

FISH mapping of 45S rRNA and IHHB genes on autosomes and B chromosome of cichlid fish *Astatotilapia latifasciata*

Jehangir, M.¹; Ahmad, S.F.¹; Cardoso, A.L.¹; Valente, G.T.²;
Martins, C.¹

Abstract/Resumo

B chromosomes (B) are supernumerary, additional and non-homologous to standard (A) chromosomes. Significant biological questions concerning the origin and structural organization of Bs are under discussion. Previous reports found that B chromosomes are enriched with repetitive elements and can carry functional genes. The present study is aimed to extend our knowledge of the structure and composition of B chromosomes. We have combined cytogenetics and genomics approaches to understand the B chromosome problem. Cytogenetics analysis, applied to cichlid fish *Astatotilapia latifasciata*, revealed the presence of 1 or 2 B chromosomes. Next generation sequencing data analysis, based on differential coverage approach, among B- (individual without B) and B+ (individual with B) samples, detected a higher number of copies for the Indian Hedgehog b (*Ihhb*) gene and 45S RNA transcriptional gene-cluster. Fluorescence in situ hybridization (FISH) confirmed that these genes are located on the B chromosome. In addition, the excessively abundant and strong signals of IHHB on B shows that this gene has accumulated and amplified its copies due to frequent duplication events. The findings also demonstrate that B chromosome have incorporated the entire 45S RNA cluster (18S ribosomal RNA, internal transcribed spacer 1, 5.8S ribosomal RNA, internal transcribed spacer 2, and 28S ribosomal RNA) from the A complement set. Our study contributes to explain that these genetic sequences are vital components in constitution of B chromosomes.

Quinta Reunião Brasileira de Citogenética e Citogenômica
5th Brazilian Meeting of Cytogenetics and Cyto-genomics

Keyword/Palavras-chave: Supernumerary chromosome; Genome; Chromosome evolution; *Astatotilapia latifasciata*

1 Department of Morphology, Institute of Bioscience, UNESP -São Paulo State University, Botucatu, SP, Brazil, farhan.unesp@yahoo.com
2 Bioprocess and Biotechnology Department, Agronomical Science Faculty, UNESP-São Paulo State University, Botucatu SP, Brazil