DETERMINATION OF REFLECTANCE VALUES OF HYPERICUM'S LEAVES UNDER STRESS CONDITIONS USING ADAPTIVE NETWORK BASED FUZZY INFERENCE SYSTEM

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Abstract: The effects of water stress and salt levels on hypericum's leaves were examined on greenhouse-grown plants of *Hypericum perforatum* L. by spectral reflectance. Salt levels and irrigation levels were applied 0, 1, 2.5 and 4 deci Siemens per meter (dS/m), 80%, 100% and 120% respectively. Adaptive Network based Fuzzy Inference System (ANFIS) was performed to estimate the effects of water stress and salt levels on spectral reflectance. As a result of ANFIS, it was found that there was close relationship between actual and predicted reflectance values in *Hypericum perforatum* L. leaves. Performance of ANFIS was examined under different numbers of epoch and rules. On the other hand, RMSE, correlation and analysis time values were found as outputs. Correlation was 99%. The estimation of optimal ANFIS model was determined in 3*3*3 number of rules with 400 epochs.

Key words: *Reflectance, ANFIS, hypericum, salt, water stress*

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1. Introduction

Saint John's wort (*H. perforatum* L.) has been domesticated and produced in a large scale in field conditions of different production areas of the world. Most of the biological activities of the plants have been reported namely, photodynamic, antiviral, antiretroviral, antibacterial, antipsoriatic, antidepressant and antitumoral, inflammatory and antiangiogenic effects [1]. The bioactive constituents in the plants

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