

A Review on The Phytochemical and Pharmacological Properties of The Ayurvedic Drug Vayugulika

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ABSTRACT

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Plants are very useful source of various bioactive compounds which have direct or indirect use in the treatment of various human ailments from the time immemorial, human civilization have been exploring and using various plants and plant products to cure the deadly diseases. Vayugulika is a medicine is formulated based on Kerala Ayurveda practice. It is used in treating indigestion, anorexia, hicup. Cold, cough, rhinitis, asthma and bronchitis Colic abdominal pain. Sprain, convulsions, epilepsy and nerve disorders. It is used as adjuvant along with other Ayurvedic medicines in wide variety of diseases. The phytomedicines are safe and environmental friendly. Infact many indigenious and local communities are immense reservoirs of traditional knowledge that can benefit biotechnology, agriculture, pharmaceutical development and health care. The present study intends to provide an overview of the phytochemical constituents present in the Ayurvedic medicine Vayugulika with special emphasis on their pharmacological action.

Keywords : Vayugulika, Ayurveda, Pharmacological property.

I. INTRODUCTION

Vayugulika is an Ayurvedic medicine used mainly in digestive and respiratory diseases. It is in tablet form. This medicine is formulated based on Kerala Ayurveda practice. It is also known as Kashthoryadi Gulika. This contains ingredients of herbal and mineral origin. The main indication of this medicine is Vayu Roga. It is administrated along with cumin seed decotion, Bhadrveradi kashayam or Nayopayam kashayam. It is used in treating indigestion, anorexia, hicup. Cold, cough, rhinitis, asthma and bronchitis Colic abdominal pain. Sprain, convulsions, epilepsy



and nerve disorders. It is used as adjuvant along with other Ayurvedic medicines in wide variety of diseases. This medicine should only be taken strictly under medical supervision. In some people, if it is taken before food, it may cause gastric or stomach discomfort. Such a side effect can be overcome by taking it after food and drinking one cup of water. Special care is required while administrating this medicine to children and pregnant ladies. Men seeking infertility treatments better avoid this medicine, since it contains kshara as ingredient, which may harm wealthy and quantity of sperm.



Vayugulika is used in treating indigestion, anorexia, hiccups, cold, cough, asthma, bronchitis, colic abdominal pain, sprain convulsions, epilepsy, and nervous disorders. It is used as adjuvant along with other ayurvedic medicine in wide variety of diseases. Bio medical actions are, removes excess mucus from the body, anti-inflammatory, reduces inflammation by acting on body mechanisms, antispasmodic, relieves spasm of involuntary muscles. The present study intends to provide an overview of the phytochemical constituents present in the Ayurvedic medicine Vayugulika with special emphasis on their pharmacological action. Natural products are increasingly purported to exert potent beneficial actions to support health and may thus play a role in reducing synthetic drug use for the treatment of metabolic complications. This has lead to the identification and isolation of compounds from




natural products with antioxidant activity against metabolic syndrome (Ghilani, 2005). The present study intends to provide an overview of the phytochemical constituents present in the Ayurvedic medicine Vayu gulika with special emphasis on their pharmacological actions.





II. METHODS AND MATERIAL




The present survey was carried out to get information about the medicinal plants used in the Ayurvedic drug “vayugulika”. The informations were collected from ayurvedic medical practitioners and literature. So this study was aimed to know about the plants and plant parts used, and the phytochemicals responsible for pharmacological effects.




Sr.No.	PLANT	DESCRIPTION	PART USED
1	CINNAMOMUM ZEYLANICUM 	The plant hardly reaches to a height more than 30 feet and is bushy. Leaves of the plant are dark green, ovate and deeply veined. The flowers of the plant are small and yellowish to white coloured with unpleasant odour and usually grow in bunches. The tree bear dark purple berries. The fruit is oval shaped and holds seeds in it. The bark of younger tree is smooth and pale while bark of older tree is brittle rough and brownish.	Stem bark Leaf
2	ELETTARIA CARDAMOMUM 	Cardamom is an herbaceous perennial grown for its fruits. It is a clumping plant, shoots between 10 and 20 arising from the rhizome. The shoots are actually pseudo stems composed of overlapping leaf sheaths. There are several additional flowering shoots. The leaves are lanceolate and dark green in colour. The plant produces flowers on a long drooping pannicle and a capsule like fruit which is green or yellow in colour. The fruit contains 15 – 20 aromatic seeds. Cardamom reaches to a height of 5m and has an economic life span of 10 – 15 years.	Fruit (Seed)





Sr.No.	PLANT	DESCRIPTION	PART USED
3	PIPER NIGRUM 	<p>It is a spreading vine, rooting readily where trailing stems touch the ground. The leaves are alternate, entire; 5 to 10 cm long and 3 to 6 cm across. The flowers are small, produced on pendulous spikes 4 to 8 cm long at the leaf nodes, the spikes lengthening up to 7 to entire as the fruit matures. Pepper can grow in soil that is neither too dry nor susceptible to flooding. A single stem bears 20 to 30 fruiting spikes. The harvest begins as soon as one or two fruits at the base of the spikes begin to turn red.</p>	Fruit
4	PIPER LONGUM 	<p>The plant is slender, glabrous climber or creeping shrub that spreads on ground striking roots at each node. It produces two distinct dimorphic branches-vegetative main branches that creep on ground; and erect growing reproductive axillary branches. The plant flowers throughout the year and is dioecious in nature with the male and female flowers produced on different parts. Inflorescence is spike, about 35 mm long and 5 mm thick, composed of large numbers of minute greyish green or darker grey fruits, which together with the bracts that support them are embedded in the elongated axis and the whole being covered with greyish dust.</p>	Fruit

5	<p>ZINGIBER OFFICINALE</p> 	<p>Ginger is a herbaceous perennial which grows annual pseudo stems about a meter tall bearing narrow leaf blades. The stems are upright and leaves are narrow medium green leaves arranged in two ranks on each stem. The plant gets about 4 feet tall with wide and long leaves. Ginger grows from an aromatic tuber like rhizome which is warty and branched. The inflorescence grows on separate stem from the leaf stem and forms a dense spike, up to 3 inch tall. Flowers are small and are yellow green in colour.</p>	Rhizome
6	<p>ACONITUM FEROX</p> 	<p>It is a plant with tuberous root, and is also a herbaceous perennial reaching 1 m tall and 0.5 m wide. It is a principal source of Indian poison. The leaves are scattered, ovate – reniform and the flowers are blue in colour with purple veins, arranged in terminal racemes. The plant has paired tuberous roots with conical and elongated daughter tubers. The fruit is capsule, composed of five follicles and bears numerous seeds. It is a poisonous herb but when used in purified form in small quantities it has many health benefits.</p>	Tuberous root
7	<p>MYRISTICA FRAGRANS</p> 	<p>The Nutmeg tree has natural conical shape with a grey – brown trunk and dark green glossy leaves. The branches of the tree spread in whorls and leaves are oval or lanceolate in shape. Leaves are arranged alternately on the branches and are smooth and lighter in colour on the underside. Tree produces cluster of male flowers while female flowers exist solitary or in a cluster of three. It is dioecious. Fruit is rounded and fleshy. The ripe fruit splits to expose a single glossy purple – brown nut enclosed by scarlet aril.</p>	Seed / Leaves
8	<p>MALLOTUS PHILIPPENSIS</p>	<p>Trees are small to medium sized monoecious in nature . They grow up to 25 m in length and with a bole up to 50 cm in diameter. Branchlets are reddish brown. Leaves are alternate and simple and appear to</p>	Fruit

		be ovate to lanceolate, cuneate to rounded with two glands at base. Leaves are mostly acute at apex, hairy and reddish, petiole 1 – 4 cm long, puberulous. Male flowers are terminal and axillary in position and 2 – 10 cm long. Fruit is a depressed globose, 3 – lobed capsule; stilate puberulous with abundant orange or reddish granules. Seeds are black in colour.	
9	ANACYCLUS PYRETHRUM 	The stems lie on the ground, and rise erect towards ends. Each of the stem bears one large flower at branch ends, with yellow coloured disk, white coloured rays and tinged with purple beneath. Leaves are alternate, smooth and pinnate. They are pale green in colour with deeply cut segments. The root is somewhat cylindrical in shape and slightly twisted. The roots are often crowned with a cluster of grey hairs. They are of brown colour with bright black coloured spots on it.	Root
10	CINNAMOMUM CAMPHORA 	Karpura is a small, glabrous, broad leaved tree , grow up to 40m with a broad sweeping crown, has diameter up to 3m. Bark of the plant is yellow brown colour with rough surface. Trunk of the plant can grow up to 8m long and 2m wide. Leaves of the plants are dark to light green colour with glossy light colour veins. Leaves can vary in shape. The leaves grow alternately on twigs. Flowers are bisexual and white in colour. Fruits are in the form of dark blueberries and are very small.	wood
11	ACORUS CALAMUS 	Vacha has strong aromatic roots and long lesser aromatic leaves. The aroma is used for making perfumes. It is a soft plant of 2 - 4ft height. Green coloured leaves with wavering edges are 2 – 3ft long and 1 inch in breadth. Flowers are small, dense and whitish in colour. Fruits are pulpy with numerous seeds. Its underground hairy and brownish root resembles to ginger rhizome. Leaves and roots of this plants are aromatic. Plant with very strong aroma is considered to be the best quality.	Rhizome

12	<p>BERBERIS ARISTATA</p> 	<p>The plant is 2 - 3m in height. It is a woody plant with bark that appears yellow to brown from outside and deep yellow inside. The bark is covered with three branched thorns, which are modified leaves and can be removed by hand.</p> <p>The leaves are arranged in tufts of 5- 8 and 4.9cm long and 1.8cm broad. The leaves are deep green dorsally and light green ventrally. Leaves show pinnate venation. Flowers are yellow and are 1.2cm in a racemose inflorescences with 11 – 16 flowers arranged along a central stem. The plant produces bunches of succulent acidic and edible berries which are bright red or pink in colour and 7mm long, 4mm diameter and weigh 227mg.</p>	Stem, Fruit
13	<p>SYZYGIUM AROMATICUM</p> 	<p>The clove tree is an evergreen tree that grows up to 8 – 12m tall, with large leaves and crimson flowers grouped in terminal clusters. The flower buds initially have a pale blue colour, which gradually turn green, then transition to a bright red when ready for harvest. Cloves are harvested when they become 1.5 - 2cm in length, consisting of a long calyx that terminates in four spreading sepals and four unopened petals that form a small central ball.</p>	Flower buds
14	<p>CUMINUM CYMINUM</p> 	<p>Cuminum cyminum is a small annual herb which grows up to 30 – 50cm in height. Its leaves are alternate, compound. The leaves are 5 - 10cm long and stem has grey or dark green colour. The flowers are small white, found in compound umbrella – like clusters.</p> <p>The flowers have both male and female structures together and an inferior ovary develops into fruit. Fruits are greenish turns grey when ripe, tapering towards both ends, having 4 - 5mm length, covered with pappus hairs. These grain like fruits are called the seeds, the true seeds are within them and come out during germination through disintegration</p>	Seeds

		of fruit wall.	
15	NIGELLA SATIVA 	The flowers are delicate, and usually coloured pale blue and white, with 5 – 10 petals. The fruit is large and inflated capsule composed of 3 – 7 united follicles, each containing numerous seeds which are widely used as spices. The flowers are hermaphrodites and are pollinated by bees. Plant also has developed tap root.	Seed
16	ASPARAGUS RACEMOSUS 	<i>Asparagus racemosus</i> is a herb common throughout Nepal, Sri Lanka, and Himalayas of India. It grows 1 - 2m tall and prefers to take root in gravelly, rocky soils high up in Piedmont plains at 1300 - 1400m elevation. The plant is considered as an 'endangered' one in its natural habitat due to habitat destruction. Leaves are reduced to minute scales and spines. It has adventitious root system with tuberous roots that measure about 1m in length, tapering at both ends. It produces minute, white flowers on short, spiky stems and fruits are blackish-purple globular berries.	Root
17	VANDA ROXBURGHII 	<i>Vanda roxburghii</i> is native to Uttar Pradesh and West Bengal and widely found in the southern states of India. It is an epiphyte orchid with special whitish grey coloured velamen roots for the absorption of water. Leaves are succulent, 15-20cm long, linear. The flowers are in 6 – 10 flowered racemes. Sepals are tessellated with brown lines and white margins. Petals are yellow with brown lines and white margins shorter than sepals. Lips are bluish, dotted with purple and side lobes rising from the mouth of the spur. Fruits are capsules which are narrowly clavate – oblong with acute ribs and shorter pedicel.	Roots, Leaves
18	TRACHYSPERMUM ROXBURGHIANNUM	<i>Trachyspermum roxburghiannum</i> is a flowering plant that grow extensively in South Asia, Southeast Asia and Indonesia. It is a plant with lots of medicinal properties and is an	Dried fruits

		active ingredient of several herbal medicines. Ayamodakam is an erect, branched annual herb, 0.5 – 3 feet tall. Stems are longitudinally triped. Leaves are double – compound, with linear segments. Flowers occur in compound umbels. They have rounded white or pink petals. Fruits are ovoid and yellowish. It is a very strong spice, with a characteristic smell similar to parsley. Flowering occurs from December to February.	
19	GLYCYRRHIZA GLABRA 	The plant grows to 1m in height, with pinnate leaves about 7 - 15cm long, with 9 – 17 leaflets. The roots are stoloniferous. The flowers are 0.8 – 1.2cm long, purple to pale whitish blue, produced in loose inflorescences. The fruit is an oblong pod, 2 - 3cm long, containing several seeds.	Roots / Stolon
20	PIPER CUBEBA 	Stem is jointed and roots arise from joints. The leaves are 4 – 6.5 inch long and 1.5 – 2 inch broad, ovate, oblong; long pointed and very smooth. Flowers are arranged in narrow spikes at the end of branches. Fruit is wrinkled, rounded, light brown to dark brown and have a long stalk. Pericarp is red to slightly brown, testa are found to fuse with pericarp, fruit is hard and has stony albumen which is white and oily. It has got a characteristic taste, that is slightly bitter and a pungent odour.	Fruits
21	HORDEUM VULGARE 	Fruits are caryopsis, elliptic, oblong, ovoid and tapering at both ends, dorsally compressed and flattened on the sides with a shallow longitudinal furrow, ridged having shallow depression between them; grains tightly enclosed and adhering to the lemma and palea.	Husk

III. RESULTS AND DISCUSSION

PLANT	FAMILY	PHYTOCHEMICAL	PHARMACOLOGICAL PROPERTY	REFERENCES
CINNAMOMUM ZEYLANICUM	LAURACEAE	Phytosterols, Tannins, Flavonoids, Saponins, Alkaloids, Glycosides, Terpinoids	Antimicrobial, Antidiabetic, Antioxidant, Anti inflammatory, Antifungal	Pandey and Gupta (2014)
ELETTARIA CARDAMOMUM	ZINGIBERACEAE	Alkaloids, Glycosides, Terpinoids, Steroids, Proteins, Carbohydrates Phenolic compounds	Antioxidant, Antimicrobial, Anti asthmatic, Anti inflammatory	Sivapala and Jeyadevan (2012) Chang et al., 2001
PIPER NIGRUM	PIPERACEAE	Amides, Piperidines, Pyrrolidines, Saffrole	Antimicrobial, Antibacterial, Antioxidant, Anti inflammatory	Kehimkarl, (2000) Pundir et al., (2010)
PIPER LONGUM	PIPERACEAE	Volatile oils, Starch, Proteins Saponins, Carbohydrates, Piperine, Piper logumine	Immuno modulatory effect, Hypocholesterolaemic, Anti asthmatic, Anti amoebic	Kehimkarl, (2000) Pundir et al., (2010)
ZINGIBER OFFICINALE	ZINGIBERACEAE	Alkaloids, Carbohydrates, Glycosides, Proteins, Saponins, Steroids, Flavonoids	Anti microbial, Antioxidant, Anti tumour, Anti diabetic, Anti emetic, Anti inflammatory	Chrubasik et al., (2005) Hassan(2012) Sahid, 2009 and Shirazi, 2007 Pandey and Gupta, 2014 Baliga and Latheef, 2013
ACONITUM FERROX	RANUNCULACEAE	Toxic alkaloids, Pseudoaconitin, Indaconitine, isoquinoline	Antibacterial, Antioxidant, Anti pyretic, Anti hypertensive, Nephroprotective, Anti inflammatory	Rani et al., 2013 Pieters and Vielentick, 2005
MYRISTICA FRAGRANS	MYRISTICACEAE	Limonene, Saffrol, Sabinene	Antioxidant, Antimicrobial, Antibacterial, Hypoglycemic	Krishnakumari and Thomas (2015) Ameen (2012)
MALLOTUS PHILIPPENSIS	EUPHORBIA CEAE	Amino acids, Flavonoids, Proteins, Saponins, Steroids, Tannins, Terpinoids	Anti microbial, Anti oxidant, Anti viral, Immunoregulatory, Anti inflammatory	Mital Patani et al., (2011)

ANACYCLUS PYRETHRUM	ASTERACEAE	Steroids, Triterpinoids, Alkaloids, Flavonoids, Saponins, Tannins	Anti microbial, Anti bacterial	Hanane et al., (2014) Tyagi and Ashim, 2011 Sujith and Ronald, 2011. Shivakumar, 2010
CINNAMOMUM CAMPHORA	LAURACEAE	Cineol, Pinene, Thymol, Terpineol, Menthol, Terpinoids	Antioxidant, Anti inflammatory, Tyrosinase inhibition	Edeoga, 2005
ACORUS CALAMUS	ACORACEAE	Asarone, Calacone, Acorin, Starch, Tannins	Antidepressant, Antihypertensive, Anti diarrhoeal, Antibacterial, Antifungal	Manikandan, (2005) Arinathan et al., (2003)
BERBERIS ARISTATA	BERBERIDACEAE	Alkaloids, Steroids, Flavonoids, Terpinoids, Glycosides, Saponins	Antihepato toxic, Anti lipidemic, Antibacterial, Antioxidant	Miana (1973) Sahid, (2009)
SYZYGIUM AROMATICUM	MYRTACEAE	Eugenol, Tannins, Flavonoids, Triterpinoids, Rahmnetin, Eugenyl acetate	Antibacterial, Antifungal, Anti thrombotic, Anesthetic, Anti inflammatory	Ghilani, 2005
CUMINUM CYMINUM	APIACEAE	Cumin aldehyde, Cymene, Terpinoids	Antimicrobial, Antioxidant, Effect on platelet function, Analgesic activity	Gohari and Saeidnia (2011) Shivakumar, 2010
NIGELLA SATIVA	RANUNCULACEAE	Thymoquinone, Dithymoquinone, Thymohydroquinone	Antioxidant, Analgesic, Hypotensive, Gastrointestinal, Antimicrobial	Khare (2004) Kris-Atherton (2002) Pund (2000) Chowdhury, (1998)
ASPARAGUS RACEMOSUS	LILIACEAE	Phytosterol, Triterpinoids, Flavonoids, Glycosides, Fatty acids, Saponins, Tannins	Antibacterial, Antimicrobial	Marinova et al., 2005
VANDA ROXBURGHII	ORCHIDACEAE	Alkaloids, Terpinoids, Flavonoids, Phenols, Tannins, Steroids	Antipyretic, Antioxidant, Antibacterial, Antifungal, Antiulcer	Simmler, (2010)
TRACHYSPERMUM ROXBURGHIANUM	APIACEAE	Alkaloids, Flavonoids, Steroids, Tannins, Phenolic compounds	Antioxidant, Antihypertensive, Antimicrobial, Antispasmodic, Broncho dialating activities	Mathew, 2008 Shirazi., (2007)

GLYCYRRHIZA GLABRA	FABACEAE	Alkaloids, Glycosides, Carbohydrates, Flavonoids, Saponins, Proteins, Steroids, Sterols, Lipids	Antidepressant, Antimicrobial, Antioxidant, Antiulcer, Anti inflammatory, Antidiabetic, Hypolipidemic	Shirazi, (2007) Asif and Khodadadi, 2013 Gohari and Saeidnia, (2011)
PIPER CUBEBA	PIPERACEAE	Alkaloids, Monoterpenes, Sesquiteroenes, Oxides	Antioxidant, Antimicrobial, Hepato protective, Nephro protective, Anti inflammatory	Prajapati, 2003; Khare, 2004 Ullah et al., 2014
HORDEUM VULGARE	POACEAE	Proteins, Phenolics, Carbohydrates, Flavonoids, Tannins, Alkaloids, Glycosides	Glucose maintenance, Anti alpha amylase activity, Antidiabetic	Kris-Atherton (2002) Sujith and Ronald, 2011 Tadeusz Aniszewski, 2007

IV.CONCLUSION

The plant constituents used in the ayurvedic drug Vayugulika are immensely rich in several phytochemical compounds that show various pharmacological activities. Medicinal plants contains a variety of compounds such as alkaloids, tannins, flavonoids, phenols etc which might be responsible for the bacteriostatic and antimicrobial activity and therefore it is widely used in the treatment of urinary tract infections. They contain a number of bioactive compounds such as flavonoids which is responsible for its antibacterial and antioxidant property. Antioxidants are part of the body's defence system against free radical attack. It is also involved in the prevention of cellular damage which leads to pathways of aging and cancer.

The phytochemicals posses a wide range of medicinal properties, which may help in protection against various diseases. Flavonoids act as antioxidants, alkaloids protect against chronic diseases, saponins protect against hypercholesterolemia and steroids terpenoids show analgesic properties. Phytochemicals have an important role in preventing chronic diseases like cancer, diabetes and coronary heart diseases.

There are a number of clinical studies suggesting that the flavonoids are the main factors for the observed efficacy of these foods in reducing the incidence of chronic diseases including heart disease and some cancers. The present survey is a brief review of the promises plant polyphenols, bioactive components of our food, hold for the future.

The terpenoids display a wide range of biological activities against cancer, malaria, inflammation, and a variety of infectious diseases (viral and bacterial). Epidemiological and experimental studies suggest that mono-, di- and tri-terpenoids may be helpful in the prevention and therapy of several cancers, including mammary, skin, lung, for stomach, colon, pancreatic and prostate carcinomas.

So the medicinal properties of these plants can be attributed to its variety of active phytochemical constituents. Although these plants had received interest for the phytochemical investigations since many years, more work has to be done on its isolation and characterization. The results of this study may also be of commercial interest to research institutes and pharmaceutical industries in the development of

new drugs. So characterization and isolation of the active chemical components possessed by these traditional plants for further study may lead to the development of a potential drug that may treat various kinds of infections and may lead to full utilization by the local community.

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