**Supplementary**

**Table S1.** Physical and chemical characterization of Caohai wetland at 1986, 2007 and 2017 with indication of maximum and minimum values

|  |  |  |  |
| --- | --- | --- | --- |
|  | 1986 | 2007 | 2017 |
| Air temperature (Mean,℃) | 17.7 | 29.4 | 22.3 |
| Water temperature (℃) | Mean 15 | Mean 25.2 | Mean 19.3 |
| Min. 13.2 | Min. 20.5 | Min. 18.5 |
| Max. 16.4 | Max. 29.5 | Max. 20.6 |
| Water salinity (mg L-1) | Mean478.647 | Mean 159.296 | Mean 156.195 |
| Min.332.397 | Min.90.734 |  |
| Max.624.897 | Max.248.391 |  |
| Water depth (m) | Mean 2.0 | Mean 1.35 | Mean 1.7 |
| Max. 5.0 | Max. 2.8 | Max. 5.0 |
| Transparency (cm) | Mean 64.2 | Mean 81.78 | Mean 91.9 |
| Min.14.5 | Min.53 | Min.34.8 |
| Max.97.0 | Max.150 | Max.164.0 |
| pH | Mean 8 | Mean 9.5 | Mean 8.9 |
| Min. 7.5 | Min. 7.7 | Min. 7.7 |
| Max. 8.4 | Max. 10.2 | Max. 9.6 |
| Dissolved oxygen  (mg/L) | Mean7.8 | Mean 6.9 | Mean6.4 |
| Min.5.9 | Min.4.3 | Min.5.3 |
| Max.8.9 | Max.10.4 | Max.7.4 |
| Organic oxygen consumption (mg/L) | Mean4.5 | Mean6.8 | Mean8.0 |
| Min.3.3 | Min.4.5 | Min.6.3 |
| Max.5.4 | Max.7.7 | Max.11.0 |
| Oxygen saturation (%) | Mean 77.8 | Mean70.0 | Mean71.7 |
| Min.59 | Min.43 | Min.59.0 |
| Max.87.7 | Max.97.3 | Max.84.4 |
| Ca2+ (mg/L) | Mean55.8 | Mean45.6 | Mean37.9 |
| Min.43.7 | Min.27.7 | Min.21.4 |
| Max.79.2 | Max.75.9 | Max.101.3 |
| Mg2+(mg/L) | Mean 6.1 | Mean9.5 | Mean20.6 |
| Min.4.2 | Min.7.5 | Min.16.3 |
| Max.10.3 | Max.14.4 | Max.32 |
| Na2+(mg/L) | Mean 4.1 | Mean10.9 | Mean14.7 |
| Min.2.8 | Min.6.5 | Min.8.8 |
| Max.11.8 | Max.25.8 | Max.32.7 |
| Cl-(mg/L) | Mean4.2 | Mean5.5 | Mean20.5 |
| Min.0.2 | Min.3.5 | Min.12.9 |
| Max.7.5 | Max.7.2 | Max.28.2 |
| SO42-(mg/L) | Mean83.9 | Mean49.5 | Mean49.6 |
| Min.38.3 | Min.23 | Min.33.3 |
| Max.130.7 | Max.89.5 | Max.66.0 |
| Total nitrogen(mg/L) | Mean1.0 | Mean0.6 | Mean2.0 |
| Min.0.7 | Min.0.2 | Min.0.5 |
| Max.1.5 | Max.1.5 | Max.12.2 |
| Total phosphorous(mg/L) | Mean0.94 | Mean0.16 | Mean0.13 |
| Min.0.1 | Min.0.01 | Min.0.045 |
| Max.0.79 | Max.0.1 | Max.0.65 |
| Silicon(mg/L) | Mean2.0 | Mean3.5 | Mean1.8 |
| Min.1.1 | Min.1.1 | Min.0.4 |
| Max.4.6 | Max.6.4 | Max.5.1 |
| Total Ferrum(mg/L) | Mean0.12 | Mean0.5 | Mean0.06 |
| Min.– | Min.0.07 | Min.0.01 |
| Max.0.23 | Max.1.68 | Max.0.37 |

**Table S2**. The ratios of coverage and biomass of phytoplankton in Caohai Lake in periods before and after exotic crayfish introduction

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Before 2010 | | | | After 2010 | | | |
| Phytoplankton | Total biomass 4.695 mg/L | | | | Total biomass 4.14 mg/L | | | |
|  | Cover, % | Biomass, % | Genus Amount | Species Amount | Cover, % | Biomass, % | Genus Amount | Species Amount |
| Cyanophyta | 40.16 | 3.70 | 16 | 27 | 18.62 | 8.40 | 16 | 46 |
| Cryptophyta | 0.01 | 0.01 | 2 | 2 | 1.21 | 0.01 | 2 | 3 |
| Chlorophyta | 58.95 | 60.03 | 47 | 99 | 52.23 | 28.90 | 44 | 129 |
| Bacilariophyta | 0.79 | 28.82 | 24 | 60 | 18.22 | 9.07 | 14 | 45 |
| Chrysophyta | 0.00 | 2.77 | 1 | 1 | 1.21 | 9.49 | 3 | 3 |
| Euglenophyta | 0.09 | 7.33 | 3 | 15 | 6.07 | 4.22 | 3 | 15 |
| Xanthophyta | 0.00 | 0.10 | 1 | 1 | 0.81 | 2.10 | 2 | 2 |
| Pyrrophyta | 0.00 | 0.02 | 2 | 2 | 1.62 | 37.76 | 2 | 4 |

**Table S3.** The ratios of coverage and biomass of Zooplankton in Caohai Lake in periods before and after exotic crayfish introduction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Group | Before 2010 | | After 2010 | |
| Genus  Amount | Species Amount | Genus Amount | Species Amount |
| Protozoa | 10(17.1%) | 24 | 9(19.26%) | 26 |
| Rotifera | 26(49.3%) | 69 | 24(47.41%) | 65 |
| Cladocera | 14(20%) | 28 | 15(20%) | 27 |
| Copepoda | 15(13.6%) | 19 | 16(13.33%) | 18 |

**Table S4.** Dominant aquatic macrophytes species list in Caohai Lake in periods before and after exotic crayfish introduction

|  |  |  |  |
| --- | --- | --- | --- |
| Type | Species | Before 2010 | After 2010 |
| Emergent plants | *Phragmites australis* | – | + |
| *Zizania latifolia* | + | – |
| *Scirpus validus* | + | + |
| *Typha angustifolia* | – | + |
| *Scirpus triqueter* | + | + |
| *Sparganium stoloniferum* (in 1986) | – | – |
| *Scirpus yagara* | + | + |
| Floating-leaved plants | *Nymphoides peltatum* | + | + |
| *Polygonum amphibium* | + | + |
| *Trapa maximowiczii* (in 1986) | – | – |
| Floating plants | *Azolla imbricata* | + | + |
| *Lemna minor* | + | + |
| *Spirodela polyrrhiza* | + | + |
| Submerged plants | *Ceratophyllum demersum* | + | + |
| *Potamogeton lucens* | + | + |
| *Potamogeton perfoliatus* | – | + |
| *Myriophyllum spicstum* | – | + |
| *Potamogeton pectinatus* | – | + |
| *Ottelia acuminata* | + | + |

**Table S5.** The species amount of Zoobenthos in Caohai Lake in periods before and after exotic crayfish introduction

|  |  |  |
| --- | --- | --- |
| Group | Before 2010 | After 2010 |
| Annelida | 15 | 5 |
| Aquatic Insect | 86 | 6 |
| Mollusca | 15 | 17 |
| Crustacea | 5 | 3 |

**Table S6.** Species change of amphibians in periods before and after exotic crayfish introduction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Ecotype | Species | Habitat | Before 2010 | After 2010 |
| Static terrestrial type | *Tylototriton kwcichowensis* | Gutter,  Ponds,  Grass,  Swamp | + | – |
| *Bufo gargarizans andrewsi Schmidt* | + | + |
| *Calluella yunncuensis* | + | + |
| *Kcloula verrucoso* | + | + |
| *Rana chaochiaoensis Liu* | + | + |
| Flowing terrestrial type | *Oreclalax rhodostigma* | Ponds,  Reservoirs | + | – |
| *Rana grahami* | + | + |
| *Rana margaratae* | + | + |
| *Psewdorana weiningensis* | + | – |
| Flowing water type | *Rana boulengeri* | Ponds,  Reservoirs | + | + |
| *Rana phrynoides* | + | + |
| Still water type | *Pelophylax pleuraden* (*Boulenger*) | Ditches,  Ponds,  Reservoirs,  Swamps | + | + |
| *Lithobates catesbeiana* | – | + |
| Arboreal type | *Rhacophorus nigropunchatus* | Gutter,  Ponds,  Shrub,  Grass | + | + |
| *Hyla annectans annectans* | + | + |