

## **Character variation along the climatic gradients in birds endemic to Sri Lanka**

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We studied phenotypic characters representing the general shape and size, and the plumage in two pairs of phylogenetic sister taxa, each consisting of a Sri Lankan endemic and its closest phylogenetic relative found in both Sri Lanka and India. The objective was to study the role of barriers to gene flow such as climate, geographic elevation and geology (being an island), on endemism in Sri Lanka. We sampled birds in two transects spanning across the island using mist nets from March to July 2013. From each captured bird a series of morphometric (8 characters) and plumage (10 characters) measurements were taken. Separate principal components analyses (PCA) were performed and clines were fitted for phenotypic characters against elevation and distance gradient. Even though the evidence for selection is difficult to measure, we found several clues for the role of local adaptations in shaping the phenotype in these two species pairs – *Dinopium* (Flameback woodpeckers) and *Zosterops* (White-eyes). The plumage variation is mostly clinal across the gradation of distance from mainland and elevation. However the morphometric measurements showed a linear trend. Phenotypic variation and resulted endemism seen in these range-restricted avian taxa are likely to be driven by adaptations to local environment and limited gene flow due to geographic and climatic barriers. The genetic drift and the associated isolation-by-distance could have also played a role in divergence. The role of climate (e.g. rainfall) as an agent of divergence needs further study. The higher the humidity the darker and bigger the individual is. The more humid and relatively dark forests of the wetzone of Sri Lanka would have selected this pattern. The opposite was true near the mainland.