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Using of Urban Secondary Wastewater as an Alternative Medium for the Culture of *Tetraselmis suecica*

Afshari, Alireza[1*]; Yahyavi, Maziar[2]; Sajjadi, Mirmasoud[3]

1- M.Sc. Student of Fisheries, College of Agricultural Sciences and Natural Resources, Bandar Abbas Branch, Islamic Azad University, Bandar Abbas, Iran. Email: ali_afshari32@yahoo.com

2- Assistant Professor, Department of Fisheries, College of Agricultural Sciences and Natural Resources, Bandar Abbas Branch, Islamic Azad University, Bandar Abbas. Email: maziar_yahyavi@yahoo.com

3- Assistant Professor, Department of Marine Biology, Faculty of Sciences, University of Hormozgan, Bandar Abbas, Iran. Email: mmsajjadi@hotmail.com

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Abstract

In this research, the growth capability of microalgae (*Tetraselmis suecica*) in urban secondary wastewater as well as the determination of the best density of wastewater for the growth of these microalga have been studied. Moreover, the capability of this microalga for the treatment of wastewater and removal of nitrogen and phosphorus has been evaluated. To study the growth rate, *Tetraselmis suecica* was cultured in stable laboratory conditions with similar densities (1×10^6 cell × ml^{-1}) in different volumes of urban secondary waste water (20, 40,60, 80 and 100%) within a period of 21 days. It was also cultured at three initial densities (5×10^5, 1×10^6 and 2×10^6 as low, moderate and high, respectively) in 250 ml of wastewater for 14 days in order to evaluate its purification effects. Results indicated that cell number increased in all treatments but the growth ratio was higher in 40 and 60 percent and was comparable to the control treatment ($P<0.05$). Also, this species is able to remove 80%, 71.8% and 56.3% of nitrate, phosphate and nitrite from wastewater, respectively. So, it is possible to use urban secondary wastewater for *T. suecica* culturing as an alternative medium. Also, the ability of this species for N & P removing from wastewater shows its ability for wastewater treatment, so that the higher densities give more satisfactory results in the removal of nutrients.

Keywords: *Tetraselmis suecica, Density cell, Nitrogen and phosphorus removal, Urban wastewater.*