

Efficacy of powdered mature leaves of *Terminalia arjuna* in reducing the nitrate - N and total hardness of the domestic well water in Kondavil area, Jaffna Peninsula, Sri Lanka

M. Shanthamareen and W.M.D.N. Wijeyaratne*

Department of Zoology and Environmental Management, Faculty of Science, University of Kelaniya.

*dimuthu.wijeyaratne@kln.ac.lk

In Jaffna peninsula, groundwater is the primary water source for domestic agricultural and industrial purposes. However, increased water hardness and contamination by nitrates are two major water quality problems prevalent in this area. The present study was conducted with the aim of assessing the efficacy of powdered mature leaves of *Terminalia arjuna* (Kumbuk) to improve the water quality in terms of nitrate concentration and total hardness. Water samples with three replicates were collected from randomly selected 15 domestic wells located in the Kondavil area, Jaffna peninsula. The nitrate-N, and total hardness (TH) were measured using standard analytical methods. The water samples were filtered in a column filter using powdered mature leaves of *Terminalia arjuna* and these water quality parameters were measured in filtered water samples as well. The water quality parameters were compared with the standard water quality parameters for safe drinking water established by the Sri Lanka Standards Institution (SLSI). The variation of water quality parameters before and after filtration were compared by paired t test using MINITAB 14 software. The mean TH of the sampled wells ranged from 644.15 mg/L CaCO₃ and The mean nitrate N ranged from 12.07 mg/L. All the the wells exceeded the SLSI standard (250 mg/ L) for TH and 60 % of the wells exceeded the SLSI standard (11.3 mg/ L) for nitrate. After filtration through the powdered mature leaves of *Terminalia arjuna*, the TH and nitrate N were reduced significantly (Paired t test, p< 0.05). The mean TH and nitrate N of the filtered water were 635.8 mg/L CaCO₃ and 9.49 mg/L respectively. Percentage reduction of TH and nitrates after filtration were 1.3 % and 21.36% respectively. Therefore, results of the present study showed that *Terminalia arjuna* leaf powder can be used as an effective low cost household treatment method to improve the water quality in terms of TH and nitrate N.