

## Genetic Variation of the Chinese Mudskipper, *Periophthalmus cantonensis* (Osbeck, 1762) (Pisces; Perciformes, Gobiidae) from Taiwan<sup>1</sup>

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**Jung-Ti Chang and Sin-Che Lee (1994)** Genetic variation of the Chinese mudskipper, *Periophthalmus cantonensis* (Osbeck, 1762) (Pisces; Perciformes, Gobiidae) from Taiwan. *Zoological Studies* 33(1): 34-43. The degree of genetic divergence of two hundred and seventy eight specimens of the Chinese mudskipper, *Periophthalmus cantonensis* (Osbeck, 1762) collected from six locations in Taiwan was estimated using starch gel electrophoresis. Fourteen enzymes corresponding to 22 gene loci and 47 alleles were recognized. An average Nei's genetic identity of  $\bar{T}=0.996$  (0.993-0.999) indicated highly homogenous protein structure. The proportion of polymorphic loci (0.95 level) varied from 0.0909 to 0.2727 with a mean of 0.1742; expected heterozygosity ranged from 0.028 to 0.065 with a mean of 0.051. The mean  $F_{st}$  differentiation among populations was only 0.0235. However, observed population phenotype numbers partly disagreed with Hardy-Weinberg equilibrium; this is probably due to some factors that affect the disequilibrium.

**Key words:** Chinese mudskipper population, Isozyme polymorphism, Genetic variation and environmental variability correlation.

The Chinese mudskipper, *Periophthalmus cantonensis* (Osbeck, 1762) is taxonomically placed in the family Gobiidae under Perciformes. The number of rays in each fin are: first dorsal XIV, second dorsal-I, 12, anal-I, 11, pectoral 14, ventral fin I, 5. The first dorsal fin upper margin is laterally rounded. The fish is covered with scattered black dots and has 26 vertebrae. This species is closely related to *P. vulgaris* of Japan. The concave upper margin on the first dorsal fin and one ray less on the second dorsal and anal fins distinguish it from *P. cantonensis*. No sensory pattern interspecific differences were found.

*P. cantonensis* is prolific in mangrove and mudflat estuaries in southern China and southeastern Asia (Gordon et al. 1985) and is sometimes found in southern Japan. In Taiwan this species is found at nearly all sandy coast estuaries (an exception is the extreme southern coasts); a small population is found in the Penghu Islands.

*P. cantonensis* is an euryhaline amphibious species, predominantly preying on insects and aquatic crustaceans. It is capable of skin respiration while exposed to air; its eurythermal tolerance is 30° to 35°C, euryhaline tolerance, 15 to 30‰.

Since *P. cantonensis* is primarily a estuarine microhabitat resident which does little immigration or emmigration, from individual habitats that are generally isolated. Gel electrophoresis (Ayala et al. 1974) permits allelic variation identification at a single gene locus. The gene locus can be selected for study without prior knowledge of its variance within or between populations due to wide distribution, eurythermal tolerance, and euryhaline tolerance. The objects of the present study are (1) the level of degree of interpopulational genetic variation estimation and (2) population heterozygosity to possible environmental parameter mean degree correlation.

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