In Vitro Antioxidant Activity of Plant *Pongamia Pinnata* (Linn.)

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ABSTRACT

DPPH is stable nitrogen centered free radical that can accept an electron or hydrogen radical tobecome a stable diamagnetic molecule. DPPH radicals react with suitable reducing agents, thenlosing colourstoichometrically with the number of electrons consumed, which is measuredspectrophotometricallty at 517 nm.17) As shown in *Pongamiapinnata*Linn. extractstrongly scavenged DPPH radical with the IC50 being (0.4157mg/ml). The scavenging wasfoundtodosedependent.Thetotalantioxidantcapacityoftheextractwascalculatedbasedonthe formation of the phosphomolybdenum complex which was measured spectrophotometricallyat 695 nm. The total antioxidant capacity of the extract was found to be 0.3299 nmol/g ascorbicacid.ThetotalantioxidantcapacityoftheEthanolic(50%)andwaterextractmeasuredspectroph otometrically at 695 nm based on the formation of the phosphomolybdenum complexwas found to be 0.3299 nmol/ g ascorbic acid in 50%Hydro aicoholic&4.5950 nmol/g ofascorbic acid.in Water.

Key word-: Antioxidant, *Pongamiapinnata* Linn, Ethanolic extract

1. INTRODUTION

Variety of reasons has been cited for the need for studying medicinal plants. Most of thetraditional knowledge about medicinal plants was in the form of oral knowledge that had beenlost with persistent invasions and cultural adaptations. There was no uniform or standardprocedure for maintaining the inventory of these plants and the knowledge about theirmedicinal properties. There is a prevalence of using plants and plant based products in variouscontemporary and traditional systems of medicines, without any written documentation or regulation. Therefore, it is essential that such uses of natural products be documented and studied for systematic regulation and wide-spread application. These include comminuted or powdered herbal substances, tincture, extracts, essential oils, expressed juices and processed exudates.Originally an Indo-Malaysian species, it is now found in many countries. *Pongamiapinnata*(Linn.) Pierre (Synonyms: *Pongamiaglabra*Vent.,*Derrisindica*(Lam.) Bennet, *Cystisuspinnatus*Lam.) is a member of the Fabaceae family (Papilionacae; Leguminasae). *Pongamiapinnata*is a medium-sized, glabrous, semi-evergreen tree, growing up to 18 meters or more in height, with a short bole, spreading crown, and grayish-green or brown bark.

Pongamiapinnata(Pongamia)

pinnata(synonyms: *Millettiapinnata*, *Cytisuspinnatus*, *Derris indica*, *Pongamiaglabra*; common names: Karanj, Indian Beech Tree, Honge Tree, Pongam Tree) is a perennial oleaginous legume (Leguminosae) with nitrogen-fixing capability and medicinal properties. This plant is native to the Indian subcontinent and grows on marginal land with no direct competition with food crops. It can thrive in areas with annual rainfall ranging from 500 to 2500 mm with the maximum temperature ranging from 27 to 38 °C and the minimum from 1 to 16 °C (Sangwan et al., 2010). Mature trees can withstand waterlogging, slight frost, and high salinity. It is used to control soil erosion and for binding dunes because of its dense network of lateral roots.

3. MATERIALS AND METHODS

AntioxidantstudiesOhkawaetal.,(1979)

The ethanolic (50%) extract of seeds of *Pongamiapinnata*Linn. was used for the evaluationofantioxidant activity.

INVITROSTUDIES

DPPHscavengingactivityR.Govindrajanetal.,(2006)

DPPH scavenging activity or the Hydrogen donating capacity was quantified in presence ofstable DPPH radical on the basis of Blois method (Blois, 1958). Briefly, to a methanolicsolution of DPPH (100 □M, 2.95 ml), 0.05 ml of test compounds dissolved in

methanol wasadded at different concentration (2 -10 mg/ml). Reaction mixture was shaken and absorbancewas measured at 517nm at regular intervals of 30 seconds for 5 minutes, and the reading wastaken till 20 min. Ascorbic acid was used as standard. The degree of discoloration indicates thescavengingefficacyof theextract.Shown in tableno.5

Scavengingeffect(%)=(1-B/A)x100

WhereA =AbsorbanceofDPPH control with solvent(517nm)

B=Absorbanceof decolorized DPPHin presenceoftest sample(517nm)

Totalantioxidantcapacity

Totalantioxidantcapacitywasmeasuredaccordingtospectrophotometricmethodof Preito, mloftheextract(10mg/ml)dissolvedinwaterwascombinedinaneppendorftubewith1mlofreagentsolution(0.6Msulfuricacid,28mMsodiumphosphateand4mMammoniummolybdate).Thetubeswerecappedandincubatedinathermalblockat950Cfor90min.Aftercoolingtoroomtemperature,theabsorbanceoftheaqueoussolutionofeachwasmeasuredat695nmagainstablank.Ascorbicacidwasusedasthestandardandthetotalantioxidant capacity is expressed as equivalents of ascorbic acid. Shown in table no.5

4.RESULT & DISCUSSION

INVITROANTIOXIDANT

Free radical oxidative stress has been implicated in the pathogenesis of a wide varietyof clinical disorders, resulting usually from deficient natural antioxidant defenses. In mostdiseases,increasedoxidantformationisaconsequenceofthediseaseactivity.Potentialantioxidant therapy therefore should include either natural free radical scavenging antioxidantprinciples or agents, which are capable of augmenting the activity of the antioxidant enzymes.ROS are capable of damaging biological macromolecules such as DNA, carbohydrates orproteins. ROS is a collective term, which includes not only the oxygen radicals (O_2, and $OH^{\cdot}$)but also some non-radical derivatives of oxygen these include H_2O_2, HOCl and ozone (O_3). Ifhumandiseaseisbelievedtobeduetotheimbalancebetweenoxidativestressandantioxidative defense, it is possible to limit oxidative tissue damage and hence prevent diseaseprogressionbyantioxidant defense supplements.DPPH is stable nitrogen centered free radical that can accept an electron or hydrogen radical tobecome a stable diamagnetic molecule. DPPH radicals react with suitable reducing agents, thenlosing colourstoichometrically with the number of electrons consumed, which is measuredspectrophotometricallty at 517 nm.17) As shown in **Table No.5**, *Pongamiapinnata*Linn. extractstrongly scavenged DPPH radical with the IC50 being (0.4157mg/ml). The scavenging was found to do sedependent. The totalantioxidantcapacityoftheextractwascalculatedbasedonthe formation of the phosphomolybdenum complex which was measured spectrophotometricallyat 695 nm. The total antioxidant capacity of the extract was found to be 0.3299 nmol/g ascorbicacid. Thus establishing the extract as an antioxidant.Photochemapparatus and method allowedprecise as well as time and cost effective determination of the integral antioxidative capacity ofthepongamia extract. Free radicals are generated in the instrument by means of photo sensitizer. The free radical sthus generatedweredetectedby theirreactionwithachemiluminogenicsubstance. Luminol acts both as photosensitizer as well as the detecting reagent. In the presenceof radical scavengers in the extract the intensity of the PCL was attenuated as a function ofconcentration. In this way the antioxidative capacity of the extract could be quantified. Theantioxidativecapacitywas found to be0.99557 nmol ascorbic acid/gequivalents.The Change in colour of DPPH is directly proportional to the amount of antioxidant present inthereactionmixture(antioxidantreactwithstablefreeradicali.eDPPH)andthe50%Hydroalcoholicextractwasfoundtheactivefreeradicalscavengingactivity increasefrom14.7108%(100µg/ml) to 88.1802 %(800µg/m).

TableNo:5Antioxidantactivityofdifferentextractofdriedseedsof*Pongamiapinnata*Linn.

<	DPPHScavengeing%				
	Butanol	**Chloroform**	**Water**	**50%Hydroaicohol**	**Ascorbic Acid**
100	3.0612	3.9115	11.9528	14.7108	20.4081
200	15.4761	17.9421	13.2996	17.7721	25.8503
400	26.8707	20.8333	25.4208	57.4829	69.8129
800	32.0578	48.3843	56.4625	88.1802	93.9625
I.C50(mg/ml) (at20min.)	0.9945	0.9823	0.7080	0.4157	0.396884

TotalAntioxidant

Thetotalantioxidantcapacityof theEthanolic(50%)andwaterextractmeasuredspectrophotometrically at 695 nm based on the formation of the phosphomolybdenum complexwas found to be 0.3299 nmol/ g ascorbic acid in 50%Hydro aicoholic&4.5950 nmol/g ofascorbic acid.in Water.

5. CONCLUSION

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