Optimizing chromosome preparation in common carp: Effects of colchicine incubation and hypotonic treatment timing on chromosomal quality

Diksha Arya[1]*, Avdhesh Kumar[1] & Nityanand Pandey[2]

[1]Department of Aquaculture, College of Fisheries, G. B. Pant University of Agriculture &Technology, Pantnagar, Uttarakhand, India

[2]ICAR- Directorate of Coldwater Fisheries Research, Bhimtal, Uttarakhand, India

Received 22 July 2024; revised 27 November 2024

Karyotyping is an analytical technique to examine chromosomal structure, characteristics, and cell division. In karyotyping, stained preparations are photographed to arrange chromosomes. Modern methods such as karyotyping, make it easier to identify specific chromosomal pairs, which advances our knowledge of the chromosomal causes of important hereditary diseases. While karyotyping variations can occur within and between species, each organism has a distinct karyotype characterized by the number and shape of its chromosomes. The present study examined the quality of chromosomes obtained from nine treatments, each with varying colchicine incubation time and hypotonic treatment duration in juveniles of common carp (*Cyprinus carpio*). The study involved varying colchicine exposure times (1, 3, and 5 h) at a concentration of 0.05%, along with hypotonic solution exposure durations (35, 45, and 60 min) applied to kidney tissue. The study found that at a colchicine concentration of 0.05% and incubation times of 3–5 h, the number of metaphase chromosomes and the quality of chromosomal spreads correlated positively with 45 min of KCl treatment, proving more effective than other treatment durations.

Keywords: *Cyprinus carpio*, Exposure time, Karyotyping, Metaphase chromosome spreads