

INFLUENCE OF SIMULATED ACID RAIN ON POPULATION DYNAMICS OF CARMINE SPIDER MITE, *TETRANYCHUS CINNABARINUS* (BOISDUVAL) (ACARI: TETRANYCHIDAE) AND ITS HOST PLANT

Jin-Jun Wang^{1, *}, Jian-Ping Zhang^{1, 2}, Wei Dou¹ and Zhi-Mo Zhao¹

1. College of Plant Protection, Southwest University, Chongqing 400716, Peoples Republic of China; 2. College of Agriculture, Shihezi University, Shihezi 832003, Peoples Republic of China (* corresponding author, e-mail: jjwang7008@yahoo.com).

ABSTRACT -The effect of simulated acid rain on the population dynamics of *Tetranychus cinnabarinus* (Boisduval) and the physiology of its host (eggplant) was measured in a series of laboratory experiments. The number of *T. cinnabarinus* on plants treated with pH 4.0 and 5.6 acid rain was higher than and the population declined later than the control. The number of mites on plants treated with pH 3.0 acid rain was less than the control, but the population declined later. However, the number of mites on plants treated with pH 2.5 acid rain was less than and the population declined earlier than the control. The pH value, water content, soluble sugar, reduced sugar, phosphorus (P) and soluble protein content of the leaves of host plants varied according to treatment with acid rain of different pH values and different treatment times. The pH values of eggplant leaves decreased with decreasing pH of acid rain. As the acidity increased, the P content and soluble protein increased significantly at the beginning of treatment with acid rain (15 days after first treatment) and reached the highest level in pH 4.0 or 3.0, respectively, then declined with lower pH of acid rain. Soluble sugars followed an opposite trend to P and soluble protein. Reduced sugar content increased linearly with the decline in pH of acid rain. Water content of eggplant leaves did not show any significant changes among different treatments. With the increase of treatment time, the water content, soluble sugar, reduced sugar, and P content also varied significantly. These results suggest that treatment of plants with acid rain (pH > 4.0) increased the levels of nutritious substances (reduced sugar, P, and soluble protein). These changes may favor growth and development of eggplant and *T. cinnabarinus*. However, strong acid rain (pH < 3.0) inhibited both plant and mite growth.

Internat. J. Acarol. 34(4): 427-434.