



NEW RECORD OF SPIRALLING WHITEFLY *ALEURODICUS DISPERSUS* RUSSELL ON BRINJAL FROM MANIPUR

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ABSTRACT

The spiraling whitefly *Aleurodicus dispersus* Russell was found infesting brinjal in Imphal, Manipur during October 2020 and January 2021, with lifestages getting completed on leaves. The spiraling nature was also found with heavily infested leaves getting crinkled before drying out. The honey dew and black sooty moulds symptoms were also observed. Moderate infestation was found during rainy season but it was heavy during November to December. The biopesticide *Verticillium lecanii* was found to be effective with incidence and the number of spirals observed to be reduced within seven days.

Key words: *Aleurodicus dispersus*, *Verticillium lecanii*, brinjal, leaves, spiralling, sooty mould, honey dew, weather factors, lifestages, infestation

Brinjal (*Solanum melongena* L.) is an important vegetable and it is nutritious with dietary fiber and has medicinal value against cancer (Matsubara et al., 2005; Obho et al., 2005). Brinjal is grown in India, in many states and occupies an area of 728 ha with a production of 12660 mt (National Horticulture Board, 2018). Among the insect pest infesting upon brinjal, aphids (*Aphis gossypii*), fruit and shoot borer (*Leucinodes orbonalis*), epilachna beetle and leafhoppers are the most common. The sap suckers like mealy bugs, thrips, jassids, scale insects and whiteflies cause considerable damage and loss in yield. Recently, a highly invasive insect species, the spiraling whitefly, which is rapidly becoming a serious threat to many crops in India, is infesting brinjal under protected cultivation. This spiraling whitefly *Aleurodicus dispersus* Russell is a native of Central American and it is named so as it lays eggs in a spiralling pattern. It has already spread to Africa, Asia and Australia and to almost all the tropical regions of the world. It was first recorded in India in 1993 at Thiruvananthapuram, Kerala on tapioca (Palaniswami et al., 1995) and later spread to all the peninsular states (David and Regu, 1995; Mani and Krishnamoorthy, 1996; Prathapan, 1996; Geetha et al., 1998; Reddy and Chandurkar, 1999; Sathe, 1999) and also spread to Lakshadweep islands (Ramani, 2000). It is highly polyphagous attacking 500 plant species and in India alone attacks on 481 host plants (Srinivasa, 2000). The present study reports its incidence from Manipur.

MATERIALS AND METHODS

During 2020-21, surveys were undertaken in the Imphal district of Manipur state (24°47'26.3"N 93°55'22.2"E), when infestation of *A. dispersus* was noticed. The specimens identified under Leica stereozoom microscope (SZM S9i) were sent to NBAIR, Bangalore for further confirmation. The biopesticide *Verticillium lecanii* (Green Mealikil) CFU 1x 1011/g was procured from Green Biotech Manipur and was sprayed as foliar @ 5 ml/l using 15 plants along with untreated control, and after spraying, the data was recorded for 1, 3, 5, 7 and 10 days. The data were statistically analysed to find out the significance of means.

RESULTS AND DISCUSSION

A population of *A. dispersus* was observed on brinjal in Imphal, Manipur state during October 2020 and January 2021. The nymphs, puparia and eggs were found underneath the leaves, with spiralling pattern, seen in number of spirals. The leaves under heavy infestation were found to crinkle and dry out with sucking by the whitefly. The honey dew secreted was found covering the leaves and black sooty moulds were found growing on them. The fungal growth was found spreading on the fruits giving a white cottony covering with white flocculent wax structures. The infestation was moderate during the rainy season but heavy from November to December. It was observed on coconut, banana, guava and king chilli plant (Arati et al., 2018). The adults when

Table 1. Efficacy of *V. lecanii* @ 5 ml/ l on *A. dispersus* on brinjal

Treatment	No. insects/ plant					
	1 DBS	1 DAS	3 DAS	5 DAS	7 DAS	10 DAS
<i>V. lecanii</i>	45.00± 5	31.67± 2.8	22.3± 2.52	13.33± 2.89	3.67± 1.15	-
No. of spirals	2.33± 0.58	2.67± 1.15	0.58	0.58	-	-
Control	43.33± 5.77	37.00± 6.08	21.67± 7.64	20.00± 8.68	18.33± 2.89	13.33± 2.89

Mean± standard deviation; DBS= days before spraying; DAS= days after spraying

observed under stereozoom microscope revealed four instars with a lifespan of 39 days. The damage is by the nymphs and adults sucking the sap and excretion of honey dew and white waxy flocculent substances, with reduced photosynthesis (Mani and Krishnamoorthy, 1996; Chien et al., 2000). The eggs and nymphs are covered by white waxy material. This insect can be a severe pest with wide host range, damage potential and rapid dispersal. The spiraling nature can be seen on the underside of the leaves but in heavy infestation, the spirals can be seen on the upper surface of leaves as well as fruit and non-plant material. As it is highly polyphagous, it attacks several vegetables, fruit trees, ornamentals, native plants and weeds.

They lay eggs in spirals, covered with white waxy material, spindle shaped with puparia being 1 mm long; adults look like a very small moth, 2 mm long with two orange- coloured eyes and two white to pale yellow coloured wings. The crawlers and other nymphal stages are oval, flattened and white, with heavy infested plants getting stunted, leaf turn yellow resulting in reduction leaf yield and fruit. The insects were found mostly during the fruiting stage. The number of spirals can be seen on the leaves and the heavy infested plants have 3-4 concentric waxy spirals on the leaves. The typical concentric waxy spiraling on the lower surface of the leaves creates a heavy white waxy material. The white waxy flocculent nature of the insect protects it from most insecticidal sprays. Table 1 provides the details of efficacy of *V. lecanii*; this treatment reduced the number of spirals, within 7 days, and @ 5ml/ l water; *V. lecanii* was observed effective causing 80-90% mortality of *A. dispersus* (Aishwariya et al., 2007). Similar observations were found with nymphs infected with *V. lecanii* (Mallappanavar, 2000).

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