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Genetic Diversity Comparison of *Pampus minor* between Chinese and Malaysian Populations Inferred from mtDNA Cytb

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YL and LL conceived and designed experiments. YL, XZ, PS and JF performed all experiments and wrote the manuscript. LZ and KL analyzed the data.

Key words
***Pampus minor*, Genetic diversity, Population structure, Population expansion, Cytb.**

ABSTRACT

Pampus minor is often mistakenly identified as the larva of *Pampus argenteus* or *Pampus cinereus* because of its small size. Despite its importance, studies on the population genetics of *P. minor* are not yet available. In the present study, the mitochondrial Cytb gene was employed to investigate the population genetics of *P. minor* collected along the coasts of China and Malaysia. The genetic diversity of all *P. minor* populations was moderate, and two major haplotype lineages were detected that were differentiated approximately 0.3 million years ago. These two haplotype lineages differed significantly in frequency distribution of Chinese and Malaysian populations, showing an imperfect geographical pedigree structure. Results of AMOVA also showed that the genetic differentiation was mainly among populations. According to the distribution of the haplotypes, an ancestral haplotype existed in both the Chinese population and the Malaysian population, further confirming that the Chinese and Malaysian *P. minor* populations originated from the same refuge in the South China Sea. A historical demographic analysis indicated that *P. minor* experienced a recent population expansion during the late Pleistocene period. Due to the need of *P. minor* to adapt to the diverse habitats, unique haplotypes were ultimately formed under the differing pressures of natural selection. This study is expected to provide a basis for future research of the population genetics of *P. minor*.

INTRODUCTION

Pampus minor Liu and Li, 1998 belongs to the class Actinopterygii, order Perciformes and family Stromateidae. It is a newly discovered warm-water *Pampus* species, distributed mainly in the offshore to the south of the Taiwan Strait (Liu and Li, 1998; Liu *et al*., 2002). Due to the similar external characteristics and small size (adult fish are generally less than 150 mm long), *P. minor* has often been mistaken for *P. argenteus* or *P. cinereus* (Cheng, 1962; Liu and Li, 1998). Zhang (2011) suggested that there is introgressive hybridization between *P. argenteus* or *P. cinereus* in the South China Sea, whereas our studies demonstrate that this species is *P. minor* (Li *et al*., 2013). There are few studies on *P. minor*, and those available are limited to morphological (Liu and Li, 1998) and phylogenetic (Guo *et al*., 2010; Cui *et al*., 2010, 2011) studies. Basic surveys on the status of fishery resources and the distribution of *P. minor* have not been reported, l*et al*one studies on its population genetic diversity.

Based on morphology and DNA barcoding studies on a large number of *P. minor* samples collected, we summarized the identifying morphological characteristics of *P. minor* as follows (Liu and Li, 1998; Li, 2015): oval body; eye diameter more than 1/2 of the head length; dorsal fins VII-IX 34-39, pectoral fins 22-24, anal fins V-VII 35-39, and caudal fins 18-20; transverse occipital canals and the dorsal branches of the lateral-line canal on top of the head with a truncated rear edge; ventral transverse occipital canals sparse and slightly longer than or equal in length to the dorsal branches; gill rakers, thin (delicate), sparse, 3-4+8-10=11-14; and vertebrae 29-31.

P. minor is also distributed in Malaysian waters, where it has been recorded recently. If the same species lives in heterogeneous habitats, different genetic diversity often emerge to allow for adaptation to local environments,

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