

A Review :

## Progress in Work of *Hirsutella thompsonii* Fisher in India

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**H***irsutella thompsonii* Fisher is considered as a potent natural biocontrol agent of eriophyid mite, *Aceria guerreronis* Keifer infesting coconut. Three separate species of the fungus have been known based on conidiogeneous structure. Temperature has a significant effect on the growth of the fungus. Temperature at 37°C and above did not record mycelial growth and temperature shifted to 25°C recovered the mycelial growth. However, temperature did not have any significant effect on the micromorphology of *H. thompsonii*. Simulated sunlight has slightly detrimental effect on conidia production and best conidiation observed under alternating light-dark conditions. A simple magnetic stirrer technique has been developed for mass production of *H. thompsonii*. Earlier, indigenous isolation of this fungus was used to suppress the coconut mite, *A. guerreronis*. Later, its commercial formulation (mycoacaricide) named "Mycohit" has been developed by PDBC, Bangalore and tested against coconut mite under field conditions in Kerala, Karnataka and Andhra Pradesh and obtained satisfactory results. Two new formulations based on *H. thompsonii* viz., Mycohit LG-20 and Mycohit OS proved equally effective to that of Mycohit against *A. guerreronis*. The adjuvants viz., Glycerol, Yeast Extract Powder (YEP) and Malt Extract Broth (MEB) found to increase the pathogenicity of *H. thompsonii*. The glycerol proved better than YEP and MEB.

The first pathogen found to cause disease in insects was the fungus. There are over 750 species of fungi which are known to attack various arthropods like insects and mites. The fungi which attack on insect called entomopathogenic fungi (EPF). Most informations of EPF infesting insects are available in literature. However, the information on fungi associated with a small creature like mite is scattered and meagre. The fungus, *Hirsutella thompsonii* Fisher has been widely used to manage the havoc caused by coconut

mite, *Aceria guerreronis* Keifer in coconut plantations. An attempt has been made to review the informations on coconut the progress and development of this important microbial agent in India.

A lot of research has been done with the fungus, *H. thompsonii* right from its isolation, mass multiplication, genetic improvement and formulation for the control of citrus rust mite (McCoy and Kanavel, 1969; McCoy *et al.*, 1972, McCoy *et al.*, 1975 and McCoy *et al.*, 1984). The efficacy of *H. thompsonii* to control citrus mite in the fields in USA, Surinam, Isarel and China has been recorded to be very promising (McCoy, 1978, Van Brussel, 1975 and Gerson *et al.*, 1979). In China, a single application of laboratory produced *H. thompsonii* mycelia at a dose of 0.5 to 1.0 g/l to citrus caused 90 % reduction in the population of mites in 3 days (Chiang and Huffaker, 1976).

Among *H. thompsonii*, three separate varieties, viz., *H. thompsonii* var. *thompsonii*, *H. thompsonii* var. *vinacea* and *H. thompsonii* var. *synnematososa* based on the ultra structured analysis of the conidiogenous structures have been identified (Samson *et al.*, 1980). Recently, comparison of different isolates of *H. thompsonii* made by PDBC, Bangalore revealed that Kerala isolate (MF(Ag)b6) produced more number of conidia as compared with the Tamil Nadu isolate (Anonymous, 2008). The percentage of germination, however was better in Tamil Nadu isolates.

Field trials with *H. thompsonii* have given mixed results in the past. The field application of the fungus against coconut mite, *A. guerreronis* in Mexico resulted in mortality up to 75 % (Espinosa and Carrillo, 1986) whereas in certain other fields in West Africa (Anonymous, 1989) and West Indies (Moore *et al.*, 1989) and this pathogen was not effective. It has been suggested that *H. thompsonii* isolated from *A. guerreronis* found to be more effective, bringing about 88 % mortality compared to 35% mortality inflicted

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