



A REVIEW OF MILLETS DIET AS A TRADITIONAL APPROACH TO PCOS (GARPAVAAYU) MANAGEMENT

B. Shalini^{1*}, K. Suresh², R. Uthaya Ganga³

¹Ph. D Scholar, Dept. of Kuzhandhai Maruthuvam, National Institute of Siddha, Affiliated to The Tamil Nadu Dr. M.G.R. Medical University, Chennai, India.

²Associate Professor & Guide, Dept. of Kuzhandhai Maruthuvam, National Institute of Siddha, Affiliated to The Tamil Nadu Dr. M.G.R. Medical University, Chennai, India.

³Ph. D Scholar, Dept. of Kuzhandhai Maruthuvam, National Institute of Siddha, Affiliated to The Tamil Nadu Dr. M.G.R. Medical University, Chennai, India.

**Corresponding Author: B. Shalini
Email: drshalini.mdsiddha@gmail.com*

ABSTRACT

A common hormonal condition that affects women during their reproductive years is polycystic ovary syndrome (PCOS). The clinical features quated for Garpavaayu more or less correlates with the symptoms of (PCOS) Polycystic ovary syndrome. Garpavaayu comes under the diseases of Vaatham. The human body contains three humours. In this Increased vatham obstructs Abanan and develops problem in regular menstrual cycle. The significance of taste is more focused on health and wellbeing in Siddha tradition. Taste influences how we perceive food and functions as a therapeutic tool. It is crucial in determining how different foods affect the balance of our bodies. According to Siddha science, there are five fundamental elements that make up everything in the universe. "Food itself is medicine and medicine itself is food," is the fundamental tenet of Siddha science. These fundamental components are also found in the six tastes of food materials. The taste of Inippu (sweet) can be taken to reduce vaatham. Therefore, the qualities opponent to the qualities of vaatham can be advised. Millets can play a beneficial role in the management of PCOS (Garpavaayu). As per, Siddha literatures the taste of Inippu (sweet) millets Like Sorghum (Solam), Pearl millet (Kambu), Kodo millet (Varagu), Finger millet (Kelvaragu), Wheat (Gothumai), Little millet (Saamai) can be taken if vaatham is reduced. In this article, we'll discuss how PCOS-affected women can emphasize a healthy diet by including traditional millets in their daily diet plans.

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Key words: PCOS (Polycystic ovary syndrome), *Garpavaayu*, *Vaatham*, **Taste (Sweet), Millets, Diet.**

INTRODUCTION:

Menstrual disorders are considered a major problem among Indian women. Changes in the menstrual cycle are considered abnormal if there is an underlying medical condition. Polycystic ovary syndrome (PCOS) is a prevalent hormonal condition that impacts women in their reproductive years. While the symptoms of PCOS may differ between individuals, some common indications include irregular menstrual cycles, fertility challenges, excessive hair growth, acne, and weight gain ⁽¹⁾. In Siddha medicine literatures, Pararasasegaram, Yugimuni vaithiya kaaviyam, Gnanavettiyan - 1500, Polycystic ovary syndrome and its associated complications may be related to sinaipai neer kattigal, soothagavaayu, soothaga kattigal, soothaga thadai, karparogam, karpa vaayu. One of such disease is Garpavaayu. As per the text of Pararasasekeram, Garparogam is classified into 9 types. Garpavaayu is one among them. It may be correlated with Poly Cystic Ovarian Syndrome of modern science of medicine ⁽²⁾.

According to the Siddhars, they have divided the diseases into 4448 types. It is believed that they are 80 vaatha diseases. Garpavaayu comes under the diseases of vaatham. One of the diseases in menstrual disorders is Garpavaayu, the name of which itself denotes the severity of the disease, which causes great difficulty to the patients. The clinical features quoted for Garpavaayu more or less correlates with the symptoms of (PCOS) Polycystic ovary syndrome. All things in this universe, including man, are made up of five basic elements such as earth, water, fire, air, and space, collectively known as the "Panchaboothams." According to our Siddha fundamentals, the three basic constituents called uyir thathukkal such as vatham, pitham and kabam are also formed by the combination of Panchaboothams. Whenever any disturbance occurs in these thathus, the result is the disease. A person's diet and daily routine play an important role in the development of the disease, as abnormal physical activity can unbalance vatha, pitha and kabam and cause disease. As for food, it contains six tastes. They are sweet, salty, sour, bitter, pungent and astringent, which are also composed of panchaboothams. When we consume food in an abnormal proportion, the Panchaboothams alter the three Thaadhus and lead to diseases ⁽³⁾. For the diseases caused by improper diet, we have to supplement the food with the opposite taste to balance them. We must select a diet whose taste, properties, action, and ultimate taste will balance the change in the composition of the patient's humours, and we must avoid the taste that increases the imbalance. The increase of one humour is always associated with the decrease of another humour. For each humor there are six qualities which a physician should learn. There may be toxic effects in the foods we take. Hence the three humours may be vitiated. Diets which can bring down each humour to the normal state should be advised⁽⁴⁾.

Therefore, the qualities opposite to the qualities the characteristics of (Miruthu) softness, (Pasumai) moistness, (Paluvu) heaviness, (Akkin) Hot, (Sthiram) stability, (Katti) lumb/mass of vaatham can be advised. The taste of Inippu (sweet) can be taken if vaatham is reduced. The qualities of vaatham's adversaries are more or less correlated with the inippu (sweet) flavor in terms of their characteristics. Millets can play a beneficial role in the management of Polycystic ovary syndrome. Therefore, the taste of Inippu (sweet) millets Like Sorghum (Solam), Pearl millet (Kambu), Kodomillet (Varagu), Finger Millet (Kelvaragu), Wheat (Gothumai), Little millet (Saamai) can be taken to reduce vaatham. And also, scientifically proven a millets diet that can reduce the incidence of obesity and IR (Insulin resistance) for women with PCOS. In this article, let's talk about for women with PCOS the how to emphasise on a healthy diet by adding traditional millets in our daily diet plan.

Garpavaayu –Panchabhoodas view ⁽⁴⁾.

Ovaries are classified under Aagaya bootham, they are structurally Aagayam and functions carried by the ovaries are Thee (fire) for ovary function, both of these bootham should be intact.

The assistance of Vaayu and Aagaym is helping the ovum mature. In order to aid in the follicle's rupture, a single follicle must mature with Aagayam and Vaayu bootham in addition to Thee. With Aagayam, Vaayu and Thee, the ovum matures and travel towards Mann (uterus) where they get implanted, if conception or shed after growth in certain period (menstruation).

The issue with PCOS is a lack of aagayam, which leads to an increase in vaayu and an abundance of immature follicles. Neer bootham, also known as cysts, makes up for this lack of aagayam. Due to increased Mann (stromal tissues) follicle does not grow further.

Garpavaayu -mukkutram approach

In PCOS, Vaatham is the kutram deranged clinically seen. Increased vaatham obstructs Abanan and develops problem in regular menstrual cycle. Amenorrhea, dysmenorrhea, hirsutism, acanthosis, weight gain and lethargy and constipation are all symptoms of an increased vaatham in that area. Vaatham is in charge of follicle development and movement, as well as ovum rupture and release during the ovarian cycle.

Abanan (Kizhnokkum kaal):

Expelling urine and fecal matter, it corresponds to the pelvic plexus. It constricts the anal spinster. It helps to spread the digestive food all over the body. It is also responsible for the expulsion of sperm and menstrual flow. Diseases of the bladder, rectum, and reproductive system result from its disruption.

Relation with five elements ⁽⁵⁾:

Vaatham – kaatru(Air) + aahaayam (Sky)-Bitter taste

Vaatham has kaatru and aagayam as its elemental constituents. If kaatru and aahaayam or any of them is decreased or increased from the normal level, it will surely lead to pathological state of vaatham.

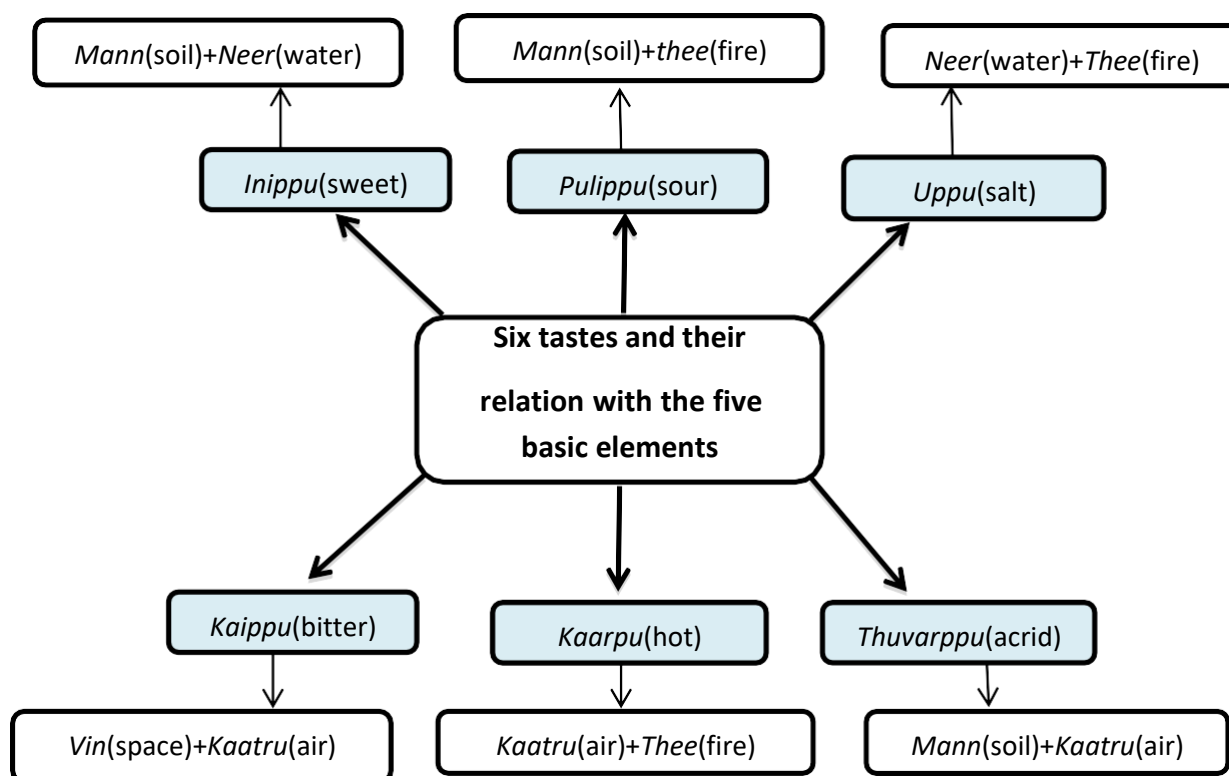
Regarding diet, bitter, pungent and astringent tastes contain vali and bitter alone contains aahaayam. So, if these are consumed in large amounts this results in the vitiation of vaatham and eventually vaatha diseases.

Table:1 Vaatham more or less correlates with the symptoms of (PCOS) Polycystic ovary syndrome.

S.no	Location of vaatham ⁽⁶⁾ .	Imbalance of vaatham in PCOS ⁽⁷⁾ .
1	Menstrual flow	Amenorrhea, Oligomenorrhoea, DUB
2	Muscles (Oon, Kozhuppu)	Weight gain
3	Skin	Acne, Acanthosis
4	Hair follicle	Facial hair growth
5	Malam	Constipation
6	Nervous system	Hyper androgenism, Thyroid dysfunction, Insulin Resistance
7	Siruneer	Diabetes
8	Foetus.	Infertility

TASTE CONSUMMATION ORDER FOR TRADITIONAL MEAL:

From ancient times to modern times, the order in which food is served has been important in Indian customs and celebrations across India. Sweet foods are best eaten first in a meal. The digestive fire is strong when we are about to start eating and are therefore hungry. Since sweet foods are heavy and dense in nature, it is best to eat them at the beginning of the meal because they take longer to digest. This order of consuming six tastes in a meal should only be followed by healthy individuals with good digestive fire and metabolism. When the digestive fire is low the order of tastes will be altered ⁽⁸⁾.

Figure 1: The proportion of the five basic elements of nature in six tastes is...**Table:2 The proportion of the two basic elements of nature in *Inippu* taste ⁽⁸⁾.**

<i>Suvai</i> (Taste)	<i>Panchaboothas</i> (Elements)	<i>Gunam</i> (Nature)	<i>Viriyam</i> (Potency)	<i>Vipakam</i> (Division)	Effect on <i>Tridosha</i>
<i>Inippu</i> / Sweet	<i>Prithvi + Appu</i> (Earth + Water)	Heavy, Cold, Oily, Soft	Cold/ Thanmai	<i>Inippu</i> / Sweet	Aggravates <i>Kapha</i> , Pacifies <i>Vatham</i> & <i>Pitha</i>

THERAPEUTIC ACTIONS OF INIPPU TASTE:

Nourishing of seven *Thathus*, build tissues, strengthening body, longevity enhancer, antitoxic, sensorial soothing and moistening. Acts as laxative, diuretic, demulcent, antispasmodic, expectorant, emollient and anti-inflammatory ⁽⁹⁾.

TASTES AND DIET – SEASONAL FACTORS:

All living things are significantly impacted by seasonal variations. Seasons, humors, and our diet all interact with one another. In order to prevent dosham imbalance, specific tastes and diets should be included in our meals according to the current seasons. The appropriateness is a list of foods to eat and seasonal preferences based on humour vitiation ⁽¹⁰⁾.

THE PHYSIOLOGICAL EFFECTS OF FOOD RELY UPON THESE FIVE PILLARS ⁽¹¹⁾

1. *Suvai* (Taste)
2. *Gunam* (Nature)
3. *Veeriyam* (Potency - Hot and cold)
4. *Vipakam* (Post -Digestive taste)
5. *Prabhavam* (Unique properties or specific action)

ARUSUVAI – relationship with TRIDOSHAS and their balance

Pungent, bitter and astringent tastes strengthen *Vaatha* and all functions related to movement, penetration and cleansing of channels. To balance *Vaatha*, add on the sweet, sour, salty tastes and eat more warm foods ⁽¹²⁾.

Figure 2: The characteristics of the *IYYAM* more or less correlates with the *INIPPU* (sweet) taste:

“Mannudane punal theekkal Muraiyae serndhittal

Varume inippu” Ref- *Thottra kirama aaraichi-Pg.no 342-343*

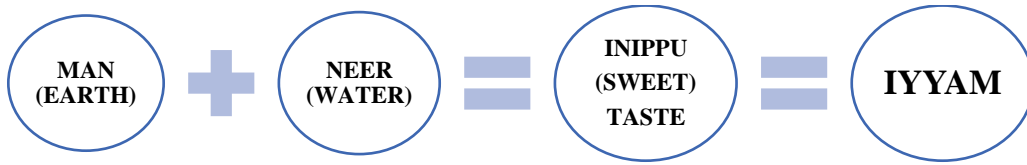


Table and Figure 3 and 4: The characteristics of the qualities opponent to the qualities of vaatham more or less correlates with the Inippu (sweet) taste ⁽¹³⁾.

Table: 3

S.NO	Opposite characters of Vaatham- Ref-Noi naadal Pg.no 113-114
1	(Miruthu) softness
2	(Pasumai) Moistness
3	(Paluvu) Heaviness,
4	(Akkinii) Hot
5	(Sthiram) Stability
6	(Katti) lumb/mass

Table:4

S.no	Characters of Iyyam Ref-Noi naadal-Pg.no 239
1	(Menmai) Soft
2	(Neippu) Moist
3	(Thinmai) Weight
4	(Mantham) Dullness
5	Vazhuvazhappu(Lubericity)
6	(Vanmai)Pasumai
7	(Thanmai) cool

Figure 3



Figure 4

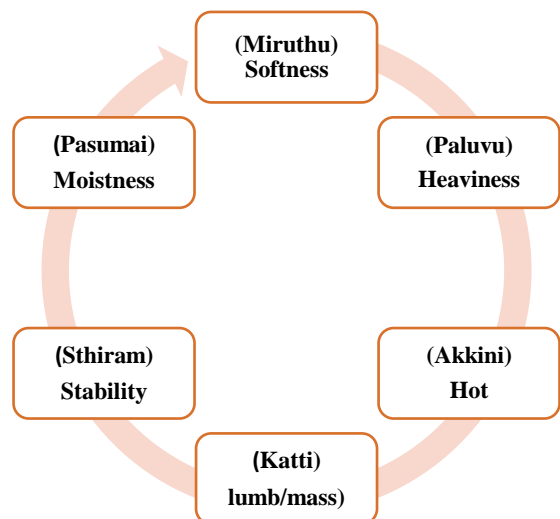


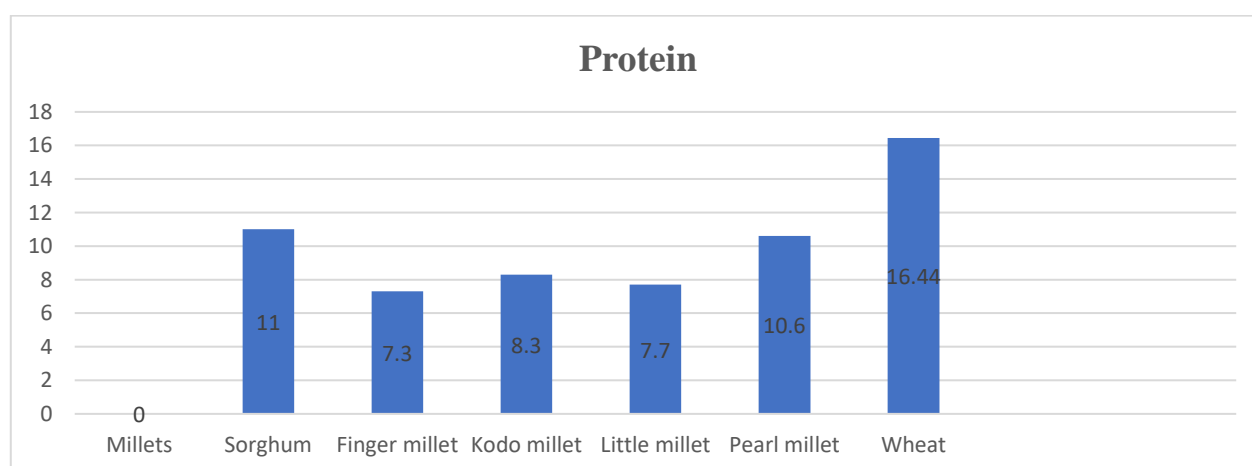
Table 3: Therapeutic indication of millets in Siddha Litrature ⁽¹⁴⁾.

Millet	Botanical Name	Suvai (Taste)	Viriyam (Potency)	Vipakam (Division)	Action	Reference
1.Kodomillet (Varagu),	Paspalum scrobiculatum	<i>Inippu</i> /Sweet	Thanmai/ Cold	<i>Inippu</i> /Sweet	Chologogue	Mooligai Book Pg.no.790
2.Sorghum vulgare(Solam),	Sorghum vulgare	<i>Inippu</i> /Sweet	Thanmai/ Cold	<i>Inippu</i> /Sweet	Nutrient Laxative	Mooligai Book Pg.no.492
3.Pearl millet (Kambu)	Pennisetum typhoides	<i>Inippu</i> /Sweet	Thanmai/ Cold	<i>Inippu</i> /Sweet	Tonic	Mooligai Book Pg.no. 226
4.Finger millet (Kelvaragu),	Eleusine Coracana	<i>Inippu</i> /Sweet	Thanmai/ Cold	<i>Inippu</i> /Sweet	Nutrient	Mooligai Book Pg.no.378
5.Wheat (Gothumai),	Triticum aestivum	<i>Inippu</i> /Sweet	Thanmai/ Cold	<i>Inippu</i> /Sweet	Nutrient Demulcent	Mooligai Book Pg.no.407
6.Little millet (Saamai)	Echinochloa frumentace	<i>Inippu</i> /Sweet	Thanmai/ Cold	<i>Inippu</i> /Sweet	Demulcent	Mooligai Book Pg.no.652

Table 4: Nutrient value of millets ⁽¹⁵⁾.

-Ref: ICAR - Indian Institute of Millets Research, 2017

S.No.	Millets	Protein (gm)	Fiber(gm)	Minerals (gm)	Iron(gm)	Calcium (gm)
1	Sorghum	11	6.7	2.7	3.4	13
2	Finger millet	7.3	3.6	2.7	3.9	344
3	Kodo millet	8.3	9	2.6	0.5	27
4	Little millet	7.7	7.6	1.5	9.3	17
5	Pearl millet	10.6	1.3	2.3	16.9	38
6	Wheat	16.44	14.64	3.3	4.66	40.8

**Fig 4:** The results showed that protein, exhibited high level in wheat. when compared to other millets.

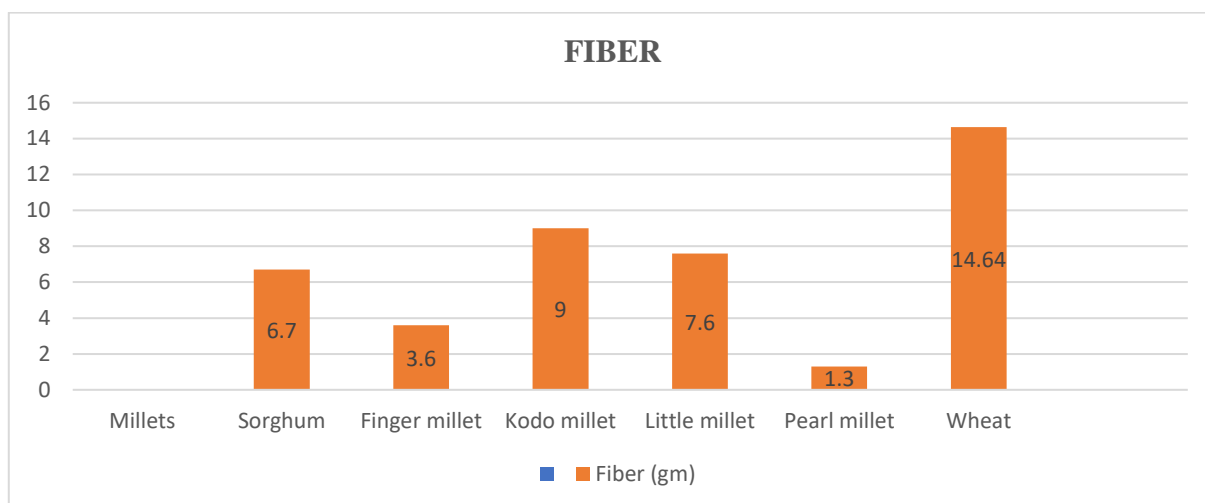


Fig 5: The results showed that Fiber, exhibited high level in wheat when compared to other millets.

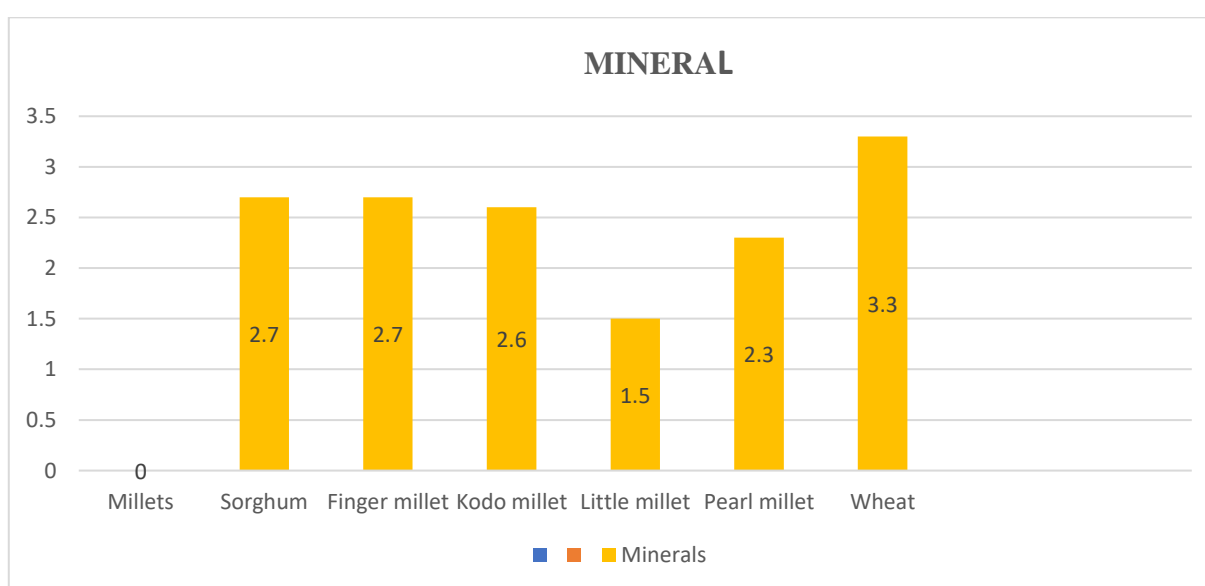


Fig 6: The results showed that mineral, exhibited high level in wheat and approximately similar level in other millets.

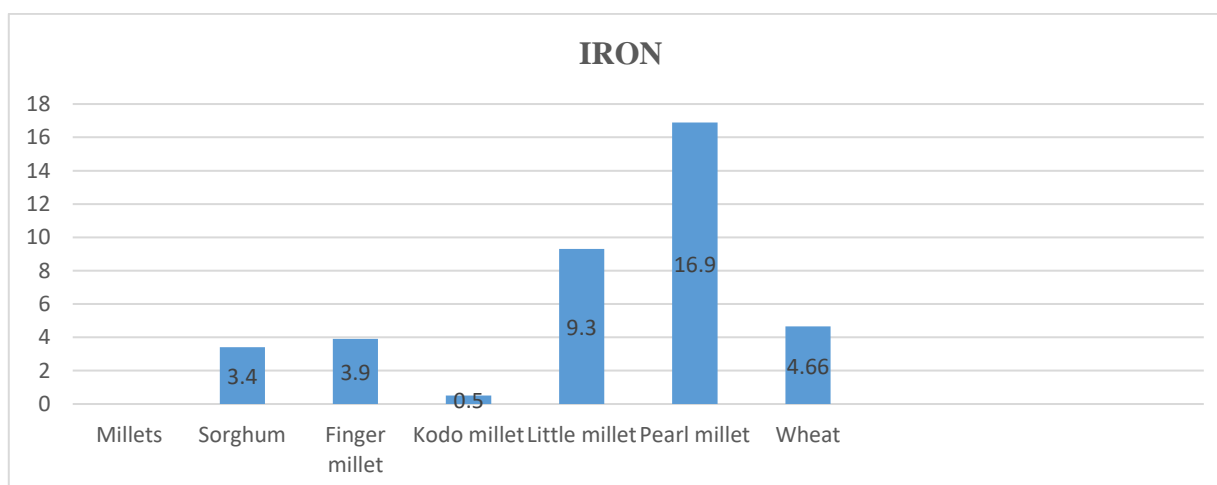


Fig 7: The results showed that iron in pearl millet, exhibited high level when compared to other millets.

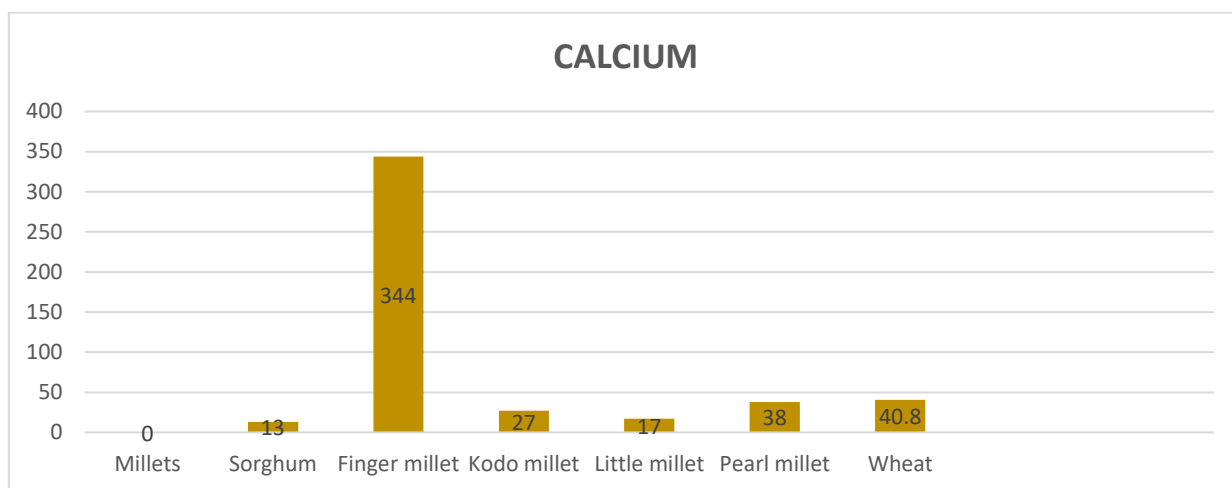


Fig 8: The results showed that Calcium in finger millet, exhibited high level when compared to other millets.

Table 5: Table 5: Traditional millets recipies as per Siddha literature & Scientific evidence.

Millets	Recipies	Siddha text reference ^{(16), (17)} .	Scientific evidence for low Glycemic index
1.Kodo millet (Varagu),	It is taken as Cooked rice form.	MooligaiPg.no.791 Noi Illa neri: Pg.no.210	Yadav Neelam et al., 2013 ⁽¹⁸⁾ . Pubmed.
2.Sorghum (Solam),	It is taken as gruel form (Kool) and. Chappathi	Mooligai:Pg.no.492 Noi Illa neri:Pg.no.210	Prasad mpr et al., 2014 ⁽¹⁹⁾ . Pubmed.
3.Pearl millet (Kambu)	It is taken as gruel form (Kool).	Mooligai,Pg.no:226 Noi Illa neri:Pg.no.209	Umapathy et al., 2022 ⁽²⁰⁾ . Pubmed.
4.Finger Millet (Kelvaragu),	Its flour used to gruel or in a semi-solid form (Kool).	Mooligai,Pg.no:378 Noi Illa neri,Pg.no.210	Shukla K et al., 2014 ⁽²¹⁾ .. Pubmed
5.Wheat (Gothumai),	It is taken as Adai (Pan cake), Gothumai noi kanji	Mooligai:Pg.no.408 Noi Illa neri:Pg.no.209	Afaghi A et al., 2013 ⁽²²⁾ ., Pubmed
6.Little millet (Saamai)	It is taken as Cooked rice form.	Mooligai:Pg no.652 Noi Illa neri: Pg no.201-20.	Kavita B et al., 2015 ⁽²³⁾ . Pubmed

Millets is a good source of other essential protein, fiber, minerals, iron, calcium contributing to overall health and well-being. (Table 4). Millets' high fiber content improves glycemic control and lowers insulin resistance, which aids in PCOS treatment ⁽²⁴⁾. The protein content addresses PCOS-related issues with obesity by aiding in weight control and muscle growth ⁽²⁵⁾. Iron is abundant in millets and is an essential mineral for the synthesis of hemoglobin, the blood's oxygen-carrying protein. Non-heme iron, which is found in millets, is more readily absorbed by the body when eaten with foods high in vitamin C. There is some calcium in millets. Many studies have demonstrated the potential improving effects of calcium on PCOS symptoms such as regularity of menstrual cycles, BMI, insulin resistance and features of hyper androgenism.

Millet's function in the management of PCOS there may be benefits to consuming millet as studies and clinical trials have examined its effect on PCOS symptoms and indicators.

In PCOS patients, millet has been shown to enhance glucose metabolism, reduce insulin resistance, and control insulin levels ^(26,27). Furthermore, millets help lipid profiles by reducing triglyceride and total cholesterol levels ⁽²⁸⁾. These findings emphasize the usefulness of millets as a dietary supplement for the management of PCOS-related metabolic abnormalities.

Dietary Millet and Gut Microbiota

The importance of gut health is becoming more and more recognized as PCOS progresses and is treated. Recent research suggests that dysbiosis, or an imbalance in the gut microbiome, may contribute to the aetiology of PCOS. Because of their prebiotic properties, millet may benefit the metabolic pathways linked to PCOS and maintain a healthy gut flora.

These prebiotics, especially those in finger millet, encourage the growth of the bacteria *Lactobacillus* and *Bifidobacterium*, which have been linked to better glucose metabolism, improved lipid profiles, and increased insulin sensitivity ^(29,30). PCOS may be affected by a balanced gut microbiota supported by a millet diet that reduces inflammation, oxidative stress, and insulin resistance as well as potentially eases hormonal imbalances and metabolic disturbances ⁽³¹⁾.

Millets in a Well-Balanced Diet

PCOS patients can ensure a varied and well-balanced diet by incorporating millet into their diet in a pragmatic manner. There are several types of millets that can be helpful to add to the diet for managing PCOS as per Siddha literature. You can substitute millet for refined grains in traditional dishes like khichdi, pongal, and upma. Using millet flour, make chapatis or pancakes, and flavor and texture soups and salads with millet grains ⁽³²⁾. To create a balanced diet plan, mix millets with lean meats, beans, or lentils as protein sources. In order to give your body, the vitamins and minerals it requires, you should also eat a range of fruits and vegetables ⁽³³⁾. Individualizing care is crucial, accounting for factors such as dietary preferences, cultural norms, and any underlying medical conditions ⁽³⁴⁾. When adding millet to your diet, emphasize the importance of maintaining overall dietary quality and quantity control.

CONCLUSION:

Millets show promise as a novel dietary intervention in PCOS management, with potential benefits in regulating insulin, improving glucose metabolism, and mitigating metabolic disturbances. Siddha dietary regime the wholesome food mentioned in Siddha literature are main key which keeps individual healthy and regulates functions of menstrual disorders. The effectiveness of millet in the treatment of PCOS needs to be established through larger, longer-term trials. More investigation is necessary to fully determine their role and ensure that dietary guidelines include them as much as possible. When it comes to treating PCOS holistically and improving patient outcomes and wellbeing, millets should be taken into consideration by researchers, policymakers, and healthcare professionals.

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