

Source identification of particulate organic matter and sediment in the Singil creek in terms of land use by multi-elements (carbon, nitrogen and oxygen) stable isotope ratios

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In this study, using the carbon, nitrogen and oxygen stable isotope ratio of particulate organic matter(POM) and sediments in Shingil creeks, we evaluate the effect of pollution sources from the surrounding industrial area,

The carbon stable isotope ratios of POM showed wide range (-23~-29‰), but had no significant difference according to land uses. The oxygen stable isotope ratio also show similar value in all sites (-22~-26‰). On the other hand, the nitrogen stable isotope ratio of the POM and sediments show very distinctive values according to surrounding area. Especially, POM and sediments near industrial regions including there's sewer outlet sites had extremely light nitrogen isotope values below 0‰ (up to -8‰) compared to other rural or urban sites(> 4‰), except for only one site(St. 9), where is no sewer outlet in spite of its location in industrial complex, indicating the enriched nitrogen isotope value similar with other rural and urban areas. This means that POM derived from industrial regions through the sewer outlet has strong impact on the nitrogen source of sediment as well as POM in downstream. So, the current study demonstrates that nitrogen stable isotope ratio can distinguish different nitrogen source and trace the origin of organic matter in various surrounding areas including multiple nitrogen source.