

**UNIVERSITI TEKNOLOGI MARA**

**MOLECULAR SEXING APPROACH USING CHD  
MARKER FOR MONOMORPHIC BIRDS OF  
GUNUNG LEDANG, NATIONAL PARK, JOHOR.**

**JESSEY ANGAT**

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## ABSTRACT

Many conservation centers in Malaysia have presented serious problem in sexing monomorphic birds as it does not possess any noticeable morphological differences between sexes. Therefore, it is very hard for them to establish the breeding strategies, conservation and management programs. Polymerase Chain Reaction (PCR) would accurately recognize which gender, by comparing the intron length between the Chromo Helicase DNA-binding gene (CHD) in Z and W chromosomes. A total of 150 individual birds from 5 species were captured from 10 sites by mist nets. The genes were amplified with 1237L/1272H, 2550F/2718R and P2/P8 primer pairs. Result showed sex determination was unambiguous in all species thus, PCR method alone was sufficient for an effective and fast in sex determination except for the Water-breasted Waterhen with 2550F/2718R primer set. The sex ratio between male and female individual was 1:1. The validity and effectiveness of using thoracic feather were tested with the aim to inflict the only potential feather that will be used for future sexing purposes. Adding more samples is vital in the future as to gain more accurate number of individual species in Gunung Ledang, National Park, Johor. In addition, habitat preferences and behavior as well as morphometric measurement in each individual of bird is required as this would assist in the alternative sexing methodology notably using discriminant function along with PCR-based molecular techniques. Overall, the outcome could have a crucial impact on many protection and reintroduction activities based on molecular-based application, hence granting preservation and enhancement of biodiversity in Malaysia.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 RESEARCH BACKGROUND

Avian were valued for so many reasons as they contribute many roles such as ecological and social services as well as key-importance in science and human self-learning (Collar *et al.*, 2007). In addition, birds also act as a great contributor in the ecological significance which each functional group serves ecosystem benefit and economical satisfaction. For example, any loss of the frugivorous that help much in seed dispersal would lead to unfavorable consequences such a minimized seed removal as well as inclined seed predation (Cordeiro and Howe, 2003). The enlargement of the human population and economic growth over decades had caused many distinct environmental obstacles that lead to enormous depletion in biodiversity.

The latest number of endangered bird species recorded for Peninsular Malaysia was 118 species and the numbers keep decreasing each time it was updated (Malaysian Nature Society, 2012). This has been put us on the act of conserving in order to reserve those dying species. Significantly, it is how the birds demonstrate the biodiversity that provides us priceless indicators for global environmental adjustment. Changes in climate can have ultimate consequences as birds are susceptible to it. Latest studies on the trends forecasted for terrestrial species reveal that warming and changes in climate parameters had a great repercussion on biodiversity mainly on water birds (Root *et al.*, 2003; Morrison *et al.*, 2001; Rehfisch and Crick 2003; Schekkerman *et al.*, 2003; Zöckler *et al.*, 2003).

Therefore, even the species abundance recorded were still high, consistently immediate action in conserving bird species is vital otherwise by the time we finally realize there is nothing can be done to save these birds. Approximately two-thirds of the avian occupy the forest, mainly in the tropics. Nevertheless, destruction of tropical forest was still measured for more than million hectares each year for many developmental purposes. Loss of habitat followed by the disintegration of populations was perceived as the main hazard disturbing birds (Owens and Bennett 2000; Fischer