
# Genetic parameters estimates for growth performance traits at harvest in Japanese flounder (Paralichthys olivaceus)

Yangzhen Li, Bo Zhang, Sheng Lu, Yongsheng Tian, Yingming Yang, Songlin Chen

PII: S0044-8486(17)32131-2
DOI: https://doi.org/10.1016/j.aquaculture.2018.01.010
Reference: AQUA 633012

To appear in: *aquaculture*

Received date: 26 October 2017
Revised date: 31 December 2017
Accepted date: 8 January 2018

Please cite this article as: Yangzhen Li, Bo Zhang, Sheng Lu, Yongsheng Tian, Yingming Yang, Songlin Chen , Genetic parameters estimates for growth performance traits at harvest in Japanese flounder (Paralichthys olivaceus). The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Aqua(2017), https://doi.org/10.1016/j.aquaculture.2018.01.010

# Genetic parameters estimates for growth performance traits at harvest in Japanese flounder (*Paralichthys olivaceus*)

Yangzhen Li[a,b,c], Bo Zhang[d], Sheng Lu[a,b], Yongsheng Tian[a,b], Yingming Yang[a,b], Songlin Chen[a,b,*]

[a] Yellow Sea Fisheries Research Institute, Chinese Academy of Fishery Sciences (CAFS), Key Laboratory for Sustainable Development of Marine Fisheries, Ministry of Agriculture, Qingdao 266071, China

[b] Laboratory for Marine Fisheries Science and Food Production Processes, Qingdao National Laboratory for Marine Science and Technology, Qingdao 266273, China

[c] College of Fisheries and Life Science, Shanghai Ocean University, Shanghai 201306, China

[d] Tianjin Bohai Sea Fisheries Research Institute, Bohai Sea Fisheries Research Center of Chinese Academy of Fishery Sciences, Tianjin 300457, China

[*] corresponding author at: Yellow Sea Fisheries Research Institute, Chinese Academy of Fishery Sciences (CAFS), No. 106 Nanjing RD, Qingdao 266071, China. Tel.: +86 532 85844606; fax: +86 532 85844606.

E-mail address: chensl@ysfri.ac.cn (S. Chen).

**ABSTRCT**

Despite Japanese flounder (*Paralichthys olivaceus*) is of importance in aquaculture of Northeast Asia, selective breeding programs for growth performance traits remain limited. The aim of this study was to estimate parameters of growth performance traits in this species. The heritabilities, genetic and phenotypic correlations, and breeding values were estimated for body weight (BW), total length (TL), condition factor (K), and average daily gain (ADG). The genetic analyses were performed on a total number of 186 full-sib families (108 sires and 146dams, 16807 individuals with integrated pedigree information) from 4 year-classes based on three mixed animal models with tank and year-class as fixed effects, mean family trait values at tagging as a covariate, and additive genetic effect as a random effect using the restricted maximum likelihood method. For all growth traits the maternal and sir-dam interaction effects in proportion to phenotypic variance were very low (0.00−0.05). The heritability estimates for growth traits ranged from 0.12 to 0.39, which is in a low to moderate level. These results indicated that there is a considerable additive genetic variation in growth traits, and the ongoing selective breeding project will produce considerable genetic improvement in growth traits of Japanese flounder. The genetic and phenotypic correlations among BW, TL and ADG were high and positive (0.87−0.94, $P<0.001$). However, the correlations between K and other three traits were low to moderate (-0.10−0.58, $P<0.001$). These data indicate that these traits (except K) could be selected and enhanced simultaneously and also imply that direct selection of TL, which is an easily measurable trait, will be more favorable than selection on BW and ADG. The estimated breeding values of parents and individuals and the average family breeding values for 4 traits were obtained. In summary, all the findings in this study will be of significance to optimize the flounder selective breeding program.

**Statement of relevance:**

This paper offers guidelines to select breeding strategy in Japanese flounder.