Impact of Pyriproxyfen on Plant Growth Parameters and Proline Content in Maize Seedlings  
Yasemin Coskun, Ragbet Ezgi Duran, Semra Kilic  
Suleyman Demirel University, Faculty of Arts and Sciences, Department of Biology, Isparta, 32 260, TURKEY  
Abstract  
In agricultural fields, considerable amount of pesticides are being used to increase the agricultural production, by controlling insect pests, diseases and weeds as these chemicals act on pests that are detrimental to agricultural output. In recent years, the uses of pesticides have increased tremendously in crops and a number of them have been shown to cause decreased or increased nodulations and directly affect the plant growth. In agriculture the pesticide pyriproxyfen [4-phenoxyphenyl (RS)-2-(2-pyridyloxy) propyl ether] is a juvenile hormone analog, preventing larvae from developing into adulthood and thus rendering them unable to reproduce. It has registered uses for the control of scale, whitefly, aphids and fire ants. It is used extensively worldwide, particularly in developing countries, but there is no information about growth parameters and proline content on maize seedlings. Uniform-sized seeds of a commercial variety of maize (Zea mays L.) were used as the test plant. Treatment concentrations were prepared using control (distilled water) and 0.1, 0.2, 0.4 and 0.6 ppm of original insecticide solution of pyriproxyfen. At the end of the 7th day, germination percentage, radicula and coleoptile lengths, radicula numbers of seedlings were measured for growth parameters. Also proline content was compared all of the concentrations. In general, pyriproxyfen had a detrimental effect on growth parameters. The most toxic effect of pyriproxyfen on germination percentage, radicula length, coleoptile length and radicula number was observed in concentration of 0.6 ppm. And also, the proline content showed a significant increase with increasing concentration of pyriproxyfen as compared to the control group. In conclusion, high concentrations of pyriproxyfen caused varying degree of toxicity on maize seedlings. The increasing accumulation of proline in response to phyto-toxicity of insecticide create stress on maize, which causes both yield and quality losses.  
Keywords: Maize, Pesticide, Proline, Pyriproxyfen, Toxicity