Determination of Nitrate and Nitrite Ion Levels of Drinking Water Bodies in Selected Locations at Gageyaya Village, Mahiyanganaya

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Monitoring nitrate and nitrite concentration levels in drinking water is important due to their potential toxicity and carcinogenicity. The World Health Organization's guideline values for nitrate and nitrite ion concentrations in safe drinking water are 50 mg L^{-1} and 3 mg L^{-1}, respectively. Mass cultivation using chemical fertilizers cause the ion levels in groundwater and drinking water to exceed the above accepted values. This research study was carried out to investigate the nitrate and nitrite levels in drinking water at selected locations of Gageyaya village, Mahiyanganaya, where cultivation of paddy using chemical fertilizers is in practice. Water samples from 10 drinking water wells (located amidst or in the vicinity of paddy fields), from a stream and from a lake were investigated twice a month from June to November, 2018, for nitrate and nitrite ion concentrations. The samples were prepared by filtering with *Whatman* No.1 filter paper followed by 0.22 µm filter. Ion levels were determined by Suppressor Ion Chromatograph. The nitrate concentrations ranged from 0.301 mg L^{-1} to 33.066 mg L^{-1}, which was below the permissible level for safe drinking water. However, the nitrite concentrations ranged from 0.439 mg L^{-1} to 8.024 mg L^{-1}, and exceeded the maximum permissible level in the months of August to October. Nitrites can damage human health when present even in lower levels. The unacceptably high levels of nitrites detected can origin from the leachate from paddy fields. Therefore, the use of fertilizer in paddy fields should be regulated in the investigated area, and the community should be educated about the drinking water quality.

Keywords: Nitrates, Nitrites, Ion Chromatography, Drinking water wells, Mahiyanganaya