# A STUDY OF CONSTITUTIVE HETEROCHROMATIN AND NOR BANDING IN THREE SPECIES OF *PUNTIUS* FROM THE STATE OF HARYANA, INDIA

NEERU KAMBOJ, A. BHATNAGAR *, A.S. YADAV

Department of Zoology, Kurukshetra University, Kurukshetra, Haryana-136119. India

E-mail: anitabhatnagar@gmail.com

*The purpose of the present study was to investigate and compare the karyotypes of three species of Puntius viz. Puntius sarana (Hamilton, 1822), Puntius sophore (Hamilton, 1822) and Puntius ticto (Hamilton, 1822) belonging to family Cyprinidae in terms of chromosomal architecture, banding pattern and number of chromosomes from aquatic ecosystems of Haryana, India. Diploid chromosome number 50 was observed in all 3 species of Puntius. The chromosomes of 3 species of Puntius showed constitutive heterochromatin at telomeric and centromeric regions of chromosomes. The Ag-NOR (Argyrophilic-Nucleolus Organizer Region) bands were observed on homologous chromosome pair numbers 2, 8 and 14 in P. sophore, pair numbers 2, 9 and 14 in P. ticto. The diploid chromosome number in P. sarana was found to be 2n = 50, 2 pairs of metacentric chromosomes, 3 pairs of subtelocentric and 20 pairs of acrocentric chromosomes. Chromosomal studies on the P. sophore revealed the diploid chromosome number to be 2n = 50, showed 16 pairs of metacentric chromosomes, 5 pairs of submetacentric, 2 pairs of subtelocentric and 2 pairs of acrocentric chromosomes. The diploid chromosome number in P. ticto was found to be 2n = 50, with 15 pairs of metacentric chromosomes, 6 pairs of submetacentric, 2 pairs of subtelocentric and 2 pairs of acrocentric chromosomes. No heteromorphic sex chromosomes were cytologically detected. Variations in chromosomes are observed with respect to earlier studies which may be due to variation in habitat conditions as a result of anthropogenic activities.*

***Key words:*** *Chromosome, Puntius sarana, Puntius sophore, Puntius ticto, Karyotype.*

## ДОСЛІДЖЕННЯ КОНСТИТУТИВНОГО ГЕТЕРОХРОМАТИНА І NOR-БЕНДИНГУУ ТРЬОХ ВИДІВ *PUNTIUS* ЗІ ШТАТУ ХАР'ЯНА, ІНДІЯ

Мета цього дослідження полягала у вивченні та порівнянні каріотипів трьох видів *Puntius* viz. *Puntius sarana* (Hamilton, 1822), *Puntius sophore* (Hamilton, 1822) і *Puntius ticto* (Hamilton, 1822), які належать до сімейства Cyprinidae у плані хромосомної структури, смугастої покресленості та кількості хромосом з водних екосистем у штаті Хар'яна, Індія. Диплоїдну кількість хромосом, 50, спостерігали у всіх трьох видах *Puntius*. Хромосоми трьох видів *Puntius* показали наявність конститутивного гетерохроматина у теломерах і центромерах хромосом. Ag-NOR (аргентофільний ядерцеутворюючий регіон) бенди спостерігали на гомологічних парах хромосом №№ 2, 8 та 14 у *P. sophore*, парах №№ 2, 9 і 14 в *P. ticto*. Було виявлено, що диплоїдна кількість хромосом у *P. sarana* становить 2n = 50, при цьому є 2 пари метацентричних хромосом, 3 пари субтелоцентричних і 20 пар акроцентричних хромосом. Дослідження хромосом *P. sophore* показало, що диплоїдна кількість хромосом становить 2n = 50, було виявлено 16 пар метацентричних хромосом, 5 пар субметацентричних, 2 пари субтелоцентричних і 2 пари акроцентричних хромосом. Було встановлено, що диплоїдна кількість хромосом у *P. ticto* становить 2n = 50, при цьому є 15 пар метацентричних хромосом, 6 пар субметацентричних, 2 пари субтелоцентричних і 2 пари акроцентричних хромосом. Цитологічний аналіз не виявив гетероморфні статеві хромосоми. Спостерігали зміни у хромосомах порівняно з попередніми дослідженнями, що може бути викликано зміною умов середовища існування внаслідок антропогенної діяльності.

***Ключові слова:*** хромосома, *Puntius sarana*, *Puntius sophore*, *Puntius ticto*, каріотип.

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Received September 23, 2019
Received October 19, 2020
Accepted January 18, 2021