Bionomics of Polyphagous Red Spider Mite, *Tetranychus urticae* Koch Under *In-vitro* Conditions

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The red spider mite (*Tetranychus urticae* Koch) is a substantial agricultural pest with a broad host range and high reproductive potential. This study explores the biological traits such as development stages, reproductive biology and morphology of red spider mite under laboratory conditions (31 ± 1℃ and 54 ± 3% RH). The red spider mite was reared on a 2.5 cm leaf disc array set up in a petri dish. Reading was taken at four-hour intervals to measure the development period. The results revealed that, its life cycle comprised egg, larva, protonymph, deutonymph, and adult stages. The immature stages were distinguished by brief periods of quiescence known as nymphochrysalis, dutochrysalis, and teliochrysalis. The male and female had recorded incubation periods of 65.07 ± 1.83 and 64 ± 0 hours, larval periods of 13.60 ± 2.53 and 16.80 ± 3.10 hours, protonymphal periods of 8.53 ± 1.41 and 11.47 ± 2.10 hours, and deutonymphal periods of 12 ± 0 and 14.93 ± 2.37 hours, respectively. Male development took shorter (140.27 ± 4.40 hours) than female (151.20 ± 3.10 hours) from egg to adult emergence. On average, 122.10 ± 19.77 and 85 ± 18.56 eggs were produced by mated and unmated females, respectively. Sexual dimorphism was observed in the deutonymphal stage, as the body size of females (0.34 ± 0.02 mm length and 0.27 ± 0.02 mm width) was higher than that of males (0.30 ± 0.02 mm length and 0.20 ± 0.02 mm width). Studying the bionomics of red spider mites under in-vitro conditions would be helpful to set the optimum conditions for rearing or mass multiplication of red spider mites for various research studies.

Keywords: Development period, Life cycle, Morphology, Reproductive biology, *Tetranychus urticae*