

# Towards the First Step of Conservation: Genetic and Molecular Analysis of *Neolissochilus stracheyi* (Day, 1871), (Cypriniformes: Cyprinidae) Found Only in Manipur within India

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**Abstract**—*Neolissochilus stracheyi* (Day, 1871), (Cypriniformes: Cyprinidae) commonly known as Blue Mahseer and Ngara in Manipuri and is found in a few clear forested stream and rivers of Manipur in India. The taxonomy of the mahseer species is confusing owing to the morphological variations and habitat adaptation. The study of genetic variability both at chromosomal and molecular levels will contribute in understanding the evolutionary and cytotaxonomic studies. Karyotype structure and chromosome location of GC-rich heterochromatin and ribosomal 18S rDNA were examined using conventional staining technique, sequential CMA<sub>3</sub> staining and fluorescent in situ hybridization (FISH). The chromosomal formula of this species reported here for the first time was found to be 20m+44sm+6st+30t showing a diploid number of 100 chromosomes, with its fundamental arm number (FN) as 164. Analysis of the chromosomal distribution of constitutive heterochromatin indicates the Chromomycin A<sub>3</sub> positive sites showing bright fluorescent signals of GC-rich active sites. The number and location of the heterochromatic bands were found species-specific and thus useful for the cytotaxonomy of this species. Examination of the number and distribution of the 18S rDNA gene sequences by two-colour in situ hybridization showed one pair of 18S rDNA signal, providing useful future inferences in unravelling the cytotaxonomic characters in this group. This molecular analysis by FISH technique will further help in chromosomal localization and as a useful genetic marker in species identification as well as phylogeny and evolutionary studies among the mahseer species. The present study of genetic characterization of fish species particularly that of threatened or economically important species is useful for planning their conservational strategies for safeguarding biodiversity.

**Keywords:** Evolutionary significance, FISH, Karyotype, *Neolissochilus stracheyi*.