ABSTRACT

Background: Utility of food as a health promoting factor beyond its nutritional value is gaining acceptance within the public arena and among scientific community. Nutraceutical is a dietary substance which has physiological benefit or provides protection against a disease. These are a combination of one or more nutritional supplements like Vitamins, Minerals etc. which are administered as an adjuvant therapy to improve disease conditions.

Objective: The objectives of such literature review were to attempt to critically review, the synergetic effect of combining herbs like Shatavari (Asparagus racemosus Wild) and Vata (Ficus benghalensis L.) with nutraceutical formulations indicated in female infertility.

Methodology: The present work is primarily based on theoretical research using related research articles, standard textbooks of epidemiology and classical treatises of Ayurveda.

Discussion: In the present scenario, cases of female infertility have increased due to various nutritional, pathological and environmental changes. Medical practitioners correct the nutritional errors in such patients by administering nutraceuticals mainly containing DHEA, antioxidants and micronutrients, thus enhancing fertility. Ayurvedic herbs like Shatavari (Asparagus racemosus Wild) and Vata (Ficus benghalensis L.) exhibit extravagant fertility-enhancing properties in females. Thus, combining these herbs with nutraceuticals would bring exemplary results in infertile and sub-fertile females. These herbs not only possess medicinal properties, but also have nutritional values. Therefore, the synergetic effect of combining herbs like Shatavari (Asparagus racemosus Wild) and Vata (Ficus benghalensis L.) with nutraceutical formulations indicated in female infertility would be tremendous.

Conclusion: This can further increase the scope and utility of, ‘Nutraherbs’ in medical practice.

Keywords: Adjuvant therapy, Nutraherbs, Female infertility, Asparagus racemosus Wild, Ficus benghalensis L.

INTRODUCTION: Nutraceuticals are dietary supplements administered not only for their nutritional value but also for their therapeutic benefits like delaying the aging process, increasing life expectancy and supporting the structures and the functions of the body. Role of nutraceuticals as an adjuvant therapy in diseases is widely accepted in the medical fraternity. Various factors like diet and lifestyle changes, infections, etc. have increased the incidence of female infertility. In Ayurvedic texts similar concept is described as Vandhyatva. Herbs like Shatavari (Asparagus racemosus Wild) and Vata (Ficus benghalensis L.) are said to be Vandhyatvanasha (anti-infertility) and Vrushya (fertility-enhancing) in the Ayurvedic texts. Combining these herbs with nutraceuticals indicated in female infertility would be tremendous.
infertility would bring extraordinary results in such patients. Hence, the synergetic effect of Shatavari and Vata with nutraceuticals can be studied and the efficacy of these herbs over nutraceuticals as an alternative therapy can further be verified. For the same, this review would prove beneficial.

**OBJECTIVE**

The idea of such a theoretical research stemmed out with this literature review, and the specific objectives of this review were to:

- summarize the current understanding of Female infertility.
- Critically review the synergetic effect of combining herbs like Shatavari (*Asparagus racemosus* Wild) and Vata (*Ficus benghalensis* L.) in female infertility.

**MATERIALS & METHOD**

An initial phase of study was made to review related scholarly articles related to the above said subject by using systematic internet-based search engines. The present work is primarily based on theoretical research. Classical treatises of Ayurveda including Samhitas and Nighantus have been referred for the study. The gathered information has been studied and presented as a review.

**REVIEW:**

**i. Factors Affecting Fertility in Females:**

- a. Infections and various pathologies occurring in the reproductive system like Polycystic Ovarian Syndrome, Endometriosis, etc.
- b. Deterioration of Oocyte quality.
- c. Irregular or disturbed menstrual cycle (Dysmenorrhea, Menorrhagia, Pre-Menstrual Syndrome etc.).
- d. Hormonal imbalance –

**ii. Luteal Phase Defect (LPD)** – Inadequate progesterone production from corpus luteum results in infertility. Endogenous progesterone not sufficient to maintain a functional secretory endometrium and to allow normal embryo implantation and growth.

- b. Factors like age, stress, anxiety, alcohol consumption, smoking, etc. [3]

![Figure 1: showing flowchart of pathophysiology of Infertility](image-url)
1) Assisted Reproductive Techniques used in cases of Infertility:
a. IUI (Intrauterine Insemination).
b. IVF (In Vitro Fertilisation).
c. ICSI (Intracytoplasmic Sperm Injection).

2) Role of Nutrition in Infertility:
In sub-fertile population, poor nutrition detrimentally affects the success rate of fertility treatments and that of the above mentioned assisted reproductive techniques. Hence, periconceptional care should comprise personalised medical and tailored nutritional interventions to enhance fertility. Here comes the role of nutraceuticals in the treatment of infertility.[2]

3) Nutraceuticals:
   i. Definition: - Nutraceuticals are substances obtained from dietary sources that are formulated to provide health benefits in certain diseases along with their basic nutritional value.

   ii. Nutraceuticals in Infertility: - Nutraceuticals containing the following nutrients are mainly administered in infertile and sub-fertile females –
      a. DHEA (Dehydroepiandrosterone) - DHEA significantly decreases cancellation rate and improves pregnancy rate in IVF.[4]
      b. Antioxidants (Vitamin C, Vitamin E, Omega 3 Fatty Acids) – Shorten time to pregnancy in unexplained infertility.
      c. Micronutrients (Zinc, Copper, Selenium, Iodine) – Adjuvant multiple micronutrient supplementation during ovulation induction has a higher chance of pregnancy.[2]

4) Ayurveda on Infertility:
Ayurveda, the ancient medical science, explains infertility as Vandhyatva. Vandhyatva is said to be the outcome of Dushtaartava(a, Alpaartava, Nashtaartava and various Yonisdoshas and Beejadoshas. Aacharyas (Ayurvedic scholars) have explained their treatment in detail. Various medicinal plants like Shatavari and Vata are described as Vandhyatva Naashak (Anti-Infertility) in the Ayurvedic texts.[7,10,11,12] Ayurveda supports health by strengthening body’s own self-healing and balancing mechanisms” and doesn’t rely on intervention by any outside or foreign substance to replace or correct the hormones in the body. Evaluation of person’s Dosha is very significant for prescribing the treatment and any blockages and weaknesses in body parts for which the treatment includes appropriate diet, body therapies, herbs, sensory therapies, and lifestyle and yoga therapies[8,9]

Shatavari[5,10,11,12,13]; -
Latin Name: Asparagus racemosus Wild.
Family: Liliaceae.
Description: A tall climbing under-shrub with annual woody terete stems, distributed throughout tropical and sub-tropical India.
Nutritional value[16]:

Shatavari [5,10,11,12,13]: -

Latin Name: Asparagus racemosus Wild.
Family: Liliaceae.
Description: A tall climbing under-shrub with annual woody terete stems, distributed throughout tropical and sub-tropical India.
Nutritional value[16]:

Nutritional value[16]:
Table no 1: Nutrients description of Asparagus racemosus Wild.

<table>
<thead>
<tr>
<th>Nutrients</th>
<th>Value (per 100 grams)</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>20</td>
<td>kcal</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>3.38</td>
<td>grams</td>
</tr>
<tr>
<td>Protein</td>
<td>2.2</td>
<td>grams</td>
</tr>
<tr>
<td>Total fat</td>
<td>0.12</td>
<td>grams</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>2.1</td>
<td>grams</td>
</tr>
<tr>
<td>Folates</td>
<td>52</td>
<td>mcg</td>
</tr>
<tr>
<td>Niacin</td>
<td>0.978</td>
<td>mg</td>
</tr>
<tr>
<td>Pantothenic Acid</td>
<td>0.274</td>
<td>mg</td>
</tr>
<tr>
<td>Pyridoxine</td>
<td>0.091</td>
<td>mg</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>0.141</td>
<td>mg</td>
</tr>
<tr>
<td>Thiamine</td>
<td>0.143</td>
<td>mg</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>5.6</td>
<td>mg</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>756</td>
<td>IU</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>1.13</td>
<td>mg</td>
</tr>
<tr>
<td>Vitamin K</td>
<td>41.6</td>
<td>mcg</td>
</tr>
<tr>
<td>Potassium</td>
<td>202</td>
<td>mg</td>
</tr>
<tr>
<td>Calcium</td>
<td>24</td>
<td>mg</td>
</tr>
<tr>
<td>Zinc</td>
<td>0.54</td>
<td>mg</td>
</tr>
</tbody>
</table>

Rasa-vipak-veerya : Madhur, Tikta-madhur-sheeta.
Chemical Composition : Saponins
(Shatavarin 1,2,3,4).
Classical texts\textsuperscript{13,14,15}:
Shukrustanyakari balyaa
vaatapittaasrashothajit |
Shatavari hima tiktaa rasesvaadu;
kshayaasrajit |
Vaatapithaharaa vrushyaa
rasaayanaaravara smrutaa ||

Shatavari svaadutiktaa vrushyaa
doshatrayapranut |
Garbhapradaa kshatakshinahita |
khaalityanaashani ||
Vata\textsuperscript{5,10,11,12,13}; -

Latin Name : Ficus benghalensis L..
Family : Moraceae
Description : It is a huge tree possessing supporting aerial roots, distributed throughout India.

Table no 2: Nutrients description of Ficus benghalensis.

<table>
<thead>
<tr>
<th>Nutrients</th>
<th>Value (per 100 grams)</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>72</td>
<td>kcal</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>12</td>
<td>grams</td>
</tr>
<tr>
<td>Protein</td>
<td>2</td>
<td>grams</td>
</tr>
<tr>
<td>Total fat</td>
<td>2</td>
<td>grams</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>8</td>
<td>grams</td>
</tr>
<tr>
<td>Calcium</td>
<td>364</td>
<td>mg</td>
</tr>
<tr>
<td>Phosphorous</td>
<td>43</td>
<td>mg</td>
</tr>
</tbody>
</table>
Rasa-vipak-veerya : Kashaaya-katru- 
sheeta.

Chemical Composition: 10% Tannins

Classical texts\textsuperscript{[13,14,15]}:

Sheetaagururgraahi 
kaphapitthavranaapah: |
Varnyo visarpadaahaghn: kashaayo 
yonidosaharat || -Bhavprakash

**DISCUSSION:**

1. *Shatavari* (*Asparagus racemosus* Wild) \textsuperscript{[1,5,6,7]}

i. *Shatavari* is known to provide protection against urinary tract infections and maintain vaginal pH.

ii. The Saponins in *Shatavari* provide relief in Dysmenorrhoea and other Menstruation related problems.

iii. Shatavarin-1 blocks oxytocin induced contractions, thus acting as an anti-

abortifacient.

iv. Shatavarin-4 acts as Oestrogen on the Uterine muscles, increases weight of accessory sex glands. This phytoestrogen enhances folliculogenesis and ovulation by binding directly to the Oestrogen receptors.

v. *Shatavari* is well-known for its balya and rasayana properties. Madhur rasa helps in restoring strength of the body. Its rasayana property helps rejuvenate all the cells and tissues of the body.

2. *Vata* (*Ficus benghalensis* L.\textsuperscript{[1,2,3]}) –

i. The tannins present in *Vata* act as astringent, correct uterine or cervical bleeding.

ii. *Vata* is known to trigger cervical mucus secretion and promotes endometrial thickening during proliferative phase.

iii. Vatashrunga (Leaf bud) is used in 
punsavana vidhi.

iv. *Vata* is well-known for its Yonidosahara property.

**CONCLUSION:** From the above discussion, the anti-infertility properties of *Shatavari* (*Asparagus racemosus* Wild) and *Vata* (*Ficus benghalensis* L.)\textsuperscript{4} can be understood. Combining these power herbs with nutraceuticals in females with infertility or sub-fertility would bring marvellous results. The Synergetic effect of this combination can further be studied clinically. Not only are they anti-infertility drugs, but also possess nutritional benefits. Hence, *Shatavari* and *Vata* can be used as medicine as well as nutritional supplements in the treatment of female infertility. The role of *Shatavari* and *Vata* as herbal nutraceuticals or say ‘Nutraherbs’ can thus be showcased. Similarly, herbs indicated for various diseases in the Ayurvedic texts can be used in combination with Nutraceuticals or as a wholesome alternative treatment for the disease. The scope of studying the synergetic effect of the combinations of Ayurvedic herbs with nutraceuticals widens, which will further increase the utility of Herbal Nutraceutical combinations in the treatment of various diseases.

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