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The Effect of Genetic Introgression on Phenotype in *Dicrurus* Drongos Across a Climatic Gradient in Sri Lanka

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Abstract

Hybridization or introgression enables species to mix traits, allowing horizontal gene flow and varying parental alleles and phenotypes. Belihuloya, located in the intermediate zone is a transitioning point between dry and wet zones, where two sister species, the Sri Lanka Drongo (*Dicrurus lophorinus*), limited to the wet zone, and the Greater Racket-tailed Drongo (*Dicrurus paradiseus*), found in the dry zone come into contact. The objective of this study was to determine the clinal variation of two species from Sri Lanka's wet to dry zones. Field sampling was done across the identified contact zone and the allopatric zones located on either side of the contact zone in Belihuloya. The analysis was done using 14 morphometric traits, 6 partially informative Single Nucleotide Polymorphisms (SNPs) identified in two molecular markers ND2 and Cytb, and 21 environmental variables. Results suggest a clinal variation in ND2 and Cytb genomic markers. The clinal models in the program CFit-7 suggested the center of the cline is located 29.24 km east of Belihuloya. The cline is narrow with a width of 19.52 km. The clinal variation of all the morphometric and environmental variables was visualized by fitting cubic splines in the program R. Among them, the variation of the total tail length of drongos and the precipitation of the coldest month aligned with the genetic cline. In this species pair, the tail length which concords with the clinal variation and the pattern of the precipitation plays a strong role in the maintenance of the hybrid zone.

Keywords: *Climatic gradient, Dicrurus, Hybridization, Introgression, Phenotype, Belihuloya*