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Nutrient removal efficiency of two plant bed substrates, and changes of selected water quality parameters in aquaponic system

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Aquaponics integrates growing plants without soil technology with aquaculture, having an important role in recovery of nutrients from effluents. Present study was carried out to assess nutrient removal efficiency of two types of plant beds, coir peat & saw dust. Single aquaponic aquatic system consisted of a fiberglass tank with fish, spinach plants grown in three plants beds i.e 50% saw dust + 50% soil (T1) and 50% coir dust + 50% soil (T2) were considered as the two treatments while 100% soil was considered as the untreated control (T3). Physico-chemical parameters such as pH, Conductivity, phosphate and nitrate levels, Biological Oxygen Demand (BOD), Dissolved Oxygen content (DO) and Chemical Oxygen Demand (COD), in water in each fish tank and water drained through the plant beds were measured. Statistical analysis was done using SPSS ver 17 software package. Kruskall Wallis test was used for comparison of water quality parameters in fish tanks, while Mann Whitney test was used to compare water quality parameters in fish tank and water drained through the plant bed. Phosphate level in the water draining through plant bed substrates has exhibited significantly different ($p<0.05$) lower values compared to water in fish tank for all treatments. However, nitrate concentration in water draining through plant bed substrates exhibited higher values compared to water in fish tank except for treatment 1. Present study revealed that coir peat and saw dust used as plant bed material have ability to remove some nutrients in fish pond through aquaponic system.

Key words: aquapoinic system, plant bed, coir peat, saw dust.

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