

The Origin of Polycyclic aromatic hydrocarbons in Snow at Hailuogou glaciers of Gongga Mt. in China

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Polycyclic aromatic hydrocarbons (PAHs), some of which are among the strongest carcinogens, are mainly derived from anthropogenic emissions and released into the atmosphere as airborne particles and gases. They may deposit and accumulate in remote cold regions, and can potentially affect the ecosystem. Origin identification is indispensable to the control strategies for environmental pollutants. Source apportionment and transport distance are the basic studies on origin identification.

The hailuogou glacier, located in the Gongga Mountain (7556m a.s.l.) in the east-edge of Tibetan plateau, has been considered as a typical maritime glacier by the tremendous impacts of the southwest and southeast monsoon. The major mass source to nourish the glacier is solid precipitation while snow is one of the most effective carriers of pollutants.

Snow samples at three sites were collected from Hailuogou glacier of Gongga Mt. during the November 2012 and January 2013. The concentration of 16 kinds of polycyclic aromatic hydrocarbons (PAHs) in the snow samples was detected by C₁₈ SPE discs-GC-MS. The results showed that the total concentrations of the 16 kinds of PAHs in snow of different sites are from 163.7ng/kg to 281.4ng/kg with the highest content of phenanthrene and the mass percentage of 2-4 ring PAHs ranges from 92.0% to 93.7%. The short-term distribution, source apportionment and maximum transport distance of the PAHs were researched. It was concluded that the levels of PAHs in snows didn't show obvious variation from November 2012 to January 2013 and the PAHs pollution in Hailuogou snows was mainly caused by coal combustion source which are located from Hailuogou at a distance of less than 357km.

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