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"SURVEY OF INSECTS ASSOCIATED WITH TEMPERATE FRUITS OF KASHMIR"

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ABSTRACT

Kashmir has rightly been described as" the land of fruits. Its land environment and climate has provided greater facilities for horticulture industry to grow more rapidly. Today we see in this valley scores of varieties of apple, pear, almond, Walnut, several types of Cherry and other fruits which are grown and exported to other states. The, apparently, growing fruit industry has changed the social and economic status of our rural Kashmir and helped its people in reshaping their economy, to some extent. However, in the race of cultivating commercialized fruits, the land has been losing several varieties of century's old traditional fruits. The fruit growers here have neglected their traditional fruit culture and are dealing with more commercial ones which yield them quick benefits but not without a huge price. Steps are needed to be taken to encourage cultivation of traditional fruits of Kashmir side by side with the more commercialized ones. Kashmir cultivator has been following the modern trends and techniques in both agriculture and horticulture. He is preferring the varieties of commercial fruit's like Pears and Apples after discarding the indigenous types as these fruit have helped cultivators to earn considerably well and attention has been divested on other commercialized varieties of such fruits, however many insects are there which damage these fruits & result in the heavy loss of fruits which directly effect the economy of the state (J&K).

KEYWORDS: SURVEY OF INSECTS, TEMPERATE FRUITS OF KASHMIR.

INTRODUCTION

Kashmir has rightly been described as" the land of fruits. Its land environment and climate has provided greater facilities for horticulture industry to grow more rapidly. Today we see in this valley scores of varieties of apple, pear, almond, Walnut, several types of Cherry and other fruits which are grown and exported to other states. The, apparently, growing fruit industry has changed the social and economic status of our rural Kashmir and helped its people in reshaping their economy, to some extent. However, in the race of cultivating commercialized fruits, the land has been losing several varieties of century's old traditional fruits. The fruit growers here have neglected their traditional fruit culture and are dealing with more commercial ones which yield them quick benefits but not without a huge price. Steps are needed to be taken to encourage cultivation of traditional fruits of Kashmir side by side with the more commercialized ones. It is better to promote the indigenous fruit culture of this land as the fruit Industry, nowadays, has been playing a vital role in developing the economy of the valley. The commercial fruits are fetching a good income for the Kashmir farmers and the trend has changed the life standards of Kashmir i villages. At many places the local farmer has discontinued the tradition of rice cultivation and has grown orchards on their agricultural lands. The superior qualities and verities of apple and pear orchards are coming up on agricultural lands which have changed the life standard of an average farmer. Knowing all this, we should not neglect those traditional fruits which this land has been producing from ancient times.

MATERIAL AND METHODS

The material used and methodologies followed in conducting studies on "Seasonal incidence and management of insect pests of apple, pear, peach etc are described here as under An extensive survey will be conducted in districts, Srinagar & Anantnag of Kashmir valley (India) in order to study the occurrence of insect pests associated with temprate fruits. In each district, different areas will be selected for surveying. In district Srinagar, some areas should be taken, while in district Anantnag the locations are khanabal, bijbehra & nanil. The survey will be conducted at weekly intervals on different fruit trees such as apple, pear & peach. Roving survey will be undertaken to record the different insect pests like san josescale, wooly aphid apple, codling moth, pear psylla stem borers etc and their natural enemies, In each location, once one spot will be selected for the purpose of counting average incidence of different insect pests. For sampling, 25 plants will be randomly selected in each orchard,

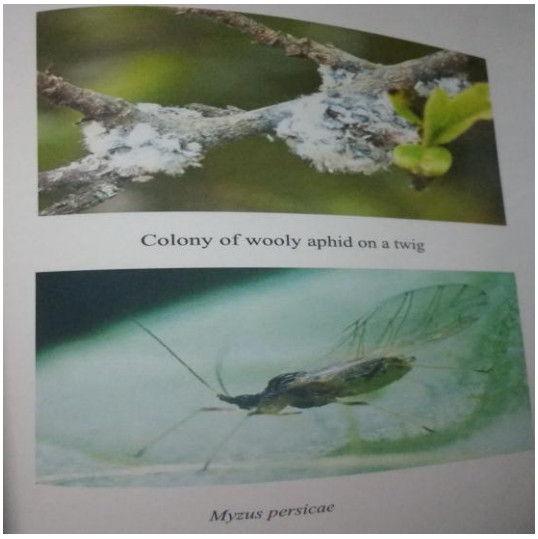
andobserved forcounting the number of plants infested by san jose scale wooly aphid, pear pysilla etc. Theper cent infestation will be calculated by using the following formula.

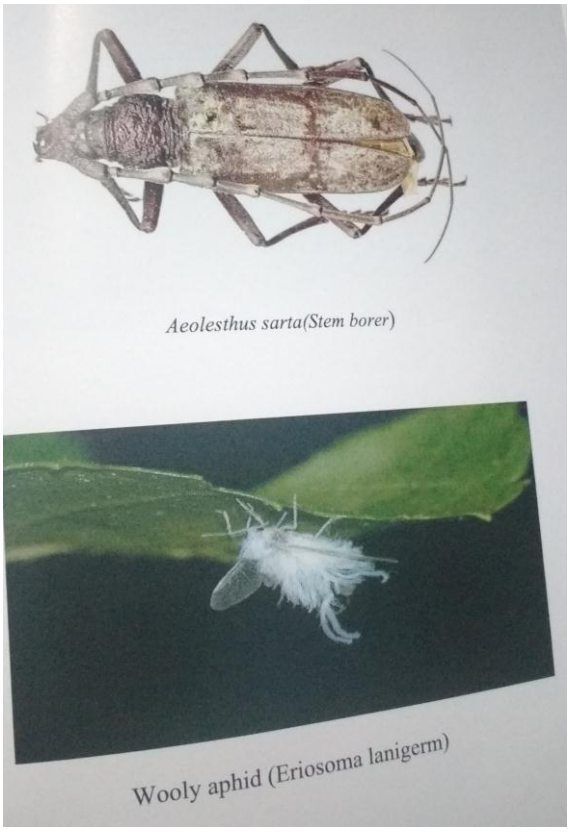
$$\text{Per cent infestation} = \frac{\text{Number of infested plants}}{\text{Total No. of plants}} \times 100$$

The number of insects will be counted from one sq cm leaf area on three leaves per plant using five plants for each observations.

Identification of specimens

Different insect pests will be collected, reared till adult stage, killed and preserved as per the standard protocol for different types of insects. The different insect pests and natural Enemies will be identified by division of Entomology, SKUAST Kashmir (J&K).





Review of literature

Review of Literature collected on various aspects of insects of apple. Pear & peach are presented here under different headings. Growing of fruit plants both wild and cultivated is a very old tradition for the man to support his family (Green,1903). Among the fruits, worth mentioning, apple is unbeautifully the most important temperate fruit, very widely distributed in the temperate climate conditions of the world like USA, Russia, China, India, South Africa and South Australia (Hayes, 1966). Frequent fluctuations in the environmental conditions occur in the Jammu region during the fruiting season of apple crops. Fluctuation in the environmental conditions directly or indirectly affects the apple crops and because of this apple orchids suffering losses and meager productivity because of certain limiting factors which includes attacks insect pests (Bindra,1967). (Burckhardt and Hodkinson 1986). (Slingerland 1892), have workdone on the different pests of pears. Two generations of S. scolytus on elm (Beaver 1967) and also of S. mali on apple (Rudinsky et al. 1978) were described under European conditions. Both these species overwinter in the larval stages. However, S. amygdali had 4 generations annually on fruit trees of Baluchistan (Janjua and Samuel 1941) and 5 generations per year on pear trees in Egypt (Kinawy et al. 1991). The developmental durations and generations of S. nitidus do not coincide with its related species worked out by other researchers (Beaver 1967, Janjua and Samuel 1941, Kinawy et al. 1991,

Li-JiangLin et al. 1995, Mustaga 1991). At least seven species of pear (*Pyrus*)-feedingpsyllids in the genus *Cacopsylla* are recognizedfrom the western Palearctic region. chloride dip treatment and gamma irradiationon storage quality and shelf-life extension Red delicious apple". Published online 6February 2011, Journal of Food Science and Technology, Springer. Hussain, P. R., Meena, R. S., Dar, M. A., Wani, A. M. "Gamma irradiation of sun-driedapricots (prunus armeniaca L.) for quality maintenance and export purposes". Published online 3 March, 2011.Prasher, R.S., Nadda, A.L. and Thakur, K.S. (2000) have done on the work of insects of apple. Jones, V.P, et.al. (1989). have given literature about apple maggot in Kashmir, they havedone alot of work on other insects associated with apple example as San Jose Scale, red mites etc. Hussain, P. R., Meena, R. S., Dar, M. A., Wani, A. M. "Effect of post-harvest calcium. Borers are known as chronically damaging pests and their inaccessibility in woody hosts made it practically difficult to investigate their bionomics and control measures; for the same reasons there have been few published reports on the population dynamics of cerambycid species under field conditions (Donley, 1978, 1981, 1983; Nielson, 1981; Powell, 1982). Some coleptera are found to damge some peachs and creat a loss of damage (Summer 2008). the overwintered generation or offspringof the overwintered generation with insecticides(Westigard and Zwick 1972, Beers et al. 1993).

RESULT AND DISCUSSION

Kashmir has rightly been described as" the land of fruits. Its land environment and climate has provided greater facilities for horticulture industry to grow more rapidly. Today we see in this valley scores of varieties of apple, pear, almond, Walnut, several types of Cherry and other fruits which are grown and exported to other states. The, apparently, growing fruit industry has changed the social and economic status of our rural Kashmir and helped its people in reshaping their economy, to some extent. However, in the race of cultivating commercialized fruits, the land has been losing several varieties of century's old traditional fruits.

Pests of Apple

1. San Jose Scale *Quadraspidiotus perniciosus* (Diaspididae: Homoptera)

Distribution: It is indigenous to Eastern Asia and has spread to many parts of the world. It is widely distributed in all the apple growing countries of the world. It was introduced in India (Kashmir) from France in 1906 and by now it has been recorded on more than 150 host

plants, including almond, apple, apricot, cherry, chestnut, citrus, crab apple, grapevine, gooseberry, mulberry, peach, pear, plum, quince, raspberry and strawberry.

Nature of damage: These tiny insects suck the sap; as a result, the young plants in the nursery become weak and ultimately die away. The leaves, twigs, fruits and sometimes even the entire bark may be seen covered with ashy-Grey scales which can be easily scraped off exposing the orange colored individuals beneath. The affected fruits present pink colored areas around the scales and the market value of such fruits is reduced.

2. Wooly aphid *Eriosoma lanigerum* (Hausman) (Aphididae: Homoptera)

Distribution: It is native of America and is cosmopolitan in distribution except for hotter parts of the tropics. In India, it was first recorded in 1889 at Conoor (Tamil Nadu) damaging young apple trees and has since then, spread to all the apple growing areas of India. Its alternate hosts in India include crab apple, pear and quince. The pest is active throughout the year.

Nature of damage: It attacks primarily the underground roots but winged form also attacks trunk, branches, stems, twigs, leaf petioles and fruit stalks. Upward and downward migrations are accentuated during hottest and coldest seasons respectively. Maximum migration from roots to aerial parts takes place in May and in the opposite direction during December - January. Due to the desapping caused by this pest, the affected trees present a sickly appearance, lose vigour and the growth of these trees as also their fruiting capacity are adversely affected. In case of young tees, the roots disintegrate to such an extent that these trees are easily blown over by even moderately strong winds.

Nature of damage: Eggs are laid singly on leaves, blossoms and fruits. The freshly hatched caterpillars feed on leaves for a while, then burrow inside the fruits and feed on the pulp. The entry holes become quite conspicuous as these are filled with dry brown frass and are surrounded by a dark reddish ring. The infested apples become brighter in colour than those that are not infested and also ripe prematurely. The fruits that are attacked early in the season often drop down before the crop is ready for harvest.

Pests of pear

Pear Psylla (Psylla Pyricoala):- The adult Psylla pyricola looks somewhat like a tiny cicada. Early season adults are small and are dark redih brown colour with blac bands on the

abdomen. The wings are held roofly like over the sides of body and are nearly translucent Eggs are yellowish and may be seen with thehelp of hand lens in crease of bark. There may be three or four generations per year.

Adults of summer generation may differ from those of hibernating onesbeing about one third smaller and having brighter coloring and different wing markings. Psylla pyricola attacks all varieties of pears it is asucking insect and feeds on plant saps Heavy feeding and injection of toxic saliva by psylla pyricola may cause early defoliation and loss of fruit crop. On the fruit a roughning or russet of the skin occours. It can be a limiting factor in pear production. It is a native species that produces abundant honeydew, which allows a sooty fungus to grow on the fruit surface. The result can be severe tree injury.

Nymphs have sucking mouthparts and feed on plant sap. The young nymphs are soft-bodied and creamy yellow. As they mature they become dark brown and more oval in shape, with distinct wing pads present on the late instars. These late instar nymphs are commonly referred to as “hard shells.

INSECT PESTS OF PEACH

Stem borer: *Aeolesthus parta* (Lamiidae: Coleoptera)

Distribution:- Aeolesthes parta (Coleoptera: Cerambycidae) origin is believed to be Pakistan and Western India. It is known to occur in Northern Afghanistan, mainland China and Western Tibet; western Himalayas, Kashmir, Himachal, Pradesh and Jammu of northern India; Iran, South Kazakhstan; localized Northwest restricted distribution in Pakistan; Tajikistan; Turkmenistan and Uzbekistan.

Host

Aeolesthes sarta is a polyphagous insect. Its preferred hosts include English walnut, apple, planetree, poplar, willow and elm. However it may also attack maples, alders, birch, quince, Russian olive, ash, locust, mulberry, Prunus (stone fruits), pears and oaks.

Identification:-The eggs are white, about 3-4 mm long. The larvae are pale yellowish in color with black mandibles and range 60 – 70 mm in length and are covered with golden hairs. The adult has an elongated, dark grey-brown body, 28-47 mm long, with the elytra being obliquely truncate at the apex and covered with short silvery hairs. Shiny, silvery spots form two irregular bands crossing the elytra. The male is usually smaller than the female. The male

has antennae 2.5 times as long as the body, whereas the female antennae are shorter than the body.

OBJECTIVES OF THE STUDY

The present study has been taken up to have a preliminary survey of the insect pests with the following objectives:-

1. To study the faunistic composition of the insect pests of temperate fruits in Kashmir.
2. **Nature of damage**

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