



## A Literature Review on the Therapeutic Potential and Pharmacological Properties of Siddha Medicine: Annda Odu Parpam

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### ABSTRACT

The Siddha system of medicine is one of the traditional healing practices originating from South India, particularly Tamil Nadu. In siddha medicine, the use of minerals, herbs, and animal products plays a crucial role in therapeutic practices. Ancient Indian culture embraced sexuality as an integral part of life and spirituality. Infertility is a complex medical condition characterized by the inability to conceive a child despite regular, unprotected sexual intercourse over a period of one year. On the basis of literature evidence and the scientific background all parts of the eggs are medicinally useful, in that the *Annda odu parpam* mentioned in siddha text *Anubogha vaidhya navaneedham Part 3 by Hakeem. P.M.Abdullah shahibu*. The ingredients of *Annda odu parpam* is Powdered Egg shell (*Gallus domesticus*) and *Neermulli (Hygrophila auriculata)*, this medicine exemplifies the siddha approach of utilising natural substances for restoring health. This review synthesizes scientific perspectives offering insights into the relevance and application of siddha medicine in contemporary infertility treatment.

**Keywords:** Siddha medicine, Annda odu parpam, Infertility, Egg shell.

### INTRODUCTION

The Siddha system of medicine is one of the traditional healing practices originating from South India, particularly Tamil Nadu. In siddha medicine, the use of minerals, herbs, and animal products plays a crucial role in therapeutic practices. Through texts and symbolic representations in art and religion, ancient India provided a comprehensive view of sexuality that combined physical, emotional, and spiritual dimensions.

Infertility is a complex medical condition characterized by the inability to conceive a child despite regular, unprotected sexual intercourse over one year (or six months if the woman is over 35 years old)<sup>1</sup>. It can affect both men and women and is a significant concern for many couples. The increasing incidence of infertility is necessitating a more and more rapid search for drugs having fertility potential with negligible side effects.

There are many medicines in Siddha which is indicated for infertility. On the basis of literature evidence and the scientific background all parts of the eggs are medicinally useful, in that the *Annda odu parpam* mentioned in the Siddha text *Anubogha vaidhya Navaneedham Part 3 by Hakeem. P.M. Abdullah Shahibu* which is indicated for *Iraippurumal* (Bronchialasthma), *Kuruthikkakal* (Hemoptysis), *Sayanoi* (TB), *Vindhukuraivu* (Oligospermia), *Vindhu velipadu* (Premature ejaculation), *Soothagakattu* (Amenorrhoea), *Pillaipetruvalukkukattu* (uterine discharge), *Pengaluku undagum meganeer olukku* (vaginal discharge), *Thathuviruthi* (increases potency), *Vindhualutham* (enhances the potency of semen), *Magalir karuppaiyil thalarchi*, *Alkul thalarchi*. The ingredients of

*Annda odu parpam* are Powdered Eggshell (*Gallus domesticus*) and *Neermulli (Hygrophila auriculata)*<sup>2</sup>.

The review of this drug provides evidence for its therapeutic action mentioned in the literature and it describes the phytochemicals and the pharmacological action of the ingredients used in this formulation.

### MATERIALS AND METHODS

#### Selection of the drug:

The *Annda odu Parpam* (Egg shells of *Gallus domesticus*) was taken as a compound drug for male and female infertility from the literature *Anuboga vaidhya navaneedham*-Third part written by Hakeem Mohamed Abdhulla Shahib, Page no.108<sup>2</sup>. Ingredients of the test drug are Egg shells of *Gallus domesticus* and extract of *Neermulli (Hygrophila auriculata)*.

#### Source of collection:

The hen egg shells (Ovitesta of *Gallus Domesticus*) were collected from the hatchery and the *Neermulli* were collected from Puliayangudi, Tenkasi District which was duly authenticated by botanist and Gunapadam experts of the National Institute of Siddha, Chennai.

#### Ingredients:

Purified eggshell powder-340gm.

Extract of *Neermulli*-570ml.

Appalakaram-Sodium carbonate (For the purification of eggshell).



**Purification of eggshell:**

The egg shells were boiled with *Appalakaram* water (Sodium Carbonate) for about 20 minutes. Then the membranous layer of the shell was peeled out and washed with water twice <sup>2</sup>.

**Preparation of parpam and storage:**

Purified egg shells were powdered and ground with the extract of *Neermulli* (*Hygrophila auriculata*) for about 12 hours. Then the product was made into villai and dried in sunlight. The medicine was then placed in earthenware, covered with 5 layers of mud-smear cloth, and burned with 2100 grams of cow-dung cake. After the pudam process, the medicines were taken out, ground again for 12 hours, and repeated four times. Each time the drug was ground for 12 hours and then burned using 1750gms, 1400gms, and 1050gms of cow-dung cake respectively. After the calcination process, the medicine was allowed to cool and ground into a fine powder, and stored in an air-tight container.

**SIDDHA ASPECT OF THE INGREDIENTS****Annda odu (ovitesta of Gallus domesticus) - Hen's-egg** <sup>3</sup>

It is also called *citrandam*, it is a highly nutritious food. The hen's eggshell is rich in calcium. It is composed of carbonate of lime; phosphate of lime and traces of sulphur, iron, some organic matter of about 1.5%, and salts such as chlorides, iodides sulphates, and phosphates of potassium, calcium, and magnesium.

**Action:**

Laxative, rubefacients, and nutrient properties.

**General properties:**

The hen's egg controls *vathadhosa*, *ulcers*, and *kapha diseases* but it increases *vatha paithiyam*, *semen*, and *eczema*.

**Other uses:**

This parpam when given in butter, controls the fever of bony origin. The white egg is dissolved in water and used as an antidote for various poisonings such as copper sulphate, perchloride of mercury, and zinc sulphate. The white egg removes impurities of foodstuff and controls the burning sensation of the body. It is also an ingredient of certain eye medicines; The yellow yolk of egg improves body strength.

**NEERMULLI-Hygrophila auriculata**

**Botanical Description: synonym:** *Asteracantha longifolia*.

*Hygrophila auriculata* is straight, herbaceous plant that has a quadrangular, hairy stem. The flowers are small bluish purple and occur in dense, axillary clusters. Commonly found in moist places on the banks of tanks, paddy fields, etc., throughout India and Ceylon. Seeds and roots in the dried state are easily obtainable in the markets<sup>4</sup>.

**Parts used:** Whole plant, seeds, flower.

**Taste:** Sweet, Mild pungent.

**Potency:** Cold

**Action:**

Seed: Aphrodisiac, Diuretic.

Leaves: Demulcent, Diuretic.

Root and flowers: Refrigerant, Diuretic, Demulcent, Tonic.<sup>5</sup>

**GENERAL PROPERTIES:**

The leaves of this plant contain aromatic oils and phytosterols such as hygrosterol. It is well-known for its demulcent and diuretic effect, which helps in treating conditions like dropsy, and swelling and increases urine output<sup>6</sup>. The aerial parts contain lupeol and stigmaterol. The triterpene and steroidal glycosides in this plant inhibits the growth of the ringworm fungi, *Trichophyton rubrum*, *T. mentagrophytis*, *Candida albicans*, and *Mycobacterium gypseum*<sup>5</sup>. The plant is combined with other medicines as a decoction. It helps reduce excess water in the body, alleviates urinary disorders, and reduces water retention<sup>6</sup>.

**APPALAKAARAM (Sodium carbonate)** <sup>3</sup>:

Impure sodium carbonate is known as *Appala kaaram*. It is obtained from the soil of an alkaline earth. It is pale yellow. Because it is used in the production of paper (Appalam), it is referred to as Appala Karam.

**Actions:** Antacid, Anti-flatulence, Carminative, Lithotriptic, Diuretics.

**General properties:** *Appala kaaram* is effective in the treatment of throbbing pain, abdominal distension, gastric ulcers, *vatha diseases*, *kapha diseases*, and arthritis.

**Usage:** 1. *Appala kaaram* 2.1 to 4.2 gm is dissolved in water for the above diseases.

2. Lemon fruit is cut into two parts and the seeds are removed. Half of the fruit is spread over impure sodium carbonate powder.

Dosage: One half piece.

Method of administration: It is given from the first day of menstruation consequently for three days only in the morning.

Indications: Dysmenorrhoea, Infertility.

**SCIENTIFIC REVIEW OF HYGROPHILA AURICULATA**

Kingdom: Plantae

Division : Tracheophyta

Class : Magnoliopsida

Order : Lamiales

Family: Acanthaceae

Genus: Hygrophila

Species: auriculata



## Botanical Description

Herbs have unbranched, sub-quadrangular stems that are 40–100 cm tall, hispid with long hairs, and numerous fasciculate, swelling nodes. At each node, there are whorls of six subsessile, lanceolate, sharp, hairy leaves that measure 6-15×1.5-3 cm. The two outer leaves are significantly larger than the four inner ones. The leaves axils have sharp, 2-3 cm long, yellowish-brown thorns. Eight flowers in axillary clusters are arranged in four pairs at each node. Like the leaves, the bracts are lanceolate, hairy, and ciliate; the bracteoles are linear-lanceolate, 1.5–2 cm long, with hyaline borders in the lower portion, and they are hairy, ciliate, and bearing long white hairs. Four partite calyxes; upper sepals unequally larger and longer than the other three; all linear-lanceolate, 1.2-2 cm long; edge hyaline ciliate; hairy on back. Four didynamous stamens, glabrous filaments, a purple-blue, 2-3 cm long, bilipped corolla, and a tube that is 11–13 mm long and swelled at the tip. Four ovules, four linear-oblong capsules, and four-pointed, 5-7 mm-long seeds make up ovary 2. Ovoid, compacted, hairy, hygroscopic, black seeds <sup>7</sup>.

## Phytochemical constituents

Butane, 1,1- diethoxy- 3-methyl, Pentane,1,1-diethoxy, 3,3 –Diethoxy-2-Butanone, Propane,1,1,3-triethoxy, Benzene, Octadecanoic acid, Diethyl Phthalate, Isopropyl myristate. tetracontane, Octacosane,  $\beta$ -sitosterol, Hexadecanoic acid, methyl ester, pentacosane, and 2-methylhexacosane<sup>8</sup>.

## Pharmacological activity

### Hepatoprotective activity

Shanmugasundram et al., (2005) showed that Rats exposed to 150 mg/kg/p. of an aqueous extract of the roots of *Hygrophila auriculata* (K. Schum), Heine showed strong hepatoprotective efficacy against liver damage caused by carbon tetrachloride <sup>9</sup>. Shailajan et al. (2005) showed that Rats exposed to CCl<sub>4</sub>-induced liver dysfunction showed hepatoprotective efficacy against the whole plant slurry of *Hygrophila auriculata*. Later on, they also observed that the whole plant powder slurry, aqueous extract, and ethanolic extract demonstrated hepatoprotective effects against hepatotoxicity induced by galactosamine <sup>10</sup>. At 200 mg/kg/p., a methanolic extract of *Hygrophila auriculata* seeds demonstrated strong hepatoprotective effects against rats' liver damage brought on by thioacetamide and paracetamol <sup>11</sup>.

### Aphrodisiac activity

Over 28 days, rats given an ethanolic extract of the seeds (100–200 mg/kg) experienced dose-dependent increases in mounting frequency (380–472% of control) and comparable decreases in mounting intromission, and post-ejaculatory latencies; however, none of the doses significantly increased libido compared to the active control, which received testosterone injections at a dose of 0.5 mg/kg <sup>12</sup>. Ghosh et al *Hygrophila auriculata* seed ethanolic extract has a protective effect against

cyproterone acetate-induced sexual dysfunction in male albino rats. The active ingredient(s) in this extract, an ethanolic extract of *H. auriculata* seeds, have some strong antioxidant properties. Testicular degeneration was observed in the CPA-treated group from a histoarchitectural perspective as a result of oxidative stress imposition; however, this degeneration was reversed by *H. articulata*'s antioxidant capability (Dare et al., 2012). Thus, in the extract-treated group, sperm motility, count, and spermatogenesis process were all returned to the control level <sup>13</sup>.

### Anti-inflammatory and antipyretic activity

Patra et al., (2009) studied the *Hygrophila spinosa* T. Anders leaf extracts in petroleum ether, chloroform, alcoholic, and aqueous medium have anti-inflammatory and antipyretic properties. The different extracts' anti-inflammatory and antipyretic properties were assessed for their impact on carrageenan-induced paw edema in rats and Brewer's yeast-induced pyrexia in rats, respectively. While the petroleum ether and aqueous extracts of *Hygrophila spinosa* leaves did not display any significant anti-inflammatory and antipyretic properties, the chloroform and alcoholic extracts of the leaves did show significant anti-inflammatory and antipyretic activity in a dose-dependent manner and found that at a dose of 400 mg/kg body weight, the alcoholic and chloroform extracts exhibited the most potent anti-inflammatory effects.<sup>14</sup>

Patra et al., (2009) reported the Rats with Brewer's yeast-induced pyrexia were used to test the antipyretic effects of an alcoholic extract made from the leaves and roots of *Hygrophila spinosa* T. Anders. In an animal model, both extracts had strong antipyretic efficacy and considerably decreased the rise in rectal temperature when administered at doses of 200 and 400 mg/kg body weight<sup>15</sup>.

### Anti-cancer activity

#### a. Breast cancer

Apigenin demonstrated a dose- and time-dependent anti-proliferative activity in the MDA-MB-453 cell line <sup>16</sup>. Extrinsic and intrinsic routes can trigger apoptosis, as demonstrated by the activation of caspase 3, caspase 8, and caspase 9 <sup>17</sup>.

#### b. Cervical cancer.

By preventing microtubule polymerization,  $\beta$ -sitosterol caused mitotic arrest and reduced the growth of SiHa cells. Tubulin- $\alpha$  and MAP2 (microtubule-associated protein 2) were found to have decreased in expression<sup>18</sup>.

### Anti-Bacterial activity

An ethanolic extract of the leaves, stem, fruits, and root of *Hygrophila auriculata* was tested for its anti-microbial properties against a variety of microorganisms, including *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Bacillus subtilis*, *Escherichia coli*, *Candida albicans*, and *Mycobacterium smegmatis*. The results showed that the



leaves had strong anti-microbial activity against these microorganisms<sup>19</sup>.

*Hygrophila auriculata* leaf extracts, at varying doses, prevent the growth of some bacteria. The acetone extract at doses of 10–30 mg/ml exhibited antibacterial activity against *Escherichia coli* but inactivity against *Staphylococcus aureus*, *Bacillus cereus*, *Bacillus subtilis*, and *Pseudomonas aeruginosa*<sup>20</sup>.

#### **Antioxidant activity**

*Asteracantha longifolia* seeds, which have been traditionally used to treat inflammatory diseases, were among the 28 different species of Nepalese medicinal plants that Sunilkumar and Klausmuller (1999) screened for an inhibitory effect on lipid peroxidation. They found that the plant inhibited lipid peroxidation with an IC50 Value of 20 µg/ml<sup>21</sup>. According to Sawadogo et al. (2006), the methanolic extract of leaves exhibits potential antioxidant activity and contains flavonoids and phenolic compounds. Strong antioxidant activity is demonstrated by an aqueous extract of *A. longifolia* leaves in several in vitro experiments (Dasgupta & De, 2007)<sup>22</sup>.

#### **Hypoglycaemic activity**

When rats were given 100 and 250 mg/kg body weight of the ethanolic extract (Al Eth) of *Asteracantha longifolia* aerial portions for three weeks, their blood glucose levels significantly decreased. Hydroperoxide and thiobarbituric acid reactive compounds (TBARS) are similarly declining in the kidney and liver. Glutathione (GSH), glutathione peroxidase (GPx), glutathione S transferase (GST), and catalase (CAT) were considerably elevated in the drug-treated group following Al Eth therapy, and these levels were comparable to those in the control group. Rats given Al Eth also exhibited reduced lipid peroxidation, which is linked to elevated catalase and superoxide dismutase (SOD) activity (Vijayakumar et al., 2006). Fernando et al. (1991) examined how hot water extracts of the entire plant material of *Asteracantha longifolia* affected the subjects' and patients' ability to tolerate glucose in both mature-onset diabetes and healthy individuals. When rats were given an aqueous extract of *Asteracantha longifolia* before glucose loading, there was a notable increase in the amount of glycogen in the liver and muscle as well as a significant increase in the amount of triacylglycerol in the adipose tissue when compared to control rats. This indicated a hypoglycaemic effect. Nonetheless, neither the kidney's gluconeogenic potential nor the intestinal absorption of glucose was impacted by the plant extract (Fernando et al., 1998, Fernando et al. 1989)<sup>23,24</sup>.

#### **Cardioprotective Activity**

Majumdar m *et al* hydro-alcoholic extract of *Hygrophila auriculata* leaves for cardio-tropic activity<sup>25</sup>.

## **EGG SHELL**

#### **Anti-oxidant activity**

With the DPPH Free Radical Scavenging Assay, the antioxidant properties of several eggshell methanolic extract fractions were assessed. The DPPH reaction is a popular method for assessing a compound's capacity to donate hydrogen or act as a free-radical scavenger, as well as the antioxidant activity of foods and plant extracts. As a stable free radical, DPPH can take on a hydrogen radical electron and transform into a diamagnetic molecule. The decrease in DPPH radical absorbance at 517 nm (in methanol) caused by antioxidants was used to measure the reduction in DPPH radical<sup>26</sup>.

#### **Anti-diabetic activity**

The process of glucose transport across the yeast cell membrane has been studied in the context of the glucose absorption in yeast cells method as an in vitro screening technique for the hypoglycemic effect of various chemicals and medicinal plants. The movement of some metabolizable glycosides and non-metabolizable sugars across the yeast cell membrane appears to be facilitated by stereospecific membrane carriers, according to recent research. It is generally accepted that the highly complex process of glucose transport in yeast cells (*Saccharomyces cerevisiae*) occurs through a process known as assisted diffusion. Certain carriers that move solutes down the concentration gradient are known as facilitators. This indicates that internal glucose must be eliminated for efficient transport to occur. According to our findings, the anti-diabetic activity of the methanolic extract of the eggshell was highest in the solid portion (51.5%) and lowest in the liquid portion (6%)<sup>26</sup>.

#### **Anti-microbial activity**

Using ciproxacillin as a reference, the antibacterial activity of the eggshell methanol extract was assessed using the disc diffusion method against both gram-positive and gram-negative bacteria. The highest antibacterial activity was observed against *Shigella dysenteriae* and *Escherichia coli*. The solid, liquid, and acetic acid portions of the shell all exhibit variable degrees of antibacterial activity, with zones of inhibition ranging from 6.5 to 30.0 mm, respectively<sup>26</sup>.

#### **Chicken Eggshell- a Source of Calcium:**

Given that over 85% of rural families in sub-Saharan Africa keep chickens, powdered eggshells from chickens may be a useful way to boost calcium consumption in this region. Calcium from chicken eggshells has an equally high bioavailability to CaCO<sub>3</sub>. The calcium absorption from a diet containing chicken eggshell powder was 45.59 ± 14.43% in a study involving rats; there was no significant difference when supplementing with CaCO<sub>3</sub> (39.88 ± 16.07%) (p > 0.05). It appears that adding eggshells to dairy products—like yogurt, fried cheese, or cranberry juice is the most advantageous and aesthetically pleasing option. The food industry's utilization of eggshells is limited





because of the risk of high microbial contamination, particularly from Salmonella.<sup>27</sup>

### Testicular function activity

Charles Obiora Nwonuma *et al* Protective Potentials of Brown Chicken Eggshell against Potassium Bromate Effect on Testicular Functional Indices in Wistar Rats<sup>28</sup>. Omelka *et al* Chicken eggshell powder more effectively alleviates bone loss compared to inorganic calcium carbonate: an animal study performed on ovariectomized rats<sup>29</sup>.

### APPALAKARAM – Sodium carbonate

Karthikeyan Karu *et al* Acute and Chronic Anti-Inflammatory Activity of *Appalakaram* Carrageenan induced Hind Paw Edema and Cotton Pellet Granuloma Method in Wistar Albino Rats. Appalakaram revealed mild acute and Good chronic anti-inflammatory action. By this action, the drug reduces joint inflammation in osteoarthritis<sup>30</sup>.

### CONCLUSION

The Siddha system of medicine with its holistic perspective and cultural heritage provides significant insights in addressing infertility. Through medicines like Annda odu parpam, Siddha medicine utilizes natural substances to treat complex reproductive health issues, aiming to reduce side effects. This review highlights the potential of Siddha medicine in treating infertility. To incorporate Siddha medicines into healthcare it is vital to pursue further scientific research and validation. This approach will preserve Siddha's knowledge and enhance its application in reproductive health issues.

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