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A Comparative Study on Antimicrobial Activity of *Vigna unguiculata* And *Cynodon dactylon*

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Abstract: Extract from different parts of medicinal plant contains lots of phytochemicals and helps to cure different types of diseases. *Vigna unguiculata* and *Cynodon dactylon* both are annual herbs and found all over the country. Both annual herbs are numerous used in Ayurveda, Unani and Siddha medicines. *Vigna unguiculata* is a leguminous plant and contain various phytochemicals like alkaloids, flavonoids, Amino acid, phenols, and phytic acid. *Vigna unguiculata* extract have been reported to cure different type of diseases like anthelmintic activity, antibacterial activity, antimicrobial activity, antidiabetic activity, antiviral and antifungal activity, antioxidant activity, hypocholesterolemic activity and hypolipidemic activities. Extracts from different parts of *Cynodon dactylon* are widely used to prevent different kinds of diseases like antiviral and antimicrobial activity, against snake bites, gout and rheumatic affection, anthelmintic activity, anti-inflammatory activity, reduce burning sensation, hyperdipsia, haematuria, leprosy, bronchitis, piles, asthma, enlargement of the spleen, tumors, dysentery, diarrhoea, conjunctivitis, vomiting etc due to the lot of phytochemical likes flavonoids, alkaloids, glycosides, terpenoids, saponins, resins, tannins, reducing sugar, phytosterols, proteins, carbohydrates, volatile oil and fixed oils presents in the plant.

Keywords: *Cynodon dactylon*, *Vigna unguiculata*, Antimicrobial Activity, Cowpea, Black eye pea, Durba.

I. INTRODUCTION

Vigna unguiculata is largely produced and used for household consumption in Africa [1] and very commonly known as Cowpea or black eye pea [2]. It is a leguminous plant and belongs to a family Papilionaceae. The most important part of *Vigna unguiculata* is its leaf and seed which are source of numerous chemical constituents like alkanoids, flavonoids, amino acid, phenol, phytic acid, etc [3,4] as well as having potassium, iron, zinc, calcium, selenium, sodium, copper and potential sources of vitamin A and C [5]. Sandy soil with rich source of organic matter and minerals are the suitable place for the growth of the plant[6]. Different parts extract shows various medicinal activities like antioxidant, antifungal, antisickling, antidiabetic, antibacterial, hypolipidemic, hypocholesterolemic, antimalarial, anthelmintic, thrombolytic activity[7,8]. Plants have strong tap and lateral roots with nodules helps to fix atmospheric nitrogen in soil. *V. unguiculata* contains a bunch white, yellow, blue or purple colour self fertilized flowers on the leaf axils. Green, brown or purple colour pods varies in length from 8 to 15 cm with straight or slightly beak or pointed beak tips. Pod contains green, black, brown, white, red, mottled and spotted seed averagely 1 – 10 seeds in a row[9-12].



Picture I: Different parts of *Vigna unguiculata*

Our earth is a rich source of medicinal plant [13]. *Cynodon dactylon*, mainly known Durba, are used both externally and internally for various medicinal value[14]. *Cynodon dactylon* belongs to a family Poaceae and available all over the country[15]. Different parts extract of the plant such as leaves, roots, stems, fruits, seeds are used to treat various disease due to presence of different phytochemical components and plants[16]. The Plant extract shows antiviral and antimicrobial activity[17].

The plant shows positive response against snake bites, gout and rheumatic affection[18]. In Homeopathic medicine *Cynodon dactylon* is used in bleeding and skin troubles.[19,20]. *C.dactylon* is grown in warm climates and all around the year[21,22]. Completely herb and its root stalk is used in medicine[23]. The gray or green leaf blades of *Cynodon dactylon* are, 2-15cm long and 4mm broad. Leaves are flat to slightly keeled, tip sharp and glabrous. *Cynodon dactylon* flowers are spikelets with a perfect floret and lanceolate and yellow in colour; styles purple; The yellow to reddish seeds are oval and about 1.5 mm long[24].



Picture II: Different parts of *Cynodon dactylon*

II. COMMON NAME OF *VIGNA UNGUICULATA* AND *CYNODON DACTYLON*

A. Common name of *Vigna unguiculata*

Sl. No.	Language	Vernacular Name
1.	English	Cowpea
2.	Hindi	Lobia, Kulathi, Kurathi
3.	Tamil	Kaattulundu, karamani
4.	Sanskrit	Mahamasah, rajamash
5.	Marathi	Alasandalu, Kaaraamanulu
6.	Telugu	Alsandalu, Kaaraamanulu
7.	Malayalam	Vellapayar
8.	Kannada	Alasande
9.	Tulu	Lattane
10.	Urdu	Kulthi
11.	Arabic	للوبياء
12.	Bengali	Kalaya, Barbati, Kulattha, Ghangra
13.	French	Dolique asperge, Haricot asperge, Doliquemongette, Haricot indigène, Niébé.
14.	Marathi	Chavali, Alasbde
15.	Punjabi	Lodhar
16.	Spanish	Costeno, Judía catjang, Frijol de costa, Judíaespárrago, Rabiza
17.	Tamil	Karamani ,Kaattuulundu,
18.	Swahili	Kunde
19.	Kashmiri	Kath
20.	Ghana	Tipielega, Tuya, ,Adua, Ayi, Saau
21.	Gujrati	Kulathi, Kalathi
22.	Malayalam	Mudiraa
23.	Nigeria	Mongo, Ewa, Akedi, ,Wake, Ezo, Nyebbe, Ngalo, Azzo, Dijok, Alev, Arebe, Lubia, Akoti
24.	Portuguese	Feijão-fradinho ,Feijão-espargo
25.	Indonesian	Kacangtoonggak ,Kacangbol, Kacangmerah, , Kacangbéngkok

Table I: Common Name of *Vigna Unguiculata* [25 - 28]

B. Common Name of *Cynodon dactylon*

Sl. No.	Language	Synonyms
1.	Tamil	Aruvaumpullu
2.	Hindi	Doob
3.	Kanada	Garikehullu
4.	Marathi	Dhoorva
5.	Telugu	GarikeandThellagariki
6.	English	Bermuda and Bahama.
7.	Sanskrit	Durva
8.	Other	Weed
9.	German	Bermundagrass, Hundezahngras
10.	Italian	Gramina
11.	Portuguese	Capim-Bermunda
12.	Spanish	Garmarastera
13.	Swedish	Hundtandsgras
14.	Chinese	Gou ya gen
15.	Afrikaans	Gewonekweek, Kweekgrss
16.	Arabic	Thaiel, Najeel, Tohma
17.	French	Chieendent pied-de-poule

Table II: Common Name of *Cynodon dactylon* [29-31]

III. SYSTEMIC CLASSIFICATION OF *VIGNA UNGUICULATA* AND *CYNODON DACTYLON*

	<i>Vigna unguiculata</i> [32,33]	<i>Cynodon dactylon</i> [34-36]
Kingdom	Plante	Plantae
Division	Magnoliophyta	Trcheobionta
Class	Magnoliopsida	Magneliophyta
Order	Fabales	Spermatophyte
Family	Fabceae	Liliopsida
Subfamily	Fboideae	Commelinidae
Genus	Vigna	Cyperales
Parts	seeds	Poaceae
Tribe	Phaseoleae	Cynodon N
Sub tribe	Phaseolinae	Cynodon dactylon
Species	Unguiculata	Cynodon dactylon

Table III : Systemic Classification of *Vigna unguiculata* and *Cynodon dactylon*

IV. PHYTOCHEMICAL CONSTITUENTS OF VIGNA UNGUICULATA AND CYNODON DACTYLON

A. Chemical Constituents of *Vigna unguiculata*

Sl. No.	Chemical Name	References
1.	Proteins (20.53-31.7%)	37,38
2.	Carbohydrates (56-67%)	
3.	Vitamins	
4.	Fat(1.14-3.03%)	
5.	Glycosides	
6.	Minerals	
7.	Flavonoids	
8.	Polyphenols	
9.	Tannins	
10.	Vignalin	
11.	Saponins	
12.	Sitosterol β -D-glycosides	
13.	Oleanolic Acid	

Table IV : Phytochemical Constituents of *Vigna unguiculata*

B. Chemical Constituents of *Cynodon dactylon*

Sl. No.	Chemical Name	References
1.	Proteins, Carbohydrates, Vitamin C, Terpenoids, alkaloids, and palmitic acid	39
2.	Flavonoids:apigenin, orientin, letuolin, and vitexin	40,41
3.	Extractive Value (water: 18.88, petroleum ether:3%, alcohol:8% and benzene:1.34 % w/w of crude drug). Volatile Oil: 1%	42
4.	Fibercontent: 30.46% and tannin content: 0.80%. Total Ash: 9.1%, water insoluble ash: 7.9%, acid insoluble ash:3.7%.	43,44
5.	Green grass (dry) 10.47% crude protein, 11.755 total ash, 28.17% fiber.	45
6.	Leaves glycerin (38.49%), 9, 12-octadecadienoyl chloride, (Z,Z)- (15.61%), ethyl ester (9.50), hexadecanoic acid, phytol (4.89%) and ethyl(5.32%)	46
7.	Phenolic extracts : furfural (6.0%), hydro quinone (69.49%) and levoglucosenone (2.72%).	47
8.	Carotenoids: neoxanthin, beta-carotene, Phenolics	48
9.	Phytosterols, saponins, glycosides	49,50
10.	Essential oil triticin 12.4%	51
11.	Cuticular wax contains octacosanol, docosanol, hexacosanol, tetracosanol, docosanoic acid & eicosanoic acid	52,53

Table V : Phytochemical Constituents of *Cynodon dactylon*

V. PHARMACOLOGICAL ACTIVITIES OF VIGNA UNGUICULATA AND CYNODON DACTYLON

A. Pharmacological Activities of *Vigna unguiculata*

Plant Parts	Extracts	Biological Activities	References
Seeds	Aqueous	Antibacterial activity,	54
		Hepatoprotective	55
Seeds	Ethanol	Anthelmintic Activity,	56
		Anti-atherosclerotic	57
		Antisickling Activity	58.59
		Hypolipidimic Activity	60
Seeds	Methanol	Antioxident	61,62
		Antibacterial	63
		Antinociceptive Activity	63
		Antidiabetic	64
		Thrombolytic Activity	65
		Hypocholesterolemic Activity,	66
		Hypoglycemic	67
Seeds	-----	HIV-1 reverse transcriptase and α -glucosidase inhibitor	68
		Antiparasitic	69
Seed oil	-----	Antimicrobial	70
		Antidiabetic	71
Leaves	Ethanol	Antimicrobial	72
		Diuretics	73
		Antisickling Activity	74
Leaves	----	Antihyperlipidemic, cardioprotective	75
Whole Plant	Methanol	Antiobesity	76
Whole Plant	-----	Antidiabetic	77

Table VI : Pharmacological activity of *Vigna unguiculata*

B. Pharmacological Activities of *Cynodon dactylon*

Plant Parts	Solvents	Pharmacological Activity	References
Whole plant	Aqueous	Antipyretic and analgesic	78
		Anthelmintic	79
		Anticataleptic	80
		Anti-inflammatory	81
	Aqueous and non polysaccharide fraction	Anti-diabetic	82
	Chloroform-methanolic	Anti-inflammatory	83
	Ethanollic	Anticonvulsant	84
	50% ethanolic	Anti-inflammatory	85
	Methanolic	Anti-diarrheal	86
	Aqueous and	Wound healing	87

Aerial parts	ethanolic	Anti-diabetic	88-90
	50% aqueous-ethanolic	Reduce kidney stone	91
	Ethanolic	Gastoprotective	92
		Central Nervous system	93
	Ethyl acetate fraction	Antioxidant	94
	Hydroalcoholic	Antioxidant	95
Rhizome	Aqueous	Anti-diuretic	96
	Hydroalcoholic	Anti-arrhythmic	97
		Cardio-protective	98
Leaves	Aqueous and Chloroform	Antimicrobial	99
		Anti-diabetic	100
	Aqueous and ethanolic	Antiepileptic	101
	Ethyl acetate fraction	Antioxidant	94
		Immunomodulatory	102
	Phosphate buffered saline	Antilipidperoxidative	103
Roots	Methanolic	Anticancer	104

Table VII : Pharmacological activity of *Cynodon dactylon*

VI. ANTI-MICROBIAL ACTIVITIES OF *VIGNA UNGUICULATA* AND *CYNODON DACTYLON*

A. Anti-Microbial Activity of *Vigna unguiculata*

Vigna unguiculata seed oil shows positive antimicrobial activity at the concentration of 400 µg/ disc showed the highest activity against Gram positive bacteria like *Sarcina lutea* and *Staphylococcus aureus* as well as *Vigna unguiculata* seed oils are active against numerous fungi namely *Penicillium* spp., *Mucor* spp. and *Candida albicans* [70].

The antimicrobial activity of three varieties of *Vigna unguiculata* L. Walp seed oil (LBS-1, LBS-2 and LBS-3) were investigated against five Gram positive bacteria (*Bacillus megaterium*, *Bacillus subtilis*, *Sarcina lutea*, *Salmonella*

typhi and *Staphylococcus aureus*) and four Gram negative (*Escherichia coli*, *Shigella dysenteriae*, *Shigella sonnei*, *Shigella shiga*) and four fungi (*Penicillium* spp., *Mucor* spp., *Candida albicans* and *Aspergillus fumigatus*). The LBS-1 oil

at the concentration of 400 µg/ disc showed the highest activity against *Sarcina lutea* (19±0.1 mm) than that of LBS-2

(14±0.3 mm) and LBS-3 (12±0.3 mm) oil whereas LBS-3 oil showed highest activity against *Staphylococcus aureus*

(16±0.1 mm) than that of LBS-1 (10±0.6 mm) and LBS-2 (13±0.4 mm) oil. All the three oils are active against the three tested fungi namely *Penicillium* spp., *Mucor* spp. and *Candida albicans* but showed no sensitivity against *Aspergillus*

fumigatus

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fumigatus

B. Anti-Microbial Activity *Cynodon dactylon*

Chloroform and aqueous extract of *Cynodon dactylon* leaves shows antibacterial activity against tested gram positive (*Pseudomonas aeruginosa* and *Staphylococcus aureus*) and gram negative (*Escherichia coli* and *Klebsiella pneumoniae*) bacteria and 75 $\mu\text{l/ml}$ concentration shows the best result compare than concentration 25 $\mu\text{l/ml}$ and 50 $\mu\text{l/ml}$ [99].

damba J, Nyazema N, Makaza N, Anderson C, Kaondera KC

(1994) Traditional herbal remedies used for the treatment of urinary schistosomiasis in Zimbabwe. Journal of Ethnopharmacology 42: 125–132

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(1994) Traditional herbal remedies used for the treatment of urinary schistosomiasis in Zimbabwe. Journal of Ethnopharmacology 42: 125–13

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Ethnopharmacology 42: 125–132

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(1994) Traditional herbal remedies used for the treatment of
urinary shistosomiasis in Zimbabwe. Journal of
Ethnopharmacology 42: 125–132

VII. CONCLUSION

Vigna unguiculata (Cowpea) and *Cynodon dactylon* is very important and extremely useful in ayurvedic, unani and siddha medicine From ancient days. Both plants are found all over the year and very easily and both plants are shows near about result in antimicrobial activity. *Vigna unguiculata* (Cowpea) extract at concentration 400 µg/ disc shows antimicrobial activity against gram positive, gram negative and different types of fungi. Others important activity like thrombolytic and antisickling activities, anthelmintic, antilipidemic, antidiabetic, antibacterial, antifungal, antiviral, antioxidant due to rich source of vitamin A, vitamin C, flavonoids, riboflavin, zinc, copper, magnesium, calcium, sodium, phosphorus, thiamine, amino acid, phytic acid, alkaloids, saponins, fats, resins, terpenoids, glycosides in the different parts of the plant. Different parts of *Cynodon dactylon* plants contain different types of phytochemical like proteins, minerals, carbohydrates, vitamin C, terpenoids, alkaloids and palmitic acid, Flavonoids: apigenin, orientin, letuolin, and vitexin. *Cynodon dactylon* have significant role in management of diabetics and cardiovascular disease as well as 75 µl/ml concentration shows the best result in antimicrobial activity.

Conflict of Interest: Nil

amba J, Nyazema N, Makaza N, Anderson C, Kaondera KC
(1994) Traditional herbal remedies used for the treatment of
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Ethnopharmacology 42: 125–132

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Ndamba J, Nyazema N, Makaza N, Anderson C, Kaondera KC
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urinary shistosomiasis in Zimbabwe. Journal of
Ethnopharmacology 42: 125–132

Ndamba J, Nyazema N, Makaza N, Anderson C, Kaondera KC
(1994) Traditional herbal remedies used for the treatment of
urinary shistosomiasis in Zimbabwe. Journal of
Ethnopharmacology 42: 125–132

Ndamba J, Nyazema N, Makaza N, Anderson C, Kaondera KC
(1994) Traditional herbal remedies used for the treatment of
urinary shistosomiasis in Zimbabwe. Journal of
Ethnopharmacology 42: 125–132

REFERENCES

- [1] Nweke, K. World literature on cowpea (*Vigna unguiculata* (L.) Walp). Annals of Library Science and Documentation; 1988; 35(1): 26-31.
- [2] Ogunlade I, Ogunleye R T, Osasona I. Chemical Composition, Antioxidant Capacity and Total Phenolic Content of the Flours Obtained from Cow Pea (*Vigna unguiculata*) Varieties Commonly Consumed in Nigeria; 2014; 5.
- [3] Bejarano A, Ramírez-Bahena M H, Velázquez E, Peix A. *Vigna unguiculata* is nodulated in Spain by endosymbionts of Genisteeae legumes and by a new symbiovar (*vignae*) of the genus *Bradyrhizobium*. Systematic and Applied Microbiology; 2014; 37(7): 533-540.

- [4] Segura-Campos M R, Chel-Guerrero L A, Betancur-Ancona D A. Purification of angiotensin-I converting enzyme inhibitory peptides from a cowpea (*Vigna unguiculata*) enzymatic hydrolysate. *Process Biochemistry*; 2011; 46(4): 864-872.
- [5] Agugo U A, Okere T O, Anya K M. Investigating the nutrient composition and anti-nutritional factors of Akidi (*Vigna unguiculata*), IOSR; 2013; 5(4): 3235.
- [6] Gupta N et al. Phytochemical evaluation of Moth Bean (*Vigna aconitifolia* L.) seeds and their divergence. *Biochemistry Research International*; 2016; 6.
- [7] Ibrahim S et al. Pharmacological activities of *Vigna unguiculata* (L) Walp: A review. *International Journal of Pharma and Chemical Research*; 2017; 3(1): 44-49.
- [8] Siddhuraju P., Becker K. The antioxidant and free radical scavenging activities of processed *Vigna Unguiculata* (L) Walp seed extracts. *Food Chem*; 2007; 101(1):10-9.
- [9] Boukar, O. et al., "Cowpea", in: De Ron, A.M. (ed.), *Grain Legumes, Series Handbook of Plant Breeding*, Springer-Verlag, New York, 2015; pp. 219-250.
- [10] Barnard, E.A. Ribonucleases. *Annual review of biochemistry*, 1969; 38(1), 677-732.
- [11] Can M, Kaymak G, Sahin M., Acar Z., Ayan I. Chapter 4 Forage Cowpea (*Vigna Unguiculata* L. Walp) 2021
- [12] Chakraborty S, Pal R, Bhattacharya S, Mandal C, Bhattacharjee A; A Short Review on *Vigna unguiculata*: A God Gifted Plant in Management of Sickling of Red Blood Cell and Thrombolysis; *IJCRT*; 2022; 10(7) : d406 - d413
- [13] Nagori BP, Renu S; *Cynodon dactylon* (L.) Pers.; a Valuable Medicinal Plant; *Research Journal of Medicinal Plant*; 2011; 5(5): 508-514;
- [14] Shendye NV, Gurav SS; *Cynodon dactylon*: A Systemic Review of Pharmacognosy, Phytochemistry and Pharmacology; *Int J Pharm Pharm Sci*; 2014; 6(8): 7-12.
- [15] Animesh DK, Rita P, Aninda M; An updated overview on *Cynodon dactylon* (L) Pers.; *Int J res Ayuveda Pharm*; 2012; 3(1): 11-14.
- [16] Rai PK, Rai NK, Rai AK, Watal G; Role of LIBS in elemental analysis of *Psidium guajava* responsible for glycemic potential; *Inst Sci Tech*; 2007; 35: 507-522.
- [17] Dhar ML, Dhwan JT, Melhorta M; Screening of Indian Plants For Biological activity; *Ind J exp Biol*; 1968; 6(4): 232-247.
- [18] Chopra RN, Nayer SL, Chopra IC; CSIR, New Delhi: Publication and Information Directorate; *J Glossary of Indian Medicinal plants*; 1999-88.
- [19] Ghosh N.C. *Comparative Materia Medica*. Hannemann Pub., Co. Pvt. Ltd.; 1998; pp: 855.
- [20] Oudhia P, Joshi BS, Kosta VK; The possibilities of preparing homeopathic drugs from the obnoxious weeds of Chhattisgarh; *Bhartiya Krishi Anusandhan Patrika*; 1998; 13: 53- 57.
- [21] Kaup SR, Nayantara AK, Bernhardt LK, Vasavi RG, Shetty SS, Pai SR; Arun KB; Antihyperlipidemic activity of *Cynodon dactylon* extract in high-cholesterol diet fed Wistar rats; *J Genom Med Biom Health Sci*; 2011; 3(3-4): 98-102.
- [22] Chandra MD, Shama S, Satish C; Overview of *Cynodont dactylon* in modern medicine as antidiabetic herb; *Journal of drug delivery & Therapeutics*; 2013, 3(6), 117-120.
- [23] Kritkar, KR, Basu BD; 1980; *Indian medicinal Plants, 2nd Edn.*; International book distributors, Dehradun; pp. 2650.
- [24] Mandal C, Chakraborty S, Bhattacharya S, Pal R, Bhattacharjee A, A Comprehensive Review on *Cynodon dactylon* in Management of Diabetes & Cardiovascular Diseases; *IJPRA* ; 2022 ; 7(4) : 624 -633.
- [25] Singh A et al. Review on standardization and phytochemical of *Vigna unguiculata*. *International Journal for Pharmaceutical Research Scholars*. 2015; 4(2):506-516.
- [26] Heuzé V, Tran G. *Cowpea (Vigna unguiculata) seeds*. Feedipedia, a programme by INRA, CIRAD, AFZ and FAO, 2015.
- [27] Gupta N et al. Phytochemical evaluation of Moth Bean (*Vigna aconitifolia* L.) seeds and their divergence. *Biochemistry Research International*; 2016; 6.
- [28] Ashraduzzaman M et al. *Vigna unguiculata* Linn. Walp. seed oil exhibiting antidiabetic effects in alloxan induced diabetic rats. *Malaysian Journal of Pharmaceutical Sciences*. 2011; 9(1):13-23.
- [29] Asthana A, Anil K, Sumit G and Jyotsna D. Pharmacological perspectives of *Cynodondactylon*. *Res. J. Pharma. Biol. Chem. Sci*. 2012; 3(2):1135-1147.
- [30] Chandra MD and Chandra SS; overview of *cynodont dactylon* in modern medicine as antidiabetic herb; *Journal of drug delivery & Therapeutics*; 2013, 3(6), 117-120.
- [31] Singh SK, Rai PK, Mehta S, Gupta RK and Watal G. Curative effect of *Cynodon dactylon* against STZ induced hepatic injury in diabetic rats. *Ind. J. Clin. Biochem*. 2009; 24:410-413
- [32] Sathe, SK. and Venkatachalam M. Fractionation and biochemical characterization of moth bean (*Vigna aconitifolia*) proteins. *LWT-Food Science and Technology*. 2007; 40(4), 600-610.
- [33] Ibrahim S et al. Pharmacological activities of *Vigna unguiculata* (L) Walp: A review. *International Journal of Pharma and Chemical Research*. 2017; 3(1):44-49.
- [34] Kumar A, Sawarkar HA, Deshmukh VS, Mishra KK, Singh M, Verma T and Kashyap P. *Cynodondactylon*(L.) Pers: Pharmacological actions and medicinal applications. *International Journal of Herbal Drug Research*; 2011; 1(1): 1-7.
- [35] Shendye NV and Shailendra S., *Cynodondactylon*: A systemic review of pharmacognosy, phytochemistry and pharmacology; *International Journal of Pharmacy and Pharmaceutical Sciences*; 2014, 6(8), 7-12
- [36] Chandra Mukesh D., Shamashilpand Satish Chandra.; overview of *cynodont dactylon* in modern medicine as antidiabetic herb; *Journal of drug delivery & Therapeutics*; 2013, 3(6) : 117-120
- [37] Onwuliri VA, Obu JA. Lipids and other constituents of *Vigna unguiculata* and *Phaseolus vulgaris* grown in northern Nigeria. *Food Chem*.2002; 78(1):1-7
- [38] Ibrahim.Sayeed.VK., S.S. Satish., Kumar Ajay and Karunakara Hegde.; pharmacological activities of *Vigna unguiculata* a review; ISSN; 2395-3411, 44
- [39] Solanki R, Nagori BP. Physicochemical and phytochemical investigation of whole plant of *Cynodondactylon*. *Int. J. Comp. Pharm*. 2012; 3(10):1-4
- [40] Nair GA. Flavonoids of *Cynodon dactylon*. *J. Med. Ethnobot. Res*. 1995; 16(3-4):153-157.
- [41] AvvaraiSK, Kattamanchi G, Doni K, Anugu MR, Raju C. Anti-diabetic activity of ethanolic extract of *Cynodon dactylon* root stalks in streptozotocin induced diabetic rats. *Int. J. Adv. Pharm. Res*. 2011; 2(8):418-422.
- [42] Chapman GW, Burdick D, Higman HC, Robertson JA. Steam volatiles from coastal Bermuda grass. *J. Sci. Food. Agric*. 1978; 29(4):312-316.
- [43] Singh V. Anatomical and phytochemical study on *Durva* (*Cynodondactylon* Linn, Pers) – An ayurvedic drug. *International Ayurvedic Medical Journal*. 2013; 1(5): 1-7
- [44] Snafi-Al Dr Ali Esmail.; Chemical constituents and pharmacological effects of *Cynodondactylon*-A Review; *IOSR Journal of Pharmacy*. 2016; 6(7):16-31.

- [45] Paranjpe P. Durva. In: Indian Medicinal Plants: Forgotten Healers. 1st Edn, Chaukhamba Sanskrit Pratishthan, Delhi. 2001; pp. 75-76.
- [46] Jananie RK, Priya V, Vijayalakshmi K. Determination of Bioactive Components of Cynodondactylon by GC-MS Analysis. New York Sci. J. 2011; 4(4):16-20.
- [47] Mohamed Shabi M, Gayathri K, Venkatalakshmi R, Sasikala C. Chemical Constituents of hydro alcoholic extract and Phenolic fraction of Cynodondactylon. Int. J. Chem. Tech. Res. 2010; 2(1):149-154.
- [48] Chou CH, Young CC. Phytotoxic substances in twelve subtropical grasses. J. Chem. Ecol. 1975; 1(2):183-193.
- [49] AvvaraiSK, Kattamanchi G, Doni K, Anugu MR, Raju C. Anti-diabetic activity of ethanolic extract of Cynodondactylon root stalks in streptozotocin induced diabetic rats. Int. J. Adv. Pharm. Res. 2011; 2(8):418-422.
- [50] Chandel E and Kumar B. Antimicrobial activity and phytochemical analysis of Cynodondactylon: A review. World Journal of Pharmacy and Pharmaceutical Sciences 2015; 4(11): 515-530.
- [51] Chandra Mukesh D., Shamashilpand Satish Chandra.; overview of cynodont dactylon in modern medicine as antidiabetic herb; Journal of drug delivery & Therapeutics; 2013, 3(6), 117-120.
- [52] Trease And Evans, Textbook of Pharmacognosy, Elsevier; 15th ed. p. 204-205, 479.
- [53] The wealth of India 2nd supplement series, Raw materials, CSIR, Vol. 1 page no.331-33
- [54] Sandeep D. Evaluation of Antibacterial activity of seed extract of Vigna unguiculata. International Journal of Pharmacy and Pharmaceutical Sciences; 2014; 6(1):75- 77.
- [55] Ibrahim S et al. Hepatoprotective potential of aqueous extract of Vigna unguiculata (L) Walp seeds against paracetamol induced hepatotoxicity in rats. International Journal of Pharma and Chemical Research; 2017; 3(3):456-461.
- [56] Maisale B et al. Phytochemical properties and anthelmintic activity of Vigna unguiculata Linn. Journal of Pharmaceutical and Scientific Innovation. 2012; 1(2):51-52.
- [57] Azizah I et al. The effects of Vigna unguiculata on aortic endothelial cells, endothelial nitric oxide synthase expression, lipid profile, and atherosclerosis in ovariectomized rats. Journal of Experimental and Integrative Medicine; 4(3):207-211.
- [58] Egba I S, Emmanuel N T, Ogugua N V, Ndohnu N N. Antisickling potential of the ethanol seed extracts of Vigna Unguiculata and Vigna Subterranean. International Journal of Biochemistry and Biotechnology; 2012; 1(9): 226-229.
- [59] Kitadi JM. et.a.. Mineral Content and Antisickling Activity of Annona senegalensis, Alchornea cordifolia and Vigna unguiculata Used in the Management of Sickle cell disease in the Kwilu province (Congo, DR). International Blood Research and Reviews, 2020; 11(3): 18-27.
- [60] Allah NSK et al. Phytochemical screening and hypolipidemic activity of extracts from seeds and leaves of Vigna unguiculata growing in Sudan. Journal of Pharmacognosy and Phytochemistry; 2017; 6(3):488-491.
- [61] Zia-Ul-Haq M et al. Antioxidant activity of the extracts of some cowpea (Vigna unguiculata (L) Walp.) cultivars commonly consumed in Pakistan. Molecules; 2013; 18(2):2005-2017.
- [62] Siddhuraju P, Becker K. The antioxidant and free radical scavenging activities of processed cowpea (Vigna unguiculata (L.) Walp.) Seed extracts. Food Chemistry; 2007; 101(1):10-19.
- [63] Chaurasia S, Saxena R. Antibacterial activity of four different varieties of green beans. Research Journal of Pharmaceutical, Biological and Chemical Sciences; 2012; 3(3):70-74.
- [64] Tazin TQ, Rumi JF, Rahman S, AlNahain A, Jahan R, Rahmatullah M. Oral glucose tolerance and antinociceptive activity evaluation of methanolic extract of Vigna unguiculata. World journal of pharmacy and pharmaceutical sciences; 2014; 3(8): 28-37.
- [65] Hussain MS et al. In vitro thrombolytic potentials of methanolic extract of Vigna unguiculata Linn (seed). Journal of Pharmacognosy and Phytochemistry; 2016; 5(3):129-131.
- [66] Weththasinghe P et al. Hypocholesterolemic and hypoglycemic effect of cowpea (Vigna unguiculata L. Walp) incorporated experimental diets in wistar rats (Rattus norvegicus). Agriculture and Agricultural Science Procedia; 2014; 2:401-405.
- [67] Weththasinghe P, Liyanage R, Vidanarachchi J, Perera O, Jayawardana B. Hypocholesteolemic and Hypoglycemic effect of Cowpea (Vigna Unguiculata (L) Walp) incorporated experimental diets in Wistar rats (Rattus Norvegicus). Agriculture and Agricultural Science Procedia; 2014; 2: 401-405.
- [68] Ye X, Wang H and Ng T. Structurally dissimilar proteins with antiviral and antifungal potency from cowpea (Vigna unguiculata) seeds. Life Sciences; 2000; 67(26):3199-3207.
- [69] Souza GS et al. Activity of recombinant and natural defensins from Vigna unguiculata seeds against Leishmania amazonensis. Experimental Parasitology. 2013; 135(1):116-125.
- [70] Ashraduzzaman M et al. Antimicrobial Activity of Vigna unguiculata L. Walp Seed Oil. International Journal of Biotechnology for Wellness Industries; 2016; 5(3):70-75.
- [71] Ashraduzzaman MD, Alam MA, Khatun S, Banu S, Absar N. Vigna unguiculata Linn. Walp. Seed oil exhibiting antidiabetic effects in alloxan induced diabetic rats. Malaysian journal of pharmaceutical sciences; 2011; 9(1): 13-23
- [72] Kritzingar Q et al. Antimicrobial activity of cowpea (Vigna unguiculata) leaf extracts. South African Journal of Botany; 2005; 71(1):45-48.
- [73] Chnadrasekaran S, Rajkishore VB, Ramalingam R. Evaluation of diuretic activity on the leaves of Vigna unguiculata. International Journal of Advanced Research and Development; 2016; 1(4):98-100.
- [74] Mpiana P et al. In vitro antisickling activity of anthocyanins extracts of Vigna unguiculata (L.) Walp. Chemistry and Medicinal Value; 2009; 25:91-98.
- [75] Janeesh P, Abraham A. Vigna unguiculata modulates cholesterol induced cardiac markers, genotoxicity and gene expressions profile in an experimental rabbit model. Food & Function; 2013; 4(4):568-574.
- [76] Nderitu KW et al. 2017. Antiobesity activities of methanolic extracts of Amaranthus dubius, Cucurbita pepo, and Vigna unguiculata in progesterone-induced obese mice. Evidence-Based Complementary and Alternative Medicine; 10.
- [77] Barnes M, Uruakpa F, Udenigwe C. Influence of cowpea (Vigna unguiculata) peptides on insulin resistance. Journal of Nutritional Health & Food Science; 2015; 3(2):1-3
- [78] Chaudhari Y, Mody H, Acharya B; Antibacterial activity of Cynodondactylon on different bacterial pathogens isolated from clinical samples; Int J Pharm Studies Res; 2011; 2(1): 16-20.

- [79] Garg VK, Khosa RL; Analgesic and anti-pyretic activity of aqueous extract of Cynodon dactylon; Pharmacologyonline; 2008; 3: 12-18.
- [80] Abhishek B, Anita T; Anthelmintic activity of Cynodon dactylon; Journal of Pharmacognosy and Phytochemistry; 2012; 1(3): 1-3.
- [81] Dhande SR; Anti-inflammatory and analgesic properties of the 50% ethanolic extract of Cynodon dactylon; Int Res J Invent Pharm Sci; 2013; 1: 8-16
- [82] Jarald, EE, Joshi SB, Jain DC; Antidiabetic activity of aqueous extract and non polysaccharide fraction of Cynodon dactylon Pers; Indian J Exp Bio; 2008; 46(9): 660-667.
- [83] Sharma N, Rana AC, Bafna P; Effect of aqueous extract of Cynodon dactylon on reserpine induced catalepsy; Int J Pharm Pharm Sci; 2011; 3(4): 424-426.
- [84] Pal DK; Determination of brain biogenic amines in Cynodon dactylon L. (Pers) and Cyperus rotundus L. treated mice; Int J Pharm Pharm Sci; 2009; 1(1): 190-197.
- [85] Garg VK, Paliwal SK; Anti-inflammatory activity of aqueous extract of Cynodon dactylon; Int J Pharmacol; 2011; 7(3): 370-375.
- [86] Yogesh HS, Kidchadi SCK, Muchandi IS, Gopalakrishna B; Evaluation of Anti-Inflammatory activity of Cynodondactylon Pers. On carrageenan induced paw edema in rats. Indian Journal of National Product and Resources 2013; 4(2): 151-154.
- [87] Yogesh HS, Kidchadi SCK, Muchandi IS, Gopalakrishna B; Evaluation of Anti-Inflammatory activity of Cynodondactylon Pers. On carrageenan induced paw edema in rats. Indian Journal of National Product and Resources 2013; 4(2): 151-154.
- [88] Singh, SK, Kesari AN, Gupta RK, Jaiswal D, Watal G; Assessment of antidiabetic potential of Cynodon dactylon extract in streptozotocin diabetic rats; J Ethnopharmacol, 2007; 114: 174-179
- [89] Singh SK, Rai PK, Jaiswal D, Watal G; Evidence-based critical evaluation of glycemic potential of Cynodon dactylon; Evidence-Based Complementary Alter Med, 2008; 5(4): 415-420.
- [90] Mahesh N, Brahatheeswaran D; Anti-hyperglycemic activities of aqueous and ethanolic extracts Cynodon dactylon (Linn) streptozotocin-induced diabetic rats; Asian J Biochem; 2007; 2(1): 66-72.
- [91] Dande P, Khan A; Evaluation of wound healing potential of Cynodon dactylon; Asian Journal of Pharmaceutical and Clinical Research; 2012; 5(3): 161-164.
- [92] Yogesh HS, Kidchadi SCK, Muchandi IS, Gopalakrishna B; Evaluation of Anti-Inflammatory activity of Cynodondactylon Pers. On carrageenan induced paw edema in rats. Indian Journal of National Product and Resources 2013; 4(2): 151-154.
- [93] Pal DK., Mandal M., Senthilkuma GP., Padhiary A; Evaluation of CNS activities of aerial parts of Cynodon dactylon Pers. in mice; Acta Pol Pharmaceutica; 2008; 65(1): 37-43.
- [94] Saradha DKM, Annapoorani S, Ashokkumar K; Hepatic antioxidative potential of ethyl acetate fraction of Cynodon dactylon in Balb/c mice; J Med Plant Res; 2011; 5(6): 992-996
- [95] Hajzadeh MR, Fatemeh BR, Abolfazl K, Alireza M; The Effects of N-butanol Fraction and N-butanol Phase Remnant From 50% Aqueous-Ethanolic Extract of Cynodon dactylon on Calcium Oxalate Kidney Stones in Rat; Pharmacognosy Research; 2009; 1(6): 431-434.
- [96] Sadki C, Atmani F; Acute diuretic activity of aqueous Erica multiflora flowers and Cynodon dactylon rhizomes extracts in rats; J Ethnopharmacol; 2010; 128(2): 352-356.
- [97] Najafi, M, Nazemiyeh H, Ghavimi H, Gharakhani A, Garjani A; Effects of hydroalcoholic extract of Cynodon dactylon (L.) pers. on ischemia/reperfusion-induced arrhythmias; DARU, 2008; 16(4): 233-238.
- [98] Garjani A, Afrooziyani A, Nazemiyeh H, Najafi M, Kharazmkia A, Maleki-Dizaji N; Protective effects of hydroalcoholic extract from rhizomes of Cynodon dactylon (L.) Pers. on compensated right heart failure in rats; BMC Complementary & Alternative Medicine; 2009; 9: 1-9
- [99] Suresh K, Deepa P, Harisaranraj R, Vaira Achudhan V; Antimicrobial and Phytochemical investigation of the leaves of Carica papaya L., Cynodondactylon (L.) Pers., Euphorbia hirta L., Melia azedarach L. and Psidium guajava L.; J Ethnobotanical Leaflets; 2008; 12: 1184-91.
- [100] Karthik S, Ravikumar A; Study on the protective effect of Cynodon dactylon leaves extract in diabetic rats; Biomedical and Environmental Science; 2011; 24(2): 190-199
- [101] Venkateswarlu G, Edukondalu K, Chennalakshmi BGV, Sambasivarao P, Raveendra G, Ramanarayana V; Evaluation of Antiepileptic activity of leaf extract of Cynodon dactylon (L.) Pers. in validated animal models; International Journal of Current pharmaceutical Research; 2012; 2(3): 571-579.
- [102] Saradha DKM, Annapoorani S, Ashokkumar K; Evaluation of the immunomodulatory activities for ethyl acetate fraction of Cynodondactylon in Balb/c mice; Journal of Agricultural Science; 2011; 3(3): 182-185.
- [103] Santhi R, Kalaiselvi K, Annapoorani S; Anti-lipid peroxidative activities of Cynodondactylon and Moringa oleifera against ELA induced mice; Pharmacologyonline; 2009; 3: 544-549.
- [104] Albert-baskar A, Ignacimuthu S; Chemoprotective activity of C. dactylon L. (Pers) extract against DMH induced colon carcinogenesis in experimental animals; Exp Toxicol Pathol; 2010; 62(4): 423-431.



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