



Species limits in *Pteruthius* (Aves: Corvida) shrike-babblers: a comparison between the Biological and Phylogenetic Species Concepts

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Abstract

The question of how to define a species continues to divide biologists. Meanwhile, the application of different species concepts has led to disparate taxonomic treatments that confound conservationists and other biologists. The most widely followed guidelines to species designation in avian and other vertebrate taxonomy are Ernst Mayr's Biological Species Concept (BSC) and Joel Cracraft's version of the Phylogenetic Species Concept (PSC). Although the BSC is considered to be more conservative in its assignment of species status, there is a lack of research demonstrating differences in taxonomic treatment between the BSC and the PSC with reference to a multi-taxon multi-trait study system. We examined the case of five traditionally recognized species of shrike-babbler (*Pteruthius*) that have recently been divided into 19 species under the PSC. Re-analyzing previous morphological and molecular data and adding new vocal data, we propose a BSC classification of 9 species. However, taking into consideration geographic gaps in the sampling regime, we contend that additional data will likely reduce discrepancies between the total numbers of species designated under the PSC and BSC. The current PSC species total is a likely overestimate owing to species diagnosis based on characters that erroneously appear to be unique to a taxon at low sample size. The current BSC species total as here proposed is a likely underestimate on account of the conservative designation of taxa as subspecies in equivocal cases, e.g. where BSC species status is potentially warranted but may be masked by insufficient data.

Key words: species concepts, *Pteruthius*, taxonomic inflation, multi-disciplinary approach, species delimitation

Introduction

Taxonomic work on species limits is critical to inform decision-making in conservation (Samper 2004). However, the quest for a universal species concept continues to be one of the most challenging issues in biology (Wheeler & Meier 2000). Although the definition of a species is widely understood and intuitive even among laymen, its exact biological characterization has always been problematic. Linnaeus (1758) considered the species as the lowest amongst a hierarchy of ranks in his *Systema Naturae*. As such, the concept of species was meant to serve as one of several nested but fundamentally equivalent categories used to organize the seemingly chaotic diversity of living organisms. Much later, during the Modern Synthesis of the 20th century, Mayr (1942, 1969) recognized the uniqueness of the species category as opposed to Linnaeus's (1758) other ranks. Noting that the circumscription of genera, families and other higher-level categories is arbitrary, Mayr (1942, 1969) pointed out that the species alone is a real biological entity, which is delimited by the reproductive behavior of its members. Reproductive isolation and absence of hybridization became the foundation of Mayr's (1942, 1969) Biological Species Concept (BSC).