

ANTIOXIDANT ACTIVITY OF FRUIT RIND EXTRACT OF GARCINIA MANGOSTANA LINN

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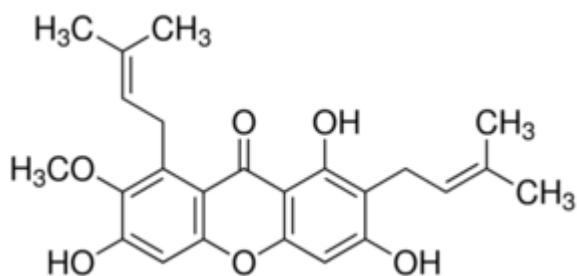
ABSTRACT-

In South East Asia *Garcinia mangostana* linn (GML) is used as phytomedicine for treatment of trauma, diarrhoea, skin infection. Antioxidants are the substances which help to inhibit the oxidation and thus increase the life of oxidizable matter. Free radicals responsible for oxidative stress cause various diseases or disorder. Antioxidants derived from medicinal plants; in the form of raw extract and/or chemical constituents, helps to block oxidation by neutralizing free radicals. In recent years *Garcinia mangostana* linn has become suitable alternative medicinal plants as they contain about fifty natural xanthenes. In study it was observed that out of sixteen xanthenes γ -mangosteen showed HO \cdot -scavenging activity which is isolated from GML fruit powder. The antioxidant activity study has been done by using two different solvent extract at different concentration.

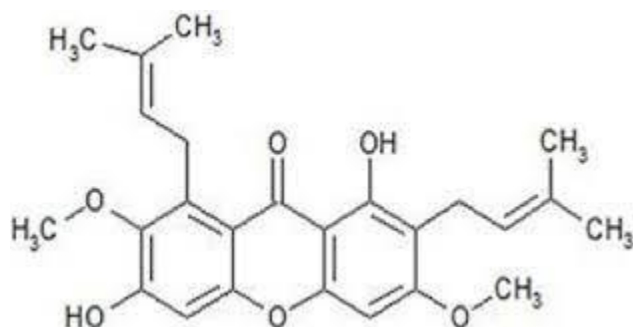
Keywords – Antioxidant activity, *Garcinia mangostana* linn, DPPH(2,2-Diphenyl-1-picryl-hydrazyl-hydrate), Free radical scavenging activity (RSA%), IC50.

Garcinia mangostana linn (GML):

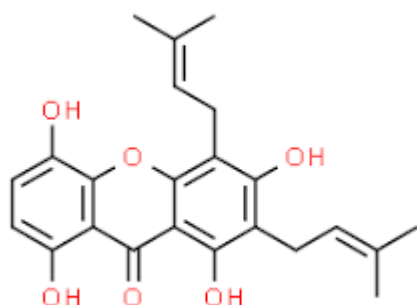
Today, usage of concentrates of plant as refreshments produced using flavors and medicinal plants based beverages, herbs, sodas, juices and syrup has expanded. Mangosteen skin is one of them. Mangosteen skin utilized. [Mishra A. K. et al, 2011] Mangosteen [*Garcinia mangostana* Linn] is a fascinating fruit and has attractive shading with high nutrient substance, comprises of carbohydrates, protein, fat, calcium, phosphorus, iron, sodium, potassium, vitamin B1, vitamin C, and others. Tough skin of mangosteen contains xanthone, tars, flavonoids and tannins. The pericarp has additionally been demonstrated in various examinations, that it is reported with antibacterial potential [Arun K. M. et al, 2011]. Mangosteen fruit contains xanthenes and tannis shows antifungal, antiviral, antibacterial and antioxidant property [Zarena et al, 2009]. It also shows good anticancer activity and also useful as remedy for inflammation, hepatitis, allergy etc. [Inas et al, 2014, Yukihiro et al, 2008].



α -Mangosteen



β -Mangosteen



Gartanin

There are some higher plant families, fungi, lichens, was found to contain secondary metabolite xanthenes or xanthen-9H-ones [Peres V et al, 2000, Vieira et al, 2005] and they are classified mainly in five groups namely xanthone glycosides, prenylated xanthenes, simple oxygenated xanthenes, xanthonolignoids and miscellaneous xanthenes. [Sultanbawa M.U.S 1980, Jiang et al, 2004]. Study has been shown that secondary metabolites prenylated and oxygenated xanthenes present in GML [Govindachari T.R.K.P. et al, 1971, Sultanbawa M.U.S 1980, Peres V et al, 2000]. Xanthenes can be isolated from leaves, bark, whole fruit, and pericarp. In studies it has been observed that xanthenes isolated from mangosteen fruits have good biological activities [Suksamrarn S. et al, 2006]. Mostly studies have been done on xanthenes such as α - mangostin, β - mangostin, γ - mangostins, garcinones E, 8 - deoxygartanin and gartanin. It was reported that xanthenes obtained from GML shows biological activities like antitumoral, anti - inflammatory antiallergy, antioxidant, antifungal, antiviral and antibacterial etc. From pericarp of mangosteen about fifty xanthenes isolated, in which first was named as mangostin which further change to α -mangosteen [Schmid W et al, 1855]. About twenty one xanthenes isolated from trunk and branches of GML. About eighteen xanthenes have been isolated from the mangosteen fruit such as α -Mangostin, β -Mangostin, 9-hydroxycalabaxanthone, 3-isomangostin, gartanin, 8-desoxygartanin, mangostenone C, D, E. [Holloway D.M. et al, 1975, Nilar et al, 2002, Walker et al, 2007, Nilar et al, 2005, Suksamrarn S. et al, 2006].

ANTI-ANTIOXIDANT ACTIVITY:

Antioxidants are the substances which help to inhibit the oxidation and thus increase the life of oxidizable matter. Free radicals responsible for oxidative stress cause various diseases or disorder [Patel Chirag J et al., 2013]. Antioxidants derived from medicinal plants; in the form of raw extract and/or chemical constituents, helps to block oxidation by neutralizing free radicals. It is considered that medicines derived from plants are safer than synthetic one, but toxicity of most medicinal plants have not been studied [Sharareh Rezaeian et al., 2015]. Antioxidant is used against damages caused by free radicals.

In recent years *Garcinia mangostana* linn has become suitable alternative medicinal plants as they contain about fifty natural xanthenes [Pedraza et al., 2008]. It was observed that α - mangosteen reduces the human low density lipoprotein (LDL) caused by copper and peroxy radical. They observed that α - mangosteen reduces thiobarbituric reactive species (TBARS) production and decreases the - tocopherol consumption which is induced by LDL oxidation. Study has been shown that α - mangosteen and their synthetic derivatives reduce α - tocopherol consumption induced by LDL oxidation [Yoshikawa M et al., 1994].

Anti Oxidant activity *Garcinia mangostana* With DPPH Scavenging Activity Method at concentration $\mu\text{g/ml}$ using fruit rind extract of *Garcinia indica* choisy and *Garcinia mangostana* linn.

Material and method:

Collection of Material:

Fruit rind of both species *Garcinia indica* choisy and *Garcinia mangostana* linn were collected from Dr. Balasaheb Sawant Konkan Krushi Vidyapeeth, Regional fruit research station, Vengurla. The specimen were prepared and authenticated at Department of Botany, Ramnarain Ruia Autonomous College.

Sample Preparation:

20gm Dried fruit rind *Garcinia mangostana* linn was added with Ethyl Acetate, THF (Tetrahydrofuran) and were kept at 37°C for 24 hours and extracted by soxhlet extraction apparatus. The extracted solvent solution was then washed with water to remove any acidic part from product; the aqueous layer was checked for its pH. The pH should be in near range of 6.5-7.05. The Organic layer (solvents) was then subjected to drying under controlled atmosphere and temperature using rotary vacuum evaporator. The solid dried material thus obtained was further used for DPPH activity at different concentrations of dried samples extract (100 $\mu\text{g/ml}$, 125 $\mu\text{g/ml}$, 150 $\mu\text{g/ml}$, 175 $\mu\text{g/ml}$ and 200 $\mu\text{g/ml}$) using ethanol.

100 $\mu\text{g/ml}$, 125 $\mu\text{g/ml}$, 150 $\mu\text{g/ml}$, 175 $\mu\text{g/ml}$ and 200 $\mu\text{g/ml}$ in Ethanol of BHT were prepared and used as external antioxidant standard product. Prepare of 0.065mM DPPH (2, 2-diphenyl-1-picrylhydrazyl) Solution and treated each extract with DPPH and after shaking 5 minutes and kept for 30 minutes each of these solutions were taken up for spectral scanning at 517 nm.

Calculation: Radical Scavenging Activity (RSA %) = $[A(c)-A(s)]/A(c) \times 100$

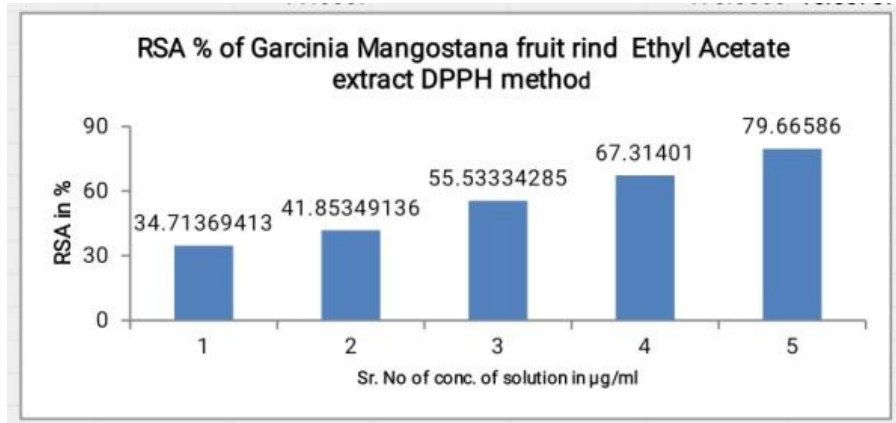
Where A(c) = Abs of Control Liquid (0.2mM DPPH in Methanol Solution) at 517 nm.

A(s) = Abs of Sample + DPPH solution after keeping in dark for 30 min.

A] Antioxidant activity of ethyl acetate extracts of *Garcinia mangostana* linn-

SR NO.	Conc. in $\mu\text{g/ml}$	Abs. of reacted material with DPPH	Radical scavenging activity (RSA %)	IC50 $\mu\text{g/ml}$
1	100	0.4572	34.7137	6.834345
2	125	0.4072	41.8535	9.002602
3	150	0.3114	55.5333	11.17086
4	175	0.2289	67.3140	9.339635
5	200	0.1424	79.6659	15.50737

Table no. - 1] DPPH radical scavenging activity of ethyl acetate extracts of *Garcinia indica* choisy fruit rind:

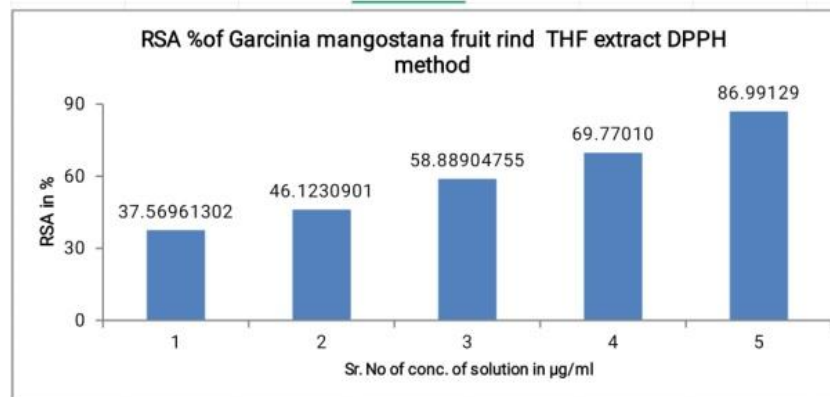


Graph no. - 1] Radical scavenging activity (RSA %) of ethyl acetate extracts of Garcinia mangostana linn fruit rind:

B] Antioxidant activity tetrahydrofuran (THF) extracts of Garcinia mangostana linn -

Table no.2] Antioxidant activity study of tetrahydrofuran (THF) extracts of Garcinia mangostana linn

SR NO.	Conc. in µg/ml	Abs. of reacted material with DPPH	Radical scavenging activity (RSA %)	IC50 µg/ml
1	100	0.4372	37.5696	6.281046
2	125	0.3773	46.1231	8.323529
3	150	0.2879	58.8890	10.36601
4	175	0.2117	69.7701	8.597214
5	200	0.0911	86.9913	14.45098



Graph no. 2] RSA% of THF extracts Garcinia mangostana fruit rind:

Conclusion:

From the antioxidant activity study it was observed that as the concentration increases antioxidant activity also increased. In ethyl acetate extract and THF extract highest free radical scavenging activity were 79.6659% with IC50 value 15.50737 and 86.9933% with IC50 value 14.45098 respectively.

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