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## Study on life history of *Apoderus sissoo* Marshall (Coleoptera: Curculionidae): A pest of *Dalbergia sissoo* Roxb. and *Dalbergia latifolia* Roxb. in Ranchi, Jharkhand

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**Abstract-** The life history of *Apoderus sissoo* Marshall (Coleoptera: Curculionidae): was studied in the laboratory as well as in the field condition. The female *Apoderus sissoo* prepares leaf roll like cigar and lays eggs inside the roll. Making roll is for shelter and food for the young larva. It shows a unique nature of the insect to protect the young one and animal behavior of parental care.

**Key words:** *Dalbergia sissoo*, *Dalbergia latifolia*, *Apoderus sissoo*, leaf roller, Pest.

### INTRODUCTION

*Dalbergia sissoo* and *Dalbergia latifolia*, commonly known as North Indian Rose wood or Shisham is a fast-growing hardy deciduous tree found in India. It is also found in Bihar and Jharkhand. After teak it is the most important cultivated timber tree of Bihar and Jharkhand. Shisham has been extensively planted along road sides, agricultural land etc.

About 125 insect species have been reported to damage shisham. Among them *Apoderus sissoo* Marshall (Coleoptera: Curculionidae) is one of the most important insect pests which has a potential to become a major pest.<sup>1-3</sup> It is a leaf damaging insect and commonly known as leaf rolling weevil causing extensive damage to shisham foliage.<sup>4,5</sup> It damages both in the nursery plants and trees.

### MATERIALS & METHODS

Survey and study were done in different protected areas of forest under Birsa Agricultural University, Kanke, Ranchi and its forest nurseries. Surveys were also done in road side plantations around Ranchi city.

The survey was done from August, 1989 to December, 1991 during the project work<sup>6-8</sup> and again in recent years during March, 2019 to Jan, 2021 to review the infestation status as there was a long gap of 30 years. In recent years random survey was made wherever the host tree (shisham tree) was found in and around Ranchi city.

The insects were collected from shisham plantations by picking the leaf rolls and brought to the laboratory to study the life history. In the nearby shisham plants perforated plastic bags were tied on the rolled shisham leaves where insects were cultured in its own environment to study their life cycle. Some pupa and adult insects were handpicked from the fallen leaves under the trees. Adult

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weevils were collected by swiping insect nets and by shaking the branches of the trees. Beetles killed by Ethyle Acetate in the killing bottles and kept in proper way in insect box by pinning and drying.

**RESULTS & DISCUSSION**

The life history of the insect *Apoderus sissoo* Marshall (Coleoptera: Curlionidae) was studied during the whole year. Four generations were studied in a year. Both the larval and adult stages were found damaging to new leaves. They damage the leaves by rolling them off or by cutting through midrib and defoliation.

After mating in March (new leaves arise after autumn). The females cut slits into leaves and roll up these leaves into cigar shape or cylinders or cradles then they lay four to five yellowish eggs inside them through a hole made in them. The developing larvae feeds and pupate in these cigar shaped leaf wraps. The leaf is folded longitudinally from tip downwards and a compact cigar shaped structure is made. Roll gradually starts drying and ultimately fall down along with pupa. Adults are reddish brown weevil with head drawn anteriorly in to a long snout and posteriorly into a neck. It has three black spots on elytra. Adults come out by making a small hole in dried, rolled mass of leaf.

The eggs hatch within a week from March to July. In rainy season from August to October. It exceeds to 1-2 weeks. It takes about 10 to 12 days to hatch. In winter season it takes further more time about 10- 14 days as the temperature falls. Larval period is 10-16 days in March-April, 6-7 days in May- July, 13-15 days in August to October and more than 20 days to about a month in winter. Most of the insect's larva died in winter in fields as well as in laboratory. Larva pupates inside the leaf. The leaf rolls are dried till pupation and fall down. In laboratory it dries and survival capacity is very low in lab condition. Pupal stage lasts for about one week in March to July and 5-8 days up to October. In winter season it was about 1-2 weeks. Most of the pupa become dormant in winter season and do not survive even in laboratory condition. Life of adult beetle is 7-10 days. Total life span ranges from 3-4 weeks from March to July and about 5-6 weeks in winter when temperature is low.

*Apoderus sissoo* Marshall is most abundant in March and April when new foliage is seen in trees. Control measures can be done in nurseries. The rolled leaves are picked and destroyed by burning.

**Table 1- Life cycle of *Apoderus sissoo* Marshall in Days (Mar, 2019-Jan, 2021)**

Collection (Month)	Eggs (Days)	Larva (Days)	Pupa (Days)	Adult (Days)	Total life span (Days)
Mar-Apr	3-7	10-16	3-6	5-7	21-36
May-Jul	4-6	6-7	3-6	5-7	16-26
Aug -Oct	10-12	13-18	3-6	5-8	21-44
Nov-Jan	10-14	20-30	5-9	5-10	40-62



**CONCLUSION**

The infestation of the insect pest is dependent on the availability of the host plant and abiotic factors like temperature, humidity and rain fall. As the insect has the potential to become a major pest, it may be concluded that it is very important to control the pest population.

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