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Research Article

ANTIOXIDANT AND ANTI INFLAMMATORY ACTIVITIES OF *THESPESIA POPULNEA* LINN

D. Sai koteswar sarma[1]*, A. Venkata Suresh Babu[2] and K. Rama Krishna[3]

[1]Department of Pharmacognosy, Siddhartha institute of pharmaceutical sciences (SIPN), Narasaraopet, Guntur, Andhra Pradesh, India.
[2]Department of Pharmaceutical Chemistry, Siddhartha institute of pharmaceutical sciences (SIPN), Narasaraopet, Guntur, Andhra Pradesh, India.
[3]Department of Pharmaceutical Analysis, Siddhartha institute of pharmaceutical sciences (SIPN), Narasaraopet, Guntur, Andhra Pradesh, India.

*Corresponding Author: dsksharma@gmail.com

ABSTRACT

The present study deals with the antioxidant and anti inflammatory activities of *Thespesia Populnea.* Antioxidant activity by nitric oxide method reveals that ethanolic extract of *Thespesia Populnea* shows good results when compared to the standard drug (ascorbic acid). Antioxidants help to neutralize free radicals, which are unstable molecules that are linked to the development of a number of degenerative diseases such as cancer, cardiovascular diseases, cognitive impairment immune dysfunction, cataract and muscular degeneration. The *in vitro* anti-inflammatory activity was carried out by HRBC membrane stabilization method at a concentrations of 250, 500, 1000 µg/ml shows good anti-inflammatory activity when compared to the standard drug (diclofenac sodium).

Keywords: *Thespesia Populnea*, Malvaceae, HRBC membrane stabilization method

INTRODUCTION

Thespesia Populnea Linn commonly called as Hibiscus populnea belongs to the Family: Malvaceae. *Thespesia populnea* is an evergreen tree[1, 5, 6]. The Leaves are alternate, simple, with petioles of length 5-10cm long. The flowers of Hibiscus like single at upper leaf axils, corolla yellow with a red center. The Fruits are Globose. The Seeds are Black, hairy. The main chemical constituents are Kaempferol, Quercetin and its glycosides, herbacetin and its glucoside, populneol, populnin, populnetin, rutin, gossipetin, gossypol, lupeol, sesquiterpenoidal quinones such as thespeson, thespone, mansonones C, D, E and F, amino acids and carbohydrates. The main uses are Unripe fruit juice was used to cure piles. Decoction of bark was given to treat diarrhoea and arthritis. Root, fruit and leaf used in psoriasis, scabies and other cutaneous diseases. Bark was used for the treatment of hemorrhoids and chronic dysentery. Leaf used as an anti-inflammatory[1-4].

MATERIALS AND METHODS

The plant was collected from the surroundings of Kerala (Kollam district Punalur). It was authenticated by the botanist Prof.P.Jayaraman M.Sc, Ph.D. (PARC), Tambaram, Chennai.

ANTIOXIDANT ACTIVITY[3, 8]

Nitric oxide method

The reaction mixture (3ml) containing sodium nitroprusside (10mM, 2ml), phosphate buffer

saline (0.5ml) and extract or standard solution (0.5ml) will be incubated at 25°C for 150 min.After incubation, 0.5 ml of the reaction mixture containing nitrate will be pipetted and mixed with 1 ml of sulphanilic acid reagent (0.33%i in 20% glacial acetic acid) and will be allowed to stand for 5 min for completing diazotization.Then 1 ml of naphthylethylene diamine dihydrochloride (1%) will be added, mixed and will be allowed to stand for 30 min.The absorbance of these solutions will be measured at 540 nm. against the blank solution The percentage inhibition will be calculated by comparing the absorbance values of control and test by using the formula.

$$(\%)\ \text{scavenged} = \frac{(\text{A control} - \text{A test})}{\text{A control}} \times 100$$

A control is the absorbance of the control reaction mixture. A test is the absorbance of sample of the extract at different concentrations

ANTI INFLAMMATORY ACTIVITY
HRBC MEMBRANE STABILIZATION METHOD[7]

Alsever solution prepared by 2% dextrose solution, 0.8% sodium citrate0.05% citric acid, and 0.42% sodium chloride dissolved in distilled water then the solution was sterilized. Blood was collected from cubital vein of healthy volunteers. The collected blood was mixed with equal volume of sterilized alsever solution. The blood was centrifuged at 3000 rpm and packed cells were washed with isosaline and a suspension of10 %(V/V) isosaline was made. Various concentrations of ethanolic extract of *Thespesia populenea* were prepared in 1mlphosphate buffer, 2ml hyposaline and 0.5ml HRBC suspension.diclofenac sodium was used as standard drug. The assay mixtures were incubated at 37°C for 30 minutes and centrifuged. The hemoglobin content in the supernant solution was estimated using UV analysis at 560 nm.the percentage haemolysis was calculated by assuming heamolysis produced in the presence of distilled water as 100%.the percentage of HRBC membrane stabilization produced was calculated by using the following equation.

Percentage inhibition of haemolysis = $100 \times OD_1 - OD_2 / OD_1$

Where OD_1 and OD_2 are absorbance of diclofenac sodium and ethanolic extract of *Thespesia populnea*

RESULTS

Antioxidant activity by nitric oxide method states that ethanolic extracts of *Thespesia populnea* shows better results when compared to the standard drug and it was mentioned in table no.1 & fig.no.1. *Invitro* anti-inflammatory activity by HRBC membrane stabilization method shows that ethanolic extract of *Thespesia populnea* gives better results when compared to the standard drug (diclofenac sodium) and it was menttioned in table no.2 & fig.no.2.

DISCUSSION

The present study shows that the flavonoid rich fraction of *Thespesia populnea* possess a good *in vitro* antioxidant and *in vitro* anti-inflammatory activities. Antioxidant activity by nitric oxide method states that ethanolic extracts of *Thespesia populena* shows good antioxidant activity when compared to standard drug (ascorbic acid). In both cases as concentration increases, % of scavenging activity also increases for both ethanolic extract and standard drug. *Invitro* anti-inflammatory activity by HRBC membrane stabilization method at a concentration of 250, 500, 1000 µg/ml shows that ethanolic extract of *Thespesia populnea* gives better results when compared to the standard drug (diclofenac sodium).The presence of phenolic compounds such as tannins and flavonoids would have played a major role in exhibiting the biological activity.

CONCLUSION

The present study shows that the flavonoid rich fraction of *Thespesia populnea* possess a good *in vitro* antioxidant and *in vitro* anti-inflammatory activities. It is due to the presence of phenolic compounds such as tannins and flavonoids would have played a major role in exhibiting the biological activity.

Table 1: Antioxidant values by nitric oxide method

S. NO.	Concentration	%Inhibition For Test Drug	%Inhibition For Standard Drug
1	31.25	21.94	64.94
2	62.5	25.78	67.97
3	125	37.21	71.99
4	250	47.99	77.05
5	500	53.63	84.22
6	1000	65.69	88.58

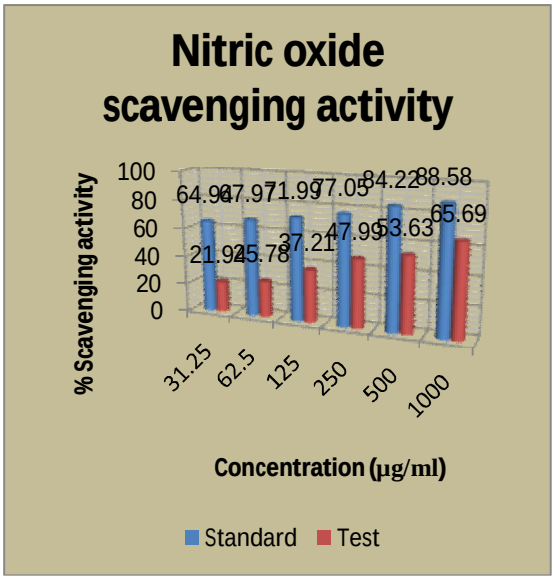

Fig. 1: *In-Vitro* Anti-inflammatory by HRBC Membrane stabilization method

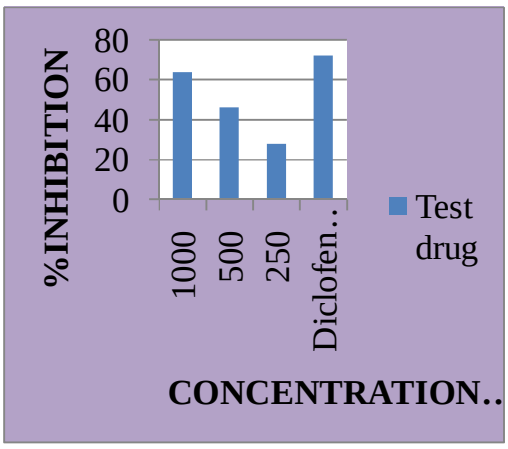

Fig. 2

Table 2: Effect of Ethanolic extract of *Thespesia populnea* on human erythrocyte haemolysis

S. No.	Concentration (µg/ml)	%Inhibition
1	250	28
2	500	46
3	1000	63
4	50 (STANDARD)	71

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