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Survey of important foliage pests of mango from south Konkan region of Maharashtra

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Abstract

Mango hopper, thrips, shoot borer and leaf miner are the important pests of mango in Konkan region of Maharashtra. Also, the incidence of other pests like mealy bug, midge and scale is increasing. However, their exact status in the South Konkan region is not known. Therefore, a fixed plot survey was conducted to know the status of important pests of mango in the South Konkan region of Maharashtra during the vegetative flush and flowering period of 2015-16 and 2016-17. Ten mango trees were selected at five different locations of the South Konkan region for recording observations which were kept unsprayed. The observations on the intensity of important pests was recorded once in a month from October to February. The results revealed that during vegetative flush and flowering period, there were seven important foliage pests viz., mango hopper, thrips, midge, shoot borer, leaf miner, mealy bug and scale. Mango hopper and thrips were observed as the major pests, whereas, leaf miner, shoot borer, mealy bug, midge and scale insect were observed as the minor pests of mango in the South Konkan region of Maharashtra.

Keywords: Mango pests, survey, mango hopper, midge, thrips, shoot borer

Introduction

Mango (*Mangifera indica* L.) is an important fruit crop grown in Konkan region of Maharashtra. The important variety grown in this region is Alphonso. In Konkan region mango is grown on an area of 1,11,715 ha. With the production of 3,53,066 MT having the average productivity of 3.16 t/ha^[1]. The low productivity of mango in Konkan region is due to the hot and humid climate of this region which is congenial for development of a number of insect pests^[2]. More than 50 insect pests have been recorded causing damage to mango crop^[3]. Mango hopper (*Idioscopus niveosparsus* Leth) is an important pest of Konkan region causing severe yield losses^[4]. About 66 percent losses in fruit yield have been reported due to mango hopper^[5]. Now-a-days, in Konkan region the incidence of many different species of thrips is increasing^[6]. Heavy incidence of mango thrips was reported on mango inflorescence and fruits^[7]. Also, the incidence of other pests viz., midge, shoot borer, leaf miner, mealy bug and scale insect is increasing in Konkan region^[8]. However, the exact status of these pests in Konkan region is not known. Therefore, a fixed plot survey was carried out from the South Konkan region during vegetative flush and the flowering period of 2015-16 and 2016-17.

Material and Methods

A fixed plot survey was carried out from the South Konkan region during vegetative flush and flowering season of 2015-16 and 2016-17. Five different locations viz., Vengurla, Nileli, Mulade, Phonda and Girye were selected for data collection. Ten mango trees were selected randomly at each location for recording observations. These trees were kept unsprayed during the flushing and flowering period i.e. October to February. Ten shoots/panicles were labeled on each tree and the observations were recorded on hopper, thrips, midge, shoot borer, leaf miner, mealy bug and scale insect by visual counting method. Also, the panicles and shoots were examined carefully to observe new pests if any. The observations were recorded at monthly interval i.e. October, November, December, January and February during each year and the data thus generated were averaged.

Method of recording observations

Hopper: Number of hoppers per panicles or shoot were counted by visual counting method.

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Thrips: Number of thrips per panicle or shoot were counted by visual counting method.

Midge: Out of ten labeled shoots of each tree, damaged shoots due to midge were counted and the percent incidence was worked out.

Shoot borer: Out of ten labeled shoots of each tree, damaged shoots due to shoot borer were counted and the percent incidence was worked out.

Leaf miner: On ten labeled shoots of each tree, total number of leaves and damaged leaves due to leaf miner were counted and the percent incidence was worked out.

Mealy bug: Out of ten labeled shoots/panicles of each tree, damaged shoots/panicles due to mealy bug were counted and the percent incidence was worked out.

Scale insect: Out of ten labeled shoots/panicles of each tree, damaged shoots/panicles due to scale insect were counted and the percent incidence was worked out.

On the basis of average incidence data, the different pests were classified as major and minor pests as given below^[9]:

Major pest = > 10 numbers per panicle or > 10 percent incidence

Minor pest = < 10 numbers per panicle or < 10 percent incidence

Results and discussion

The data recorded on the incidence of different pests of mango during vegetative flush and flowering period of 2015-16 and 2016-17 in Sindhudurg district of Maharashtra are presented in Table 1. The data revealed that during flushing and flowering period (October to February), seven different foliage pests viz., mango hopper (*Idioscopus niveosparsus* Leth), thrips (*Scirtothrips dorsalis* Hood), midge (*Erosomiya indica* Grover), mealy bug (*Ferisia virgata* Stebbins), scale insect (*Aspidiotus destructor* Signoret), shoot borer (*Chlumetia transversa* Walker) and leaf miner (*Acrocercops syngamma* Meyrick) were recorded damaging mango foliage and inflorescence in South Konka region of Maharashtra.

From the data presented in table 1, it is revealed that the average incidence of mango hopper (*I. niveosparsus*) in different locations of Sindhudurg district ranged from 9.89 to 12.82 hoppers per panicle with the maximum incidence (12.82 hoppers/ panicle) in village Girye during 2017. The thrips incidence ranged from 6.31 to 15.35 thrips per panicle with the maximum incidence in the Girye village (15.35 thrips/panicle) during 2017. Six different species of mango thrips were found damaging mango foliage, inflorescence and fruits viz., *Scirtothrips dorsalis* Hood, *Thrips flavus* Schrank, *Thrips hawainsis* Morgan, *Bathrips jasminae* Ananthakrishnan, *Thrips florum* Schmutz and *Haplothrips ganglbaueri* Ananthakrishnan.

The percent leaf miner (*A. syngamma*) infested leaves ranged from 7.15 to 8.99 percent at different locations. The highest leaf miner incidence (8.99%) was recorded in village Girye during 2017. The shoot borer (*C. transversa*) infested shoots ranged from 4.00 to 6.67 percent and the maximum shoot borer incidence (6.67%) was recorded in village Girye (2016), Mulade (2017) and Nileli (2017). The mealy bug (*F. virgata*) infested shoots ranged from 3.33 to 6.00 percent with the maximum incidence (6.00%) in the Mulade village during 2016. About 1.33 to 5.33 percent shoots were found infested by the midge (*E. indica*) with the maximum incidence (5.33%) in Vengurle village during 2017. The incidence of scale insect (*A. destructor*) ranged from 0.00 to 4.00 percent with the maximum scale infested shoots (4.00% shoots) in Mulade and Nileli village during 2016.

On the basis of average incidence of different pests, the pests were classified as major and minor pests and the data are presented in Table 2. The data revealed that in Sindhudurg district mango hopper and thrips were the major pests. Whereas, shoot borer, leaf miner, mealy bug, midge and scale insects were the minor pests.

From the data presented in table 2, it is seen that mango hopper was the major pests at all the five locations of Sindhudurg district with the incidence ranging from 10.38 to 12.62 hoppers/panicles. The average incidence of mango hopper in Sindhudurg district was 11.70 hoppers per panicle. Thrips was observed as the major pest in village Vengurle (12.81 thrips/panicle) and Girye (15.33 thrips/ panicle), but it was observed as the minor pest in village Mulade (9.29 thrips/panicle), Nileli (9.92 thrips/ panicle) and Phonda (7.71 thrips/panicle) with the average incidence of 11.01 thrips per panicle.

Leaf miner was found to be the minor pest with the incidence ranging from 7.86 to 8.51 percent. The average incidence of leaf miner in Sindhudurg district was 8.14 percent. The shoot borer recorded as the minor pest. The incidence of shoot borer ranged from 5.00 to 6.50 percent with the average incidence of 5.53 percent.

Mealy bug was recorded as the minor pest with the incidence ranging from 3.67 to 5.00 percent. The average incidence of mealy bug in Sindhudurg district was 4.40 percent. Midge was recorded as the minor pest with the incidence ranging from 1.66 to 5.00 percent. The average incidence of midge in Sindhudurg district was 3.07 percent. The scale insect was recorded as the minor pests with the incidence ranging from 1.00 to 3.66 percent with the average incidence of 2.73 percent in Sindhudurg district.

The present finding are in confirmation with Anonymous (2017 and 2018)^[10-11]. They reported mango hopper as the major pest at Paria (Gujrat), Pantnagar (Uttarakhand), Mohanpur (West Bengal) and Lucknow (Uttar Pradesh). Also, they reported thrips as the major pest at Paria, Sangareddy (Telangana) and Lucknow. Whereas, present result differ from the results of Anonymous (2015)^[12] who reported thrips as a minor pests at Pantnagar and Mohanpur. This might be due to different climatic condition prevailing in their respective region.

Table 1: Incidence of different pests of mango in various villages of South Konkan

S. No.	Name of pest	Average incidence during flushing and flowering period														
		Vengurle			Girye			Mulade			Nileli			Phonda		
		2016	2017	Mean	2016	2017	Mean	2016	2017	Mean	2016	2017	Mean	2016	2017	Mean
1.	Hopper, <i>Idioscopus niveosparsus</i> Leth (Number per panicle)	11.90	12.73	12.31	12.43	12.82	12.62	12.09	11.35	11.72	11.34	11.62	11.48	10.87	9.89	10.38
2.	Thrips, <i>Scirtothrips dorsalis</i> Hood (Number per panicle)	12.85	12.77	12.81	15.31	15.35	15.33	10.37	8.21	9.29	9.95	9.89	9.92	9.11	6.31	7.71
3.	Leaf miner, <i>Acrocercops syngamma</i> Meyrick (% leaves damaged)	7.65	8.91	8.28	7.15	8.99	8.02	8.10	7.92	8.01	8.52	8.49	8.51	7.81	7.91	7.86
4.	Shoot borer, <i>Chlumetia transversa</i> Walker (% shoots damaged)	4.00	6.00	5.00	6.67	4.00	5.33	6.33	6.67	6.50	4.67	6.67	5.67	4.33	6.00	5.15
5.	Mealy bug, <i>Ferisia virgata</i> Stebbins (% shoots damaged)	4.67	3.33	4.00	4.67	5.33	5.00	6.00	5.33	4.33	4.67	5.33	5.00	4.00	3.33	3.67
6.	Midge, <i>Erosomiya indica</i> Grover (% shoots damaged)	4.67	5.33	5.00	2.67	4.67	3.67	2.00	1.33	1.66	2.67	2.67	2.67	2.00	2.67	2.33
7.	Scale insect, <i>Aspidiotus destructor</i> Signoret (% shoots damaged)	2.67	2.00	2.33	3.33	2.67	3.00	4.00	3.33	3.66	4.00	3.33	3.66	0.00	2.00	1.00

Table 2: Status of different foliage pests in South Konkan region during 2015-16 and 2016-17 (Pooled)

S. No.	Name of Pest	Incidence of different pests in village					Average Incidence	Status
		Vengurle	Girye	Mulade	Nileli	Phonda		
1.	Hopper (Per Panicle)	12.31	12.62	11.72	11.48	10.38	11.70	Major
2.	Thrips (Per Panicle)	12.81	15.33	9.29	9.92	7.71	11.01	Major
3.	Leaf miner (%)	8.28	8.02	8.02	8.51	7.86	8.14	Minor
4.	Shoot borer (%)	5.00	5.33	6.50	5.67	5.15	5.53	Minor
5.	Mealy bug (%)	4.00	5.00	4.33	5.00	3.67	4.40	Minor
6.	Midge (%)	5.00	3.67	1.66	2.67	2.33	3.07	Minor
7.	Scale insect (%)	2.33	3.00	3.66	3.66	1.00	2.73	Minor

Major => 10 numbers/ panicle or > 10 percent incidence

Minor = < 10 numbers/ panicle or < 10 percent incidence

Conclusion

From the average data it is concluded that, mango hopper and thrips are the major pests, whereas, leaf miner, shoot borer, mealy bug, midge and scale insect are the minor pests in South Konkan region of Maharashtra.

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