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Assessment of behavior, distribution, ecology and interaction study of Cinnamon Tree Sparrow (*Passer rutilans*) in district Bagh-Pakistan

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ABSTRACT

Introduction: The *Passer rutilans* sparrow female is sexually dimorphic. It is abundant throughout the upper mountain slopes of Azad Kashmir also all over the Murree mountain range. The food of this species is granivorous, however may be further diverse in woody regions with berries as well as fruits.

Materials and Methods: This study was started from December 2016 and end in November 2017; in the surveys linear count survey method was applied; which consists of six transect lines. Both direct method and indirect method were applied for the examination of behavior, anthropogenic impacts, ecology and ethnozoology of cinnamon tree sparrow.

Results: Cinnamon tree sparrow (*Passer rutilans*) time budget was recorded in natural habitat. During the research noted that this bird used greater time in invigilation (31.35%) followed by feeding (22.12%), stand (18.79%), jumping (12.35%), sitting (11.62%), flying (2.41%) and preening (1.37%). *Passer rutilans* prefers to live in rural areas and slightly disturbed areas. This bird parts are also used for different purposes.

Conclusion: It is concluded from this study that the Cinnamon tree sparrow (*Passer rutilans*) spent greater time in invigilation (31.35%).

Key words: Forest, Rural, Preening, Ecology

INTRODUCTION

This species has highly large range, and therefore does not reach the thresholds for threats. The population of this species trend appears to be stable. The population of this species size has not been measured. For these reasons the species is evaluated as Least Concern (BirdLife, 2012; IUCN, 2012). This species is native in the following countries; Viet Nam, Thailand, Taiwan, Russian Federation, Province of China, Pakistan, Nepal, Myanmar, Korea, Japan, India, Democratic People's Republic of Korea, China and Bhutan; while vagrant in Afghanistan (BirdLife, 2012; IUCN. 2012). The world population size has not been measured, but the species is described as locally common, while scarce in few parts of its range (Clement, 1999), while high population was recorded in following countries i.e. China, Korea and Russia (Brazil, 2009).

This sparrow size is as the house sparrow; but the male has whole of the crown, upper back and hind neck are bright chestnut unmarked; while lower back is also bright rufous chestnut alongwith black streaks; and black band present from the lores to eye. Lower neck color is lemon yellow. The throat and chin are black. The ear converts color is grayish buff. The tail and wings are blackish brown and there are two noticeable white wingbars (Roberts, 1992).

This species is less aggressive than *Passer domesticus*. It prefers to live in forest clearings and the edges of forest and away from the human habitation. They start nesting in May and as a result the *P. rutilans* move back to near woodlands. They are regularly met in pairs in summer and breed solitarily, but in autumn and winter from into little flocks (Roberts, 1992). This study was planned to know behavior, distribution, ecology and traditional uses of this bird.

MATERIALS AND METHODS

This study was started from December 2016 and end in November 2017; to analysis ecology, behavior and population of *P. rutilans*. Linear count method was used; which consists of six transects lines, while each transects line consists of 1 km long selected. For the observation of

ecology, behavior, ethnozoology, assessment of distribution of *P. rutilans* used both direct (i.e. physical count and sounds of bird) and indirect methods (i.e. nests, carcasses and body parts). Roberts, 1992; Mirza and Wasiq, 2007; were used for identification of *P. rutilans*.

For the behavioral study following characteristics noted for one hour for hundred times i.e. invigilation, feeding, flaying time, sitting time, stand time, preening, fight time, aggressive time and walking. Random of cinnamon tree sparrow selected each time. For the ecological study following points are noted as; nesting, breeding period, clutch size and broad size. Ethnozoology study consists of following points which were noted; hunting, food, superstitious, harmful impact, medicine and entertainment. Anthropogenic impacts i.e. deforestation and urbanization impacts are noted.

Study area: Bagh is situated 80 Kilometers from Muzaffarabad. The altitude is among 1500m to 2500m above sea level. In the Bagh Mahl nala sub-division, as well as in the Haveli Betar nala, sub-division, are the two main streams. Though, several other streams run in the district (DRU, 2007).

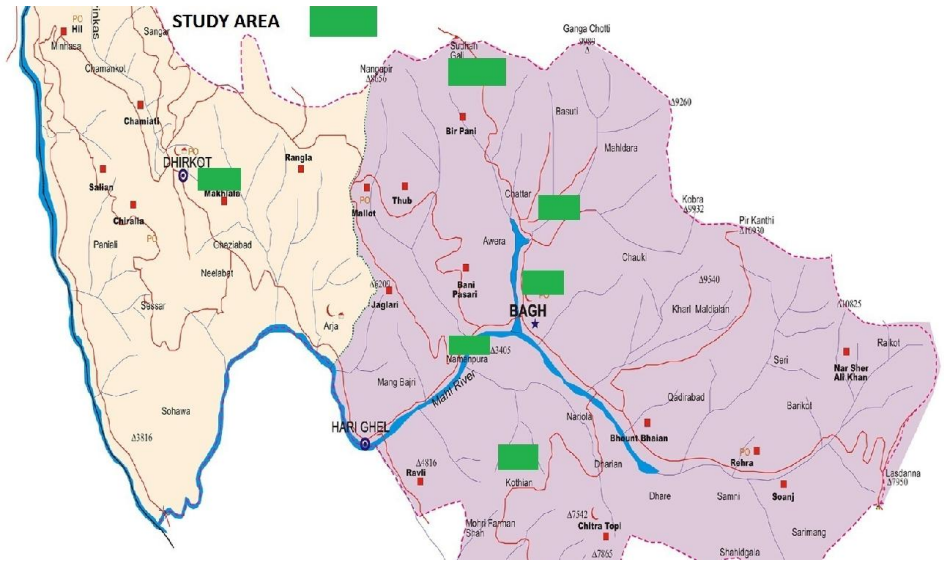

Figure 1: Map of the selected sites of district Bagh.

Time budget of Cinnamon tree sparrow (*Passer rutilans*) in natural habitat was recorded. Throughout the study period cinnamon tree sparrow (*Passer rutilans)* used greater time in invigilation (31.35%) followed by feeding (22.12%), stand (18.79%), sitting (11.62%), flying (2.41%), preening (1.37%) (Table 1).

Table 1: Behavioral study of Cinnamon Tree sparrow from the selected sites of district Bagh.

Behavior	Values
Invigilation Time	31.35
Feeding/Foraging Time	22.12
Flying Time	2.41
Sitting Time	11.62
Stand Time	18.79
Preening Time	1.37
Jumping	12.35

This species recorded higher from the natural habitats than rural habitats and absent from the urban areas (Table 2).

Table 2: Distribution of cinnamon tree sparrow from the selected sites of district Bagh.

Study areas	Sub areas	Distribution
1	Forest	7
	Rural	3
	Urban	0
2	Forest	8
	Rural	2
	Urban	0

During the study noted that, this species was started nesting from the April to September in the study area; while clutch size was as 3 to 5 eggs and brood size was in same number (Table 3).

Table 3. The ecological study of the cinnamon tree sparrow in the study area.

Ecology	Description
Nesting and breeding	Nesting starts from April to September.
Clutch size	Clutches typically contain 3-5 eggs.
Broad size	Broods contain 3-5 young ones.

During the questionnaire noted that *Passer rutilans* is hunted for food, taxidermy and feather collection; which is used in pillow as well as used for medicinal purposes i.e. paralysis, flue and fever as shown in table 4. Similar finding recorded by Haider *et al.* (2017) on white cheeked bulbul (*Pycnonotus leucotis*) in district Bagh, Azad Jammu and Kashmir, Pakistan; while Hakeem *et al.* (2017) on streak laughingthrush (*Trochalopteron lineatum*).

Table 4: Ethnozoological uses of cinnamon tree sparrow from the study area.

Cultural uses	Description
Product use	Skin of cinnamon sparrow is used for taxidermy. Feathers used as filling of pillows and blankets.
Entertainment	The melodious voice of cinnamon tree sparrow entertains the people in morning.
Hunting	Hunting is done for the food and medicinal purposes i.e. paralysis, joints problem.

Conclusion: It is concluded from this study that the Cinnamon tree sparrow (*Passer rutilans*) spent greater time in invigilation (31.35%). This species do not like human involvement. And this species is used for different purposes like food, product use, medicine (i.e. paralysis, flue and fever).

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Availability of data: We have included all relevant data in the manuscript that were collected during the field survey.

Authors' contributions: Kiran designed this study and Altaf supervised and helped in data write up; all authors read critically and approved as final manuscript.

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