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Feeding biology of *Tetranychus ludeni* Zacher (Acari: Tetranychidae) on velvet bean

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Abstract

Feeding characteristics and damage induced by the spider mite, *Tetranychus ludeni* Zacher on the detached leaves of the velvet bean *Mucuna deeringiana* were evaluated in the laboratory at $30 + 2^{\circ}$ C and 70 + 5% RH. Cultivation of mite-infested (M⁺) and mite-free (M⁻) host plants was done by constructing block design plots and replicated. Live cultures of different stages of mites were also maintained in the laboratory using leaf flotation technique. The results showed that *T. ludeni* could infest almost all age groups of leaves though the middle aged ones showed high population densities. Further, the upper leaf lamina was the preferable feeding site of the mite. Concomitant with feeding, deposition of two types of faecal pellets (black & white) were a notable feature. These pellets exhibited hygroscopic property in accordance with the ambient RH on the leaf surface. The results further reflected on the highly complex colony structure of *T. ludeni* through silken webbing of the individuals. Analysis of damage symptoms revealed extensive bleaching and chlorosis of the leaves. Chlorophyll loss was significant at 1% levels. Per cent loss in chlorophyll 'a' and 'b' recorded 79.26 + 4.3 % and 74.09 + 4.07 % respectively

Key words: spider mite Mucuna deeringiana, faecal pellet, chlorotic spots, webbing

Introduction

The spider mite species, *Tetranychus ludeni* Zacher (Acari : Tetranychidae) is a serious pest of a wide variety of economically important plants limiting the production of these crops (Jeppson et al, 1975; Puttaswamy and ChannaBasavanna, 1980b; Reddy, 2001; Zhang, 2002; Reddy and Baskaran, 2006). The mites often infest the upper surface of the leaves (Zhang, 2002) causing yellowing of leaves, followed by formation of necrotic patches and drying up. It is one of the important mite pests of vegetable crops in India (Ansari and Pawar, 1992; Narayanaswamy et al, 1996) and has been reported to attack a wide variety of vegetables in other parts of the world (Bolland *et al.*, 1998; Migeon and Dorkeld, 2006 and Adango et al. 2006). As a highly polyphagous mite, T. ludeni occurs in the field almost throughout the year. Moreover, this is the only spider mite in India known to be the vector of the plant virus, Dolichos Enation Mosaic Virus (DEMV) (Rajagopalan, 1974). The current host plant of T. ludeni, the velvet bean, Mucuna deeringiana (Bort.) Merr is grown mainly as livestock fodder and for soil improvement. Velvet bean has also been shown to exhibit nematicidal property and is significant in lowering fungal and bacterial populations (Kloepper, et al. 1999). Velvet bean also influences bacterial diversity, generally increasing frequency of bacilli, Arthrobacter spp. and Burkholderia cepacia, while reducing fluorescent pseudomonads (Vargas-Ayala et al., 2000). Hence, it marks its importance in the field of agriculture and livestock management. Further, all parts of the plant are nutritious and the long hairy pods are used for preparation of curries. Field observations showed that these plants are highly susceptible to attack by T. ludeni as the species emerged as the prominent faunal element on them. Whereas a large body of