

REVIEW ON KULTTHA (DOLICHOS BIFLORUS LINN.) ON THE BASIS OF AYURVEDIC AND MODERN ASPECT

Dr. Pooja Panchaware^{1*}, Dr. T. A. Pansare², Dr. D. V. Kulkarni³ and Dr. Ashwini Makadi⁴

¹PG Scholar, Dravyaguna Department, 3rd Year GAC Osmanabad.

²Associate Professor, Dravyaguna Department, GAC Osmanabad.

³Head of Department, Dravyaguna Department, GAC Osmanabad.

⁴PG Scholar, Dravyaguna Department, 3rd Year GAC Osmanabad.

Article Received on
24 Feb. 2021,

Revised on 14 March 2021,
Accepted on 04 April 2021

DOI: 10.20959/wjpr20215-20083

*Corresponding Author

Dr. Pooja Panchaware

PG Scholar, Dravyaguna
Department, 3rd Year GAC
Osmanabad.

ABSTRACT

Kultha with the botanical name *Dolichos biflorus* Linn. / *Macrotyma uniflorum* (Lamk.) is a plant from the Leguminosae family. It's found in Asia and Africa. In India, It's grown in southern states like Andhra Pradesh, Maharashtra and Karnataka. Kultha is popularly referred to as Kulattha or Kulatthika in Sanskrit and its general name is Horse gram. This plant has a crucial place in Ayurveda. It works on the balancing the doshas of the body. Horse grain may be a storehouse of polyphenols, flavonoids and potent anti-oxidants that keep your body strong, vibrant and young. Kulttha, besides being intrinsically vast in carbohydrate and protein content, also abounds in essential trace

minerals like iron, molybdenum and calcium. These insure optimal energy, muscle strength, regulated red blood corpuscle synthesis and fortified bones. Hence, it comes as no surprise that horse grain is being widely consumed globally today, within the sort of the sprouted or boiled seeds, as a health drink made with ground powder, also as in traditional Indian dishes like dals, soups and salads. Ayurveda strongly suggests several formulations where horse grain is employed as a key ingredient for its indispensable medicinal value like Kulathadhi kashayam that has been used extensively in treating health anomalies. Digestive issues, renal stone problems (Ashmari-bhedan), arthritis, inflammatory issues and fever are some common problems which will be treated naturally with Kultha. This review draw the awareness towards the nutritional, medicinal value and therapeutic uses of the Kulttha plant.

KEYWORDS: Kulttha, Dolichos biflorus, Ayurved, nutrition.

INTRODUCTION

As we all know “Prevention is better than cure”. The most important aim of Ayurveda is too “Swasthasya swasthya rakshanama Aaturasya vikaraprashamana” for these in Ayurveda many Medicinal plants are described as dietary supplements or as a medicine. Kulttha is one among the medicinal plant which have various nutritional and medicinal value. It’s commonly called as Horse grain (Dolichos biflorus Linn.) belongs to family Fabaceae (Leguminosae). In Bhavprakasha nighantu this drug mentioned in Dhanya varga because its seeds are rich in natural phenols; mostly phenolic acids, flavonoids and therefore the anti-oxidants. Kulttha is taken into as animal fodder and its full potential as a neighborhood of human diet has not been exploited completely. It is often consumed as seeds, as sprouts or as meal by itself.^[1] Kulttha is a superb source of protein (22-24%). Seeds contain carbohydrates (57.2%), fat (1.1%), vitamins, minerals (3.2%) and good amount of soluble fibers.^[1]

In Ayurveda the properties of Kulattha are mentioned such as Kashaya Rasa, Laghu, Ruksha, Tikshna Guna, Ushna Veerya and Katu Vipaka.^[6] Because the drug is predominant of kashaya rasa, it’s Kapha vata shamaka (reduces the vitiated kapha and vata) and Rakta pitta kopaka (increases the Rakta and Pitta dosha).

It is mainly used as a tonic, astringent, diuretic and also recommended in rheumatism, jaundice, conjunctivitis, piles, neuralgia and other several diseases.^[1] Decoction of Kulttha are utilized in various diseases like Ashmari (Kidney stone), Shwasa (Asthma), Kasa (Anti-tussive), pradar (Menorrhagia), Medahara(Anti-obesity) etc.

Extract of those seeds shows potent anti-adipogenic, anti-hyperglycemic, anti-hypercholesterolemic, Anti-oxidant, Anti-microbial, Anti-urolithiatic activities.

- **Ayurvedic aspect**

Kulattha is one amongst the Navadhanyas (nine cereals) that is commonly available and used as food, fodder and medicine in chief parts of the country.

Botanical name: Dolichos biflorus Linn. (Dolichos: old Greek name for bean; biflorus: having two flowers)

Synonyme: Macrotyma uniflorum (Lamk.) Verdc., Vigna unguiculata (Linn.) Walp., Vigna

sinensis, Dolichos unguiculata; Dolichos uniflorum Lamk.

Family: Papilionaceae; Fabaceae

Synonyms – Table no.1^[2,3,4,5,6]

Synonyms	BPN	DN	RN	KN	DGS	MPN	Sha. N
Kulattha	+	+				+	
Kulatthika	+			+		+	
Kulittha							+
Kulaali				+		+	
Kumbhakari				+		+	
Karshana		+					
Kaalavrunta		+					
Tamabeeja							+
Sthiramudra		+					
Urvara							
Vitapapaha				+			
Aliskandha		+					
Dheera				+			
Drukprasada						+	
Peetamudga		+					
Surashtraka		+					
Chakshushya							
Lochanahita						+	
Chakra						+	
Chakree						+	
Vaajana						+	
Mahaphala						+	
Apoora						+	
Malapaha						+	

Vernacular names

Hindi : Kulthi, Kurthi, Kurati, Gahat Marathi : Kulith, Kulthi

Konkani : Kulid

Kannada : Hurali kalu, Hurali, Durali, Jurali Telugu : Vulavulu, ulavalli, Wulavalli Tamil :

Kollu, Kaanam

English : Horsegram, Mysoregram, Cowpea

Botanical classification

Kingdom : Plantae

Subkingdom : Tracheobionta (Vascular plants) Division : Spermatophyta

Subdivision : Magnoliophytina (Angiospermae) Class : Magnoliatae (Dicotyledonae)

Subclass : Archichlamydeae (Rosidae) Order : Rosales(Fabales)

Family : Fabaceae (Leguminosae) Subfamily : Papilionaceae

Genus : Dolichos Species : bifloruss

- **Ganas/Vargas of Kulattha**^[2,3,4,5,6,7,8,9]

Table no.2

Samhita/ Nighantu	Ganas/ Vargas
Charaka samhita	Swedopaga gana, Dhanyavarga
Sushruta samhita	Artavajanaka dravyas, Dhanyavarga
Ashtanga samgraha	Dhanyavarga
Ashtanga hrudaya	Dhanyavarga
Bhavaprakasha nighantu	Dhanyavarga
Dhanwantari nighantu	Suvarnadi varga
Raja nighantu	Shalyadi varga
Kaiyyadeva nighantu	Dhanya varga
Shaligram nighantu	Dhanyavarga
Dravyaguna samgraha	Dhanyavarga
Sodhala nighantu	Shimbidhanya varga
Madanapala nighantu	Dhanyavarga
Priya nighantu	Pippalyadi varga

Varieties: According to certain Nighantukaras, Kulattha is of two types as:

1. Kulattha (Dolichos biflorus)
2. Vana kulattha/aranya kulattha (Cassia absus)

Different species identified as Kulattha are

1. Dolichos biflorus Linn.
2. Dolichos uniflorum
3. Dolichos unguiculata
4. Macrotyma uniflorum (Lamk.) Verdc.,
5. Vigna unguiculata (Linn.) Walp.
6. Vigna sinensis

In the current research work, Dolichos biflorus is considered as synonymous with Macrotyma uniflorum.

Geographical distribution: Horse gram, is a legume that grows and proliferate in arid regions, such as in the drylands in southern, central and northern parts of tropical countries namely India, Sri Lanka and Malaysia.^[12] A sub-erect or trailing annual which is a native of India and is dispersed throughout the tropical regions of the world. It occurs all over India up

to an altitude of 5,000 feet. It is an essential pulse crop particularly in hilly regions of Tamilnadu, Madras, Mysore, Bombay and Hyderabad and other parts of Andhra Pradesh.^[10]

Family features – Papilionaceae – The family Papilionaceae is the biggest of the three sub families of the order Leguminales. This comprise about 375 genera.^[11]

Parts	Characteristics
Distribution	Cosmopolitan distribution The members of the family are being distributed in the temperate regions of both northern and southern hemispheres. In our country the Papilionaceae characterized by many important genera usually found in the hills and plains.
Habit	Herbs, Shrubs or trees of various habits.
Root	Tap branched root, bear tubercles containing nitrogen fixing bacteria.
Stem	Herbaceous or woody, erect or climber
Leaves	Alternate rarely opposite, compound or simple, leaf base frequently swollen, stipulate.
Inflorescence	Racemose type
Flower	Zygomorphic, sepals 5 connate in an irregular calyx, imbricate, petals-5 descending imbricate, the posterior petal is largest-standard petal, the lateral petals free and long clawed, from the wings, the anterior pair petals boat shaped structure, stamens-10, mostly diadelphous. Gynaecium-carpel is always one, ovary unilocular.
Fruit	Legume or lomentum/seed – Non-endospermic with leathery testa, an aril is present in some.
Seed	Many, Exalbuminous usually flattened.
Pollination	Entomophilous (insect pollinated).
Formula	0 K (5), C 1+2+ (2), A (9) + 1, GI

Morphology^[13,14]

Dolichos biflorus (Linn):

Annual, twining herb upto 4 cm high;

Branches- sub-erect or twining, downy or glabrescent^[11] Stipules - oblong, ovate, lanceolate, acuminate, basifixed. Leaves- alternate and trifoliate, petioles splendor;

Leaflets- 2.5-5 cm., acute, ciliate, pubescent, broadly lanceolate or oblong, entire, membranous, downy, stipules subulate.^[12]

Flowers- solitary or paired, axillary

Bracts lanceolate, one at the base of each one pedicel and two placed laterally at the bottom of each flower.

Calyx - 6 mm. downy; teeth lanceolate-setaceous, campanulate, upper two connate, others linear, much exceeding the tube.^[11]

Corolla- pale yellow, 1.3-2 cm long; keel narrow, obtuse, rather smaller than the standard.^[11]

Fruits- Pods about five cm long, scimitar shaped, condensed recurved, plane, beaked, straw brown; downy, tipped with persistent style. Seeds 5-6 compressed, reniform, grey or reddish brown, shining, seed coat glistening, cotyledons 2 in number, whitish in colour.^[13]

Rasa-panchaka^[7,8,9] – Table no.3

Property	Description
Rasa (taste)	Kashasya (astringent), Madhura (Sweet)
Guna (attributes)	Laghu, Ruksha, Teekshna, Ushna
Veerya (potency)	Ushna (hot)
Vipaka (end result of digestion)	Katu (pungent)
Prabhav (special attribute)	Bhedana
Dosh-karma	Kapha-vata shamaka
Other properties	Krimighna (anthelmintic), Ashmarinasha (antilithiatic), Swedakaraka (diaphoretic), Mutrakaraka (diuretic), Artavajanana (emmenagogue), Kaphaghna (reduce vitiated Kapha Dosh) Jvaraghna (febrifuge), Chakshushya (ophthalmic), Lekhana (lipolytic), hikka-shwas nashaka (Anti-asthmatic)

Nutritional value (per 100 gm) of different nutrient in Kultthi^[1,15] (Table no.4)–

D. biflorus seeds are known as the poor man's pulse crop in Asian countries, especially India. It is usually used for both food and fodder. The application of dry seeds of horse gram is restricted due to their poor cooking quality. newly, the US National Academy of Sciences recognized this legume as an upcoming potential food resource.^[16]

Nutrients	Amount
Carbohydrates	57.3 gm.
Moisture	11.8 gm.
Ash	3.34%
Fat	0.5 gm.
Unsaturated fat	72.49 %
Saturated fat	27.51%
Starch	31.86%
Sugar	5.81%
Crude protein	22.0 gm.
Calories	321 calorie
Fiber	5.3 gm.
Mineral matter	3.1 mg.
Iron	7.6 mg.
Calcium	-.28 mg.
Manganese	37.00%
Magnesium	0.17%
Zinc	0.28%

Nicotinic acid	1.5 mg.
Carotene	11.9 IU.
Phosphorus	0.39 mg.
Copper	19.00%
Vitamin A	2.1%
Vitamin C	1.4%
Ascorbic acid	0.7%
Niacin (Vitamin B3)	1.5%
Ribloflevin (Vitmin B2)	0.09%
Thiamin (Vitamin B1)	0.42%

Identity, purity, strength and assay^[11]

Table no.5

Foreign organic matter	Nil
Total ash	Not more than 5%
Acid insoluble ash	Not more than 1%
Water soluble extractive	Not less than 12%
Alcohol soluble extractive	Not less than 3%

Chemical constituents^[1,11]

Urease, strepogenin, B-sitosterol, genestein, 2'-hydroxygenestein, dalbergioidin, kievitone, phaseollidin, isoferreirin, coumestrol, psoralidin, 5-O-A-Lrhamnopyranosyl (1-> 2)-O-B-D-glucopyranoside, phytohaemagglutinins, B-N-acetyl glucosaminidase, A & B-galactosidases, A- mannosides, B-glucosides, 5-hydroxy-7,3'4'-trimethoxy-8-methoxy-methyl isoflavone-5-neohesperidoside, D-glucose, Dgalactose, L-rhamnose, D-arabinose and L-ascorbic acid, aminoacids viz.-glycine, alanine, cysteine, serine as well as aspartic acid (seeds); genistein, 2'- hydroxygenistein, dalberiodin, keivitone, phaseollidin, coumesterol, psoralidin, lectin similar to glycoprotein (leaves and stem); dolichin A and dolichin B (leaves); isoferreirin(5,7,4'- trihydroxy-2'-methoxy isoflavanone) (plant).

Phytochemicals isolated from the Dolichos biflorus^[1] – (Table no.6)

Category	Phytoconstituents
Anthocyanins	Cyanidin, delphinidin, malvidin, pteunidin
Flavonoids	Diadzein, genistein, kaampferol, myricetin, quercetin
Phenolic acids(benzoic acid derivatives)	Gallic acid, protocatechuic acid, p-hydroxybenzoic acid, syringic acid, vanillic acid
Phenolic acids(cinnamic acid derivatives)	Caffeic acid, chlorogenic acid, ferulic acid, p-coumaric acid, synaptic acid
Enzyme source	A amylase a and b glucosidase b-N-acetylglucosaminidase, urease.

Pharmacological activities

Anti-hypercholesterolemic effect: Kumar, et al^[17] demonstrated that *M. uniflorum* extracts have strong activities against hypercholesterolemia and obesity. Antihypercholesterolemic effect of *M. uniflorum* extract is examined in rats by assessing its effects on food consumption, weight gain, serum lipid profile, serum glutamate oxaloacetate transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT) and body fat.^[17] Researchers reported that the consumption of ethanol and water extract of the plant for 5 weeks resulted a significant decrease ($p < 0.01$) of whole cholesterol (TC), triglycerides, low-density lipoprotein (LDL), very low density lipoprotein (VLDL) SGOT and SGPT levels. There was a significant increase in high-density lipoprotein (HDL) ($p < 0.01$). They also discovered ethanol extract-treated group has exposed a significantly higher fecal excretion of cholesterol level than those treated with water extract. Body weight of rats in the water extract-treated group was radically lower than that in the ethanol extract-treated group.

Anti-microbial activity: According to Kawsar, et al.^[18], Ram, et al^[19] and Gupta, et al^[20] extracts from *D. biflorus* seeds had shown important activity against *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas aeruginosa*.^[18-20]

Anti-helminthic activity: The seeds of *D. biflorus* have anthelmintic activity which may be beneficial in eliminating worms.^[21] Philip, et al. tested the alcohol extracts of *M. uniflorum* seeds for their anthelmintic activity. These extracts exhibited potent anthelmintic activity in opposition to *Pheretima posthuma* and its activity was comparable with that of the standard, albendazole.^[22]

Analgesics and anti-inflammatory effect: Giresha et al., assayed the aqueous extracts of *D. biflorus* coat as well as pulp by *in-vitro* method for inhibition of human secretory phospholipase A2 (sPLA2) as a measure of anti-inflammatory activity. The extract effectively neutralized indirect hemolytic activity and showed similar potency in neutralizing the *in vivo* PLA2 induced mouse paw edema.^[23]

Anti-diabetic activity: Gupta et al., investigated the antidiabetic effect of α -amylase inhibitor isolated from the seeds of *D. biflorus* in streptozotocin- nicotinamide induced diabetic mice. They have determined the biochemical parameters such as serum total cholesterol, aspartate aminotransferase (AST) and alanine aminotransferase (ALT) levels.^[24] Purwar, et al., found that *M. uniflorum* α -amylase inhibitor (MUAI) inhibited both the mouse pancreatic

in adding to human salivary α -amylase. MUAI condensed the serum glucose level in the treated diabetic mice. Histological findings revealed minimum pathological changes in the treated diabetic mice as compared to the diabetic control.^[24]

Anti-choliolithic activity: Bigonia, et al. found that *D. biflorus* seed exerted antilithogenic power by decreasing the configuration of lithogenic bile in mice. Both the methanolic and acetone extracts (ME and AE) were capable of decreasing cholesterol hyper-secretion addicted to bile and increasing the bile acid output. The maximum effect was create in the AE as it decreased the papillary proliferation of gallbladder and hepatic fatty degeneration. Antioxidant property of polyphenol and tannin in AE may provide its potential antilithogenic effect.^[25]

Anti-histaminic activity: Suralkar et al., screened the ethanolic extract of *D. biflorus* seeds for their anti-histaminic activity by with histamine induced contraction on goat tracheal chain preparation and histamine induced bronchoconstriction in Guinea pigs. Histamine induced narrowing of isolated goat tracheal chain grounding was significantly subdued by the ethanolic extract of *M. uniflorum* seeds. The guinea pigs were significantly protected next to histamine induced bronchospasm as indicated by impediment in the preconvul sivedyspnoea time (PCT) following the exposure of histamine aerosol.^[25]

Anti-peptic ulcer activity: Panda, et al., estimate the antiulcer activity of the hydroalcoholic extract of the seeds of *D. biflorus* (MUSE) and p-coumaric acid against indomethacin (non-steroidal anti-inflammatory drug) and absolute ethanol (necrotizing agent) induced ulcers in rats. A dose-dependent decrease in the ulcer index could be seen in both models after the pre-treatment with MUSE and p-coumaric acid. MUSE and p-coumaric acid elicited important antioxidant activity by attenuating the ulcer elevated levels of malondialdehyde and restored the ulcer-depleted levels of condensed glutathione and the antioxidant enzymes superoxide dismutase, catalase, glutathione peroxidase and glutathione reductase.^[26]

Anti-oxidant activity: Singh, et al. reported the *in-vitro* antioxidant activity of ethanolic seed extracts of *D. biflorus*.^[27] As per Ravishankar, et al. administration of *D. biflorus* extract to rabbits with high-fat diet induced oxidative stress, showed development in anti-oxidant enzymes such as superoxide dismutase, catalase and increased glutathione concentration.^[28]

Free radical-scavenging capacity: Siddhuraju, et al. revealed that along with the various extracts, 70% acetone extracts of dry-heated samples of brown variety of *M. uniflorum* as well as raw and dry-heated samples of black variety exhibited significantly ($P < 0.05$) higher hydroxyl radical-scavenging activity. usually all extracts showed good antioxidant activity (53.3-73.1%) next to the linoleic acid emulsion system but were significantly ($P < 0.05$) inferior than the synthetic antioxidant, BHA (93.3%).^[29]

Anti-urolithiatic activity: *D. biflorus* was found to be effective in preventing the deposition of the stones in experimental rats. Chaitanya, et al. reported the antiurolithiatic activity of aqueous and alcohol extracts of *D. biflorus* seed on ethylene glycol induced urolithiasis in albino rats.^[30] Das, et al. noticed an excessive urinary excretion of oxalate, calcium along with phosphate was resulted after the feeding of ethylene glycol.^[31] As per their findings of Atodariya, et al. and Bijarnia, et al. the seeds of *D. biflorus* are endowed with significant antiurolithiatic activity and the alcoholic extract of *D. biflorus* prove better anti urolithiatic activity than aqueous extract.^[32,34]

Diuretic activity: Ravishankar, et al. explored the diuretic outcome of ethanolic seed extracts of *D. biflorus* in albino rats. The urine volume, Sodium, Potassium, Chloride and Bicarbonate contents were measured after the oral administration of extracts at doses of 200mg/kg and 400mg/kg. Diuretic effect was significant in experimental animals treated with of *D. biflorus* extracts compared to the control, Furosemide (5mg/kg).^[35]

Hemolytic activity: The 1-butanol extract demonstrate the significant hemolytic activity by mouse erythrocytes. Kawsar, et al. details the presence of compounds such as methyl ester of hexadecanoic, ethyl ester of hexadecanoic acid mixture and n-hexadecanoic could be constituted a possible chemotaxonomic marker.^[36]

Hepatoprotective activity: Parmar, et al. showing the significant hepatoprotective properties of *M. uniflorum* seeds against D-Galctosamine and paracetamol induced hepatotoxicity in rats.^[37]

Toxicological studies: Kawsar, et al. evaluate the aerial parts of *D. biflorus* for their cytotoxicity effects. basic extracts of dichloromethane (CH₂Cl₂), ethyl acetate (EtOAc), 1-butanol (1-BuOH) and aqueous (H₂O) were monitor by using the brine shrimp lethality bioassay technique. Most of the extracts were establish to be non-toxic and this point to that

the ethnobotanical use (oral applications) of the *D. biflorus* is justified.^[38]

Therapeutic uses^[11,37]

1. Ghee cooked with of decoction of horsegram and panchakola is administered in cough caused by kapha and also in hiccough and asthama.
2. The flour of parched kulattha mixed with fateless curd is useful in annadrava shula.
3. In abdominal pain, soup of kulattha properly soured and processed with soup of quail, added with rocksalt and black pepper is recommended.
4. Kulattha and some others are considered wholesome in amenorrhoea and its related conditions.
5. Kulattha is useful in piles; specially in situation of passing loose stools soup of kulattha and dried radish are advised.
6. Diet containing soup of kulattha is fine for sheetapitta(urticaria), amavata, gandamala, hudsonia etc.
7. Kulatthadya ghrutha and kulatthadya guda are prescribed in urinary calculus, hiccough and breathing problem.
8. In case of excessive perspiration, fine powder of parched Horse gram is rubbed on different parts of the body.
9. If the plants are cut when flower, they are excellent for all farm animals, and particularly in mixtures are considered as particularly good for milk animals.
10. For scrofula, the decoction of the grain with proper powder added is given and for diarrhea 1 tola of the expressed juice of the fresh plant and ¼ tola of catechu mixed together is given thrice daily.
11. A decoction made of ¼ seer of the pulse and five pieces of cachew-nuts is useful in cases of haemorrhage from the bowels etc.
12. A decoction of the grain is given to females during parturition to encourage discharge of the lochia; also used in leucorrhoea and menstrual derangements.
13. With asafoetida, ginger powder and bidalone added the decoction is given in colic.
14. A soup is a diet in sub-acute cases of enlarged liver and spleen; also a diet in piles.
15. Pulse is a demulcent in calculus affections, coughs, etc. For this a decoction of the pulse with 30 grains of Saindbhav added is used.
16. Its decoction is also employed to decrease corpulence.

Side effects and Risk factors^[38]

Consuming horse gram is good and has benefits for the body, but there are side effects to be wary about.

1. In gastric ulcer and hyperacidity should not consume horse gram seeds since it would worsen the condition because horse gram have Rakta-pitta vardhaka property.
2. Horse gram don't give in gout patients because it harms the rakta dhatu cycle by Ayurveda.
3. Also in rakta-dhatu vikara (bleeding disorders) horse gram are not applicable because it have Rakta-prakopaka property.

CONCLUSION

Horse gram is a miracle super food and it is broadly consumed as a staple diet in the southern parts of India. Horse gram is loaded in nutrients and have plenty of minerals too phosphorus, calcium, protein and iron. Hence it is known to be very valuable for human health, as much as it is supportive for animal health too. According to Ayurvedic pharmacodynamic properties *D. biflorus* is capable of pacifying vitiated Vata Dosha by its Madhura Rasa, Ushna Guna and Ushna Veerya. It pacifies elevated Kapha Dosha, due to Kashaya Rasa, Laghu Guna, Ruksha Guna as well as Ushna Veerya. Therefore it can be used to treat a variety of ailments, originating through a multitude of causes. Seeds are having technically proven bioactivities such as anti- diabetic, antihyperlipidemic, diuretic, antioxidant and chemo modulatory. Therefore it can be useful in the management of the diseases such as diabetes mellitus, renal stone, hyperlipidaemia, hypertension and stroke. This review provides nutritional value, therapeutic action and pharmacological action of Kulttha according to ayurved and modern aspect.

REFERENCES

1. Ranasinghe RLDS* and Ediriweera ERHSS Medicinal and Nutritional Values of *Macrotyloma uniflorum* (Lam.) Verdc (Kulattha): A Conceptual Study.
2. Dr. Zarkhande Oza, Dhanavantari Nighantu, Suvarnadi varga, Kulttha(Dhanyavishesh) 278- 80 Chaukhamba Surbharti Academy (2016) Varanasi.
3. Dr.Indradeva Tripathi, Rajanighantu, Shaalyadi varga, Kulttha 556-558 Chaukhamba Krushnadas academy, Varanasi (2016)
4. Shaligram Nighantu bhooshanama, Dhanyavarga, Kulttha 540-542, Khemraj shreekrushndas Prakashan Mumbai -4 (2004)

5. Dr. Gangashaya Pandeya, Bhavprakash Nighantu, Dhanyavarga, Kulttha 645-46 Chaukhamba Bharti Acadamy (2008)
6. Shri. Bapalal vaidya, Nighantu aadarsh, Kulttha 374-377 Chaukhamba Bharti Acadamy (2018)
7. Acharya vidyadhar Shukla, Charak samhita, sutrasthan, Shadavirechan-shataashreetiya Adhyaya 12/78 chaukhamba prakashana Delhi 2015.
8. Kaviraj Ambikadutta Shastri, Sushruta samhita, sutrasthan, Annapanvidhi Adhyaya 37-38/245 chaukhamba Sanskrit Sansthan Varanasi.
9. Acharya vidyadhar Shukla, Charak samhita, sutrasthan, Annapanvidhi Adhyaya 26/349 chaukhamba prakashana Delhi 2015.
10. <https://www.preservawellness.com/herbs/kultha>
11. Dr.pratibha – A critical survey on aharadravyas in ayurvedic literature and clinical evaluation of Tila and Kulttha for their artavjanaka karma.
12. <https://m.netmeds.com/health-library/post/horse-gram-super-food-way>
13. in Ceylon (Part 3). The National Science Council, Sri lanka, pp: 1-297.
14. Verdcourt B (1970) Studies in the Leguminosae-Papilionoideae, Flora of Tropical East Africa, Kew Bulletin, 24(3): 507-569.
15. <https://www.bimbima.com/ayurveda/kulthihorse-gram-medicinal-uses>
16. Kawsar SMA, Huq E, Nahar H (2008) Cytotoxicity Assessment of the Aerial Parts of *M. uniflorum*. International Journal of Pharmacology, 4(4): 297-300.
17. Kumar DS, Prashanthi G, Avasarala H, Banji D (2013) Anti-hyper cholesterolemic effect of *M. uniflorum* (Lam.) Verdc (Fabaceae) extract on high-fat diet-induced Hypercholesterolemia in Sprague-Dawley Rats. J Diet, Suppl 10(2): 116-128.
18. Kawsar SMA, Seraj Uddin M, Huq E, Nahar N, Yasuhiro Ozeki (2008) Biological investigation of *M. uniflorum* Linn. extracts against some pathogens. Journal of Biological Sciences, 8(6): 1051-1056.
19. Jeevan Ram A, Bhakshu LM, Venkata Raju RR (2004) *In-vitro* anti-microbial activity of certain medicinal plants from eastern ghats, India, used for skin diseases. J Ethnopharmacol, 90(2-3): 353-357.
20. Gupta SK, et al. (2005) Anti-microbial activity of *Dolichos biflorus* seeds. Indian J Nat Prod, 21: 20-21.
21. Ansa Philip, Athul PV, Ajmal Charan, Afeefa TP (2009) Anti-helminthic activity of seeds of *M. uniflorum*. hygeia, 1(1): 26-27.
22. Varicola Karuna Sree, Meda Soundarya, Maddala Ravikumar, Tiyyagura Ravichandra

- Reddy, Nelluri Kanaka Durga Devi (2014) *In-vitro* screening of *Macrotyloma uniflorum* extracts for anti-oxidant and anthelmintic activities. *Journal of Pharmacognosy and Phytochemistry*, 3(4): 6-10.
23. Giresha A S, Narayanappa M, Vikram Joshi, Vishwanath BS, Dharmappa KK (2015) Human secretory phospholipase A2 (spla2) inhibition by aqueous extract of *Macrotyloma uniflorum* (seed) as an anti-inflammatory activity. *International journal of pharmacy and pharmaceutical sciences* 7(Suppl 1).
24. Gupta LH, Badole SL, Bodhankar SL, Sabharwal SG (2011) Anti-diabetic potential of α - amylase inhibitor from the seeds of *M. uniflorum* in streptozotocinnicotinamide-induced diabetic mice. *Pharm Biol*, 49(2): 182-189.
25. Bigoniya P, Sourabh Bais, Brijesh Sirohi (2014) The effect of *M. uniflorum* seed on bile lithogenicity against diet induced cholelithiasis on mice. *Ancient Science of Life*, 33(4): 242- 251.
26. Suralkar AA, Kasture SB (2013) Evaluation of Anti-histaminic activity of *Dolichos biflorus*. *International Journal of Pharma and Bio Sciences*, 4(4): 346-352.
27. Vandana Panda, Swetha Suresh (2015) Gastro-protective effects of the phenolic acids of *M. uniflorum* (horse gram) on experimental gastric ulcer models in rats. *Food Bioscience*, 12: 34-46.
28. Renu Singh, Manoj Kumar Singh, Lovy Raj Chandra, Deepa Bhat, Manmeet Singh Arora, et al. (2012) *In-vitro* Anti-oxidant and free radical scavenging activity of *M. uniflorum* (Gahat dal) from Kumauni region. *International Journal of Fundamental and Applied Sciences*, 1(1): 9-11.
29. Marimuthu M, Krisnamoorthi K (2013) *In-vitro* anti-oxidant potential of chloroform seed extract of underutilized/less edible South Indian legumes. *PHARMANEST- An International Journal of Advances in Pharmaceutical Sciences*, 4(4): 647-658.
30. Perumal Siddhuraju, Sellamuthu Manian (2007) The antioxidant activity and free radical-scavenging capacity of dietary phenolic extracts from horsegram seeds. *Food Chem*, 105(3): 950-958.
31. Das I (2005) *In-vitro* inhibition and dissolution of calcium oxalate by edible plant *Trianthema monogyna* and pulse *M. uniflorum* extracts. *Journal of Crystal Growth*, 273(3-4): 546-554.
32. Chaitanya DAK, Santosh kumar M, Manohar Reddy A, Ramesh A (2010) Anti-urolithiatic activity of *M. uniflorum* seed extract on ethylene glycol induced urolithiasis in albino rats. *Journal of Innovative trends in Pharmaceutical Sciences*, 1(5): 216-226.

33. Ahmad J (1992) Inhibitory effects of aqueous extracts of natural products on the crystallization of urinary lithiasis *in-vitro* (Part III) Uric acid. Pakistan Journal of Biochemistry, 25: 65-70.
34. Ravishankar K, Priya P (2012) Evaluation of diuretic effect of ethanolic seed extracts of *Macrotyloma uniflorum* and *Cucumis melo* in rats. International Journal of Pharma & Bio Sciences, 3(3): 251-255.
35. Kawsar SMA, Mostafa G, Huq E, Nahar N, Ozeki Y (2009) Chemical constitutions and hemolytic activity of *M. uniflorum*. International Journal of Natural and Engineering Sciences, 3(1): 69-72.
36. Chen CH, Lin JY, Lin CN, Hsu SY (1992) Inhibition of angiotensin-I converting enzyme by tetrahydroxyxanthenes isolated from *Tripterospermum lanceolatum*. J Nat Prod, 55(5): 691- 695.
37. Nadkarni KM. Indian materia medica. Vol. I. Bombay Popular Prakashan Pvt Ltd, Mumbai, 1982, 743-746. Anonymous. PDR for herbal medicines. 2nd ed. Medical Economic Company. New Jersey (Montvale), 2000; 458-459.
38. <http://www.fashionlady.in/surprising-health-benefits-ofhorse-gram-kulthi/112970>