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Notes on a larval *ectoparasite (Bracon Sp. Hymenoptera)* on Rice Hispa *(Hispa armigera Ol) aenesces* Baly in Nizamabad District, Hyderabad State

by

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Introduction: Amongst the major insect pests occuring on Rice crop in Hyderabad State, *Hispa (Hispa armigera Ol.)* occupies the most important place. It occurs on both the *abi* seasonal crop which is sown in the months of June – July and *tabi* crop which is sown in the months of January – February.

Apart from Hyderabad State, *Hispa* also occurs as a pest of rice crop in West Bengal, Madhya Pradesh, Bombay, Orissa, Madras and Andhra States in the Indian Union. Padwick (1948) in a review on plant protection and food crops in India mentions that it is present throughout the year in Assam and Bengal and that in 1946 it took a heavy toll of 20,000 acres of crop in Madhya Pradesh, causing an average loss of over 20% in yield. Outside India, the pest is found on Rice Crop in the Republic of China, Formosa, Indonesia and Pakistan. According to Chu (1938), hispa destroyed 3,000 acres of early rice in Pho-lo district in Kwangtung province in China in 1932. Recently, Shen and Kung (1954) have reported that serious out breaks of Rice hispa have occurred in the past few years in Taiwan island, infestation occuring on tens of thousands of hectares.

It is very surprising that in view of its importance in many rice growing countries, nothing seems to be known about its natural enemies. Logothetis (1951), who has reviewed the published work on rice insect pests in S. E. Asia has not mentioned any natural enemy of this important pest. The following notes deal with a larval parasite obtained on Rice hispa in the perennial irrigated zone of Nizamabad district, Hyderabad State. The authors believe that this is the first published report of a natural enemy of the above.

Seasonal History of Rice Hispa: A brief note on the seasonal history of *Rice hispa* is essential in fully understanding the utility or otherwise of the parasite. As already mentioned above the *abi*

seasonal crop is sown in the months of June–July. The crop sown during the above season is a long duration one and transplanting of the crop is common. The nurseries are sown early in June or sometimes even in last fortnight of May. During this period the pest is observed in few numbers on the sprouted stubbles of the previous seasonal crop and early sown nurseries. Soon after the first showers in June, copulation and egg-laying are observed. The first brood adults emerge by 3rd week of July. The transplanting of the *abi* crop will be in full swing at this time. The 2nd brood adults emerge by last week of August. This brood is the most destructive and wide-spread. A small third brood is observed by last week of September but the attack dwindles down and only few adults are observed in October and November on very late sown crops. These adults transfer themselves to germinated stubble crop or early sown *tabi* nursery in 2nd week of December. The 4th brood adults emerge by last week of January and spread on a wide scale. The 5th brood adults emerges by 25th of February and are very harmful to the *tabi* crop. A partial 6th brood emerges by last week of March. Attack dwindles down from here on and adults migrate to early harvested crop stubbles (sprouted).

As already said, it is the 2nd brood that is most destructive in *abi* season and the 5th brood in *tabi* season. The pest population would be at its maximum at these periods and the crops in general would be in their 'active tillering' and 'elongation' stage. Broadly speaking, *abi* crop is safe after August as it would have sufficiently grown to withstand further attack by this pest. The same can be said of *tabi* seasonal crop after February. Observations made by the authors have shown that *Hispa* attack reduces effective tillering in rice crop considerably.

Brief description of the parasite and Biological notes: The *Bracon* sp. *(Braconidae*: Hymenoptera*)* is an ectophagous larval parasite. The body of the adult female is in general brown in colour and measures 2·5 in length and 1·0 mm in width. The eyes are black; Anetennae is dark brown, 22 jointed and 3·0 mm in length. Abdomen is compressed, 0·8 mm long and 1·0 mm broad. Ovipositor is black in colour and 0·1 mm in length. Forewings are hyaline with brownish tinge and measure 3·5 mm x 1·0 mm.

Multiple-parasitism is very common. Host grubs with less than two parasite larvae are rarely encountered. This cannot be attributed to lesser host density or lack of suitable stage of host

grubs. Only medium to full grown grubs are mostly attacked. The full grown parasite larva is white in colour and 3·0 mm in length. After full grown, the parasite spins a cocoon and pupates in the same leaf mine as that of the host. The pupal cocoon is dull white in colour, tough and elliptical. The cocoons are closely packed in the leaf mine. The pupal stage averages six days and the adult emerges out of the cocoon by cutting a neat circular cap at one end. The parasites are short lived, average longevity being 5 days.

Incidence in Nature: The parasite was first observed in March 1957 in Bodhan taluka on *tabi* crop. It was not encountered in 1948 but was got again in last week of August 1949 when 40% of grubs were found attacked. Regular monthly observations were started in 1950 on *abi* and *tabi* seasonal crops which are given below:—

Season	Abi Season			Tabi Season			
	June	July	Aug.	Sept.	Jan.	Feb.	March
1950	Nil	Nil	45%	82%	Nil	Nil	Nil
1951	Nil	Nil	56%	80%	Nil	Nil	Nil
1952	Nil	Nil	42·5%	70%	Nil	Nil	Nil
1953	—	—	Not observed		Nil	Nil	41%
1954	15%	35%	74·5%	—	—	—	—

Two points emerge out of these field collections. The parasite which was first observed in *tabi* season in 1947, was not observed again on *tabi* seasonable crop till 1953. In *abi* season, the parasite which used to be active only after the first fortnight of August till 1952, is now observed as early as last week of June.

An appraisal of the value of the parasite: Till 1953, it was estimated that the parasite was not of much practical utility on the basis of the following points.

(a) Its appearance and activity from August onwards. As observed already, this coincides with the emergency of 3rd brood of *Hispa* in abi season when maximum damage by the pest would have already occured and the crop sufficiently grown up to withstand further attack.

(b) Selection of mainly medium to full grown grubs for parasitisation. Sufficient damage would have occured already to the crop by the early instar grubs.

(c) Its almost complete absence in *tabi* season. *Hispa* is equally destructive te *tabi* seasonal crop as well.

(d) Occurence of multiple parasitism with the attendant defects.

As a result of recent observations, however, it has become necessary to revise our estimate. The almost total disappearance of Hispa in the endemic area of Bodhan taluk a zone of 'normal outbreak' from 1953 onwards appears to be mainly due to the natural check exercised by this parasite as well as the other two minor natural enemies not dealt with here. The area that used to be infested annually by Rice Hispa in Bodhan taluk is given below :—

Year	Area infested in acres
1949	228–00
1950	395–00
1951	138–00
1952	369–00
1953	15–00
1954	12–00 (upto end of August)

The causes of reduction in population of this important pest from the past 3 crop seasons has been preliminarily studied from the following angles :

(1) Climatological factors.

(2) Intensification of Plant Protection measures since 1950 against the pest

(3) Changes in the practice of rice cultivation, especially adoption of high doses of artificial fertilisers to stimulate the growth and yield of the crop.

These studies reveal that inspite of the above factors being uniform in other parts of the district, it is only in Bodhan taluk that the pest has recorded a reduction almost approaching to eradication. This has got to be attributed mainly to the effect of the parasite on the pest.

The parasite has been recorded from all the three taluk in the perennial zone of Nizamabad district viz., Bodhan Banswada and Nizamabad. The following table gives the incidence of parasitisation recorded during the current year at various localities.

Table showing percentage Parasitism of Bracon Sp. during Abil 1954 — '55 season in Nizamabad District

Date	*Locality (taluka)*	*% Incidence*
26—6—1954	Kamareddy (Kamareddy)	Nil.
29—6—1954	Bodhan (Bodhan)	15%
4—7—1954	Kamareddy (Kamareddy)	Nil.
7—7—1954	Alisagar (Bodhan)	60%
26—7—1954	Borgaon (Nizamabad)	24%
27—7—1954	Rudroor (Bodhan)	64·3%

Date	*Locality (taluka)*	*% Incidence*
27—7—1954	Jankempet (Bodhan)	16·6%
31—7—1954	Banswada (Banswada)	10·0%
7—8—1954	Borgaon (Nizamabad)	82·0%
16—8—1954	Rudroor Farm (Bodhan)	50%
22—8—1954	Borgaon (Mozamabad)	84·0%
23—8—1954	Banswada (Banswada)	63·0%
24—8—1954	Humnapur (Bodhan)	90·0%
24—8—1954	Rudroor Farm (Bodhan)	50·0%
25—8—1954	Ghanpur (Bodhan)	93·0%
26—8—1954	Mosrah (Bodhan)	84·0%

Hyperparasites: *Eupteromalus* sp. *(Chalcidoidea: Pteromalidae)* has been observed as a secondary parasite. It has also been got as a primary parasite as well. Other hyperparasites observed are *Dimmockia* sp. and *Achrysocharia cardigaster* Masi *(Chalcidoidea: Eulophidea)*

Summary: Hispa (*Hispa armigera* Ol.) is a major insect pest of rice crop in Hyderabad State observed on both *abi* and *tabi* seasonal crops sown in June–July and January–February respectively. Apart from Hyderabad State, it is found in almost all major rice growing states of the Indian Union, and also in the Republic of China, Taiwan, Indonesia and Pakistan. In spite of such a wide distribution, information on its natural enemies is lacking. The paper deals with larval ectoparasite (*Bracon* sp.) on Hispa observed in the perennial irrigated zone of Nizamabad District in Hyderabad State. Brief description of the parasite and its seasonal incidence in relation to the pest is given. An appraisal of its value as a natural factor in keeping rice hispa under control is also made. The parasite appears promising and the present decline in the incidence of the pest in the Bodhan Taluk — an endemic area noted for its regularity for Hispa infestation is mainly attributed to this parasite, apart from two other minor natural enemies not dealt with. Three hyperparasite have also been observed.

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