

# Effect of Oleandrin on Micronucleus Cells of Freshwater Air Breathing Fish *Channa punctatus* (Bloch)

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**Abstract:** *The micronucleus test (MNT) of peripheral blood, gill and kidney cells of freshwater fish Channa punctatus has been carried out in specimens treated with different doses of oleandrin extracted from leaf of Nerium indicum. The higher frequency of micronucleated cells in these tissues in treated series against control. The data showed that the cells of the three different tissues had different response against the of plant extracts of Nerium indicum. The effect was dose dependent as shown by the frequencies in peripheral blood and kidney cells of treated fish Channa punctatus.*

**Keywords:** Oleandrin, *Nerium indicum*, Micronucleus, Pesticidal activity, *Channa punctatus*

## I. INTRODUCTION

**PLANTS.** *Nerium indicum* Mill. (family- Apocynaceae) leaves, collected from Botanical Garden of D.D.U. Gorakhpur University, Gorakhpur in month of November 2016 and identified by Prof. R.P. Shukla, Department of Botany, D.D.U. Gorakhpur University, via voucher No. 1704 is on deposited.

**USES IN TRADITIONAL MEDICINE.** Leaves are used against snake bites and claimed possess cardiotoxic, diuretic, antibacterial and insecticidal properties (Jacobson, 1985; Wealth of India, 2000). Aqueous extract of bark and latex possess insecticidal, piscicidal and molluscicidal properties (Singh and Singh, 2005; Yadav and Singh, 2016)

**PREVIOUSLY ISOLATED CONSTITUENTS OF COMPOUNDS.** Glycosides, steroids, terpenoids, various fatty acids, sugars and hydro carbons have been isolated leaves of *Neirum indicum* (Yamuchi, et.al., 1973; Singh et.al., 1993, Tiwari and Singh, 2006; Singh, 2011).

**TESTED MATERIALS.** Oleandrin isolated from *Nerium indicum* leaf by the method of Singh, 2001. Fresh leaves were dried in incubator at 80°C, powdered with electrical device and percolated with methanol. The percolate was concentrated, diluted with water to 50% and filtered. The filtrate was crystallized in form of Oleandrin. Identification of compounds was further confirmed with authentic sample of Oleandrin (C<sub>32</sub>H<sub>48</sub>O<sub>9</sub>) supplied by Sigma Chemical Company, USA.

**EXPERIMENTAL ANIMAL.** Freshwater air breathing fish *Channa punctatus* (Bloch) (10.5 ±0.9 cm in total length) were collected from Ramgarh lake of Gorakhpur District. Test animals were acclimatized at 25°C for 72h in plastic container and further used for micronuclei test experiment.

**STUDIED ACTIVITY.** The Micro Nuclei Test (MNT) is quicker, easy and authentic method for screening of genotoxic agents (Barat, et.al., 1998). In present study, author studied the genotoxic effect of *Nerium indicum* against freshwater fish *Channa punctatus* by the methods of Hooftman and Raut (1982) modified by Kushwaha, et. al., 2012. Student “t” test and regression values were calculated by Russell et al. (1977).

Results: As given in Table 1.

**Discussion:** The presented data indicate that the frequencies of micro nucleated cells were highest during the initial period of exposure and therefore declined. However, they are still higher than the control. As evident from co-migration

of purified fraction obtained by column chromatography of oleandrin, the genotoxic effect may due to glycoside and alkaloids from *Nerium indicum* leaf (Kinghorn and Evans, 1975; Wealth of India, 2000; Bhatnagar, et.al., 2016). It has been suggested that such type of plant product cannot be used directly in freshwater bodies, without their detailed studies on long term effect on non-target organism as well as their structure relationship.

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Table 1: Frequency of MN and MNC from peripheral blood, gill and kidney cells of control and latex extract *Nerium indicum* treated *Channa punctatus*.

Tissues	Dose (mg/L)	No of animal	No of cells	No. of MN	No. of MNC	Percentage	
						MN	MNC
Peripheral blood	2.4	5	10,000	19 (8)*c	19 (8)	19 (0.08)	19 (0.08)
	2.6	5	10,000	40 (6)*b	40 (6)	0.4 (0.06)	0.4 (0.06)
	2.8	5	10,000	59 (10)*c	56 (10)	0.56 (0.1)	0.56 (0.1)
Gill	2.4	5	10,000	60 (11)	45 (10)	0.6 (0.11)	0.6 (0.11)
	2.6	5	10,000	89 (16)c*	60 (14)	0.89 (0.16)	0.89 (0.16)
	2.8	5	10,000	136 (17)a*	85 (13)	1.36 (0.17)	1.36 (0.17)
Kidney	2.4	5	10,000	51 (8) a*	50 (8)	0.51(8)	0.51 (8)
	2.6	5	10,000	76 (9) a*	75 (9)	0.76 (0.09)	0.76 (0.09)
	2.8	5	10,000	99 (10) a*	96 (10)	0.99 (0.1)	0.99 (0.1)

Control values are given in bracket

Student "t" tests: a\* = P<0.001, b\*=P<0.01, c\*=P<0.05

r value for peripheral blood ---r---1.1668, P<0.001

r value for gill epithelia ---r---0.924, P<0.001

r value for peripheral blood ---r---0.977, P<0.001