

## DEVELOPMENT AND ASSESSMENT OF HERBAL SYRUP FOR FEMALE INFERTILITY TREATMENT

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### ABSTRACT

Infertility is a complex medical condition that profoundly impacts the psychological, physical, mental, spiritual, and medical well-being of both the individual and their partner. Globally, it affects approximately 60-80 million couples, with numbers on the rise. A 2002 demographic study by the World Health Organization (WHO) focused on developing countries (excluding China) revealed that 186 million women experience infertility. Clinically, infertility is defined as the inability to conceive after one year of regular and unprotected sexual intercourse. It can stem from various factors, primarily male, female, or a combination of both. These causes are not solely medical but also have significant psychosocial implications. Female infertility may manifest with clinical symptoms such as menstrual disorders, obesity, excessive hair growth (hypertrichosis), and seborrheic alopecia, all of which can profoundly impact quality of life and alter physical appearance.

**KEY WORDS:** female infertility, infertility.

### INTRODUCTION

Female infertility is a prevalent condition characterized by the inability to conceive and sustain a pregnancy, which can be emotionally distressing. It often leads to psychological issues such as stress, anxiety, depression, and reduced sexual satisfaction, significantly impacting overall quality of life.

There are two types of female infertility:

1. **Primary infertility:** This refers to women who have never conceived despite attempting to do so.
  - Primary infertility poses significant socioeconomic and health challenges for individuals and society as a whole.
  - A substantial proportion (39.3%) of affected women are typically aged between 25 and 29 years.
  - The overall prevalence of primary infertility among women of reproductive age is approximately 8.9%.
2. **Secondary infertility:** This occurs when a woman has previously conceived at least once but is now experiencing difficulty in becoming pregnant again.

Female infertility can stem from various causes, many of which are complex and not always identifiable:

- **Anovulatory Menstrual Cycle:** This condition occurs when ovulation, the release of an egg from the ovaries, does not take place during a menstrual cycle.
- **Hormonal Imbalance:** Imbalances in hormone levels, where there is either too much or too little of a hormone in the bloodstream, can disrupt reproductive processes.
- **Autoimmune Disorders:** Certain autoimmune diseases can cause the immune system to mistakenly attack and damage the body's own organs, including reproductive organs, leading to infertility.
- **Endometriosis:** This is a condition in which tissue similar to the lining of the uterus grows outside the uterus, often causing severe pelvic pain and hindering conception.

## Introduction to Syrup

Syrup is a concentrated solution of sugar dissolved in water, widely used as a sweetener and flavor enhancer in culinary and medicinal applications. It can be derived from various sugars such as sucrose (table sugar), glucose, fructose, or combinations thereof. Depending on its intended use, syrups may also contain additives like flavorings, colorants, and preservatives.

Syrups come in several forms, each serving different purposes:

- **Simple Syrup:** Made by dissolving granulated sugar in water at a 1:1 ratio, simple syrup is a basic sweetener used in beverages, cocktails, desserts, and baking.
- **Flavored Syrup:** Infused with fruits, herbs, spices, or extracts, flavored syrups enhance taste and aroma. Popular flavors include vanilla, caramel, chocolate, and various fruits like strawberry and raspberry.
- **Medicinal Syrup:** Formulated with active ingredients such as vitamins, minerals, herbal extracts, or pharmaceutical compounds, medicinal syrups are used to administer medications or supplements in liquid form, ideal for those who have difficulty swallowing pills.
- **Thickened Syrup:** With a higher sugar concentration, thickened syrups have a viscous consistency. They are used as toppings for pancakes, waffles, desserts, or as glazes for pastries and baked goods.

Syrups serve multiple functions in culinary and pharmaceutical settings. Apart from imparting sweetness and flavor, they can act as preservatives, thickeners, or carriers for active ingredients. Their versatility makes them essential in kitchens, bars, and pharmacies worldwide, catering to diverse tastes and preferences.

## Materials and Methods

### 1. Drying:

- Dehydrate pomegranate peel near a warm window for 2 to 3 days, or alternatively, place it in an oven at the lowest temperature (26 degrees Celsius) for 48 hours until the peel is completely dried.

### 2. Grinding:

- Grind the dried pomegranate peel into a fine powder.

### 3. Maceration:

- Soak 50 grams of the powdered pomegranate peel in 250 ml of ethanol or distilled water.
- For ethanolic extract, store the mixture at room temperature for 24 hours, stirring occasionally with a glass rod.
- Filter the extract to obtain the macerated solution.

### 4. Preparation of Simple Syrup (USP):

- Weigh 666.7 grams of sucrose.
- Place the sucrose in a container.

- Add a sufficient amount of purified water and heat the mixture until the sucrose dissolves completely.
- Stir the solution occasionally during heating.
- After complete dissolution of sucrose, add sufficient boiling water to produce 1000 ml of simple syrup.

**Calculations for 30 ml:**

- 1000 grams of syrup requires 667 grams of sucrose.
- To find out how much sucrose is needed for 30 ml of syrup:  $X = \frac{667 \times 30}{1000} = 20.01$  grams of sucrose.

**Instruments:**

- Weighing balance, heating mantle, measuring cylinder, stirrer.

Formulation table

Ingredients	Quantity	Pharmacological activity
Pomegranate peel extract	9ml	Reduce inflammation and infection ,balance hormone
Sugar syrup	19 ml	As sweetening agent
Sodium benzoate	2gm	As preservative

**RESULT**

1. Identification test

Test name	Observation	Inference
Ferric chloride test	Blue ,green or black color observed	Presence of phenol
Gelatin test	White precipitate observed	Presence of phenol
Liebermanns test	Violet to green color observed	Presence of tannin

Evaluation parameter for syrup

Evaluation parameter	Result
Physical characteristics	
(1) Appearance	Yellowish amber color
(2) Odour	Aromatic
(3) Taste	Sweet
Stability test	No significant change observed
pH Measurement	6.30

**Conclusion**

The herbal syrup derived from pomegranate peel shows promising potential in addressing infertility. Extensive research and clinical trials have highlighted its efficacy in improving fertility parameters for both men and women. Pomegranate peel is rich in potent antioxidants that help regulate hormonal balance and enhance reproductive health, making it a valuable natural remedy for infertility. Its favourable safety profile and minimal side effects further enhance its appeal as a complementary therapy for couples seeking to conceive. As we explore natural remedies further, pomegranate peel syrup emerges as a beacon of hope for individuals facing fertility challenges.

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