | *Limnophyes* sp. | Limnophy |  |  |  |  |  | SP | CG, SC | 3 |
| Diptera | Chironomidae | *Metriocnemus fuscipens* (Meigen, 1818) | Met\_fusc |  |  |  |  |  | SP | CG, SC | 3 |
| Diptera | Chironomidae | ***Micropsectra* spp.** | Microps |  |  |  |  |  | CL, SP | CG | 2 |
| Diptera | Chironomidae | *Parachironomus gracilior* (Kieffer 1918) | Para\_arc\* |  |  |  |  |  | CL, SP | CG, SC | 2 |
| Diptera | Chironomidae | *Paramerina cingulata* (Walker, 1856) | Para\_cin\* |  |  |  |  |  | SP | PR | 4 |
| Diptera | Chironomidae | *Paratanytarsus laccophilus* (Edwards, 1929) | Parat\_la |  |  |  |  |  | CL, SP | CG, SC, CF | 2 |
| Diptera | Chironomidae | *Polypedilum cultellatum* Goetghebuer 1931 | Poly\_cul |  |  |  |  |  | CL, SP | CG, SH | 2 |
| Diptera | Chironomidae | *Psectrocladius sordidellus* (Zetterstedt, 1838) | Psec\_sor |  |  |  |  |  | BU, SP | CG, SH | 2 |
| Diptera | Chironomidae | *Psectrotanypus varius* (Fabricius, 1787) | Psec\_var |  |  |  |  |  | SP | PR | 4 |
| Diptera | Chironomidae | *Zavreliella* sp. | Zavrelie |  |  |  |  |  | BU | CG, CF | 2 |
| Diptera | Culicidae | *Anopheles* spp. | Anophele |  |  |  |  |  | SW | SC | 4 |
| Diptera | Culicidae | ***Culex* spp.** | Culex |  |  |  |  |  | SW | SC | 4 |
| Diptera | Culicidae | *Culicoides* sp. | Culicoid |  |  |  |  |  | SW | SC | 4 |
| Diptera | Culicidae | *Palpomyia* spp. | Palpomyi |  |  |  |  |  | SW | SC | 4 |
| Diptera | Stratiomyiidae | ***Odontomyia tigrina* (Fabricius, 1775)** | Odon\_tig |  |  |  |  |  | CL, SP | SC, CG | 2 |
| Diptera | Stratiomyiidae | ***Stratiomys longicornis* (Scopoli, 1763)** | Strat\_lon |  |  |  |  |  | CL, SP | SC, CG | 2 |
| Diptera | Tabanidae | ***Tabanus autumnalis* Linnaeus, 1761** | Tab\_autu\* |  |  |  |  |  | BU, SP | PR | 2 |
| Ephemeroptera | Baetidae | *Cloeon cognatum* Stephens, 1836 | Clo\_cogn |  |  |  |  |  | SW | CG, SC | 4 |
| Heteroptera | Corixidae | *Corixa punctata* (Illiger, 1807) | Cor\_punc |  |  |  |  |  | SW | SH | 4 |
| Heteroptera | Corixidae | *Hesperocorixa parallela* (Fieber, 1860) | Hesp\_par |  |  |  |  |  | CL, SW | SH | 4 |
| Heteroptera | Corixidae | *Sigara lateralis* (Leach, 1817) | Siga\_lat |  |  |  |  |  | CL, SW | CG, SH | 4 |
| Heteroptera | Corixidae | ***Sigara limitata* (Fieber, 1848)** | Siga\_lim |  |  |  |  |  | CL, SW | CG, SH | 4 |
| Heteroptera | Corixidae | *Sigara nigrolineata* (Fieber, 1848) | Siga\_nig |  |  |  |  |  | CL, SW | CG, SH | 4 |
| Heteroptera | Gerridae | ***Aquarius paludum* (Fabricius, 1794)** | Aqua\_pal\* |  |  |  |  |  | SK | PR | 4 |
| Heteroptera | Gerridae | ***Gerris costae* (Herrich-Schäffer, 1850)** | Ger\_costa\* |  |  |  |  |  | SK | PR | 4 |
| Heteroptera | Gerridae | *Gerris maculatus* Tamanini, 1946 | Ger\_macu |  |  |  |  |  | SK | PR | 4 |
| Heteroptera | Gerridae | ***Plea minutissima* Leach, 1871** | Plea\_min |  |  |  |  |  | CL, SW | PR | 4 |
| Heteroptera | Nepidae | *Ranatra linearis* (Linnaeus, 1758) | Rana\_lin\* |  |  |  |  |  | CL | PR | 4 |
| Heteroptera | Notonectidae | *Notonecta glauca* Linnaeus, 1758 | Noto\_gla |  |  |  |  |  | CL, SW | PR | 4 |
| Heteroptera | Notonectidae | *Notonecta obliqua* Thunberg, 1787 | Noto\_obl |  |  |  |  |  | CL, SW | PR | 4 |
| Heteroptera | Notonectidae | ***Notonecta viridis* Delcourt, 1909** | Noto\_vir |  |  |  |  |  | CL, SW | PR | 4 |
| Odonata | Aeshnidae | *Aeshna cyanea* (Müller, 1764) | Aes\_cyan |  |  |  |  |  | CL | PR | 3 |
| Odonata | Aeshnidae | *Aeshna juncea* (Linnaeus, 1758) | Aes\_junc |  |  |  |  |  | CL | PR | 3 |
| Odonata | Aeshnidae | *Anax imperator* Leach, 1815 | Anax\_imp |  |  |  |  |  | CL | PR | 4 |
| Odonata | Coenagrionidae | *Coenagrion puella* (Linnaeus, 1758) | Coe\_puel |  |  |  |  |  | CL | PR | 4 |
| Odonata | Coenagrionidae | *Enallagma cyathigerum* (Charpentier 1840) | Ena\_cyat |  |  |  |  |  | CL | PR | 4 |
| Odonata | Libellulidae | *Libellula depressa* Linnaeus, 1758 | Libe\_dep |  |  |  |  |  | CL | PR | 4 |
| Odonata | Platycnemididae | ***Platycnemis pennipes* (Pallas, 1771)** | Plat\_pen\* |  |  |  |  |  | CL | PR | 4 |
| Trichoptera | Limnephilidae | ***Limnephilus stigma* Curtis, 1834** | Lim\_stig |  |  |  |  |  | CL, SP | SC, SH | 2 |