CHAPTER 1
INTRODUCTION

A bird song is an advertisement signal with dual functions; territory defense and mate attraction. Encoded information from the senders can be relevant for intra- and inter-species communication. A bird song is an ideal form of communication for several reasons. Song production has some costs (i.e. energetic consuming and genetic cost), however, recent research suggests that a birdsong is comparatively cheap and carries a large amount of information (Catchpole and Slater, 2008). Moreover, sound travels for long distances with less signal degradation, than other kinds of signals (i.e. obstacles block visual signals; water solubility and structural degradation may affect signal precision of chemical signals).

Bird songs change greatly between species. One reason is that birds have species-specific songs to recognize each other as belonging to the same species. Also, songs have evolved in accordance with evolutionary history (phylogenetic) or morphological derivations (i.e. body size), which also play a primary role in acoustic divergences between bird species. Therefore, to understand the enormous variety of bird songs, we need take into account the selective pressures in several dimensions (i.e. plumage coloration, genetic evolution, morphological differentiation).

In this study, sympatric species of the genus *Pycnonotus* were selected as a selective model species. There are six species of Bulbuls in the genus *Pycnonotus* that co-exist in the tropical forests of Southeast Asia. These birds usually produce specific vocalizations while foraging together in mixed-species flocks. These vocalizations are assumed important for species recognition. The objective of this research is to investigate the importance of bird songs for species recognition of all six sympatric *Pycnonotus* bulbul species. Vocal behaviour of all six species was described, followed by analyses of the acoustic differences using bioacoustic measurement. Furthermore, the degree to which similarities in plumage, morphology and genetics reflect differentiations in vocalization was examined. Finally, factors that influence vocalizations of all six *Pycnonotus* species were discussed. This study may be useful for biologists and conservationists, particularly since several species of bulbul are threatened.

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Objectives

1. To study species recognition and acoustic selection traits among sympatric *Pycnonotus* bulbul species.
2. To reveal the relative extent of evolutionary divergence among the species and further investigating on song differences of all six *Pycnonotus* correlate with variables i.e. body size and genetic.

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