

## Glyphodes Infestation in Mulberry

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Received: 27.11.2017 | Revised: 8.12.2017 | Accepted: 15.12.2017

### ABSTRACT

*One of the major factors that decides the productivity and profitability in sericulture is the maximization of quality mulberry leaf per unit area. Being a major pest, Glyphodes pyloalis walker takes a heavy toll of mulberry especially from July to October under Kashmir climatic conditions. The damage is mainly caused by the fourth and fifth larval stage of the pest from July to October under Kashmir conditions. Though this insect still finds enough time and place on mulberry leaves for its feeding and breeding habits, feeding of such leaves to silk worms affects their growth and development, thereby reducing the quality silk production which ultimately has negative impact on overall growth of silk industry.*

**Key words:** *Glyphodes pyloalis, Pest, Mulberry, Sericulture, Kashmir.*

### INTRODUCTION

Glyphodes pyloalis walker is a moth in the Crambidae family. It was described by Walker in 1859. It is found in Iran, China, Japan, India, Indonesia, Sri Lanka, Tiawan, Florida of North America. It is a monophagous Lepidopteran pest of family Pyralidae (crambidae), which is also known as mulberry defoliator. *Glyphodes pyloalis* walker is a major pest of mulberry in temperate regions, which causes a great loss to the mulberry yield (above 10%).

Mulberry is the sole food of silkworm *Bombyx mori* L. prone to depredation of diverse organisms, because of its growth throughout the year. The pests that cause considerable damage to mulberry is sporadic and sometimes, seasonal. Insect pests are

known to interfere considerably with all the phases of sericultural practices and account for 20 to 25 per cent crop loss world wide Sengupta *et al.*<sup>7</sup>. The importance of quality of mulberry leaves on growth, development and silk production in silkworm is well documented Dasgupta<sup>3</sup>, Yokoyama<sup>11</sup>, Kulbir<sup>6</sup> and Mir<sup>10</sup>.

So far over 300 insect and non-insect, species of pest are known to infest mulberry in various intensities during different stages of the crop and season Reddy and Kotikal<sup>9</sup> and Zeya *et.al.*<sup>12</sup>, In India, more than 70 insect and non-insect species belonging to Lepidoptera, Hemiptera, Coleoptera, Thysanoptera, Orthoptera, Isoptera and Acarina are known to feed on mulberry crop Biradhar<sup>2</sup> and Naik<sup>8</sup>,

**Cite this article:** Hassan, F. and Mir M.A., Glyphodes Infestation in Mulberry, *Int. J. Pure App. Biosci.* 6(1): 1195-1197 (2018). doi: <http://dx.doi.org/10.18782/2320-7051.6039>

Some of the major insect pest of mulberry like Bihar hairy caterpillar – *Siplosoma oblique*, leaf roller – *Diaphania pulverulentalis* and mealy bugs- *Maconellicoccus hirsutus* Green are known to cause a crop loss of 25 per cent to 30 per cent, 12 to 15 per cent and 10 to 15 per cent respectively Manjunath *et al*<sup>5</sup>.

Zeya *et al*<sup>13</sup> reported that almost all the mulberry genotypes are prone to attack by a number of insect pests in different seasons causing considerable loss to cocoon crop both qualitatively and quantitatively in Jammu and Kashmir state.

In 1995-96 an extensive survey was conducted in various agro-climatic zones of Kashmir valley in order to identify the insect pests of mulberry. Different pests belonging to different families of the order Lepidoptera were found to be new on mulberry. Among different pests, the infestation by *Glyphodes pyloalis* *Glyphodes pyloalis* walker in Kashmir valley was found to be 20 to 40 per cent at Temperate Sericulture Research Institute Mirgund. Anonymous<sup>1</sup>. Insects have been found to cause around 20 per cent of loss to silk production. In 2003 during the survey about 20 to 25 per cent was reported due to *Glyphodes pyloalis* Walker during July to October. Zeya *et al*.<sup>14</sup>, Insect pests are known to interfere considerably with all the phase of sericultural practices. During infestation, the insect pests damage physio-chemical processes of the foliage of mulberry which ultimately alter biochemical constituents of the plant. Feeding of *Glyphodes pyloalis* infested leaves affects the silkworm growth and development which in turn deteriorates the quality of silk produced. Farooz<sup>4</sup>.

**Life Cycle:** *Glyphodes pyloalis* walker belongs to kingdom Animalie, phylum Orthopoda, class Insecta, order Lepidoptera and family Crambidae. The life cycle of *Glyphodes pyloalis* walker is of complete metamorphosis (holometabolite) that is. egg-larva-pupa-adult. The lifecycle of this pest synchronizes with the lifecycle of silk worm. The moth is nocturnal and each female moth lays about 200 eggs on the ventral side of leaves which are pale yellow in colour, round

and measuring 0.2mm in size. These eggs hatch into larvae within 5-6 days. The larvae are slender, fusiform, segmented and measuring from 0.2mm to 2cms in length. The larvae has three pairs of forelegs, four pairs of hind legs and a pair of caudal legs. These larvae become mature and get transformed into brown pupae and finally into moth and the whole life cycle gets completed in about a month.

**Economic Damage:** In Kashmir agro-climatic conditions the *Glyphodes pyloalis* walker infestation is mainly recorded in mulberry plants during July to October. *Glyphodes pyloalis* walker (Pyrallidae: Lepidoptera) assumed greater significance in recent years owing to its damage to mulberry plants both qualitatively and quantitatively. The newly hatched larvae spin fine silky net of threads around themselves and eat leaf flush, leaving behind transparent cuticular layer. The excreta of larvae is held in the fine silky threads, making leaves unfit for silkworms. The reduction in leaf quality by this insect pest leads to inferior performance of silk worm breed especially in autumn season. Therefore the quantity and quality of mulberry leaves in rearing decides the prosperity of sericulture.

The pest damages foliage, deprive the nutrients and arrest the growth of plants. The pest damaged leaves can be detected easily from the mulberry garden. The damage is caused by the larvae stage, mainly the infestation range is highest in 4<sup>th</sup> and 5<sup>th</sup> larval stage. The larvae web the leaves together and feed inside the leaves. The larvae eat all the internal green portion of the leaf and skeltonise the mulberry leaf. The infested portion of the leaf is dark brown in colour and lacks various components like proteins, sugars, chlorophyll, moisture content etc.

**Management:** The infestation by this pest can be controlled by adopting different management practices like as:-

1. Hand picking of larval stages and their destruction
2. Deep ploughing and dweeding destroys the hibernating larvae.
3. Burning of diseased (fallen) leaves in the

- month of sep. to oct.
4. Straw banding of trees.
  5. Light trapping for moths.
  6. Spray of 0.04 % D. D. V. P. on the mulberry leaves can reduce the infestation up to 80 to 90 %.
  7. The parasitoid like *Apanteles* spp can be used as a biocontrol agent.

### CONCLUSION

Since the quality and quantity of mulberry leaves play a dominant role in success of silkworm rearing, it is imperative to combat the menace of *Glyphodes* infestation of mulberry by adopting the approved integrated pest management practices without causing much damage to environment especially when autumn rearing is to be conducted on commercial scale Thus *Glyphodes pyloalis* walker can prove as one of the serious biological determinants in the silk productivity under Kashmir conditions if not taken seriously.

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