# Arsenic contamination in pond sediment of central India

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The pond is widely used for the fish culture and other house hold activities in India. The environment of the Kaudikasa, central India is one of the most arsenic contaminated sites in the World [1]. In this work, the contamination of arsenic and other 33 elements in eight pond sediments (N 20º51' and E 80$^0$45') is described. The sediment samples were collected in summer 2012, and the crushed sample (≤ 0.1 mm) was digested in the micro-oven with acids. The acid extracts were analyzed by using techniques: ICP-AES and ICP-MS. Among 34 elements analyzed, eight elements i.e. Na, K, Mg, Ca, Al, S, P and Fe occurred at macro levels, ranging from 0.01 – 0.06, 0.21 – 0.45, 0.17 – 1.08, 0.18 – 0.76, 1.41 – 3.14, 0.01 – 0.06, 0.02 – 0.03 and 2.8 – 6.3% with mean value of 0.01±0.01, 0.33±0.07, 0.43±0.30, 0.38±0.14, 2.12±0.48, 0.03±0.01, 0.03±0.01 and 4.2±0.9%, respectively. Tweve metals i.e. As, Ba, Sr, Ti, V, Cr, Mn, Co, Ni, Cu, Zn and Pb was present at milligram levels, ranging from 48 - 256, 129 – 264, 12 – 30, 62 – 735, 38 – 144, 29 – 732, 388 – 1109, 12 – 42, 23 – 108, 35 – 73, 40 – 100 and 17 – 40 mg kg$^{-1}$ with mean value of 111±52, 192±32, 20±5, 226±151, 72±25, 77±49, 646±177, 23±8, 48±21, 53±9, 66±17 and 24±6 mg kg$^{-1}$, respectively. Twelve metals i.e. Li, Rb, Cs, Be, Ga, Tl, Sn, Sb, Bi, Mo, Ag, Cd, Th and U present at lower milligram levels with mean value of 11, 31, 1.3, 1.7, 10, 0.2, 1.5, 0.5, 0.2, 0.8, 0.6, 0.13, 11.7 and 1.24 mg kg$^{-1}$, respectively. Arsenic content was correlated well with the P, Pb and Zn content. The arsenic concentration was found to be several folds higher than the recommended value of 5 mg kg$^{-1}$. The arsenic content in the pond sediment of this region was found to be much more higher than other region of the World [2].

[1] Patel *et al* (2005) *Environ. Geochem. Health* **27**,131-145
[2] Durant *et al*. (2004) *Water Res*. **38**, 2989–3000.

# Microphysical properties of BC in anthropogenic and biomass burning plumes

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The impact of aerosols on regional air quality necessitates improved understanding of their emission and microphysical properties. The size distributions of black carbon (BC) and light scattering particles (LSP) were measured with a single particle soot photometer on board the NASA DC-8 aircraft during the ARCTAS mission 2008. Air sampling was made in the air plumes of both urban and forest fire emissions over California during the CARB (California Air Resources Board) phase of the mission. Air plumes were identified using tracers for fossil fuel (FF) combustion and biomass burning (BB). Enhancements of BC and LSP in BB plumes were signficantly higher compared to those in FF plumes. The average mass concentration of BC in BB plumes was more than twice that in FF plumes. Distinct ***emission ratios of*** $BC/CO_2$, $BC/CH_3CN$, $CH_3CN/CO$, and $CO/CO_2$ were estimated for the plumes from the two sources. The size distributions of BC and LSP also showed different behaviours. The BC count median diameter of 115 nm in FF plumes was smaller compared to 141 nm in the BB plumes. BC aerosols were thickly coated in BB plumes as the average shell/core ratios were 1.47 and 1.24 in BB and FF plumes, respectively.


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