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Temperature Dependent Life History Traits of Brevicoryne brassicae (L.) (Hom., Aphididae) on White Cabbage

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Abstract: The developmental time, survival rate and reproduction of the cabbage aphid, Brevicoryne brassicae (L.) (Homoptera, Aphididae), were evaluated on detached cabbage leaves (Brassicae oleracea var. capitata) at four constant and two alternating temperatures (15, 20, 25, 30, 25/30 and 30/35 ºC). Developmental periods of immature stages ranged from 12.5 days at 15 ºC to 6.0 days at 25/30 ºC. The alternating temperature of 30/35 ºC was lethal to immature stages of B. brassicae. The lower developmental threshold for the cabbage aphid was estimated at 4.0 ºC and it required 142.9 degree-days for a first instar to become an adult. The average longevity of adult females was reduced from 16.3 days at 15 ºC to 9.8 days at 30 ºC. The average reproduction rate per female (R_O) was 47.1 aphids/aphid at 25 ºC and 1.5 aphids/aphid at 30 ºC. Mean generation time (T_O) of the population ranged from 11.3 days at 30 ºC to 22.6 days at 15 ºC. The highest per capita growth rate (r_m = 0.317 aphids/aphid per day) occurred at 25 ºC, and the lowest at 30 ºC (r_m = 0.037 aphids/aphid per day). It was evident that temperatures above 25/30 ºC prolonged development, increased the mortality of immature stages, shortened adult longevity and reduced fecundity. The optimal range of temperature for the population growth of B. brassicae on white cabbage was 20 to 25/30 ºC.

Key Words: Brevicoryne brassicae, development, longevity, fecundity, intrinsic rate of increase, white cabbage

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