



Herbal PCOS Tablets: “Exploring Natural Remedies for Hormonal Balance”

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ABSTRACT:

Millions of women worldwide suffer from the complex endocrine condition known as polycystic ovarian syndrome, or PCOS. Medication and lifestyle changes are common components of traditional therapies. But because they are thought to have fewer negative effects and more natural advantages, interest in herbal medicines has increased. The effectiveness and safety of herbal PCOS tablets are investigated in this abstract, with an emphasis on how well they may be able to treat symptoms including insulin resistance, irregular periods, and hormonal imbalances. Fenugreek, cinnamon, licorice, and saw palmetto are important herbs that are frequently employed in these tablets; they are all thought to have anti-inflammatory and hormone regulating qualities. Herbal PCOS tablets have been shown in studies to lower testosterone levels, increase insulin sensitivity, and improve menstrual regularity. Moreover, the growing inclination for natural and integrative treatment is consistent with their holistic approach. To determine their long-term effectiveness, safety profile, and recommended dosage, more investigation is necessary. Herbal PCOS tablets are a viable option for women looking for natural remedies to manage their PCOS symptoms; nevertheless, in order to confirm their efficacy and guarantee patient safety, extensive clinical research are required.

KEYWORDS:

Herbal medicine ; Infertility; PCOS; Hormonal imbalance ; Natural extract.

INTRODUCTION:

Using medicinal plants to prevent and treat illnesses is known as herbal medicine. It can take many forms, from the usage of standardized and triturated herbal extracts to traditional and widely used remedies from around the world. In traditional medicine, the presence of enduring and widely used cultural roots may indicate the safety of a treatment, but not its efficacy. This is particularly true for herbal medicine, where the tradition largely relies on remedies that contain active ingredients at extremely low or ultra low concentrations, or that rely on magical-energetic principles. Male sex hormones called androgens, which are typically present in modest amounts in women, are reproduced abnormally by the ovaries in patients with polycystic ovarian syndrome

(PCOS). The numerous little cysts (fluid-filled sacs) that develop in the ovaries are referred to as polycystic ovarian syndrome. On the other hand, some women without the disease develop cysts, while some women with the disorder do not. When a developed egg is released from an ovary, ovulation takes place. This takes place in order for a male sperm to fertilize it. During your menstruation, the egg is expelled from the body if it is not fertilized. In a few cases, a lady doesn't make sufficient of the hormones required to ovulate. When ovulation doesn't happen, the ovaries can create numerous little sores. These sores make hormones called androgens. Ladies with PCOS regularly have tall levels of androgens. This could cause more issues with a woman's menstrual cycle. And it can cause numerous of the side effects of PCOS. Treatment for PCOS is frequently done with medicine. This can't remedy PCOS, but it makes a difference diminish side effects and avoid some wellbeing issues.

MATERIALS AND METHODS:

- **Ashwagandha (*Withania somnifera*)**, moreover known as Indian ginseng or winter cherry, may be a venerated herb in conventional Ayurvedic medication for its adaptogenic and reviving properties. Local to India, the Center East, and parts of Africa, ashwagandha has been utilized for centuries to advance essentialness, upgrade versatility to push, and back by and large wellbeing and well-being. In later a long time, logical investigate has progressively approved its conventional employments, shedding light on its assorted pharmacological impacts and restorative potential.

Botanical Profile:

Ashwagandha belongs to the Solanaceae family and could be a little bush with oval clearouts and yellow blooms. The roots of the plant are the essential restorative portion, containing bioactive compounds such as withanolides, alkaloids, steroidal lactones, and saponins. These phytochemicals contribute to ashwagandha's pharmacological activities, counting anti-inflammatory, antioxidant, immunomodulatory, and neuroprotective impacts.

- **Manjistha (*Rubia cordifolia*)**, too known as Indian madder or rubia, could be a venerated herb in conventional Ayurvedic and Chinese pharmaceutical for its wide range of restorative properties and helpful applications. With a dynamic ruddy root and a long history of utilize in different social hones, manjistha has been esteemed for its detoxifying, anti-inflammatory, and restoring effects on the body. This monograph points to supply a comprehensive outline of manjistha, counting its botanical characteristics, helpful employments, and rising clinical prove.

Botanical Profile:

Manjistha has a place to the Rubiaceae family and could be a climbing perpetual plant with woody stems, heart-shaped takes off, and little greenish-yellow blooms. Local to India, Southeast Asia, and China, manjistha's essential therapeutic portion is its root, which contains bioactive compounds such as anthraquinones, tannins, flavonoids, and triterpenoids. These phytochemicals contribute to manjistha's different pharmacological activities, counting antioxidant, anti-inflammatory, antimicrobial, and hepatoprotective properties.

- **Shatavari (*Asparagus racemosus*)** could be a venerated herb in Ayurvedic pharmaceutical known for its multifaceted restorative properties and authentic utilize in advancing women's wellbeing and ripeness. Too alluded to as the "Ruler of Herbs," shatavari has been cherished for centuries for its restoring, feeding, and adjusting impacts on the female regenerative framework. With a wealthy convention crossing centuries, shatavari proceeds to earn consideration in advanced home grown pharmaceutical for its restorative potential and clinical applications.

Botanical Profile:

Shatavari belongs to the Asparagaceae family and could be a climbing, woody lasting plant with padded foliage and little, fragrant white blossoms. Local to India and parts of Asia, the roots of shatavari are the essential restorative portion, containing bioactive compounds such as saponins, alkaloids, flavonoids, and steroidal glycosides. These phytochemicals contribute to shatavari's differing pharmacological activities, counting adaptogenic, immunomodulatory, antioxidant, and estrogenic impacts.

- **Gokhru (*Tributer terrestris*)**, moreover known as cut vine or bindii, may be a famous herb in conventional Ayurvedic and Chinese pharmaceutical prized for its assorted restorative properties and restorative applications. With a long history of utilize in differentsocial conventions, gokhru has been regarded for its reviving, sexual enhancer, and diureticeffects on the body. This monograph points to supply a comprehensive diagram of gokhru, counting its botanical characteristics, helpful employments, and developing clinical experiences.

Botanical Profile:

Gokhru has a place to the Zygophyllaceae family and could be a low-growing yearly plantwith trailing stems, little yellow blossoms, and spiked natural products. Local to warm calmand tropical districts around the world, gokhru's essential therapeutic parts are its natural products and roots, which contain bioactive compounds such as saponins, flavonoids, alkaloids, and steroidal compounds. These phytochemicals contribute to gokhru's different pharmacological activities, counting diuretic, anti-inflammatory, and immunomodulatory properties

- **Licorice (*Glycyrrhiza glabra*)** could be a venerated herb in conventional medication frameworks over the globe, prized for its sweet flavor and differing restorative properties. With a wealthy history crossing thousands of a long time, licorice has been regarded for its part in advancing respiratory wellbeing, alleviating stomach related inconvenience, and supporting by and large well-being. This monograph points to supply a comprehensive diagram of licorice, counting its botanical characteristics, helpful employments, anddeveloping clinical experiences.

Botanical profile:

Licorice has a place to the Fabaceae family and may be a perpetual herbaceous plant withunmistakable pinnate takes off and clusters of purple to blue blossoms. Local to Europe and Asia, licorice's essential restorative portion is its root, which contains bioactivecompounds such as glycyrrhizin, flavonoids, coumarins, and saponins. These phytochemicals contribute to licorice's differing pharmacological activities, counting anti-inflammatory, expectorant, demulcent, and hepatoprotective properties.



Table 1: Ingredients of tablet and their role

Sr.no	Ingredient	Part used	Role
1	Withania sonifera	Root extract powder	Improve insulin sensitivity
2	Rubia Cordifolia	Root extract powder	Assist in hormonal balance,promotes smooth blood flow during periods
3	Asparagus racemous	Root extract powder	Reduces hyperglycemia and hyper androgenism
4	Tributer terrestris	Root extract powder	Used to treat urinary disorders
5	Glycerrhiza galabra	Root extract	Anti androgen activity
6	Lactose	powder	Diluent
7	Gum acacia	Powder	Binder
8	Magnesium stearate	powder	Lubricant
9	Starch	Powder	Disintegrant

FORMULA OF TABLET:

Table no.2 formula of 500mg tablet (1 tablet).

Sr.no	Ingredient	F1	F2	F3
1	Withania sonifera	100mg	90mg	80mg
2	Rubia Cordifolia	100mg	90mg	80mg
3	Asparagus racemous	60mg	75mg	80mg
4	Tributer terrestris	60mg	70mg	60mg
5	Glycerrhiza galabra	50mg	50mg	60mg
6	Lactose	80mg	75mg	95mg
7	Gum acacia	15mg	20mg	20mg
8	Magnesium stearate	-	5mg	5mg
9	Starch	30mg	20mg	15mg
10	Talc	5mg	5mg	5mg



Fig 1 : Herbal extract powder



Fig 2 :Herbal PCOS Tablet

Research Through Innovation

PREFORMULATION STUDIES :**1) Bulk density :**

Bulk density was carried out in 100 ml dried measuring cylinder. Pouring of dried granules in measuring cylinder and calculated by using the following formula;

$$\text{Bulk density} = \text{Mass of the granules} / \text{Bulk volume of the granules}$$

2) Tapped density :

Tapped density was carried out by pouring of dried granules in 100ml measuring cylinder. 100 tapping was done, note down the volume and calculate by using the following formula;

$$\text{Tapped density} = \text{Granules weight} / \text{Volume of tapped granules}$$

3) Hausner's ratio :

Hausner's ratio is the ratio of the tapped density of granules to the bulk density of granules. Calculated by using the following formula.

$$\text{Hausner's ratio} = \text{Tapped density} / \text{Bulk density}$$

4) Carr's index :

Carr's index or compressibility index is determined by the following formula.

$$\text{Carr's index} = \frac{\text{Bulk density} - \text{Tapped density}}{\text{Tapped density}} \times 100$$

(%)

5) Angle of repose

Angle of repose was determined by using the funnel method. Following formula was used to calculate the angle of repose.

$$\Theta = \text{Tan}^{-1}[h/r]$$

Where ,

h = height of granule cone formed.

r = radius of the granule cone formed.

Flowability chart:

Table 3: Scale of flowability

Sr. No	Flow character	Hausner's ratio	Carr's index (%)	Angle of repose (%)
1	Excellent	1.00-1.11	≤10	25-30
2	Good	1.12-1.18	11-15	31-35
3	Fair	1.19-1.25	16-20	36-40
4	Passable	1.26-1.34	21-25	41-45
5	Poor	1.35-1.45	26-31	46-55
6	Very poor	1.46-1.59	32-37	56-65
7	Very very poor	>1.60	>38	>66

Procedure:

1. All the requires powdered mixtures were precisely wighted, and were pass through seive no.80and blended for 5 min.
2. Add suitable excipients like, lactose, starch, talc, magnesium stearate, etc. to the herbal powdered extracts.
3. Then the powder was subjected to preformulation studies for evaluation. Evaluation parameters include tapped density, bulk density, Hausner's ratio, angle of repose, carr's index.
4. Later on the tablets was prepared by using single punch tablet compression machine.

Three batches of tablet (F1, F2, F3) was done with an average weight 500 mg, and post evaluation parameters was performed for the formulation i.e. Weight variation test, thickness of tablet, friability test, disintegration test, pH test.

EVALUATION OF HERBAL PCOS TABLETS:**a. TABLET DESCRIPTION:**

General appearance of tablet involves the measurement of a number of attributes such as a tablet's size, shape, color, presence or an odor, taste, surface texture, physical flaws and consistency and legibility of any identify markings.

b. TABLET DIMENSIONS:

Thickness and were measured using a calibrated vernier caliper. Three tablets of each formulation were taken randomly and thickness was measured individually.

c. HARDNESS:

Hardness indicates the ability of a tablet to withstand mechanical shocks while handling. The hardness of the tablets was determined using Monsanto hardness tester. It is expressed in kg/cm². Three tablets were randomly picked and hardness of the tablets was determined.

d. FRIABILITY TEST:

The friability of tablets was determined using Roche friabilator. It is expressed in percentage (%). Twenty tablets were initially weighed (w₀ initial) and transferred into friabilator. The friabilator was operated at 25rpm for 4 minutes or run up to 100 revolutions⁹⁰. The tablets were weighed again (w). The % friability was then calculated by Percentage of Friability = 100 (1-w/w₀) Percentage friability of tablets less than 1% is considered acceptable.

e. WEIGHT VARIATION TEST:

Twenty tablets were selected at random and the average weight was determined⁹¹. Not more than two of the individual weights deviate from the average weight by more than the percentage deviation shown in table and none deviates by more than twice the percentage. USP official limits of percentage deviation of tablet are presented in the below table.

Table no. 4: Weight variation tolerances for uncoated tablets

Sr.no	Average weight of tablet (mg)	Maximum % difference allowed
1	130 or less	10
2	130-324	7.5
3	325 or more	5

Maximum positive deviation = $(WH - A / A) \times 100$

% Minimum negative deviation = $(A - WL / A) \times 100$ Where, WH = Highest weight in mg. WL = Lowest weight in mg. A = Average weight of tablet in mg.

DISINTEGRATION TIME

This test determines whether dosage forms such as tablets, capsules, boluses pessaries and suppositories disintegrate within a prescribed time when placed in a liquid medium under the prescribed experimental conditions. The apparatus consists of a basket-rack assembly, a 1-litre beaker, a thermostatic arrangement for heating the fluid and a mechanical device for raising and lowering the basket in the immersion fluid at a constant frequency rate.

IN VITRO DISSOLUTION STUDIES:

The dissolution medium, 900 ml of 0.1N HCl kept at $37.0 \pm 0.5^\circ\text{C}$, was used. At 5, 10, 15, 30, 45, and 60 minutes in each experiment, 5 ml of the dissolution sample was removed and replaced with a volume of the same size to maintain the sink condition. Samples were analysed using a Shimadzu UV-visible spectrophotometer at 273 nm. From a calibration curve created using *Shatavari* standard samples, the concentration at each sample was calculated. It was calculated the % dissolution.

RESULT AND DISCUSSION

Table no. 5: Pre-formulation parameters for herbal tablet

Sr.no	Pre-formulation parameters	F1	F2	F3
1	Bulk density	0.267g/cm ³	0.29g/cm ³	0.18g/cm ³
2	Tapped density	0.325g/cm ³	0.33g/cm ³	0.23g/cm ³
3	Carr's index	17.84%	12.12%	21.73%
4	Hausner's ratio	1.21	1.27	1.14
5	Angle of repose	27.29	25.74	26.22

Table no.6: physical parameters for herbal tablet.

Sr. no	Parameter	F1	F2	F3
1	Weight variation test	497±5%	506±5%	502.5±5%
2	Hardness (kg/cm ²)	3.13	3.3	3.15
3	Thickness (mm)	6.06	6.14	6.08
4	Friability test (%)	1.23	1.15	0.83
5	Disintegration test (min)	10	12	16

In vitro dissolution studies .

Table no. 7 Invitro dissolution studies

Ingredients	Percent drug release in different time interval						
	0	10	20	30	40	50	60
Withania somnifera	0	2	9	15	34	52	76
Rubia cordifolia	0	6	10	27	38	53	67
Asparagus racemosus	0	3	17	30	47	59	86
Tributer terrestris	0	7	12	37	49	52	83

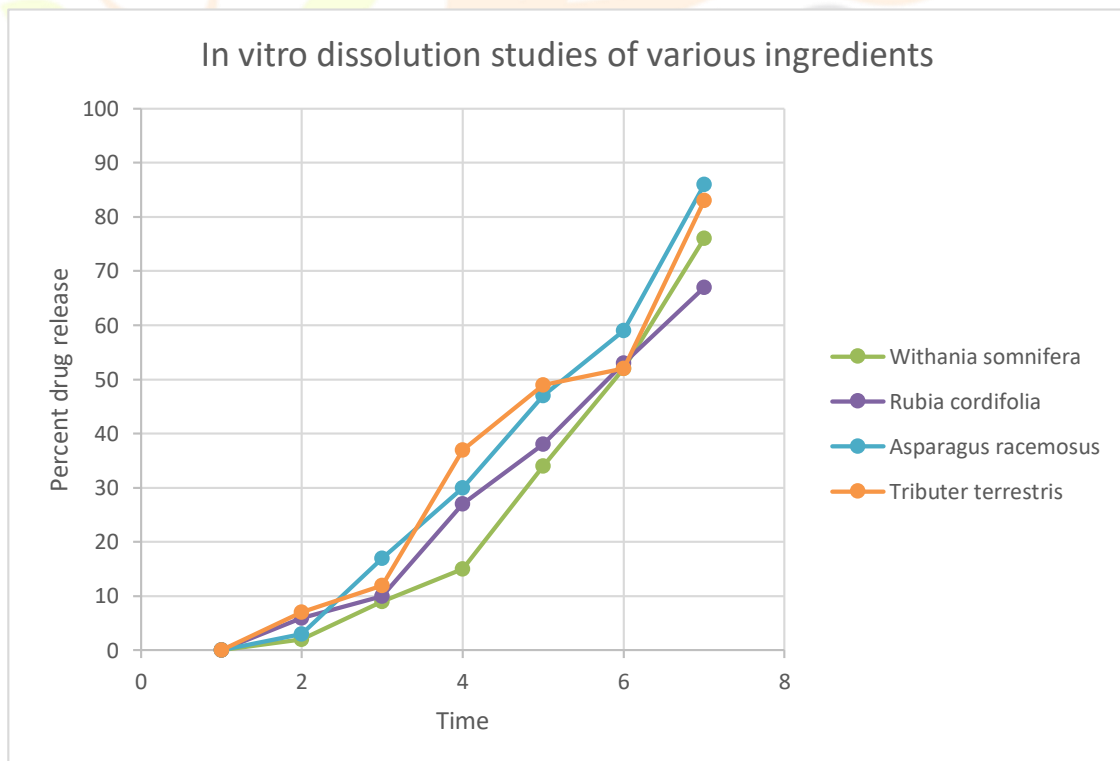


Fig no. 3 Graph for dissolution studies

Conclusion:

The herbal PCOS tablet presents a promising avenue for managing PCOS symptoms, potentially offering benefits such as hormone regulation and menstrual cycle normalization. However, it's crucial to approach its use with caution and under the guidance of a healthcare professional. Further research is needed to fully understand its efficacy, safety, and long-term effects in the context of PCOS management. In this formulation various herbs like withania somnifera (ashwagandha), rubiacordifolia (manjista), asparagus racemosus (shatavari), tributer terrestris (gokhru), glycerrhiza glabra (licorice) are used. The tablets was prepared by direct compression method by adding various excipients, and making three batches like F1, F2, F3. For these batches separate preformulation studies was performed. F3 batch gives satisfactory results like friability and disintegration time. Thus F3 is optimised formula for herbal PCOS tablet. Based on the results it is concluded that the formulation and evaluation are good. The pharmacological evaluation is required for the treatment of PCOS.

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