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REVIEW ARTICLE

Ten Leafy Vegetables (*Pattila*) of *Karkidaka* Month

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ABSTRACT

People around the world consume a variety of green leafy vegetables. A number of recipes can be made from it depending on its seasonal availability. They are with a sour, sweet or bitter taste. Thus, they taste good in a variety of combinations. The ten green leafy vegetables (*Pattila)* that are primarily consumed by Keralites during *Karkidaka* month are described here. The month of *Karkidaka* starts on July 17 ends on August 16. It comes under the *Varsha Ritu.* As per Ayurveda a person's *Bala* (Strength) and *Agni* (digestive power) will be very low during this period. Therefore, Kerala residents adopt specific regimens and dietary patterns throughout this season in order to improve *Bala,Agni* and combat numerous ailments of the rainy season. Some of them are *Pattila Thoran, Karkidakakanji* and *Karkidaka Cikitsa*. *Pattila* is the combination of ten leaves that are commonly available and used by people in different areas of Kerala. Vitamins, minerals, and other nutrients are abundant in green leafy vegetables. This will keep the person healthy and aid to prevent several ailments. It is because of the presence of certain chemical constituents found in plant leaves. Lack of knowledge on the nutritive value of green leafy vegetables among the public is the main drawback in their lower consumption. This article attempts to explain the significance of ten leaves among green leafy vegetables.

Key Words *Pattila, Leafy vegetables, Karkidaka,Varsha ritu*

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INTRODUCTION

As per Ayurveda classics a year is divided into six parts according to seasons. The northward movement of the sun and its act of dehydration (*Adanakala*) bring about the seasons beginning from late winter to summer. This is known as *Uttarayana* and the seasons are *Sisira,Vasanta,* and *Greeshma*. The southward movement of the sun and its act of hydration(*Visargakala*) give rise to the other three seasons beginning with the rainy to early winter. This is known as *Dakshinayana* and the seasons are *Varsha,Sarat* and *Hemanta.*In these seasons strength of a person will start to decrease from *Sisira ritu* and it weak more in *Greeshma* and *Varsha Ritu*. So possibility of many diseases are there.Thereafter it increases and a person will experience more *Bala* in *Hemanta* and *Sisira*.These *ritus* are also the causes for mild moderate and high aggravations of doshas like *Vata,Pitta and Kapha*[1,2,3]. The last month of the Malayalam calendar is *Karkidakam*. According to the

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gregarian calendar, it begins on July 17 and concludes on August 16[4]. From ancient times, Keralites have viewed *Karkidakam* as a month of poverty and famine. *Karkidaka* comes under *Varsha ritu*, which belongs to *Sraaavana* and *Bhadrapada*. As the *Bala* of the body decreased in *Adana kala* digestive power also starts to decrease, It is weakened much more during the rainy season due to the vitiation of *Vata* and other doshas. As a result, *Karkidaka* month is a season dedicated to body purification and the prevention of monsoon-related ailments. Keralaites have particular regimens in *Karkidaka*. During this time, special food regimens, therapies, and other procedures are being implemented. *Karkidaka* is also known as Ramayana month. During this time they will read Ramayana throughout the month.

In India as per the demographies 23-39% of population are vegetarians and in world it is only 14%[5].Leafy vegetables are rich source of vitamins minerals dietary fibers with low fat content.Normal recommended intake of green leafy vegetables for childrens,adult women and men are respectively 50 gram and 100 gram[6].WHO observed that lower levels of intake of fruits and vegetables are one among the ten high risk factors of mortality.

Leafy vegetables are the plant leaves along with tender petiole and shoot eaten as vegetables when the plants are in their young and active growth phase[7].*Pattila* ten leaves) are leafy vegetable used by Keralite especially in *karkidaka* month. Ten leaves are *Punarnava,Aluki,Surana,Rajamasha,Kushmanda, Kushmandi,Sivalingi,Vrschikali,Cakramarda,Tan duliyaka*. They will make use of these ten leaves to prepare various dishes. One of the main dish is Toran(Sabji).

METHOD OF PREPARATION

Each leaf or a combination of ten leaves can be used to make toran .Collect the leaves and then wash properly with water. Due to the presence of hairs, *dusparsa* leaves should be soaked in boiling water for 10 minutes before cutting. Chop the tender leaves finely, then squeeze off any remaining water. Coconut, mustard, green chilli, jeeraka, salt, oil and turmeric can all be used. To start, lightly crush the coconut, green chilli, and jeeraka. Oil in the pan is heated while the mustard seeds crackle. Next, add the chopped leaves, turmeric powder, and salt. Cook for five minutes on low heat. If the leaves are cooked through, add the crushed mixture and stir thoroughly until the water is completely absorbed. We can eat it as such by boiling with turmeric and salt without adding the spices (table 1). **PUNARNAVA**

A very variable,diffusely branched,pubescent or glabrous,prostrate herb abundantly occurring as a weed throughout India.Leaves long petioled,ovate or oblong cordate,entire or sinuate,usually whitish and smooth beneath and rough green on upper surface.It is a good Rasayana dravya. Leaf juice is given internaly as a blood purifier and to relieve muscular pain. It will also helps to hasten parturition[8].

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Table 1 List of ten leafy vegetables with its *Karma* and *Rasapancaka*.

S.No.	DRUG	VERNACULAR NAME	BOTANICAL NAME	FAMILY	RASAPANCAKA
1.	**Punarnava**	Sanskrit: Dirgapatrika, Sothaghni Assamese: Punarnabha Bengali: Punarnava English: Hog Weed Gujrati: Dholisaturdi, Hindi: Gadahpurna, Punarnava Kannada: Sanadika, Kommeberu, Malayalam: Tazhutama,tavizhama Marathi: Ghetuli Oriya: puiruni Punjabi: Khattan Tamil: Mukurattai Telugu:Ataatamamidi	*Boerhavia diffusa Linn.*	Nyctaginaceae	***Rasa:****Madhura,Tikta* ***Guna:****ruksha* ***Veerya:****ushna* ***Karma:****vatasamana,sothahara,sulahara,gulma,plihahara* *Dipana*[2,17,18] [Su.Su.46] [Sal.Ni]
2.	**Aaluki**	Sanskrit:Aaluki,Alukam Assamese:Kola Kochu Bengali:Alti Kachu English:Cocoyam,wild Taro Gujarati: alavi, patarveliya Hindi: kachalu,Arvi,Kochai Kannada:Kesavedantu Malayalam:Chembu Manipuri: Pan Marathi: Chempu, Ran Aalu Oriya:Jongal Saaru Tamil:Sempu,Shamakkilangu Telugu:Chamadumpa	*Colochasia esculenta Linn*	Araceae	***Rasa:****Madhura* ***Guna****:Guru,ruksha* ***Veerya:****seeta* ***Vipaka:****Madhura* ***Karma:****Mala bhedana*[1] *[Ca.Su.27]*
3.	**Rajamasha**	Hindi : Lobia Bengali : Ghangra, Kalaya Sanskrit: Mahamasah, Rajamasah Tamil : kaattuulundu, karamani Marathi : Alasunda, Chavali Telugu : Alasandalu, Kaaraamanulu Kannada : Alasabde, Alasund, Huruli, Hurali Sanskrit : Khalva, Vardhipatraka Gujrati : Kalathi, Kulathi Kashmiri : Kath Urdu : Kulthi[WJPR]	*Vigna unquiculata Linn.*	Fabaceae	***Rasa****:Madhura, Kashaya* ***Guna*** *: Guru,Ruksha,visada,sara* ***Virya*** *: seeta* ***Vipaka*** *: Madhura* ***Karma*** *: Kaphapittahara,grahi,balya,Ruchikara* *(Dh.Ni.)*
4.	**Surana**	Sanskrit :Arshoghna, Kandala Assamese:Kath Alu Bengali: Ole English: Elephant Foot Gujarati: Sooran Hindi: Suranakanda, Zamikanda Kannada: Suranagadde Malayalam :Chena, Kattuchena Marathi: Jungli Suran, Suran Oriya: Olooakanda, Suran Punjabi: Gimikanda Tamil: Karunai Kizhangu Telugu: Mancai Kanda Durada Gadda Urdu: Zamin-qand, Zamikand	*Amorphophallus campanulatus (Roxb.) Blume*.	Araceae	***Rasa-*** *Katu,Kashaya* ***Guna****-Ruksha, Tikshna, Guru, Vishada, Laghu* ***Vipaka****-Katu* ***Veerya-*** *Ushna* ***Karma-*** *Kapha Vata Shamaka, Pitta-Hara,*

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5.	**Kushmanda**	Sanskrit:Pushpaphalam,Brihatphalam Assamese : Kumra Bengali : Chal Kumra English : White guard melon Gujrati : Safed Kohalu, Bhuru, Kohalu, Bhuru Kolu Hindi : Kushmand, Petha Kannada : Boodi HumBala Malayalam : KumBalanga Marathi : Kohala Oriya : Kakharu, Panikakharu Punjabi : Petha Tamil : Pooshanikkai Telugu : Boodida Gummadi	*Benincasa hispida (Thunb.) Cogn.*	Cucurbitaceae	***Rasa :*** *Madhura* ***Guna:*** *Laghu,snigdha* ***Virya:****ushna* ***Vipaka :****Madhura* ***Karma:*** *Tridoshahara Balya, Depana, Hridya, Bastisodhaka*[2]*,*
6.	**Kushmandi**	Sanskrit:karkaru, kurlaru, kushmandi Assamese:Kunurakarkaru, Hindi:Kumhara,saphed kaddhu Bengali:Saada kumhara Marathi:Kaula Tamil:Suraikai English:field pumpkin Kannada:bude-kum,Bala-kayi Malayalam: Kumpalam, Gujarati:Kashiphal	*Cucurbito pepo Linn.*	Cucurbitaceae	***Rasa:****Tikta,Madhura* ***Guna:****Guru* ***Veerya:****Sita* ***Vipaka:madhura*** ***Karma:****raktapittahara, Grahi,dipana.kshaareeya* *,*
7.	**Dusparsa**	Sanskrit:Vrischikali,Agamavarta Assamese: Dumuni Chorat Kannada:Turike Balli Hindi:Barhanta,Bicchubuti Malayalam:Kodithoova Cherukodithuva Tamil:Kanchori Telugu:Telukondicettu Marathi: Aag Paan ,Aagya Kallaavi,Laghumedhshingi Oriya: Kasalakku English:stinging nettle	*Tragia imvolucrata*	Euphorbiaceae	***Rasa :*** *Katu,Madhura,tikta* ***Guna :*** *Ushna* ***Virya :*** *Ushna* ***Vipaka :*** *Katu* ***Karma:****vatapittaghna,Balya*
8.	**Sivalingi**	English:Lollipop climber Hindi:Shivalingi Kannada:Limgatomde Balli Malayalam: Neyyunni,Pambukodi Marathi: Sivalingi Gujarati:Sivalingi Sanskrit:Apashtambhini,Chitraphala,Lingin,Shivalingi Tamil:Aivirali Telugu:Linga-donda	*Diplocyclos palmatus L.C.Jeffrey.*	Cucurbitaceae	***Rasa:****Katu* ***Guna:****Ushna* ***Veerya:****Ushna* ***Vipaka****:katu* ***Karma:****Vatapittahara,Rasayana,lohasthambhini,sidhmanasana*[19]
9.	**Cakramarda**	Sanskrit:prapunnada,dadrughna Hindi:cakvada,pavaar Bengali:cakunda Marathi:taroda Gujarathi:Kuvaadiyo Kannada:Tagac Telugu:Tagiris English:Foetid cassia Malayalam:Takara	*Cassia tora Linn.*	*Caesalpinaceae*	***Rasa:****Madhura* ***Guna:****Laghu,ruksha* ***Veerya:****Sita* ***Vipaka:****Madhura* ***Karma:****pittahara,kaphavataghna,grahi,pacana,kandasodhanam.vrshyam,vishahara,Kasahara*[19]*]*

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10. Tanduleeya	Hindi: Chauraiya Kannada: Chelakeerae soppu, Dagglisoppu, keere soppu Malayalam: Cerhiraa, Mullanchira Sanskrit: meghanada,kaandera,tanduleraka, bhandira Tamil: Kuppaikkeerai Telugu: Chilaka thota koora	*Amaranthus spinoses*	Amaranthaceae	***Rasa:****Madhura* ***Guna:****laghu,ruksha* ***Veerya:****sita* ***Vipaka:****madhura* ***Karma****:Raktapittahar,vishahara,kasahara,daahasosha hara,graahi*[19]

AALUKI

A tuberous perennial with a group of underground farinaceous corms cultivated throughout the hotter parts of India. Leaves with sheathing leaf base and erect petiole up to 1.2 m long bearing a thick peltate ovate, cordate lamina. The bitter juice collected from the leaf stalk is styptic, and the juice from the leaves is used to treat colic and constipation. Additionally, it serves as an appetiser and expectorant. Raw consumption of taro leaves and tubers is harmful because of the presence of calcium oxalate, hence boiling is required to remove that[9].

SURANA

A tuberous stout,indigenous herb 1-1.5 m height found almost throughout India and also cultivated. Leaves are solitary tripartite,30-90 cm broad or even more appearing long after the flowers.petioles 60-90 cm long,stout,warted,darkgreen and mottled with paler blotches.Tender petioles have a very pleasant taste when leaves are still young and unexpanded.Fermented juice of petioles is used to cure diarrhoea[10].

RAJAMASHA

It is an annual herbaceous vine. The stems are generally glabrous, green, and up to 5 mm across. The petioles are up to 10cm long without pubescence, thickened at the base. The stipules are lanceolate, peltate, and narrow at the attachment point. The leaves are arranged alternately, compound with 3 ovate leaflets. The leaflets are often basally hastate, apically acute, entire, 5-15cm long and 4-6cm broad, often glabrous; lateral leaflets are asymmetrical; the rachis is 0.5-3.5cm long[31].

KUSHMANDA

A large climbing or trailing herb with stout,angular,hispid stems,cultivated as a vegetable throughout India upto an altitude of 1200 m. Leaves large and long petioled,5-7 lobed, reniform rotund, deeply cordate, upper surface sparsely pilose and scabrous,lower rigidly hispid,margin sinuate,dentate or crenulate,tendrils slender and short .The juice of leaves are cooling and rubbed on bruises[11].

KUSHMANDI

Kushmandi is an annual herb with climbing creeping or in some varieties bushy,5 angled stems up to 15 meter long considered as native to America, cultivated in many parts of India. The shallow root system is branched. Stems and leaves with a harsh prickly armature. Foliage stiff, more or less rigid erect.Leaves with a broad triangular pointed outline and often with deep lobes.Leaves are used for strengthening the

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digestive system and used in biliousness and burning sensation.Used as an external application for burns[12].

SIVALINGI

A slender much branched tendril climber,distributed throughout India on hedges and bushes upto 1200 meter.It has a thick permant root stock,tendrils bifid,leaves simple,alternate, membraneous,5 lobed,scabrid above,pale and smooth beneath deeply cordate at the base,margins sinuate sometimes sub serrate.Leaf paste is used as an anti-inflammatory agent[13].

VRSCHIKALI

A perennial evergreen,climbing hispid herb with scattered stinging hairs,distributed throughout India ascending upto an altitude of 750 meter.Stems slender,elongate,twining.Leaves simple,alternate,stipulate,oblong lanceolate to broadly ovate ,serrate,base rounded or cordate.Leaves are good for headache[14].

CAKRAMARDA

An annual foetid herb 30-90 cm high.Leaves are 7.5-10 cm long,rachis grooved,more or less pubescent,with a conical gland between each of the two lowest pairs of leaflets,stipules 1.3-2 cm long,linear subulate,caducous.Leaflet are 3 pairs opposite,obovate oblong, glaucaus, membraneous, glabrous more or less pubescent base somewhat oblique, usually rounded. Leaves are used as laxatives. Leaves and seeds are also beneficial in ringworm infection[15].

TANDULIYA

An erect spinous annual or perennial herb varying in colour from green to purple, native to tropical America and found throughout India as a weed in cultivated as well as fellow lands. Leaves are 3.7 -10 cm long,1.9-5 cm broad, base cuneate, slender petiole, equally the blade or shorter.Root and leaves are used as expectorant[16] (table 2).

Table 2 Chemical constituents and activity of ten leafy vegetables

Plant	Chemical constituents in leaves	Activity
Punarnava	Saponins Alkaloids Flavanoids Vitamin C Vitamin B2,B3 Calicium Sodium Magnesium [20]	Immunostimulatory Anticancer activity Antidiabetic activity Hepatoprotective activity Antioxidant activity Anti inflammatory activity[21]
Aluki	Calcium oxalate Proteins Flavanoids Apigenin β-carotene Vitamin C Folic acid Iron riboflavin phosphorous Thiamine Alkaloid Starch Tannins Terpenoid[22]	Antidiabetic activity[23] Anti inflammatory Anticancerous Nervine tonic[24] Antioxidant[25] Antimicrobial[26]

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Rajamasha	isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, valine and histidine and the non-essential amino acids tyrosine, aspartate, glutamate, glycine, alanine, cysteine, serine and proline Vitamin A, Iron, flavanoids ,Calcium,phosphorous,magnesium, Manganese,zinc,potassium[27,28,29,30]	Antidiabetic Activity Antioxidant Activity [27,30] Antimicrobial activity[31]
Surana	Polysachharides 3,5 duacetyltambulin[18]	Antidiarrheal activity Antibacterial activity[32]
Kushmanda	Alkaloids,flavonoids,steroids Phytol,trimethyl bicyclo heptane,hexanedioic acid[33]	Antimicrobial activity Larvicidal effects Hypoglycemic activity[34] Antinociceptive activity[35] Antioxidant activity[36] Antihelminthic activity[37] Antidiabetic activity[38]
Kushmandi	Alkaloid,flavonoids,carbohydrate,phytosterol,tannin,saponin,steroid,gums,mucilage,fixed oil, fats,proteins,aminoacids, Sodium,potassium,calcium,iron,ascorbic acid, β-carotene ,glutamine synthetase [39] ,[40,]	Antimicrobial activity Antioxidant activity[39]
Dusparsa	Sugars,starch,protein,lipids,alkaloids,tannins ,phenolic compounds,flavonoids,steroids,terpinoids	Antiparasitic Antitumor Diuretic Hemolytic Anti-inflammatory Antidiabetic Antioxidant Antinociceptive Antihistaminic Antimicrobial[41] Antiurolithiatic [42]
Sivalingi	Alkaloids,flavonoids,tannins,saponins,glycosides,di&tri terpinoids,phenols,steroids[43]	Antioxidant Anti-inflammatory[43] Analgesics Antimicrobial[44] Antivenom
Cakramarda	Flavanoids,Anthraquinone,sennosides,kaempferol, .Emodin, tricontan-1-0l, stigmasterol, Betasitosteral-beta-D-glucoside, freindlen, palmitic, stearic, succinic and d-tartaric acids uridine, quercitrin and isoquercitrin [45]	Antifertility Antiinflammatory Spasmogenic Antinociceptive Antifungal Anticancerous[46] Antioxidant[47]
Tanduleeya	Flavonoids Phenols Proteins β-carotene Calcium Linoleic acid Iron Vitamin C,A Magnesium fatty acids Potassium sterols Zinc[53]	Antioxidant[48] Antiinflammatory Hepatoprotective[49] Anlagesics Haematology [50] Antideppresent[51] Bronchodilatory[52]

DISCUSSION

Kerala is situated in the southern part of India and it is considered as an *Anupa desa*. *Anupa desa* which is predominant of *Prithwi* and *Ap mahabhutas* and *Kaphadosha* bestows the dwellers with *Mrudu,Sukumara* , *Upachita sareera* and *Bala*. This *Desa* has predominance of *Kapha* dosha and the level of *Agni* should be maintained properly to live healthy. Rainy season is a period where *Vata Kopa* is dominant.So if we try to Balance *Vata* using *Snigdha,Ushna,Guru Dravyas*,it will badly affect the *Kapha dosha*. Also *Pitta* is in *Sancaya* stage during this period so care must be given to *Pitta* also. So a Balanced diet should be follow during this time by considering the three *doshas*. So people adopt

such kind of dietary regimens in order to stay healthy.

Also due to the fall in *Bala* and the decreased *Agni* during the *Karkidaka* month, a person's immunity is quite low when compared to other *Rtus*. Therefore, foods that are simple to digest and rich in nutrients are favoured. Some of the diets are *Karkidaka kanji* and *Pattila toran*. As per Susruta collection of leaf is mainly done in *Varsha ritu*, that means it's nutrient supply and phytohormones are rich in leaves during this time. Leafy vegetables are rich source of vitamins, minerals, dietery fibers, high in proteins, carbohydrate with low fat. While analysing these ten leaves, they are abundant in macronutrients, micronutrients, vitamins and minerals. Majority of the drugs in these group are rich in phenolic and flavonoid contents (Table:2). Phenolic and flavonoid chemicals that are good for cellular function and fight free radicals to reduce oxidative stress. Antioxidant activity of leafy vegetables are noteworthy. This will aid in the prevention of ageing as well as a number of illnesses like diabetes, cancer, autoimmune diseases, degenerative diseases, and others. Most of these leaves have strong antimicrobial properties. During rainy seasons there will be an increase in bacterial,fungal,viral infections so *Pattila* will help to prevent from these. The high dietary fibre content of leafy vegetables aids in the management of intestinal transit and bowel motions, keeping the digestive tract in a good function. While using the leaves also give consideration to antinutrient factors also. These are the factors which develop itching,tingling,burning sensation etc in body. Antinutrient factors can be removed by simple boiling,putting in tamarind or lime water. Research findings of Van Jaarsveld et al stated that 3/4 cup (90 g) of cowpea leaves fulfil ≥75% of recommended dietary allowance (RDA) for vitamin A (700–900 µg/day for adults; and 25–50% RDA for Fe (10 mg/day) for children (4–8 years).

CONCLUSION

Around us, there are numerous leafy vegetables that are a great source of vitamins, minerals, and other nutrients. Try to use these vegetables in accordance with various seasons. Due to the erratic weather fluctuations, *Karkidakam* is seen as a time that is bad for both physical and mental health. Therefore, we can employ certain dietary regimens like *Pattila*, *Karkida kanji*, etc. Like this people living in different parts of India can also adopt these kinds of dietery regimens according to different seasons considering their *Agni* and *Bala*. Each and every human has a certain kind of *Agni bala*,*Deha bala* depending on his age,place,*Prakrti*. So we should give at most care while taking all these food items because some leaves will not be suited for the health of all. Proper processing,quantity,way of intake will result in providing good and bad effects.

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Figure 1 Punarnava

Figure 2 Aaluki

Figure 3 Surana

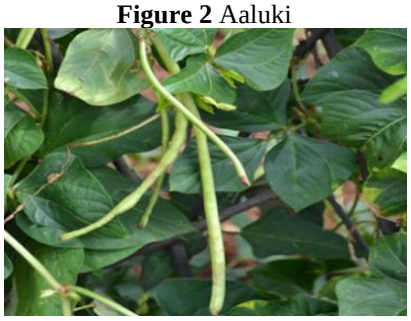

Figure 4 Rajamasha

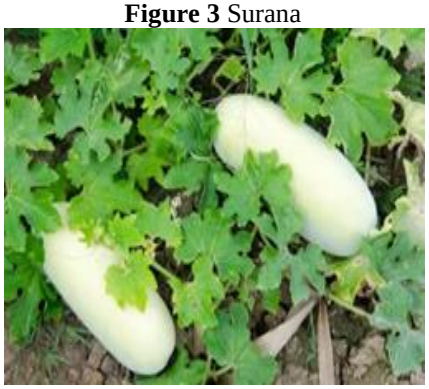

Figure 5 Kushmanda

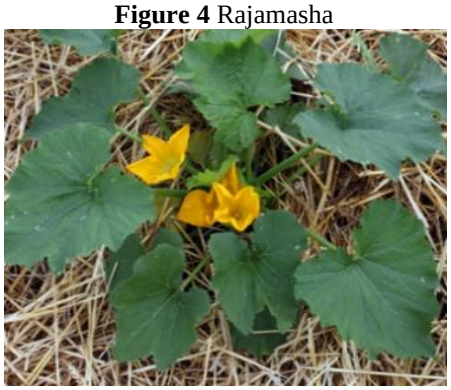

Figure 6 Kushmandi

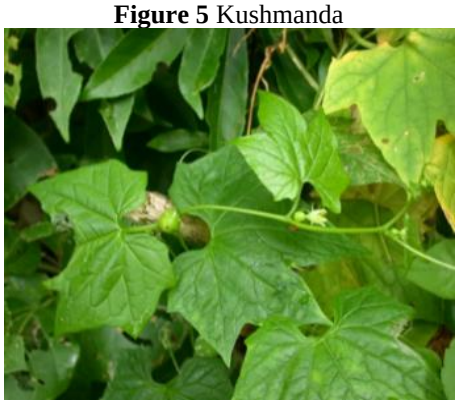

Figure 7 Sivalingi

Figure 8 Vrschikali

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Figure 9 Cakramarda

Figure 10 Tanduliyaka

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REFERENCES

1. Dr. Sharma Ram Karan, Vaidya Das Bhagavan: Agnivesa's Caraka Samhita Sutrastana Volume 1. Chaukamba Sanskrit series:2004
2. K.R. Murthy Srikantha: Susruta Samhita Sutrastana:Chaukamba Orientalia:2006
3. Dr.T.Sreekumar,Dr.Kavitha:Ashtanga Hridaya Sutrastana Fourth edition:2012
4. https://www.boddunan.com/articles/people-places/59-customs-and-culture/20236-do-you-know-the-significance-of-ramayana-month.html
5. http//www.bbc.com
6. http//thevou.com
7. Dr.Dhantore Vandana, Dr.Chakradhar Mukesh: Chattisgarh panorama of leafy vegetables :IJCRT 2021,Vol 9,issue 10
8. The Wealth of India:A dictionary of Indian raw materials and industrial products,NISCAIRNewdelhi:2003:Vol.2:p:174
9. P.K.Warrier:Indian medicinal plants:A compendium of 500 species:Aryavaidyasala kottakkal:University press:1993:Vol.1:p
10. The Wealth of India:A dictionary of Indian raw materials and industrial products,NISCAIRNewdelhi:2003:Vol:4:p:230
11. The Wealth of India:A dictionary of Indian raw materials and industrial products,NISCAIRNewdelhi:2003:Vol:2:p:104
12. P.K.Warrier:Indian medicinal plants:A compendium of 500 species:Aryavaidyasala kottakkal:University press:1993:Vol.3:p:1137
13. P.K.Warrier:Indian medicinal plants:A compendium of 500 species:Aryavaidyasala kottakkal:University press:1993:Vol.3:p:1137
14. The Wealth of India:A dictionary of Indian raw materials and industrial products,NISCAIRNewdelhi:2003:Vol:10:p:272
15. The Wealth of India:A dictionary of Indian raw materials and industrial products,NISCAIRNewdelhi:2003:Vol:10:114
16. The Wealth of India:A dictionary of Indian raw materials and industrial products,NISCAIRNewdelhi:2003:Vol:2:p:218
17. Yadu Nandan Dey, Sarada Ota, N. Srikanth, Mahvish Jamal,and Manish Wanjari4. A phytopharmacological review on an important medicinal plant - Amorphophallus paeoniifolius. Ayu. 2012 Jan-Mar; 33(1): 27–32
18. https://climbers.lsa.umich.edu/?p=416
19. Khemaraj sreekrishnadas:Shaligramnighantu-Shakavarga,Shri.Venkateswara press:2002
20. C.O. Ujowundu , C.U. Igwe,V.H.A. Enemor , L.A. Nwaogu and O.E. Okafor: Nutritive and Anti-Nutritive Properties of Boerhavia diffusa and Commelina nudiflora Leaves ,. Pakistan Journal of Nutrition 7 (1): 90-92, 2008
21. 17. Vidhu Aeri, Praveen Kumar Gaur and Sanjay M. Jachak: Phytochemical, Therapeutic, and Ethnopharmacological Overview for a Traditionally Important Herb: *Boerhavia diffusa* Linn. Biomed

REVIEW ARTICLE

ResearchInternational..:Volume 2014 |Article ID 808302.

22. Rakesh Prajapati, Manisha Kalariya, Rahul Umbarkar, Sachin Parmar, Navin Sheth: Colocasia esculenta: A potent indigenous plant. | Volume : 1 2011 | Issue : 2 | Page : 90-96

23. Melese Temesgen, Negussie Retta:Nutritional Potential, Health and Food Security Benefits of Taro Colocasia Esculenta (L.): A Review:Food Science and Quality Management, ISSN 2224-6088 (Paper) ,Vol.36, 2015

24. Kumawat N. S., Chaudhari S. P., Wani N. S.,Deshmukh T. A., Patil V. R: Antidiabetic activity of ethanol extract of Colocasia esculenta leaves in alloxan induced diabetic rats.

25. Rashmi DR, Raghu N, Gopenath TS, Pradeep Palanisamy, Pugazhandhi Bakthavatchalam,Murugesan Karthikeyan, Ashok Gnanasekaran,Ranjith MS, Chandrashekrappa GK and Kanthesh M Basalingappa: Taro (Colocasia esculenta): An overview: JMPS 2018; 6(4): 156-161

26. Amit Keshav, Alok Sharma, Bidyut Mazumdar: Phytochemical Analysis and Antioxidant Activity of Colocasia esculenta (L.)Leaves,International Journal of Chemical and Molecular Engineering,Vol:13, No:1, 2019

27. Mapula R.,Anh Dao T.,Jerry L. Shai ,Yasmina Sultanbawa and Dharini Sivakumar:Comparison of Phenolic Compounds, Carotenoids, Amino Acid Composition, In Vitro Antioxidant and Anti-Diabetic Activities in the Leaves of Seven Cowpea (Vigna unguiculata) Cultivars, Universal Journal of Applied Science 5(1): 1-4, 2017

28. 25. Enyiukwu DN, Amadioha AC and Ononuju CC, Biochemical Composition, Potential Food and Feed Values of Aerial Parts of Cowpea (Vigna unguiculata (L.) Walp.).Vol. 1(1), pp. 11-18, 2018

29. Aziagba, Bibian O, Okeke, C.U., Ezeabara, Anthonia C., Ilodibia, Chinyere V., Ufele Angela N., Egboka, Tochukwu P: Determination of the Flavonoid Composition of Seven Varieties of Vigna unguiculata (L.) Walp as Food and Therapeutic Values: Universal Journal of Applied Science 5(1): 1-4, 2017

30. K. Sha's: Determination, Evaluation and Comparison of the Antioxidant Activities and Nutritional Composition of Cucurbita maxima and Vigna unguiculata Leaf Extracts. Emerging Challenges in Agriculture and Food Science Vol. 4, 8 April 2022, Page 98-109.

31. Sanjita Das, Shaneza Aman and Amit Nayak. PHARMACOLOGICAL ACTIVITIES OF VIGNA UNGUICULATA- A REVIEW: Pinnacle Biomedical Research Institute, Bhopal, Madhya Pradesh, India.

32. http//www.stuartxchange.org>pungapung

33. Carolyn Arbotante, Elvie Arriola, :Investigation of the Bioactive Properties and Hypoglycemic Effects of Ethanol, Hexane and Ethyl Ethanoate Extracts from Kondol Leaves (Benincasa hispida Cogniaux), American Journal of Clinical Pathology, Volume 146, Issue 1, September 2016, p:83.

REVIEW ARTICLE

34. Farhana Israt Jahan, Mohammad Shahadat Hossain,Abdullah Al Mamun, Md.Tozammal Hossain, Syeda Seraj, Anita Rani Chowdhury, Zubaida Khatun, Nahin Zaman Andhi, Majeedul H. Chowdhury, Mohammed Rahmatullah:An Evaluation of Antinociceptive Effect of Methanol Extracts of Desmodium Gangeticum(L.) Dc. Stems and Benincasa Hispida (Thunb.) Cogn. Leaves on Acetic Acid-induced Gastric Pain in Mice, Advances in Natural and Applied Sciences, 4(3): 365-369, 2010ISSN 1995-0772.

35. Yenda, B; Rao, BV; Ganga Rao: In vitro antioxidant activity studies on leaves of Benincasa hispida (Thunb.) Cogn, Research Journal of Pharmaceutical, Biological and Chemical Sciences Volume5 Issue3 Page Numbers141-147

36. Chiranjib Bhattacharjee ; Debjit, B. ; Pankaj Tiwari ; Tripathi, K. K. ; Dutta, A. S:Invitro antihelmintic activity of benincasa hispida.thub leaves, International Journal of Pharma and Bio Sciences 2010 Vol.1 No.2 p:91

37. Vemulapalli Ravi Kumar,Shri Jagdishprasad: Anti-diabetic and wound healing potential of Benincasa hispida in streptozotocin-induced diabetic rats

38. Fadupin Grace T.:Effect of blanching on nutrient and antinutrient content of pumpkin(Cucurbita pepo)leaves: www.foodbasketfoundation.org 18 ISSN 1595 2290 | Dec., 2014| Vol. 12 | No.2.pages 18-23

39. Muhammad Adnan, Sidra Gul†, Sidra Batool, Bibi Fatima, Ali Rehman, Samina Yaqoob, Hassan Shabir, Touqeer Yousaf, Sakina Mussarat, Nawab Ali, Shahid Niaz Khan, Hazir Rahman, Muhammad:A review on the ethnobotany, phytochemistry, pharmacology and nutritional composition of Cucurbita pepo L.

40. Muhammad Farman1, Amara Dar2, Zaman Khan3, Rebecca Munir1, Amina Rasheed1 and Usama Waqas: Evaluation of Antioxidant potential and comparative analysis of Antimicrobial activity of Various Extracts of Cucurbita pepo: Journal of Agricultural Science and Food Technology Vol. 3 (6), pp. 103-109, November, 2017.

41. R.GoBalakrishnanaM.KulandaivelubR.Bhuvaneswaribd.KandavelbL.Kannana: Screening of wild plant species for antibacterial activity and phytochemical analysis of Tragia involucrata L: Journal of Pharmaceutical Analysis Volume 3, Issue 6, December 2013, Pages 460-465.

42. Vinodhini Velu, Moonjit Das, Arunai Nambi Raj N, Kamal Dua & Himaja Malipeddi: Evaluation of in vitro and in vivo anti-urolithiatic activity of silver nanoparticles containing aqueous leaf extract of Tragia involucrate: Drug Delivery and Translational Research volume 7, pages439–449 (2017).

43. Parveen Bano1, Dr.(Smt.) Neeta Singh2: Preliminary Phytochemical Investigation on Leaves,Seeds Extract of Diplocyclos palmatus (L.) C. Jeffrey: IJSDR | Volume 1, Issue 7,P:63-66.

44. DK Patel: Diplocyclos palmatus (L.) Jeffry: Morphological variations and medicinal values: Journal of Medicinal Plants Studies 2018; 6(1): 03-05.

REVIEW ARTICLE

45. Sarika Sharma ,Man Singh Dangi , Shailendra Wadhwa , Vivek Daniel , Akhilesh tiwari : Antibacterial Activity of Cassia tora Leaves:International Journal of Pharmaceutical & Biological Archives2010; 1(1): 84 – 86.

46. C.S.RejiyaT.R.Cibin Annie Abraham: Leaves of Cassia tora as a novel cancer therapeutic – An in vitro study: Volume 23, Issue 6, September 2009, Pages 1034-1038.

47. ArthanariSaravanakumaraManiGaneshaJay aBalanJayaprakashbHyun TaeJanga: Biosynthesis of silver nanoparticles using Cassia tora leaf extract and its antioxidant and antibacterial activities: Volume 28, 25 August 2015, Pages 277-281.

48. Phytochemical Screening, Pharmacognostic Evaluation and Biological Activity of Amaranthus spinosus L.Dharma Prasad, Lalitpur B Raut, https://doi.org/10.3126/jmmihs.v1i4.11999.

49. HussainZeashanaG.AmreshaSatyawanSing hbChandana VenkateswaraRao:Hepatoprotective activity of Amaranthus spinosus in experimental animals: Food and Chemical Toxicology: Volume 46, Issue 11, November 2008, Pages 3417-342.

50. Deenanath Jhade, Dheeraj Ahirwar, Ritesh Jain, Neeraj Kumar Sharma and Sandeep Gupta: A Pharmacological Review : Amaranthus spinosus: Research Journal of Pharmacognosy and Phytochemistry. 1(3): Nov. – Dec 2009, 169-172.

51. Umakanta Sarker & Shinya Oba: :Nutraceuticals, antioxidant pigments, and phytochemicals in the leaves of Amaranthus spinosus and Amaranthus viridis weedy species: Scientific Reports volume 9, Article number: 20413 (2019).

52. B.S Ashok Kumar,1,* K Lakshman,2 C Velmurugan,3 S.M Sridhar,4 and Saran Gopisetty1: Antidepressant Activity of Methanolic Extract of Amaranthus Spinosus: Basic Clin Neurosci. 2014 Winter; 5(1): 11–17.

53. Mueen Ahmad Chaudhary, Imran Imran, Samra Bashir, Malik Hassan Mehmood, Najeeb-ur Rehman & Anwarul-Hassan Gilani: Evaluation of gut modulatory and bronchodilator activities of Amaranthus spinosus Linn. BMC Complementary and Alternative Medicine volume 12, Article number: 166 (2012).