First incidence of a spider mite, *Oligonychus tylus* (Baker & Pritchard), in date palm (*Phoenix dactylifera* L.) groves of Kachchh in Gujarat, India

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Date palm (*Phoenix dactylifera* L.) is one of the oldest cultivated crops of the desert region. It is believed to be originated in Mesopotamia (Southern Iraq) during 5000 BC (Zohary and Hopf, 2000) and it is commercially cultivated in more than 40 countries with 100 million hectares with a production of 7-8 million tones of dates (FAO Stat, 2017). In India, date palm is commercially cultivated in the western border, i.e., the coastal belt of Kachchh district of Gujarat having about 2.0 million trees producing 17 thousand tons of fresh dates (Anonymous, 2018). This region enjoys the monopoly of the commercial cultivation of date palm and it is one of the subsistent crops of the agrarian community of western part of India.

One hundred and twelve species of insect and mite pests have been reported worldwide on date palm (El-Shafie, 2012). However, in the coastal belt of Kachchh, red palm weevil (*Rhynchophorus ferrugineus* Oliver; Coleoptera: Curculionidae), rhinoceros beetle (*Oryctus rhinoceros* L.; Coleoptera: Scarabaeidae) and date palm white scale (*Parlatoria blanchardi* Targionii Tozzetii; Hemiptera: Diaspididae) - cause economic damage (Muralidharan, 1993; Muralidharan et al., 2000).

Mite infestation and damage to date palms were first recorded in Israel in the Southern Arava valley during the late 1970s (Gerson *et al.*, 1983) and fifteen species of phytophagous mites have been reported from various date palm growing areas of the world (El-Shafie, 2012). However, no economic damage of mite incidence has reported so far from this crop from the Indian subcontinent.

A survey conducted by the Date Palm Research Station (DPRS), Sardarkrushinagar Dantiwada Agricultural University (SDAU), Mundra, during May-2016 has brought to the notice, certain mite species infesting fruit bunches from Dhrub village of Mundra taluk for the first time. The fruits were near to colour breaking stage (*khalal*), and severe mite infestation/damage was evident with spinning webs around fruit bunch with dusty appearance (Fig. 1). Extensive mite feeding on date fruit with webbing and mites’ shed skins get covered by dust particles (Fig. 2). In addition to this, the highly turbulent wind carrying dust during summer months in the region was also responsible for this dusty appearance, which reduces the marketability of fruits.

The mite specimens were identified morphologically as *Oligonychus tylus* by the All India Network Project on Agricultural Acarology at the University of Agricultural Sciences, Bangalore using 10 male and five female microscopic slide-mounted mite specimens. Also, molecular data (for the mitochondrial gene) were

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selected from each mite affected orchards, and five bunches per palm were selected randomly for assessing the damage.

The varietal response of mite infestation on five different varieties/clone at DPRS, Mundra was recorded and expressed as per cent webbing index (PWI) as per the procedure suggested by McKinney (1923) with slight modification on five randomly selected bunches per palm repeated on three palms per variety. The observation was taken at 15 days interval starting from 2nd week of April to 2nd week of May. The per cent webbing index (PWI) was derived on fruit bunches by applying a web rating scale of 0-10 (0 = no webbing; 10 =100 % webbing in fruit bunches) and an index was derived as per the following formula.

\[ \text{PWI} = \frac{\text{Sum of all numerical score (Total score)}}{\text{Max. Score (Highest score observed in 0-10 × Number of bunches observed)}} \times 100 \]

The survey conducted on 118 orchards spread over 25 villages of four taluks of Kachchh district of Gujarat, presented in Table 1, revealed that the incidence of *O. tylus* was spread over 63.55 per cent of the orchards and 43 orchards (36.45%) were free from mite incidence. Among different taluks, the highest incidence was observed in Anjar taluk (73.08 %), followed by Mundra, Bhuj and Mandvi taluks with an incidence of 64.32, 55.56 and 50.00 per cent respectively. Among the infested orchards (75), 18.64 per cent orchards shown severe mite

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**Fig. 1.** Spinning webs of *Oligonychus stylus* on date fruits

**Fig. 2.** Damaged fruit skin of dates by *O. tylus*
The intensity of webbing observed on five different varieties/clones of date palm, starting from 2nd week of April to 2nd week of May presented in Table 2. The results indicated the highest webbing index of 41.93 per cent observed on cultivar KCCL 63, which was at par with cultivar KCCL 169 and cultivar ADP-1. Barhee showed lowest webbing index initially, which was at par with cultivar KCCL 091. However, no significant difference was observed among different varieties/clones.

**Table 2. Incidence and severity of spider mite damage on different villages of Kachchh (Apr-May, 2017)**

<table>
<thead>
<tr>
<th>Taluk</th>
<th>Villages</th>
<th>Number of orchards visited</th>
<th>Mite incidence*</th>
<th>Severe</th>
<th>Medium</th>
<th>Mild</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anjar</td>
<td>Khedoi, Anjar, Veedi, Satapar, Ratnal (05)</td>
<td>26</td>
<td>19 (73.08)</td>
<td>06 (23.07)</td>
<td>04 (15.38)</td>
<td>09 (34.61)</td>
</tr>
<tr>
<td>Mandvi</td>
<td>Guthiyali, Bidada, Mankuva, NaniKhakar (04)</td>
<td>12</td>
<td>06 (50.00)</td>
<td>01 (8.33)</td>
<td>03 (25.00)</td>
<td>02 (16.67)</td>
</tr>
<tr>
<td>Mundra</td>
<td>Dhrub, Zarpara, Borana, Kapaya, Vadala, Bhujpar, Bharapar, Mangra, Sadau, Navinal (10)</td>
<td>62</td>
<td>40 (64.52)</td>
<td>11 (17.74)</td>
<td>10 (16.12)</td>
<td>19 (30.64)</td>
</tr>
<tr>
<td>Bhuj</td>
<td>Reldi, Kera, Kukma, Jhumka, Baldiya, Mankuva (06)</td>
<td>18</td>
<td>10 (55.56)</td>
<td>04 (22.22)</td>
<td>01 (5.56)</td>
<td>05 (27.77)</td>
</tr>
<tr>
<td>Total (4)</td>
<td>25</td>
<td>118</td>
<td>75 (63.55)</td>
<td>22 (18.64)</td>
<td>18 (15.25)</td>
<td>35 (29.66)</td>
</tr>
</tbody>
</table>

Note: Severe (>50 % webbing bunch⁻¹ palm⁻¹); Medium= 10-50% and Mild <10%
*Values in parenthesis are in percentage value

Fig. 3. Intercropping of fodder sorghum with date palm

infestation (>50% webbing per fruit bunches per palm), however, 15.25 per cent orchards registered medium infestation level (10-50% webbing), and 29.66 per cent orchards revealed mild infestation (<10% webbing). Among the taluks, Anjar recorded maximum orchards having severe mite incidence (23.07 %), followed by Bhuj (22.22 %) and Mundra (17.74 %). In Mandvi taluks, the severity of the mite incidence among the different orchards under survey was lowest (8.33 %).
Oligonychus senegalensis Gutierrez and Etinne and O. afrasiaticus McGregor are the two other dominant spider mite species occurring on date palm (Palevsky et al., 2003) causing economic damage. However, in date groves of Kachchh we could observe only O. tylus, which is considered as a dubious species (Gupta and Gupta, 1994) and already reported from India on Musa sapientum L. of family Musaceae, Panicum maximum L. of family Poaceae, Cocos nucifera L. and Areca catechu L. of family Arecaceae (Zeity, 2015). This species is also reported from Mauritius on Panicum maximum Jacq. (Baker and Pritchard, 1960) and sorghum (Sorghum bicolour L.) both of family Poaceae by Sirsikar and Nagabhushan (1989).

Interestingly, in Kachchh cultivating fodder sorghum as an intercrop of date palm is a common practice to feed their domestic animals (Fig. 3). Even though O. tylus has been reported on date palm in Israel (Gerson et al., 1983), but in their subsequent publication, it was reported that the species was misidentified as it was originally O. senegalensis (Palevsky et al., 2003). Hence, the incidence and widespread fruit damage by O. tylus on date palms is the first report from India and the world.

No predatory Phytoseiids was observed in the mite colony. However, mite coccinellid predator Stethorus sp. (Coleoptera: Coccinellidae) was observed in the webs (Fig. 4). More detailed studies have to be initiated to understand the bio-ecology of mite faunal complex existed in the date groves of Kachchh.

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### References


