

E2-29 Aluminium concentrations in acidic well waters at Ranala, Kaduwela

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Aluminium is the most abundant metal in the earth crust. The levels of aluminium in natural waters are generally low due to its low solubility at neutral pH values. However, elevated levels of aluminium have been found in acidified soil solutions and surface waters, causing harmful effects to living organisms. In the present study, aluminium concentrations in acidic well waters at Ranala, Kaduwela were measured to determine whether their concentrations are within the acceptable limits. Water samples from wells located over 2 km² were collected and their pH, conductivity and salinity were determined. The concentrations of total aluminium and monomeric aluminium were measured using spectrophotometric methods based on the formation of the complex between aluminium and pyrocatechol violet.

The method produced a limit of detection of 18 µg/L aluminium with a percentage recovery of 97% and linear dynamic range of 0 - 300 µg/L aluminium. The results show that all the well waters in the study area were acidic (pH 3.57 - 4.88) and below the safe limit given by the WHO standards for drinking water. In addition, water samples contained high concentrations of total aluminium (0.13 - 8.94 µg/L) and monomeric aluminium (0.13 - 7.58 µg/L) which were above the tolerance limits of aluminium reported by WHO. This study reveals that the drinking water in the wells in Ranala, Kaduwela is acidic and heavily polluted with aluminium.