CHAPTER 1: INTRODUCTION

Channa striata commonly known as snakehead fish is freshwater fish of the Channidae family. Common names of *Channa striata* are chevron snakehead, striped snakehead, banded snakehead and different regions use different common names such as soali (Pakistan) and murrel (India). The Channidae is one of the most widespread families of freshwater fish (Abol-Munafi *et al.*, 2007). The fish are widely distributed in Asia and Africa; however members of this family are now present in America, Europe and Australia due to releases by fish hobbyists. They distribute naturally in rivers, canals, lake, swamps, marshes earthen ponds and rice field (Abol-Munafi *et al.*, 2006).

Genetic diversity or genetic variation and its measurement are very important in interpretation, understanding and management of populations and individuals. The patterns of genetic variation among populations can provide clues to the population's life histories and degree of evolutionary isolation. Genetic differences are expressed as differences in the quantity and quality of alleles, genes, chromosomes, and gene arrangements on the chromosomes that are present within and among constituent populations (Williamson, 2001; Çiftci and Okumus, 2002). Distribution of genetic variation among species, populations and individuals can be defined as population genetics, and fundamentally, it is concerned with how the evolutionary forces of mutation, selection, random genetic drift and migration affect the distribution of genetic variability (Hansen, 2003).

A development of allozyme electrophoresis and chromosomal techniques provides the ability to observe the genetic variation in genetic studies of wild and cultured stocks, but in recent years, these have been replaced by DNA markers. These molecular markers combined with new statistical developments enable the determination of differences and similarities between stocks and individuals, and the population of origin of single fish.

Therefore, there are numerous new research possibilities and applications in practical fisheries and aquaculture stock management. Various molecular markers either mitochondrial DNA or nuclear DNA such as minisatellites, microsatellites, transcribed sequences, anonymous cDNA or RAPDs are now being used in fisheries and aquaculture.

Microsatellite markers have an advantage over other molecular markers because they are typically short and this makes it easy for amplification by PCR. Only small amounts of tissue are required for typing microsatellites and these markers can be assayed using non-lethal fin clips and archived scale samples, facilitating retrospective analyses and the study of depleted populations (McConnell *et al*., 1995).

The current study is important because there were no previous reports on the development of microsatellite markers in *Channa striata*. Besides that, polymorphic microsatellite markers are very important in fisheries and aquaculture studies in which they are useful for applications such as parent-offspring identification in mixed populations, and population genetics. These polymorphic markers should provide efficient tools to study population genetic structure of this fish. The identification of highly polymorphic genetic markers that provide high reliability is a crucial step to generating population genetic data. Polymorphic markers provide allele frequencies, heterozygosities, and other imformation related to the population structure of the species, its distribution patterns and genetic makeup of the population.