

Formulation & Evaluation of Anti-inflammatory & Analgesic Herbal Ointment of Punicagranatum Peel

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ABSTRACT

The present study was aimed to developed formulation on the anti-inflammatory, & Analgesic activity of Punicagranatum peels waste. Non-steroidal anti-inflammatory drugs (NSAIDs) are associated with too much side effects and adverse drug reactions. Constant used of NSAIDs produces gastrointestinal irritation and other side effects on body organs like liver and kidneys. Anti-inflammatory & Analgesic activity of Punicagranatum peel extract was previously reported on different experimental models. Generally pomegranate peels are waste material obtained from many pomegranate processing industries. These peels consists important polyphenols, flavonoids & β -sitosterol as an active chemical constituents which is useful in the inflammation. Inflammation is associate with pain, redness & swelling. Flavonoids shows antioxidant activity with indirect inhibition of inflammatory markers such as tumor necrosis factor alpha. Analgesic activity of punicagranatum peels is useful in the management of pain. Ointment formulation of punicagranatum peel shows a good result in all the evaluation test parameters such as General appearance, Consistency, pH, Spreadability, Extrudability, Diffusion study, Non irritancy test, & Stability study etc.

Keywords:- Punicagranatum, Herbal ointment, Anti-inflammatory, Analgesic, etc.

1. INTRODUCTION

In the last few years there has been rapid growth in the field of herbal medicines and these drugs gaining popularity both in developing and developed countries due to their natural origin and less side effects. There for the use of herbal medicines is essential to overcome the problems of adverse drug reactions. Punicagranatum commonly known as pomegranate, is a member of monogeneric family puniceae. punica granatum is a small tree which measures between five and eight meters tall and mainly found in Iran, the Himalayas, in northern India, china's and throughout the Mediterranean's regions. The juicy arils of fruit are eaten fresh, and the juice is the source of grenadine syrup, used in flavorings and liqueurs. pomegranate is high in dietary fiber, folic acid, vitamin c, and vitamin k. in western diets, meat and meat products are one of the main source are one of main sources of high-biological value proteins, in addition to containing micronutrients such as a minerals (iron, magnesium, potassium, selenium and sodium) and vitamins (a, b12, folic acid, amongs others) that are highly bio-available. Despite these excellent nutritional properties, the intake of meat and meat products is related with a higher incidence of cardiovascular diseases and obesity, increasing the negative perception attach to consumer of these food product in recent years. Pomegranate is a Latin word derived from ponus and granatus a seeded or granular apple is delicious fruit consumed worldwide. It was introduced into Spanish America in late 16th century and into California in 1769. The fruit is typically in season in northern hemisphere from October to February and in southern hemisphere from March to May. The genus punica consist at the present time of two species, the one under consideration and punicaprotopunica. The pomegranate is one of the oldest known edible fruits. Punicagranatum has been used long time as a therapeutics agent for the treatment of inflammatory diseases. The aqueous ethanolic extract of fruit rind, flower, and leaves of punicagranatum have shown anti-inflammatory, analgesic, antimicrobial, antioxidant properties and activity. The pomegranate peel consider as a waste material, this peel contain active chemical constituent such as tannins, flavonoid beta sitosterol responsible for anti-inflammatory. generally pomegranate peel are waste material obtain from many pomegranate processing industries. These peels consist important polyphenols, flavonoid, beta sitosterol, tannins as active chemical constituent which is usefully in inflammation and painkillers. Inflammation associate with pain redness and swellings. Analgesic activity of punicagranatum peels are useful in management of pain. it consist of so many therapeutic properties and activities. People are moat familiar's with acute inflammation. This is a redness, warmth, swelling, and pain around tissue and joints that occurs in response to an injured. The inflammation is prevented by regular exercise, eating

saladevery day, avoid hungry, spice things of, take a break from alcohol, etc. the analgesic drug used to prevent or reduce the pain. An ointment is a smooth substance that you put on sore of skin injury to help it to get better. They are easier applied as compared to the liquid dosage forms & gives rapid results.

2. DRUG PROFILE

2.1 Origin: The pomegranate is one of the world's most ancient's fruit has had a long and fascinating history. Although is probably originated in Persia, cultivation spread quickly throughout the Mediterranean and extended to Arabia, Afghanistan, India And China, where it is called as "Chinese apple", the alternate appellation.

2.2 Synonym: Punica Nana L, Punica Florida Salisb.

Table No -1: Synonyms

Sr.No	Language	Name
1	Hindi	Anar
2	Marathi	Dalimba
3	Sanskrit	Dadimah
4	English	Pomegranate

2.3 Biological Source: Dried peels of punicagranatum.

2.4 Geographical Source: Pomegranate are widely cultivated throughout the middle east and Caucasus region, north and tropical Africa, Iran, Indian subcontinent central Asia, the dried part of south east Asia, and the mediterranean basin.

2.5 Family: Lythraceae / Punicaceae.

2.6 Sub Family: Punicoideae.

2.7 Kingdom: Plantae.

2.8 Genus: Punica.

2.9 Order: Myrtales.

2.10 Part Used: Fruit, seed, peel.



Fig No -1: Punicagranatum Fruit

2.11. History Pomegranate has a long and exceptionally colorful history, having been embraced by a number of different cultures, while at the same time it had been a major horticulture fruits in different countries. The pomegranate is one of the world's most ancient fruit has a very long and fascinating history. "Eat a pomegranate and visit a bath your youth will hast back"- said by an ancient Egyptian proverb. The word pomegranate is derived from the Medieval Latin "pomumgranatum" it means apple of many grains or seeds. Because of its exotic appearance prolific seed cluster, the pomegranate has long been imbued which rich with symbolic meaning indeed the association that envelope this crimson fruit are almost as abundant as the seedsthemselfes. The pomegranate was highly esteemed by the wondering Israelites, who express there longing to return to the promise land "wherein fig trees and pomegranates, and olive yards grow". The ancients Greeks believes that the pomegranates tree sprang from the blood of Dionysus, the god of wine. The fruit was also associated with Persephone who, as result of eating it, was forced by Pluto to return under world for a 3rd ofeach year.⁸

3. PHARMACOLOGICAL PROPERTIES

Anti-inflammatory

Analgesic property

Anticancer property



Antioxidant property

Antimicrobial property

3.1 USES

High blood pressure

Athletic performance

Heart disease

Diabetes

Digestion

Alzheimer

3.2 Where Inflammation Occurs

There are mainly two types of inflammation such as

3.2.1 Acute Inflammation

1. Tonsillitis
2. Joint pain
3. Bowel inflammation
4. Headaches
5. Body pain

3.2.2 Chronic Inflammation:

1. Arthritis
2. Atherosclerosis
3. Bowel disease
4. Joint disease
5. Skin disease
6. Cardiovascular disease
7. Neurological disease
8. Cancer.



3.3 Symptoms

1. Pain
2. Heat
3. Swelling
4. Redness
5. Loss of functions
6. Fever
7. Muscle stiffness.

4. COLLECTION & CULTIVATION

The freshly fruit was collected from Alephata marketyard. P.granatum is grown for its fruitcrop and as ornamental tree and shrubs in parks and gardens.

Soil: Well Driend ordinary soil.

Climate: Temperature below 12F

Irrigation: Saline water and soil conditions

Fertilization: Generally Nitrogen and ammonium sulphate and others compost.

Propagation

Pests and disease.¹²

4.1 Chemical Constituents Pomegranate consists of a rich variety of flavonoids (0.2% to 1.0%) of the fruit. Approximately 30% of anthocyanins found in pomegranate are contained within the peels. The isoflavones genistein, diadzein, genistin, and diadzin as well as estrone, the metabolic derivative of estradiol, have been isolated from the seeds. The stem and root of pomegranate contain an alkaloid including isopelletierine, pseudopelletierine and n-methylisopelletierine, anthocyanins, pelargonidine, ellagotannin, gallic acid and ellagic acid.

4.2 Various Varieties of Punicagranatum

Mrudula

Arakata

Ganesh

Jyoti

Muskat

Purple

Heart

Red Silk

5. MATERIALS AND METHODS

Fresh fruit of punicagranatum was collected from local market yard Alephata, Maharashtra and transferred to laboratory.

- 1) The fruits were washed with tap water, rinsed well and dried at room temperature for about 10 min in open air.
- 2) The peel from the fruit was removed carefully by knife and sundried.
- 3) The dried material was properly ground into powder.
- 4) This powder material was separated according to the particle size with the help of sieves no#44, #60, #80.
- 5) To obtain different batches for further reformulation study.⁽¹⁾

Table No -2: Material

Sr.No	Biological Name	Synonym	Family
1	Punicagranatum	Punica Nana L Dalimba	Lythraceae
2	Clove Oil	Caryophyllum bud Flower	Clove Myrtaceae

5.1 Excipients

Cholesterol, petroleum jelly, cetyl alcohol, white soft paraffin, etc.

5.2 Preparation of Ointment Base

By using fusion method

- 1) Weigh an accurate gm of all excipients such as cholesterol (1 gm), petroleum jelly (1 gm), cetyl alcohol (1 gm), white soft paraffin (17 gm).
- 2) For small scale: porcelain dish is placed on water bath.
- 3) For large scale: carried out in large steam jacket.

5.3 Procedure

- A) The ingredients and base are melted & properly mixed to obtain uniform products.

B) Initially the ingredients of highest melting point is melted then remaining are added in decreasing orders of melting points.

C) Mixture is removed from water bath and stir to cool it.

5.4 Preparation of Ointment

- 1) All ingredients was mixed and heated gently with stirring then cooled.
- 2) The extract of punicagaranatum peel was added in respectively in 40 gm of base.
- 3) Then clove oil is added as a penetration enhancer in 40 gm of base.
- 4) Mixed it properly by using ointment slab.
- 5) Transfer it into a suitable container.

6. EXTRACTION METHOD

6.1 Maceration Method

1. In this process solid ingredients are placed in a stoppered container with the whole of the solvent and allowed to stand for a periods of at least 3 days with frequent agitation, until soluble matter is dissolved.
2. The mixture is then strained the more pressed and combined liquid clarified or by decantation after standing.
3. Weigh about 20 gm of crude powder then add 100 ml ethanol kept for 4 hours with continuous shaking on magnetic stirrer then filter it.
4. For preparation of filtrate 1 add residue then add 25 ml ethanol kept for four hours with continuous shaking.
5. For preparation of filtrate 2 add residue add 25 ml ethanol kept for overnight.
6. For preparation of filtrate 3 add residue 25 ml ethanol kept for a night.
7. For preparation of filtrate 4 add residue 25 ml ethanol and pool all filtrates and kept for evaporation then the extract was obtained.

6.2 Soxhlet Apparatus Method

- 1) This is continuous process of extraction with a hot organic solvent.
- 2) Take a powder (crude drug) is taken in the thimble which is place in soxhlet extractor.
- 3) The extractor, which has siphoning system is fitted on top on round bottom flask.
- 4) A condenser, is fitted at the of extractor.
- 5) Enough quantity of the extracting solvent is poured into the flask place on a heating metal.
- 6) On heating the solvent evaporate, rise to the condenser, where it condenses and drains back to the extractor holding the thimble with the crude drug material.
- 7) When the extractor become full with hot solvent. The solvent siphons down to the flask along with extracted constituents.
- 8) The recycling of the evaporated solvent is allow to continue until the extraction is complete.

7. CONCLUSION

The puniceagranatum peel powder were used to formulate anti-inflammatory and analgesic herbal ointment & evaluated for physical parameters. Preformulation study & physical parameter exposed that all the values were acceptable limit. The herbal ointment useful for an anti-inflammatory and analgesic activity. The puniceagranatum was useful in various body part. It having various pharmacological activities which are useful in our life. From the above evaluation parameter it can be conclude that overall batches the f3 batch shows all parameter in acceptable limit. Therefore it consider as good formulation.

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