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Anti-oxidant activity of ethanolic extract of flowers *Hymenocallis littoralis (*Jacq.*) Salisb.* by scavenging of hydroxyl radical in p-NDA method

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ABSTRACT

Hymenocallis littoralis (Jacq.) Salisb. (Amaryllidaceae) commonly known as Beach spider lily, is an ornamental and medicinal plant, traditionally used for wound healing. It is used as an emetic and has shown anti-neoplastic, cytotoxic and anti-viral properties. The plant is folk remedy to treat freckles and blemishes. The aim of this research is to explore the anti-oxidant potential of this selected plant material. Two successive and two crude extract of its flowers were subjected for in-vitro anti-oxidant activity by savenging of hydroxyl radical in p-NDA method. The successive ethanol extract have shown potent anti-oxidant activity by p-NDA method with 71 ± 0.011, 79 ± 0.011, 56 ± 0.011, 54 ± 0.011 (mean ± S.E.M) f or 10 µg/ml, 20 µg/ml, 40 µg/ml and 80 µg/ml, respectively. The crude ethanol has shown significant anti-oxidant activity by scavenging of hydroxyl radical in p-NDA method. All the concentrations prepared were paving dose dependent anti-oxidant activity.

Key words: *Hymenocallis littoralis (Jacq.) Salisb.*, Ethanolic extract; p-NDA method, Anti-oxidant activity.

INTRODUCTION

Hymenocallis littoralis (Jacq.) Salisb (Amryllidaceae) is native to coastal regions of southern Mexico and Central America, and also two wild populations are reported to have been found along the west coast of Florida. It is found in a broad range of growing conditions, from wet and boggy to dry areas. [1] The bulb is the only part of the plant used for wound healing. In Lao, roots boiled in water, used for testicles too low because of excessive running. Mixture of oil and crushed bulbs applied on face to treat freckles and blemishes. [2,3]

MATERIALS AND METHODS

2.1 Collection and preparation of extracts

The plant material was collected from the plant *Hymenocallis lttoralis (Jacq.) Salisb,*. which are collected during the month of December at Vadlamudi, Guntur (Dist.) of Andhra Pradesh. Then it was authentified by Dr. P. Satyanarayana Raju, professor, Department of Botany and Microbiology, Acharya Nagarjuna University, Nagarjuna nagar, Guntur. The flowers were extracted with soxhlet apparatus using hydro alcoholic solvent (yield 3.7%). The samples were prepared and used for anti-oxidant activity.

2.2 Chemicals and instruments

All chemicals used in the study were pure. Reference standard Ascorbic acid obtained from LOBA Chemicals Pvt. Ltd., Mumbai. p-Nitroso Dimethyl Aniline obtained from Qualigene fine chemicals, Mumbai. U.V. Spectrophotometer was used for observing the absorbance.

Fig-1. Plant of *Hymenocallis littoralis (Jacq.) Salisb.*

2.3 Preliminary phytochemical screening

Preliminary phytochemical screening was performed by using standard protocol. [4-6]

2.4 Anti-oxidant activity by scavenging of hydroxyl radical in p-NDA method

To a solution containing ferric chloride (0.1 mM, 0.5 ml), EDTA (0.1 mM, 0.5 ml), ascorbic acid (0.1 mM, 0.5 ml), hydrogen peroxide (2 mM, 0.5 ml) and p-nitroso dimethyl aniline (0.01 mM, 0.5 ml) in phosphate buffer pH 7.4 (20 mM) were added various concentrations of the test compounds in distilled DMSO or dissolving solvent or alcohol to produce a final volume of 3 ml. Absorbance was measured at 440 nm. [7-9]

RESULTS AND DISCUSSION

All the four extracts of *Hymenocallis littoralis* have shown potent or moderate anti-oxidant activity in the method tested. Successively the crude ethanol extracts have shown potent anti-oxidant activity with 0.071 ± 0.01155, 0.079 ± 0.01155, 0.056 ± 0.01155, 0.054 ± 0.01155 (mean ± S.E.M) for 10 µg/ml, 20 µg/ml, 40 µg/ml and 80 µg/ml, respectively.

$$\text{p} - \text{NDA radical scavenging activity}(\%) = \frac{[\text{Abs(standard)} - \text{Abs(sample)}]}{\text{Abs(standard)}} * 100$$

Table-1 showed p-NDA radical scavenging activity (%). The crude ethanol extract showed % radical scavenging concentration. The preliminary phytochemical investigation revealed the presence of phenolic compounds in the polar extracts of the plant. Plant phenolics are known to exhibit potent anti-oxidant activity. Hence, the observed anti-oxidant activity of the extracts of *Hymenocallis littoralis* may be due to the presence of these constituents. The present study also confirms the anti-oxidant property of the plant. However, further studies are required to confirm the same. The plant merits further investigation to isolate its active constituents and to establish the activity in animal models. The experiment was done in triplicate and the average was taken. p-NDA radical scavenging activity (%) was calculated from the control where no extract or standard was present. [10] The activity assessment was shown in Table no.1.and Figure no 1.

Table-1: Evaluation of Anti-oxidant activity by p-NDA radical scavenging method

S. No.	Name of the Drug	Concentration (µg/ml)	% p-NDA radical scavenging
1.	Ethanolic extract	10	70.29
		20	71.16
		40	77.95
		80	78.57
2.	Ascorbic acid	10	74.30
		20	76.40
		40	78.20
		80	79.01

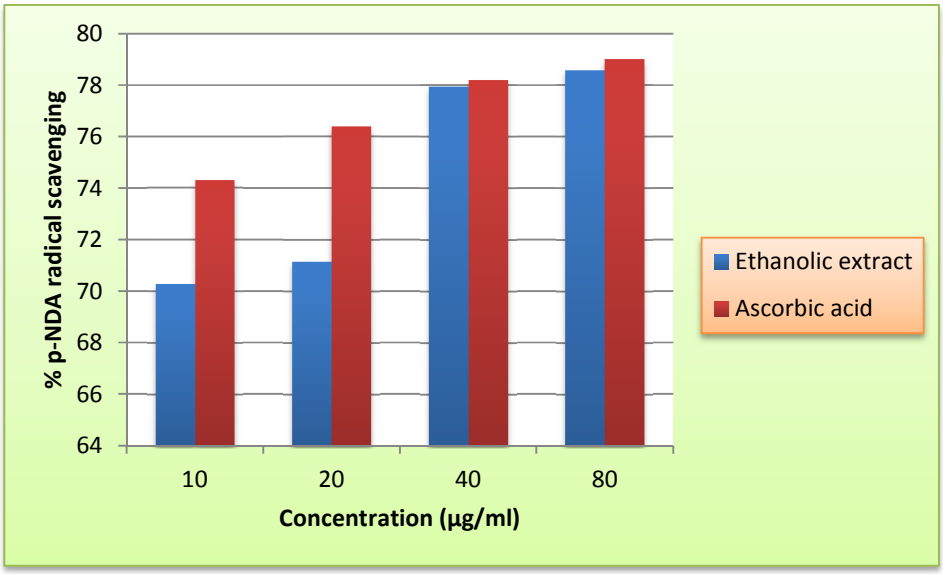

Figure-1: Evaluation of Anti-oxidant activity by p-NDA radical scavenging method

Statistical analysis:
The calculation parts in these studies were calculated by EXCEL sheet. The mean ± S.E.M values were analysed by software graph pad version 1.0. Remaining all other calculations were done with specific formulae mentioned in the respective part of the study.

CONCLUSION

In conclusion, this study provides evidences for the anti-oxidant activity of *Hymenocallis littoralis (Jacq.) Salisb.*, which could partly contribute to its ethno-medical use. However, further investigation is required to isolate the active constituents responsible for this activity and to elucidate the exact mechanism of action.

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