World Journal of Pharmaceutical and Life Sciences

Impact Factor: 8.21 www.wjpls.org Coden USA: WJPLA7

PHARMACOGNOSTIC, PHYTOCHEMICAL AND BIOLOGICAL ACTIVITY STUDIES ON SOME MEDICINAL GRASSES BELONGING TO THE FAMILY POACEAE - A COMPREHENSIVE REVIEW

Landge T. T.[1]*, Kakpure M. R.[2]

[1]*Research Scholar, Botany Research Center, L.R. Bharti Arts, Commerce & S. S. R. Bharti Science College, Arni, Dist Yavatmal, Maharashtra, India.

[2]Assistant Professor, Department of Botany, L. R. Bharti Arts, Commerce & S. S. R. Bharti Science College, Arni, Dist Yavatmal, Maharashtra, India.

***Corresponding Author: Landge T. T.**

Research Scholar, Botany Research Center, L.R. Bharti Arts, Commerce & S. S. R. Bharti Science College, Arni, Dist Yavatmal, Maharashtra, India.

DOI: https://doi.org/10.5281/zenodo.21489999

How to cite this Article: Landge T. T.[1]*, Kakpure M. R.[2] (2026). Pharmacognostic, Phytochemical And Biological Activity Studies On Some Medicinal Grasses Belonging To The Family Poaceae - A Comprehensive Review. World Journal of Pharmaceutical and Life Sciences, 12(7), 205–211.

Article Received on 05/06/2026 **Article Revised on 25/06/2026** **Article Published on 01/07/2026**

ABSTRACT

The most of the grasses of family Poaceae possess significant medicinal, economic and ecological importance. In addition to well-known medicinal grasses such as *Cymbopogon citratus* (DC) Stapf., *Cynodon dactylon* (L.) Pers., *Chrysopogon zizanioides* (L.) Rob., *Imperata cylindrica* (L.)P.Beauv., *Saccharum spontaneum* L. and *Bambusa bambos (*L.) Voss., several indigenous grasses including *Andropogon pumilus* Roxb., *Dichanthium annulatum* (Forssk.) Stapf, *Setaria pumila* (Poir.) R. & S., *Sehima nervosum* Forssk. and *Eragrostiella bifaria* (Vahl.)Bor. have attracted attention because of their ethnobotanical importance and therapeutic potential. Medicinal grasses are rich in bioactive phytochemicals such as flavonoids, phenolic compounds, terpenoids, alkaloids, tannins, glycosides, saponins and essential oils, which exhibit antioxidant, antimicrobial, anti-inflammatory, antidiabetic, hepatoprotective and wound-healing activities. Pharmacognostic evaluation involving macroscopic, microscopic, physicochemical and chromatographic analysis plays an essential role in the authentication and standardization of herbal materials. This review summarizes the phytochemical composition, pharmacognostic characteristics, ethnomedicinal uses and biological activities of important medicinal grasses belonging to the family Poaceae, with particular emphasis on underexplored indigenous species. The review also highlights research gaps and future perspectives for the scientific validation and sustainable utilization of medicinal grasses in herbal drug development.

KEYWORDS: Pharmacognosy, phytochemistry, biological activity, medicinal grasses and poaceae.

1. INTRODUCTION

Medicinal plants continue to play a vital role in primary healthcare and pharmaceutical research owing to their diverse bioactive constituents and therapeutic efficacy.[1,2,3] Among flowering plants, the family Poaceae (Gramineae) is one of the largest families, comprising approximately 780 genera and more than 12,000 species distributed worldwide.[4] Although primarily recognized for cereal crops and forage grasses, numerous members of Poaceae possess significant medicinal properties and have been used in traditional healthcare systems such as Ayurveda, Siddha, Unani, Traditional Chinese Medicine and various indigenous practices.[5]

Several medicinal grasses, including *Cymbopogon citratus* (DC) Stapf., *Cynodon dactylon* (L.) Pers., *Chrysopogon zizanioides* (L.) Rob., *Imperata cylindrica* (L.)P.Beauv., *Saccharum spontaneum* L. and *Bambusa bambos* (L.) Voss. are traditionally used for the treatment of fever, inflammation, urinary disorders, diabetes, skin diseases, gastrointestinal disorders and microbial infections.[6,7,8] These therapeutic properties are attributed to the presence of secondary metabolites like flavonoids,

phenolic acids, alkaloids, terpenoids, tannins, glycosides, saponins and essential oils.[9,10,11]

Besides these well-established medicinal grasses, several indigenous species including *Andropogon pumilus* Roxb., *Dichanthium annulatum* (Forssk.) Stapf., *Setaria pumila* (Poir.) R. & S., *Sehima nervosum* Forssk. and *Eragrostiella bifaria* (Vahl.)Bor. have been documented in ethnobotanical surveys and regional floras. Although these grasses are ecologically important and are occasionally used in traditional healthcare, their phytochemical composition, pharmacognostic characteristics and pharmacological activities remain inadequately explored. Scientific investigation of these underutilized species may reveal novel bioactive compounds with potential pharmaceutical applications. Pharmacognostic evaluation forms the basis for the authentication, quality control and standardization of medicinal plants.[12,13]

The present review provides a overview of the taxonomy, ethnomedicinal importance, phytochemical constituents, pharmacognostic characteristics and biological activities of medicinal grasses belonging to the family Poaceae. Special emphasis is given to underexplored indigenous species, highlighting their potential as promising resources for future phytochemical, biological and pharmacological research.

2. TAXONOMY AND GENERAL CHARACTERISTICS OF FAMILY POACEAE

The family Poaceae (Gramineae) belongs to the order Poales and represents one of the most diverse families of monocotyledonous plants. Members are characterized by fibrous root systems, cylindrical culms with distinct nodes and internodes, linear leaves with parallel venation, spikelet-type inflorescences, and caryopsis fruits.[14,15,16,17,18] Their wide ecological adaptability enables them to grow in diverse habitats ranging from wetlands and forests to dry grasslands and semi-arid regions.[19]

In addition to economically important cereals, Poaceae includes several medicinal grasses used in traditional medicine. Many species synthesize biologically active secondary metabolites that contribute to their therapeutic properties, making the family an important source of natural products for pharmaceutical research.[20]

3. ETHNOMEDICINAL IMPORTANCE OF MEDICINAL GRASSES

Medicinal grasses belonging to the family Poaceae have been used in traditional healthcare systems for centuries owing to their therapeutic and nutritional properties. In Ayurveda, Siddha, Unani, Traditional Chinese Medicine (TCM) and various indigenous healthcare practices, different plant parts such as leaves, roots, rhizomes, stems, inflorescences and seeds are utilized for treating a wide range of ailments.[21] The medicinal value of these grasses is mainly attributed to the presence of biologically active secondary metabolites.[22]

Among the extensively studied species, *Cymbopogon citratus* (DC) Stapf. is traditionally used as an antipyretic, digestive stimulant, antimicrobial and anti-inflammatory agent.[23,24] *Cynodon dactylon* (L.) Pers.is employed in the treatment of wounds, urinary disorders, diabetes, skin diseases and bleeding conditions. *Chrysopogon zizanioides* (L.) Rob. is valued for its cooling, diuretic, antimicrobial and aromatic properties, while *Imperata cylindrica*(L.)P.Beauv and *Saccharum spontaneum* L. are commonly used for dysuria, jaundice, fever and urinary tract disorders. Young shoots and leaves of *Bambusa bambos* (L.) Voss. are used in traditional medicine for respiratory disorders, inflammatory conditions and bone-related ailments.[25,26,27,28]

Apart from these well-documented medicinal grasses, several indigenous species have been recognized in ethnobotanical surveys.[29] *Andropogon pumilus* Roxb is traditionally used by rural communities for minor wounds, fever and inflammatory conditions. *Dichanthium annulatum* (Forssk.) Stapf. has been reported in folk medicine for treating skin disorders and wound infections. *Setaria pumila* (Poir.) R. & S. is occasionally used as a remedy for fever and urinary complaints, whereas *Sehima nervosum* Forssk. is reported in traditional veterinary and indigenous medicine for inflammatory disorders.[30] Although *Eragrostiella bifaria* (Vahl.)Bor. has limited documented medicinal use, its occurrence in ethnobotanical records suggests potential therapeutic significance (Table-1). These underexplored grasses warrant systematic pharmacognostic, phytochemical and biological investigations to validate their traditional uses.

Table 1: Some medicinal grasses of family Poaceae.

Species	Common Name	Traditional Uses
Cymbopogon citratus (DC) Stapf.	Lemongrass	Fever, digestive disorders, antimicrobial
Cynodon dactylon (L.) Pers.,	Bermuda grass	Wound healing, diabetes, urinary disorders
Chrysopogon zizanioides (L.) Rob.	Vetiver	Fever, skin diseases, cooling agent
Imperata cylindrica (L.)P.Beauv	Cogon grass	Diuretic, haemostatic
Saccharum spontaneum L.	Wild sugarcane	Dysuria, jaundice
Bambusa bambos (L.) Voss.	Bamboo	Respiratory disorders, antioxidant
Andropogon pumilus Roxb.	Small beard grass	Traditional wound care*
Dichanthium annulatum (Forssk.) Stapf.	Marvel grass	Skin ailments, wound care*
Setaria pumila (Poir.) R. & S.	Yellow foxtail	Fever, urinary disorders*

Sehima nervosum Forssk.	White grass	Traditional anti-inflammatory uses*
Eragrostiella bifaria (Vahl.)Bor.	Love grass	Ethnobotanical uses*

Note: ***represents that ethnobotanical reports and preliminary investigations; comprehensive phytochemical and pharmacognostic studies remain limited.**

4. PHYTOCHEMICAL CONSTITUENTS OF MEDICINAL GRASSES

The therapeutic potential of medicinal grasses is primarily associated with the presence of diverse secondary metabolites. Phytochemical investigations have demonstrated that members of the family Poaceae contain flavonoids, phenolic acids, alkaloids, terpenoids, tannins, saponins, glycosides, steroids, coumarins, lignans, polysaccharides, pigments, vitamins and essential minerals. These compounds contribute to various biological activities through antioxidant, antimicrobial, anti-inflammatory and cytoprotective mechanisms.

Species of the genus *Cymbopogon* are particularly rich in essential oils containing citral, geraniol, citronellal, limonene and myrcene, which exhibit broad-spectrum antimicrobial and antioxidant activities.[31] *Chrysopogon zizanioides* (L.) Rob. contains sesquiterpenes such as khusimol, vetiverol and vetivone that contribute to its medicinal and aromatic properties. *Cynodon dactylon* (L.) Pers. possesses flavonoids, phenolic acids, alkaloids and triterpenoids responsible for antioxidant, wound-healing and antidiabetic activities.[32,33] *B. bamboo* possesses phenolic compounds and flavonoids that contribute to cure different ailments.[34,35]

Scientific information on *Andropogon pumilus* Roxb., *Dichanthium annulatum* (Forssk.) Stapf, *Setaria pumila* (Poir.) R. & S., *Sehima nervosum* Forssk. and *Eragrostiella bifaria* (Vahl.)Bor. is comparatively scarce (Table-2). Preliminary phytochemical screenings and reports on related species suggest the presence of phenolic compounds, flavonoids, tannins, terpenoids and other secondary metabolites. However, comprehensive phytochemical profiling using advanced analytical techniques such as GC–MS, HPLC, LC–MS and NMR is required to identify their active constituents and evaluate their pharmaceutical potential.

Table 2: Phytochemical constituents and ethnomedicinal uses of some medicinal grasses.

Species	Major Phytochemical Constituents	Ethnomedicinal Uses
Cymbopogon citratus (DC) Stapf	Citral, geraniol, flavonoids, phenolics	Fever, digestive disorders, infections
Cynodon dactylon (L.) Pers.,	Flavonoids, alkaloids, phenolic acids, tannins	Wound healing, diabetes, urinary disorders
Chrysopogon zizanioides (L.) Rob.	Khusimol, vetiverol, vetivone	Fever, rheumatism, skin diseases
Imperata cylindrica (L.)P.Beauv	Flavonoids, phenolics, saponins	Diuretic, haemostatic
Saccharum spontaneum L.	Phenolics, flavonoids	Dysuria, jaundice
Bambusa bambos (L.) Voss.	Flavonoids, silica, phenolics	Respiratory disorders, antioxidant
Andropogon pumilus Roxb.	Phenolics, flavonoids*	Wounds, fever*
Dichanthium annulatum (Forssk.) Stapf.	Phenolics, flavonoids*	Skin disorders, wounds*
Setaria pumila (Poir.) R. & S.	Phenolics, carbohydrates*	Fever, urinary disorders*
Sehima nervosum Forssk.	Phenolics, terpenoids*	Inflammation, veterinary medicine*
Eragrostiella bifaria (Vahl.)Bor.	Not extensively investigated	Ethnobotanical importance*

**Note: ***Based on ethnobotanical reports and preliminary phytochemical observations; comprehensive phytochemical characterization is still lacking.

5. PHARMACOGNOSTIC STUDIES OF MEDICINAL GRASSES

Pharmacognostic evaluation is essential for the identification, authentication and quality control of medicinal grasses. It involves the study of macroscopic and microscopic characters, powder microscopy, physicochemical parameters, fluorescence analysis and chromatographic fingerprinting. These parameters help establish standards for the purity, safety and efficacy of herbal drugs.[36,37,38,39]

Microscopically, they exhibit typical monocot features such as silica bodies, cork cells, collateral vascular bundles, bundle sheath cells, sclerenchyma and parenchymatous tissues. Powder microscopy commonly reveals epidermal cells, fibres, xylem vessels, silica bodies, starch grains and oil cells, which serve as diagnostic characters for species identification (Table-3).

Physico-chemical parameters including moisture content, ash values, extractive values and volatile oil content are routinely employed for the standardization of crude drugs. Advanced analytical techniques such as TLC, HPTLC, HPLC, GC–MS, LC–MS and NMR further facilitate the qualitative and quantitative analysis of phytoconstituents and provide characteristic chemical fingerprints.[40,41]

Comprehensive pharmacognostic standards have been established for well-known medicinal grasses such as *C. citratus*, *C. dactylon*, and *C. zizanioides*. In contrast, species including *A. pumilus*, *D. annulatum*, *S. pumila*, *S. nervosum* and *E. bifaria* remain poorly investigated. Detailed pharmacognostic studies on these indigenous grasses are required to support their authentication, standardization and utilization in herbal medicine.

Table 3: Pharmacognostic status of some medicinal grasses.

Species	Key Diagnostic Features	Pharmacognostic Status
Cymbopogon citratus (DC) Stapf	Aromatic leaves, oil cells	Well established
Cynodon dactylon (L.) Pers.,	Creeping stolons, silica bodies	Well established
Chrysopogon zizanioides (L.) Rob.	Aromatic fibrous roots, oil cells	Well established
Imperata cylindrica (L.)P.Beauv	Erect culms, silky panicles	Moderately studied
Saccharum spontaneum L.	Tall culms, plume-like inflorescences	Moderately studied
Bambusa bambos (L.) Voss.	Woody culms, lignified fibres	Moderately studied
Andropogon pumilus Roxb.	Limited morphological data	Underexplored
Dichanthium annulatum (F.) Stapf.	Limited anatomical information	Underexplored
Setaria pumila (Poir.) R. & S.	Limited pharmacognostic reports	Underexplored
Sehima nervosum Forssk.	Insufficient pharmacognostic studies	Underexplored
Eragrostiella bifaria (Vahl.)Bor.	Pharmacognostic data unavailable	Highly underexplored

6. BIOLOGICAL ACTIVITIES OF MEDICINAL GRASSES

Medicinal grasses of the family Poaceae exhibit a wide range of biological activities due to the presence of diverse bioactive phytochemicals such as flavonoids, phenolic compounds, terpenoids, alkaloids, tannins, saponins and essential oils. Experimental studies have demonstrated their therapeutic potential in the management of various diseases.[42]

Extracts of *C. citratus*, *C. dactylon* .and *C. zizanioides* possess significant antioxidant activity by scavenging free radicals and reducing oxidative stress. The essential oils of *Cymbopogon* species exhibit broad-spectrum antimicrobial activity against several bacterial and fungal pathogens.[43] *C. dactylon*, *I. cylindrica* and *S. spontaneum* have shown anti-inflammatory**,** analgesic**,** hepatoprotective and antidiabetic properties in experimental studies. Wheatgrass (*Triticum aestivum* L.) and barley grass (*Hordeum vulgare* L.) are recognized for their antioxidant, immunomodulatory and nutraceutical benefits (Table-4).

Although *A. pumilus*, *D. annulatum*, *S. pumila*, *S. nervosum* and *E. bifaria* have been reported in ethnobotanical surveys for the treatment of wounds, fever, inflammatory conditions and urinary disorders, scientific evidence supporting their biological activities remains limited. Further phytochemical, pharmacognostica, and biological investigations are required to validate their traditional uses and identify their active constituents (Table-5).

Table 4: Biological activities of some medicinal grasses.

Species	Major Bioactive Constituents	Reported Pharmacological Activities
Cymbopogon citratus (DC) Stapf	Citral, geraniol, flavonoids	Antioxidant, antimicrobial, anti-inflammatory
Cynodon dactylon (L.) Pers.,	Flavonoids, phenolics	Antidiabetic, wound healing, antioxidant
Chrysopogon zizanioides (L.) Rob.	Khusimol, vetiverol	Antimicrobial, anti-inflammatory
Imperata cylindrica (L.)P.Beauv	Phenolics, flavonoids	Diuretic, antioxidant
Saccharum spontaneum L.	Phenolic compounds	Hepatoprotective, anti-inflammatory
Bambusa bambos (L.) Voss.	Flavonoids, silica	Antioxidant, antimicrobial
Triticum aestivum L.	Chlorophyll, phenolics	Antioxidant, immunomodulatory
Hordeum vulgare L.	β-Glucans, flavonoids	Antidiabetic, hypolipidaemic
Andropogon pumilus Roxb.	Preliminary reports of phenolics	Ethnomedicinal use; pharmacological validation required
Dichanthium annulatum (F.) Stapf.	Preliminary reports of flavonoids	Traditional medicinal use; further studies needed
Setaria pumila (Poir.) R. & S.	Limited phytochemical data	Ethnomedicinal use; scientific validation required
Sehima nervosum Forssk.	Limited phytochemical data	Preliminary traditional use; further investigation needed

Table 5: Comparative profile of some medicinal grasses of the family Poaceae.

Botanical Name	Distribution	Plant Part Used	Major Phytochemicals	Biological Activities and Traditional Uses	Pharmacognostic Status	Research Status
Cymbopogon citratus (DC) Stapf	Tropical Asia, India	Leaves	Citral, geraniol, myrcene, flavonoids	Antioxidant, antimicrobial, anti-inflammatory, hepatoprotective	Well established	Well studied
Cynodon dactylon (L.) Pers.,	Worldwide	Whole plant	Flavonoids, alkaloids, phenolics, tannins	Antidiabetic, wound healing, antioxidant, anti-inflammatory	Well established	Well studied
Chrysopogon zizanioides (L.) Rob.	India, Southeast Asia	Roots	Khusimol, vetiverol, vetivone	Antimicrobial, antioxidant, anti-inflammatory	Well established	Well studied
Imperata cylindrica (L.)P.Beauv	Tropical and subtropical regions	Rhizomes	Flavonoids, saponins, phenolics	Diuretic, haemostatic, antioxidant	Moderate	Moderately studied
Saccharum spontaneum L.	India, Asia	Roots, rhizomes	Phenolic compounds, flavonoids	Diuretic, hepatoprotective	Moderate	Moderately studied
Bambusa bambos (L.) Voss.	India, Southeast Asia	Leaves, shoots	Flavonoids, silica, phenolics	Antioxidant, antimicrobial	Moderate	Moderately studied
Triticum aestivum L.	Cultivated worldwide	Young shoots	Chlorophyll, vitamins, phenolics	Antioxidant, immunomodulatory	Well established	Well studied
Hordeum vulgare L.	Worldwide	Young leaves	β-Glucans, flavonoids	Antidiabetic, hypolipidaemic	Well established	Well studied
Andropogon pumilus Roxb.	India	Whole plant	Phenolics, flavonoids*	Traditional wound healing, anti-inflammatory*	Not established	Underexplored
Dichanthium annulatum (Forssk.) Stapf	India, Africa	Whole plant	Phenolics, flavonoids*	Traditional skin disorders, wound healing*	Not established	Underexplored
Setaria pumila (Poir.) R. & S.	Asia, Europe	Whole plant	Phenolics, carbohydrates*	Fever, urinary disorders*	Not established	Underexplored
Sehima nervosum Forssk.	India	Whole plant	Phenolic compounds*	Anti-inflammatory (traditional)*	Not established	Underexplored
Eragrostiella bifaria (Vahl) Bor	Peninsular India	Whole plant	Yet to be investigated	Ethnobotanical importance	Not established	Highly underexplored

Note: * represents traditional use and preliminary reports; detailed phytochemical and pharmacological validation is limited.

7. RESEARCH GAP

Despite the growing interest in medicinal grasses, pharmacognostic and phytochemical information on *A. pumilus*, *D. annulatum*, *S. pumila*, *S. nervosum* and *E. bifaria* remains inadequate. Future investigations should focus on detailed botanical characterization, physicochemical standardization, chromatographic fingerprinting, metabolomic profiling and bioactivity-guided isolation of active constituents. Such studies will provide scientific evidence for their traditional uses and facilitate the development of standardized herbal formulations.

8. NOVELTY OF THE REVIEW

Unlike previous reviews that primarily focus on economically important medicinal grasses such as *C. citratus* and *C. dactylon*, the present review also compiles the available information on underexplored indigenous grasses including *A. pumilus*, *D. annulatum*, *S. pumila*, *S. nervosum* and *E. bifaria*. By integrating ethnomedicinal knowledge with phytochemical, pharmacognostic and biological evidence, this review identifies important research gaps and highlights these species as promising candidates for future herbal drug discovery and standardization.

9. FUTURE PERSPECTIVES

Despite the extensive medicinal importance of the family Poaceae, only a limited number of species have been scientifically investigated. Indigenous grasses such as *A. pumilus*, *D. annulatum*, *S. pumila*, *S. nervosum* and *E. bifaria* remain largely unexplored with respect to their

phytochemistry, pharmacognosy, pharmacology, and toxicity. Future research should focus on comprehensive pharmacognostic standardization, phytochemical profiling, chromatographic fingerprinting, metabolomic analysis and bioactivity-guided isolation of active compounds. Such studies will facilitate the development of standardized herbal formulations and may lead to the discovery of novel therapeutic agents.

10. CONCLUSION

Medicinal grasses belonging to the family Poaceae represent an important source of bioactive phytochemicals with considerable therapeutic potential. Well-studied species such as *C. citratus*, *C. dactylon*, *C. zizanioides*, *I. cylindrica*, *S. spontaneum* and *B. bambos* have demonstrated significant pharmacological activities, whereas indigenous grasses including *A. pumilus*, *D. annulatum*, *S. pumila*, *S. nervosum* and *E. bifaria* remain insufficiently explored. Pharmacognostic, phytochemical and biological investigations are essential for the authentication, quality control and scientific validation of these medicinal grasses. Further multidisciplinary research integrating phytochemistry, pharmacognosy, molecular biology and pharmacology is necessary to establish their therapeutic efficacy and promote their utilization in herbal drug development.

11. REFERENCES

1. Newman D.J., Cragg G.M., Natural products as sources of new drugs over nearly four decades, Journal of Natural Products, 2020; 83(3): 770-803.
2. Sofowora A., Ogunbodede E., Onayade A., The role and place of medicinal plants in healthcare delivery, African Journal of Traditional, Complementary and Alternative Medicines, 2013; 10(5): 210-229.
3. Wink M., Modes of action of herbal medicines and plant secondary metabolites, Medicines, 2015; 2(3): 251-286.
4. Prasanna P.V., Chowdhery H.J., Arumugam S., et al., *Flora of India: Poaceae*, Botanical Survey of India, 2024.
5. Dash S., Rajasekaran S., Hota R., Mohanty A., Das C., An overview of the phytopharmacological characteristics of selected forage grasses (Poaceae), Current Traditional Medicine, 2026.
6. Prakash N., Pullaiah T., Ethnobotanical uses of grasses (Poaceae) in India: A review, Ethnobotany, 2017; 29: 1-12.
7. Saha A., Hoque A., Mallick S.K., Panda S., Medicinal uses of grasses by tribal communities in West Bengal: An overview, International Journal of Basic and Applied Sciences, 2014.
8. Sharma B.P., Behera M., Agrahari D., Kumar S. (Eds.), *Medicinally and Pharmacologically Important Grass Species of India*, Ambika Prasad Research Foundation, 2025.
9. Mitra S., Mukherjee S.K., Ethnobotanical uses of grasses by tribal communities of West Dinajpur District, West Bengal, Indian Journal of Traditional Knowledge, 2005; 4(4): 396-402.
10. Chou S.T., Chang W.L., Chang C.T., Hsu S.L., Lin Y.C., Shih Y., Chemical composition and biological activities of vetiver (*Chrysopogon zizanioides* (L.) Rob.) essential oil, Journal of Essential Oil Research, 2012; 24: 1-8.
11. Singh V., Tiwari V., Dash P.P., Patni T., Mishra T., Gupta R.K., Exploring the potential of wild weeds and grasses as nutraceuticals: A comprehensive review, Current Nutrition & Food Science, 2025.
12. Atanasov A.G., Zotchev S.B., Dirsch V.M., et al., Natural products in drug discovery: Advances and opportunities, Nature Reviews Drug Discovery, 2021; 20: 200-216.
13. Evans W.C., *Trease and Evans Pharmacognosy*, 16th ed., Elsevier, 2009.
14. Cooke T., *The Flora of the Presidency of Bombay*, Vols. 1-2, Botanical Survey of India, 1958.
15. Karthikeyan S., Anand Kumar, *Flora of Yavatmal District*, Botanical Survey of India, 1993.
16. Naik V.N., *Flora of Marathwada*, Vols. 1-2, Amrut Prakashan, 1998.
17. Prasanna P.V., Chowdhery H.J., Arumugam S., et al., *Flora of India: Poaceae*, Botanical Survey of India, 2024.
18. Sharma B.D., Karthikeyan S., Singh N.P., *Flora of Maharashtra State: Monocotyledones*, Botanical Survey of India, 1996.
19. Soreng R.J., Peterson P.M., Romaschenko K., et al., A worldwide phylogenetic classification of the family Poaceae (Gramineae), Journal of Systematics and Evolution, 2022; 60(3): 476-521.
20. Gurib-Fakim A., Medicinal plants: Traditions of yesterday and drugs of tomorrow, Molecular Aspects of Medicine, 2006; 27: 1-93.
21. Fatima N., Narain S., Kumar P., Rahul, Medicinal repository and propagation aspects of grasses, Indian Forester, 2025; 151(6): 573-576.
22. World Health Organization, *Quality Control Methods for Herbal Materials*, World Health Organization, 2011.
23. Avoseh O., Oyedeji O., Rungqu P., Nkeh-Chungag B.N., Oyedeji A.O., *Cymbopogon* species: Ethnopharmacology, phytochemistry and biological activities, Molecules, 2015; 20(5): 7438-7453.
24. Shah G., Shri R., Panchal V., Sharma N., Singh B., Mann A.S., Scientific basis for the therapeutic uses of *Cymbopogon citratus*, Journal of Advanced Pharmaceutical Technology & Research, 2011; 2(1): 3-8.
25. Benjamin M.A.Z., Saikim F.H., Ng S.Y., Rusdi N.A., A comprehensive review of the ethnobotanical, phytochemical, and pharmacological properties of the genus *Bambusa*, Journal of Applied Pharmaceutical Science, 2023; 13(5): 1-22.
26. Haida Z., Sanusi R., Ethnomedicinal uses, phytochemical constituents, pharmacological properties, and toxicology of the Bambusoideae species: A review, BioResources, 2025; 20(2): 4925-4961.

27. Haris M., Rehman S., Rauf A., Ethnopharmacology, phytochemistry, pharmacological activities and toxicity study of *Bambusa bambos* (L.) Voss: A comprehensive overview, Discover Plants, 2025; 2: 48.
28. Sawarkar A.D., Shrimankar D.D., Kumar M., Kumar P., Singh L., Bamboos as a cultivated medicinal grass for industries: A systematic review, Industrial Crops and Products, 2023; 203: 117210.
29. Dewick P.M., *Medicinal Natural Products: A Biosynthetic Approach*, 3rd ed., John Wiley & Sons, 2009.
30. Damor K., Kadia R., Modi N., A review of phytochemical and pharmacological analysis of Poaceae family plants, International Journal of Scientific Research in Science and Technology, 2025; 12(1): 450-462.
31. Singh G., Maurya S., de Lampasona M.P., Catalan C.A.N., Chemical constituents and biological activity of lemongrass essential oil, Journal of Agricultural and Food Chemistry, 2007; 55: 7899-7905.
32. Al-Snafi A.E., Chemical constituents and pharmacological effects of *Cynodon dactylon*: A review, IOSR Journal of Pharmacy, 2016; 6(7): 17-31.
33. Ashokkumar K., Selvaraj K., Muthukrishnan S.D., *Cynodon dactylon*: A review of its phytochemistry and pharmacology, Journal of Medicinal Plants Research, 2013; 7(48): 3477-3483.
34. Xu X., et al., Bamboo leaf: A review of traditional medicinal property, phytochemistry, pharmacology, and purification technology, Journal of Ethnopharmacology, 2023; 306: 116166.
35. Zulhilmi Benjamin M.A., Saikim F.H., Ng S.Y., Rusdi N.A., Ethnobotanical, phytochemical, and pharmacological properties of *Bambusa*: A scoping review, Journal of Applied Pharmaceutical Science, 2023; 13(5): 1-22.
36. Evans W.C., *Trease and Evans Pharmacognosy*, 16th ed., Elsevier, 2009.
37. Harborne J.B., *Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis*, 3rd ed., Chapman & Hall, 1998.
38. Heinrich M., Barnes J., Gibbons S., Williamson E.M., *Fundamentals of Pharmacognosy and Phytotherapy*, 3rd ed., Elsevier, 2018.
39. Kokate C.K., Purohit A.P., Gokhale S.B., *Pharmacognosy*, 56th ed., Nirali Prakashan, 2021.
40. Handa S.S., Khanuja S.P.S., Longo G., Rakesh D.D., *Extraction Technologies for Medicinal and Aromatic Plants*, ICS-UNIDO, 2008.
41. Wagner H., Bladt S., *Plant Drug Analysis: A Thin Layer Chromatography Atlas*, 2nd ed., Springer, 1996.
42. Pandey K.B., Rizvi S.I., Plant polyphenols as dietary antioxidants, Oxidative Medicine and Cellular Longevity, 2009; 2(5): 270-278.
43. Negrelle R.R.B., Gomes E.C., *Cymbopogon citratus*: Botanical, phytochemical and pharmacological review, Revista Brasileira de Plantas Medicinais, 2007; 9(1): 80-92.