Research Paper

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"Seasonal Incidence of Scale Insect *Hemilecanium Imbricans* (Green) on Mango and Different Host Plants in Dharwad District of North Karnataka"

Agriculture

KEYWORDS : Scale insect, Mango, Host plants, Hemilecanium imbricans

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ABSTRACT

The scale insect Hemilecanium imbricans (Green) was found damaging the twigs and tender branches of many host crops along with fruit crop mango. This pest was active during winter (Nov-Dec-Jan) and affects the growth of the host plants adversely. The incidence of this scale starts from October months and persistent up to May-June on all host crops. The eggs of these insects were observed during October-November months on all host plants. However on all different host plants the incidence of scale insect was peak in February and March months with a range of 90.40-190.80 per 10 cm length of twigs which were coincide with the grand growth stage of all host plants. The recorded hosts other than mango were includes, viz., Ficus religiosa, Jathropa curcas, Flyggea lycoperos, Elaegnus conferata, Sterospermum persunatum and Legerstromia flas regini. Among all the host plants the mango infested with maximum number of scales (190.80 per 10 cm length). The data on scale insect population on many hosts revealed that incidence was recorded with range of 90.40-190.80 per 10 cm length. The highest number was recorded on mango and least number was on Flyggea lycoperos (90.40 per 10 cm length). Other hosts viz., Ficus religiosa (128.80), Jathropa curcas (95.80), Elaegnus conferata (105.80), Sterospermum persunatum (96.00) and Legerstromia flas regini (188) were also harbored the highest scale insect population.

Introduction:

The scale insects are small insects of the order Hemiptera, suborder Sternorrhyncha. They comprise the super family Coccoidea, previously placed in the now obsolete group called Homoptera. Scale insects vary dramatically in appearance; some are very small organisms (1–2 mm) that grow beneath wax covers to shiny pearl-like objects, to creatures covered with mealy wax. Adult female scales are almost always immobile and permanently attached to the plant they have parasitized. Adult males usually have wings (depending on their species) but never feed, and die within a day or two. Most scale insects are parasites of plants, feeding on sap drawn directly from the plant's vascular system. Scale insects feed on a wide variety of plants, though particular species commonly are specific to particular host plants or plant groups. Scale insects are serious plant pests and because they are small and cryptic, they frequently are not detected until they have caused significant damage. They are most important as agricultural pest of perennial plants and can cause serious damage to nut and fruit trees, woody ornamentals, forest vegetation, greenhouse plants, and house plants. Damage is usually caused by removal of plant sap, injection of toxins and the excretion of large quantities of honeydew with resultant growth of sooty mold fungi that cover leaf surfaces and reduce photosynthesis.

In mango orchard of Nakhon Pathom and Sukhothai provinces, Thailand, *Hemilecanium manngiferae* was reported causing serious infestation during April associated with sooty mold. On some trees, the surface of the twigs and branches was completely covered by the insects. Large amount of sooty mold were growing on the honey dew, blackening the ground just below the infested canopy, and also on the trunk, branches and twigs. Furthermore, the leaves of the infested trees showed a signs of yellowing (Kondo and Michael, 2005).

Material Methods:

Extensive survey of scale insects was made during the years 2013 and 2014 by visiting various mango orchards and other host plants in Navalur, Jogellapur, Kelegari and Mugad villages of Dharwad districts of North Karnataka, at fortnight interval. The observations on small twigs (10 cm length) leaves and fruits and damaged symptoms were recorded at fortnight interval .The infested samples were collected along with scale insects and diversity of scale pest was studied by consulting literature and also sent to National Bureau of Agricultural Insect Resources (NBAIR), Bangalore for identification. The population counts on the number of crawlers, adults on twigs, and all parts of host plants covering all the direction were made. For damage detection spot observations were made in the fields. The incidence of the scale was recorded on different parts of hosts along with mango crop. The population dynamics of scale insect on different hosts were recorded along with symptoms and presented in table 1.

Results:

Results recorded indicated that scale insect *Hemilecanium imbricans* (Green) was found damaging the twigs and tender branches of many host crops along with fruit crop mango. The *Hemilecanium imbricans* is most abundant and damaging scale pest which affected the growth and development of all host crops including mango. It was active during winter (Nov-Dec-Jan) and affected growth adversely. The incidence of this scale starts from October months and persistent up to May-June on all host crops. The eggs of these insects were observed during October-November months on all host plants. Once eggs hatched from the encrusted cups the newly hatched young ones (Crawlers) they crawled all over the plant surface and preferred to settle on young succulent tissues of the host plants by inserting their hairy thread like sharp stylet. Due to heavy incidence of this pest on different host leads to whiting of all infested parts and wilting of affected parts and leads to death of the infested parts. Development of sooty mold on the excreted honeydew on different parts of the hosts was also common in all hosts. The tender branches were found seriously affected with distinguish, forming whitish, brownish circular spots and marking the infested branches. Once crawlers settled there is no further movement until completion of its life cycle. The settled instars continuously produce white waxy material on its body through wax glands. Due course of time the growth of settled scales increased and overlaps each others on the tissues which looks like white band appearance on the infested part. Due to continuous sucking of the sap from tender branches of the host plants leads to excretion of honey dew. On this honeydew there is development of sooty mold on the plant parts, which inhibits the photosynthesis process and retards the growth and development of the plants.

The population dynamics of scale insect, *Hemilecanium imbricans* indicated that, the incidence was started in first week of October and persistent up to May-June on all host crops along with mango. Further the incidence of scale insect, *Hemilecanium imbricans* was observed very severe during months of February and March. Due to heavy secretion of wax on its body appeared as white thick band on affected parts of the plants. However on all different host plants the incidence of scale insect

was peak in February and March months with a range of 90.40-190.80 per 10 cm length of twigs which were coincide with the grand growth stage of all host plants. The recorded hosts other than mango were includes, viz., *Ficus religiosa*, *Jathropa curcas*, *Flyggea lycoperos*, *Elaegnus conferata*, *Sterospermum persunatum* and *Legerstromia flas regini*. Among all the host plants the mango infested with maximum number of scales (190.80 per 10 cm length).

Discussion:

The data on scale insect population on many hosts revealed that incidence was recorded with range of 90.40-190.80 per 10 cm length. The highest number was recorded on mango and least number was on *Flyggea lycoperos* (90.40 per 10 cm length). Other hosts viz., *Ficus religiosa* (128.80), *Jathropa curcas* (95.80), *Elaegnus conferata* (105.80), *Sterospermum persunatum* (96.00) and *Legerstromia flas regini* (188) were also harbored the highest scale insect population. However, there was a steep increase in the population of scale insect from first October to January recording a maximum population during February-March months. Later the pest population started declining from second week of February where coincides with male emergence irrespective of the host plants.

These results were to similar findings of Vijay and Suresh (2013) who reported that *Hemilecanium imbricans* was mainly found in ornamental shrubs. Pest can be recognized by the presence of white mealy wax/Powdery coating on the stem. They have also recorded this pest on *Emblica officinalis* in Tamilnadu. The increased incidence may be due to frequent and overuse of insecticides. The results on incidence of this scale insect on *Jathropa* plant were similar findings with Ali, (1971) who recorded this pest on *Jathropa multifedia*. The results on seasonal incidence of scale insects on many hosts were also supported by Suresh and Chandra Kavitha (2007) who reported that the mealy bugs were most abundant during May month. The Cerococcid population was present between October and February. The population of *S.coffeae* was present throughout the year but most abundant during February and March.

Table 1: Recorded host plants of scale insect Hemilecanium imbricans during survey period

SL. NO.	Host plant scientific name	Family	Mean population of scale insects per 10 cm twig* (Range)	Period of occurrence	Location
1	Mangifera indica	Ancaradiaceae	190.80 (180-201)	October-May	Navalur, Kelgare,Mugad and Jygevellapur
2	Ficus religiosa	Moraceae	128.80 (110-150)	September-April	Mundagod
3	Jathropa curcas	Euphorbiaceae	95.80 (92-99)	September-April	Agriculture College Campus Dharwad
4	Flyggea lycoperos	Phyllanthaceae	90.40 (88-94)	September-April	Agriculture College Campus Dharwad
5	Elaegnus conferata	Elaeagnaceae	105.80 (99-114)	October-March	Agriculture College Campus Dharwad
6	Sterospermum persunatum	Bignoniaceae	96.00 (89-101)	October-March	Agriculture College Campus Dharwad
7	Legerstromia flas regini	Lythraceae	188.00 (185-194)	September-April	Dharwad

* Average of five twigs

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