

Asian Journal of Phytomedicine and Clinical Research

Journal home page: www.ajpcrjournal.com



PHYTOCHEMICAL INVESTIGATION AND ANTI-OXIDANT STUDIES ON THE ROOTS OF *SOLANUM XANTHOCARPUM* LINN

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ABSTRACT

Chemical and physical investigation of methanolic extract of roots of *Solanum xanthocarpum* was carried out. By phytochemical screening the presence of alkaloid, triterpenoid, phenols, tannins, flavanoids, carbohydrates, phytosterols, fats and fixed oil were confirmed. Column chromatography was performed and a compound was isolated. The extract was estimated for their total phenolic content. Total phenolic content was found to be 76µg. Total flavonoid content was found to be 73µg. Antioxidant study was carried out on methanolic extract. It showed good % DPPH radical scavenging activity. IC50 value of the compound was found to be 52µg/ml.

KEYWORDS

Solanum xanthocarpum and Antioxidant activity.

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INTRODUCTION¹⁻⁶

Solanum xanthocarpum(SX) (Family: Solanaceae) commonly known as the Indian night shade or Yellow berried night shade (English) and kantakari (Sanskrit). SX has held a place of some importance in the Hindu Materia Medica, primarily as an expectorant and antipyretic. It is one of the members of the dashamula (ten roots) of the Ayurveda. It occurs throughout India, in dry situations as a weed along the roadsides and wastelands. It is naturally propagated by seed in waste lands. A very prickly diffuse bright green perennial herb, somewhat

woody at the base; stem is somewhat zigzag; branches are numerous. Various medicinal properties are attributed to it, particularly in the treatment of asthma, chronic cough and catarrhal fever.

MATERIALS AND METHODS⁷⁻¹⁰

PLANT MATERIAL

Solanum xanthocarpum collected in mature stage from its natural habitat in Palakkad in month February and March and the plant was identified. Plants were washed with water to remove soil and other extraneous matter. Roots were taken and cut into small pieces and was dried under shade for one month. Then dried root was homogenized to coarse powder.

FRACTIONATION

The powdered roots of *Solanum xanthocarpum* were continuously (soxhlet) extracted for 72h with methanol. The solvent was evaporated under reduced pressure Equal volume of methanolic extract of roots of *Solanum xanthocarpum* and toluene was shaken for about 2h for separation into two layers. The toluene fraction was separated and then evaporated to dryness. The residue was then weighed.

Preliminary qualitative chemical evaluation

The extracts obtained by the above methods were subjected to qualitative test for identification of various plant constituents. Toluene fraction was subjected to column chromatography. Extract was analyzed for total phenolic content and total flavanoid content. Antioxidant study was also conducted.

RESULTS AND DISCUSSION

The physical and chemical investigation of methanolic extract of roots of *Solanum xanthocarpum* was carried out. By phytochemical screening the presence of alkaloid, triterpenoid, phenols, tanins, flavanoids, carbohydrates, phytosterols, fats and fixed oil were confirmed. The extract was estimated for their total phenolic content (Table No.1 and Figure No.1). Total phenolic content was found to be 76µg. Total flavanoid content was found to be 73µg (Table No.2 and Figure No.2). Antioxidant study was carried out on methanolic extract. It showed good % DPPH radical scavenging activity. IC50 value of the compound was found to be 52µg/ml (Table No.3, 4 and Figure No.3).

Table No.1: Standard graph of total phenolic content

S.No	Concentration (µg)	Absorbance
1	20	0.047
2	40	0.085
3	60	0.125
4	80	0.166
5	100	0.209
6	Sample(76)	0.153

Table No.2: Total flavanoid content determination

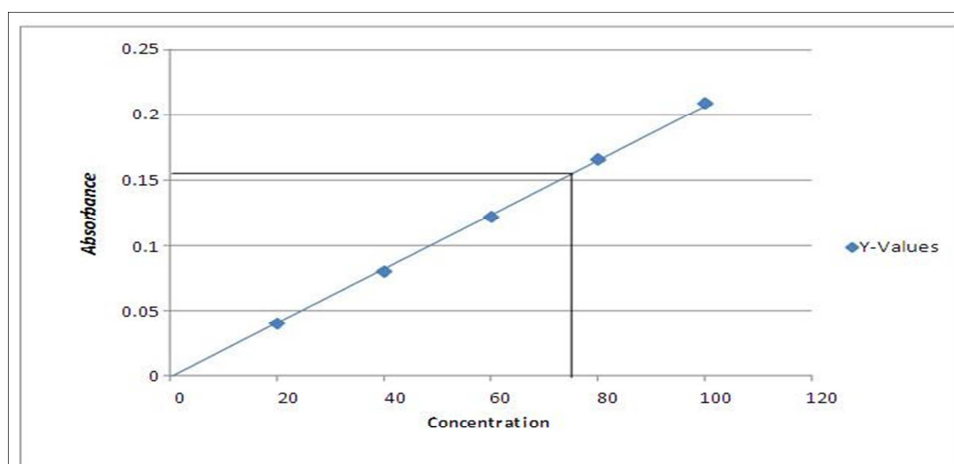
S.No	Concentration (µg/ml)	Absorbance
1	50	0.063
2	100	0.132
3	150	0.197
4	200	0.248
5	250	0.304
6	Sample (73)	0.09

Table No.3: % scavenging of DPPH radical by Ascorbic acid

S.No	Concentration (µg/ml)	Absorbance	% scavenging
1	3	0.0624	63.51
2	6	0.0601	64.86
3	9	0.0577	66.21
4	12	0.0554	67.56
5	15	0.0531	68.9

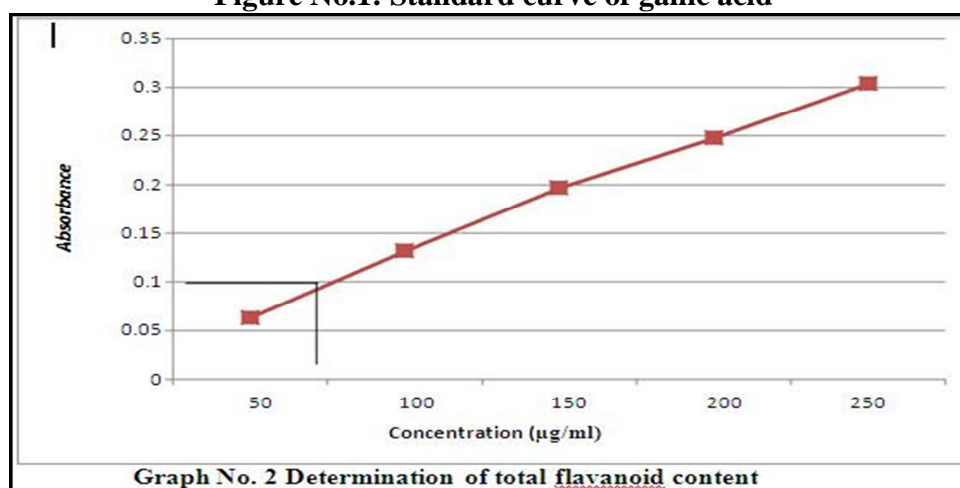
Table No.4: % scavenging of DPPH radical by extract

S.No	Concentration (µg/ml)	Absorbance	% scavenging
1	50	0.089	47.9
2	100	0.051	70.17
3	150	0.029	83.04
4	200	0.027	84.21



Graph no.1 Standard curve of gallic acid

Figure No.1: Standard curve of gallic acid



Graph No. 2 Determination of total flavanoid content

Figure No.2: Determination of total Flavanoid content

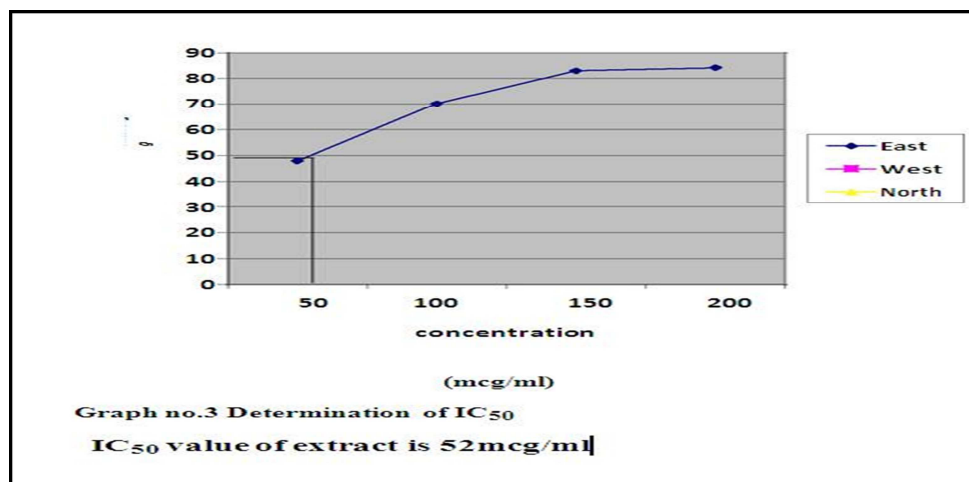


Figure No.3: Determination of IC 50

CONCLUSION

In the present study chemical and physical investigation of methanolic extract of roots of *Solanum xanthocarpum* was carried out. By phytochemical screening the presence of alkaloid, triterpenoid, phenols, tannins, flavanoids, carbohydrates, phytosterols, fats and fixed oil were confirmed. Column chromatography was performed and a compound was isolated. The extract was estimated for their total phenolic content. Total phenolic content was found to be 76µg. Total flavonoid content was found to be 73µg. Antioxidant study was carried out on methanolic extract. It showed good % DPPH radical scavenging activity. IC₅₀ value of the compound was found to be 52µg/ml.

ACKNOWLEDGEMENT

The authors are sincerely thankful to the management of Regional Institute of Medical Sciences and Research, Rubber board P.O, Kottayam, India for providing the facilities to carry out this research work.

CONFLICT OF INTEREST

We declare that we have no conflict of interest.

BIBLIOGRAPHY

1. Rates S M K. Plant as a source of drugs, *Toxicon*, 39, 2001, 603-613.

- Sheth A K. The Herbs of Ayurveda, A.K.Sheth Publisher, Vol-4, 2001, 1044.
- Kirtikar K R, Basu B D. Indian Medicinal Plants, *International book distributors*, 2nd edition, 2005, 1759-1761.
- Roshy Joseph *et al.* Therapeutic potentials of kantakari, Ayurpharm, *Int J AyurAlli Sci.*, 1(2), 2012, 46-53.
- Singh K N, Kaushal R. Comprehensive notes on commercial utilization, characteristics and status of steroid yielding plants in India, *Ethnobot Leafl*, 11, 2007, 45-51.
- Khare C P. Encyclopedia of Indian Medicinal Plants, *Springer*, 1st edition, 2004, 4532-433.
- Thirumalai T, David E, Viviyana Therasa S, Elumalai E K. Effect of *Solanum surattense* seed on the oxidative potential of caudaepididymal spermatozoa, *Asian Pacific Journal of Tropical Biomedicine*, 2(1), 2012, 21-23.
- Khanam S and Sultana R. Isolation of β-sitosterol and stigmasterol as active immunomodulatory constituents from fruits of *Solanum xanthocarpum* (Solanaceae), *International Journal of Pharmaceutical Sciences and Research*, 3(4), 2012, 1057-1060.
- Arnnok P, Ruangviriyachai C, Mahachai R, Techawongstien Sand Chanthai S. Determination of total phenolics and anthocyanin contents in the pericarp of hot chilli

- pepper (*Capsicum annuum* L.), *International Food Research Journal*, 19(1), 2012, 235-243.
10. Roshy Joseph C, Ilanchezhian R, Patgiri B J. Therapeutic potentials of kankari (*Solanum xanthocarpum* (Schrad. And Wendl.), *Ayurpharm Int J Ayur Alli Sci*, 6, 2012, 46-53.
11. Parameswari K, Sudheer Aluru and Kishori B. *In vitro* antibacterial activity in the extracts of *Solanum nigrum*, *Indian Streams Research Journal*, 2(7), 2012, 1-5.
12. Raja Sidambaram R, Dinesh M G, Jayalakshmi E T, Shafeer Subair and Kansrajh Chandrasekaram. Antibacterial, antifungal and cytotoxic studies on leaf and seed extracts of *Solanum xanthocarpum* shard and wendl, *International Journal of Phytopharmacology*, 2(2), 2011, 61-65.
13. Ramar K and Nandagopala V. Rapid *in vitro* propagation of medicinally important plant *Solanum surattense*, *International journal of pharmacy and life sciences*, 2(1), 2011, 499-501.

Please cite this article in press as: Archana C and Jessy Jacob. Phytochemical Investigation and Anti-Oxidant Studies on the Roots of *Solanum Xanthocarpum* Linn, *Asian Journal of Phytomedicine and Clinical Research*, 3(1), 2015, 32 - 36.