

Comparison of Dusky Munia (*Lonchura fuscans*) Time-budget Allocations with Respect to Proximity to Human Settlements

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ABSTRACT

A behavioral study regarding time budget allocation of one of Borneo's endemic birds, Dusky Munia (*Lonchura fuscans*), was conducted at the Maliau Basin Conservation Center, Malaysia. The study evaluates whether or not the birds behave differently when located near or away from human settlements. Two monitoring sites were chosen with respect to proximity to human settlement. Observations were done in the morning as well as in the evening so as to avoid a bias – if any – due to the time of the day. Activities recorded include moving (M), eating (E), resting (R), being actively vigilant (V) and other activities (ETC). Results indicate that Dusky munias allocate more time for R and less time for M when present near human settlements; the scenario being reversed when the birds are away from human disturbances. This can be attributed to the shy nature of the bird, as it may prefer hiding and lesser movement when present near human settlements. No significant differences were seen for V and E activities between the two locations.

Key words: Lonchura fuscans, bird behaviour, human settlements, time budget allocation

INTRODUCTION

Borneo has about 622 species of birds of which 39 are endemic. For the Bornean birds, many small articles and short communications exist which are fundamentally descriptive in nature, but very few quantitative studies have been conducted on bird ecology and behavior (Sheldon *et. al*, 2001). The Dusky Munia (*Lonchura fuscans*, (Cassin) 1852) is one of Borneo's endemic birds. These granivorous birds are ~10 cm long, brownish-black in color and are abundant in paddy fields, along riverbanks and open grasslands (Smythies, 2000). Observational studies indicate that this species is shy, unobstrusive, prefers to forage on lower grains and sits still or hides in the undergrowth when alarmed (Smythies, 2000). However, these observations have not been corroborated by any time-budget assement and other such quantitative studies.

We hypothesize that the Dusky Munia's time budget allocations would differ when present near or away from human settlements, and that the major difference might be in vigilance and eating behavior.

METHODS

The study was conducted at the Maliau Basin Conservation Area from 2nd to 4th August 2008. Two grassland areas were chosen as the monitoring sites; (a) near the Study Center as a place near human settlement and (b) grassland besides Maliau River (Belian Camp) as a place away from human settlement. Flocks of Dusky Munia were monitored in the morning (6.00 am to 9.00 am) and evening (3.00 pm to 6.00 pm). Since simultaneous monitoring of the entire flock was not possible, multiple individuals were singly observed throughout the monitoring period using binoculars. An estimated distance of at least 25 m was maintained from the flock to ensure that the birds are not affected by the observer's presence. Each individual was closely followed and its activities – which included (a) eating, (b) being actively vigilant, (c) moving, (d) resting and (e) others – were recorded every 5 seconds. We recorded one bird from a chosen flock for a maximum of 5 minutes, or until the bird went out of sight. As the birds were not continuously within sight during the 3-hour duration of each observation, a total of 720 activity readings were recorded accounting for a period of 1 hour.

TABLE 1: Definition of activities

Activity	Definition
Eating (E)	Ingesting/ Chewing/ Looking at food
Being Vigilant (V)	Actively keeping a watch, looking around
Moving (M)	Flying, Hopping, Sliding, Walking
Resting (R)	Being idle
Other (ETC)	Preening, Fighting, Defecating

For the analysis of data, the 60-minute observation period was divided into 12 fractions of 5 minutes each and each of the 12 fractions was thus treated as a replicate for that site. The percent of time spent on each activity during each of the fraction was calculated. Comparison of each behaviour category was done between the two study-sites by using Student's Paired t-tests.

RESULTS

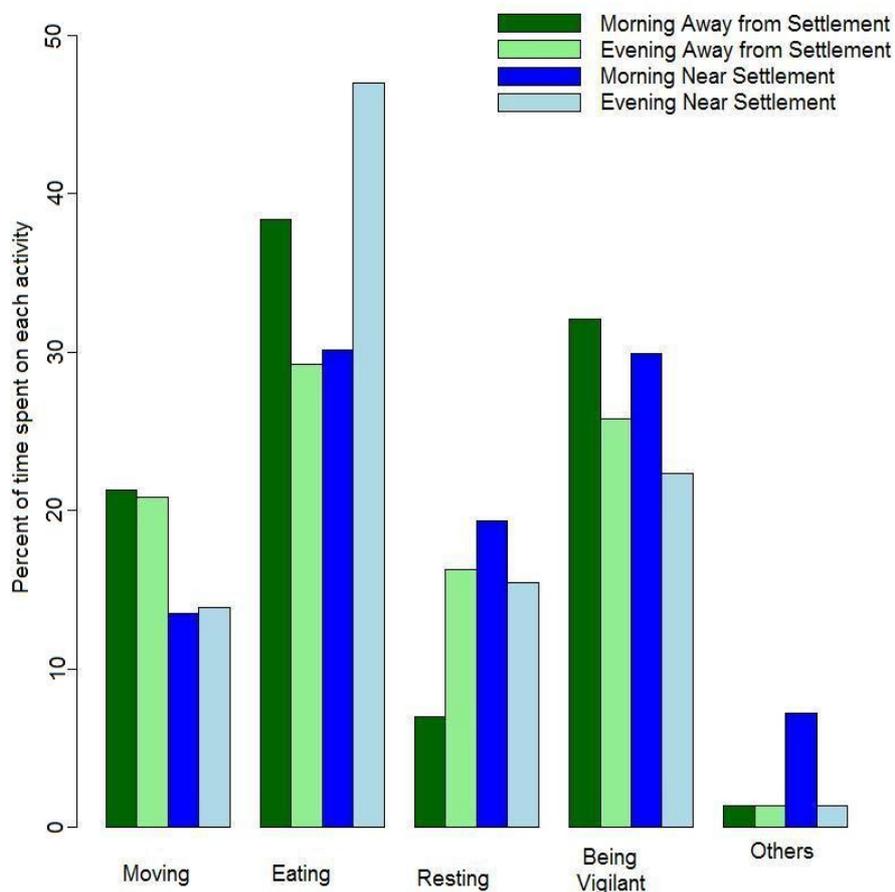


FIGURE 1: Time budget allocation of Dusky Munia at locations near and away from human settlement.

A total of 2831 behavior observations – each of a 5-second slot – were recorded over a total observation period of 12 hours.

To compare the vigilance behavior between the two sites, Student's paired t-test was performed (using $\alpha = 0.05$); but no significant difference was detected ($p = 0.295$). Similarly, no significant difference was found in the eating behaviour between the two sites ($p = 0.269$). However, resting/hiding and moving behaviour had significant differences ($p = 0.025$ and 0.003 respectively) between the two sites.

TABLE 2: Time Budget Allocation

Time	Proximity from Human Settlement	Activity (%)					TOTAL
		M	E	R	V	ETC	
Morning	Near	13.47	30.14	19.31	29.86	7.22	100
	Away	21.25	38.33	6.94	32.08	1.39	100
Evening	Near	13.89	46.94	15.42	22.36	1.39	100
	Away	20.86	29.21	16.24	25.78	7.9	100

M - Moving, E - Eating, R - Resting, V - Being Vigilant, ETC - Other activities

DISCUSSION

Upon performing the Student's Paired t-test for vigilance and eating behaviors between the two sites, no significant difference was detected, which is not in accordance with the results we had expected. This might indicate that the species tends to exhibit a baseline level of vigilance and feeding behaviour irrespective of the level of human-mediated disturbance. Interestingly, we observe that the Dusky Munia spends a significantly more time for resting/hiding when present near human settlements as compared to away from the settlements ($p = 0.025$). Conversely, more time is spent in moving about, when they are present away from the settlements in comparison to near the settlements ($p = 0.003$). This is in agreement with the study by Smythies (2000) who mentioned that the Dusky Munia prefers staying still when it is alarmed. There are more human activities and therefore more disturbance near the Study Center which may be causing the Munias to be less active around the Study Center. However, there were less human activities near Belian camp, which may have resulted in an increase in the unrestrained movements of the Munias.

Although the Munias are extremely shy creatures and sensitive to human presence and disturbance, they seem to be capable of utilising the niches even near human settlements inspite of the disturbances. Thus, they seem to have adapted to the challenge by modifying their behaviour (i.e. hiding more and moving less).

Due to time constraints, it was not feasible to perform replicates at each study-site. Future studies conducted could possibly encompass a more apparent heterogeneity (in terms of human disturbance) in the study-sites. Also, it would greatly corroborate the authenticity of this study if the errors of having small samples are avoided by undertaking extensive sampling. It would be interesting to evaluate what other covariates (availability of sunlight, time of the day, seasons, etc.) are responsible for shifts in the Munia's time-budget allocation. For example, it was noted during our study that Munias tended to have a preference for sun-lit patches of grasslands as compared to shaded patches. A potential area for further exploration would be to test whether or not such a preference actually exists; and to try and elucidate the reasons for such a preference.

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