Geogenic Arsenic and Fluoride contaminations in the Claromecó fluvial basin, Argentina

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The Claromecó fluvial basin, as the rest of the Chaco-Pampean plain (Argentina) is afflicted with high As and F concentrations in groundwaters, resulting in a serious health problem for the communities. The aim of this project is to understand the geochemical, sedimentological and hydrological reasons and controls of these high As and F concentrations in regional groundwaters.

Typical hydrochemical analyses show the presence of Na-HCO_3 type groundwaters and pH ranging between 7.1 and 8.1 throughout the basin. Arsenic concentrations are consistently high (mean As in the basin ∼ 91.04 µg L^{-1}) especially in the discharge zones and within the shallow aquifers. The same trend is observed for F (mean F ∼ 3.09 mg L^{-1}). Sediment extractions reveal As concentrations to vary between ~ 4.6 and 30.9 mg kg^{-1}. Nevertheless, statistically different As concentrations are found in the pedogenic units: modern soils and hydromorphic paleosols (mean As ~ 10 and 16.5 mg kg^{-1} respectively). In these units, the highest As concentrations are observed within the Fe-Mn neoformed oxyhydroxides, indicating that the composition or the age of the sediments may not necessarily represent a systematic control on the sediment-As concentrations. Postdepositional processes may be even more effective and favored over high infiltration rates (e.g. rainwater, irrigation).

Only few localities within this study area have been provided with water treatment facilities, while the rest of the population is lacking access to safe waters. This situation is common to the rest of the region where it is estimated that 58% of the population is exposed to As levels >50 µg L^{-1}. This fact enhances the need for more studies in the area and impact on public policies to systematically inform the existence of these issues and thereby promote remediation strategies.