Effect of some chemical elements on mulberry silworm, bombyxmori L.

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The present study was carried out during two spring seasons, 2005 and 2006 in silkworm laboratory, Sericulture Department of Plant Protection Research Institute, Sharkia Branch. The following mulberry variety were used; Morus alba native (Balady) and the fourth & fifth larval instars mulberry silkworm, Bombyx mori L. The following experiments werecarried out:PART 1: Effect of Enriching Mulberry Leaves With Some Nutritional Elements on Biology, Physiology and Silk Production of Silkworm,Bombyx mori L.1. Effect on food consumption:Effect of enriching mulberry leaves with nitrogen, ascorbic acid, potassium, calcium and a mix of nitrogen and ascorbic acid, and mixture of nitrogen and potassium and calcium on food consumption (FC), growth rate (GR) and consumption index (CI), coefficient of utilization (CU), and efficiency conversion of ingested food (E.C.I) and efficiency conversion of digested food (E.C.D) of 4th larval instar of silkworm. Summarized results are as follows:1.1. Growth rateThe treatment N (2300 ppm) + As (125 ppm) caused highest the mean growth rate of 4th larval instar recording (0.221 and 0.229 g) for in both season. Meanwhile, the treatments Ca(350 ppm) and As (50 ppm) caused the least mean recording 0.210 and 0.203 g in 2005 and 2006 seasons, respectively.1.2. Food consumptionThe treatment N (2300 ppm) + As (125 ppm) caused highest mean recording (22.100 and 18.840 g) in both season, while the least one (16.840 and 15.150 g) was recorded for K (380 ppm) and for the treatment N (2300 ppm) + K (760 ppm) in 2005 and 2006, respectively.1.3. Consumption Index (C.I.)The treatments N (2300 ppm) + As (125 ppm) and K (570 ppm) caused highest consumption index recording (1.311 and 1.668 g) in 2005 and 2006, respectively. On the other hand, the least consumption index was detected for the treatment Ca (125 ppm), especially in the first season.1.4. Coefficient of utilization (CU)The highest mean coefficient of utilization was (85.357 and 88.441 %) recorded for the treatment N (2300 ppm) + As (125 ppm) in the two seasons, respectively. Meanwhile, The treatments N (2300 ppm) caused the least mean coefficient of utilization in the two seasons.1.5. Efficiency of conversion of ingested food (E.C.I.):The treatment N (2300 ppm) + As (125 ppm) caused highest mean (E.C.I.) recording (164.753 and 128.027) in both seasons, while the treatment Ca (175 ppm) caused least mean, especially in 2005 season. Control larvae recorded 132.640 and 123.319 in both seasons, respectively.1.6. Efficiency of conversion of digested food (E.C.D.):The treatment N (2300 ppm) + As (125 ppm) caused highest mean (E.C.D.) recording (146.069) especially in 2005 season. While the least mean of E.C.D. (114.120 91.101) was recorded for Ca (87.5 ppm) in the first season and for N (2300 ppm) + K (760 ppm) in the 2nd season.2. Biological studies: 2.1. Larval mortality:The percentage of larval mortality during the 4th larval instar did not exceed 5.33 % in all treatments in both seasons. 2.2. Larval duration:The duration periods of the 4th instar of silkworm larvae ranged 5.83-6.07 days for used treatment, meanwhile it attained 7.00 days for control larvae. Analysis of data clear that this parameter was shorted significantly in treated larvae as compared to that of the control ones.2.3. Larval weight:The highest mean larval weight (4.564 and 3.750 g) was recorded for K (760 ppm) in 2005 season, and for N (2300 ppm) + As (125 ppm) in 2006 season, while the treatments N (2300 ppm) + Ca and N (2300 ppm) + K (760 ppm) caused reduction larval body weight in both season, respectively.2.4. Silk gland weight:The treatment N (1150 ppm) caused highest mean silk gland weight in both season. However, lower silk gland weights were recorded with combination N+ K, N+Ca and N+K+Ca,.