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**Quality of ground water in selected areas of northern part of Sri Lanka**

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In Northern part of Sri Lanka, ground water is used for drinking and other domestic purposes. Water samples from twenty areas in Jaffna Peninsula and eighteen areas from Vavuniya were tested for physical, chemical and microbiological parameters. The pH of all water samples studied ranged from 6.8 – 8.2, which is slightly alkaline; the total alkalinity reflects the same. The amounts of total solids, total dissolved solids, calcium, magnesium, sodium, potassium, sulphate, carbonate, chloride, nitrate, phosphate, oxalate, iron and silicon present in these well water samples were determined. The amounts of magnesium, potassium, phosphate, oxalate and silicon present in Vavuniya well water samples were found to be greater when compared with those present in Jaffna well water samples. In areas where there is agricultural activity taking place (both in Vavuniya and Jaffna) the amount of nitrate present is above the safe level (45 ppm). Urinary track stones are formed when urine becomes too concentrated with certain ions/chemicals such as calcium, oxalate, phosphate and/or uric acid. When calcium and oxalate join (or ) they bind so tightly that most acids present in urine will not even dissolve them.

It has been noted over the years that most of the residents in Vavuniya suffer from urinary track stones and it is believed that this is due to calcium in the ground water combines with the oxalate, which is present in the green leafy vegetables forming calcium oxalate. However our studies show that this may be due to the presence of comparatively high amounts of oxalate, silicates and phosphates in Vavuniya water samples. The presence of oxalate and silicates in these water samples were confirmed by solid-state <sup>13</sup>C- and <sup>29</sup>Si-NMR studies respectively. <sup>29</sup>Si-NMR chemical shift values indicate that the silicon is tetrahedrally coordinated and forsterite and Si(OSi)<sub>2</sub>(OH)<sub>2</sub> units may be present. Attempts were also made to remove the oxalate and silicate from well water samples using lime and Layered Double Hydroxides. Lime [Ca(OH)<sub>2</sub>] removed greater than 60% of oxalate from the water samples depending on the amount of lime used. However, no oxalate or silicate was detected in the water samples after passing them through Mg-Al (2:1 and 3:1) Layered Double Hydroxides. The mass spectral peaks in the range *m/z* 604 – 255 indicates the presence of natural organic acids - humic acids and fulvic acids - in some of these water samples.

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