Pharmacological Effect of Dried Leaf Extract of Moringa oleifera on Experimentally induced Hypothyroidism in Albino Rats

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ABSTRACT

Objective

To determine utility evaluation Pharmacological Effect of Dried Leaf Extract of Moringa oleifera on experimentally induced Hypothyroidism in Albino Rats and Evaluation of routine practices followed by the oleifera on experimentally and to understand the basic Pharmacological Effect.

Methods

40 cases Pharmacological Effect of Hypothyroidism in Albino Rats were studied at the department of Pharmacological, Institute of Pharmaceutical Sciences, Kurukshetra University, Kurukshetra- 136118, HARYANA from March 12, 2018 to June 10, 2018. various factors which causes Pharmacological Effect of Dried Leaf Extract of Moringa oleifera on experimentally induced Hypothyroidism in Albino Rats were noted.

Results/ Conclusion

The dried leaf extract of Moringa oleifera was evaluated for its ameliorative effect in the regulation of hypothyroidism in rat model. Male and female albino rats of 150-200 g were treated orally with the dose of 250mg/kg body weight and 500mg/kg body weight of alcoholic extract of dried Moringa oleifera leaf. Results show that T3 and T4 were increased and TSH was decreased significantly ($p<0.0005$) at high doses compared to those in the control group. The result of this study suggest that the extract may have beneficial effect on thyroid functions.

Key Words: Moringa oleifera, Hypothyroidism in Albino Rats.

INTRODUCTION

Hypothyroidism decreased activity of thyroid results in hypothyroidism,and in severe cases myxoedema.once again,this disease is immunogical in origin,and the manifestations include low metabolic rate, slow speech,deep hoarse voice,bradycardia,sensitivity to cold and mental impairment.Patients also develop a characteristic thickening of skin(caused by the subcutaneous deposition of glycosaminoglycans),which gives myxoedema its name.Hashimoto's thyroiditis, a chronic autoimmune disease in which there is an immune reaction against thyroglobulin or some other components of thyroid tissue,can lead to both hypothyroidism and myxoedema.Genetic factors play an important role.Therapy of thyroid tumours with radioiodine is another cause of hypothyroidism. Thyroid hormones, the only known iodine-containing compounds with biological activity, have two important functions. In developing animals and human

beings, they are crucial determinants of normal development, especially in the central nervous system (CNS). In the adult, thyroid hormones act to maintain metabolic homeostasis, affecting the function of virtually all organ systems. To meet these requirements, the thyroid gland contains large stores of preformed hormone. Metabolism of the thyroid hormones occurs primarily in the liver, although local metabolism also occurs in target tissues such as the brain. Serum concentrations of thyroid hormones are precisely regulated by the pituitary hormone, thyrotropin, in a classic negative-feedback system. The predominant actions of thyroid hormone are mediated via binding to nuclear thyroid hormone receptors (TRs) and modulating transcription of specific genes. In this regard, thyroid hormones share a common mechanism of action with steroid hormones, vitamin D, and retinoids, whose receptors make up a super family of nuclear receptors. As with steroid hormones, it has become clear that thyroid hormones also have diverse nongenomic action. Disorders of the thyroid are common. They consist of two general presentations: changes in the size or shape of the gland or changes in secretion of hormones from the gland. Thyroid nodules and goitre in the euthyroid patient are the most common endocrinopathies and can be caused by benign and malignant tumours. Overt hyper- and hypothyroidism often exhibit dramatic clinical manifestations; however, more subtle presentations require the use of biochemical tests of thyroid function. Screening of the newborn population for congenital hypothyroidism, followed by the institution of appropriate thyroid hormone replacement therapy, has dramatically decreased the incidence of mental retardation and cretinism. Effective treatment of most thyroid disorders is readily available. Treatment of the hypothyroid patient is straightforward and consists of hormone replacement. There are more options for treatment of the hyperthyroid patient, including the use of antithyroid drugs to decrease hormone synthesis and secretion and destruction of the gland by the administration of radioactive iodine or by surgical removal. Treatment of thyroid disorders in general is extremely satisfying, as most patients can be either cured or have their diseases control. Moringa oleifera is a fast growing tree which can reach upto a height of 10-12 metres (32-40ft) and the trunk can reach a diameter of 45 cm.M.oleifera is basically found everywhere in India and generally in warm and dry areas.The maximum height to which it can grow is about 10 metre. There are 14 species of M.oleifera. It has been raised by traditional societies for centuries. Several antioxidant qualities are found in leaves of M.oleifera.In addition to vitamin C and Beta-carotene these includes Quercetin (flavanoid containing anti oxidant properties).

Materials AND METHODS

The study was carried out at Pharmacological, Institute of Pharmaceutical Sciences, Kurukshetra University from March 12, 2018 to June 10, 2018 and included 40 assessment various factors which causes Pharmacological Effect of Dried Leaf Extract of Moringa oleifera on experimentally induced Hypothyroidism in Albino Rats.

PLAN OF WORK- Steps involved

1) Extensive literature survey. 2) Selection of plant (M.oleifera). 3) Identification and collection of plant.
4) Extraction of leaves of M.oleifera using Maceration. 5) Animal studies

a) Dosing of animals using plant extraction.

b) Biochemical estimation in blood (T3,T4,TSH).

c) Compliation of data and statistical analysis.

RESULTS

Collection and identification of plant material- The collection of the Moringa oleifera leaves was done from Kurukshetra University Campus near music department in the month of January-February and the authentificaton of the plant was done by Dr. B.D.Vashistha, Chairman, Botany department, Kurukshetra University, Kurukshetra. The herbarium sheet were prepared and is placed in Department of Botany, Kurukshetra University,Kurukshetra for further reference with a specimen numberIPS/KUK/01/2018.

Preparation of extract- Moringa Leaves (3 kg) collected from the campus were brought to the laboratory. The leaves were separated from stems and washed with tab water so that the adhered impurities were removed. The process of drying in shade was done in pharmacology laboratory of Institute of Pharmaceutical sciences, KUK. The dried leaves were crushed into coarse powdery substance was dried in shade again and was then sieved to get fine powder using the sieve no-18. The powdered material was soaked in hydroalcohol (10:90) for 72 hours by cold maceration method. The percentage yield of the extract was 1.3% w/w and with dark green colour.

Table 1 : Preliminary phytochemical screening

S.No	CHEMICAL TEST	TYPE	RESULT
01.	**Alkaloids**		
		Dragendorff‘s test	+
		Mayer‘s test	+
		Hager‘s test	+
		Wagner‘s test	+
02.	**Saponin**		
		Foam test	+
		Haemolytic test	+
		Olive oil test	+
03.	**Flavonoids**		
		Shinoda test	+
		Lead acetate test	+
04.	**Glycosides**		
		Libbermann-Burchardtest	+
		Baljet‘s test	+

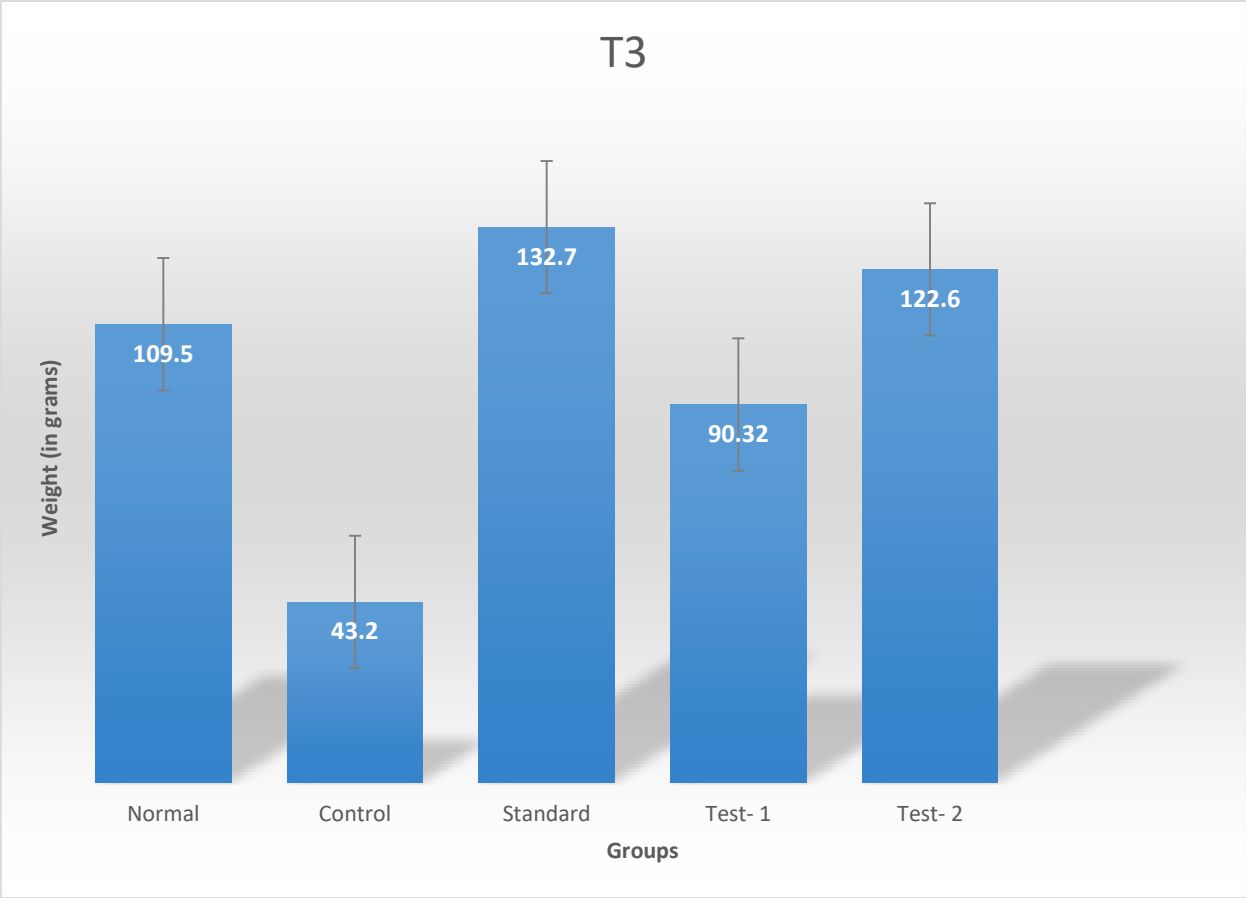
		Legal's test	+
05.	**Steroids and triterpenoids**	Salkowaski test Libbermann- Burchard reaction	+ +
06.	**Tannins**		
		Ferric chloride test Lead acetate test Acetic acid test	+ + +

Preliminary Phytochemical Screening- For analysis and assuring the presence of active phytochemical constituents present in the extract was subjected for preliminary phytochemical screening.

Table 2: Induction of hypothyroidism.

Group	T_3 (ng/dL)	T_4 (ng/dL)	TSH (uIU/ML)
Normal	**105.6±12.74**	**7.89±1.50**	**3.62±1.84**
Control	**47.75±1.74**	**2.8±0.26**	**12.8±0.47**
Standard	**41.25±3.34**	**2.3±0.39**	**16.2±1.27**
Test-I	**39.50±3.68**	**3.63±0.05**	**10.52±0.09**
Test-II	**39.05±3.89**	**2.72±0.28**	**11.64±0.18**

Values are expressed as M± S.e from the experiments.

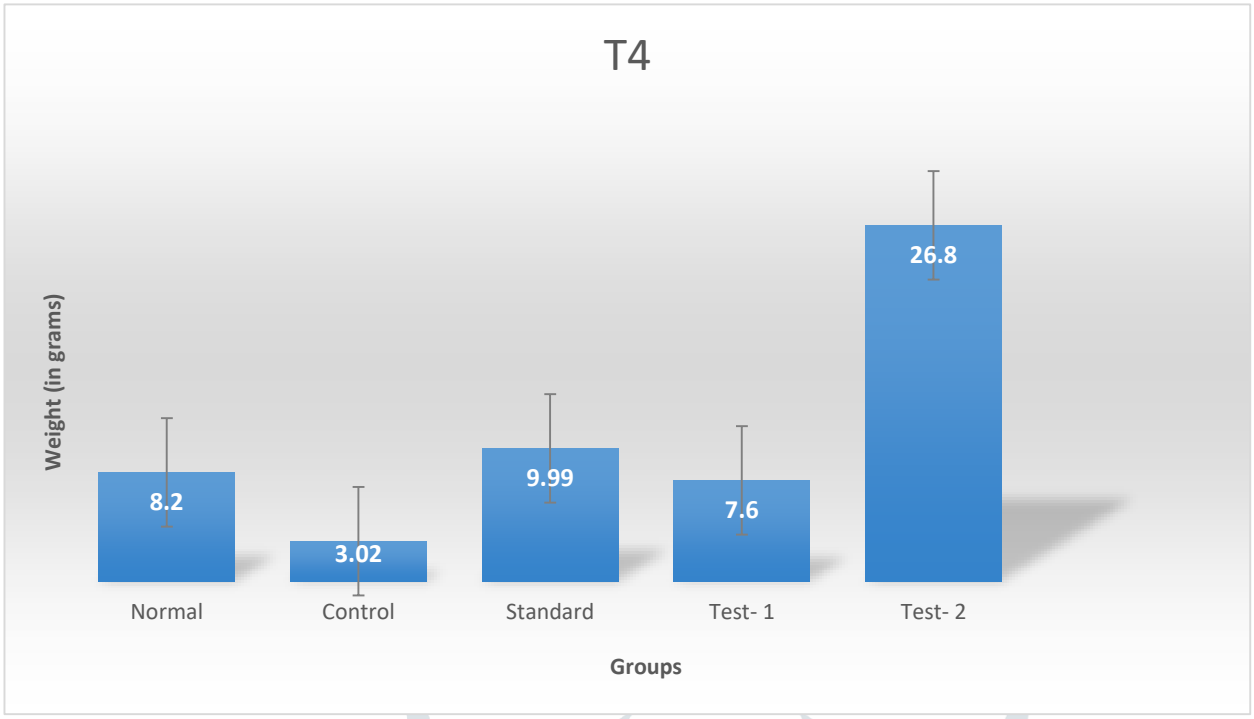


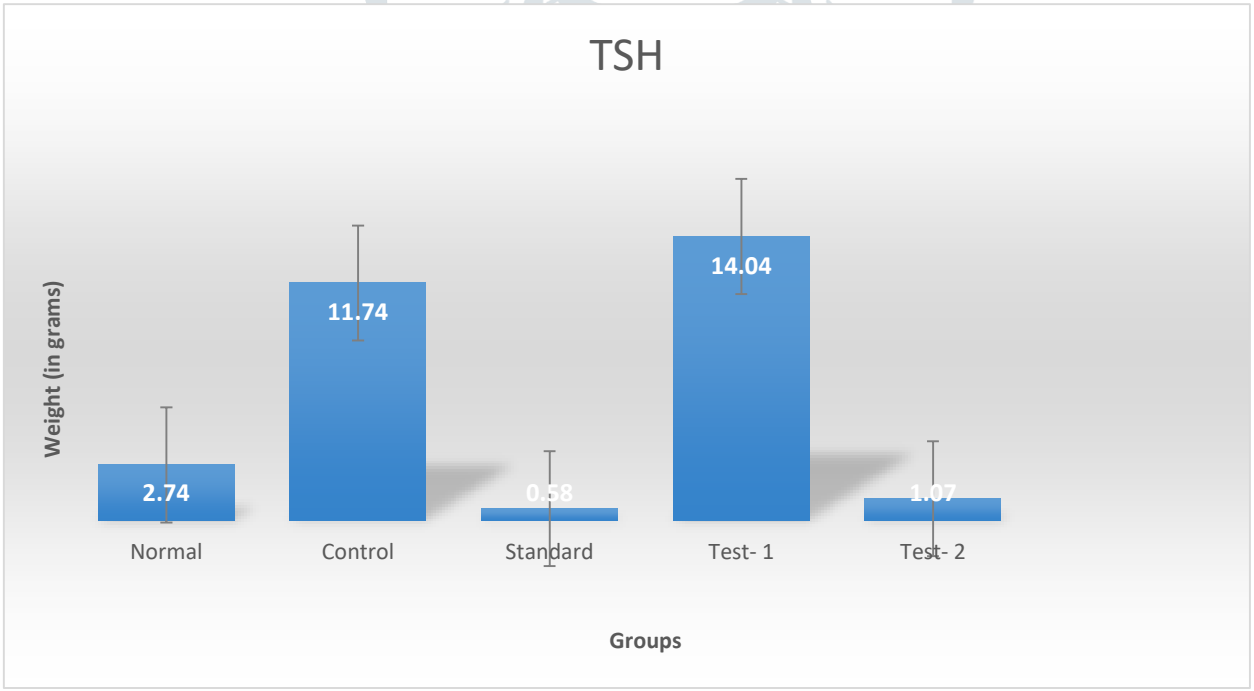
Induction of hypothyroidism- There was a significant increase in the serum concentration of TSH in propylthiouracil treated groups copmpared with normal, where there was a significant decrease in the serum concentration of T3 and T4propylthiouracil treated groups when compared to the normal group.

Table 3: Antihypothyroidism activity of the leaf extract of M. oleifera.

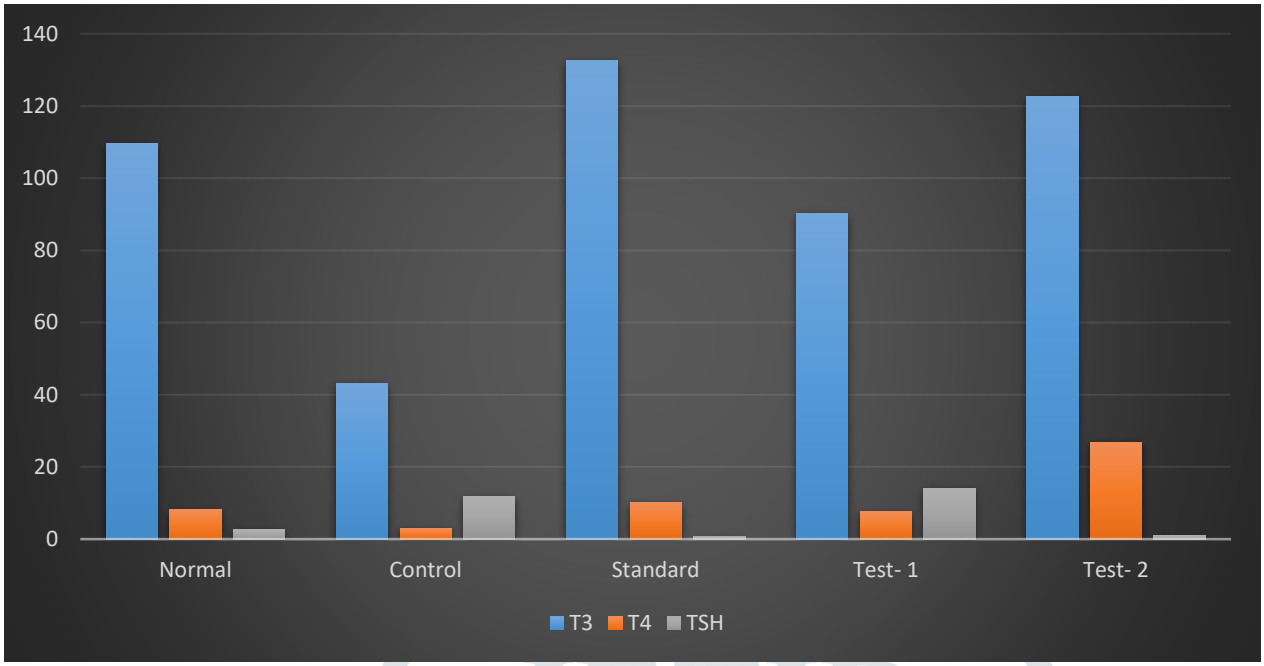
Group	T_3(ng/dL)	T_4 (ng/dL)	TSH (uIU/mL)
Normal	109.5±2.46	8.2±0.73	2.74±0.8
Control	43.2±43.23	3.02±2.02	11.74±1.4
Standard	132.7±8.26	9.99±0.28	0.58±1.36
Test-I	90.32±2.33	7.6±0.88	14.04±2.11
Test-II	122.6±5.73	26.8±3.92	1.07±1.24

Values are expressed as M± S.e from the experiments, n=4, p<0.0005 relative to control.





The dried leaf extract of Moringa oleifera was evaluated for its ameliorative effect in the regulation of hypothyroidism in rat model. Male and female albino rats of 150-200 g were treated orally with the dose of 250mg/kg body weight and 500mg/kg body weight of alcoholic extract of dried Moringa oleifera leaf. Results show that T3 and T4 were increased and TSH was decreased significantly ($p<0.0005$) at high doses compared to those in the control group. The result of this study suggest that the extract may have beneficial effect on thyroid functions.



Discussion/ concussion

The Present results thus clearly reveal that *M. oleifera* extract is stimulatory to thyroid function and may ameliorate hypothyroidism, as it was able to increase the concentration of the thyroid hormone, T3, in PTU induced hypothyroid animals. Furthermore, it appears that the drug at its present dose is not hepatotoxic, rather antiperoxidative, in nature. Since a parallel increase in T3 and 5′D activity was observed following drug administration, it may be suggested that the *M. oleifera* -induced increase in T3 could be the result of enhanced conversion of T4 to T3, the major source of T3 generation. Whatever the mechanism of action(s) in Rats, it appears that *M. oleifera* therapy may ameliorate the hypothyroid condition without any hepatotoxic effect. The dried leaf extract of Moringa oleifera was evaluated for its ameliorative effect in the regulation of hypothyroidism in rat model. Male and female albino rats of 150-200 g were treated orally with the dose of 250mg/kg body weight and 500mg/kg body weight of alcoholic extract of dried Moringa oleifera leaf. Results show that T3 and T4 were increased and TSH was decreased significantly ($p<0.0005$) at high doses compared to those in the control group. The result of this study suggest that the extract may have beneficial effect on thyroid functions.

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