

Group size in Jungle Babblers: revisiting the ‘seven sisters’ theory

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Abstract

Association with a social group can have benefits for species, e.g. reduced vigilance and opportunities to access new feeding areas. The jungle babbler (*Turdoides striata*) is an endemic avian species found in India and past literature suggests that it forms groups of 2-20 individuals. Their groups have previously been referred to as ‘seven sisters’. A study was conducted in Pune, Maharashtra, India to estimate the modal value for the number of individuals within existing social groups of jungle babblers. Overall, these social groups comprised of 3-12 individuals. 29% of the social groups consisted of 5 individuals - the modal value. Sentinel behaviour was observed within the social groups during foraging. There is an urgent need to quantify the population size of the jungle babblers across India to not only understand the ‘seven sisters’ notion; but also assist with the species’ status assessment in the IUCN Red List of Threatened Species.

Keywords: *Turdoides striata*, social group, sentinel, Pune, Maharashtra, India

1. Introduction

Many species prefer a solitary existence during foraging. However, being associated with a social group has its own advantages [1,2]. For example, there are opportunities to be less vigilant towards predators [3,4] and instead concentrate on higher food intake [5,6]. Additionally, the combined efforts of individuals within a social group assists in locating new feeding areas or exploring novel habitats [1,5]. Importantly, group size can act as an indicator of surrounding ecological conditions for any given species [6]. However, being part of a social group can have its disadvantages too, e.g. competition and aggression during foraging or mating [5].

The jungle babbler (*Turdoides striata*; Passeriformes: Timaliidae) is an endemic, insectivorous bird [7], and is widely distributed in India [8]. It is a passerine species found from dry deciduous woodlands to moist semi-evergreen forests [9]. Sexual differentiation is quite difficult

in these birds, i.e. body coloration is brownish grey with a yellow bill in both sexes [10]. These species are co-operative breeders living in social groups which varies in number from 2-20 individuals [8,11]. Such groups usually consist of a breeding female, a dominant male breeder, and non-breeding helpers [7]. These birds have been referred to as ‘seven sisters’ in the past [12]. There are a couple of hypotheses for this ‘seven sisters’ notion. Past literature suggests that a jungle babblers’ social group on average consists of 6-10 individuals, hence roughly 7 individuals in a group. However, a few naturalists have recently compared the bird’s continuous, unforbearing babbling to a group of 7 arguing humans, hence the term.

The aim of this study was to examine if a modal value did exist for the group size of jungle babblers in India. To begin with, the fieldwork was conducted in the city of Pune, Maharashtra during the winter months of 2010-2011. The objectives were to record the number of individual birds within existing jungle babblers’ groups in Pune, and provide a baseline for an all India investigation.

2. Methodology

The study area was the city of Pune, Maharashtra. The research was conducted over 3 months during the winter of 2010-2011. A pilot study (2 weeks) was carried out to identify and record (global positioning system) the location of 30 different groups of jungle babblers in the city. This initial survey was largely dependent on the accessibility of sites and financial constraints of the author. During the observation period, the selected groups of jungle babblers were visually witnessed in the wild between 6-9am every day. The number of individual birds in each group was noted. Furthermore, the total number of birds foraging or indulging in social activities on the ground and on higher vantage points, (e.g. trees, electric poles,

roof of houses) was also logged for all groups. In order to avoid documenting the same group of birds again, it was ensured that the individual locations of selected groups was at least 3-4 km away from each other. For this study, the null hypothesis (H_0) was as follows - all observed groups of jungle babblers will have the same number of individuals, i.e. between 6-10 individuals. A chi-squared test was carried out to determine if the observed distribution fit an expected normal distribution. The equation used was as follows: $\chi^2 = \sum (O_i - E_i)^2 / E_i$, where O_i = observed frequency, E_i = expected frequency.

3. Results

All the groups of jungle babblers were observed in the wild, and the total number of individuals in each social group was recorded. An attempt was made to differentiate between the sexes; however this was not conclusive because of similar body colouration of males and females. Within each group, the total number of individuals foraging or

indulging in social activities on the ground and on higher vantage points was also logged (Table 1). The total number of individuals documented within all the groups of jungle babblers was between 3 and 12 adults per social group. None of the social groups were found to contain 9, 10 or 11 individuals (Table 1). The highest occurrence was of 5 individuals within a social group, i.e. 29%. This was followed by 3 individuals within a group, i.e. 22% (Table 1). Therefore, for this study the modal value was considered to be 5 adults in each social group of jungle babblers. Based on the observations made, the mean was 5.78 individuals per social group of jungle babblers. The chi-squared test gave a value of 4 ($\alpha=0.05$). This value did not lie in the critical region, i.e. $\chi^2 > 12.592$. The standard deviation was 2.49. Therefore, there is evidence that at $\alpha=0.05$, the observed distribution did fit an expected normal distribution. Based on the data obtained, the null hypothesis was accepted.

Table 1: Group size (n) in jungle babblers; also shown are the mean number (n) of birds on the ground and on higher vantage points for each social group (* = not recorded).

Group size (n)	Occurrence (%)	Mean no. of birds on the ground (n)	Mean no. of birds on higher vantage points (n)
3	22	1	2
4	7	3	1
5	29	3	2
6	7	5	1
7	14	6	1
8	14	6	2
9	*	*	*
10	*	*	*
11	*	*	*
12	7	9	3

4. Discussion

The inclusion within a social group does offer benefits to various species, and this was observed in jungle babblers too. During foraging activities within a group of jungle babblers, there was always a sentinel perched on a high vantage point (see Table 1). Since no threats, e.g. predator presence was observed to the group during the field survey, the behaviour of the sentinel in moment of danger was not recorded. However, verbal and physical altercation with other species of birds, e.g. common crow and Indian mynas over a common food source was a group activity and witnessed quite regularly during the study period.

Based on the data obtained during this study, the 'seven sisters' notion, i.e. on average, the presence of 6-10 individual birds per group of jungle babblers cannot be ruled out. 35% of the observed social groups did consist of 6-10 individuals (see Table 1). However, the author does acknowledge the limitations in his work, i.e. the total number of social groups of jungle babblers observed in the wild, and the work being localised in just one major city of India. Additionally, similar work from Delhi has recorded the group size of jungle babblers to be between 2-20 individuals [9,11]. The author believes that more data collection and further analysis is required to better understand the 'seven sisters' notion. On the other hand, irrespective of the group size, the continuous, unforgiving babbling of the jungle babblers was well documented throughout the study period and also supports the alternate view for the 'seven sisters' notion.

One of the interesting findings of this study was that when similar social groups were observed repeatedly, there was a fluctuation in group sizes, (i.e. number of individuals) of the jungle babblers. This could be because of an addition of new members to the group, or their loss due to predation or illness. However, this could also be due to the observations being conducted in the winter months and not during the breeding period. Much more work is needed to answer these and other questions regarding this under studied avian species. The second stretch of this study will aim to answer some of these questions and attempt to re-establish the modal value for the number of individuals within a social group of jungle babblers in India. Natural variables such as predation risk, death due

to illness and intra- and inter-social complexities within the species will also be taken into consideration.

This work attempted to provide some clarity to the 'seven sisters' notion, and more social groups across India are currently being studied by the author to deduce a modal value for the number of individuals within a social group of jungle babblers. More importantly, estimating group size in jungle babblers will hopefully assist with quantifying this species' population size in India, and provide vital data to the IUCN Red List of Threatened Species for updating their current assessment of this species.

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