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Effect of Alpha-cypremethrin on morphological parameters in tomato plants (*Lycopersiconesculentum Mill*.)

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Abstract: Devastating insects are responsible of losses in quantity and quality of agricultural production. To overcome this problem, farmers use pesticides, obtained by chemical synthesis and representing the major cause of agricultural contamination of soil and groundwater. Thus, pesticides may present important risks because of their persistence, bioavailabilityand mobility, in spite of their correct application. This study has evaluated the effect of alphacypermethrin (pyrethroids class), largely used in tomato (*Lycopersiconesculentum* Mill*.)* treatment in the Northern area of Morocco.Synthetic pyrethroids are widely used as the broad-spectrum pest control agents in agricultural production because of their selective insecticidal activity, rapid biotransformation and excretion by the mammalian catabolic system and non-persistence in the environment. The effect of alpha-cypermethrin on seeds germination and seedlings growth of tomato has been studied based on morphological parameters and by using four dilutions of the normal concentration used in agriculture (100%, 75%, 50%, 25%) for germinating seeds, and only the normal concentration used in agriculture for growing tomato plants. The results indicated that alpha-cypermethrin induced a delay of germination and growth process. The germination rate of treated seeds was generally 20% lower than the control treatment. Generally the control's germination rate was around 97% in all days of measurement period. A decrease in germination rate was observed in all concentrations of α-cypermethrin; the rate was between 80% and 88.7% and it was generally constant throughout the test period. Furthermore, the length of roots and shoots in treated seeds was significantly reduced. In this regard, shoot length of the treated seedlings was 25% and 50%-reduced for the concentrations of 25% and 100%, respectively, when compared to control shoots length. A similar result was also observed in roots, the length of the treated seedlings'roots was generally 29% and 50%-reduced for the concentrations of 25% and 100%,respectively, when compared to control roots length. Concerning the growth of roots and shoots in treated plantlets, a reduction was observed when compared to the control plantlets growth. The growth delay in the treated seedlings was observed at the 2nd week of the test period. Shoot length of treated plantlets was generally around 12%reduced when compared to the control. The same result was observed in treated plants' roots which length was also 7% reduced compared to untreated seedlings. The analysis of variance (ANOVA) and the Tukey test were utilised for the Post-hoc tests. A significance level of 0.05 was used for all statistical tests.

Keywords: Insecticides, Tomato, Seed Germination, Plant Growth

1. Introduction

The tomato (*Lycopersicumesculentum* Mill.) is one of the most widely grown vegetables in the world. In recent years, competition has intensified as the world exports of tomato products from main suppliers have increased substantially. Tomatoes growth can be inhibited by various arthropods, plant diseases and nematodes, which significantly reduce yield and quality of fruit (Oerke*et al,* 1994).

In Northern Morocco, the most important way to protect cropsis the use of chemical pesticides. Many pesticide types are used, especially: organochlorine, organophosphorus, carbamate and pyrethroids pesticides