INTERNATIONAL JOURNAL FOR INNOVATIVE RESEARCH IN MULTIDISCIPLINARY FIELD ISSN: 2455-0620 Volume - 6, Issue - 12, Dec – 2020
Monthly, Peer-Reviewed, Refereed, Indexed Journal with IC Value: 86.87 Impact Factor: 6.719
Received Date: 12/12/2020 Acceptance Date: 25/12/2020 Publication Date: 31/12/2020

Ameliorating effect of Murraya koenigii leaves (curry leaves) against paracetamol induced genotoxicity in mice sperm cells.

[1] Nidhi Verma, [2] Dharmshila Kumari
[1] Research Scholar, [2] Asst. Professor
P.G. Dept. of Zoology, P.G. Dept. of Zoology
T.M.B.U., Bhagalpur, (Bihar), India, T.M.B.U., Bhagalpur, (Bihar), India
Email - [1] nidhivermabgp@gmail.com, [2] dharmshilakumarihtc154@gmail.com

Abstract: *The increasing demand of analgesics among people are indulging them towards various health hazards leading to kidney damage, liver damage and also leading to genetics toxicity, in present work the ameloriating effect of curry leaves were evaluated against the genetic toxicity induced by paracetamol in mice sperms morphology the result shows that total sperm abnormality in paracetamol treated group were significantly (11.77%) higher than control (2.44%).*

Whereas concurrent treatment with Curry leaves extract with paracetamol shows value of 2.24$ this value was highly significantly lower than paracetamol treated group and almost equivalent upto the control level.

Various type of abnormalities including coiled tails, hookless, banana shaped, double-headed, club-headed, pin-headed were observed during the experiment.

Key Words: *Analgesics, Paracetamol, Genotoxicity, Sperm morphology.*

1. INTRODUCTION:

- Today the medicines are considered as one of the most important necessity to all of us, in minor problems relating to our health we prefer self –medication.
- Analgesics, antipyretics, antidepressants and antibiotics are consumed throughout the world for the purpose of self-medication.
- Analgesics are most likely group of medicines in comparison to others (Aqueel et al., 2014).
- These are commonly consumed to prevent pain and produce their therapeutic effect through inhibition of prostaglandin synthesis (Gilman et al., 1990).
- These analgesics are easily available in market and people are using them at fast rate without paying attention to their doses and probable side effects (Sahu, 2009).
- Paracetamol is most commonly and widely used as analgesics –antipyretics drug, since it is considered as a safe drug but its overdose produce hepatic necrosis, renal failure due to increase in lipid peroxide levels and depletion of glutathione (Abraham, 2005) and also results in pulmonary toxicity (Jones and Prescott, 1997).
- Some reports are available about genotoxic effect of paracetamol (Ying and Yi, 2000), and its amelioration (Salah et al., 2012).
- Human beings have been utilizing plants and their products for preventative and curative health care since very long time (Jakhar et al., 2015).
- The magical plant of Indian spices “Murraya koenigii” commonly called as curry native of India, Sri Lanka and other south Asian countries has served human kind not only as food enhancer but also served as an important medicine to cure many disorders. It is reported to posses anticancer (Yinkok et al., 2012), anti-inflammatory(Muthumani et al., 2009)
- Anti-ulcer, anti-diarroheal (Sharma, et. al., 2010) and also anti-mutagenic (Mehra et al., 2013).
- It has Vit-A, Vit-b2, Vit-c, ca and iron in plenty (Singh et al., 2014).
- Murraya koenegii is recognized to be the good source of carbazole alkaloids Nafiah & Ahmad (2014) as well as it posses potent antioxidant property due to mahanimbine, murrayanol and mahanine (Tachibana et. al., 2003, Ningappa et al., 2005).
- It has been reported that there is inverse relationship between dietary intake of antioxidants rich food and incidence of number of human diseases.
- Therefore the present work is designed to investigate the genotoxicity induced by paracetamol and its amelioration by Murraya koenigii leaves on mice sperms morphology. Since, sperm morphology is one of the convenient and widely used techniques in genetic toxicology and has potential in identifying chemical that induces spermatogenic dysfunction and perhaps heritable mutations (wyrobek et al., 1983).

2. MATERIALS AND METHOD:

A 4-6 week old Swiss albino male mouse with an average body wt. of 25 gm was used as test animal. Animals were obtained from animal house colony, university department of zoology, Tilka Manjhi Bhagalpur University, animals were caged in group and was provided normal laboratory as well as nutritional condition throughout the experimental period. For the treatment the Paracetamol Tablet of 500mg was used in powdered form and curry leaves were shed dried and powered for the purpose of experiment. Mice were divided into 4 experimental groups, 6 mice in each group as shown in table-1 and was subjected for treatment duration of 35 days.

Table - 1

Sl No.	Experiment Group	Symbol	Dose
I	Control	C	No Treatment
II	Paracetamol	P	7.10mg / kg
III	Murraya koenigii	M	100mg / kg (Deshmukh.et.al,2012)
IV	Paracetamol + Murraya koenigii	P + M	As I & II

The slides were prepared by sperm suspension obtained by minicing the cauda epidydmis using methodology of wyrobek et.al. and approx 500 sperms cells were screened for each group.

STATISTICAL ANALYSIS:

For statistical analysis t-test were used for the evaluation of data.

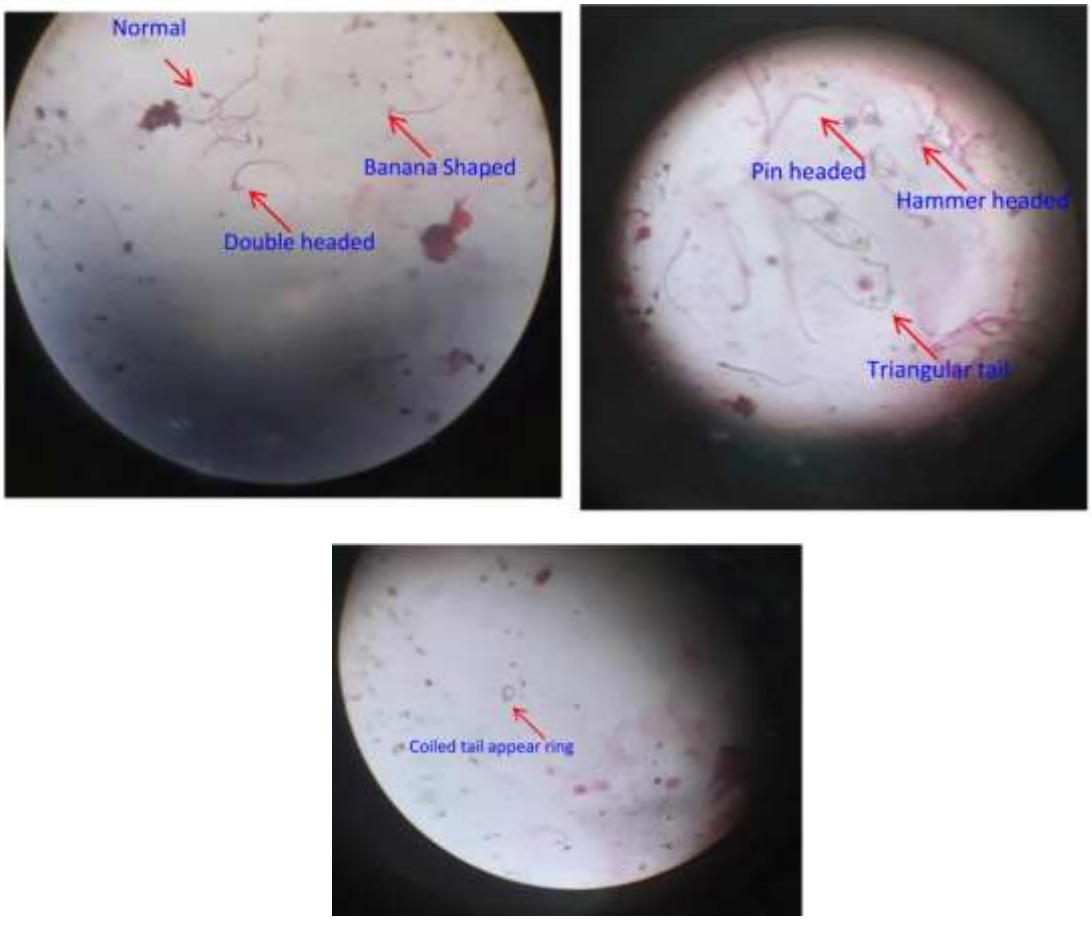

Figure-1: Abnormalities examined under microscope in sperms cells of paracetamol treated group.

3. RESULT AND DISCUSSION:

- Various types of abnormalities including coiled tails, hookless, bent neck, detached head ,distal bent tail, proximal bent tail, banana shaped, double headed, club-headed, pin headed were observed most abruptly in a paracetamol treated group.
- The total sperm abnormality in paracetamol treated group were significantly (11.77%) higher than control (2.44%). When Murraya koenigii leaf extract was administrated alone the abnormalities was 2.88%, this value was almost equal to control level.
- However concurrent treatment with Murraya koenigii leaf extract with paracetamol shows value of 2.24% this value was highly significantly lower than paracetamol treated group and almost equivalent upto the control level.
- Paracetamol with the concurrent treatment of leaf extract of curry leaves significantly minimized the genotoxic effect of paracetamol and thus produced a suitable ameliorating effect against paracetamol induced genotoxicity.

TABLE – 2

TREATMENT VARIANT	SYMBOL	NO. OF SPERMS STUDIED	NO. OF ABNORMAL SPERMS	% ± S.E.
Control	C	490	12	2.44 ± 0.69
Paracetamol	P	484	57	11.77 ± 1.46 [a]
Murraya koenigii	M	416	12	2.88 ± 0.88 b
Paracetamol + Murraya koenigii	P + M	489	11	2.24 ± 0.66 b

- a indicate significant diff with control and
- b indicate significant diff with Paracetamol

Figure-2: Graph showing the percentage of four experimental variant group

4. CONCLUSION:

From the obtained results it is concluded that paracetamol produces vigorous genotoxic as well as mutatic effect on sperm morphology and to recover its toxic effect the curry leaves proves to be the potent ameliorating agent

So my objective behind this work is to make people alert regarding the hazards of this medicine and aware them about the medicinal importance of antioxidants rich common herbal spices, “Murraya koenigii (Curry leaves) found in our locality.

REFERENCES:

1. Abraham P (2005). Oxidative stress in paracetamol-induced pathogenesis :(1)-Renal damage Indian J.Biochem. Biophys.42:59-62
2. Aqueel, T., Shabbir, A., Bashavat, H., Bukhari, M., Mobin, S., Shahid, H., and Waquar, S.A. (2014) Prevelence of self medication among urban and rural population of Islamabad, Pakistan. Tropical Journal of Pharmac Resea; B (4); 627-633. http://dx.doi.org/10.4314/tiprv1314-12.
3. Deshmukh, S., Pathak A.K., Burande M.D. (2012). Antigenotoxic effect of Murraya koenigii towards cyclophosphamide induced cytogenetic damage in mouse bone marrow cells. International journal of pharmacognosy and Phytochemical research. 2012; 4(2); 59-63.
4. Gilman, A.G.; Goodman, L.S. and Gilman, A. (1990). The Pharmacological Basis of Therapeutics. 6th edition Macmillon Pub. Co. Inc. New York.
5. Jones al. Presscott lt. (1997) unusual complications of paracetamol poisioning QJM 90: 161-168.
6. Jakhar, S ,Gahawat K ,Dahiya S. Swami U, Verma M and Dahiya P. (2015). Antibacterial and antioxidant potential of leaf and seed extracts of Murraya koenigii spreng British microbiology research journal, 10(6);1-7,2015 .
7. Muthumani P. ,S.Venkataraman , K.V. Rameshu R.Meera, P.Devi and B. Kameswari ,(2009) Pharmacological studies of anticancer and anti-inflammatory activities of Murraya koenigii spreng in experimental animals J.Pharm.sci and Res 1:137-141.
8. Mishra .A., Gupta .V., Nagar.H, Shrivastav. V. (2013). Protective effect of Murraya koenigii leaves extract against genotoxicity induced by cyclophosphamide in mouse bone marrowcells. Global veerenerian 10(20. 128-133, 2013.
9. Ningappa , M,B., Dinesha , R., and Srinivas, 2008. Antioxidant and radical scavenging activities of polyphenol- enriched curry leaf (Murraya koenigii) extracts .Food chemistry 106: 720-728
10. Sahu CR (2009), Developmental toxicity of ibuprofen treated mice Int. Pharm Sci., 1:92-102.
11. Sharma .U.S., U.K., Sharma, A. Singh . Sutar and P.J.Singh (2010). In vitr o antihelmenthic activity of Murraya koenigii leaves extract . International journal of pharma and biosciences, 1:3.
12. Salah, S.H., Abduoh S., Hodal, B; Rahim, A.A., (2012). Effect of zingiber officinale on paracetamol induced genotoxicity in male rates. Journal of medicinal plants research, Vol. 6(41), pp. 5425-5434, oct. 2012.
13. Singh S., OMRE, P.K., Mohan Madan S., (2014). Curry leaves (Murraya koenigii Linn. Sprengal)- A miracle plant Indian J.Sci. Res. 4(1): 46-52, 2014.
14. Tachibana, Y., Kikajaki.H., Lajis, N.H.and Nakatani N. 2003. Comparision of antioxidative properties of carbazole alkaloids from Murraya koenigii leaves .Journal of agriculture and food chemistry 51:6461-6467
15. Wyrobek, A.J., Gordon, L.A., Burkhart, J. G. et. Al. (1983). An evaluation of human sperms as indicators of chemically induced alteration of spermatogenesis in man. Mutation Res., 115, 73-148.
16. Ying, H and Yi, L (2000) effect of aspirin and paracetamol on inner cell mass and protein expression of rat embroys in preggastrulation stage, Biol. Abstr. 07 (17) : 253-261
17. Yihkok,S. L,,Mooi,k.Ahmad and M.A. Sukari, (2012). Anti-tumour promoting activity and antioxidant properties of grinimbine isolated from the stem bark of Murraya koenigii. Molecule, 17;4651-4660.