Research Article

TAXONOMIC CHARACTERISATION AND HEALTH BENEFITS OF SELECTED LEGUMES IN KANYAKUMARI DISTRICT

J. S. Jaya* and J. Lohi Das
Scott Christian College, Nagercoil, Tamil Nadu, India.

Abstract
Legumes are grown agriculturally, primarily for their grain seed called pulse, for livestock forage and silage, and as soil enhancing green manure. A legume fruit is a simple dry fruit that develops from a single carpel and usually dehisces on two sides. Legumes are notable in that most of them have symbiotic nitrogen-fixing bacteria in structures called root nodules. For that reason, they play a key role in crop rotation. Legumes are grown well in tropical and subtropical regions. It plays a vital role in human health, it cure so many dangerous diseases like obesity, blood pressure, heart problems and cancer.

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1. Introduction

Legumes are nutritious and economical source for populations of developing countries and play an important role in their diets (Omar et al., 2010). Seed legumes provide one - fifth of all plant proteins consumed by man on a global basis (Arlete Becker et al., 2004). Beans and legumes are commonly found in diets all over the world. High in fiber, calcium, magnesium and iron, beans and legumes are also a great source of protein (Kutos et al., 2002; Smith et al., 2004; Cooket al., 2005). Like other plant-based foods, pulses contain no cholesterol and little fat or sodium (Philip and Mcwatters., 1991; Shiringani and Shimeles, 2011).

Legumes are sometimes referred to as "Green Manure" (Liener, 1985). Many legumes contain symbiotic bacteria called Rhizobia within root nodules of their root systems. These bacteria have the special ability of fixing nitrogen from atmospheric, molecular nitrogen into ammonia (Agbogidi, 2010). Legumes are containing some health protecting compounds (Parul, 2014). The seed is diuretic. It is used strengthen the stomatch (Omaret et al., 2010) and to treat menstruation, epilepsy and chest pain (Nielsen et al., 1993). The seeds are cooked with the roots of the other herbs to treat blood in urine and Biharziasis (Jones et al., 2000). Leaves are applied in burns and can be used as a snuff to treat headaches. Emetics made from the plant are taken to relieve fever (Boulter et al., 1975).

* Corresponding author: J. S. Jaya
Scott Christian College, Nagercoil, Tamil Nadu, India.
2. Materials and Methods

Study Area

Kanyakumari District takes its name from the township of Kanyakumari, the southern tip of India. The district has a favourable agro-climatic condition, which is suitable for various crop legumes.

Collection and Identification of plant samples

Frequent field visits were made in different parts of the study area for identification and collection of legumes. The 13 selected leguminous plants were collected from different agricultural fields of the selected study sites in Kanyakumari District, Tamil Nadu. The cultivators of legumes were consulted to know the common names of the legumes. The collected plants identified by referring the Flora of presidency of Madras (Gamble 1967), 'Flora of Presidency of Bombay’ (Cooke, 1967), Flowering plants of Travancore (RamaRao, 1914), Flora of Nilgris and Pulney Hill tops (Fyson, 1974); Hookers flora of British India (Hooker, 1875).

3. Results

Legumes a common concept

In the present study 13 cultivable varieties of legumes were identified from selected study sites in Kanyakumari district. A legume is a plant in the family fabaceae. Legumes are grown agriculturally, primarily for their grain seed called pulse, for livestock forage and silage, and as soil enhancing green manure. Legumes are notable in that most of them have symbiotic nitrogen-fixing bacteria in structures called root nodules. For that reason, they play a key role in crop rotation.

1. Botanical name: Arachis hypogea, L.

Common name: Pea nut

Peanut, is an herbaceous annual plant, usually erect, thin stemmed plants. Feather-like leaves, leaves are arranged in alternate pairs. The peanut plant produces yellow. The pods can reach up to 10 cm (4 in) in length. The seeds vary from oblong to nearly round, whitish to darkpurple colour.

Medicinal value

Arachis hypogea have antidabetic and anticancer effects. It is aphrodisiac, cholecystosis, decoagulant. It is used in the treatment of inflammation and nephritis, rheumatism, mucorrhagia and arthritic hemorrhages.

<table>
<thead>
<tr>
<th>SI. No</th>
<th>Scientific name</th>
<th>Common name</th>
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<tbody>
<tr>
<td>1</td>
<td>Arachis hypogea L.</td>
<td>Peanut/Groundnut</td>
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<tr>
<td>2</td>
<td>Cajanus cajan (L.) Millsp.</td>
<td>Pigeon Pea</td>
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<td>3</td>
<td>Canavalia ensiformis (L) D.C</td>
<td>Jack bean</td>
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<td>4</td>
<td>Cicer arietinum L.</td>
<td>Chick pea</td>
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<td>5</td>
<td>Cyamopsis tetragonoloba (L) Taub</td>
<td>Guavar bean</td>
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<td>6</td>
<td>Dolichos lablab (L) Sweet</td>
<td>Lablab bean</td>
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<td>7</td>
<td>Glycine max, Wild</td>
<td>Soy bean</td>
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<tr>
<td>8</td>
<td>Macrotyloma uniflorum (Lam) verdc</td>
<td>Horse gram</td>
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<tr>
<td>9</td>
<td>Phaseolus vulgaris L.</td>
<td>Green/Kidency bean</td>
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<td>10</td>
<td>Pisum sativum, L.</td>
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<td>11</td>
<td>Vigna mungo (L) Hepper</td>
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<td>12</td>
<td>Vigna radiata (L), R. Wikzek</td>
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<td>13</td>
<td>Vigna unguiculata (L) Walp</td>
<td>Cow pea</td>
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</table>


Common name: Pigeon pea or Red gram

It is perennial shrub. Stem is slender, highly branched with a woody base. The flowers are produced on racemes of 5 - 10 yellow flowers. Pod is measures about 5 – 9 cm in length. Each pod can contain between 2 and 9 seeds which can be white, cream, brown, colours.
Medicinal value

*Cajanus cajan* is used to treat diabetes, sores, skin, diseases, bedsores, measles, jaundice, dysentery and other illness, for expelling bladder stones and stabilizing menstrual period. The leaf and seed are applied as poultice over the breast to induce lactation.

3. Botanical name: *Canavalia ensiformis* (L.) DC.

Common name: Jack bean

Jack bean is a Vigorous herbaceous annual climber. A plant with a weak stem that derives support from climbing. Flowers are rose, mauve or white with red base, about 2.5 cm long. Pods are variable, sword-shaped, elongate, 30 cm or more long. Seeds are narrowly ellipsoid, white colour.

Medicinal value

*Canavalia ensiformis* is used for animal fodder and human nutrition, it kills intestinal bacteria, and it cures stomach problems.

4. Botanical name: *Cicer arietinum* L.

Common name: Chick pea

The chickpea is a leguminous annual plant. Stems are branched, straight or bending. Small feathery leaves arranged alternately on the stem. Flowers are produced singly or in pairs and can be white, pink, purple or blue in colour. The seed pod is rhomboid or ellipsoid shaped. Pods contain 1-4 cream, brown, green or black seeds.

Medicinal value

*Cicer arietinum* act as antimicrobial, antioxidant, estrogenic and anti-heatolytic activities. It is used to treat kidney stones, increasing sperm count and lactation provoking menstruation and urine.

5. Botanical name: *Cyamopsis tetragonoloba* (L.) Taub.

Common name: Cluster bean.

Cluster bean is a bushy, upright annual herb. Flowers are white or pink. Pods are straight, hairy, pale green and up to 10 cm long. Small oval seeds, 5 mm in length, usually white or gray colour.

Medicinal value

*Cyamopsis tetragonoloba* act as good appetizer, digester and laxative, it is useful in the treatment of dyspepsia anorexia. It has hypolipidemic and anti-hyperglycemic effects.
*Common name:* Papaya bean

It is a novelty garden twining annual vine plant. The vines produce hundreds of spikes of white or lavender flowers. Seeds are variable in size. Colour ranging from white, red, and brown, in colour.

**Medicinal value**

*Dolichos lablab* is used to treat cholera, vomiting, diarrhea. The juice from the pods is used to treat inflamed ears and throats. The seeds are used as an anthelmintic, antispasmodic, astringent, digestive, febrifuge and stomachic. Survey of current literature revealed that *Dolichos lablab* seeds are used in the treatment of type 2 diabetes mellitus.

*Common name:* Soy bean

The soybean plant is usually an erect bush with woody stems. It produces small white or purple flowers, curved seed pods which are 3 - 15 cm (1.2 – 6 in) in length. The seeds can be a variety of colors including yellow, green, brown and black.

**Medicinal value**

*Glycine max* is used to treat Hyperhidrosis, night sweats, confusion, hyper cholesterolemia and joint pain. *Glycine max* has been proved for its liver and gall bladder complaints, anemia, cerebral nerve conditions and general debility.

*Common name:* Horse gram.

Horse Gram grows as an annual climbing plant with an attractive appearance. The stem is slightly hairy. Small yellow flowers grow in clusters from the leaf axils. The flowers are 1.3 cm to 2 cm long. Pods are scimitar-shaped, compressed pods measures around 5 cm in length. The large seeds can be round or slightly flattened in shape. They turn nearly black when dried.

**Medicinal value**

*Macrotyloma uniflorum* is used to treat haemorrhages, tumours, bronchitis, cardiopathy, nephrolithiasis, urolithiasis, splenomegaly, strangury, hiccough, ophthalmopathy, verminosis, and vitiated condition of vata, remove kidney stone, inflammation and liver trouble.
9. **Botanical name**: *Phaseolus vulgaris* L.  
**Local name**: String bean  
The common bean is an herbaceous annual plant. It produces white, pink or purple flowers which are approximately 1 cm (0.4 in) in diameter. The pods are 8 - 20 cm (3.1–7.9 in) long and 1-1.5 cm (0.4 – 0.6 in) wide which can range in color from green to yellow or black to purple. Seeds are smooth, plump, kidney-shaped, often mottled in two or more colours.

**Medicinal value**  
*Phaseolus vulgaris* seeds exhibit different biological activities like enhancement of the bifidogenic effect, antioxidant, anticarcinogenic antidepressant, antibacterial and antitubercular, estrogenic, etc. *Phaseolus vulgaris* seeds have an important place in the folk medicine of the traditions of many cultures because of their pharmacotherapeutic effects.

10. **Botanical name**: *Pisum sativum* L.  
**Common name**: Pea  
Pea is an annual herbaceous legume. Slender stems which attach to a substrate using tendrils. The plant produces white, red or purple flowers, swollen or compressed green seed pods which can be straight curved. The pods can range in size from 4 to 15 cm long and 1.5 - 2.5 cm wide. Pod contains between 2 and 10 seeds.

**Medicinal value**  
*Pisum sativum* act as antioxidant, anti-inflammatory and it restrict linoleic acid oxidant. It is used to treat anaemia.

11. **Botanical name**: *Vigna mungo* (L) Hepper.  
**Common name**: Black gram  
Black gram is an herbaceous annual plant. Stem is erect or ascending. Flowers are axillary clusters or few flowered. Pods are hairy, 3 - 10 seeded. Seeds are ovoid to round in outline, Seed reniform, Seed surface smooth. Seeds are olive brown or black.

**Medicinal value**  
*Vigna mungo* is used as astringent. It reduces high blood pressure or hypertension and erectile dysfunction, increasing body bulk and body energy level. It increases sperm count and sperm motility.

12. **Botanical name**: *Vigna radiata* (L.) R. Wikzek.  
**Common name**: Green gram  
Green gram is a Climbing or erect herb. Flowers are axillary, many flowered, greenish yellow, Vexillum 1.2 cm long. Pods are 4-9 cm long, linear-cylindrical, 5 - 6 mm broad some what constricted between the seeds, pubescent, hairs spreading, dark brown, 8 - 14 seeded, globose sometimes wrinkled.
Medicinal value

*Vigna radiata* act as antioxidant and antimicrobial activity, it kills food spoilage bacteria.

Local name: Cow pea

Cow pea is a climbing annual plant. The plant produces clusters of flowers. The seed pods are smooth, cylindrical and curved, reaching up to 35 cm (10 in) in length. The seeds can be white, cream, green, red brown or black in colour.

Medicinal value

*Vigna unguiculata* exhibit a number of other biological activities, including effects on cellular signaling and the prevention of infertility in animals, and are believed to play a preventive role in diseases associated with oxidative stress like cancer, cardiovascular diseases, cataracts, age-related macular degeneration, central neurodegenerative diseases and diabetes mellitus.

4. Discussion

Legumes are the simple crop plants but its beneficial role is lot. It is normally used as food, but indirectly treats so many harmful diseases. This includes the soybean, chickpea, bean, and pea, among others (Morris, 2003). Present investigation shows each and every variety of legumes seed size and colour varied. Seed color and seed size are two traits that impact acceptance in the human edible market. The crude protein content of field pea may vary due to the influence of variety and environment (Bajpai *et al*., 2005). Legumes are excellent sources of protein, low-glycemic index carbohydrates, essential micronutrients, and fiber. Substituting legumes for food that are high in saturated fats or refined carbohydrates are likely to lower the risk of cardiovascular disease (Liener, 1985). Although, legumes are rich in a number of compounds that could potentially reduce the risk of certain cancers (Graham and Vance, 2003).

The cooking of the seeds of cowpea with spices is considered to be a potential remedy for common cold (Tresina *et al*., 2010). Cowpea starch jelly is used against thirst (Shetty 1997). The leaves and seeds are applied as a poultice to treat swellings and infections, leaves are chewed to treat tooth ailments, powdered carbonized seeds are applied on insect stings, the root is used as an antidote for snakebites (Singh *et al*., 1997).

*Phaseolus vulgaris* is gaining increasing attention as a functional or nutraceutical food, due to its rich variety of phytochemicals with potential health benefits. *Phaseolus vulgaris* seeds have a pharmacotherapeutic effects (Hangen and Bennink, 2002; Mishra *et al*., 2010), antioxidant (Heimler *et al*., 2005); anticarcinogenic (Hangen and Bennink, 2002), estrogenic, antidepressant and antibacterial and antitubercular (Pradeep Kumar *et al*., 2014).

The seeds of *Vigna unguiculata* are sweet and they have astringent, laxative, diuretic, anthelmintic, antibacterial and galactogogue properties. The seeds also help in relieving the condition like anorexia, jaundice and general debility (Sandeep, 2014). The stem of *Dolichos lablab* is used for the treatment of cholera, vomiting, diarrhea. The juice from the pods is used to treat inflamed ears and throats (Kamachi,
1997). *Vigna mungo* is used in traditional Indian medicine. Plant extracts have demonstrated to possess immunostimulatory activity (Tresina et al., 2010).

*Macrotyloma uniflorum* has been used in traditional system of medicine for treating haemorrhoids, tumours, bronchitis, cardiopathy, nephrolithiasis, urolithiasis, splenomegaly, strangury, hiccough, ophthalmopathy, verminosis, and vitiated condition of vata, remove kidney stone, inflammation, liver trouble (Priyanga et al., 2014).

*Cajanus cajan* has been used in the management of pains in traditional chinese medicine and as a sedative (Sahu et al., 2014). It has been used widely for many years for treating diabetes, sores, skin, bedsores, measles, jaundice, dysentery and other illness, for expelling bladder stones and stabilizing menstrual period (Raveena Devi et al., 2016). The leaf and seed are applied as poultice over the breast to induce lactation (Sahu et al., 2014).

5. Conclusion

Green vegetation is the primary replenishable source of food in the world. Legumes seeds are important sources of nutrients and can serve as high quality dietary protein sources to meet nutrient requirements. The present studies highlighted the taxonomical charecters and medicinal values of leguminous plants present in the study area. Legumes are rich in a number of compounds that could treat various diseases and enhance human life.

6. References


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