Data Article

Data collected in an integrated ecological survey of rotifer communities and corresponding environmental variables in the highly polluted Haihe River Basin, China

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ARTICLE INFO

ABSTRACT

Here we presented two datasets (biological and environmental datasets) collected in a comprehensive large geographical scale (approximately 1.1×10^5 km^2) survey of rivers/streams in the Haihe River Basin (HRB), which has become the most polluted river basin in past two decades in China. The survey selected a total of 94 representative sampling sites in the plain region of HRB, where environmental pollution is more severe than the mountain region. The biological dataset contains the information on the identified rotifer species and their abundance, while the environmental dataset provides the measured environmental variables at each sampling site. Based on this ecological survey, we identified a total of 91 rotifer species and their abundance, as well as abundance of two crucial taxonomic groups on rotifers' food webs (i.e., protozoans and crustaceans), and also presented seven environmental variables, particularly those associated with nitrogen and phosphorus pollution.

Specifications Table [*Please fill in right-hand column of the table below.*]

Subject area	*Ecology*
More specific subject area	*Ecology of Environmental Pollution*
Type of data	*Table, Figure*
How data was acquired	*Microscope, Chemical analysis*
Data format	*Raw data, analyzed data*
Experimental factors	–
Experimental features	*Rotifer samples were preserved in 5% formaldehyde for microscopic examination. Water samples were added 1% sulfuric acid in the field for measurement of TN and TP; Water samples were filtered by 0.45μm glass microfiber filters for measurement of NO_3-N, NH_4-N and SRP.*
Data source location	*The plain region of the Haihe River Basin, covering cities of Beijing and Tianjin, as well as Hebei, Henan and Shandong provinces in the North China.*
Data accessibility	*Data is presented in this article.*
Related research article	*Data is related to articles published and in review [1,2]*

Value of the Data

1. Both datasets from a large geographical scale survey (approximately 1.1×10^5 km^2) provide baselines for the river/stream status, as well as references for meta-surveys on both biological and environmental factors in future studies in the Haihe River Basin.
2. As many rotifer species have been reported as sound environmental indicators of aquatic ecosystem health, the species identified here, as well as associated environmental factors, can provide promising indicators for environmental pollution in Northern China.
3. The datasets improve the overview of the rotifer biodiversity and geographical distributions, as well as geographical distributions of environmental pollutants in the Haihe River Basin, China.
4. Rotifers, which are an important taxonomic group of freshwater biodiversity, may help understand how river/stream biodiversity is influenced by different types and/or degrees of environment pollution.
5. Both datasets of environmental variables and rotifer biodiversity are useful for water quality assessment and potential influence of environmental pollution on biodiversity in many environmental management programs.

1. Data

The river ecosystem is likely the most impacted one on the Earth, as rivers/streams are heavily influenced by intensive anthropogenic activities such as pollutant release [3]. Increasing anthropogenic activities have become a major threat to freshwater biodiversity [4]. In China, the Haihe River Basin (HRB) has become the most polluted water ecosystem in the past two decades based on the Report on the State of the Environment in China, 1997-2016. Given an increasing level of environmental pollution in river ecosystems in both China and globally, the study of causes and consequences for biodiversity loss in stressed ecosystems is the prerequisite for management and restoration programs.

Rotifers are one of the dominant microscopic animal groups in river ecosystems [1,5]. They have been recognized as ecological indicators for environmental changes such as environmental pollution [1,5]. Investigating biodiversity patterns and geographical distributions of rotifers in stressed river ecosystems would be conducive to understanding biological responses to water pollution and