

# OBSERVATIONS ON OUTBREAK AND BIOLOGY OF OAK DEFOLIATOR, *GAZALINA CHRYSOLOPHA* KOLL.

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## ABSTRACT

In 1989 an outbreak of *Gazalina chrysolopha* Koll. occurred in oak forest (*Quercus dilatata*) causing serious defoliation over an area of 1600 hectares in Bagh Forest Division of Azad Jammu and Kashmir. The moths emerging from mid July to mid August, lay eggs on the under surface of leaves in clusters. Hatching of eggs takes place from mid August to mid September. The caterpillars, exhibiting nocturnal and processionary behaviour, live for 10 to 11.5 months, mid August to end of June next year. Pupation takes place from mid June to end of July for a period of 1-2 months. Their life cycle is annual.

## INTRODUCTION

*Gazalina chrysolopha* Koll. (Thaumetopoeidae; Lepidoptera) became serious for the first time in oak forest of Aliabad Block of Kahuta Range in Bagh Forest Division of Azad Jammu and Kashmir in 1989. Review of literature revealed that the pest existed in the region since long as Stebbing (1914) recorded it defoliating oak, *Quercus lamellosa* of Darjeeling forests in the eastern Himalaya and Sietz (1913) reported it from Kashmir and North-West Himalaya to Sikkim. The pest seems to be widely distributed in hilly areas as Chaudhry *et al* (1966) collected its adults on light in Murree, Thandiani (Hazara), Fatehpur



(Swat) and Bagh (AJK). No work on life and seasonal histories of the pest has been done in the past.

An allied species, *Thaumetopoea processionalae* (Thaumetopoeidae; Lepidoptera), having the same processionary behaviour, has been reported as serious pest of oak forests from Ukraine. (Avramenko *et al*, 1984), Italy (Goidanich, 1983), Germany (Gosswald, 1979) and Iberian peninsula, Spain (Bustillo, 1978).

## MATERIALS AND METHODS

Observations were recorded in the affected oak forests of Kahuta Range during 1989 and 1990. Compartment 33 and 34 of Kahuta and compartment 54 of Chanjal block were surveyed to find out intensity of defoliation. Information about other compartments was supplied by the Range

Forest Officer. A forest in a compartment giving burnt up, brownish and greenish look from a distance was taken as heavy, medium and light defoliation areas, respectively. Affected areas of various compartments was judged by visual observations in company with forest field staff.

Life history of the pest was determined by recording observations on the appearance of different life stages viz moths, eggs, larvae and pupae in the field.

## RESULTS AND DISCUSSIONS

Outbreak: The out-break of *Gazalina chrysolopa* Koll. occurred in 1989 in oak forests of Bagh Forest Division in Azad Jammu and Kashmir, as follows:

Table 1. Incidence and Intensity of Defoliation of Oak by *Gazalina chrysolopa* Koll.

Compartment	Area Affected (ha)	Intensity of Defoliation		
		<u>Light</u> 3	<u>Medium</u> 4	<u>Heavy</u> 5

### KAHUTA BLOCK

27	160	+	+	+
28	80	+	+	
29	80	+	+	
30	20	+		
31	20	+		

### ALIABAD BLOCK

32	140		+	+
33	140		+	+
34	80	+	+	
35	80	+	+	



36	80	+	+
37	80	+	+

#### CHANJAL BLOCK

53	60	+	+	
54	200		+	+
56	80	+	+	
57	60	+	+	
58	100	+	+	
59	140		+	+

The pest, spreading over an area of 1600 hectares of 17 compartments defoliated *Quercus dilatata* with heavy to medium damage in compartment 27 of Kahuta Block, compartments 32 and 33 of Aliabad Block and compartments 54 and 59 of Chanjal Block. In rest of the compartments the pest caused medium and light defoliation.

**Biology:** Life history of the pest was found to be as follows:

Table 2. Life history of *Gazalina chrysolopha*

Life Stage	Appearance	Period (Months)
Egg	Mid July to Mid September	1 - 2
Larvae	Mid August to end of June	10-11,5
Pupa	Mid June to end of July	1 - 2
Adult	Mid July to Mid August	-

The moths, white in colour with three black transverse lines on the forewings, are on wings from mid July to mid August. Eggs are laid in clusters on the inner surface of the leaves, covering with light brown cement intermixed with the anal wool. Hatching of eggs takes place from

mid August to mid September. Larvae after hatching live in groups on the under surface of the leaves for two to three months and feed on epidermis of leaves. The larvae over winter on trees and remain there upto March. Later instar larvae live in silken nests made at the base of the



trees during day and come out at dusk and climb up the trees in regular processions to attack the foliage. They march one behind the other in lines, always the rear ones touching the proceeding ones. Devouring foliage for the while night the larvae return to their nests at dawn in the same way. The larval period is 10 to 11.5 months. The larvae pupate from mid June to end of July depending upon the elevation and aspect of the forest. Pupation takes place either in the nest in cocoon intermixed with tufts of hair or in the soil singly. Pupal period is 1 to 2 months. Life cycle of the pest is annual.

## CONCLUSION

Biology of the pest revealed two weaker links, its annual life cycle and congregational and nocturnal larval behavior. Annual life cycle restricted quick multiplication and population resurgence allowing natural enemies to breed a number of times and overtaking pest population. After night long feeding larval congregation in a colony at the bases of trees at ground level for the whole day made the chemical control practically easier, safer and economical.

Accordingly the pest outbreak was suppressed by insecticidal spray on the resting caterpillars at the bases of trees without adversely affecting the environment. As a result no defoliation has occurred since 1990.

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