



## RESEARCH NOTE

### Ecological notes on blossom thrips, *Frakliniella schultzei* (Trybom) on date palm (*Phoenix dactylifera*) in Kachchh, Gujarat, India

C. M. MURALIDHARAN, D. A. BAIDIYAVADRA, K. M. SHARMA and S. N. RATHAVA

Date palm Research Station, S. D. Agricultural University, Mundra, Kachchh - 370421, Gujarat, India

E-mail: muralidharanm@yahoo.com

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The coastal belt of Kachchh district of Gujarat located in the western boarder of India encompasses a unique date palm based agrarian ecosystem, consisting of about 1.9 million date palms with a production of 1.8 lakh tones of fresh date fruits (Anonymous, 2016). The commercial cultivation of this crop occurs only in this part of India, which is very unique as this crop is highly salt tolerant, dioecious and highly cross pollinated. For commercial exploitation, the pollination of this crop is done manually by dusting the male inflorescence over female inflorescence.

A roving survey was undertaken by our team during April-May 2016 in various date palm growing villages of Kachchh region covering 20 villages and 83 orchards when the fruits were of in *Habbab* stage or beginning of *Khalal* stage. During the survey, it was observed that both immature and mature fruits were distorted in several orchards. The fruits showed scarring, blistering symptoms with a constriction giving an '8' (eight) shape to the fruits (Fig.2). This infestation was observed in both '*barhee*' as well as elite clones and initially it was suspected for mite infestation but no mite specimens were observed on fruits. No live insect was noticed on affected fruit bunches also. Scanning of literature also indicated that no such symptoms on fruits reported due to mites. Hence, it is presumed that it might be due to some other insect and the damage must have been done at early stages of the fruit development. Observations on extent of fruit deformation (%) per bunch in different villages were recorded (Table 1).

The highest damage (40-50/ bunch) was observed in eight orchards distributed in villages Satapar, Reldi, Veedi and Khedoi. No orchard has registered more than 50% fruit deformation and in majority of the orchards fruit damage was less than 10% in various villages. The deformed fruits fetch very low market price, hence it was considered a significant economic damage to farmers. The percent deformed fruits varied from 5-20% in different

varieties and clones at the Research farm of DPRS, Mundra (Table 3). In order to find out the cause of the fruit damage, critical observations were made right from the pollination by closely observing the fronds, male and female inflorescence for the presence of any insect or mite during 2017, February by tapping the same under a white paper. This has been facilitated to collect number of thrips from inflorescence which was later identified as *Frakliniella schultzei* by National Bureau of Agricultural Insect Resources, Bengaluru.

This thrips, commonly known as cotton thrips, is widely distributed throughout the world especially tropical and subtropical areas of the world (Vierbergen and Mantel, 1991). In India, its presence has been reported from Andhra Pradesh, Chattisgadh, Gujarat, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal (Anonymous, 1999). It is a polyphagous pest feeding on various ornamental and vegetable hosts in different parts of the world (Milne *et al.*, 1996). It has been reported from 83 species of plants among 35 families (Palmer, 1990). In India it is reported to cause economic damage to tomato, tobacco, cotton, grain, legumes, groundnut and lettuce (Garima *et al.*, 2010). *Frankliniella schultzei* can cause both direct and indirect damage to crop and both adults and nymphs feed on pollen and floral tissue leading to flower abortion. Severe infestations can cause discolouration and stunted growth of the plant (Amin and Palmer, 1985) and indirect damage by this insect is done by virus transmission.

The damage by *F. schultzei* on fruit crop is not reported extensively. However, the distortion of the date fruits in different orchards of Kachchh drawn present attention. In mature fruits, no live insects was observed and hence presumed that, it must have damaged in early stages. It was also observed that the population of thrips/ inflorescence were more in male (table 2) compare to female inflorescence (Table 3). In male, it varied from

Blossom thrips on date palm

**Table 1. Percentage fruit deformation observed in different villages (2016)**

Percent fruit damage/bunch	No. of orchards	Villages
<10 %	26	Mundra, Bhujpar, Dhrub, Jhumkha, Mokha, Vadala
10-20 %	11	Bharapar, Guthiyali, Kothara, Kera.
20-30 %	24	Bhujpar, Zarpara, Kapaya, Mangara
30-40 %	14	Ratnal, Sadau
40-50 %	08	Satapar, Reldi, Veedi, Khedoi
>50 %	0.0	-
Total	83	

**Table 2. Thrips population /spathe /tap**

Male	2017		2018	
	No. of spathe	(*) No. thrips/tap	No. of spathe	(*) No. thrips/tap
M-1	2	10.90	2	6.33
M-2	2	9.00	2	5.55
M-3	2	12.00	3	4.78
M-4	2	13.75	3	4.56
M-5	2	10.50	2	3.56
M-6	2	7.50	2	5.30

\* Average of three taps/ spathe

**Table 3. No. of thrips on different female clones of the date palm 2017**

Cultivar	No. of spaths	No. of thrips/tap	% fruit damage/bunch
AT- 1	3	2.8	20.0
Ace- 100	5	0.0	0.00
KCCL- 091	07	0.2	5.00
Barhee	12	4.2	25.00
KCCL- 169	02	0.0	10.00
KCCL- 63-II	01	1.3	15.00

7.5 to 13.75/tap where as in female it ranged from 0-4.2/tap. Moreover no thrips were observed on female inflorescence in which spathe cover is freshly removed. Hence it is assumed that male inflorescence mainly sheltered thrips, which were later shifted to female inflorescence through pollination process. Both black and white morphs were observed, however, the number of black morphs were very scanty. It was also observed that the per cent deformed fruits is not exactly reflected on the corresponding population of thrips per spathe.

So far there are no reports on the economic damage to date palm fruits due to thrips though the occurrence of other species of thrips (*Palmiothrips palmae*) on date palm is documented (Tyagi and Kumar, 2016; Rachana and Varatharajan, 2017). Recently, Sabah *et.al.*, (2019) reported nine thrips species associated with date palm from Algeria where *F. occidentalis* is considered to cause economic damage. Hence presence of *F. schultzei* on date palm and its economic damage is probably the first report from India.



**Fig. 1. Pollination process in date palm**



**Fig. 2. Nature of damage by thrips in date palm (a) Fruit damage at immature stage (b) Distortion of fruits at *Khalal* Stage (c) & (d) Damage in fruit bunches**

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