

## **GEOCHEMICAL FINGERPRINTING AND THE ETIOLOGY OF BALKAN ENDEMIC NEPHROPATHY IN THE BULGARIAN ENVIRONMENT**

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### **ABSTRACT**

Balkan Endemic Nephropathy (BEN) is a chronic tubulointerstitial nephritis whose mosaic like distribution throughout the Balkans has not changed significantly since its initial description in 1950. Hypotheses to explain the occurrences of BEN include genetic predisposition; infection with a slow virus; selenium deficiency; and exposure to selected metals (e.g., As), Ochratoxin A, or polycyclic aromatic hydrocarbons. Here we explore the hypothesis that the occurrence of BEN is linked to the inorganic geochemistry of the environment. Preliminary environmental samples (soils and selected foods) were collected from BEN and non-BEN areas in Bulgaria. Samples were digested in nitric acid and the leachates analyzed for 22 elements by hexapole, inductively coupled plasma, mass spectrometry (HEX-ICP-MS). Selected results include: 1) absolute concentrations from both types of locations were not enriched above “background” concentrations; and 2) As concentrations were typically higher in BEN samples than non-BEN soils and Se concentrations lower; Mo and Al also showed patterns of higher concentration in BEN samples; and 4) depending on the sample type other elemental differences were found between BEN and non-BEN locations. Although geochemical differences between BEN and non-BEN areas were evident, not all difference were found to be statistically significant, in part due to small sample sizes. However, the results do indicate that potentially there are differences in the inorganic geochemistry of BEN and non-BEN areas, that HEX-ICP-MS is an exciting tool to measure environmental geochemical fingerprints, and that the occurrence of BEN is most likely a multifactoral phenomenon.