

# ABSTRACT VOLUME

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**Bioacoustic differentiation of Greater Coucal (*Centropus sinensis*) at subspecific level****Aritra Bhattacharya<sup>1,\*</sup> and Tanoy Mukherjee<sup>1,2</sup>**<sup>1</sup>Estuarine and Coastal Studies Foundation, Howrah, West Bengal, India<sup>2</sup>Lab for Landscape Ecology and Wildlife Sciences, Indian Statistical Institute, Kolkata, West Bengal, India

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**Abstract**

Greater Coucal is a widely distributed avian member of the family Cuculidae. Two subspecies of the genus *sinensis* are described from India – *sinensis* (North Indian distribution) and *parotti* (South Indian distribution). The aims of the study were to assess subspecific variation through acoustics and develop an acoustic classification scheme using an artificial intelligence (AI) model. To test this, available recordings from Xeno-canto, a citizen-science website, were accessed. The calls were categorised as belonging to one of the two subspecies based on subspecific geographic range. Data were analysed based on pre-determined spectral (eg. 1<sup>st</sup> syllable bandwidth, first syllable peak power density, etc.) and temporal (eg. last syllable duration, last intersyllable duration, etc.) acoustic parameters. The 1<sup>st</sup> syllable frequency bandwidth differed significantly among the two subspecies (p-values 0.0147 and 0.0179 for lower and upper frequencies respectively). The last syllable upper frequency also had significant variation (p-value 0.0198). The categorised calls were classified using recursive partitioning available from the package *rpart* in R (v 4.1.2) to check whether an AI model can correctly classify the two subspecies. The dataset was divided into two subsets (a training and a test subset) and the model was allowed to train and test the classification on the respective subsets. The results indicate that based on threshold values of certain parameters, the subspecies can be correctly classified (with acceptable margin of error). The model correctly classified 90% of the calls, thus validating the existing classification and also developing a classification scheme based on acoustics. Given the current trends of acoustic evidences as a major taxonomic tool, especially for avian species, studies like this may prove to be valuable in taxonomy, with the collective efforts of both citizens and scientists alike.