PERIODICAL LESSER DATE MOTH INFESTATION ON INTACT AND DROPPED FRUITS

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ABSTRACT

Lesser date moth, Batrachedra amydraula (Meyr) is a very important insect pest of date. It attacks the date fruits and causes heavy losses. There are three generations of this insect per year. It appears in April, while the fruits are in unripe stage and remains till September. The study was carried out on Aseel variety of date palm, to monitor the peak period of infestation of the insects both on intact fruit as well as dropped fruit on four locations viz: Kot Digi, Kingri, Khairpur and Therhi district Khairpur, Sindh Province, Pakistan. The observations were recorded on weekly basis from 1st April to the end of August during 2007 and 2008. It was concluded that the attack of this insect was on its peak during the months of June. It was also found that the attack on dropped dates was more than on intact fruit. The attack during peak period reached 10-12% in intact fruits and 17-18% in dropped fruits. The infestation percentage decreased during August and September, 2007-08.

Key Words: **Date Palm, Lesser date moth, phenology and infestation.**

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INTRODUCTION

Date palm *Phoenix dactylifera* L. is a heavenly fruit. Its properties have been described in most of the religious books. The ancient Hakeem (Medicinist) has used this fruit as a medicine and food. Presently it has been identified as a most useful fruit and universally used in most of the food items. As far as its production is concerned, it can be grown in coastal, tropical and arid regions where irrigation water is available. The trees of date palm grow slowly, but last for decades. The fruit can be used in many products and various dishes.

Like other fruits date palm have got some production problems and its fruits are attacked by a number of pests such as black palm beetle, *Oryctes rhinoceros*, Linnaeus, greater date moth *Arenipses saabella*, Hampsm, Red palm weevil, *Rhynchophorus ferrugineus*, Oli, lesser date moth *Batrachedra amydraula*, Scales and mites (Baloch, *et al*. 1992, Zaid, 2002). Among these pests, lesser fruit borer, *Batrachedra amydranla* Merck is the most important insect pest of the date palm that causes more than 75% losses to the crop (Michael, 1970 and Elwan, 2000). This insect pest is also known to cause serious damage to date palm is Libya, Egypt, Iran, Iraq, Israel and other countries of the world (Blumberg, 1975 and Blumberg *et al*. 1977). Dates have found their way into sweets, confectionery, chocolates, baking products, preservatives, salads, sauces, and breakfast cereals. Dates also have bulk industrial uses with advancements in food technology, newer and very useful date products are being developed, indicating fruit's bright future. The area under cultivation of dates in Pakistan and Sindh was 84,700 and 29,300 hectares respectively and its total production were 426,300 and 201,100 respectively tonnes Sayed, 2006-2007). Only Khairpur district share is 34% of Pakistan and 83.33% of Sindh even though the area is increasing day by day. Therefore, Khairpur district is known as Queen of Date palm in Pakistan. Khairpur, Kingri and Kot Diji are three major Date palm growing talukas of the district. This district provides economic source to hundreds of thousands families and labour force whose come every year to earn money for their livelihood from all of the provinces especially from Punjab.

In Pakistan date palm is successfully cultivated in the arid regions. In the province of Punjab date plants are cultivated in Dera Ghazi Khan, Multan, Muzaffargarh and Jhang districts. In the province of Balochistan, date palm is grown in Makran Division. In Sindh, district Khairpur is prominent besides others districts. District Khairpur is peculiar in date production because of its typical climatic conditions many varieties of dates are grown there from commercial point of view. ”Aseel” is the most important and popular variety of date palm due to its special taste, it is the high priced item of the markets.

MATERIALS AND METHODS

Pest Phenology

Pest phenology study was conducted on Aseel date palm variety which is most predominant in Khairpur District. Five medium size (10-15 acre) date palm orchards were selected for studies. Pest activity in relation to infestation intensity period was observed throughout the fruiting stage.

Period	***Date palm seasonal cycle (Tree position)***	***Observation intervals***	***Place to look for pest (egg, larva, pupa, adult)***
April(1st week)	Fruit formation	Weekly	Fruit (Larvae)
April(last week)	initial of stone formation in fruit	Weekly	Fruit (Larvae)
May	Unripe fruit	Weekly	Fruit (Larvae)Tree (Adult)
June-July	Ripe fruit	Weekly	Tree (Adult) Larvae
July-August	Fruit harvest	Weekly	Tree/ Frond (Adult)

Egg Monitoring: During the month of February and March insect eggs were monitored in the frond of the tree.

Larval Monitoring

Larval population was monitored on the fruits from April to July. Infested fruits possessing tiny holes near the pedicel show typical symptoms of date palm moth attack. Larval population was monitored on immature, mature and ripened fruits on the tree as well as those dropped on the ground. Hundred each intact and dropped fruits were observed from selected trees at four selected villages on weekly basis from 1st April to the end of August. The infested fruits were counted and recorded.

Pupal Monitoring

After July larvae came out from dates in search for a safe place to rest and begin its pupal stage. The pupae were observed in fronds and other parts of the trunk.

Adult

Adult population was monitored through light trap and sweep-net method. The moths are attracted to artificial light at night. Light was emitted by an ultraviolet lamp which was run by electricity or generator, by using 150 watts mercury bulb. The insect pest was sampled in date palm field using 36 cm diameter sweep net at day time (8-10 am) thirty sweeps were taken from each four fields. This makes a total of 120 sweeps in four fields for each observation. The collected insects in polythene bags were brought to the laboratory. The samples were kept in freezer at 0^{o}C for 24 hours. The specimens were sorted out by the help of camel hair brush into Petri dishes for identification. Data were summarized and analyzed through SPSS-2006 method. The observation intervals were reduced to monthly basis from September up to mid of February.

RESULTS AND DISCUSSION

The insect attack was observed throughout the year. However, the observation intervals during the attack period (April to August) were recorded on weekly basis. But when the insect attack decreased (during off-season months), the observation interval was increased from weekly basis. The pest phenology observation intervals are given in the following table:

Period	**Insect life cycle phase**
Late August to mid February	The pupal period and adult phase
Mid February to early April	Eggs and larval stages with frond of the tree.
Late April to late August	Eggs, larvae, pupae and adult phases

The results of population studies of lesser date moth on date palm orchard were carried out through out the year. Data in Table I revealed that the emergence of the first adults coincides with the beginning of pollination of dates, and the adults feed on the pollen and the female oviposit on the developing fruit clusters and the petioles. The insect attack percentage was observed on weekly basis from 1st April to the end of August. The data on 21 weeks is presented in table for intact and dropped fruit. The table showing intact fruit indicated that the attack started from April and reached to its peak (11.9%) in May and June and it further decreased during August (2.6%).The data showed significant difference at (P 0.05). The infestation was almost negligible during September.

Table I *Mean infestation percentage of lesser date moth on intact and dropped fruit in Khairpur district*

Month	Week	Percent fruit infestation*	
		On tree	Dropped
April	1	6.52	15.25
	2	6.95	17.3
	3	8.35	19.15
	4	8.95	20.1
	5	9.15	18.3
May	1	10.1	25.8
	2	11.65	23.35
	3	11.9	16.75
	4	10.55	18.65
June	1	10.75	20.55
	2	11.45	20.7
	3	11.9	14.75
	4	11.7	18.3
July	1	10.25	16
	2	9.65	14.55
	3	8.25	12.7
	4	8.25	12.65
August	1	8.6	9.8
	2	5.6	9.9
	3	4.4	8.5
	4	2.6	6.65

*****Mean of four replications

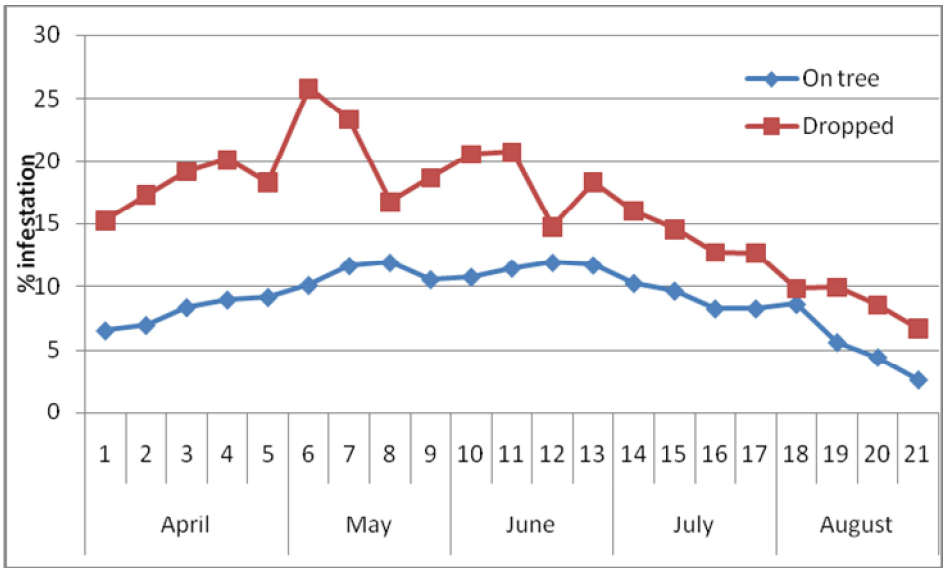

Fig.1 Mean infestation percentage of lesser date moth on intact and dropped fruit in Khairpur district.

Data in Table I showed that the lesser date moth infestation started in 1st week of April .Its intensity during April was recorded up to 20.1 %. However, the lesser date moth attack on dropped fruits was on peak (25.8 %.) during May.

The insect attack in dropped fruits was observed higher than intact fruits. The reason could be the easy migration of insects from one fruit to another from soil than at bunch of the fruits on the tree. Kamal *et al.* (1977) reported that fallen date fruits were much attacked with lesser date moth and described that tree litter, shrubs and weeds around the trees favoured increased population of insects.

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