Scientific Study & Antioxidant Activity of Mature Fruit Kernels of the Plant *Monestera Deliciosa Liebm*

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Abstract: ***The present study was carried out to investigate the preliminary phytochemical screening, total phenolic, tannin and falconoid contents, and In-Vitro antioxidant activities of different solvent extracts of Monstera deliciosa Liebm. Fruit kernels. Phytochemical screening was carried out using standard protocols. The antioxidant activity was carried out by DPPH (2, 2-diphenyl-1-picryl-hydrazyl) method. The phytochemical screening study of Monstera deliciosa fruit kernels extracts revealed the presence of important phytochemicals namely Tannins, Steroids, Flavonoids, Alkaloids sugar and Saponins. TLC analysis shows two active compounds in Ethanolic extract which is isolated via column chromatography. Both isolated compounds show the high antioxidant property. Ethanol extract, sample 1 at 100µg/ml concentrations exhibited more free radical scavenging activity than the standard Ascorbic acid, whereas sample 2 at 200µg/ml concentrations showed more free radical scavenging than the standard Ascorbic acid. The results of this study are suggesting the medicinal importance of this plant due to the presence of various phytochemicals.***

Keywords: Ascorbic acid, DPPH, prepative TLC, column silica, In-vitro-DPPH assay, Monstera fruit kernels

1. Introduction [1-3]

Nature always stands as a golden mark to exemplify the outstanding phenomenon of symbiosis. The plants are fruitful to man for his life, three important necessities life – Food, Cloth and shelter and host of other useful products are supplied to him from plant kingdom[8].The *Red Data Book of India* has 427 entries of species of which 28 are considered extinct, 124 endangered, 81 vulnerable, 100 rare and 34 insufficiently known species.[9]

***Monstera deliciosa* Liebm**. belong to family **Araceae** is a tropical fruit that flourishes in muggy, humid temperatures with no frost. In India, Delicious monster makes for a common decorative houseplant, but not fruit crop. They are not sold in markets and are thus quit difficult to find outside of nurseries. The flower of monster are 8-12cm long, creamy white, jack-in-the-pulpit type (spathe). The fleshy up spike (spadix) with tiny flower is surrounded by the boat shaped spathe. The fruit swelling into 9 cone like structure that looks a green cob of corn with hexagonal kernels. . The fruit ripens from the bottom up & hexagonal scales covering begin to dry out & split off, custard like white pulp underneath is used to consumption. The taste is like a combination of pineapple, banana, jack-fruit & mango. Medically, Mexicans have used the root infusion to relieve arthritis. Martinique uses the leaf or root infusion to soothe snakebite.

In China plant remedy cough, bruises, fever, cancer and Brazilians heat the leaves & mash it to cauterize wounds

2. Material & Methodology

The fresh mature fruit of *Monstera deliciosa* used in the study collected from Village – Rajawala, Dehradun, Uttarakhand and were identified on its physical characteristics. The herbarium file of the plant parts was made and the plant is authenticated from Botanical Survey of India, Dehradun. The species *Monstera deliciosa* Liebm. family-Araceae is Authentified by Kumar Ambrish scientist-D by Acc. No 118700.

In successive extraction process the plant material fruit kernels extracted with non polar to polar solvent i.e. Pt. ether, ethanol, hydro alcohol, Water in soxhlet apparatus[4].

The phytochemical screening of *Monstera deliciosa* Liebm fruit kernels extracts shows presence of phytochemicals namely carbohydrates, Steroids, Saponins, Tannins & phenolic compound. [10]

TLC Procedure

Step1-Prepare the Developing Chamber: The developing chamber for TLC can be especially intended chamber, a jar with a lid, or A beaker with a watch glass on the top. Pour solvent into the chamber to a depth of just less than 0.5cm. To support in the diffusion of the TLC chamber through solvent vapors. Cover the beaker with a watch glass quickly, allow it to stand While you prepare your TLC plate.

Step 2-Prepare the TLC Plate: TLC plate used are purchased as 5 by 20cm preparative Al Sheets . Every large piece is cut horizontally into plate which is 5cm tall by various width. Measure 0.5cm from the bottom of the plate. Using a pencil, draw a line across the plate at the 0.5cm mark.

Step 3-Spot the TLC Plate: Dissolve about 1mg of sample in 1ml of methanol. Dip the microcap into the solution and then gently touch the end of it onto the proper location on TLC plate.

Step 4-Develop the Plate: Place the ready TLC plate in the developing chamber, cover the chamber with watch glass, and then leave it undisturbed on your work surface top. The solvent start rising up through TLC plate by capillary action.

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Make sure that the solvent does not cover the spot. Allow the plate to develop until the solvent is about half a centimeter below the top of the plate. Take away the plate from the beaker and instantly mark the solvent front with a pencil.

Step 5-Visualize the Spots: Hold a UV lamp over the plate and circle any spot you see.

Column Chromatography [5]

Slurry Method (Wet Method)

1) Combine the silica gel with a small amount of Non polar solvent in a beaker containing compound.
2) Carefully mix the two substance until a consistent paste is formed, but is still capable of flowing.
3) Pour the homogeneous mixture into the column as carefully as possible using a spatula to scrape out the solid as you pour the liquid.
4) The slurry process usually gives the most excellent column packing, but is also not easy technique to master. Either the dry or slurry method is select, the most significant feature of packing the column is creating an evenly distributed and packed stationary phase.
5) Prevent the Column from cracks, air bubbles by tapping the column to prevent the formation of voids.
6) Then pass the solvent Methanol : Chloroform (7:3) until the compound shows separation and spot is applied on TLC plates to visualize the desired compound.
7) Dry the compound and weighed.

In-Vitro Antioxidant Activity[7]

DPPH ASSAY: - The DPPH (2, 2-diphenyl-1-picryl hydrazine) is a stable free radical, which has been used in – phyto Medicine for the assessment of scavenging activities of bioactive fractions. In radical form, DPPH absorbs at 517nm, but upon reduction with antioxidant, its absorption decrease due to formation of it's non radical form. Thus, the radical scavenging activity can be monitored as a decrease in absorbance of DPPH solution.

Chemical Requirement:- DPPH, Methanol, DMSO, Ascorbic acid as standard.

Method:-The DPPH free radical scavenging activity of different extracts was measured according to the method of Dr. V. Umamaheshwara rao et al 2015. (14) .

The crude extracts of different concentration viz. 100mcg\ml, 200mcg\ml, 300mcg\ml, 400mcg\ml, 500mcg\ml were prepared in DMSO (DiMethylSulphoxide). One ml of each concentration was mixed with 4 ml of the 0.004% w\v solution of DPPH prepared in methanol. The reaction mixture was kept for incubation in dark for 30 min.

Methanol was used as Control and Ascorbic acid was used as standard antioxidant. The absorbance was measured at 517 nm.

The DPPH scavenging activity percentage% was calculated by using the formula:-

DPPH scavenging activity(%) = $A_0 - As / A_0 \times 100$

3. Result and Discussion

Antioxidant activity

Table 1: Absorbance of extract and standard(Ascorbic acid) with DPPH(control) .

Concentration(mg/ml)	sample	Ascorbic acid
0	0	0
0.02	0.113	0.127
0.04	0.214	0.219
0.06	0.324	0.341
0.08	0.432	0.448
0.10	0.516	0.520

Absorbance of control=0.524

% inhibition = absorbance of control – absorbance of sample / absorbance of control × 100

Concentration(mg/ml)	Sample	Ascorbic acid
0	0	0
0.02	54.28	62.45
0.04	89.68	75.38
0.06	97.78	85.68
0.08	104.9	92.93
0.10	110	104.6

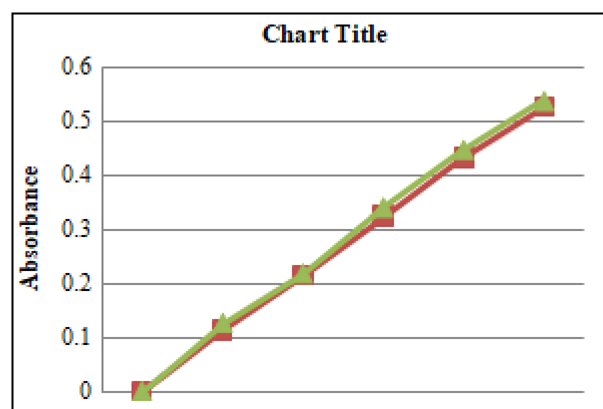

Figure: Shows the dose response curve of DPPH radical scavenging activity of Ethanol extract of fruit of Monstera *deliciosa* Liebm. Compared with ascorbic acid (standard)

4. Conclusion

By the Qualitative phytochemical screening of various extract of fruit kernels of the plant *Monstera deliciosa* It was concluded that it contains different secondary metabolites of plants like Carbohydrate (monosaccharide's, ketoses sugar), Steroids, Tannins & Phenolic compound, flavonoids, saponins (aq.), Essential oil (Pet. Ether) .

By the Antioxidant Activity of isolated compound from Fruit extract of the plant *Monstera deliciosa* It was found that strong DPPH free radical scavenging activity in Ethanolic extract.

Thus, it may be concluding that the isolated Phytoconstituents may be effective in antioxidant disease.

In future if studies performed *In-vivo Monstera deliciosa* can be used in the cure of above mentioned ailments.

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