

# I. INTRODUCTION

## 1.1 Research Background

Otters belong to the subfamily Lutrinae, which currently has 13 species worldwide, five of which can be found in Asia (Basnet *et al.*, 2020). One type of otter found in West Sumatra is *Aonyx cinereus* (Aadrean *et al.*, 2010). Based on IUCN Redlist data, *A. cinereus* is listed as a vulnerable species (Vulnerable) and included in Appendix I list because there has been a population decline of  $> 30\%$  over the last 30 years (Aadrean, 2009; Wright *et al.*, 2021; CITES, 2022). However, until now, *A. cinereus* has not been listed as a protected species in the Ministry of Environment Regulation No. 92 of 2018 concerning Protected Plant and Animal Species, making this species more vulnerable to exploitation (Gomez and Shepherd, 2018; Minister of Environment and Forestry, 2018).

The population decline of *Aonyx cinereus* is caused by human activities, habitat destruction, declining prey species, and hunting for hairs and organs for traditional medicine (Abdullah *et al.*, 2015; de Silva, 2011). In addition, public demand is relatively high, especially for body parts such as skin and pets (IOSF, 2014; Kitade and Naruse, 2018; Aadrean, 2013). Otter skins are one of the most valuable commodities in Tibet and are often used to make clothing, hats, and pillows. Tibetans also use otter meat and body parts for Tibetan medicine (Yongdan, 2018). From 1980 to 2015, 161 seizures were made in 15 Asian countries, acquiring 5881 specimens in life and death (Gomez *et al.*, 2016). Gomez *et al.* (2017) report shows that about 82% of confiscated otters are challenging to identify up to the species level as they are often found in skins with otter species. Morphological identification is quite difficult

because the samples have been aged and degraded. Therefore, it is necessary to identify species more accurately using molecular markers because it does not require intact samples (Alac *et al.*, 2010).

One of the molecular methods used for species-level identification is DNA barcoding. For animal identification, a barcode marker of the cytochrome c oxidase subunit I (COI) gene was used (Hebert *et al.*, 2003b). The COI gene has variations that can distinguish up to the species level; DNA from the COI gene can be amplified from most animals using PCR machines and has been widely used in environmental monitoring, biodiversity, and food (diet) studies (Deagle *et al.*, 2014).

Research on the DNA barcode *Aonyx cinereus* was reported to NCBI in 2021 by Zhang *et al.* (2022). Samples came from Nanjing, Jiangsu, China. *A. cinereus* was also found in West Sumatra (Aadreaan *et al.*, 2010). Research on the DNA barcode of *A. cinereus* at Kayu Tanam (West Sumatra) needs to be done because Kayu Tanam (West Sumatra) has been separated from the Malay Peninsula, which served as a link for animal land routes from Mainland China to Sumatra 250,000 years ago (Voris, 2000). Therefore, genetic differences are expected due to the geographical isolation between Sumatra Island (West Sumatra) and Mainland China. Geographic isolation can cause a decrease in genetic diversity due to reduced gene flow (Frévol *et al.*, 2023). For this reason, it is necessary to study how the DNA sequence barcode of small clawed-otter *A. cinereus* at Kayu Tanam in West Sumatra as a first step to add a reference barcode of *A. cinereus* at Kayu Tanam in West Sumatra in the BOLD System. BOLD System is a bioinformatic website that acquires, stores, analyses and publishes DNA barcodes (Ratnasingham and Hebert, 2007). Data from the BOLD System can be used as a basis for species identification and population monitoring in

conservation studies and forensic studies. The availability of DNA barcode data for *A. cinereus* species from Indonesia, especially at Kayu Tanam in West Sumatra in the BOLD System, is still not available, thus adding to the reason for this research.

### 1.2 Research Problem

How is the DNA barcode sequence of *Aonyx cinereus* at Kayu Tanam in West Sumatra?

### 1.2 Research Objectives

To know and analyse the DNA barcode sequences of *Aonyx cinereus* at Kayu Tanam in West Sumatra.

### 1.3 Research Benefits

This research is expected to be a source of information in the form of *Aonyx cinereus* barcodes that will be uploaded on *Bold Systems* to be used as a reference for further research.

