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Year round incidence and preference of Cicadellid hoppers on different mango cultivars in sub-Himalayan Terai region of West Bengal

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Abstract

The population fluctuation of mango hopper species on different cultivars of mango was recorded during 2019 at Horticultural Farm of Uttar Banga Krishi Vishvavidyalaya, Pundibari, Cooch Behar belongs to Sub-Himalayan Terai region of West Bengal. The Mango cultivars selected for screening against the mango hopper were Himsagar, B.N. Chatterjee, Peyaraphuli, Meghlanthan, Langra, Bombai, Dashehari, Banganpalli and Bangalora. Population dynamics of mango hoppers were studied during flowering to harvesting stages on different cultivars. The maximum and minimum population of mango hopper were observed on Peyaraphuli (5.5, 11.67 hoppers/ inflorescence) and B.N. Chatterjee (4.83, 6.48 hoppers/ inflorescence), respectively in the months of February-March (flowering time). Based on suitability of different mango cultivars as host plant for hoppers, the mango cultivars are ranked as Peyaraphuli (9.56 hoppers/ inflorescence) > Bangalora (6.07) > Banganpalli (5.86) > Langra (5.81) > Dashehari (5.81) > Bombai (5.20) > Himsagar (5.05) > B. N. Chatterjee (4.91) > Meghlanthan (4.71).

Keywords: Incidence, population, mango hoppers, varietal preference, West Bengal

Introduction

Mango (*Mangifera indica* L.) belongs to the family Anacardiaceae and it is originated from in South East Asia. It is one of the major fruits of Asia and has developed its own importance all over the world. Because of taste, flavour and good qualities, it is called "The King of Fruit", as well as it is considered as 'National Fruit of India'. Mango fruit has been in cultivation in Indian Sub-Continent for well over 4000 years and has been the favourite of the Kings and the commoners. Mango having good nutritional value as every 100 g of mango fruit contains 16 g carbohydrate, 0.7 g protein, 0.4g fat and 0.1 g fibres. In India, it is grown in an area of 2.2 million hectares and its production is up to 19.68 lakh metric tons with 8.71 t/ha productivity, which is much low in comparison to average world productivity, while, in West Bengal, total area under mango cultivation is about 90.74 thousand ha and production is about 836.07 metric tons with 8.54 t/ha productivity^[1].

West Bengal is an important mango growing state in the country due to favourable soil and climatic conditions, but the production of mango is decreasing day by day due to many factors, among them the main reason which affects the vitality and yield of mango are the insect pests such as mango hopper, thrips, scale insects, fruit flies, shoot borers, mealy bugs and leaf blisters. Out of them mango hoppers infest the mango round the year^[2] and is considered as the major as well as key pest of mango. It is the serious monophagous pest of mango causing heavy damage of inflorescences, flowers, young fruits and young tender foliage^[3, 4]. Different hopper species like, *Amritodus atkinsoni* Leth., *Idioscopus clypealis* and *Idioscopus niveosparsus* (Cicadellidae, Homoptera) inflicting the yield losses to an extent of 25-60 per cent^[5]. The information on mango hoppers infestation and their damage on different mango cultivars from the Terai region of West Bengal are scanty. Therefore, this study may be helpful to assess the damage and yield losses due to mango hopper in different cultivars. Beside the information on the least preferred cultivar by the mango hopper may be used in the future breeding programme.

Materials and Methods

The experiment was conducted at the Horticultural Farm of Uttar Banga Krishi Vishvavidyalaya, Pundibari, Cooch Behar located at Sub-Himalayan Terai region of West

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Bengal during 2019. Nine different mango cultivars with 12 year old namely, Himsagar, B.N. Chatterjee, Peyaraphuli, Meghlanthan, Langra, Bombai, Dashehari, Banganpalli and Bangalora were considered for recording of mango hoppers population. Six trees were selected from each cultivar and five shoots/tree were tagged randomly for recording monthly observations of the hopper population. The pest population was recorded when the pest had started activity on the inflorescence i.e., from month of February and the observations was continued up to the end of fruiting season. The varieties Meghlanthan, Banganpalli and Peyaraphuli are early varieties, which produce inflorescences/vegetative shoots about 2-3 weeks earlier than other cultivars. Whereas Himsagar, B.N. Chatterjee, Bombai, Dashehari, Bangalora and Langra are mid varieties. However, the variation in development of inflorescences in different mango varieties is also dependent upon temperatures. The pest populations were recorded by sweeping on the panicle for five times with a standard insect sweeping net (60 × 30 cm) following the procedure [6]. Then average hopper population per panicles at

monthly intervals were analysed statistically in RBD design.

Results and Discussion

The data on population of mango hoppers on different mango varieties are presented in (Table 1). It is depicted from the table that no cultivar was free from the mango hopper damage. The population of mango hoppers on all varieties increased during flowering time i.e., in the months of February- March. The maximum mean hopper population was recorded in Langra (8.33) during February where as in all other varieties the hopper population were statistically at par. Similarly during March higher population of mango hopper were recorded on Peyaraphuli, Langra and Bangalora and these were statistically at par. [7] also found similar trends when worked on different mango varieties. They reported maximum mean population of (5.65 and 4.91) per shoot on Langra and Sarolee varieties and minimum mean population of (1.40, 1.72 and 2.10) per shoot on Neelum, Zafran and Dashehari, respectively.

Table 1: Monthly mean population of mango hopper on different varieties of mango at Terai Region, West Bengal during 2019.

Treatments	Mean mango hopper population per inflorescence		Mean mango hopper population per twig (till fruit harvesting stage)						Pooled mean population of mango hoppers
	February	March	April	May	June	July	August	September	
Himsagar	4.20	7.59	5.93	4.63	5.33	4.1	5.13	3.53	5.05
B.N. Chatterjee	4.83	6.48	7.71	4.20	2.6	3.27	4.93	4.73	4.91
Peyaraphuli	5.50	11.67	9.31	10.33	10.13	9.43	9.80	10.33	9.56
Meghlanthan	4.23	5.83	5.55	5.73	4.20	4.73	3.87	4.60	4.71
Langra	8.33	9.67	5.62	4.4	5.10	4.80	3.60	5.00	5.81
Bombai	5.57	7.00	6.05	3.93	4.10	5.53	4.60	4.83	5.20
Dashehari	5.00	9.82	7.65	5.80	4.77	4.8	4.07	4.53	5.81
Banganpalli	6.00	9.82	4.61	3.67	6.57	4.53	3.73	5.33	5.86
Bangalora	4.23	11.00	6.86	7.23	4.73	4.87	4.47	5.20	6.07
C.D at 5%	2.07	4.77	10.8	3.86	3.29	1.06	3.31	3.07	0.53
SE(m) ±	0.69	1.27	0.88	1.29	1.10	NS	1.10	1.02	1.59

Lower mean hopper population were recorded in Meghlanthan (4.23 and 5.83) variety at flowering stage followed by B.N. Chatterjee (4.83 and 6.48) and Himsagar (4.2 and 7.59). From the screening of mango cultivars against hopper in terms of pooled mean population, the cultivars are ranked as Peyaraphuli (9.56 hoppers/ inflorescence) > Bangalora (6.07) > Banganpalli (5.86) > Langra (5.81) > Dashehari (5.81) > Bombai (5.20) > Himsagar (5.05) > B.

N. Chatterjee (4.91) > Meghlanthan (4.71).

The results of present studies are agreement with Amur (1986) [3], Soomro (1988) [2], Rahimo (1989) [8] and Talpur *et al.* (2002) [4] who reported maximum population of mango hoppers during March-April. Similarly, Gundappa *et al.*, 2016 [9] recorded lower hopper population (0.69 to 1.15 hoppers panicles⁻¹) on Dashehari during 2011-12.

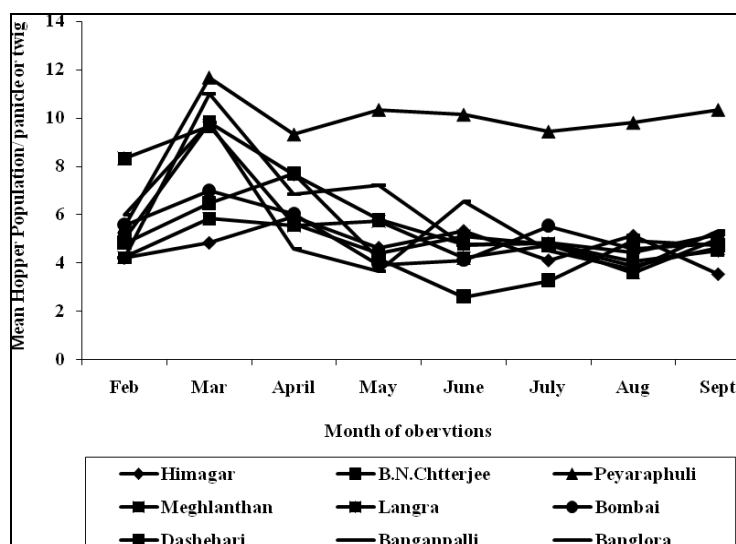


Fig 1: Fluctuation of hoppers population on different mango cultivars at Terai Region of West Bengal during 2019.

The population fluctuation of mango hopper in different mango cultivars are presented in the Fig. 1 which shows that maximum hopper population was found in Peyaraphuli among.

all the cultivars where as minimum hopper population was noticed in Meghlanthan. The population of hopper were mostly prevalent during March and April irrespective of mango varieties. Then their population was found in decreasing trend upto the month of September.

Purohit and Kumar (2008) ^[10] screened fifteen mango cultivars and noted that Totapuri cultivar was least susceptible whereas Alphonso remained most susceptible. Besides, Khaire *et al.*, 1987 ^[11] reported two varieties of mango i.e. Rajmanu and Vanraj as relatively less susceptible to mango hoppers out of 19 mango varieties.

Conclusion

The maximum mean hopper population were recorded in Langra and Peyaraphuli in the month of February -March. These cultivars were highly susceptible to mango hoppers, whereas, B.N. Chatterjee and Meghlanthan varieties were recorded as least preferred by the hoppers. Langra, Dashehari, Banganpalli, Bombai and Himsagar showed moderate infestation of hoppers. The ranking positions of different mango cultivars towards their susceptibility to mango hoppers are ranked as Peyaraphuli (9.56 hoppers/ inflorescence) > Bangalora (6.07)> Banganpalli (5.86)> Langra (5.81) > Dashehari (5.81)> Bombai (5.20)> Himsagar (5.05)> B. N. Chatterjee (4.91)> Meghlanthan (4.71).

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