Association study between single nucleotide polymorphisms in *leptin* and growth traits in *Cyprinus carpio* var. Jian

Y. Tang, H. Li, J. Li, F. Yu and J. Yu

Key Laboratory of Freshwater Fisheries and Germplasm Resources Utilization, Ministry of Agriculture, Freshwater Fisheries Research Center, Chinese Academy of Fishery Sciences, Wuxi, China

Corresponding author: J. Yu
E-mail: yujh@ffrc.cn

Received September 15, 2015
Accepted January 15, 2016
Published August 5, 2016
DOI http://dx.doi.org/10.4238/gmr.15037635

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ABSTRACT. Leptin is a hormone that affects the regulation of body weight, energy expenditure, fat metabolism, food intake, and appetite. In this study, we cloned the *jlLEP-A1* and *jlLEP-A2* genes in Jian carp (*Cyprinus carpio* var. Jian) and performed an association analysis between identified polymorphisms and growth traits. Three polymorphisms in exons of *jlLEP-A1* (A1-T113C) and *jlLEP-A2* (A2-G415A and A2-G427A) were identified, and genotyped by the polymerase chain reaction - restriction fragment length polymorphism method in 263 female and 294 male Jian carp. All three SNPs were missense mutations. Association analysis revealed that the three SNPs were significantly associated with growth traits in male Jian carp. Only SNP A1-T113C was significantly associated with growth traits in female Jian carp. Analysis of diplotypes derived from *jlLEP-A2* SNPs revealed an association with growth traits in male but not female Jian.
carp. These results demonstrate that polymorphisms in the leptin gene are associated with growth traits and may be used for marker-assisted selection programs in Jian carp breeding and production.

**Key words:** *Leptin*; Single nucleotide polymorphisms; Growth traits; *Cyprinus carpio* var. Jian