

Weed-derived compounds in Serbian groundwater could contribute to endemic kidney disease

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People living in Balkan farming villages along the Danube River have long suffered from a unique type of kidney disease known as Balkan

endemic nephropathy. Recently, scientists linked the disorder to compounds from a local weed that could be taken up into food crops from the soil. Now, researchers reporting in ACS' journal *Environmental Science & Technology* have discovered that contaminated groundwater could be another important source of human exposure.

Aristolochic acids (AAs) were recognized as potent kidney toxins after people taking herbal medicines containing the compounds developed kidney disease. A weed that is widespread in the Balkan regions, *Aristolochia clematitis* L., produces AAs, and when the plant decays, it releases the toxic compounds into the soil. As a result, scientists have detected AAs in Balkan food products. Nikola Pavlovic, Wan Chan and colleagues wondered if the weed-derived compounds could also leach into groundwater, polluting the drinking water of local residents.

To measure AAs in water, the researchers used a positively charged silica-based sorbent to collect AAs, which are negatively charged, from water samples. They released the AAs from the sorbent and then converted the substances to aristolactams for detection by mass spectrometry. The team applied this new method to the analysis of 123 water samples collected from wells in rural Serbia. They found that the groundwater was extensively contaminated with one form of AA at nanogram/liter levels. These results suggest that drinking, cooking and irrigating with the contaminated water is a highly important, but previously unrecognized, source of AA exposure. Weed control of *A. clematitis* is urgently needed to reduce the incidence of Balkan endemic nephropathy, the researchers say.

More information: Ka-Ki Tung et al. Occurrence and Environmental Stability of Aristolochic Acids in Groundwater Collected from Serbia: Links to Human Exposure and Balkan Endemic Nephropathy, *Environmental Science & Technology* (2019). [DOI: 10.1021/acs.est.9b05337](https://doi.org/10.1021/acs.est.9b05337)

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