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Behaviour Associated with Habitat Utilization of Endangered Black-Cheek Lizard (*Calotes nigrilabris*) in the Grasslands of Horton Plains National Park in Sri Lanka

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Abstract

Behavioural adaptations and related utilization of habitat by the endemic lizard *Calotes nigrilabris* was studied utilising line transects and quadrates for a period of one year from January to December 2016 in the grasslands of Horton Plains National Park (HPNP), Nuwara Eliya District. A total of 108 transects, each 200 meters in length, were laid and traversed to collect data. Lizard census were carried out by placing 1x1m quadrates along transects. The distance between transects exceeded 200m. Quadrates were placed taking each lizard sighting as the centre of quadrate. A total of 303 lizard-occupied quadrates were examined throughout the study. The maturity stage of each lizard encountered was determined. At each lizard occupied quadrate, perch type, perching plant, perching height and perching light level was recorded. An ethogram was developed and focal animal sampling was conducted dividing the day into four time periods; morning, mid-day, evening and night. Activity level was determined considering the number of lizards that could be visually observed. Behavioural patterns varied in the temporal and spatial scales indicating a clear resource partitioning between different maturity stages. The most preferred perch type of *C. nigrilabris* was tree branches (55.12±11.97) and preferred perch plant varied significantly between maturity stages (Kruskal-Wallis, $p<0.05$). Adult males preferred *Rhododendron sp.* while adult females preferred *Ulex sp.* Sub-adults utilized both these plants. Juveniles mostly utilized *Rhododendronsp.* And the fern *Pteridium sp.* Hence, there was a resource partitioning in the spatial scale. Perch light and perch height of lizards varied in the temporal scale during the day. Perch height varied significantly between different maturity stages of *C. nigrilabris* (ANOVA, $F=21.93; p<0.05$). Lizard activity increased gradually from 06:00 to 09:00 h and highest activity was recorded between 09:00 and 10:00h (11.56±5.59). There was a significant variation of activity patterns within each time period considered (Kruskal-Wallis Test, $p<0.05$). Four different prominent behaviors were observed in each time period morning-basking (27.15±13.27)%, mid-day-alert (42.778±11.756)%, evening-resting (53.78±13.74)%, night-sleeping (85.74±5.78)%].The results of this study indicate that *C. nigrilabris* is well adapted for the utilization of grassland habitats of HPNP. For that, it shows behavioral adaptations which varies within maturity stages which results in more efficient and effective resource use. Therefore, this study provides important insights for conservation and management of *C. nigrilabris* by critically evaluating the differing requirements of different life stages of this species. It will also help the conservation of the natural habitat as well.

Keywords: Black-cheek lizard, HPNP, Endemic lizard, *Agamidae*, Behaviour