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Preparation and characterization of Pomegranate for Cough Treatment

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Abstract: ***Pomegranates fruits have innumerable health benefits and its implication in diseases cure have been widely recognized since ancient time. Moreover, pomegranate fruits, seeds and peels are intensively used in traditional medicine as a natural therapy. It contains numerous valuable ingredients such as flavonoids, ellagitannin, punicalagin, ellagic acid, vitamins and minerals. The principal constituents including punicalagins and ellagitannin are responsible for immeasurable health benefits due to its strong antioxidant activity. Additionally, constituents of pomegranate show health promoting effect through the modulation of physiological and biochemical pathways. Recent evidences suggested that pomegranates fruits, peels and seeds illustrate therapeutics implications in health management via inhibition of free radical effect and modulation of enzymes activity linked with diseases development and progression. In this review, we summarize the therapeutic role of pomegranate fruits, seeds and peels in the health managements based on in vitro and in vivo studies.***

Keywords: Pomegranates, Anti-oxidant, Anti-inflammatory effect, Heptoprotective effect, Neuroprotective effect and anti-microbial effects.

I. INTRODUCTION

Plants and their products are commonly used in the cure of diseases since ancient time. Recent study demonstrated that medicinal plant shows therapeutic role in disease management through the modulation of biological activities.1,2 Recent finding based on *in vitro* and *in vivo* suggested that pomegranate has health-promoting effects mainly attributed due to its polyphenol content/antioxidant activity.

However, its health promoting effect has also been mentioned in the traditional medicines. Fruits, seeds, peel and leaves of pomegranate contain various types of valuable ingredients and such ingredients show therapeutics role in the disease cure. Pomegranate peel is a rich source of tannins, flavonoids and other phenolic compounds.3 Its juice also contains various constituents such as polyphenols, tannins, anthocyanins, including vitamin C, vitamin E, and lipoic acid4 and punicalagin bioactive constituent responsible for more than 50% of the antioxidant activity of pomegranate juice.5 Pomegranate fruits, peels and seeds have proven its role in diseases cure via modulation of biological activities. Earlier investigators demonstrated that pomegranate extract exhibited scavenging activity against hydroxyl (OH) and superoxide.6 Consumption of pomegranate extract potently delayed the onset and reduced the incidence of collagen-induced arthritis and severity of arthritis was significantly lower in pomegranate extract fed animals.7 In this review, we summarize the therapeutic role of pomegranate in the diseases managements based on *in vitro* and *in vivo* studies.

Pomegranate fruits hold various types of constituents in different parts such as seeds, peels and arils. Such ingredients show therapeutic role in the health management through the modulation of various biological activities. Peels of the pomegranate covers around 60% of the fruit and they hold various types of ingredients including flavonoids, ellagitannins and proanthocyanidin compounds and minerals such as calcium, magnesium, phosphorus, potassium and sodium.

Pomegranate fruit arils contain huge amounts of organic acids, sugars, minerals, vitamins, and polyphenols that show antioxidant effect.9 Moreover, flavonoids are chief polyphenols of fruit, condensed tannins and hydrolysable tannins.10-12 Hydrolyzable tannins including ellagitannins and gallotannins consist of the common constituents present in pomegranate, and punicalagin is the major hydrolyzable tannin present in pomegranates.13-16 The juice of arils consist ofwater, sugars such as glucose, sucrose, and fructose,17 1.5% pectin, organic acids including citric, malic, tartaric, succinic, fumaric and ascorbic acid.18 Pills also have hydroxybenzoic acids such as gallagic acid, ellagic acid and EA glycosides.19 Additionally, seeds hold constituents such as protein, crude fibers, vitamins, minerals, sugars, polyphenols, the phytoestrogen coumestrol estrone.

Medicinal plants make their importance in health managements through antioxidant activity and inhibition of free radical effects. Antioxidant activities of plants have been proven by earlier studies.24-26 Pomegranate shows antioxidant activity due to abundance of compounds such as flavonoids, flavones, anthocyanins and catechins in different parts including fruits, seeds and peels [Table 1].

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Experiment was made to explore the antioxidant activity of pomegranate peels and seeds result of the confirmed that extract of peels and extract of seeds showed antioxidant activity. Furthermore, methanol extract of peel demonstrated highest antioxidant activity among all of the tested extracts.27 Another study revealed that pretreatment of extract of peel followed by treatment of CCL4 showed preservation of enzymes including catalase, peroxidase, and SOD . Additionally, lipid peroxidation was brought back by 54% as compared to control.



II. COMPOSITION AND CONSTITUTION OF POMEGRANATE

The edible parts of pomegranate fruit represented 52% of total fruit weight, comprising 78% juice and 22% seeds. The fresh juice contained 85.4% moisture, 10.6% total sugars, 1.4% pectin, 0.1 g/100 ml total acidity (as citric acid), 0.7 mg/100 ml ascorbic acid, 19.6 mg/100 ml free amino nitrogen and 0.05 g/100 ml ash. Pomegranate fruits hold various types of constituents in different parts such as seeds, peels and arils. Such ingredients show therapeutic role in the health management through the modulation of various biological activities. Peels of the pomegranate covers around 60% of the fruit and they hold various types of ingredients including flavonoids, ellagitannins and proanthocyanidin compounds and minerals such as calcium, magnesium, phosphorus, potassium and sodium.8 Pomegranate fruit arils contain huge amounts of organic acids, sugars, minerals, vitamins, and polyphenols that show antioxidant effect.9 Moreover, flavonoids are chief polyphenols of fruit, condensed tannins and hydrolysable tannins.10-12 Hydrolyzable tannins including ellagitannins and gallotannins consist of the common constituents present in pomegranate, and punicalagin is the major hydrolysable tannin present in pomegranates.13-16 The juice of arils consist ofwater, sugars such as glucose, sucrose, and fructose,17 1.5% pectin, organic acids including citric, malic, tartaric, succinic, fumaric and ascorbic acid.18 Pills also have hydroxybenzoic

A. Uses

Possibly Effective for High blood pressure. Some research shows that drinking pomegranate juice daily can lower systolic blood pressure (the top number) by about 5 mmHg. Lower doses might work the same as higher doses. Pomegranate juice doesn't seem to reduce diastolic pressure (the lower number).

B. Possibly Ineffective for

A lung disease that makes it harder to breathe (chronic obstructive pulmonary disease or COPD). Drinking pomegranate juice does not seem to improve symptoms or breathing in people with this condition. High levels of cholesterol or other fats (lipids) in the blood (hyperlipidemia). Taking pomegranate doesn't seem to lower cholesterol in people with or without high cholesterol.

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C. Insufficient Evidence for

Hardening of the arteries (atherosclerosis). Early research shows that drinking pomegranate juice might help to keep the arteries in the neck (carotid arteries) clear of the build-up of fatty deposits. Athletic performance. Early research shows that taking pomegranate extract might make cycling feel easier. It might also increase how long cycling can be done. But doesn't improve cycling time in competitive athletes. Heart disease. Some early research shows that drinking pomegranate juice might improve blood flow to the heart. But drinking pomegranate juice doesn't seem to prevent narrowing of blood vessels in the heart (stenosis). There is also not enough information to know if drinking pomegranate juice helps prevent heart disease-related events such as heart attack.

Tooth plaque. Early research shows that rinsing with pomegranate extract mouthwash for one minute once or twice daily reduces dental plaque. Diabetes. Early research shows that drinking fresh pomegranate juice 1.5 mL/kg improves blood sugar in some people with diabetes. Serious kidney disease (end-stage renal disease or ESRD). The effects of pomegranate in people with ESRD are unclear. Results from research are inconsistent. Some early research shows that drinking pomegranate juice during or after dialysis helps to reduce blood pressure and to improve "good" (HDL) cholesterol and triglyceride levels. But other early research shows that drinking pomegranate juice before dialysis sessions or taking pomegranate extract for only 4 weeks doesn't improve blood pressure or cholesterol in people on dialysis. Erectile dysfunction (ED). Early research shows that drinking pomegranate juice daily for 4 weeks does not improve erectile dysfunction in men. Muscle soreness caused by exercise. Early research in trained men shows that drinking pomegranate juice twice daily for 15 days reduces muscle soreness after exercising in the elbow but not the knee. But other research in untrained men shows that drinking pomegranate juice twice daily for 9 days doesn't reduce muscle soreness in the elbow. Symptoms of menopause. Early research shows that taking pomegranate seed oil for 12 weeks does not reduce hot flashes but might improve sleep in some women with symptoms of menopause. A grouping of symptoms that increase the risk of diabetes, heart disease, and stroke (metabolic syndrome). Early research shows that drinking pomegranate juice daily for one month improves blood vessel function in adolescents with metabolic syndrome. Muscle strength. Early research shows that taking pomegranate extract can improve muscle strength recovery after exercise. Obesity. Most research shows that taking pomegranate products doesn't help with weight loss. But many studies of these studies included people who were not overweight or obese. And some research does show benefit of certain pomegranate products. More research is needed to know if some products are better than others in people who are overweight or obese.

Thrush. Applying a gel containing pomegranate extract to the gums improves symptoms in people with thrush.

A serious gum infection (periodontitis). There is some evidence that painting the gums with pomegranate fruit peel extract in combination with gotu kola extract might improve gum disease.

Prostate cancer. Early research shows that drinking pomegranate juice or taking pomegranate extract for up to 2 years might slow the progression of prostate cancer. Other early research shows that taking a combination of pomegranate powder and other ingredients for 6 months can slows the rising of prostate-specific antigen (PSA) levels in men with prostate cancer. PSA levels are linked with prostate cancer growth, with faster increases indicating more growth.

Rheumatoid arthritis (RA). Early research shows that taking pomegranate extract twice daily for 12 weeks can improve symptoms of rheumatoid arthritis.

Sunburn. Early research shows that taking pomegranate extract by mouth does not prevent sunburn.

III. HEALTH BENEFITS OF POMEGRANATE JUICE



Medically reviewed by Natalie Butler, R.D., L.D. — Written by Mandy Ferreira on January 21, 2019

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IV. BENEFITS OF POMEGRANATE

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Fresh juice doesn't have to be green or full of spinach to be healthy. Pomegranate juice contains more than 100 phytochemicals. The pomegranate fruit has been used for thousands of years as medicine.

Today, pomegranate juice is being studied for its many health benefits. It may help with cancer prevention, immune support, and fertility. Here are some of the potential benefits of pomegranate.

A. Antioxidants

Pomegranates have been eaten throughout history for their health benefits. Nowadays, the juice of this fruit is a popular part of healthy diets. Pomegranate seeds get their vibrant red hue from polyphenols. These chemicals are powerful antioxidants.

Pomegranate juice contains higher levels of antioxidants than most other fruit juices. It also has three times more antioxidants than red wine and green tea. The antioxidants in pomegranate juice can help remove free radicals, protect cells from damage, and reduce inflammation.

B. Vitamin C

The juice of a single pomegranate has more than 40 percent of your daily requirement of vitamin C. Vitamin C can be broken down when pasteurized, so opt for homemade or fresh pomegranate juice to get the most of the nutrient.

C. Cancer Prevention

Pomegranate juice recently made a splash when researchers found that it may help stop the growth of prostate cancer cells. Despite multiple studies on the effects of the juice on prostate cancer, results are still preliminary.

While there haven't been long-term studies with humans that prove that pomegranate juice prevents cancer or reduces the risk, adding it to your diet certainly can't hurt. There have been encouraging results in studies so far, and bigger studies are now being doneTrusted Source.

D. Alzheimer's Disease Protection

The antioxidants in the juice and their high concentration are believed to stall the progress of Alzheimer disease and protect memory.

E. Digestion

Pomegranate juice can reduce inflammation in the gut and improve digestion. It may be beneficial for people with Crohn's disease, ulcerative colitis, and other inflammatory bowel diseases. While there are conflicting beliefs and research on whether pomegranate juice helps or worsens diarrhea, most doctors recommend avoiding it until you are feeling better and your symptoms have subsided.

F. Anti-inflammatory

Pomegranate juice is a powerful anti-inflammatory because of its high concentration of antioxidants. It can help reduce inflammation throughout the body and prevent oxidative stress and damage.

G. Arthritis

Flavonols in pomegranate juice may help block the inflammation that contributes to osteoarthritis and cartilage damage. The juice is currently being studiedTrusted Source for its potential effects on osteoporosis, rheumatoid arthritis, and other types of arthritis and joint inflammation.

H. Heart Disease

Pomegranate juice is in the running as the most heart-healthy juice. It appears to protect the heart and arteries.

Small studies Trusted Source have shown that the juice improves blood flow and keeps the arteries from becoming stiff and thick. It may also slow the growth of plaque and buildup of cholesterol in the arteries. But pomegranate may react negatively with blood pressure and cholesterol medications like statins. Be sure to talk with your doctor before indulging in the juice or taking a pomegranate extract supplement.

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I. Blood pressure

Drinking pomegranate juice daily may also help lower systolic blood pressure. A comprehensive review of randomized controlled trials stated that it would be beneficial for heart health to include pomegranate juice daily.

J. Antiviral

Between the vitamin C and other immune-boosting nutrients like vitamin E, pomegranate juice can prevent illne

Formulation Table

Sr.No	Ingredients	Quantity	Action
1	Pomegranate	50 ml.	Reduce Inflammation

K. Evaluation Parameters

Physical Evaluation

1. Colour	Pink (Pink Beautyful, Pink shade)	
2. Teste	Tangy,Sour & Sweet	
4. PH	4.83	

V. SIDE EFFECTS

When taken by mouth: Pomegranate juice is LIKELY SAFE for most people when taken by mouth. Most people do not experience side effects. Some people can have allergic reactions to pomegranate fruit. Pomegranate extract is POSSIBLY **SAFE** when taken by mouth or applied to the skin. Some people have experienced sensitivity to pomegranate extract. Symptoms of sensitivity include itching, swelling, runny nose, and difficulty breathing.

The root, stem, or peel of pomegranate is POSSIBLY UNSAFE when taken by mouth in large amounts. The root, stem, and peel contain poisons.

When applied to the skin: Pomegranate extract is POSSIBLY SAFE when applied to the skin. Some people have experienced sensitivity to pomegranate extract. Symptoms of sensitivity include itching, swelling, runny nose, and difficulty breathing.

Cholesterol Medication Interactions

A case report published in the September 1, 2006, issue of the American Journal of Cardiology suggests that pomegranate may interact with common medications.

A 48-year-old man was taking 10 mg of Zetia (ezetimibe) a day and 5 mg of Crestor (rosuvastatin) every other day for 17 months. Both medications are used for high cholesterol.

He began drinking pomegranate juice (200 ml twice weekly) and was admitted to emergency three weeks later with thigh pain and an elevated serum creatine kinase level. Both are symptoms of rhabdomyolysis, a serious condition that causes the breakdown of muscle fibers and may lead to kidney failure.

Rosuvastatin belongs to a group of medicines called HMG-CoA reductase inhibitors—better known as statins. Grapefruit juice is known to increase the risk of statin-induced myopathy, but up until now, there was little information about whether pomegranate juice might do the same.

A. Dosing

The following doses have been studied in scientific research:

ADULTS

By Mouth: For high blood pressure: 43-330 mL of pomegranate juice has been used daily for up to 18 months.

VI. CONCLUSION

After conducting an extensive amount of research and analysis of the pomegranate fruit, I have gained a much greater understanding of the pomegranate's role in Sandro Boticelli's *Madonna of the Pomegranate* as it portrayed the hope, sacrifice, and faith of Mary as the mother of the son of God. Along with this, I have also discovered the valuable symbolism deeply rooted within the seeds of this fruit.

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While there are many factors that draw people in to wanting to experience the pomegranate fruit, the most meaningful reason is the belief in the pomegranate's gift of life, health, and rebirth. As the concepts of life and death have remained an inevitable mystery to mankind, it is clear to see why pomegranates have been constantly sought out throughout the years.

They have been beautifully featured in various pieces of artwork, mysteriously portrayed in in biblical stories and greek mythology, and of course, simply enjoyed in everyday food consumption. The mutual passion for the pomegranate fruit has connected individuals and communities throughout history as well as across different cultures and religions.

The pomegranate has a true transformative power among us in which many consume the pomegranate for its benefits to health and fertility. It is important to remember that it is not just the pomegranate fruit that can have an affect on our bodies, but all foods in general. During our life spent here on Earth, we must make a conscious effort to love the land we live on and treat the animals and plants with respect. Remember you are what you eat, so please treat your bodies and environment with love. Whether it is by knowing where you buy your pomegranates from or by taking the time to appreciate the unique benefits from the pomegranate juices, you can really start to taste the difference. So now with this new knowledge, grab a pomegranate and eat, drink, and be merry :)

VII. RESULT

Evaluation Paramater	Result Obtained
Colour	Pink (Pinkbeautyful shade)
PH	4.83
Stability	Stable (Refrigerator)
Homogenecity	Good

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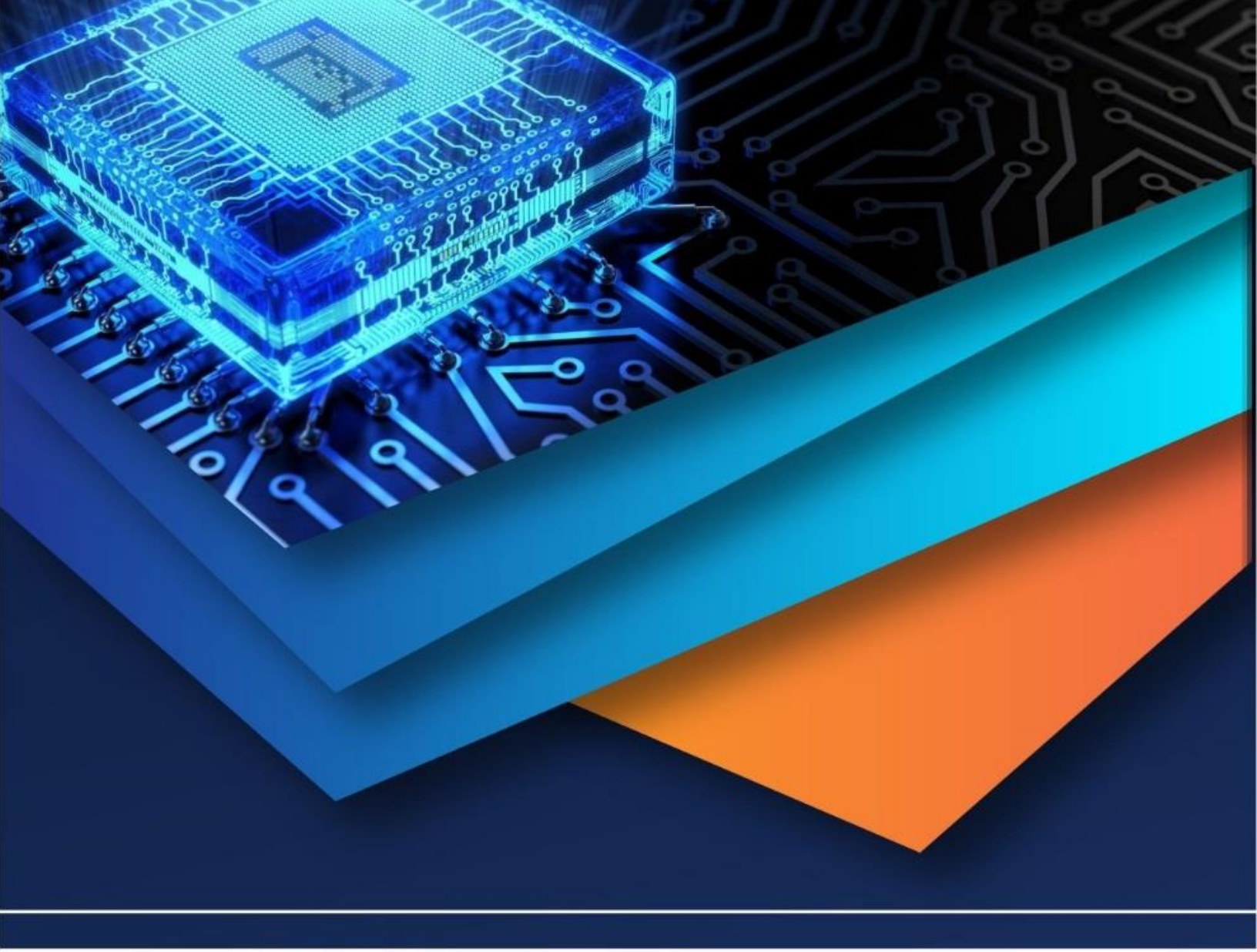
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