Environmental Engineering and Management Journal *August 2014, Vol.13, No. 8, 2031-2038*
http://omicron.ch.tuiasi.ro/EEMJ/

"Gheorghe Asachi" Technical University of Iasi, Romania

THE ROLE OF AQUATIC PLANTS AND MICROORGANISMS IN DOMESTIC WASTEWATER TREATMENT

Nguyen Thi Loan*, Nguyen Minh Phuong, Nguyen Thi Nguyet Anh

Hanoi University of Science – Vietnam National University, Faculty of Environmental Sciences, 334 Nguyen Trai, Hanoi, Vietnam

Abstract

This study aimed to assess the ability of microorganism populations and two aquatic plant species (water hyacinth - *Eichhornia crassipes Solms* and water morning glory - *Ipomoea aquatica)* to treat domestic wastewater in Nhue Giang pond, Tay Mo village, Tu Liem District, Hanoi City in Vietnam. The results showed that microorganism populations in the pond water contained all of groups of microorganisms including bacteria, Actinomycetes, mold and yeast. In water inlet and outlet samples, bacteria has the largest number in population ($2.1x10^6$ and $8.7x10^5$ CFU/mL at inlet and outlet), accounting for 99.91% of total microorganisms. Regarding the number of microorganisms attached on roots of aquatic plants, the highest number was recorded for bacteria, while the numbers of Actinomycetes, mold and yeast were quite small. The total number of microorganisms attached on water hyacinth roots is $2.5x10^6$ CFU/g and $1.5x10^6$ CFU/g (at inlet and outlet sample) higher than that on water morning glory roots in both sampling sites.

The wastewater treatment efficiency for TSS, COD, NH_4^+ and PO_4^{3-} parameters at the site without aquatic plants was in the range of 1% to 5% only, while treatment efficiency for those parameters at location with aquatic plants was much higher. Particularly, it was in range of 37.8% - 53.3% for TSS; 44.4% - 53.4% for COD; 56.7% - 61.4% for PO_4^{3-} and 26.8% - 32.6% for NH_4^+. All the lower values belonged to water morning glory sample and the higher values belonged to water hyacinth sample at the outlet.

Key words: aquatic plants, domestic wastewater, microorganisms

Received: February, 2014; Revised final: August, 2014; Accepted: August, 2014

* Author to whom all correspondence should be addressed: e-mail: ngthiloan@gmail.com; Phone: +84 912352344