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Toxic Effect of Paracetamol on Mitotic Index of Onion Root Tip

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ABSTRACT

The toxic effect of Paracetamol on Mitotic index of onion root tip developed over a period of 72 hours in three different concentration of 0.5 ml, 0.25 ml and 0.125 ml. The percentage of total dividing cell were found more or less as control and there was no significant difference in Mitotic index. But paracetamol was shown to induce abnormalities at these concentration including Binucleated cell, Double Anaphase, Multipolar Spindle, Anaphase Bridge, Double Prophase, Metaphase abnormalities etc. Taken together the data that Paracetamol can cause cytotoxic effect but not cause much affect on mitotic index of onion root tip cell.

KEYWORDS: *Mitotic Index, Paracetamol, Onion root tip, Cytotoxic effect*

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INTRODUCTION

Population growth and fast development of medical science has also result in the increased consumption of medicine.

Today in minor problem related to health, people prefer in self-medication in comparison to antibiotics, multivitamins and others (Aqueel etal, 2014).

- Paracetamol is the most preferred analgesic antipyretic plus OTC drug and can be easily available on several medical store.
- Since it is considered as a safe drug but its overdose produces hepatic necoris, renal failure due to increase in lipid peroxide levels and depletion of glutathione (Abraham, 2005) and also results in pulmonary toxicity (Jonas and Prescott, 1997).
- Few reports are available regarding genotoxic affect of paracetamol (Ying and Yi 2000, Arun and Robeth 2010).
- The present work is designed to investigate the toxic effect of Paracetamol on Mitotic onion root tip.

MATERIALS AND METHOD

The paracetamol solution was prepared using 500mg, 250mg, and 125mg tablet which was dissolved in 100ml of distilled water, and the concentration .05ml, .025 ml and .0125ml was prepared respectively. 5 bulbs of onion (average wt.40-45g) were taken for each concentration. After growing 1 to 2 cm long roots, they were treated with these concentration for 72 hours. A controlled was also maintained where there was no treatment done. After 72 hours of treatment, these root were cut, washed, fixed and preserved in 70% alcohol. Acetocarmine stain squash preparation were made. About 2000 cells were randomly analyzed. Frequency of Mitotic Index and Phases there after were calculated. The chromosomal abnormalities were noted in TABLE-1

FORMULA USED

- $\boldsymbol{Mitotic\ Index} = \frac{\textbf{Total No.Of Dividing cell}}{\textbf{Total No.of cell}} \times \mathbf{100}$
- $\boldsymbol{S.ERROR} = \sqrt{\frac{\%\times(\mathbf{100}-\%)}{N}}$
- $\boldsymbol{t-diff} = \sqrt{\frac{\%\ of\ treated - \%\ of\ control}{(S.E\ of\ treated)^2+(S.E\ of\ control)^2}}$

TABLE NO:- 1

Concentration	Total no of cell obsv.	Total no. Of dividing cell			Prophase		Metaphase		Anaphase		Telophase		Abnormalities
		No.	%± SE	t-diff	No.	%± SE	No.	%± SE	No.	%±SE	No.	%±SE	
Control	2314	113	4.8± 0.4		29	1.25± 0.23	45	1.94± 0.28	22	0.95± 0.2	17	0.75± 0.17	0
0.5%	2256	122	5.40± 0.47	1.12	48	2.2±0 .30	23	1.04± 0.21	12	0.53± 0.64	20	0.88± 0.19	24
0.25%	2906	124	4.26± 0.37	1.36	65	2.23± 0.27	26	0.89± 0.7	22	0.75± 0.16	11	0.27± 0.11	17
0.125%	2240	116	5.7± .46	0.84	41	1.83± 0.28	25	1.11± 0.22	21	0.03± 0.2	14	0.62± .16	15

*** Abnormalities:- Binucleated cell, Double Anaphase, Multipolar Spindle, Anaphase Bridge, Double Prophase.**

STASTICAL ANALYSIS

Statistical analysis was calculated using t-test.

RESULT AND DISCUSSION

Different types of abnormalities including binucleated cell, multipolar, double anaphase, double prophase, anphase bridge etc. were found at three different concentration but the percentage of total dividing cell were found more or less as control and there was no significant difference in mitotic index at three different concentration. Therefore it can be concluded that paracetamol could induce cytotoxic effect but does not cause much effect on mitotic index of onion root tip cells.

CONCLUSION

The investigation of the present work provide us an opportunity to conclude that paracetamol is a potent cytotoxic agent since it causes the several abnormalities in the dividing cell. Therefore people must be aware towards its consumption and also reasearchers should draw their attention to work on its amelioration so that its hazards can be reduced.

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