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New report of *Neozygites* sp. infecting red spider mite *Tetranychus urticae* infesting French bean from Eastern Plateau and Hill region, India

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An anamorphic entomopathogenic fungus *Neozygites* sp. belonging to the Family Neozygiteaceae was found infecting the tetranychid mites *Tetranychus urticae* Koch (Acari: Tetranychidae) of French bean (*Phaseolus vulgaris* L.) for the first time in Eastern Plateau and Hill region of India in the month of October 2011. The report of entomopathogenic fungus could be of help in managing acaricide resistant mites.

Keywords: *Neozygites* sp.; entomopathogenic; *Tetranychus urticae*; French bean

The tetranychid mite *Tetranychus urticae* (Acari: Tetranychidae) is one of the most serious agricultural pests in the world. They generally live under the surface of leaves, where they spin protective silk webs, but in severe cases they also appears on the upper surfaces of leaves. The importance of this mite pest is not only due to the direct damage to plants including defoliation, leaf burning and in excessive outbreak, plants may die but also due to indirect damage to plants by decreasing the rate of transpiration and photosynthesis (Brandenburg & Kennedy 1983; Razmjou et al. 2009).

In the month of October 2011, dull coloured mites *T. urticae* were observed from French bean leaves in the vegetable experiment fields at ICAR Research Complex for Eastern Region Research Centre, Ranchi, Jharkhand, India (23° 45' N latitude, 85° 30' E longitude, elevation 620m AMSL). The dull coloured mites which were moribund were collected and kept under ambient conditions in laboratory for further investigation. The fungal infection was observed on dull coloured moribund mites under microscopic examination. An extensive survey was then conducted to know the percent level of infection on phytophagous mites. During the survey it was observed that 70–75% mites found moribund due to *Neozygites* sp. infection. Identification of the fungus infecting mites was carried out using standard laboratory procedures (Humber 1997). For morphological studies, mites were mounted in lactophenol cotton blue and gently pressed by the cover slip. Semipermanent mounted slides were prepared and examined under a phase contrast microscope (Type 020–519.503 LB 30T, Leica, Germany) equipped with a photomicrograph camera. Measurement of mycelial bodies was done with the help of an ocular micrometre calibrated with a stage micrometre. On the basis of morphological characteristics, the fungus infecting mite was identified as *Neozygites*

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sp. (Figure 1). *Neozygites* sp. mycelia are hyaline, irregularly shaped, rod to slightly curved, multinucleate (usually three to five), and with thickness ranging between 38.00 and 42.75 μm ($n=25$).

Humber (1997) reported that the mycelium of *Neozygites* sp. were easily fragmented in a single cell and they were capable of forming a conidiophores bearing one or more conidia; conidia were round, ovoid, or broadly fusoid with relatively flattened basal papilla, mostly four nucleate at maturity and discharged forcibly. They may also produce secondary conidia (more or less almond-shaped) usually when infect Hemiptera, thrips, aphids, and mites. *Neozygites* species was first recorded on infecting spider mites by Fisher (1951). Species of *Neozygites* are found infesting various mites worldwide. *N. tanajoae* was reported on cassava green mite in Africa (Delalibera et al. 1992, 2004). *Neozygites floridana* was described as an entomopathogen of Texas citrus mites (Weiser & Muma 1966). *N. floridana* has subsequently been observed on several species of spider mites on various agricultural crops. It was reported on *Triploetius tumidus* on cotton from Florida (Saba, 1971), *Tetranychus evansi* on tomato from Brazil (Humber et al. 1981). Another entomopathogenic mite, *Entomophthora* has been

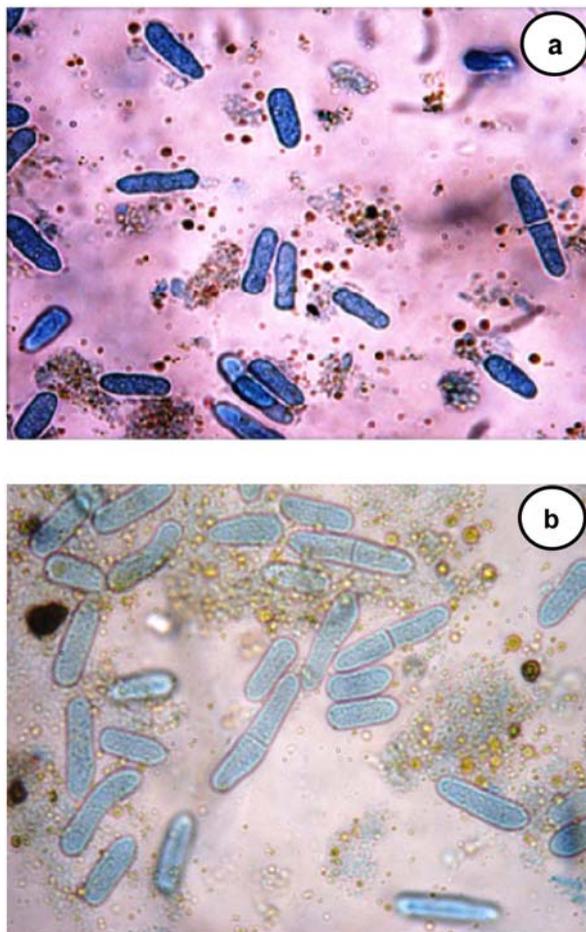


Figure 1. Hyphal bodies of an entomopathogenic fungus *Neozygites* sp. on *T. urticae* (a)–(b).

reported on *T. tudenii* of bean from India (Ramseshiah 1971). The most common of the mite pathogenic fungi is *N. floridana*. This entomopathogenic fungus takes some time after the infection occurs on the host for the vegetative development of a fungal pathogen to increase the fungus to the point the host dies and sporulation by the pathogen can begin.

This is the first report of an anamorphic entomopathogenic fungus *Neozygites* sp. infecting the tetranychid mites *T. urticae* on French bean (*Phaseolus vulgaris*) in Eastern Plateau and Hill region of India to the best of our knowledge and there is no report of it infesting *T. urticae* in India.

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