



Karyotype analysis and ribosomal gene localization of spotted knifejaw *Oplegnathus punctatus*

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ABSTRACT. The spotted knifejaw, *Oplegnathus punctatus*, is an important aquaculture fish species in China. To better understand the chromosomal microstructure and the karyotypic origin of this species, cytogenetic analysis was performed using Giemsa staining to identify metaphase chromosomes, C-banding to detect C-positive heterochromatin, silver staining to identify the nucleolus organizer regions (Ag-NORs), and fluorescence *in situ* hybridization (FISH) for physical mapping of the major (18S rDNA) and minor (5S rDNA) ribosomal genes. The species showed a karyotype of $2n = 48$ for females, composed of 2 submetacentric and 46 telocentric chromosomes, with a fundamental number (FN) = 50, while the karyotype of males was $2n = 47$, composed of 1 exclusive large metacentric, 2 submetacentric, and 44 telocentric chromosomes, with FN = 50. These karyotype results

suggest that *O. punctatus* might have an $X_1X_1X_2X_2/X_1X_2Y$ multiple sex chromosome system. C-positive heterochromatin was distributed in the centromeres of all chromosomal pairs and in the terminal portions of some chromosomes. A single pair of Ag-positive NORs was found to be localized at the terminal regions of the short arms of the subtelocentric chromosome pair, which was supported by FISH of 18S rDNA. After FISH, 5S rDNA were located on the interstitial regions of the smallest telocentric chromosome pair. This study was the first to identify the karyotype of this species and will facilitate further research on karyotype evolution in the order Perciformes.

Key words: *Oplegnathus punctatus*; Karyotype; 18S rDNA and 5S; rDNA Cytogenetic characteristics