



## EFFECT OF *Phyllanthus amarus* ON REPRODUCTIVE FUNCTION OF MALE ALBINO MICE

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**Abstract:** Oral administration of *Phyllanthus amarus* leaf extract, fungicide caused a significant radiation in the weight of testes and sex accessory glands of male albino mice. A sharp decline in the fertility 80%(-ve) and a significant reduction in sperm motility and density were observed. The s-acid total protein and glycogen contents of testes were reduced significantly ( $P < 0.002$ ) where as the testicular glycogen contents were increased. The plant has also served as lead for several experimental investigations that explored its phytochemical constituents and pharmacological uses present paper compiles traditional use, phytoconstituents and pharmacological properties of *Phyllanthus amarus*. This herb is in traditional medicine for more than 3000 years.

**Keywords:** *Phyllanthus amarus*, traditional use, mice, testicular glycogen, chemical constituents, Pharmacological properties.

**Introduction:** *Phyllanthus amarus* is a plant of the family Euphorbiaceae and has about in tropical and subtropical countries of the world. The name *Phyllanthus* means leaf and flower and the named. So because of its appearance where flower, fruit and leaf appears fused. Plant is a branching annual glabrous herb which is 230-60cm high and have slender, leaf-bearing branchlets distichous leaves which are subsessile elliptic-oblong obtuse rounded base flowers are yellowish, whitish or greenish, axillary, male flower in groups of 1-3 where as females are solitary. Fruits are depressed globose like smooth capsules present underneath the branches and seeds are trigonous, pale brown with longitudinal parallel ribs on the back.

It has been found in India, Cuba, Philippines and Nigeria. *Phyllanthus amarus* (L.e.) resulted in toxic effects in kidney, liver and reproductive organs in exp animals [1, 2]. However, exps has been conducted to prove *Phyllanthus* (L.e.) administration can actually decrease fertility [3, 4].

Therefore, experiments were performed to determine the ability of orally administered to determine the ability to alter the fertility of male

mice. The present study deal with the effects of leaf extract on testicular morphology, dynamics fertility tests and biochemical changes in the testes of albino mice.

### Materials and Methods

Ten healthy adult male albino mice of inbred colony housed in air conditioned animal house at  $24^{\circ}\text{C} \pm 2^{\circ}\text{C}$  with 16 hrs light water and food was given. They were divided into two groups containing five animal each groups. The first group served as vehicle (olive oil) treated control. In the second group animals, leaf extracts 5ml each mice, mixed in 0.1ml olive oil was given orally for the period of 45 days. (A- 20mg/kg and B- 20mg/kg). The animals were screened for fertility test and autopsied for detailed biochemical studies, reproductive organs were excised, blotted free of blood, wt and were frozen for biochemical examination. The sperm motility and density of cauda epididymal spermatozoa was assessed by the method [5]. The total protein [6] sialic acid [7], total cholesterol [8] and glycogen [9].

*Phyllanthus amarus* have numerous phytochemicals such as phyllanthin, alkaloids, flavonoids, tannins, lignin, polyphenolic

compounds and tetracyclic triterpenoids. Several phytoconstituents isolated from this plant are enlisted method. We study, it has been found that boiled water extract of the fresh and dried *Phyllanthus amarus* plant had comparatively greater antioxidant activity than microwave

assisted extraction method employed for the extraction.

### Results

**WT Responses:** The wt of testis, epididymis, seminal vesicle and prostate gland were decreased significantly ( $P < 0.002$ ) after the extract administration (Table–A)

**Table- A: Change in the Body wt and Organs wt after *Phyllanthus Amarus* Extracts Treatment in Albino Mice**

Treatment	No. of albino Male mice	Average body wt(g)		Organs wt(mg)			
		Initial	Final	Testis	Epididymus	Seminal vesicle	ventral prostate
Control (untreated)	5	250±7.0	200±6.5	160.2±5.0	60.5±5.2	170±8.0	24.0±0.4
Leaf extract (treated)	5	220±6.0	180±6.2	90.2±6.5	42.5±2.1	85.5±6.0	20.9±0.9

**Sperm Dynamics and Fertility:** Extract administration resulted in a sharp decline in sperm motility in cauda epididymis. A significant ( $P < 0.002$ ) decrease in sperm quantity in testes and sauda epidlymus was observed (Table – B ).

**Table- B: Biochemistry Testicular Sperm Dynamics and Fertility Test After Leaf Extract Treatment**

Treatment	Cholesterol (in mg)	Glycogen (in mg)	Sialic acid (in mg)	Total Protein	Sperm testis	quantity (million/ml) cauds epididymus	Sperm motility (%)	Fertility (%)
Untreated Control	12.2±1.2	2.4±0.2	6.9±1.2	275±12.0	1.25±0.5	41.1±0.2	70.2±6.2	98(+ve)
Treated leaf Extract for 45 days	16.5±0.7	0.81±0.1	5.0±0.8	162±10.2	0.69±0.9	24.1±0.2	29.6±0.2	80(-ve)

Fertility test showed 80% (-ve) fertility in extract treated albino male mice. Extract component brings about a marked reduction in testicular contents of total protein ( $P < 0.002$ ), sialic acid ( $P < 0.002$ ) and glycogen ( $P < 0.002$ ).

The cholesterol contents of testis were increased significantly where as the seminal vesicular fructose was decreased ( $P < 0.002$ ) significantly (Table-B). This work was performed in order to investigate histological effects of *Phyllanthus amarus* leaf extracts on the kidney<sup>[10, 11]</sup>.

**Statistical Analysis:** The results were expressed as mean ± SD. Data was analyzed by one way analysis of variance. Sequential difference among means were calculated at the level of ( $P < 0.05$ ) using Turkey contrast analysis as needed.

### Discussion

The result revealed that administration of *Phyllanthus amarus* caused varying degree of cyto architectural distortion and vasculogenic effect on the kidney, which affected blood vessels etc. The present study indicates that oral administration of Leaf extract 5 ml each mice (20mg/kg wt for 45 days), brings about a significant reduction in wt of testes epididymis ventral prostate and seminal vesicle. This is could be due to androgen ablation which results in a decrease in overall cellular activities and increase in cell death, leading to regression of

these organs<sup>[12]</sup> documented the strong correlation between testicular size, total sperm count, sperm motility and sperm epididymis is of importance in the end result of fertilization. The androgenic parameter like protein and sialic acid were decreased in testes. The reduction of protein may be due to suppression of testosterone biosynthesis. The importance of this report lies in the potential adverse of *Phyllanthus amarus* on the microanatomy of tissues and organs. Sialic acid involved in maintaining the structural integrity of acrosomal and plasma membrane of sperm and play a role in sperm maturation and transport in epididymis. It caused a significant reduction in the glycogen contents could be due to impaired glycolysis. The cholesterol contents of testes increased in mice.

**Conclusion:** The results obtained in this study revealed that administration of *Phyllanthus amarus* could affect the biochemical component of testes of albino male mice. The present results suggest that leaf extract suppressive effects on testicular function and causes infertility in albino male mice it causing disruptions and distortions. These results suggest that the functions of the reproductive organs of albino male mice affected. It is recommended that caution should therefore be advocated in the intake of this product and further studies be carried out to examine these findings.

**References**

1. Hellman, B. and Laryea, D. (1997): Inhibitory effects of benomyl and carbendazim on the H thymidine incorporation in various organs of the mice. *Evidece for a more pronounced action of benomyl Taxicalogy*, 61: 161-169.
2. Lim, J. and Miller, M.G. (1997): The role of benomyl metabolite carbendazim in benomyl induced testicular toxicity. *Toxical and Appl. Pharmacol*, 142: 401-410.
3. Linder, et.al. (1988): Evaluation of reproductive parameters in male wistar rats after subchronic exposure to benomy. *J Toxical. Environ. Health*, 125: 285-286.
4. Carter, S. D., Hein, J. E., Rehnberg, G.L. and Laskey, J.W. (1984): Effect of benomyl on the reproductive development of male rat. *J. Taxical. Environ Health*, 13: 53-68.
5. Prasad, M.R.N., Chinoy, N.J. and Vadam, K.M. (1972): Changes in succinate dehydrogenase level in the rat epididymis under normal and altered physiological conditions. *Ferister*, 123: 86-190.
6. Lowry, O. H., Rasenbrough, M.J., Farr, A.L. and Randal, R.J. (1951): Protein measurement with Folin- phenol reagent. *J. Biol. Chem.*, 193 :265-275.
7. Warren, L.(1959). The thiubar buturic acid assay of sialic acid. *J. Biochem*, 234:1971-1975.
8. Oser, B. L. (1965). Hawk's Physiological Chemistry (New York: McGraw Hill Book Company) p. 1177.
9. Montgomery, R.(1957). Determination of glycogen Arch Biochem. *Biophys*, 67: 378-381.
10. Miller, R.K., et al. (1998). The kinesin-related proteins, Kip2p and Kip3p, function differently in nuclear migration in yeast. *Mol Biol Cell*, 9(8):2051-68.
11. Calixto, J.B. (1984). Antispasmodic Effects of an alkaloid extracted from *Phyllanthus sellowianus*; a comparative study with papaverine. *Brazilian Journal of Medical and biological Research*, 17(3-4):313-397.
12. Huang H.F.S., Li M.T., Hagen S.V., Zhang, Y.F. and Irwin, R.J. (1997). Androgen modulation of messenger ribonucleic acid of retinolic acid receptors in the prostate, seminal vesicle and kidney in the rat. *Endocrinology*, 138 (2): 553-559.
13. Mohri, H., Suter, D.A.J., Brown-Woodmann, P.D.C., White, J.G. & Ridley, D.D. (1975). Identification of the biochemical lesion produced by alpha-chlorohydrin in spermatozoa. *Nature*. 255: 75-77.