

# A Study On Medicinal Plants Used In 'Karkidaka Kanji': The Ayurvedic Medicine

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## ABSTRACT

'Karkidaka kanji' is an ayurvedic medicine and is advised to take during the month of 'Karkidaka' (July- August) in the Malayalam calendar. People of Kerala practices this as a health tonic. It provides a wide range of health benefits due to the medicinal properties of its ingredients. 'Karkidaka kanji' is a rice gruel made of Njavara along with few herbs and spices like *Boerhaavia diffusa*, *Ciccus quadrangularis*, *Cuminum cyminum*, *Elettaria cardomomum*, *Sida cordifolia*, *Syzygium aromaticum*, *Trachispermum ammi*, *Trigonella foenum graecum* and *Strobilanthes ciliates*. This work reviews and discuss the medicinal values of ingredients of this traditional ayurvedic medicine and also analyse why it is advised to take during the month of 'Karkidaka.'

## Objectives:

- ✓ To investigate the medicinal properties of herbs and spices used in the preparation of 'karkidaka kanji' which are responsible for the health effects.
- ✓ To analyse why this ayurvedic medicine is advised to take during the month of 'Karkidaka'.

**Methodology:** This study has developed as a descriptive one. Journals, magazines, newspapers were used as a secondary source of data collection. The present study focus on the analysis of medicinal properties of herbs and spices used as ingredients in 'Karkidaka kanji'.

**Keywords :** Karkidaka kanji, ayurvedic medicine, medicinal plants, medicinal properties

## I. INTRODUCTION

The month of 'Karkidaka', is one of the months in the Malayalam calendar. The Malayalam month, 'Karkadaka' falls between July- August. According to the ayurvedic teachings, the month is the time when the Earth, air and water get contaminated due to climatic changes. During this season, our digestive system may get weaker due to the weak digestive power and turbid atmospheric water. As a result, toxins will accumulate in the body. So the people of Kerala practices the 'Karkidaka kanji' also known as 'marunnu kanji' or 'oushadha kanji', which serves as a health tonic. It provides a wide range of health benefits due to the medicinal properties of its

ingredients. The 'kanji' is a unique combination of herbs, grains and spices. This work gives information on medicinal plants used in 'Karkidaka kanji' and it also elucidate the medicinal properties of the ingredients.

### Herbs and spices used as ingredients of 'Karkidaka kanji'

Njavara rice (*Oryza sativa*), *Boerhaavia diffusa*, *Ciccus quadrangularis*, *Cuminum cyminum*, *Elettaria cardomomum*, *Sida cordifolia*, *Syzygium aromaticum*, *Trachispermum ammi*, *Trigonella foenum graecum*, *Strobilanthes ciliates*

## Medicinal properties of herbs and spices used in

### Karkidaka kanji:

#### 1) Njavara rice (*Oryza sativa*)

Njavara is an endemic cultivar of Kerala and is considered as a medicinal rice. It is an ingredient of many ayurvedic formulations and has varied medicinal and therapeutic applications due to its unique nutrient composition and physicochemical properties.

Attempts to reveal the bio-active compounds are not completely accomplished till today. Deepa G. *et al.*, 2008 reported that, Njavara rice consists of 73% carbohydrates, 9.5% protein, 2.5% fat, 1.4% ash and 1628 KJ per 100g of energy. Njavara rice had 16.5% higher protein and contained higher amounts of thiamine (27-32%), niacin (2-36%) and riboflavin (4-25%) compared to IR 64 and Jyothi, the non-medicinal rice varieties. So it is an excellent source of carbohydrate, rich in proteins, vitamins and minerals. The total dietary fibre content in Njavara was found to be 34-44% higher than that of IR 64 and Jyothi. Significantly higher phosphorus, potassium, magnesium, sodium and calcium levels were found in Navara rice, compared to the other two varieties. According to the comparative study of black glumed Njavara variety and the yellow glumed Njavara variety by Menon and Potty., 1997 the free amino acid content of black glumed variety and yellow glumed variety are 0.316mg/g and 0.089 mg/g respectively. Black glumed Njavara contained with amino acids DL-2 -amino-n-butyric acid and DL iso-leucine while, golden yellow glumed Njavara contained L-Histidine monochloride, L-ornithine monochloride and DL-isoleucine.

Investigation on anti-cancerous property of Njavara rice is actively going on. Molecular studies conducted from the Kerala Agriculture University on Njavara rice has revealed the presence of Bowman-Birk Inhibitor (BBI) protein in Navara, which is effective especially against breast cancer. (T Ramavarman. *The Hindu*-Aug 15, 2007)

Rice bran methanolic extract from Njavara showed the highest antioxidant and cell cytotoxic properties compared to the other three rice varieties such as Vasumathi, Yamini and Jyothi. The crude methanolic extract from Njavara rice bran contains significantly high polyphenolic compounds with superior antioxidant activity. (Rao *et al.*, 2010)

Leena Kumari S., 2010, reported that the Njavara grains are diuretic, carminative and anti-dysenteric. Application of Njavara rice paste is found effective for swelling in foot and it also reduces pain of snake bites. It is recommended for acute complaints of piles and for diabetic patients.

#### 2) *Boerhaavia diffusa*

The physicochemical properties of leaves of *B. diffusa* showed moisture content 84.5 %; protein 6.1 %; fat 0.9 %; carbohydrates 7.2 %; minerals 1.3g/100g; calcium 667.0; phosphorus 99.0; iron 18.4; vitamin C 27 mg/100g and energy 61 Kcal/100g. The roots are rich in proteins and fats. The herb contains 15 amino acids, including 6 essential amino acids and the root contains 14 amino acids, including 7 essential amino acids. (Agarwal R.R *et al.*, 1936) Major amino acids are alanine, arginine, aspartic acid, glutamic acid, leucine, methionine, ornithine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, asparagine and glycine. The plant contained large quantities of potassium nitrate and other potassium salts, besides the water soluble alkaloid punarnavine. (Chopra R.N *et al.*, 1923)

Plant extracts of *B. diffusa* showed significant immunomodulatory, immunosuppressive and anti-lymphoproliferative activities. Pharmacological studies reported that, it possesses diuretic and anti-inflammatory activities. It also exhibited anti-diabetic, anti-fibrinolytic, analgesic and antioxidant activities. However, there is only a minimal knowledge available of its uses traditionally in tumors or cancers, experimental results revealed that the plant *B. diffusa* has significant cytotoxic activity against tumor cells,

which should be further studied. It also gives protection in radiation induced damage. Various studies reported that the plant shows immunosuppressive and immunomodulatory activities. (Mungantiwar A. A *et al.*, 1999)

### 3) *Ciccus quadrangularis*

Phyto-chemical compounds which functions as the active constituents includes triterpenes,  $\alpha$ - and  $\beta$ -amyriins,  $\beta$ -sitosterol, ketosteroids, phenols, tannins, carotene and vitamin C. Several other constituents such as flavonoids quercetin and kaempferol, stilbene derivatives, quadrangularins A, B, C etc are present. Several other constituents such as resveratrol, piceatanon, pallidol, perthenocissi and phytosterols have been isolated from plant. Stem extract showed a high percentage of calcium and phosphorus which are essential for bone strength. (Sah *et al.*, 2011)

In traditional systems the roots and stems of *C. quadrangularis* are mostly used for healing fracture of the bones. In Ayurvedic practices the plant has been documented for the treatment of osteoarthritis, rheumatoid arthritis and osteoporosis. (Yoganarisimhan S N., 2000) Asolkar LV *et al.*, 1992 reported that the plant is useful against helminthiasis, anorexia, dyspepsia, skin diseases, leprosy, hemorrhage, epilepsy, convulsion, haemoptysis, tumors, chronic ulcers, swellings. The stout fleshy quadrangular stem is traditionally used for treatment of gastritis constipation, eye diseases, piles and anemia. Methanol extract of the plant showed analgesic, anti-ulcer and anti-inflammatory potentials due to the presence of flavonoids. It was found that the methanol extract of *C. quadrangularis* showed strong anti-oxidant activity due to the presence of  $\beta$ -carotene. (Murthy K N C *et al.*, 2003)

### 4) *Cuminum cyminum*

The cumin seeds contain carbohydrate (32%), aldehyde (60%) fats(74%), fibers(26%), amino acids, flavonoids, glycosides (22%), volatile oil (2-5%) and

the yellow colored fresh oil contains cuminaldehyde as its chief component. Vanilin and anethole are also present. (El- Kani M *et al.*, 2007) The nutritional profile of cumin indicates that, it is rich in iron, copper, calcium, manganese, selenium, zinc, potassium and sodium. The antioxidant activity of cumin oil is because of the presence of monoterpene alcohols, flavonoids and other poly-phenolic molecules. Anti-oxidant activity of many vitamins also enhances the nutritional quality of cumin seeds. For example, vitamin B-complex, thiamine riboflavin, niacin, pyridoxine, folic acid, vitamin E, vitamin A, vitamin C and vitamin K.

The cumin seeds are yellow to brownish-gray in color and is elongated in shape. The seeds of cumin are carminative, aromatic, stomachic, stimulant, astringent and cooling in effect. It is well used in the treatment of mild digestive disorders as a carminative and also as an analgesic. (De M *et al.*, 2003) Cumin has also been widely used in traditional medicine to treat a variety of diseases such as cancer, diabetes and hypolipidemia. (Sami Mnif and Sami Aifa., 2015)

From the ancient time itself cumin seeds are useful in reducing inflammation, increasing urination, preventing gas and suppressing muscle spasms, an aid for indigestion, jaundice, diarrhea and has been taken orally. Its therapeutic effects have been described on gastrointestinal, gynecological and respiratory disorders and also for the treatment of toothache, diarrhea and epilepsy. (Singh RP *et al.*, 2017)

### 5) *Elettaria cardamomum*

Phytochemical characterization of *E. cardamomum* showed the presence of major metabolites such as alpha pinene (1.5%), beta-pinene (0.2%), sabinene (2.8%), myrcene (1.6%), alpha phellandrene (0.2%), limonene (11.6%), 1,8, cineole (36.3%), terpinene (0.7%), cymene (0.1%), terpenolene (0.5%), linalool (3%) etc. Cardamom is a rich source of the compound 1, 8-cineole, which used to treat various ailments and relieve tension. The oil extracted from cardamom

seeds contain alkaloids, saponins, terpenes, esters, flavonoids, anthocyanin, phenolic compounds etc. It is well known for its anti-oxidant properties. (G.M. Abu-Tawee., 2018)

In a study conducted by, Mehjabeen *et al.*, 2015 they concluded that Crude extract of Cardamom showed a significant analgesic and anti-inflammatory properties. Its anxiolytic and muscle relaxing effect gives an additional effect for the use of stress related gastric troubles. It also can be effectively used as an insecticidal and anthelmintic agent. *E. cardamomum* were used for the treatment of cardiovascular, digestive, kidney associated, lung associated, liver associated disorders and other stress associated diseases due to the potential activity of its bioactive components. (Vidya and Rathod., 2014)

#### 6) *Sida cordifolia*

In the phytochemical analysis of *S. cordifolia* the presence of reducing sugar, saponins, steroids and alkaloids were detected. (Mohammad Abdul Motalib Momin *et al.*, 2014)

In vivo studies of methanol and ethyl acetate extract of *S. cordifolia* root showed anti-inflammatory, analgesic and hypoglycemic properties. Research studies have shown that it possesses a significant blood sugar lowering activity and therefore may help to reduce the storage of fat with fat cells. (Kanth V R and Diwan P V., 1999) effective anti-oxidant activity has reported in it. (Auddy *et al.*, 2003) The roots of *S. cordifolia* have been reported to possess astringent, diuretic and tonic properties. The drug has also demonstrated antibacterial, antiplaque and antifungal activities. Research work conducted by Kubavat J B *et al.*, 2009 concluded that the leaf extracts showed cardioprotection and hypotensive action. Kaur G *et al.*, 2011 reported the antihypercholesterolemic and anti-diabetic therapeutic properties of the herb.

#### 7) *Syzygium aromaticum*

Clove is one of the major source of phenolic compounds such as flavonoids, hydroxybenzoic acids, hydroxycinnamic acid and hydroxyphenylpropene. Chaieb K *et al.*, 2007 reported that the main constituents of the essential oil are phenyl propanoids such as carvacrol, thymol, eugenol and cinnamaldehyde.

The following are the therapeutic roles played by clove. It has powerful germicidal properties. Hence it is used extensively in dental care, for relieving tooth ache and oral ulcers. Clove has prominent anti-bacterial and anti-fungal properties. Clove oil can be used to reduce infections, wounds and insect bites. Clove regulates the enzyme flow and it thereby boost the digestive system of the body. Along with purifying the blood, it also aids in stabilizing blood sugar levels and may have benefits for diabetic individuals. Clove's antiviral and cleansing properties purify the body which implement resistance to disease. Thus clove act as an immune system booster. Clove can positively regulate the cardiovascular health. Eugenol, the active essential oil in clove, can act as an effective platelet inhibitor, preventing blood clots. (Debjit bhowmik *et al.*, 2012)

#### 8) *Trachispermum ammi*

Essential oil obtained from *T. ammi* is comprised of p-cymene, dipentene,  $\alpha$  and  $\beta$  pinenes,  $\gamma$ -terpinene, thymol, camphene, myrcene,  $\delta$ -3-carene, limonene, carvacrol and others. Among all these thymol (35-60%) forms the main constituent. Its seeds consist of protein, fat, minerals, fiber, carbohydrates, calcium, phosphorus, iron, carotene, thiamin, riboflavin and niacin. (Yadav R *et al.*, 2011) 25 different water soluble constituents, including two monoterpenoids, eight light monoterpenoid glucosides, one alkyl glucoside, three aromatic glucosides, two nucleosides and eight glucides were isolated from it. *T. ammi* also contains a fixed oil containing resin acids, palmitic acid, petroselinic acid, oleic acid and linoleic acid, as nutrients riboflavin, thiamin, nicotinic acid, carotene, calcium, chromium, cobalt, copper, iodine, iron,

manganese, phosphorus, and zinc. (Ishkawa T. *et al.*, 2001)

According to Yadav R *et al.*, 2011 *T. ammi* is used as a germicide and also as an antiseptic. It is good for indigestion and gas relief. Its seeds were used in traditional systems to treat acidity related problems. It is found to be effective for the treatment of ulcers, ringworm infection, stomach worm, menstrual and post-natal disorders, leucorrhoea, pimples, kidney stones, piles etc. *T. ammi* is a powerful cleanser and laxative. It can stimulate the appetite and has a prominent antioxidant activity. According to Unani system of Medicine, It is useful in treatment of weakness of limbs, paralysis, chest pains, diseases of liver, spleen, hiccup, vomiting, dyspepsia, kidney troubles, inflammations.

#### 9) *Trigonella foenum graecum*

Jhahria A. and Kumar K., 2016 reported that, physico-chemical constituents of *T. foenum graecum* seeds include different alkaloids, saponin and flavonoids. Fenugreek seeds are rich in vitamins-A, B1, B2, C, niacin and nicotinic acid. It also possess good amount of minerals such as phosphorus, sulphur, calcium, iron and zinc. Acetic acid, linalool, isovaleric acid, butanoic acid, 3-isopropyl-2-methoxypyrazine, olfactometry diacetyl, eugenol, caproic acid, 3-Amino-4, 5-dimethyl-3, 3-isobutyl-2-methoxypyrazine etc are the major volatile components in *T. foenum graecum* which impart characteristic odour. According to Mathur P and Choudhry M., 2009 fenugreek endosperm is highly rich in protein such as globulin, albumin, histidine and lecithin. High fiber, protein content and other bioactive compounds make it a naturally health promoting herb.

*T. foenum graecum* leaves and seeds are widely used in many traditional systems for medicinal purposes. It is known to exhibit anti-bacterial and anti-fungal agent and anti-diabetic effect, gastric stimulant, against anorexia and as a lactation-inducer. It is well known for its antidiabetic effect, hypocholesterolemic

influence, antioxidant potency, anti-cataract effect and hepatoprotective effect. It also has immune-modulatory activity. ie, it acts as an agent that can increase or reduces the immune responses. (K. Srinivasan., 2006) fenugreek seeds have hypocholesterolaemic and anti-cancerous values. (Acharya S. *et al.*, 2006)

#### 10) *Strobilanthes ciliates*

The reports of active constituents indicate the presence of mainly terpenoids, phytosterols, flavonoids, carbohydrates and tannins. Some of them are flavanol constituent (8.86%), flavonoids (1.63%), flavanols (4.57%), tannins (106.75%) and lipids (2.20%) were quantified. Besides these other parameters includes ash value, loss on drying, and extractive values (total ash 15%, acid insoluble ash 7.5%, water insoluble ash 6.1%, loss on drying 5.03%, ether soluble extract 1.24%, ethanol soluble extract 2.12%, water soluble extract 4.36% and the crude fibre content 17.61%). (Sony et al., 2017) Analysis of ethanolic extract of plant reveal the presence of sterols such as campesterol and stigmasterol. Terpenoids and steroids such as lupeol, stigmasterol and betulin were also reported from the acetone extract of the stem. Lupeol the major constituent of phytochemicals present and is responsible for the broad spectrum of biological activities. (Anjana Karunakaran Nair *et al.*, 2016)

Plant parts on various solvent extracts showed significant anti-oxidant potential, hepatoprotective activity, anti-carcinogenic activity, anti-inflammatory activity, analgesic activity, anti-diabetic activity and anti-viral activity. (Anjana Karunakaran Nair *et al.*, 2016) *S. ciliatus* is traditionally used for rheumatism, toothache, inflammation and allergy. Besides these activities it was also used for post delivery treatment. It also exhibit activity like antibacterial, cytotoxicity and antifungal activity. Lupeol obtained from the roots has high medicinal value. *S. ciliatus* is a used to treat tooth ache, skin infections and urinary tract infections. (Sony S *et al.*, 2017)

## II. CONCLUSION

From this study, it is concluded that the practice of 'Karkidaka kanji' in Kerala during the month of 'Karkidaka' provides a lot of health benefits. During this season due to the climate change our digestive system get weaker. At this time taking this ayurvedic medicine can give promising results due to the therapeutic potential and medicinal values of herbs and spices used for its preparation. Phytoconstituents present in these plants contribute the medicinal properties. In short, it aids digestion, removes toxins from the body and thus improves the immunity thus prevent various diseases during monsoon season, it aids digestion and is good for diabetes, reduces cholesterol, good for arthritis and it provides energy. In Ayurveda it is believed that this traditional medicine help to balance the tridoshas (vatha, pitha, kabha) in the body. Hence it has rejuvenating effect and is well known as a traditional health tonic in Kerala. It is effective for effective for removing general fatigue.

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