



# Genomic characterization and sequence diversity of the $\beta_2$ -microglobulin gene in the miiuy croaker, *Miichthys miiuy*

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Genet. Mol. Res. 14 (3): 10249-10257 (2015)

Received February 4, 2015

Accepted June 29, 2015

Published August 28, 2015

DOI <http://dx.doi.org/10.4238/2015.August.28.9>

**ABSTRACT.**  $\beta_2$ -Microglobulin ( $\beta_2m$ ) is related to major histocompatibility complex class I alpha chains, and forms cell-surface glycoproteins that mediate a variety of functions in immune defense. In general,  $\beta_2m$  has no isoforms and is not polymorphic in higher vertebrates, but polymorphisms between different alleles have been found in some fish species. In this study, full-length  $\beta_2m$  cDNA and genomic sequences were cloned from the miiuy croaker (*Miichthys miiuy*). The miiuy croaker  $\beta_2m$  gene shares many of the same characteristics as other fish species. Three exons and two introns were identified in the miiuy croaker  $\beta_2m$  gene; these genomic structural features are similar to those present in other fish. The deduced  $\beta_2m$  amino acid sequence exhibited 34.7-90.1% identity with mammal and teleost  $\beta_2m$  amino acid sequences. Sequence polymorphism analysis in six individuals identified three alleles that encoded two proteins, confirming that  $\beta_2m$  polymorphisms exist in this species. Phylogenetic

analysis elucidated the evolutionary history of the  $\beta_2$ m protein among warm-blooded vertebrates and bony fish.

**Key words:** *Miichthys miiuy*;  $\beta_2$ -microglobulin; Genomic; cDNA; Sequence diversity