

### Journal of Advanced Scientific Research

Available online through http://www.sciensage.info/jasr

### A STUDY ON ANTIMICROBIAL PROPERTY OF CYNADON DACTYLON (L.) PERS,- A REVIEW

Shailja Singh<sup>1</sup>, Khushbu Verma<sup>2</sup>\*

<sup>1</sup>Department of Microbiology, Jayoti Vidyapeeth Women's University, Jaipur, Rajasthan, India. <sup>2</sup>Department of Food & Biotechnology, Jayoti Vidyapeeth Women's University, Jaipur, Rajasthan, India. \*Corresponding author: shailjassingh@gmail.com

#### ABSTRACT

The following literature review is an available data about antimicrobial properties of *Cynadon dactylon*(L.) Pers, for control of micro infection and diseases. Various synthetic drugs and chemical formation are currently in use but due to the problem of microbial drug resistance, new alternative synthetic drugs have been explored. Oral disease due to plaque biofilm at present is a major health issue worldwide. *Cynadon dactylon* (L.) Pers, can be utilized as a part of instance of numerous maladies, microbial resistance to most of the antibiotic commonly used to treat oral infection has been documented. *Cynadon dactylon* (L.) Pers. is an enduring grass that has an assortment of therapeutic properties. The resistance of microorganism against the traditional antibiotics needs urgent attention for the development of the new drugs molecules. *Cynadon dactylon* (L.) Pers revealed huge incredible health beneficiary and antimicrobial property.

Keywords: Cynadon dactylon (L.) Pers, Infection, Antimicrobial property, Bacteria

### 1. INTRODUCTION

*Cynadon dactylon (L.) Pers* is a sort of perpetual grass that have incredible therapeutic esteems in this examination the antimicrobial dynamic of the plant separate was explored against *streptococcus* in creating nation low wage individuals, for example, agriculturist individuals of little seclude town and local groups utilize people drug for the treatment of regular disease these plants are ingested as decoctions, teas and juice predation to treat breath infections [1, 2].

Distinctive pieces of restorative plants like root, stem, bloom, natural product, seed and so forth are utilized to get pharmacologically dynamic constituents. Restorative exercises of plants can be ascribed to the auxiliary for example, alkaloids, metabolites, flavonoids, glycosides, tannins and terpenoids present in these plants [3]. Restorative plants are discovered valuable in the treatment of assortment of medical issues, for example, bacterial diseases, peptic ulcers irritation, and joint pain and so on. Restorative plants are the wellspring of numerous strong and amazing medications. They present a more beneficial and more secure exchange to the manufactured medications [4, 5]. Our natural resources are enriched with a rich abundance of restorative plants. They are critical wellsprings of new synthetic substances that have gainful restorative impacts.

*Cynodon dactylon*(L.) Pers. is an enduring grass that has an assortment of therapeutic properties. It is developed all through the tropics and subtropics. Entire herb and its root stalk are utilized for restorative use [6]. Antibacterial activity of mixture of Cynodon dactylon(L.) Pers and other extracts of screened medicinal plants possess a broad spectrum of activity against a panel of bacteria responsible for the most common bacterial diseases [7, 8]. Therefore, there is a constant and dire requirement with examine new antimicrobial mixes for different compound structures furthermore novel components from claiming movement. Those movement about characteristic results particularly key oil against microorganism need been as of late affirmed eventually tom's perusing a few investigations keeping tabs with respect to antimicrobial action for key oil against planktonic mobile then again microscopic organisms developing previously.

## 1.1. General characteristics of *Cynodon dactylon* (L.) Pers

The grass *Cynodon dactylon*(L.) Pers *sp*. is otherwise called the Bermuda grass or the Doob grass is a crawling grass, light green in shading, extremely intense and has an unpleasant surface. The stems are marginally leveled, and are blooming purple in shading. Its surface is hard, smooth, revealed, longitudinally wrinkled and yellow to yellowish darker in shading and shows the nearness of hub on certain pieces. It has a sweet thick taste. The grass has distinctive vernacular names. It systematically has a place with the family Graminae/Poaceae. It comprises of three sectionsi.e root, stem and leaves. It is quickly developing and its root develops any place a hub contacts the ground, shaping a thick tangle. It is dry season safe, yet it isn't very shade tolerant and shows up in short barrel shaped pieces around 3 to 20 mm long and 2 to 3 or at times 4 mm in width. Bengali, it is ordinarily known as-Durva, Dub, Dubla, Durba, Doorva, Neel Doorva. In English, it is called as the Creeping frenzy grass, Couch grass, Bahama grass, Bermuda grass, Dun grass, Devil's grass, Doab grass, Doorwa, Dog's teeth grass and in Hindi, it is referred to by the accompanying names, for example, Doob, Dub, Dubra, Khabbal, Kaligas, NeeleeDoob [9, 10].

# 1.2. Phytochemical analysis of *Cynodon dactylon*(L.) Pers

The plant contains crude proteins, carbohydrates, mineral constituents, oxides of magnesium, phosphorous, calcium, sodium and potassium. The whole plant affords  $\beta$ -sitosterol, flavanoids, alkaloids, glycosides and triterpenoides. Other compounds like vitamin C, carotene, fats, palmitic acid etc. are also reported [11, 12].

The phytochemical analysis showed that Cynodon dactylon contained flavanoids, alkaloids, glycosides, terpenoides, triterpenoids steroids, saponins, tannins, resins, phytosterols, reducing sugars, carbohydrates, proteins, volatile oils and fixed oils [13]. Previous studies showed that Cynodon dactylon possessed central nervous, cardiovascular, antidiabetic, gastrointestinal, antioxidant, immunological, antiallergic, antiinflammatory, antipyretic, analgesic, anticancer, dermatological, diuretic, protective, antimicrobial, antiparasitic, insecticidal and repellent. This review will highlight the chemical constituents, pharmacological and effects of Cynodon dactylon. The therapeutic physicochemical screening test results discharges prevailing alkaloid in likewise in concentrates. The steroids, tannins, nutrient and gums are respectably present. While the starches, proteins, are available in immaterial sum [13, 14]. The decontaminated compound is portrayed by utilizing different ghostly strategies, for example, UV-visible spectrophotometer, ESI mass spectroscopy and H1 NMR (proton) for its adaptation of structure of Hydroxycinnamic corrosive. The outcomes are coordinating with the standard spectra of hydroxycinnamic corrosive, henceforth the isolated compound is affirmed the hydroxycinnamic corrosive [15, 16].

### 1.3. Antimicrobial Activity of Cynodon dactylon(L.) Pers. (bermuda) against selected microbes in particular studies

Cyndon dactylon(L) pers with each of the standard antimicrobics, showed the synergic effect against Esherichia coli, Pseudomonas aeruginosa, Staphylococcus coagulasse and Enterococcos faecale. Antibacterial activity of mixture of Cynodon dactylon(L) Pers and other extracts of screened medicinal plants possess a broad spectrum of activity against a panel of bacteria responsible for the moste common bacterial diseases. These promissory extracts open the possibility of finding new clinically effective antibacterial compounds. Further chemical and pharmacological investigations may be carried out to isolate and identify the chemical constituents in the selected plants responsible for the antimicrobial potential [3, 7, 9].

Antimicrobial Activity of Cynodon dactylon(L.) Pers. (bermuda) against chosen microbes revealed that the crude and chloroform concentrates of the, Cynodon dactylon(L.) Pers, hindered the development of the tried microorganisms viz., Bacillus subtilis, Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa and Staphylococcus aureus. This, subsequently, the study demonstrated the concentrate contains substances that can restrain the development of certain microorganisms [4]. Further chemical and pharmacological points have likewise demonstrated that concentrates of certain plants restrained the development of different microorganisms at various focuses A few studies have additionally ascribed the antimicrobial impacts of plant concentrates to the nearness of these Secondary metabolites (medications) [5]. The watched antibacterial impacts on the disengages is accepted to be because of the nearness of alkaloids, tannins and flavonoids which have been appeared to gangs antibacterial properties. A few specialists have likewise recognized tannins, flavonoids and alkaloids in the concentrates of some restorative plant [2]. On the other hand, the entry of the dynamic compound through the gram negative cell divider might be hindered. It is however that watched contrasts may result from the dosages utilized in this investigation. What's more, microorganisms show variable affectability to synthetic substances identified with various opposition

levels between strains. Studies showed the significance of plant extricates when related with anti-infection agents, to control resistant bacteria, which are turning into a danger to human wellbeing. Furthermore, in a couple of cases, these plant removes were dynamic against antiinfection safe microscopic organisms under extremely low concentration, in this manner limiting the conceivable poisonous impacts [9, 19].

Cynodon dactylon(L.) Pers. is a kind of lasting grass that has incredible restorative qualities. Some examination revealed the antimicrobial action of the plant unrefined concentrate from seven unique solvents (CH<sub>3</sub>)<sub>2</sub>CO, chloroform, diethyl ether, ethanol, ethyl acetic acid derivation, methanol, and n-pentane) was researched against certain pathogens (Bacillus cereus, Bacillus subtilis, Escherichia coli, Klebsiella spp., Pseudomonas aeruginosa, *Staphylococcus* aureus, Streptococcus pyogenes, and Streptococcus pneumonia) utilizing plate dissemination technique and flimsy layer chromatographic (TLC) bioassay for plant-SPE extricates against Aspergillus niger [11]. Rough extraction demonstrated that ethanolic extraction delivered most elevated yield trailed by methanolic and chloroform extraction. The most reduced yield was gotten from n-pentane extraction [13]. The antimicrobial examination uncovered wide range of antimicrobial movement from ethanol and ethyl acetic acid derivation removes against the majority of bacterial pathogens. Alcoholic concentrate of Cynodon dactylon(L.) Pers was screened for antiulcer action in pale skinned person rodents at portion dimension of 200, 400 and 600 mg kg-1 b.wt. The concentrate at 400 mg kg-1 and 600 mg kg-1 indicated noteworthy (>0.001) antiulcer action when contrasted with the standard medication, ranitidine. This action might be because of the nearness of flavonoids [16]. Wound healing and regeneration by orderly progression of a series of biological events that establish the integrity of the unfunctional tissue. Traditional wound healing is adversely full of several factors [20]. Home grown medication can improve the cancer prevention agent state of renal tissue and damage repair by antimicrobial effect. Cynodon dactylon (L.) Pers is a therapeutic plant with antioxidative and diuretic properties and various arrangements of this plant have indicated promising impacts in stone malady and on sepsis results in intravenous fluids due to kidney stone ailment. Appraisal of the entire plant decoction to avoid kidney stone ailment and antimicrobial action can be promising in cancer prevention [21]. A comparative study of the

antibacterial drug activity of *Cyndon dactylon* (L.) Pers shows its synergic result with a number of the quality antimicrobs and extracts of some medicative plants [22].

### 1.4. Bioactive components of *Cynodon dactylon* (L) Pers. consist antimicrobial property

The phytochemicals, for example, quinines, tannin and phenols are chiefly in charge of antimicrobial properties. The alkaloids of Cynodon dactylon(L.) Pers display antimicrobial action against human pathogens. It was recently announced that the dissolvable concentrate of Cynodon dactylon (L.) Pers displayed antimicrobial movement due to the nearness of gramine, tyramine, tyrptamine and alkaloids. The aerial parts of Cynodon dactylon (L.) Pers contain cynodin, triticin, hydrocyanic corrosive and beta carotene [1]. Investigation have shown that ethanol and methanol concentrate indicated significant movement than different solvents and boiling water by using well dissemination technique for antimicrobial movement. The methanol concentrate of C. dactylon(L.) Pers demonstrated high movement against S. aureus and P. aeruginosa. Be that as it may, ethanol concentrate was exceedingly dynamic against E. coli and B. subtilis. Cynodon dactylon (L.) Pers extricated with water, ethanol and methanol indicated noteworthy action against enterobacter species. This outcome was in agreement the perceptions made already with other restorative plants. The aqueous concentrate of Cynodon dactylon(L.) Pers rhizome is utilized for diuretic, hostile to emetic, filtering operator and looseness of the bowels [6]. The plant separate likewise has critical application in dropsy and auxiliary syphilis, injuries and cardio defensive [7, 20].

In an ongoing report, the concentrates of Cynodon dactylon(L.) Pers had likewise been accounted for to be successful for antimicrobial movement against bacterial pathogens and parasite [23]. In view of the previously mentioned remarks, it isn't astonishing that the pharmacological advantages of Cynodon dactylon(L.) Pers have been drawing in extraordinary intrigue. In this way, the present survey has been point by point updates of the phytochemical and pharmacological properties of Cynodon dactylon(L.) Pers just as its various employments. A few mixes have been distinguished and evaluated from various morphological pieces of the Cynodon dactylon(L.) Pers. The plant contains proteins, sugars, minerals and different mixes like terpenoids, nutrient C, palmitic corrosive and alkaloids [5, 20]. Green grass contains (dry issue premise) 10.47% unrefined protein, 28.17% fiber and 11.75% of complete fiery remains [18]. Other

significant phyto-constituents revealed from this plant were Flavonoids: apigenin, luteolin, orientin and vitexin carotenoids: [24-26]; beta-carotene, neoxanthin, violaxanthin, phenolics, phytosterols, glycosides, saponins [27, 32]. Gas chromatography-mass (GC-MS) investigation spectrometry of Cynodo ndactylon(L.) Pers leaves contained glycerin (38.49%), 9, 12-octadecadienoyl chloride, (Z, Z)-(15.61%),hexadecanoic corrosive, ethyl ester (9.50%), ethyl  $\alpha$  - Dglucopyranoside (8.42%), linoleic corrosive ethyl ester (5.32%) and phytol (4.89%) just as other bioactive mixes were accounted [11, 28]. Separated significant constituents, for example, tricosane (22.05%), 1, 2propanediol (20.30%), 3-benzyloxy-1, 2 diacetyl (12.62%) and other 7 minor constituents in ethanolic

concentrates of *C. dactylon*. Hydroalcoholic concentrate of *Cynodon dactylon* (L.) Pers was found to contain 22 mixes altogether, chiefly hexadecanoic corrosive, ethyl ester (17.49%), D-mannose (11.48%) and linolenic corrosive, ethy ester (11.28%). Furthermore, hydroquinone (69.49%), furfural (6.0%) and levoglucosenone (2.72%) were observed to be the most extravagant constituents among the 20 portrayed constituents from phenolic extricate [29]. The oil ether concentrate of the restorative plant, *Capparis zeylanica* demonstrated greater action against *K. pneumonia*, *P. vulgaris*, *S. aureus* and *B. subtilis* [32]. The inhibitory zone extended from 10 to 16 mm at a convergence of 10 µg/ml [30]. Chloroform concentrates of the therapeutic plant showed least antibacterial action against the chose bacterial pathogens.

Table 1: Organic constituents pro	esent in <i>Cynodon</i>	dactylon (L	) Pers
-----------------------------------	-------------------------	-------------	--------

Plant part (Cynodon	The organic constituents present in Cynodon dactylon (L.) Pers	References
dactylon (L.) Pers)		
Whole plant	$\beta$ -sitosterol, $\beta$ -carotene, nutrient C, palmitic corrosive, triterpenoids, arundoin, friedelin, selenium, alkaloids-ergonovineergonovinine, ferulic, syringic, p-coumaric, vanilic, p hydroxybenzoic and o-hyroxyphenyl acidic acids, cyanogenic hyperoside, cyanogenic glucoside- triglochinin, furfural, furfural liquor, phenyl acetaldehyde, acidic corrosive,	[ 11, 14, 17]
	phytol, $\beta$ -ionone; mono and oligosaccharides, lignin	
Surface cuticular wax	Hydrocarbons(tritriacontane) esters, eicosanoic and docosanoic acids, freealcohol, free aldehydes (hexadecanal) and free acids (hexadecanoic	[11, 18]
	corrosive)	
Aerial parts	flavone – apigenin, luteolin, flavone glycosides – orientin (8-C- $\beta$ -Dglycosylluteolin), vitexin (8-C- $\beta$ -D-glycosylapigenin), iso –orientin (6-C- $\beta$ -	[8,13]
	D-glycosylluteolin) and iso-vitexin (6-C- $\beta$ -D-glycosylapigenin)	

In the present investigation additionally, chloroform concentrate demonstrated less movement than different solvents and high temp water extricate.

It was additionally seen that chosen gram negative microscopic organisms were progressively touchy to the greater part of the concentrates tried contrasted with gram-positive microbes [33, 34]. The gram-negative microscopic organisms were exceedingly impervious to anti-infection agents than that of gram positive microbes. Furthermore, this obstruction is predominantly because of the varieties in their cell divider synthesis [29, 35].

In an another examination six different natural solvents were utilized to extricate the antibacterial mixes from the leaves of *Cynodon dactylon*(L.) Pers against the pathogenic strain, for example, *Streptococcus pyogens*, *Bacillus subtilis, Klebsiella pneumoniae, Escherichia coli*, Staphylococcus aureus, Proteus mirabillis and Pseudomonas aeruginosa. Among the solvents tried butanolic concentrate of Cynodon dactylon (L.) Pers was observed to be great than other tried solvents [3]. Cynodon dactyl n(L.) Pers was observed to be compelling against different human pathogens [36, 37]. From this investigation we make an inference that the customary utilization of plant Cynodon dactylon (L.) Pers for the irresistible illness is promising against microbes [28, 38].

### 2. CONCLUSION

Various studies reveal the subsequent evaluation of antimicrobial activity of the extracted ingredient of *Cynadon dactylon* (L.) Pers, extracts showed appreciable good inhibitory effect against selected strains of bacteria. Antimicrobial activity of *Cynodon dactylon* (L.) Pers. (bermuda) against chosen microbes revealed that the crude and chloroform concentrates of the, Cynodon dactylon (L.) Pers, hindered the development of the tried microorganisms viz., Bacillus subtilis, Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa and Staphylococcus aureus. The specific extract such as quinines, tannin and phenols are chiefly in charge of antimicrobial properties in Cynadon dactylon(L.) Pers. They are critical wellsprings of new synthetic substances that have gainful restorative impacts. Cynodon dactylon (L.) Pers. is an enduring grass that has an assortment of therapeutic properties. In various investigation the extracts of selected species contains a good potential antimicrobial component that may be of great use for the development of potent and powerful drugs for the treatment of health problems. Further investigations are required for making popularize Cynodon dactylon (L.) Pers for medicinal uses.

#### 3. REFERENCES

- Kirtikar KR and Basu BD. Indian Medicinal Plants., Edn 2, Vol. 3, Lalit Mohan Basu, Allahabad, India, 1980; 1774-1777.
- Tuhin KB, Srikanta P, Shrabana C, Saheli B, Nandini Pand Tapan S. *Journal of Ethno* pharmacology., 2017; 197(2):128-137.
- 3. Chaudhari Y, Mody HR and Acharya VB. International Journal of Pharmaceutical Studies and Research, 2011; 1:16-20.
- Singh SK, Rai PK, Jaiswal D and Watal G. Evidence-Based Complementary Alter. Med., 2008; 5:415-420.
- 5. Solanki R. Int. J. Pharm. Sci. Bio., 2010; 1:67-70.
- Shah BN, Seth AK and Maheshwari KM. Res. J., Med. Plant., 2011; 5:101-115.
- Garjani A, Afrooziyan A, Nazemiyeh H, Najafi M, Kharazmkia A and Maleki-Dizaji. N. BMC., Complementary Alternative Med., 2009; 9:28-38.
- 8. Surendra V, Prakash T, Sharma UR, Goli, et al. *Pharmacog., Magazine.*, 2008; **4:**195-201.
- 9. Albert-Baskar A, and Ignacimuthu A. *Experi- mental* and *Toxicology Pathology.*, 2010; **62:**423–431
- Beauv P, Tropicos.org. Missouri Botanical Garden, Retrieved 5 December; 2015.
- 11. Jananie RK, Priya V and Vijaya lakshmia K. New York Science Journal, 2011; **4**:16-20.

- 12. Santhi R and Annapoorani S. Drug Invention Today, 2010; 2:112-114.
- 13. Rekha D and Shivanna MB. Int. J. Curr. Microbiol. App. Sci., 2014; 3(8):573-591.
- 14. Oudhia P. Traditional Medicinal knowledge about useful herb Doobi (*Cynodondactylon*) in Chhattisgarh, India, 2003.
- 15. Koushik OS, Babu PS and Karthikeyan R. *Transl Biomed.*, 2015; 6:3.
- 16. Patil MB, Jalalpure SS, Prakash NS and Kokate CK. *Ishs Acta Horticulturae*, 2005; 6.
- 17. Santhi R and Annapoorani S. Drug Invention Today, 2010; 2:112-114.
- Paranjpe P. Durva. In: Indian Medicinal Plants: Forgotten Healers. 1st Edn., Chaukhamba Sanskrit Pratishthan, Delhi. 2001; 75-76.
- Abdullah S, Gobilik J and Chong KP. In: Pogaku R., Bono A., Chu C. (eds) Developments in Sustainable Chemical and Bioprocess Technology. Springer, Boston, MA.2014.
- Nagori BP and Solanki R. Research Journal of Medicinal Plants, 2011; 5:508-514.
- Alireza G,Parichehr H, Mousa H, Abolfazl KR, Nema MR, Abbasali, A, Seyed MM, Roghayeh P, Batool Z and Azita A. *J Phytomed.*,2017; 7(2):180-190.
- 22. Atmani A, Sekhri. Biomed Pharmacol J., 2016; 9(1).
- 23. Nair GA. J. Med. Ethnobot. Res., 1995; 16(4):153-157.
- 24. Johnson AW, Snook ME, Wiseman BR. Crop Sci., 2002; **42:**2004-2010.
- Annapurna HV, Apoorva B, Ravichandran N, Arun KP, Brindha P, Swaminathan S et al. *J. Mol. Graphics Model*, 2013; **39:**87-97.
- Avvarai SK, Kattamanchi G, Doni K, Anugu MR, Raju C . Int. J. Adv. Pharm. Res., 2011; 2(8):418-422.
- 27. Rajeshwari S, Poongothai E and Hemalatha N. Int.J of current Pharmaceutical Research, 2016; 8(4).
- 28. Kanimozhi D, Ratha BV. Int. J. Res. Pharm. Sci., 2012; 2(2):34-43.
- 29. Mohamed SM, Gayathri K, Venkatalakshmi R, Sasikala C. Int. J. Chem. Tech. Res., 2010; 2(1):149-154.
- Chopade, Tankar AN, Tekade, Gowekar NM, Bhandari SR, Khandake SN. International Journal of Green Pharmacy, 2008; 4103.
- 31. Kumar KG and Khosa R. Pharmacologyonline., 2008;12-18.

- 32. Schneider-Canny R, Chekhovskiy K, Munoz P, et al. *Euphytica.*, 2019; **215:**40.
- 33. Babarbi E, Haffas M, Guerri M and Sekhri L. Biomedical & Pharmacology Journal, 2010; 3(2): 277.
- 34. Johnson AW, Snook ME, Wiseman BR. Crop Sci., 2002; **42:**2004-2010.
- 35. Annapurna HV, Apoorva B, Ravichandran N, Arun KP, Brindha P, Swaminathan S, et al. *J. Mol. Graphics Model*, 2013; **39:**87-97.
- Mohamed SM, Gayathri K, Venkatalakshmi R, Sasikala C. Int. J. Chem. Tech. Res., 2010; 2(1):149-154.
- 37. Suresh K, Deepa P, Harisaranraj R, VairaAchudhanV. *Ethnobot.*, 2008; **12:**1184-1191.
- Emori TG and Gaynes RP. *Clin Microbiol Rev.*, 1993;
  6(4): 428-442.