

RESEARCH ARTICLE

Seasonality and nesting pattern of warblers in ragi fields

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ABSTRACT

Insectivorous warblers, namely, Indian wren-warbler, *Prinia subflava* Sykes (IWW), streaked fantail warbler, *Cisticola juncidis* (Franklin) (SFW) and ashy wren-warbler, *Prinia socialis* Sykes (AWW) were found frequently in ragi fields. The seasonality of the warblers was observed from August to July. The commencement of seasonal activity of Indian wren-warbler started with the onset of crop tillering. There was continuous increase in their population till earhead maturity and declined then onwards till the crop was harvested. Such a trend was not observed in case of streaked fantail warbler and ashy wren-warbler. Their population was found to be stable throughout the cropping season. All the three species utilized ragi fields for nesting. These insectivorous warblers placed their nests at different heights of the crop stand. The heights of the nests positively correlated with the plant heights ($r=0.74$; $y=7.01+0.67x$; $p<0.001$; $SE=7.76$).

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INTRODUCTION

Ragi (*Eleusine coracana* Gaertn.) is one of the most important dry land crops in India being cultivated mainly in states of Karnataka, Andhra Pradesh, Tamil Nadu, Orissa and Maharashtra. Several insect pests infest ragi crop during various stages of growth, but very little effort has been diverted towards taking up proper control measures. In such a situation, birds serve as other mechanism of regulating the insect pests.

A wide variety of birds are frequently inhabit dry land cultivations and among them Indian wren-warbler was one of the common birds found breeding in grasslands, cultivated land and in open wasteland (Ali and Ripley, 1987). Few studies taken by Beri *et al.* (1972) in mustard fields, Subramanya (1987) and Subramanya and Veeresh (1998a and 1998b) in rice fields, Ranga Rao, *et al.* (1998) in groundnut fields indicated that birds do frequent various crops. Streaked fantail warbler is a bird of grassland and open cultivated that breads in areas with plenty of grass and ashy wren-warbler breeds in grassland, scrub and bush jungle, cultivated tracts and in gardens but not in forests (Baker, 1933). A number of bird

species frequent cultivated fields mainly for feeding (Subramanya, 1987) and insectivorous birds do frequent ragi fields (Vergheese and Subramanya, 1985).

Avifaunal activity is more dependent on food supply, nesting material, sites that provide cover from predator and other natural enemies and other factors contributed to changing avifaunal activity (Anderson, 1972). Both the species Indian wren-warbler and streaked fantail warbler were found in cultivated field almost throughout the year, except when no standing crop was available (Subramanya and Veeresh 1998a). In Australia breeding of different groups of birds and their sequence of nesting correlated with the local period's optimal plant growth (Nix, 1976).

The birds commence nesting in rice fields only when the crop reached certain growth stage (Subramanya, 1987). The nesting activity of streaked fantail warbler synchronizes with the availability of standing crop of rice and rice growing regime (Avery, 1982). Information on exact role played by these insectivorous warblers, seasonality and nesting activity of these birds was lacking. Hence, the seasonality and nesting

activity of insectivorous warblers in ragi fields were studied.

MATERIALS AND METHODS

Field studies were carried out in Gandhi Krishi Vignana Kendra (GKVK), Bangalore from August 1999 to July 2000. During this period the seasonality of the warblers was observed in Millet's scheme area (1.93 hectare), Gandhi Krishi Vignana Kendra (GKVK) entrance (6.09 hectare) and Dryland agriculture area (8.98 hectare). Census of birds was the main mode of gathering data. Bird censusing was carried out twice in a week by spot map method according to International bird census committee and Subramanya (1987) from August to July wherein a fixed route (Census path) was traversed by walking slowly and the position of individual species sighted were marked on a small scale map of the study site. In addition different stages of ragi crop was also recorded.

The details of the nesting activity of the birds were recorded with the help of nest record cards (Subramanya,

1987). Most of the nests were tracked by observing birds with either nesting material or food materials in their beaks with the help of 10 X 50 binoculars. Once the nest was located, a nest record card was maintained and all observations regarding activity of the warblers and their nesting activity was recorded in nest record cards. The reasons for failure of nesting attempt were also recorded. In addition, the height of the nest from the ground level, height of the plants bearing the nest, use of leaves or stem to conceal the nest and materials used to construct the nest were also recorded.

RESULTS AND DISCUSSION

The experimental findings obtained from the present study have been discussed in following heads:

Seasonality of the warblers in ragi fields :

The seasonality of the warblers in the ragi fields is represented in Table 1. The mean populations of the warblers

Table 1: Seasonality of insectivorous warblers at GKVK

Period					
Month	Week	DAS	Average No. of IWW	Average No. of SFW	Average No. of AWW
August	I	7	-	-	-
	II	14	-	-	-
	III	21	-	-	-
	IV	28	-	-	-
September	I	35	-	-	-
	II	42	11.50	2.00	1.00
	III	49	23.00	4.00	1.00
	IV	60	32.00	5.00	1.67
October	I	70	35.00	5.00	5.00
	II	77	28.00	5.00	4.00
	III	84	28.00	5.50	-
	IV	91	29.33	5.30	-
November	I	98	46.00	6.00	-
	II	105	47.00	3.50	1.00
	III	112	44.00	3.00	2.00
	IV	121	43.30	2.50	4.50
December	I	128	30.00	2.50	2.50
	II	135	21.00	0.50	3.00
	III	142	8.00	-	-
	IV	152	-	-	-
January	I	161	4	-	-
	II	168	2	-	-
	III	175	2	-	-
	IV	185	-	-	-
February	I	191	-	-	-
	II	198	-	-	-
	III	205	-	-	-
	IV	213	-	-	-

were arranged over all the three study areas. It was found that the mean population of Indian wren-warbler started increasing from September II week (11.5), reached a maximum (47) during November II week and then decreased abruptly. The birds were not encountered outside the ragi cropping season. The mean population of streaked fantail warbler started increasing gradually from September II week (Two), reached maximum (Six) during November I week and then decreased gradually. These warblers were not seen outside the ragi cropping season (from January till July). The mean population of ashy wren-warbler started increasing gradually from September II week (One) and reached a maximum (4.5) during November IV week. Later the warblers were not seen due to absence of ragi crop.

The activity of Indian wren-warbler started with the onset of crop tillering, increased till ear head reached maturity stage and then declined till the crop was harvested. Such a trend was not observed in case of streaked fantail warbler and ashy wren-warbler. The activity of the two warblers was synchronized with cultivation of ragi crop. These results are in agreement with the study of Ali and Ripley (1987) only with respect to breeding aspect that coincided with the onset of monsoon where Ali and Ripley (1987) stated that the three insectivorous species began to breed with the onset of monsoon and continued till the beginning of winter. However, the commencement of the seasonal activity of the three species of warblers in September that continued up to November was purely due to dry spell owing to delayed monsoon by virtue of which ragi could be sown in 1st week of August. These observations indicate that despite environment being the prime factor which regulates reproduction through physiological regulatory mechanisms, the availability of suitable nesting substrate does play a major role in the onset of building activity of birds (Weise, 1974).

Nesting pattern of warblers in ragi fields :

All the three species of insectivorous warblers utilized ragi fields for nesting. These insectivorous warblers placed their nests at different heights of the crop stand. The details of plant heights and nests heights from ground are graphically represented in Fig.1. It can be seen that nest heights are positively correlated with the plant height ($r=0.74$; $y=7.01+0.67x$; $p<0.001$; $SE=7.76$). The mean plant height and nest height from the ground for Indian wren-warbler was 84.4 cm and 63.5 cm and in case of streaked fantail warbler the values were 87.5 cm and 21.3 cm. Observation on the nesting pattern of Indian wren-warbler and streaked fantail warbler seemed to co-exist within ragi fields by placing their nests at different heights on the ragi plant. Cody (1968 and 1975) indicated such a division of resource permits co-existence among birds.

The nests of Indian wren-warbler were invariably placed at earhead level in ragi crop. The nests were deep cup shaped to pear shaped, entrance placed laterally at the top. The

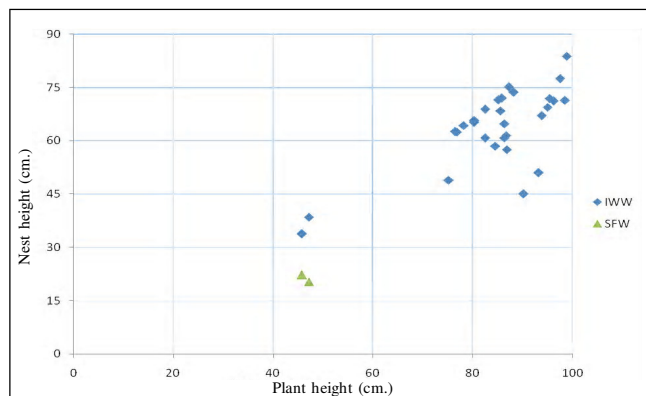


Fig. 1: Correlation between crop heights and nest heights in Indian wren-warbler (IWW) and streaked fantail warbler (SFW)

structure was neatly woven of fine grass fibres and internally lined with dry rachis of grass earheads. The nest of SFW was flask shaped pouch with an opening at the top. These nests were built by vertically fastening the margins of the leaf blades of ragi with cobweb. The nest of ashy wren-warbler was cup shaped with an opening placed laterally. It was built using root bits. Despite their occurrence together in ragi fields, the three resident insectivorous warblers are able to co-exist in ragi fields by different means of resource partitioning.

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