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NOTE

Antioxidant Potential of Methanolic Extract Tuberous Root of *Ipomoea digitata* (Linn)

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In vitro antioxidant activities of methanol extract of tuberous root of *Ipomoea digitata* (Linn.) was investigated by various method. The antioxidant activity was evaluated by nitric oxide radical scavenging activity, total antioxidant activity and estimation of flavonoids. The methanolic extract of *Ipomoea digitata* and reference standard ascorbate IC_{50} values was found to be 880 µg/mL and 410 µg/mL in nitric oxide radical scavenging activity. Total antioxidant activity of methanolic extract was evaluated by phosphomolybdic acid method and reference standard ascorbate IC_{50} values was found to be 50 µg/mL and 410 µg/mL and flavonoid content of methanolic extract was found to be 2.112 mg/g. It is concluded that the free radical scavenging activity of the methanolic extract of *Ipomoea digitata* responsible for the therapeutic properties.

Key Words: *Ipomoea digitata*, Nitric oxide reducing scavenging, Total antioxidant, Flavanoids.

It is well known that the compounds having antioxidants rich in diet, such as herbs, vegetables, fruits and grains can prevent various diseases caused by reactive oxygen species[1]. It has been well accepted that dietary antioxidants may present these physiologically important molecules from oxidative damage and consequently reduce the size of aging related disease and promote general human health[2].

Most living species have protective system against oxidative stress and toxic effects of reactive oxygen species (ROS). Several studies have demonstrated that the antioxidant properties of plant compounds could be correlated with oxidative stress defense[3,4]. Plant products, whether volatile or non-volatile are valuable sources of novel bioactive compounds useful in combating various disease such as cancer, cell damage, inflammation, viral infection, allergic responses as well as in the provision of primary healthcare in most developing countries[5].

Several studies have revealed that plants produces potent antioxidants to control the oxidative stress caused by oxygen and represents source of new compounds with antioxidant activity[6]. The rising awareness and consumer concern on issues of food preservation and safety in uses of chemical preservatives, necessitates a search for natural antioxidants that could not only be used to preserve food but also in the treatment of some of the diseases and their management[7]. The tuberous root of *Ipomoea digitata* (Linn) belongs to the convolvolaceae family. The root large ovoid or elongated tuberous roots. The root is regarded as a diuretic, leprosy, burning sensation, vomiting, disease of blood, anthelmintic, syphilis and spleen disease[8]. The plant used as aphrodisiac activity[9] and anticancer, anti-microbial activity[10]. Resin glycoside was isolated from leaves and stems of *Ipomoea digitata*[11] and anti-microbial and anti-complement activity[12]. Flowering plants used against snake-bite[13]. The plant toxic proteins used insecticidal properties[14] and used as treatment of oral diseases[15]. Therefore, the present investigation focused to evaluate the *in vitro* antioxidant potential of methanolic extract of tuberous root of *Ipomoea digitata* by different screening methods.

The tuberous root of *Ipomoea digitata* (Linn), were collected form Kilikulam, Tirunelveli District of Tamilnadu, India. Taxonomic identification was made from Botanical Survey of Medical Plants Unit Siddha, Government of India, Palayamkottai. The tuberous root of *Ipomoea digitata* (Linn), were dried under shade, segregated, pulverized by a mechanical grinder and passed through a 40 mesh sieve.

Preparation of extracts: The above powdered materials were successively extracted with methanol by hot continuous percolation method in Soxhlet apparatus[16] for 24 h. The extract was concentrated by using rotary evaporator.

Evaluation of antioxidant activity by *in vitro* techniques

Nitric oxide method[17]: Nitric oxide generated from sodium nitroprusside in aqueous solution at physiological pH interacts with oxygen to produce nitrite ions, which were measured by the method of Garrat[17]. The reaction mixture (3 mL) containing 2 mL of sodium nitroprusside (10 mM), 0.5 mL of phosphate

buffer saline (1 M) were incubated at 25 ºC for 150 min. After incubation, 0.5 mL of the reaction mixture containing nitrite was pipetted and mixed with 1 mL of sulphanilic acid reagent (0.33 %) and allowed to stand for 5 min for completing diazotization. Then 1 mL of naphthyl ethylene diamine dihydrochloride (1 % NEDA) was added, mixed and allowed to stand for 0.5 h. The nitrite ions can be estimated by the use of Griess Illosvery reaction at 540 nm.

The free radical scavenging potential showed maximum activity is 52.84 % at 1000 µg/mL for as standard (ascorbate) was found to be 62 % at 1000 µg/mL. The IC_{50} of the methanol extract of *Ipomoea digitata* and standard (ascorbate) was found to be 880 µg/mL and 410 µg/mL, respectively (Table-1).

TABLE-1
ANTIOXIDANT ACTIVITY OF METHANOLIC EXTRACT OF TUBEROUS ROOT OF *Ipomoea digitata* (Linn) BY NITRIC OXIDE FREE RADICAL SCAVENGING METHOD

S. No.	Concentration (µg/mL)	% Activity (± SEM)	
		Sample (methanolic extract)	Standard (ascorbate)
1	125	39.61 ± 0.05	27.63 ± 0.076
2	250	40.24 ± 0.13	49.53 ± 0.054
3	500	44.18 ± 0.04	55.12 ± 0.022
4	1000	52.84 ± 0.04	62.00 ± 0.014
		IC_{50} = 880 µg/mL	IC_{50} = 410 µg/mL

*All values are expressed as mean ± SEM for three determinations.

Total antioxidant activity (phosphomolybdic acid method)[18]: The antioxidant activity of the sample was evaluated by the transformation of Mo(VI) to Mo(V) to form phosphomolybdenum complex[18]. An aliquot of 0.4 mL of sample solution was combined in a vial with 4 mL of reagent solution (0.6 M sulfuric acid, 28 mM sodium phosphate and 4 mM ammonium molybdate). This vials were capped and incubated in a water bath at 95 ºC for 1.5 h. After the samples had cooled to room temperature, the absorbance of the mixture was measured at 695 nm against a blank. The antioxidant activity was expresses relative to that of ascorbic acid.

The free radical scavenging potential shown maximum activity is 70.30 % at 1000 µg/mL for as standard (ascorbate) was found to be 62 % at 1000 µg/mL. The IC_{50} of the methanol extract of *Ipomoea digitata* and standard (ascorbate) was found to be 50 µg/mL and 410 µg/mL, respectively (Table-2).

TABLE-2
ANTIOXIDANT ACTIVITY OF METHANOLIC EXTRACT OF TUBEROUS ROOT OF *Ipomoea digitata* (Linn) BY PHOSPHOMOLYBDATE METHOD

S. No.	Concentration (µg/mL)	% Activity (± SEM)	
		Sample (methanolic extract)	Standard (ascorbate)
1	125	64.92 ± 0.02	27.63 ± 0.076
2	250	68.49 ± 0.02	49.53 ± 0.054
3	500	69.85 ± 0.03	55.12 ± 0.022
4	1000	70.30 ± 0.15	62.00 ± 0.014
		IC_{50} = 50 µg/mL	IC_{50} = 410 µg/mL

*All values are expressed as mean ± SEM for three determinations.

Estimation of flavonoid content[19]: 0.2 g of the plant material was grounded with ethanol-water in two different ratios namely 9:1 and 1:1, respectively. The homogenate was filtered and these two ratios were obtained. This was evaporated to dryness until most of the ethanol has removed. The resultant aquous extract was extracted in a separating funnel with hexane or chloroform. The solvent extracted aquous layer was concentrate for 0.5 h.

The flavonoid contents of methanol extract of tuberous root of *Ipomoea digitata* was found 2.112 mg/g of flavonoid compound.

Conclusion

The results indicated that the methanolic extract of tuberous root of *Ipomoea digitata* (Linn) showed strong antioxidant activity. However, phytochemical screening of methanolic extract showed presence of triterpenoids, phenolic compound and flavonoids. So it can be concluded that these components might be involved in the antioxidant activity of *Ipomoea digitata* (Linn).

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