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Assessment of the potential utility of sugarcane distillery spent wash as a liquid nutrition source for agricultural crops

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Spent wash generated from sugarcane molasses-based ethanol industries has the potential to be used as an organic fertiliser for various crop types due to its nutritional qualities. The present study evaluated the potential of raw spent wash as a liquid nutrition source to improve the growth of the commonly grown vegetable variety, tomato (*Solanum lycopersicum*). Selected physicochemical characteristics of the spent wash of the raw spent collected from a distillery industry in Sri Lanka were measured using APHA (2017) standard procedures. The crop experiment was conducted in the open field using agricultural guidelines provided by the Department of Agriculture. Tomato plants were treated with different spent wash doses (0.5, 1.5, 2.5, 5.0, 7.5 and 10 mL) divided into six treatment categories. Certified organic fertiliser and tap water were used as positive and negative control categories, respectively. Growth morphometric attributes of the plants and fruits were monitored for 60 days. The data were statistically analyzed using univariate statistical methods. The physicochemical analysis revealed a highly acidic nature (pH, 3.3 ± 0.08) with Nitrate (255 ± 0.04 mg/L), Phosphate (38 ± 0.07 mg/L), and Potassium (3.39 mg/L) levels. The physicochemical characterization of the raw spent wash proves that the spent wash may contain minerals and nutrients where the land application can enhance the crop yield of selected crops. Among growth-related morphometric attributes of tomato plants, shoot lengths, the number of leaves, and the number of buds and flowers were found to have less significant variations ($p > 0.05$). In contrast, other treatment categories recorded significantly reduced fresh fruit weight compared with the positive control ($p < 0.05$). Measured fresh fruit weight was more favourable towards high-end doses. The experiment results indicate that the sugarcane spent wash could be more favourable during the fruiting stage than in the vegetative stage. However, these findings should be solidified through repeated scientific studies. A recent study recommends mixing raw spent wash with other organic ingredients to improve the nutritional qualities. Continuous soil testing should be conducted in future studies to identify the effects on soil characteristics while conducting further experiments using the raw spent wash for different crop types.

Keywords: Molasses-based, Morphometric attributes, Physicochemical characters, Spent wash.