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RESEARCH ARTICLE

DPPH Radical Scavenging Activity of Two Medicinal Important Plants *Tinospora cordifolia* and *Argemone maxicana*

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ABSTRACT

Antioxidant potential of different plant parts of Tinospora cordifolia and Argemone maxicana were determined by using DPPH assay and ascorbic acid as standard compound (IC_{50}: 10 µg/ml). The maximum antioxidant potential in A. Maxicana was found in leaf (IC_{50}: 29µg/ml) followed by stem (IC_{50}: 95µg/ml), Seed (IC_{50}: 97µg/ml) and root (IC_{50}: 111µg/ml). In T. cordifolia leaf (IC_{50}: 37µg/ml) showed maximum antioxidant activity then the roots (IC_{50}: 172 µg/ml).

KEYWORDS

Medicinal Plants, Phytochemical Screening, DPPH, Antioxidant

INTRODUCTION

According to Ayurveda the *Argemone maxicana* plant is diuretic. purgative and destroys worms. It cures lepsory, skin-diseases, inflammations and bilious fevers. Roots are anthelmintic. Juice is used to cure ophthalmia and opacity of cornea. Seeds are purgative and sedative. In Homoeopathic system of medicine, the drug prepared from this herb is used to treat the problem caused by tape-worm. In India it is introduced and naturalized and occur as wasteland weed in almost every part of India. In many parts it is reported as crop weed also. It is native of Tropical America. The genus *Argemone* includes 12 species. Some major species are: *A. alba* Lestib, *A. platyceras*.

Tinospora cordifolia contains many different chemicals that might affect the body. Some of these chemicals have antioxidant effects. Others might increase the activity of the body's immune system.

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Some chemicals might have activity against cancer cells in test animals. Most research has been done in test tubes or in animals. There isn't enough information to know the effects of *Tinospora cordifolia* in the human body. *Tinospora cordifolia* is used for diabetes, high cholesterol, allergic rhinitis (hay fever), upset stomach, gout, lymphoma, other cancers, rheumatoidarthritis (RA), hepatitis, peptic ulcer disease (PUD), fever, gonorrhea, syphilis, and to boost the immune system.

DPPH is a stable nitrogen-centered free radical the colour of which changes from violet to yellow upon reduction by either the process of hydrogen or electron donation. Substances which are able to perform this reaction can be considered as antioxidants and therefore radical scavengers.[1] It was found that the radical scavenging activities of bark and stem extracts increased with increasing concentration. The bark extract possessed more hydrogen donating ability than the stem extract and it was comparable to that of BHT. The DPPH scavenging activity of bark and stem was higher

than that exhibited by its fruit extract.[2] The DPPH scavenging capacity of the plant extracts may be related to the phenolic compounds present.[3]

MATERIAL AND METHOD

Collection of Plant Material

Tinospora cordifolia and Argemone maxicana were collected (Oct- Nov, 2013) from Kapur Chand Kulish Smriti Van Jaipur Rajasthan India. Plants were identified by comparing with those available in the Herbarium, Department of Botany, University of Rajasthan, Jaipur, India.

Preparation of Extracts

The collected plants were shade dried and finely powdered. Different plant parts were extracted with constant agitation for 48 hrs. The extracts were filtered using Whatman No. 1 filter paper and then concentrated in vacuum at 40°C using a Rotary evaporator and stored at 4°C.[4]

10 gm of each of the powdered specimen samples *Tinospora cordifolia and Argemone maxicana* of were taken for the antioxidant activity and extracted with 100 ml of methanol for 3 days. The extracts obtained from each of the plant materials were filtered separately and concentrated by vacuum evaporation.[5]

DPPH Radical Scavenging Assay

Radical Scavenging Activity of plant extracts against stable DPPH (2,2-diphenyl-2-picrylhydrazyl hydrate) was determined spectrophotometrically. When DPPH reacts with an antioxidant compound, which can donate hydrogen, it is reduced. The changes in colour (from deep violet to light yellow) were measured at 515 nm on a UV visible light spectrophotometer. Extract solutions were prepared by dissolving 2 g of dry extract in 10 ml of methanol. The solution of DPPH in methanol (6 x 10^{-5} M) was prepared freshly, before UV measurements. 3.9 ml of DPPH is added in different concentration of extracts to measure IC_{50} value in microcuvettes.[6] The samples were kept in the dark for 15 min at room temperature and then the decrease in absorption was measured. Absorption of blank sample containing the same amount of methanol and DPPH solution was prepared and measured in every experiment. The experiment was carried out in triplicates. Radical scavenging activity was calculated by the following formula:

% Inhibition = [(AB-AA)/AB] X 100

Where, AB – absorption of blank sample (t = 0 min); AA - absorption of tested extract solution

RESULTS AND DISCUSSION

Antioxidant potential of different plant parts of *Tinospora cordifolia and Argemone maxicana* were determined by using DPPH assay and ascorbic acid as standard compound (IC_{50}: 10 µg/ml). The maximum antioxidant potential in A *Maxicana* was found in leaf (IC_{50}: 29µg/ml) followed by stem (IC_{50}: 95µg/ml), Seed (IC_{50}: 97µg/ml) and root (IC_{50}: 111µg/ml). In *Tinospora cordifolia* leaf (IC_{50}: 37µg/ml) showed maximum antioxidant activity then the roots IC_{50}: 172 µg/ml) (Table 1, Fig. 1).

Table 1: Antioxidant potential (IC_{50}: Value µg/ml) of deferent plant parts of Argemone maxicana and Tinospora cordifolia

Sr No	Plant Name & Parts	IC_{50} value in µg/ml
	Argemone maxicana	
1	Leaf	29
2	Stem	95
3	Root	111
4	Seed	97
	Tinospora cordifolia	
1	Leaf	37
2	Stem	90
3	Root	172
4	Fruit	83

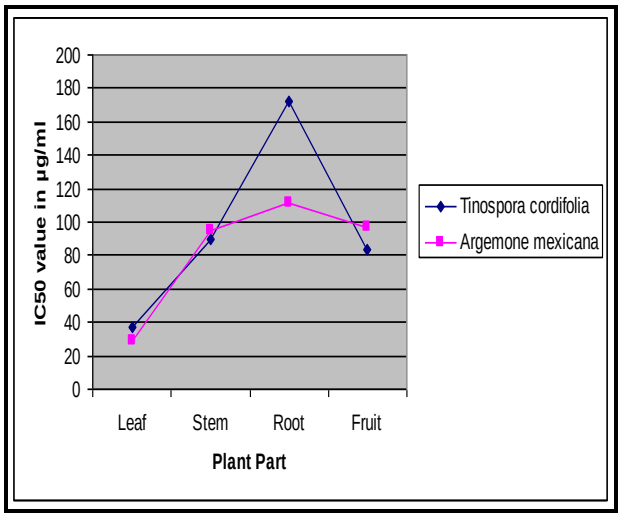

Figure 1: Antioxidant potential (IC50 Value µg/ml) of different plant parts of *Argemone maxicana* and *Tinospora cordifolia*

The results obtained in the present investigations showed that the concentration of flavonoids and phenolic compounds in both the plants *Tinospora cordifolia and Argemone maxicana* is very high.[7] These flavonoids have been reported to possess anti-oxidant and anti-radical properties.[8] The DPPH test provided information on the reactivity of test compounds with a stable free radical. Because of its odd electron, 2, 2- diphenyl-picryl-hydrazyl radical (DPPH) gives a strong absorption band at 517 nm in visible spectroscopy (deep violet colour). Present study concluded the presence of antioxidant activity in varying degrees in all the plant parts of *Tinospora cordifolia and Argemone maxicana.*

REFERENCES

1. Wolf, G. (2005). The discovery of the antioxidant function of vitamin E: the contribution of Henry A. Mattill. *The Journal of nutrition*, *135*(3), 363-366.
2. Karuppusamy, S., Muthuraja, G., & Rajasekaran, K. M. (2011). Antioxidant activity of selected lesser known edible fruits from Western Ghats of India.*Indian J Nat prod Resour*, *2*(2), 174-178.
3. Barku, V., Opoku-Boahen, Y., Owusu-Ansah, E., & Mensah, E. (2013). Antioxidant activity and the estimation of total phenolic and flavonoid contents of the root extract of Amaranthus spinosus. *Asian Journal of Plant Science and Research*, *3*(1), 69-74.
4. Harborne, J. B. (1984). *Phytochemical methods* (Vol. 278). London; New York: Chapman and Hall, 100-101.
5. Wagner, H. (1996). *Plant drug analysis: a thin layer chromatography atlas*. Springer. 195–197, 359–364.
6. Brand-Williams, W., Cuvelier, M. E., & Berset, C. (1995). Use of a free radical method to oxidant activity. *LWT - Food Science and Technology*, 1995, 28(1), 25-30.
7. Verma, R. K. & Parashar, P. (2011). Primary and secondary phytochemical analysis of some medicinally Potent Plants. International Research Journal of Pharmacy, 2(6), 166-168.
8. Nakayoma, J. & Yamada, M. (1995). Suppression of active oxygen-indeed cytotoxicity by flavonoids. *Biochem Pharmcol*, 45, 265-267.