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## Impact of *Citrus limonum* seed on sperm parameters of male albino rats

Haque Sana\*, Shamshun Nehar<sup>b</sup>, Priyanka Kujur<sup>a</sup> & Md. Amzad Khan<sup>a</sup>

<sup>a</sup>University Department of Zoology, Ranchi University, Ranchi, Jharkhand, India

<sup>b</sup>Principal, S.S.Memorial College, Ranchi University, Ranchi, Jharkhand, India

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**Abstract** : Evaluation of herbs has been in progress worldwide for several decades to identify effective and safe substances for fertility regulation. This approach proved to be a good alternative to synthetic drugs. The present study was carried out to find out the antifertility activity of ethanolic extract of *Citrus limonum* seeds. The extract was administered orally for 30 days. The extract showed a significant reduction in sperm count. ( $p < 0.001$ ) at a dose level of 500mg/kg b.wt. Therefore it is suggested that lemon seeds can be a good alternative for regulating sperm parameters.

**Keywords** : *Citrus limonum*, sperm count, normality

### INTRODUCTION

Exploration of drugs having anti-fertility activity is the need of current time, and many time plant extracts have been investigated for their anti-fertility effect in female and male albino mice. *Citrus limonum* commonly known as lemon, belongs to the citrus-Linn (Ruteaceae) family. Lemon peel is used as stomachic and carminative. Anti-pneumonia factor is said to be present in lemon juice and it is also used in the treatment of acute tropical dysentery and diarrhoea. Citrus fruits are rich in vitamin C and in mineral salts.<sup>1</sup> *Citrus limonum* seeds have shown significant antifertility activity in female albino mice.<sup>2,3</sup> In the present study ethanolic extract of seed of the native species *Citrus limonum* is investigated for its anti-fertility activity in male wistar rats.

### MATERIALS & METHOD

Fresh seeds of *Citrus limonum* were obtained from Birsa Agriculture College and were authenticated in the Department of Botany, Ranchi University, Ranchi. Ethanol alcoholic extract which prepared by taking 50 gm of powdered sample that was extracted in soxhlet by (400) mL of ethanol (95%) solvent. then evaporated at 45°C by rotary evaporator, and further transferred into sterile bottles and refrigerated at 4°C until used.

Adult albino mice of Wistar strain weighing between 150-200 gms housed in clean environment under 12 hour light and 12 hour dark cycle, having free access to food pellet and water *ad-libitum*, were used after approval of the protocol by the Institutional Animal Ethical Committee.

#### Treatment phase

30 male albino rats were divided into three groups (n=10). Each group was kept in a separate cage. Group I served as control. Group II and group III were treated with

\*Corresponding author :

Phone : 8235487540

E-mail : sanaafroz8@gmail.com

lemon seed extract at a dose level of 250mg/kg and 500mg/kg b.w. respectively for 30 days.

**Assessment of sperm count and morphology**

Sperm from the cauda epididymis were released by cutting and was suspended into 2mL of medium (Hams F10) containing 0.5% bovine serum albumin.<sup>4</sup> After 5min incubation at 37°C the cauda epididymis sperm reserves were determined using the standard hemocytometric method.<sup>5</sup> Sperm motility was analysed using a microscope (Olympus IX7) at 10 successive fields for each sample and reported as the percentage mean of the motile sperm of each sample according to the World Health Organisation (WHO) method. Sperm morphology was determined by the method explained in WHO method manual.

The data was statistically analysed using Student's 't' test.

**RESULT & DISCUSSION**

Table 1 shows the result of the study on semen parameters. Sperm count significantly decreased from 42.0±4.1 to 31.3±4 and 27.9±5 in group II (low dose animals) and group III animals (high dose animals) respectively. However there were minor differences observed in sperm morphology.

**Table 1: Effect of *Citrus limonum* seed extract on sperm parameters of adult male albino rats**

Parameters	GROUP I (Control)	GROUP II (250mg/kg b.w)	GROUP III (500mg/kg b.w)
Sperm count (million/ml)	42.0±4.1	31.3±4**	27.9±5**
Sperm normality (%)	48.7±2.3	47.12±1.9	45.4±3.1 <sup>ns</sup>

Values are expressed as mean ± S.D, n =10. where, \*\*p<0.001 & ns = non significant

The decrease in sperm count may be due to the interference of extract with spermatogenesis and epididymal functions. These decreases are suggestive of alternation in sperm maturation and sperm production.<sup>6</sup> The present result is in agreement with studies related to various other plants extract.<sup>7-9</sup> The sperm count is considered as one of the important parameters to assess the effect of any agents on spermatogenesis.<sup>10</sup>

**REFERENCES**

1. Wealth of India Raw materials Council of Scientific and Industrial Research, New Delhi 1950: Vol. II. p. 77-82.
2. Patil, S. J. & Patil, S. B. 2010. Pre-clinical toxicity studies of orally administered petroleum ether extract of *Citrus medica* seeds on the reproductive organs of female mice. *International Journal for contemporary Reserach. Review.* 1:1-6.
3. Patil, S. J. & Patil, S. B. 2011. Toxicity studies on Hepatic, Nephric and Endocrine Organs of *Citrus medica* seeds extract on female Albino Mice. *Global Journal of Pharma Technology.* 3: 14-21.
4. Wang, R. S., Ohtani, K., Suda, M. & Nakajima, T. 2006. Inhibitory effect of ethylene glycol monoethyl ether on rat sperm motion. *Ind. Health.* 44: 665-668.
5. Aman, R. P. and Almquist, J. O. 1961. Reproductive capacity of Dairy Bulls. I. Technique for direct measurement of gonadal and extra-gonadal sperm reserves. *J. Dairy Sci.* 44: 1537-1545.
6. Sarkar, M., Gangopadhyay, P., Basak, B., Chakrabarthy, K., Banerji, J., Adhikari, P. & Chatterjee, A. 2000. The reversible antifertility effect of Piper betle Linn. on Swiss albino male mice. *Contraception.* 62: 271-174.
7. Njar, V. C., Alao, T. O, Okogun, J. I., Raji, Y., Bolarinwa, A. F. & Nduka, E. V. 1995. Antifertility activity of *Quassia amara*: quassin inhibits the setroidogenesis in rat Leydig cells in vitro. *Planta Med.*, 61:180-182.
8. Raji, Y. & Bolarinwa, A. F. 1997. Antifertility Activity of *Quassia amara* in Male Rats-in Vivo Study. *Life Sci.* 61:1067-1074.
9. Parveen, S., Das, S., Kundra, C. P. & Pereira, B. M. 2002. A comprehensive evaluation of the reproductive toxicity of *Quassia amara* in male rats. *Reprod. Toxicol.* 17: 45-50.
10. Reddy, P. S. Pushpalatha, T. and Reddy, P. S. 2006. Reduction of spermatogenesis and steroidogenesis in mice after fentin and fenbutation administration. *Toxicol Lett.* 166: 53-59.

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