

**HIRSUTELLA THOMPSONII VAR. SYNNEMATOSASAMSON, MCCOY & O'DONNELL ON COCONUT MITE ACERIA (ERIOPHYES) GUERRERONIS (KEIFER) - A NEW REPORT FROM INDIA**

The eriophyid mite *Aceria (Eriophyes) guerrieronis* (K.) has become a serious pest of coconut in Kerala, some parts of Tamil Nadu and Karnataka, causing heavy loss in yield. First report of this mite was from Ernakulam district of Kerala, being a new report from India and other Asiatic countries (Sathiamma *et al.*, 1998). The mite is spreading very fast to other areas and now reported from eleven districts of Kerala state. This mite, *A. guerrieronis* lives in colonies in the shelter of coconut floral parts after pollination and feeds by sucking sap from the tender tissues of the nut under the perianth. The initial symptom of feeding is the appearance of white triangular patch on the nut surface very close to the

lower portion of the perianth. Later, it turns brown leading to subsequent warting and longitudinal fissures, as the nuts grow. Ultimately, the mite affected nuts become malformed, undersized, leading to reduction in copra yield and poor quality husk. As these mites remain well protected inside the perianth, control measures are very difficult. Earlier studies in other countries have indicated that, if the chemical control is to be effective, the pesticides should be applied at least six times a year and hence it is uneconomic (Mariau, 1977). Biological control has been recommended as the most efficient, suitable and economic means of control (Julia and Mariau, 1979., Hall *et al.*, 1980).

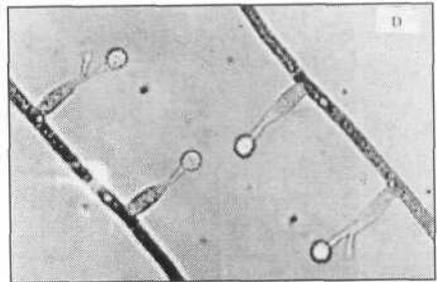
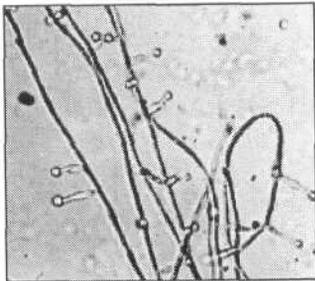
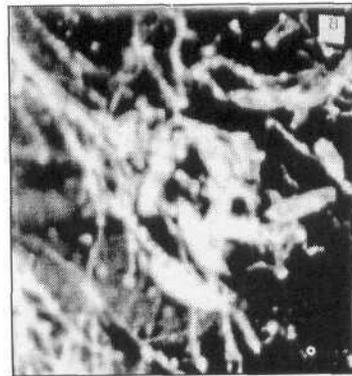


Plate 1. Microphotographs of *H. thompsonii* isolated from *A. guerrieronis*

A. Dead colony of *A. guerrieronis*; B. Fungal hyphae on mites; C. Hyphae bearing phialides and globose rough-walled conidia (400x); D. Magnified view of hyphae, phialide, branched neck and verrucose conidia (100x)

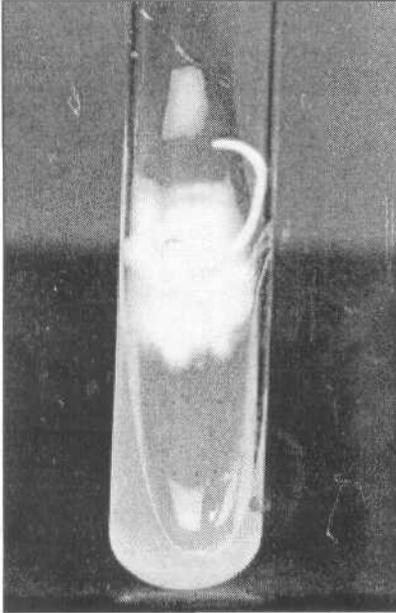


Plate 2 *Hirsutella thompsonii* var. *Synnematosana* in pure culture showing synnemata production

Observations on the natural enemies of the mite in the coconut garden of the College of Horticulture, Vellanikkara, Trichur and premises revealed the presence of two species of predatory mites (unidentified) associated with *A. guerreronis*. However, as compared to the host density, the predator population was found to be very low. Interestingly, massive mortality of mite colonies was observed in some of the nut samples collected from the field (Plate 1A). In association with the death of mites, mycelial growth of a fungus was consistently found to be present on the mites (Plate 1B). The fungus was isolated and brought to pure culture on PDA. Mycelial growth observed on the second day after the isolation and the colonies attaining a diameter of 2.0 to 2.5 cm. within 15 days at 28 °C, grey, raised and soon producing pale pinkish synnemata. The mycelial and spore characters were also studied. Hyphae were hyaline, septate, wide, smooth and highly branched (1.7 - 2.7 $\mu$ m). From the vegetative hyphae large

number of conical to flask shaped phialides (6.5 -8.7  $\mu$ m high x 2.3 -2.8  $\mu$ m wide) arose singly at regular intervals (Plate 1C). These phialides consist of broadly based inflated portion with a narrow neck (1.9-4.5  $\mu$ m long x 0.5- 0.8  $\mu$ m wide) bearing single spore. Neck is sometimes unbranched often branched once. Conidia spherical, verrucose and hyaline measuring 2.5 - 3.8  $\mu$ m diam. (Plate 1D). The above characters are in conformity with the descriptions made by Samson *et al.* (1980) for the fungus *Hirsutella thompsonii* Fisher var. *Synnematosana* Samson, McCoy & O'Donnell. Thus the fungus isolated from the coconut mite, *A. guerreronis* during the present study is identified as *Hirsutella thompsonii* Fisher var. *Synnematosana* Samson, McCoy & O'Donnell. The identification was confirmed by David Minter of International Mycological Institute, England and deposited as IMI 382199. This is the first report of the fungus *H. thompsonii* var. *Synnematosana* on *A. guerreronis* from India.

The fungus *H. thompsonii* has already been reported as the most promising and potential biological control agent against coconut mite *A. guerreronis* in the Ivory Coast and Mexico and mortality of the mites due to this fungus was 25-75 % in Mexico (Julia and Mariau, 1979; Hall *et al.*, 1980; Bccrril and Sanchez, 1986; Lampedro and Rosas, 1989). *Hirsutella thompsonii* var. *Synnematosana* seems to be restricted to the tropics (Samson *et al.*, 1980). Another fungus *H. nodulosa* has been reported as a good biological control agent against *A. guerreronis* in Cuba (Cabrera and Dominguez, 1987).

During the present investigation there aroused a positive indication that the biocontrol agents have already established in the field, which in the long run may suppress the mite population. Further studies are in progress to know the host range of the fungus and to evolve techniques to utilize the fungus as a successful

biological control agent for the management of the coconut mite.

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### References

- Becerril, E. A. and Sanchez, C. J. L. 1986. The fungus *Hirsutella thompsonii* Fisher for the control of the eriophyid *Eriophyes guerreronis*. *Agricultura -Tecnica-en-Mexico*. 12: 319-323
- Cabrera, R. I. and Dominguez, D. 1987. *Hirsutella nodulosa* fungus, a new pathogen for the coconut mite *Eriophyes guerreronis*. *Ciencia-y-Tecnica-on-la-Agricultura*. 10 : 41-51
- Hall, R. A., Hussey, N. W. and Mariau, D. 1980. Results of a survey of biological control agent of the coconut mite *Eriophyes guerreronis*. *Oleagineux* 35 : 395-398
- Julia, J. F. and Mariau, D. 1979. New research in the Ivory Coast on the coconut mite, *Eriophyes guerreronis*. *Oleagineux* 34 : 181-189
- Lampedro, L. and Rosas, J. L. 1989. Selection of *Hirsutella thompsonii* Fisher strains to fight the coconut mite *Eriophyes guerreronis*. Pathogenicity bioexperiments. *Revista-Mexicana-de-Micologia* 5 : 225-231
- Mariau, D. 1977. *Aceria (Eriophyes) guerreronis* an important ravageur des cocotiers africaines et americaines *Oleagineux* 32 : 109-111
- Samson, R. A., McCoy, C.W. and O'Donnell, K.L. 1980. Taxonomy of the acarine parasite *Hirsutella thompsonii*. *Mycologia* 72: 359-977
- Sathiamma, B., Radhakrishnan, C. P. and Koshy, P. K. 1998. Outbreak of a nut infesting eriophyid mite *Eriophyes guerreronis* (K.) in coconut plantations in India. *Indian Coconut J.* June '98 : 1-3