

Diurnal Activity Budget of Yellow-eared Bulbul (*Pycnonotus penicillatus*) in Different Habitats of Tropical Montane Cloud Forests of Horton Plains National Park, Sri Lanka

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ABSTRACT

Quantitative studies about behaviour are important to determine activity budget of birds. The present study was carried out about Sri Lanka Yellow-eared Bulbul (*Pycnonotus penicillatus*). This species is a member of the Family Pycnonotidae of Order Passeriformes, occurs in forest and nearby gardens, at higher elevations in 900-2000 m. It is an endemic bird, assessed under IUCN global conservation status of the Near Threatened (NT) and national conservation status of Vulnerable (VU) category. The research was conducted in Tropical Montane Cloud Forests (TMCF) of Horton Plains National Park (HPNP), situated at Central highlands, from January 2017 to December 2017. The objective of this study is, to construct diurnal activity budget of Yellow-eared Bulbul (*P. penicillatus*) in the Different Habitats and to find out the seasonal variations. Data was recorded on three consecutive days in every month. Three main habitats were identified as Cloud Forest habitat, Cloud Forest Die-back habitat and Grassland habitat. *Ad Lib.* Sampling and Focal-Animal Sampling was carried out in the field and an ethogram was constructed. Activity budget was constructed and diurnal and seasonal variation was observed. Locomotion was the most prominent behaviour when compared with other activities. Most of the behavioural patterns were observed from the Cloud Forest Habitat and Cloud Forest Die-back Habitat, which were the occupied habitats of *P. penicillatus*. Cloud Forest is their main habitat of reproductive activities. Community interactions and defence behaviour in the morning and evening time periods were significantly higher than the mid-day time period. The time spent for resting was significantly higher in the mid-day time period. There was no seasonal variations among the time allocation for locomotion, foraging, and resting. However, the time allocation for elimination, preening, community interactions, reproduction and defence varied seasonally. Reproduction is highest in the FIMS, which has the highest encounter of visitors. Therefore, these special habitats should be protected with proper managed waste disposal plans to warrant the generations of *P. penicillatus*.

Keywords: Sri Lanka Yellow-eared Bulbul (*Pycnonotus penicillatus*), Endemic birds, Diurnal Activity Budget, Tropical Montane Cloud Forests, Horton Plains National Park

INTRODUCTION

ACTIVITY BUDGET

An activity budget shows how much time an animal spends in various activities. Many quantitative behavioural experiments were conducted in laboratories (Burger, 1976). Therefore, field observations should be carried out to determine habitat use of birds.

YELLOW-EARED BULBUL (*Pycnonotus penicillatus*)



- ❖ Scientific Name: *Pycnonotus penicillatus* Blyth, 1851
- ❖ Endemic Bird
- ❖ Confined to highlands
- ❖ Conservation status –
 - ❖ IUCN global - Near Threatened (NT)
 - ❖ National - Vulnerable (VU)

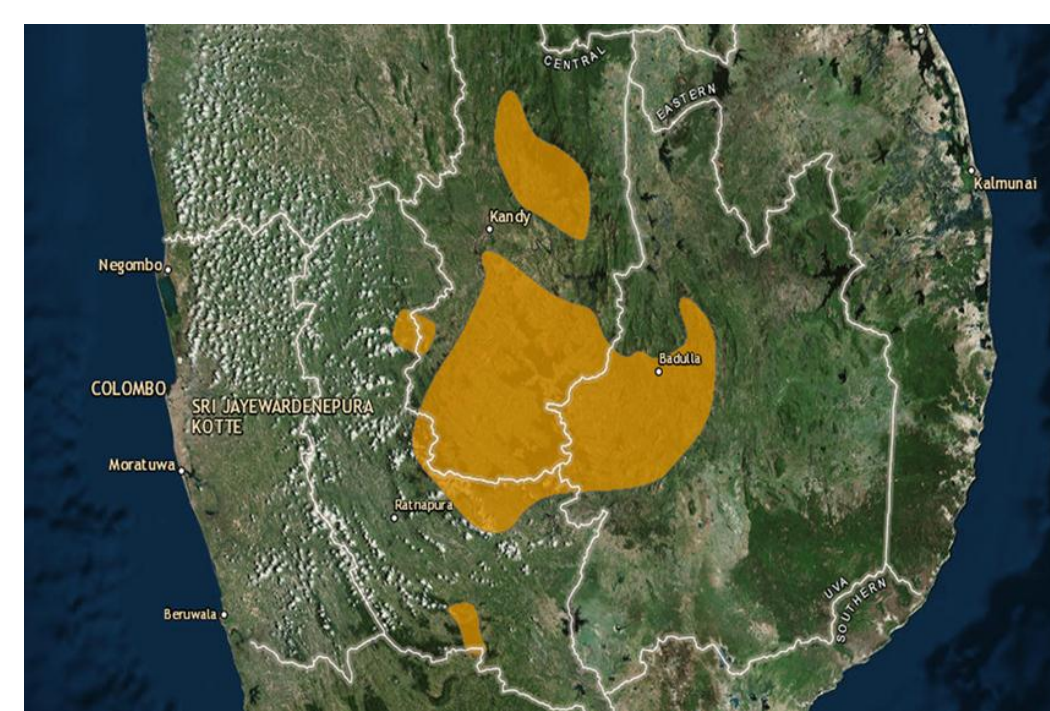
Adult *P. penicillatus*

- ❖ A slow population decline is likely to be occurring as a result of habitat loss in some parts of the species's range. No targeted conservation actions are known for this species (BirdLife International, 2016)

HORTON PLAINS NATIONAL PARK

6°48'00.0"N, 80°48'00.0"E

- ❑ Tropical Montane Cloud Forest in highland plateau
- ❑ Area of 3,160 ha
- ❑ Protected under Department of Wildlife Conservation
- ❑ Climate
 - ❖ Mean temperature is ~ 14° C
 - ❖ Annual precipitation <2,000 mm
 - ❖ Frequent mist cover throughout the year



Distribution of *P. penicillatus*

RESEARCH GAP

- ❑ Distribution of *P. penicillatus* throughout the country, is studied (MOE, 2012).
- ❑ Breeding ecology of this species has studied previously (Sarathchandra & Wickramasinghe, 2012) at Knuckles forest, and Chandrasiri & Mahaulpatha (2016) studied about distribution at HPNP, Foraging ecology (Chandrasiri & Mahaulpatha, 2017a) and Nest construction (Chandrasiri & Mahaulpatha, 2017b). However, there is a research gap to fill about behavioural studies.

OBJECTIVES

- ❑ To study the diurnal activity patterns of *P. penicillatus*.
- ❑ To find out the seasonal variations of activity budget of *P. penicillatus*

METHODOLOGY

This research was conducted from January 2017 to December 2017 in 3 consecutive days per month. Habitats of HPNP were selected as: Cloud Forest habitat, Cloud Forest Die-back habitat and Grassland habitat.



Cloud Forest, Cloud Forest Die-back and Grassland habitats of HPNP

Ad lib. Sampling & Focal animal sampling

Ethogram

Activity Budget

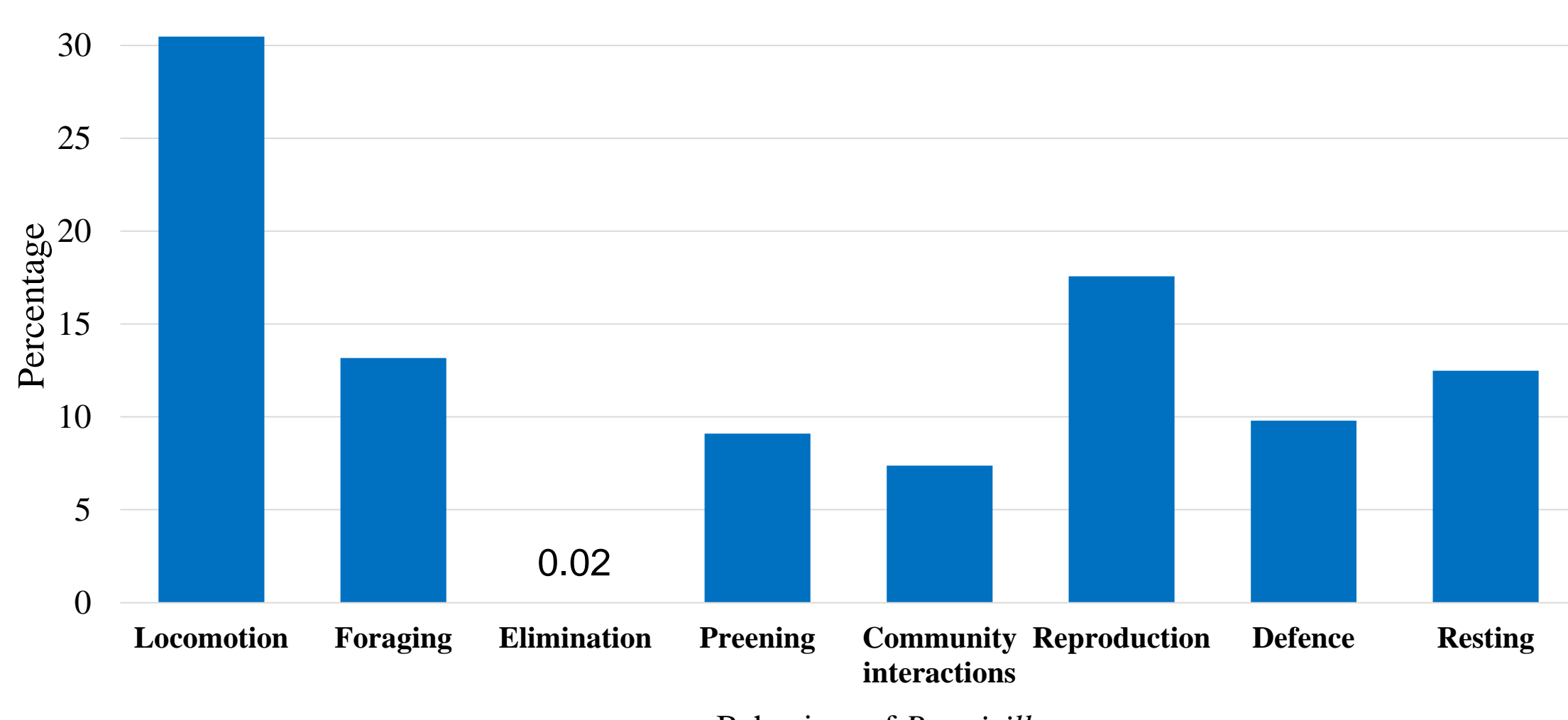
- Habitats
- Cloud Forest
 - Cloud Forest Die-back
 - Grassland

- Time Period
- Morning (0600h – 1000h)
 - Mid-day (1001h-1400h)
 - Evening (1401h-1800h)

- Seasons
- Northeast -monsoon Season (December- February)(NEMS)
 - First Inter-monsoon Season (March - April)(FIMS)
 - Southwest -monsoon Season (May - September)(SWMS)
 - Second Inter-monsoon Season (October-November)(SIMS)

Analysis
 Arcsine transformation, ANOVA, Tukey Pairwise post hoc comparison in Minitab 17(α= 0.05)

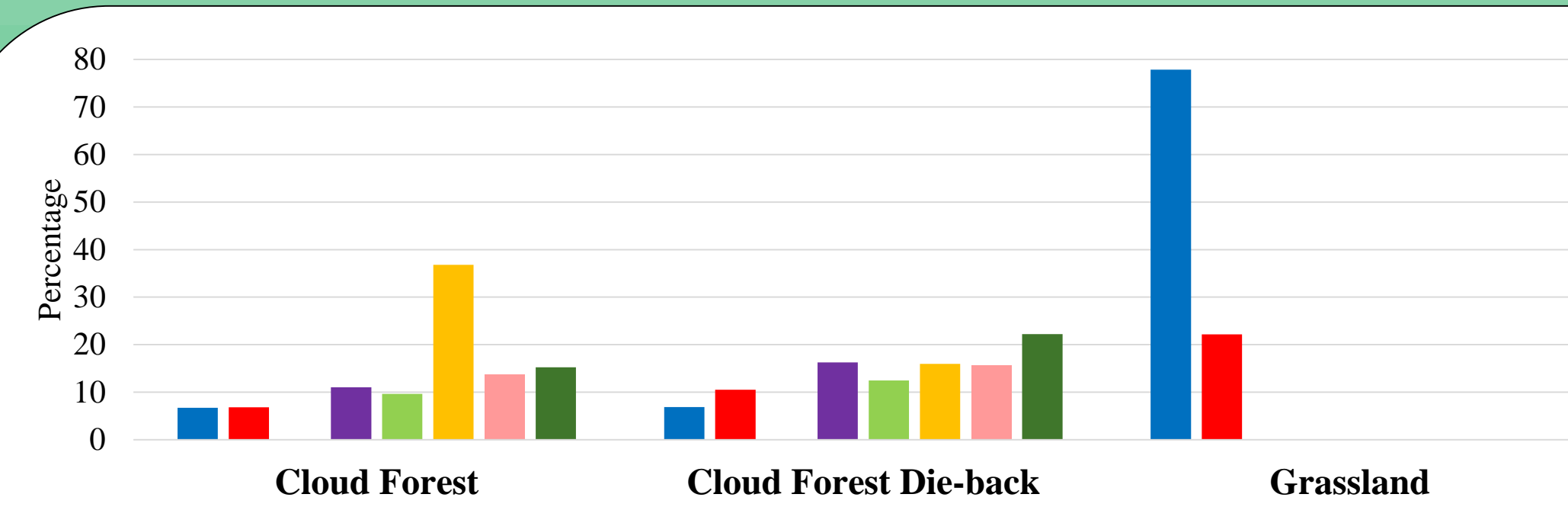
RESULTS & DISCUSSION



Behaviour of *P. penicillatus*

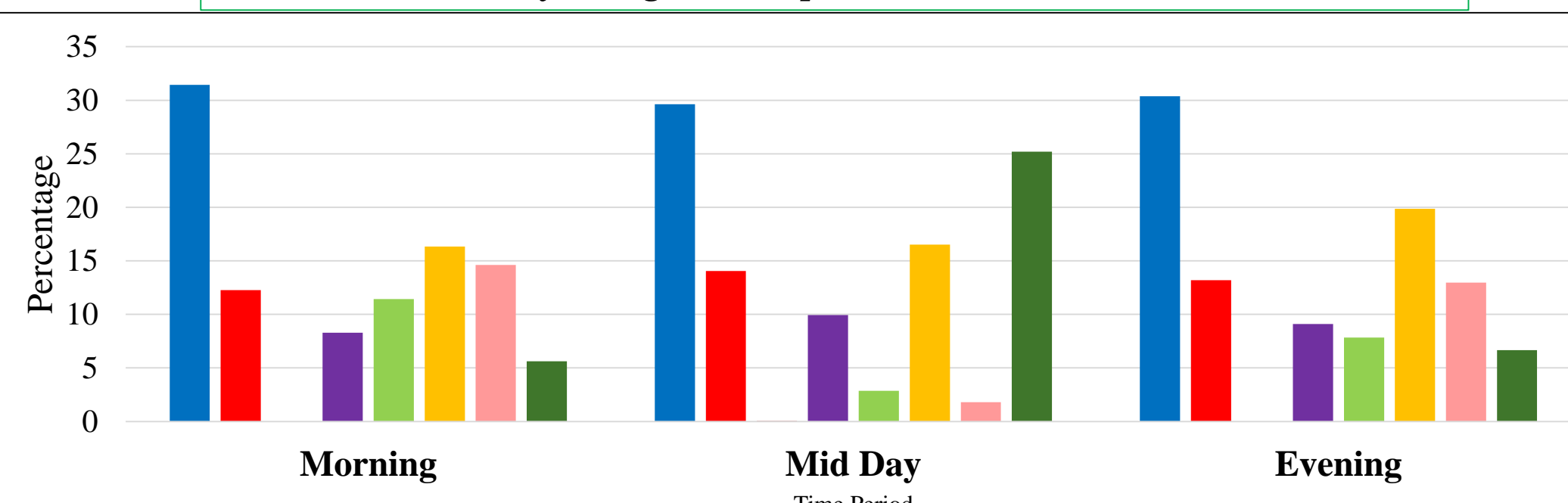
Overall time allocation for different behaviour types of *P. penicillatus*

- They spent their maximum time for locomotion.
- They spent adequate amount of time for reproduction and foraging respectively.



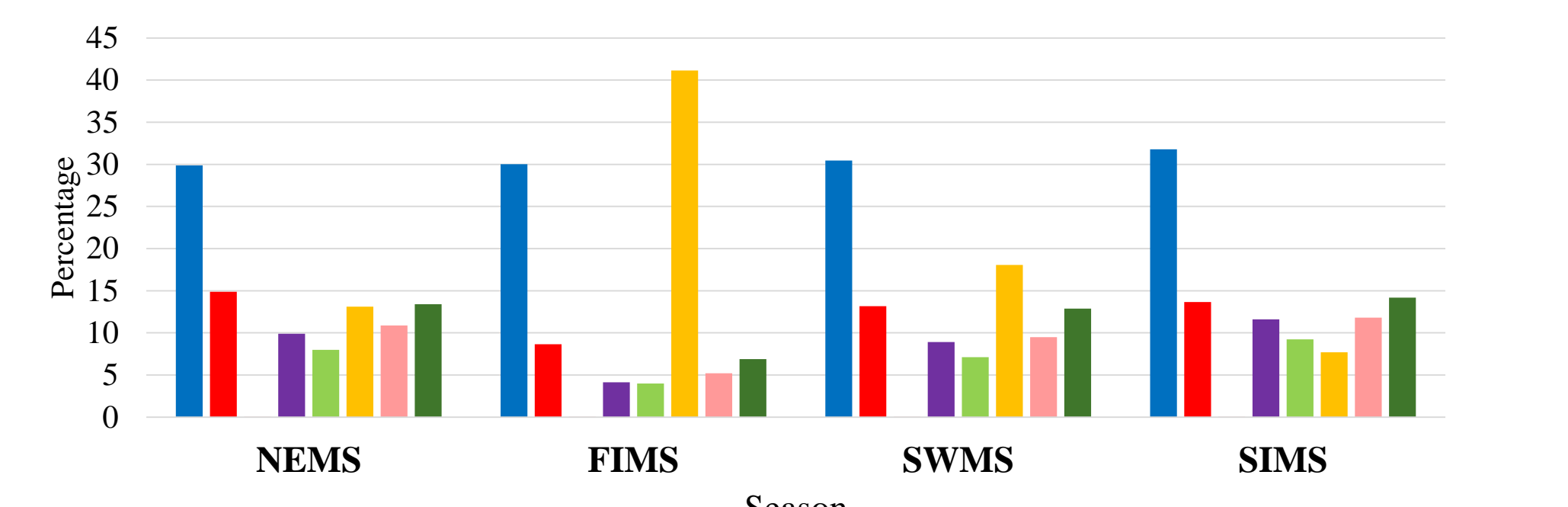
Diurnal activity budget of *P. penicillatus* in different habitats

- Most of the behaviours were observed in the Cloud Forest and Cloud Forest Die-back habitats.
- Locomotion and foraging were the behaviours recorded from Grassland



Diurnal activity budget of *P. penicillatus* in different time periods

- Community interactions and defence behaviour in the morning and evening time periods were significantly higher.
- The activity budget for resting was significantly higher in the mid-day.



Diurnal activity budget of *P. penicillatus* in different seasons

- The activity budget for reproduction was significantly higher in the FIMS.

CONCLUSIONS

- ❖ *P. penicillatus* spent their maximum energy for locomotion, reproduction and foraging.
- ❖ Cloud Forest and Cloud Forest Die-back were their preferred habitats.
- ❖ *P. penicillatus* was active throughout the day because of the cold weather conditions in the TMCFs, they have high energy requirements as well as other montane bulbul species (Balakrishnan, 2007).
- ❖ Breeding behaviour was continuous throughout the diurnal period.
- ❖ They spent their maximum time for breeding in the first breeding season contemporary within FIMS.

MANAGEMENT IMPLICATIONS

Finding

- The FIMS is the first breeding period and the same season has more visitors at HPNP.
- Nest building birds usually leave their nests if they were disturbed.
- Hence *P. penicillatus* has high nest failure rate.
- The massive number of visitors is the reason for unplanned garbage dumping at HPNP. Therefore, number of crows will also increase with that. These predators destruct the nests.
- *P. penicillatus* utilize montane forest habitats to their important life strategies. However, there is a habitat decline.

Recommendation

- To conduct awareness programs such as sign boards which should be displayed by showing the importance of *P. penicillatus*.
- Therefore, properly managed waste disposal system should be planned.
- To encourage the surrounding plantations (Eucalyptus, tea, Pinus etc...) to environmental friendly practices, such as: to keep natural forest belts between montane forests and develop mixed plantations with other native fast-growing species to make feeding and breeding habitats.

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