

Formulation of Antioxid and Antidiabetic Activities of Black Grapes and Dragon Fruit Extract

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Abstract: *Diabetes mellitus (DM), a chronic disease characterized by hyperglycemia, is an increasing global health problem which is associated with various chronic diseases such as hypertension, hyperlipidemia and cardiovascular diseases. Despite traditional insulin therapy, nutrients and nutritional factors are also known to play a significant role in the control and treatment of DM*

Keywords: Diabetes mellitus

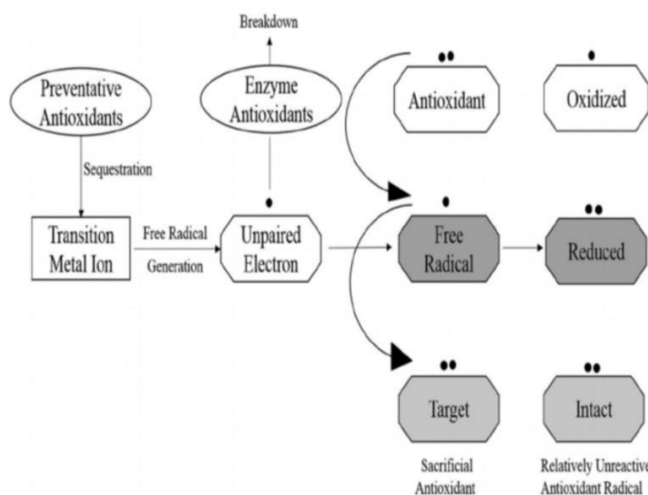
I. INTRODUCTION

Herbal plants also known as medicinal herbs have been discovered and used in traditional medicine practices since prehistoric times. Plants synthesize hundreds of chemical compound for function including defense against insect, fungi, disease and herbivores mammals. Many of these phytochemical have beneficial effects on long term health when consumed by humans and can be used to effectively treat human disease. Herbal fruits like Black grapes, Watermelon, Dragon Fruit, Pomegranate, apple are used in various treatment and prevention of disease. The disease such as Antioxidants, Antidiabetic, Anti- inflammatory, Antitumor, Anti-malaria, Anti- obesity, Anti amoebic, etc can be cured.

ANTIOXIDANTS:

Antioxidants are the compounds that inhibit oxidation a chemical reaction that can produce free radicals and chain reaction that may damage cell of organism. Antioxidant such as things or ascorbic acid (vitamin C) may act to inhibit these reaction. Free radicals are believed to be one of causes over sixty health problems according to various scientific and medical groups. These problems include cancer, aging and atherosclerosis. Phenolic compounds including flavonoids, Anthovyanins and Tannins are main group of antioxidants play key role in antioxidants mechanism.

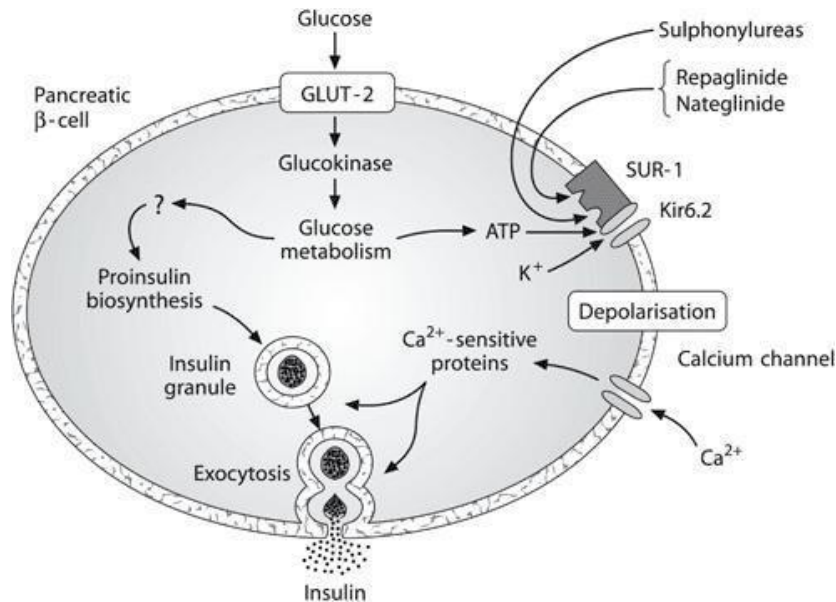
MOA of Antioxidants:



ANTIDIABETICS:

Antidiabetic drug, any drug that works to lower abnormally high glucose (sugar) levels in the blood, which are characteristic of the endocrine system disorder known as diabetes mellitus. Diabetes is caused by the body's inability to produce or respond to the pancreatic hormone insulin.

MOA of Antidiabetics



BLACK GRAPES:

Black grapes have been grown in Europe and Asia for over 6,000 years. The black grapes we enjoy today (*Vitis vinifera*) come in two varieties one grows in Western Asia near the Black Sea, and the other grows in the Americas. Most are cultivated for use in wine, but they also make a delicious and healthy snack.

The health benefits of black grapes have been studied extensively. The chemicals they contain can give you healthier hair and skin, improve your heart health, and even protect your cells against cancer. Rich in Antioxidants

Some varieties of black grapes are much higher in antioxidants than green or red grapes.

These chemical compounds help protect your cells from damage. They protect against diseases like cancer, diabetes, Alzheimer's, Parkinson's, and heart disease. They can also help you heal from illness faster



ADVANTAGES:

- Black grapes are high in polyphenol and flavonoids two compounds that act as antioxidants to help promote your health.
- The antioxidants present in black grapes prevent oxidation.
- Black grapes improve brain function.
- Black grapes immunity booster
- In the cancer fighting properties

II. DRAGON FRUIT

Dragon fruit is a food that grows on a climbing cactus called *hylocereus*, which you'll find in tropical regions around the world. The plant's name comes from the Greek word "hyle," which means "woody," and the Latin word "cereus," which means "waxen."

On the outside, the fruit has the appearance of a hot pink or yellow bulb with spike-like green leaves shooting up like flames around it. Cut it open, and you'll find fleshy white stuff inside dotted with black seeds that are OK to eat.

This fruit comes in red- and yellow-skinned varieties. The cactus originally grew in southern Mexico and South and Central America. The French brought it to Southeast Asia in the early 19th century. Central Americans call it "pitaya." In Asia, it's a "strawberry pear."

Dragon Fruit Nutrition

In one 6-ounce serving of dragon fruit cubes, you'll get:

Calories: 102

Fat: 0 grams

Protein: 2 grams

Carbohydrates: 22 grams

Fiber: 5 grams

Dragon Fruit Health Benefits

Dragon fruit has many potential health benefits, including:

It's rich in antioxidants like flavonoids, phenolic acid, and betacyanin. These natural substances protect your cells from damage by free radicals -- molecules that can lead to diseases like cancer and premature aging. It's naturally fat-free and high in fiber. It makes for a good snack because it can help keep you full for longer between meals.

It may help lower your blood sugar. Researchers say this might be partly because it replaces damaged cells in your pancreas that make insulin, the hormone that helps your body break down sugar. But the studies were done on mice, not people. It's unclear just how much dragon fruit you'd have to eat to get these benefits. It contains prebiotics, which are foods that feed the healthy bacteria called probiotics in your gut. Having more prebiotics in your system can improve the balance of good to bad bacteria in your intestines. Specifically, dragon fruit encourages the growth of the probiotics *lactobacilli* and *bifidobacteria*. In your gut, these and other helpful bacteria can kill disease-causing viruses and bacteria. They also help digest food. It can strengthen your immune system. Dragon fruit is high in vitamin C and other antioxidants, which are good for your immune system.



ADVANTAGES:

- Dragon fruit reduces risk of cancer
- Dragon fruit good for digestion
- Dragon fruit fights cancer.
- Dragon fruit good for heart.
- Dragon fruit good for hair
- Dragon fruit fight ageing skin
- Very important it reduces the blood sugar level
- Healthy bones

III. LITERATURE SURVEY**LITERATURE ON ANTIOXIDANTS:**

P.O. ovlasogle et.al (June 2009):

Total phenolic content of some fruits and vegetables name; garden egg, lemon, grapes, carrot etc were purchased and total phenolic gallic acid equivalent was determined.

Junaid R shaikh et.al (March 2020):

Alkaloids, Flavonoids, Phenolic, Tannins, Saponins, Steroids, Glycosides etc, are important phytochemicals with diverse biological activates. Currently phytochemicals are determined by various modern technique but conventional qualitative test are still popular.

Siddhartha Baliyan et, al (2022):

To explain process behind DPPH test as well as their applicability in manufacture of metal oxide nanoparticles in particular MgO and their influence on antioxidant, a specimen from test was chosen for study.

LITERATURE ON BLACK GRAPES:

1. Kaibing Zhou et.al (July 2011):

The high amount of total phenolics and total flavonoids in ethyl acetate and n- butanol fraction contributed to their antioxidant activities. The ethyl acetate fraction was subjected to column chromatography to yield two phenolic compounds, p- hydroxybenzoic acid and vanillic acid, which possessed significance antioxidant activities.

2. Maisarah Mutalib et.al (January 2013):

The study was conducted to compare total antioxidant activity (TAA), total phenolic content (TPC) and total flavonoid content (TFC) from different parts of papaya. DPPH radical Scavenging activity and beta-carotene bleaching assay were used to determine TAA.

3. Tarun Vij et.al(January 2015):

In present review nutritional value of fruit and medicinal properties of various parts have been discussed to provide collective information on this multipurpose commercial fruit crop.

4. Arshad H. Rahmani et.al (September 2015):

In this review, we aim to evaluate application of papaya in cancer, diabetes, wound healing, malaria, dengue fever and other various diseases prevention and treatment.

LITERATURE ON DRAGON FRUIT:

1. Y.S.Rao et.al (January 1999):

This describes origin, classification, chemical composition, production, sources, main uses health aspects and quality issues associated with this crop. The pulp constitute 30-50% of ripe fruit, shell and fiber account for 11-30% and seed about 25-40%.

2. Dipali.Y. Jadhav et.al (March 2010):

Tamarind pulp extracts were screened for anti-microbial activities using agar well diffusion method and detection of phytochemicals were carried by gas chromatography. Major phytochemicals detected are 2- furan-carboxaldehyde, 2,3-butanediol.

3. Safiya Artuhami et.al (October 2016):

The work was to study physiochemical properties of tamarind fruit pulp for production of Vinegar and to evaluate characteristics of produced vinegar.

DRUG PROFILE

A naturally occurring plant phenol is present in black grapes and dragon fruit. Plant polyphenol are well known to show biological activity such as antioxidant and antidiabetic activity. In black grapes and dragon fruit high amount of polyphenols are present respectively.

BLACK GRAPES:

A grape is a fruit, botanically a berry, of the deciduous woody vines of the flowering plant genus *Vitis*. Grapes are a non-climacteric type of fruit, generally occurring in clusters.

The cultivation of grapes began perhaps 8,000 years ago, and the fruit has been used as human food over history. Eaten fresh or in dried form (as raisins, currants and sultanas), grapes also hold cultural significance in many parts of the world, particularly for their role in winemaking. Other grape-derived products include various types of jam, juice, vinegar and oil

The Middle East is generally described as the homeland of grapes and the cultivation of this plant began there 6,000-8,000 years ago. o. Yeast, one of the earliest domesticated microorganisms, occurs naturally on the skins of grapes, leading to the discovery of alcoholic drinks such as wine. The earliest archeological evidence for a dominant position of wine-making in human culture dates from 8,000 years ago in Georgia. The oldest known winery was found in Armenia, dating to around 4000 BC. By the 9th century AD, the city of Shiraz was known to produce some of the finest wines in the Middle East. Thus it has been proposed that Syrah red wine is named after Shiraz, a city in Persia where the grape was used to make Shirazi wine.

Ancient Egyptian hieroglyphics record the cultivation of purple grapes, and history attests to the ancient Greeks, Cypriots, Phoenicians, and Romans growing purple grapes both for eating and wine production. The growing of grapes would later spread to other regions in Europe, as well as North Africa, and eventually in North America.

In 2005 a team of archaeologists concluded that some Chalcolithic wine jars, which were discovered in Cyprus in the 1930s, were the oldest of their kind in the world, dating back to 3,500 BC. Moreover, Commandaria, a sweet dessert wine from Cyprus, is the oldest manufactured wine in the world, its origins traced as far back as 2000BC.

Scientific classification

Kingdom: Plantae Family : vitaceae Genus : vitis Species : v. vinifera

Common Names

Hindi: kale angur English: black grapes Sanskrit: draksha Marathi: kali draksh

Family:

Chemical constituents

Flavonoids: Anthocyanins, stilbenes, and lipids Alkaloids : Protein, carb, carbohydrates, sugar, calories

Dragon fruit:

A pitaya or pitahaya is the fruit of several different cactus species indigenous to the region of southern Mexico and along the Pacific coasts of Guatemala, Costa Rica, and El Salvador. Pitaya is cultivated in East Asia, South Asia, Southeast Asia, the United States, the Caribbean, Australia, and throughout tropical and subtropical regions of the world.

Pitaya usually refers to fruit of the genus *Stenocereus*, while pitahaya or dragon fruit refers to fruit of the genus *Selenicereus* (formerly *Hylocereus*), both in the family Cactaceae. The common name in English dragon fruit derives from the leather-like skin and scaly spikes on the fruit exterior. Depending on the variety, pitaya fruits may have sweet- or sour-tasting flesh that can be red, white, or yellow in color.

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These fruits are commonly known in English as "dragon fruit", a name used since 1963, apparently resulting from the leather-like skin and prominent scaly spikes on the fruit exterior. The fruit may also be known as a strawberry pear.

The names pitahaya and pitaya derive from Mexico, and pitaya roja in Central America and northern South America, possibly relating to pitahaya for names of tall cacti species with flowering fruit. Pitaya or dragon fruit is native to the region of southern Mexico and along the Pacific coasts of Guatemala, Costa Rica, and El Salvador. The dragon fruit is cultivated in East Asia, South Asia, Southeast

Asia, the United States, the Caribbean, Australia, and throughout tropical and subtropical regions of the world

Scientific classification

Kingdom : plantae Order : caryophyllales Family : cactaceae Genus : selenicereus Species : s.undatus

Common names

Hindi : pitaya English :Dragon fruit Sanskrit : lotus

Marathi : Dregana phal Family : cactaceae

Material	Quantity
Black Grapes Extract	100ML
Dragon Fruit Extract	100ML
Phenol	1ML
Flavonoid	1ML
Sodium Carbonate	1ML
Sodium Chloride	1ML
Methyl acetate	250ML
Methyl Chloride	2ML

Name of apparatus	Quantity
Breaker	250Ml
Test tube	8
Volumetric Flask	2
Petridish	2
Soxhlet Apparatus	1
UV visible Spectrophotometer	1
Heating metal	1

IV. EXPERIMENTAL WORK

PREPARATION OF BLACK GRAPES EXTRACT:

Black grapes were collected from grapes from Aurangabad. Black grapes were dried and crushed into powder in mixture. 10 g of powder was packed into cellulose bag and extracted using ethanol in 250 ml by soxhlet extractor for 8 hour. The solvent was separated and collected in volumetric flask.

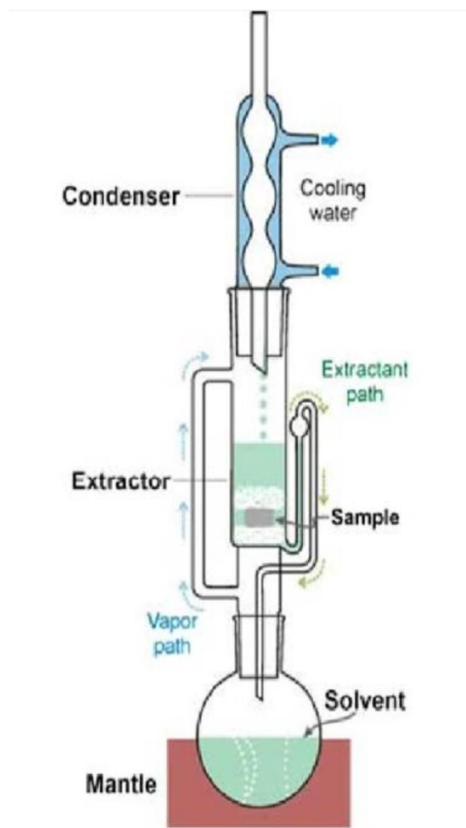
PREPARATION OF DRAGON FRUIT EXTRACT

The shell of dragon fruit was removed manually and then were dried. The dried dragon were crushed into powder form. 10 g of powder was packed into cellulose bag and extracted using ethanol in 250 ml by soxhlet extractor for 8 hours. The solvent was separated and collected in volumetric flask.

PHYTOCHEMICAL TEST FOR PHENOLS: (For black grapes)

Litmus test:

1 ml of black grapes extract was taken in test tubes and blue litmus paper was used for test.



Ferric Chloride test:

1 ml of black grapes extract was taken in test tube and few drops of ferric chloride was added to it.

Liebermann's test:

1 ml of black grapes extract was taken in test tube and few drops of Liebermann's reagent was added to it.

Bromine water test:

1 ml of black grapes extract was taken in test tubes and few drops of bromine water was added to it.

PHYTOCHEMICAL TEST FOR PHENOLS: (For dragon fruit)

Litmus test:

1 ml of dragon fruit extract was taken in test tube and blue Litmus paper was used for test.

Ferric Chloride test:

1 ml of dragon fruit extract was taken in test tubes and few drops of ferric chloride reagent was added to it.

Bromine water test:

1ml of dragon fruit extract was taken in test tubes and few drops of bromine water was added to it.

TEST FOR FLAVONOIDS: (For black grapes)

1 ml of Papaya extract was taken in test tube and few drops of dilute Sodium hydroxide was added to it.

TEST FOR FLAVONOIDS: (For dragon fruit)

1 ml of dragon fruit extract was taken in test tubes and few drops of dil. Sodium hydroxide was added to it

V. RESULT AND DISCUSSION RESULT

Observation Table 1 Black Grapes Extract

Test	Observation	Inference
Litamus Test	Blue litmus turn red	Phenol present
Feric Chloride Test	Violet Coloration	Phenol present
Bromaine Water Test	White ppt form	Phenol present

Observation Table 2

For dragon Fruit Extract

Test	Observation	Inference
Litmus test	Blue litmus turn redd	Phenol present
Bromaine Water Test	White ppt form	Phenol present

Observation Table 3

For Black Grapes Extract

Test	Observation	Inference
Lead acetate test	Yellow Colour Formation	Flavonoids present

Observation Table 4

For Dragon Fruit Extract

Test	Observation	Inference
Lead acetate test	Yellow Colour Formation	Flavonoids present

VI. SUMMARY AND CONCLUSION

SUMMARY:

Aim of our study is to evaluate antioxidant and antidiabetic activity in black grapes extracts and dragon fruit extract. There extract were prepared by using ethanol and different phytochemical test were done to evaluate antioxidant properties in black grapes extract and dragon fruit extract Phytochemical test for phenols and flavonoids were done, antidiabetic activity was evaluated in agar media using dragon fruit extract. DPPH Assay was done to evaluate antioxidant properties. Results for test were shown in observation table.

Results for DPPH can be shown using graph.

CONCLUSION:

This Aim studies about antioxidant and antidiabetic activity in black grapes extracts and dragon fruit extract by phenols and flavonoids test. This concluded presence of antioxidants and antidiabetic activities in both (black grapes and dragon fruit extract).

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