



## ORIGINAL ARTICLE

# Identification of Semi-parasitic mites on *Mylocerus undecimpustulatus undatus* Marshall

Geetha G. T<sup>1\*</sup>, N. K. Krishna Kumar<sup>2</sup>, Riaz Mahmood<sup>3</sup>

<sup>1</sup> Division of Biotechnology, Indian Institute of Horticultural Research (IIHR), Hessarahatta Lake Post, Bangalore 560089, Karnataka, INDIA

<sup>2</sup> Division of Horticulture, Krishi Anusandhan Bhawan - II, New Delhi - 110 012 INDIA

<sup>3</sup> Post-Graduate Department of Studies and Research in Biotechnology and Bioinformatics, Kuvempu University, Jnanasahayadri, Shankaraghatta, Shimoga 577451, Karnataka, INDIA

E-mail: geethagt85@gmail.com

### ABSTRACT

The weevil *Mylocerus undecimpustulatus undatus* Marshall is one of the important insect pest on several host plants in India. Weevils were collected from laboratory reared population. Semi-parasitic mite was recorded on weevils. The abundance of mites varied among body parts of *M. undecimpustulatus* and the maximum numbers occurred in the femur, mouth parts, antennae, eyes and coxa region. The number and abundance of mites did not differ between male and female weevils. Most mites aggregated under the sub-elytral space, which presumably offers protection from the hot and dry environment. This study is the first to document the presence of mites on *M. undecimpustulatus undatus* Marshall in India and will help to direct future research on their interactions.

**Key words:** *M. undecimpustulatus undatus*, mites, semi-parasitic mite.

Received 31/10/2013 Accepted 01/12/2013

©2013 Society of Education, India

### INTRODUCTION

The Srilanka weevil or Asian gray weevil, *Mylocerus undatus* Marshall is native to southern India, Sri Lanka and Pakistan. The species has been reported in Florida on numerous ornamental plants and fruit crops. It causes damage to the foliage and possibly root systems [1, 2]. Adults' feeding is most noticeable when plants are producing new foliage. The species is particularly abundant in northern Miami-Dade and southern Broward Counties. There are 336 species recognized as valid in this genus from Southeast Asia, the Indian subcontinent, Africa, Asia (including China and Japan), the Palearctic, Indonesia, Australia and the United States (Florida). There are 73 species recognized as valid for the Indian subcontinent and the excellent revision of the species by Ramamurthy and Ghai [3] and by Marshall [4] in the fauna of British India series, were used to identify our introduced species. Four subspecies of *M. undecimpustulatus* including *muculosus* Desbrochers des Loges, *undecimpustulatus*, *marmoratus* Faust and *undatus* Marshall are among the most serious pest weevils in India and Pakistan, where they attack more than 20 crops [2].

Adults feed on leaves potentially reducing the quality and quantity of ornamentals and fruit production. In southern India pest is active from April to November and passes winter in the adult stages under the debris [5]. Oviposition occurs in soil close to roots. A single female lays on an average of 360 eggs over a period of 24 days. Larvae feed on roots, however, extent of root damage is unknown. Pupation occurs in soil inside the earthen cells and take about one week. Life cycle is usually completed in 6-8 weeks [5]. Adults of this insect can be easily confused with a native weevil species known as little leaf notcher, *Artipus floridanus* Horn due to their general similarity. However, *M. undatus* has a dull, white and black, maculate, scale covering (often with yellowish scales on the rostrum and head). Also, it has the front and middle femora bidentate and hind femora distinctly tridentate. Although, few references exist on this weevil pest, it can be considered a pest of quarantine significance. The present paper describes the first report on the occurrence of mites on *M. undecimpustulatus undatus* with the aim understanding their interactions with plant development and pest management decisions.

## MATERIALS AND METHODS

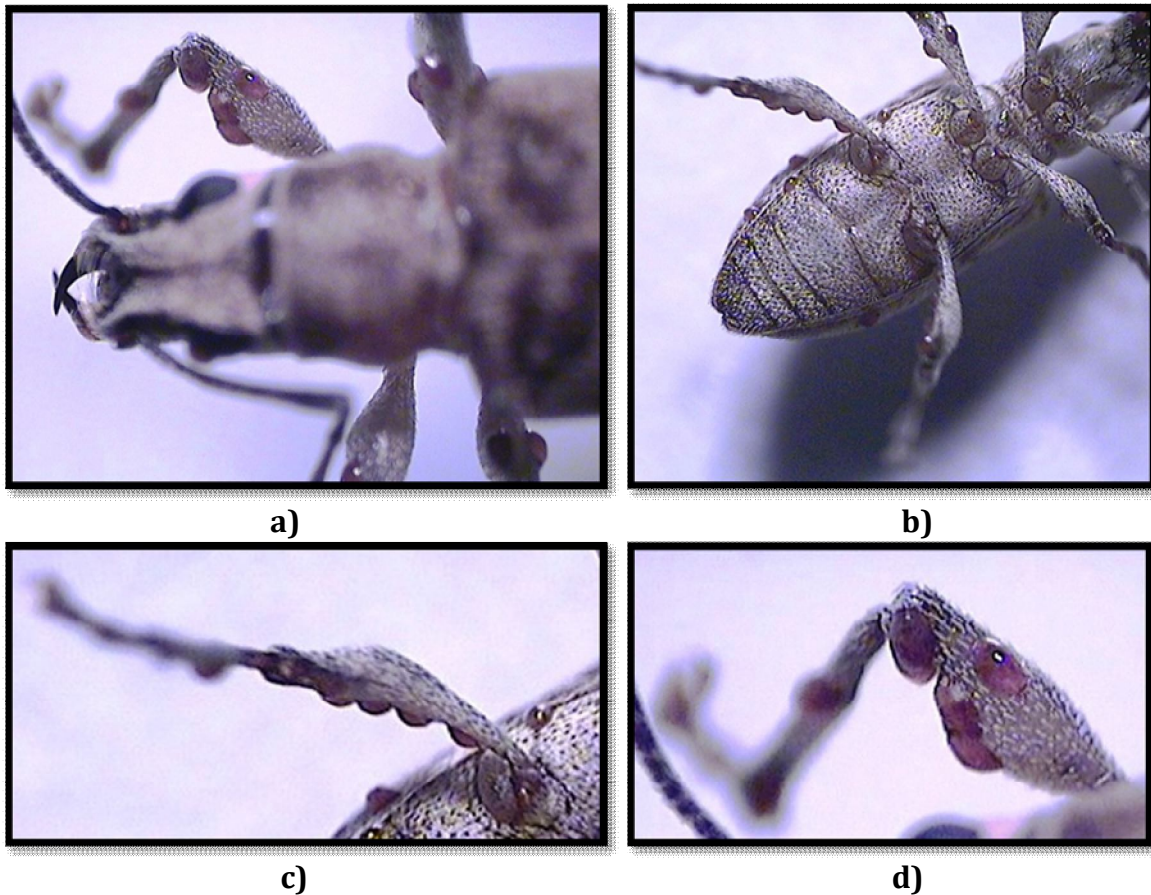
### Sample Collection and Preparation

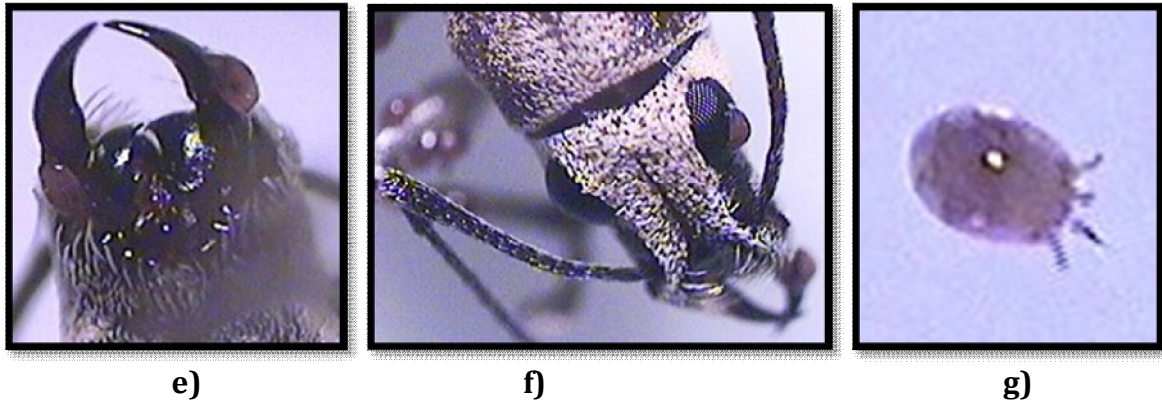
Live adults and of *M. undecimpustulatus* undatus were collected from laboratory rearing cages at National Bureau of Agriculturally Important Insects (NBAII), Bangalore from January 2012 to October 2012. The freshly emerged adults were individually collected from rearing container and observed for the presence of mites under compound microscope. For identification, mites were brushed off the weevils using a camel hair brush and stored in 70% ethanol until further processing. Mite specimens were cleared in lactophenol solution, mounted in Hoyer's medium on microscope slides [6, 7], and examined under a compound microscope. The mites were identified broadly as semi-parasitic mites.

## RESULTS AND DISCUSSION

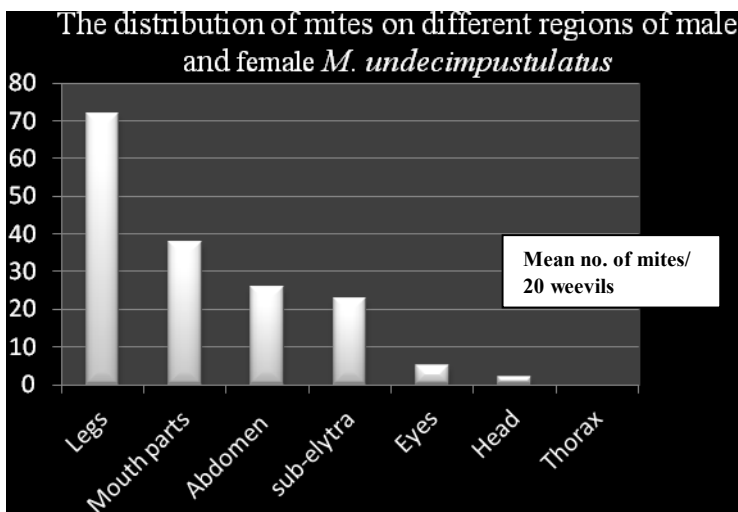
Fifty numbers of freshly emerged adult *M. undecimpustulatus* were collected from laboratory reared population. Mites were counted on each weevil's head, thorax, legs, sub-elytral space, and abdomen under a compound microscope. The semi-parasitic mites could have a detrimental impact to the host (*M. undecimpustulatus*) if, by virtue of their presence in extremely large numbers. Such potential negative impacts may include reduction in the efficiency of foraging activities or of movement, making the weevils more susceptible. Therefore, behavioral experiments need to be performed to illustrate if high mite loads are detrimental to *M. undecimpustulatus*. Many mites live on hosts without seemingly harming them [6, 8]. In this study it was noticed that phoresy or parasitism was not a mandatory choice for every mites. Many of these nymphs were observed in large numbers on different body parts moving freely on the teneral adult weevils emerged from the mud cage carrying this semi-parasitic mites. Finding a large number of nymphs near and on the non-flying stage (teneral adult stage) could be explained by shelter- and/or moisture-seeking inside the mud cage.

In conclusion, this study documented preferential distribution of phoretic or semi-parasitic mites on *M. undecimpustulatus* weevils. The semi-parasitic mites were numerically abundant on *M. undecimpustulatus* and the effects of this association may be more parasitic. The possible detrimental role of excessive semi-parasitic mites on the weevils needs further investigation. To our knowledge, this study is the first record of semi-parasitic mites in India.





**Fig. 1.** *M. undecimpustulatus* weevil, infested with semi-parasitic mites a) presence of mites on upper side of the weevil's body b) presence of mites on dorsal side of the weevil's body c) & d) presence of mites on sub-elytra e) presence of mites on mandibles f) presence of mites on the eye of the weevil g) the semi-parasitic mite.



**Fig.2.** The distribution of mites on different regions of male and female *M. undecimpustulatus*

**Table 1.** Shows number of mites on weevil's body parts

Weevil's body parts	Mean no. of mites/50 weevils
Legs	72
Mouth parts	38
Abdomen	26
sub-elytra	23
Eyes	5
Head	2
Thorax	0

**REFERENCES**

1. Thomas, M.C., (2002). *Mylocerus undatus* Marshall, a weevil new to the Western Hemisphere. Pest Alert. Florida Department of Agriculture & Consumer Services, Division of Plant Industry [http://www.doacs.state.fl.us/pi/enpp/ento/weevil-pestalert.html].
2. O'Brien, C.W., Haseeb, M., and M.C. Thomas. (2006). Entomology Circular., 412, 1-4.
3. Ramamurthy, V.V., and Ghai, S., Oriental Insects., (1988). 22, 377-500.
4. Marshall, G.A.K., (1916). Coleoptera, Rhynchophora: Curculionidae. Fauna of British India. 1916. Taylor and Francis, London. 367 pp
5. Atwal, A.S., (1976). Agricultural Pests of India and Southeast Asia. Kalyanri Publishers, Delhi, India.
6. Krantz, G.W., (1978). A Manual of Acarology, 2nd edition.

7. Evans, G.O, (1992). Principles of Acarology. Wallingford, CAB International.
8. Houck, M.A. and B.M. OConnor, (1991). Ecological and Evolutionary Significance of Phoresy in the Astigmata. Annu. Rev. Entomol., 36: 611-636.

**Citation of This Article**

Geetha G. T, N. K. Krishna Kumar, Riaz Mahmood. Identification of Semi-parasitic mites on *Myllocerus undecimpustulatus undatus* Marshall. Adv. Biores. Vol 4[4] December 2013: 117-120