

Changing Status of *Virachola isocrates* (Fab.) in Different Varieties of Aonla

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ABSTRACT

Commercially Aonla (*Emblca officinalis*) cultivation is increasing due to its great nutritional and medicinal value accompanied by the release of high yielding varieties. It is being grown mainly in agroforestry systems in this region. *Virachola isocrates*, which was a minor pest earlier, has now attained a major pest status on Aonla resulting in the damage to the extent of 38%. The present study revealed that NA 6 (16.04%) and Chakaiya (19.37%) were less susceptible than NA 7 (22.60%) and Kanchan (37.89%). High temperature and low relative humidity along with the pest behaviour favoured the multiplication of this pest.

Key words : *Abiotic factors, aonla, biotic factors, Embilca officinalis, insect pests, pest management, Viruchola isocrates.*

Aonla (*Emblca officinalis* Gaertn), also known as Indian Gooseberry, is an important minor fruit crop of Indian origin. It can be grown successfully in semi-arid climate and in the soils with higher pH and poor fertility status (Pathak and Pathak, 2001). It occupies an area of 20,000 ha with production of two-lakh metric tons and productivity of 15 - 20 t ha⁻¹ (Pathak, 2000). Aonla is widely grown in Uttar Pradesh, Maharashtra, Gujarat, Haryana, Punjab, Tamilnadu, Andhra Pradesh and Kamataka wherein Uttar Pradesh alone contributes for 60% production.

Aonla fruit has special significance due to its high nutritive value and rich medicinal properties. It is a rich source of vitamin-C (ascorbic acid) and is widely used in Unani and Ayurvedic systems of medicine. Aonla fruit is utilized for processing several value-added products like preserves and pickles. It is also an important ingredient of *Chyavanprash*, *Trifla*, *Amla ki Rasayan* and powder, which are good for diabetic patients (Singh, 2001).

In general, Aonla is considered as a hardy tree and few pests and diseases were reported so far causing minor damage (Chandra et al, 1994). But with the release and wide spread cultivation of commercial high yielding varieties like Chakaiya and NA series (NA- 4, 5, 6 & 7) there is a dramatic increase in the pest infestation over the years. *Virachola isocrates* (Fab.), most commonly known as Anar Butterfly was reported as a minor pest on Aonla. But in the last year there was an increase in the population of this pest in Bundelkhand region resulting in the heavy damage of fruits. In view of this, the present study was taken up to know the factors responsible for the changing status of this pest and also to assess the damage in different varieties.

The present study was carried out at Central Research Farm, Indian Grassland and Fodder Research Institute,

Jhansi under silvi-pasture management system. Commercial varieties of Aonla viz., Chakaiya, NA-7, Kanchan (NA-4) and NA-6 were planted in 1996 at spacing of 6 x 6m. All the recommended agronomic practices were followed. *Dichanthium annulatum* was grown in the inter-tree spaces for fodder purpose. Fruiting started from fourth year onwards. Behaviour and nature of damage of the pest was observed. Damage on different varieties was recorded. The number of fruits damaged out of total number of fruits on a branch was counted and percent damage was calculated. Statistical analysis was done after transforming the percent damage values to arc-sine values.

There was a coincidence of the development of the fruit and the lifecycle of the pest leading to more infestation (Fig.1). Flower bud initiation in Aonla was observed during the first week of March and flowers started opening from last week of March. After pollination and fertilization dormancy took place for about three and half months. Dormancy discontinued between last week of July and first week of August. At this point of time, adult emergence took place in *V.isocrates*. Immediately after the emergence, females laid eggs on small fruits (dormancy broken zygote). The fruit development started gradually in the initial stage but rapidly during the last week of August to September. This slow development helped the caterpillars to bore into the developing fruits and feed on developing seeds (Fig.2a & b). At this stage the seed kernels were soft and hence caterpillars could easily bore into the seed. Just before pupation, the caterpillar came out of the fruit and tied the stalk of the fruit with the main branch of the tree with silken strands to ensure that the fruit doesn't fall down, then reentered into the fruit and pupated therein.

A number of commercial, high yielding varieties of Aonla were released over the years, which are being grown in

Short communication

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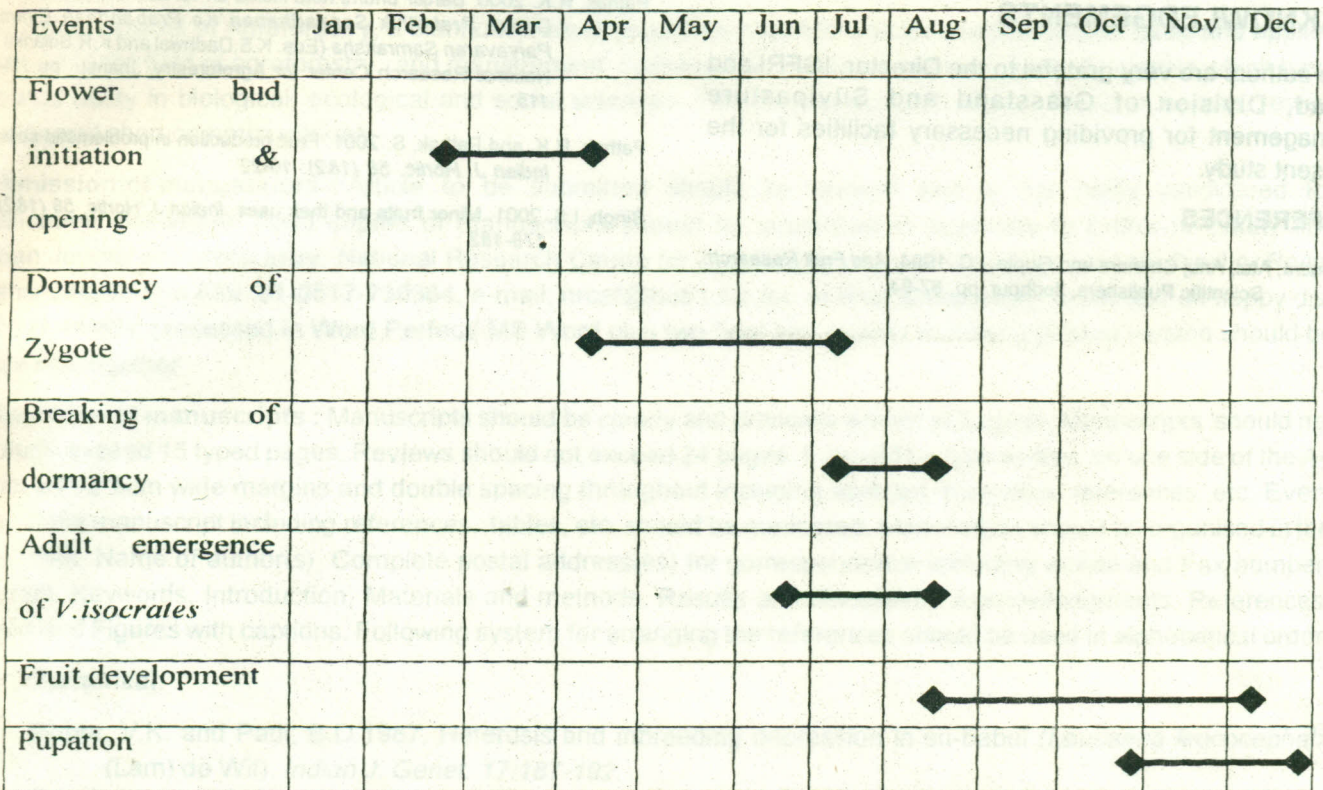


Fig. 1. Calendar of important events in fruit and pest development in Aonla

Table 1. Relative susceptibility of Aonla varieties to *Virachola isocrates*

S.No.	Variety	Mean damage (%)
1	NA-6	16.04 (23.58)
2	Kanchan (NA-4)	37.89 (37.94)
3	Chakaiya	19.37 (26.06)
4	NA-7	22.60 (28.38)
	CD at 1%	3.01

Values in parenthesis are arc-sine values

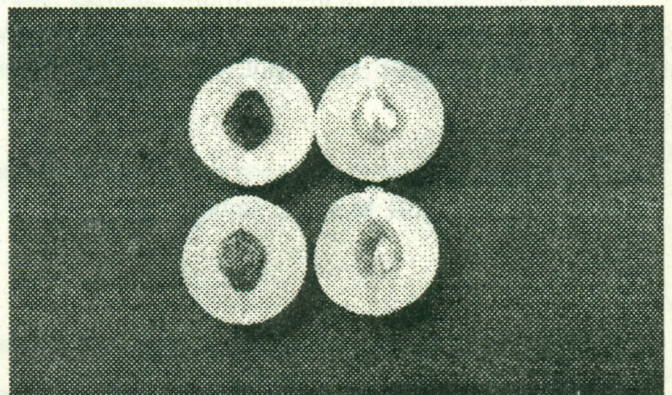


Fig. 2b. Damaged and undamaged fruits of Aonla



Fig. 2a. Aonla fruits damaged by *Virachola isocrates*

this region. Some of these varieties were found highly susceptible. Table 1 shows the percent damage of this pest on different varieties. It was found that Kanchan (37.89%) and NA-7 (22.60%) were more susceptible as compared to Chakaiya (19.37%) and NA-6 (16.04%). Hardiness of the kernel at the time of entry of the caterpillar is an important factor that contributes for the susceptibility. In NA-6 and Chakaiya, stone was small in size and it became hard (due to fast development) earlier than Kanchan and NA-7. The susceptibility/ resistance could also be due to the difference in vitamin-C content (ascorbic acid) at the time of boring into the fruit that needs further investigation.

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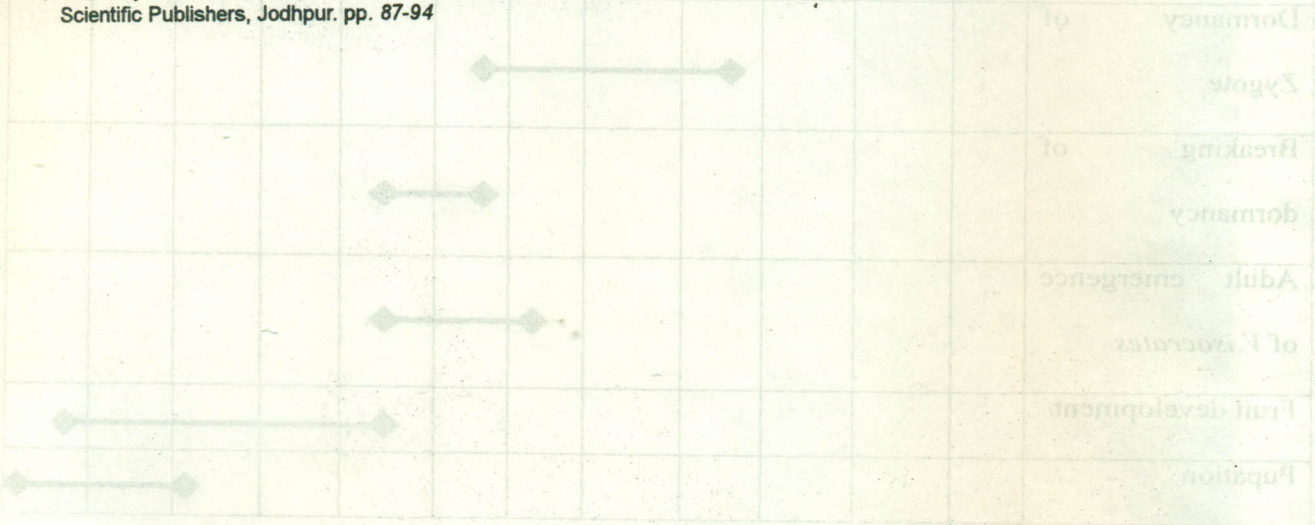


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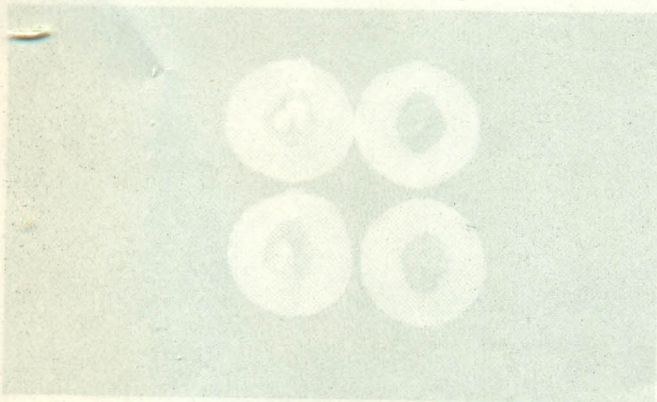


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