

# Sources and contamination characteristics of PAHs in multiple media in a karst underground river system

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## Introduction

PAHs are a type of persistent organic pollutant that are mainly derived from the incomplete combustion of fossil and biomass fuels [1]. Even in karst areas, most scholars only study PAHs in a single environmental medium [2, 3]. The aim of this study was to determine the sources and contamination characteristics of polycyclic aromatic hydrocarbons (PAHs) in various environmental media in a karst underground river system. The Qing-shui Spring underground river is used as a study area, which is located in the suburb of Nanning city in Southwest China.

## Methods

From 2013 to 2014, air, underground river water, sediment, and soil samples were collected from the Qing-shui Spring underground river in the dry and wet seasons, and the compositional spectra, distribution, and ratio characteristics of 16 types of polycyclic aromatic hydrocarbons (PAHs) were determined for comparative analysis.

## Discussion of Results

The results show the 2–3 ring PAHs mainly occur in air and underground river water. In sediments and soils, 4–6 ring PAHs are the main components. The concentration of PAHs in the air in the wet season is obviously larger than that in the dry season, in the underground water it is the opposite. The seasonal differences in the concentration of PAHs in the sediments and soils are small. The concentrations of PAHs in the overall environmental media shows variation in the following order: upstream < midstream < downstream, and is related to pollutant discharge, adsorption, etc. The main source of PAHs in the upstream rural areas is the combustion of grass, wood, and coal, while in the midstream it is petroleum, and near the outlet of the underground river, it is combustion of grass, wood, coal, and petroleum.

[1] Dugay A *et al.* (2002) *J Chromatogr A* **958**, 1-7. [2] Kong X-S *et al.* (2011) *China Environ Sci* **32**, 1081-1087. [3] Lang J-C *et al.* (2014) *China Environ Sci* **35**, 2937-2973.