

Rugose spiraling whitefly: An invasive pest of coconut in Bastar plateau of Chhattisgarh

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Whiteflies belong to the order Hemiptera and the suborder Sternorrhyncha with a single superfamily, Aleyrodoidea, within the whitefly genus *Aleurodicus* Douglas. It comprises of 35 species of which only the spiraling whitefly (*Aleurodicus disperses* Russel) was so far known to occur in India. The Rugose Spiraling Whitefly (RSW) was first described from Belize on coconut during 2004 (Martin, 2004). So far in India the infestation of RSW on coconut has been reported in Tamil Nadu (Sundararaj and Selvaraj, 2017), Kerala (Sundararaj and Selvaraj, 2017), Karnataka (Selvaraj *et.al*, 2017), Assam (Chandrika, *et. al*, 2020), Gujarat (Jethva, *et. al*, 2020) and Chhattisgarh (Patel *et. al*, 2020). This pest is polyphagous devouring wide range of hosts including palms, ornamentals, fruits and weed flora. Bio mortality factors of RSW are the aphelinid parasitoid, *Encarsia guadeloupae* and the sooty mould feeding Leiochrinid beetle, *Leiochrinus nilgirianus* that are mostly used as conservatory biological control.

Occurrence of RSW in Bastar

A survey and monitoring for rugose spiraling whitefly in coconut were carried out in AICRP on Palms, S. G. College of Agriculture and Research Station, Jagdalpur and farmers field of Kondagaon and Dantewada districts of Chhattisgarh. The survey was based on typical characteristics of the pest i.e., spiraling pattern and

concentric circular egg laying which is covered with white woolly waxy matter underside of the leaflets and fruit along with the presence of their nymphs and adults. The nymphs are light to golden yellow in colour that produces a dense, cottony wax as well as long, thin waxy filaments. The adults are lethargic, larger in size than other common white flies. These usually have a pair of irregular light brown band across their wings. Males have a pair of long pincers like structure at the end of their abdomen. They remain congregated on abaxial surface of leaves. The upper side of the leaflets show development of black sooty mould due to the secretion of glistening liquid *i.e.* honey dew.

The rugose spiraling whitefly was first time observed on coconut palm (*Cocos nucifera* L.) from Bastar plateau of Chhattisgarh during month of September, 2020. During the survey occurrence of this pest was not observed in the farmer's field of Bakawand, Kondagaon and Dantewada. Based on the present study the average population of the pest on different coconut cultivar revealed that it varied from 14.2 to 30.6 RSW / cm². The highest population was recorded in Gautami Ganga (30.6 / cm²) followed by Kera Bastar (23.2 / cm²) while the minimum population in Kalpa Raksha (14.2 / cm²) (Patel, *et. al*, 2020). The invasive pest, *A. rugioperculatus* has already been reported to cause significant damage in India. Currently, this pest has invaded the



Figs 1-8: 1. Eggs and Nymphs of RSW, 2. Adults of RSW, 3. Spiral Pattern of Egg Laying, 4. Sooty Mould Development, 5. View of Infested tree, 6. View of Infested field 7. Lace wing grub feeding on nymphs, 8. Survey of farmers field (Sh. Somaru Ram)

coconut fields of Bastar region in Chhattisgarh. In order to manage its further spread in the experimental area; guidance and help was taken from the Project Coordinator, AICRP on Palms and scientists of NBAIR, Bengaluru. The culture of *Isaria fumosorosea* was procured from NBAIR, Bengaluru. Apart from the use of *Isaria* formulation; installation of yellow sticky traps and regular spray of water as well as Azadiractin was carried out. As this pest is polyphagous in nature the current incidence in Bastar is alarming as it has a great potential to extend its host range and spread to other coconut growing areas in the Chhattisgarh State.

Symptoms of Damage

- Egg spirals of rugose spiraling whitefly on the underside of leaves.
- Presence of heavy white, waxy material with silky filaments.
- Presence of sticky honeydew.
- Black sooty mold formation on upper side of leaves.

Suggested Management Practices

- Avoid transportation of planting materials from affected area to non affected area to check the spread of the pest.
- Spray Azadiractin 1% @ 1 ml per liter of water with 10 gms detergent 2-3 sprays at 15 days interval.
- Forcibly spray water or detergent + water on leaves to washout sooty mould as well as various life stage of RSW at fortnight interval.
- Installation of yellow sticky traps smeared with castor oil on palm trunk to attract adult of RSW. Castor oil

should be applied after 7 to 10 days interval.

- Release of *Dichochrysa astur* @ 100-150 eggs / palm in case of low incidence and upto 300 eggs / palm during medium incidence for at least 10 % of the infested palms.
- Release and augmentation of *Encarsia guadeloupae* in affected palms for satisfactory pest suppression.
- Foliar application of entomopathogenic fungi *Isaria fumosorosea* @ 1×10^8 spores/ ml (5gms/ liter of water along with sticker 1 ml/ liter).
- Avoid application of chemical pesticides to reduce the chances of resistance and pest resurgence problem.

References

Chandrika M, Josephraj Kumar A, Singh, L. S and Das A. 2020. New distributional record of rugose Spiraling whitefly on Coconut in Kamrup and Nalbari districts of Assam. Indian Coconut Journal. 2020; 61(8):19-21.

Jethva D M, Wadaskar PS and Kachot AV 2020. First report of rugose spiraling whitefly, *Aleurodicus rugioperculatus* martin (Hemiptera: Aleyrodidae) on coconut in Gujarat, India. Journal of Entomology and Zoology Studies. 8(2): 722-725.

Martin JH. 2004. The whiteflies of Belize (Hemiptera: Aleyrodidae) Part 1 - introduction and account of the subfamily Aleurodicinae Quaintance & Baker. Zootaxa. 681:1– 119.

Patel RK, Salam, PK, Singh B. and Chadar, V. 2020. First report of invasive rugose

spiraling whitefly, *Aleurodicus rugioperculatus* Martin (Hemiptera: Aleyrodidae) on coconut in Bastar, Chhattisgarh, India. Journal of Entomology and Zoology Studies. 8 (6): 1865-1867.

Selvaraj K, Gupta A, Venkatesan T, Jalali S. K, Sundararaj R and Ballal, C. R. 2017. First record of invasive rugose spiraling whitefly, *Aleurodicus rugioperculatus* Martin (Hemiptera: Aleyrodidae) along with parasitoids in Karnataka. Journal Biological Control. 31(2).

Sundararaj R, Selvaraj K. 2017. Invasion of rugose spiraling whitefly, *Aleurodicus rugioperculatus* Martin (Hemiptera: Aleyrodidae): A potential threat to coconut in India. Phytoparasitica. 45(1):71-74.

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