RESEARCH PAPER

Phytochemical Profiling and Evaluation of Bioactive Compounds in Selected Medicinal Plants in Drug Delivery prospective for future applications

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ABSTRACT

This review comprises phytochemical profiling and bioactive potentials of Ocimum tenuiflorum (Krishna tulsi leaves), Madhuca indica flower and wheat strains HI 8826 and K 9162 in relation to their application in nutrition and medicine. The main objectives are to compare the major types of phytochemicals, to determine their effects on living organisms and to evaluate their potential to develop phytopharmaceuticals and functional foods. Krishna tulsi has phenolics, flavonoids, terpenoids and triterpenes which are known for their anti-inflammatory, antimicrobial and diabetic effects. Flavonoids, Saponins, Steroids, Triterpenoids and Glycosides which have healing and metabolic effects are known to be present in Madhuca indica flower. Wheat genotypes, on the other hand, are cited as valuable cereal products having differences in phenolic acids, sterols, tocols, and antioxidant potential depending on the genotype. The review recommends the use of tulsi and mahua for herbal medicine and HI 8826 and K 9162 for genotype-specific confirmation and nutritionally improved wheat breeding. All these materials are promising for future study in pharmaceuticals, nutraceuticals and functional foods.

In addition, the review briefly highlights how these bioactive compounds are relevant within plant-based drug delivery systems, which is a little bit like a bridge between nature and therapy. Many phytochemicals run into trouble because of poor solubility, low stability, and limited bioavailability; so, by folding them into the right delivery platforms, like nano formulations, herbal carriers, encapsulated extracts and controlled-release systems, their therapeutic performance might actually get better.

Keywords: Phytochemical profiling, bioactive compounds, Krishna tulsi, Madhuca indica, wheat genotypes, plant-based drug delivery, phytopharmaceuticals, bioavailability.

How to cite this article: Prajapati R, Shrivastava R, Chand V, Dixit R. Phytochemical Profiling and Evaluation of Bioactive Compounds in Selected Medicinal Plants in Drug Delivery prospective for future applications. Int J Drug Deliv Technol. 2026;16(54s): 1400-1407. DOI: 10.25258/ijddt.16.54s.124

Source of support: Nil.

Conflict of interest: None.

1 Introduction

1.1 Purpose-made plants and medicines Introduction

Medicinal plants and functional crops are very important in modern health studies because they are natural sources of biologically active compounds which can be used to treat and prevent disease. Medicinal plants have been used in traditional medicine since long time ago. The functional foods are becoming very popular now as they are good for you and have phytochemicals that are good for your health. This change has led to increased interest of people in using plants to treat chronic diseases, boost immune system, counteract oxidative stress and generate nutraceutical products [1].

1.2 Importance of phytochemical analysis

Phytochemical profiling is important as it helps in the finding, describing and comparing of the secondary molecules that plants and crops use to do biological work. Some groups of compounds including phenolic acids, flavonoids, terpenoids, saponins, alkylresorcinols, tocopherols, and triterpenes were found to be associated with the protective, anti-inflammatory, antimicrobial, hypoglycemic and hepatoprotective activities [2]. It also assists with standardisation, quality assessment, extraction strategy and selection of plant materials for use in medicine, functional foods and nutraceuticals.

1.3 Why some types of tulsi, mahua and wheat should be chosen

Ocimum tenuiflorum (Krishna tulsi) was selected as the plant because it is a popular medicinal herb and has a large number of bioactive compounds with antioxidant, antimicrobial, anti-inflammatory and anti-diabetic properties. The Madhuca indica flower was chosen due to its reported pharmacological promise and presence of flavonoids, saponins, steroids, triterpenoids, glycosides, fatty acids and carbohydrates [3]. We included wheat genotypes HI 8826 and K 9162 as wheat is a useful grain and differences between genotypes in phenolic compounds and antioxidant potential may affect the quality of nutraceuticals.

1.4 Scope and Objectives of the Review

The purpose of this study is:

1. Review on phytochemical composition of Ocimum tenuiflorum (Krishna tulsi leaves) and medicinal importance of its secondary metabolites such as phenolics, flavonoids, terpenoids and triterpenes.
2. Review the key chemical components found in Madhuca indica flower and discuss their potential use in medicinal or nutraceutical formulations.
3. Assessment of wheat genotypes HI 8826 and K 9162 as source of functional food material based on genotypic variation in phytochemicals and antioxidant potential.
4. Compare the selected medicinal plants and wheat genotypes based on the type of phytochemicals they contain, their likely biological functions and their potential use for treatment.
5. Highlight the importance of phytochemical screening as a scientific process of standardisation, quality testing and manufacture of plant-based medicines and supplements.
6. Identify areas that require further study and plan the future on how to utilise these selected plant materials and crop genotypes in drug discovery and functional food research.

2. The way medicines work through phytochemicals

2.1 Primary and secondary metabolites in plants

Plants produce primary metabolites such as carbohydrates, amino acids, proteins and lipids which are essential for growth, development and reproduction. Secondary metabolites are important, however, for defence, adaptation and interactions with their environment [4]. Primary metabolites are of importance with regard to nutrition; secondary metabolites are more directly related to pharmacological activity. This is because they contain many compounds that are antimicrobial, anti-inflammatory, anti-oxidant and disease preventing.

2.2 Major classes of phytochemicals relevant to the study

These are the main classes of phytochemicals that are usually present in useful crops and medicinal plants [5]. They are phenolics, flavonoids, terpenoids, glycosides, sterols and other antioxidants. These chemicals are important as they occur in large amounts in Ocimum tenuiflorum, Madhuca indica and wheat [6]. The chemicals in them are diverse and useful for many medical and nutritional purposes.

2.3 Significance of phenolics, flavonoids, terpenoids, glycosides, sterols and antioxidants in analysis

The potential of phenolics and flavonoids has been widely studied for their antioxidant activity and ability to reduce oxidative stress [7]. Terpenoids and glycosides, meanwhile, are often credited with fighting infections, combating inflammation and keeping the metabolism in check. Sterols protect heart and membranes. Oxidative tests help to know how good plant extracts and cereal parts are. Thus, phytochemical analysis provides us a way of thinking about how to connect the chemical composition with bioactivity, and how we can compare the healing potential of the selected medicinal plants and wheat genotypes in this study.

2.4 Drug delivery relevance of phytochemicals

From a drug delivery viewpoint, phytochemicals are important not only because of their biological activity, but also because of the formulation issues they bring along, which really points to needing innovative answers. A lot of plant derived bioactive compounds, like phenolics, flavonoids, terpenoids, and triterpenoids, show solid antioxidant, anti-inflammatory, antimicrobial, and metabolic impacts. When people acknowledge these obstacles, it can push researchers and pharmaceutical scientists to invent better delivery approaches, giving them that sense of meaning and respect for what they do.

Plant bioactives can be tucked into modern delivery formats, such as nanoparticles, liposomes, phytosomes, nanoemulsions, polymeric carriers, and hydrogel-based systems. These platforms may guard fragile compounds from degradation, support more controlled release, lower how often doses are needed, and boost overall therapeutic performance. Emphasizing these advantages can make researchers and pharmaceutical scientists feel more confident about what could be achieved, so they are more likely to continue examining, and tuning these methods, further.

3. Plant or gene-based phytochemical analysis

3.1 Major components of Ocimum tenuiflorum (Krishna tulsi leaves) and the functions they are believed to perform

The Krishna tulsi leaves are rich in various secondary metabolites which are of great significance in traditional and modern herbal researches. They include phenolics, flavonoids, phenylpropanoids, terpenoids, coumarins, essential oil constituents and fatty acid derivatives. Rosemary contains some of the most important chemicals in the world, such as rosmarinic acid, ursolic acid, oleanolic acid, luteolin, limonene, eugenol, linalool, beta-caryophyllene, methyl cinnamate and others, which all work together to help the body in many ways [8]. These bioactives possess anti-inflammatory, antimicrobial, anti-diabetic, hepatoprotective, wound healing, neuroprotective, antistress and anticancer properties. This makes the leaves very useful for phytopharmaceutical and nutraceutical purposes. Phytochemical tests have also been carried out and they have shown that tulsi leaves contain saponins, alkaloids, steroids, tannins, glycosides and phenols which add further value to tulsi leaves as a general medicine.

3.2 The Madhuca indica flower: its medical importance and its nutritional and phytochemical components

Madhuca indica flower is advantageous to health and diet due to the existence of carbohydrates, fatty acids and other bioactive substances. In the flower and similar extracts, flavonoids, saponins, steroids, triterpenoids, glycosidic compounds and other antioxidant-active parts have been reported, justifying their medicinal use. Research in pharmacology shows that mahua flower has healing, anti-inflammatory, anti-cancer, hepatoprotective, anti-diabetic, wound healing, tonic, demulcent and general restorative qualities [9]. This suggests that it holds a great deal of promise as an ethnomedicinal and nutraceutical ingredient. The flower is a good bridge between traditional plant therapy and the development of functional food since it contains both high-energy nutritional components and phytochemicals which are useful for medicine.

3.3 Wheat genotype HI 8826: predicted bioactive value, grain quality, nutritional and biofortification value

HI 8826 is a nutritionally important wheat genotype and is often discussed in the context of quality improvement and biofortification focused breeding [10]. This means that it is helpful for the research of functional food. Although genotype-specific phytochemical data for HI 8826 are not as extensive as those for medicinal plants, studies on wheat in general have demonstrated that genotype significantly influences total phenolic content, antioxidant activity and nutritionally relevant grain properties. Phenolic acids, flavonoids, alkylresorcinols, carotenoids, sterols, tocopherols, and tocotrienols are normally present in wheat grains. These compounds have been associated with protection of cells from damage, promotion of a healthy gut and reduction of your risk of chronic disease [11]. So, HI 8826 could be a good gene to test for the effect of phytochemical and bioactive potential on grain quality and nutritional value.

3.4 Wheat genotype K 9162: Genotypic effect, potential benefit for phenolic antioxidants, breeding/nutritional value

K 9162 is a valuable wheat genotype to use for diet and breeding comparisons, especially for studies on adding value beyond yield alone. Wheat research has repeatedly demonstrated the variation in phenolic content and antioxidant activity among genotypes and environments [12]. This justifies the use of K 9162 in phytochemical evaluation although not many direct reports are available on this compound yet. Phenolic acids such as ferulic acid and similar bound phenolics are very important in wheat because they play a big role in its nutritional value and antioxidant activity. From the breeding point of view, K 9162 is an important genotype, which could be utilised in breeding of wheat with improved health benefits. It is also important for future research on bioactive chemicals and nutraceutical uses from cereals.

Wheat group	Antidiabetic relevance	Key phytochemicals/traits	Why it matters
Colored wheat genotypes	High	Anthocyanins, phenolic acids, flavonoids, strong antioxidant activity	Best candidates for phytochemical screening and glycemic-protection studies.
Purple wheat lines	High	Elevated total phenolics and bound/free phenolic acids	Especially promising for antioxidant-linked antidiabetic nutrition.
Red wheat lines	Moderate to high	Phenolics, flavonoids, moderate-to-strong antioxidant activity	Useful as comparator genotypes in phenotype validation.
Ancient wheat lines	High	Bioactive phytochemicals plus improved glycemic response in dietary studies	Relevant for functional food and diabetes-prevention research.
High-amylose / resistant-starch wheat	Very high for dietary glycemic control	Resistant starch, slower digestibility, lower glucose rise	Strong candidate for antidiabetic food design even when phytochemical

			density is moderate.
Diverse bread wheat accessions	Variable	Genotype-dependent phenolic content and antioxidant activity	Needed for selecting elite lines such as HI 8826 and K 9162.

Table 1: Wheat genotypes with elevated phenolic acids, anthocyanins, and resistant starch, Source: https://pubs.acs.org/doi/10.1021/jf052683d

Solvent	Raw plant material (g)	Final dry extract (g)	Yield (%)
Ethanol	10	0.504	5.04
Methanol	10	1.200	12.00
Aqueous	10	—	—
Ethyl acetate	10	0.774	7.74
Acetone	10	0.544	5.44
Pet. ether	10	0.214	4.28
n-Hexane	10	0.289	5.78

Table 2: Percentage yield of crude extracts obtained from the selected plant material using different solvents, Source: Author Generated

Values represent the percentage of dried extract obtained from a fixed amount of raw plant material. Yield percentage was determined using the formula $\frac{\text{dry extract weight}}{\text{raw plant material weight}} \times 100$. This table is intended to compare solvent-dependent extraction efficiency.

3.5 Quantitative estimation of total phenolic content and total flavonoid content

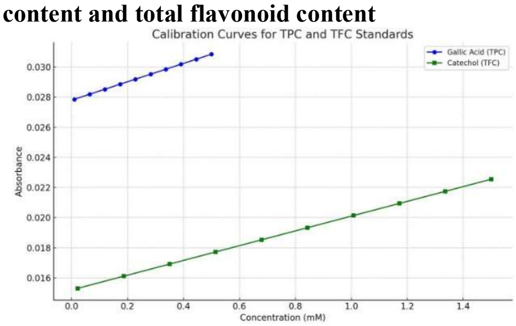

Figure 1: Calibration Chart, Source: https://pmc.ncbi.nlm.nih.gov/articles/PMC12662178/figure/fig4/

Calibration charts for gallic acid and catechol standards are used to determine the total phenolic content (TPC) and total flavonoid content (TFC). A standard curve for gallic acid was prepared from 0.01 to 0.5 mM. It gave the equation of y=0.0061x+0.0278 and the value of R 2 was 0.9987. The catechol standard curve was prepared using 0.022 to 1.5 mM with the equation y = 0.0049x + 0.0152 and R2 = 0.9979. Absorbance was measured at two different wavelengths, 700 nm for TPC and 510 nm for TFC.

4. Comparative evaluation of bioactive compounds

4.1 Comparative matrix of compound classes

When we compare the four materials together, we can see that Ocimum tenuiflorum contains the highest number of secondary metabolites, namely phenolics, flavonoids, terpenoids, constituents of essential oil, triterpenes and related aromatic compounds. Alternatively, Madhuca indica flower contains a mix of nutritional constituents with flavonoids, saponins, steroids, triterpenoids, glycosides, and fatty acid fractions. Finally, wheat genotypes HI 8826 and K 9162 belong to the field of cereal phytochemistry [13]. On the other hand, wheat genotypes HI 8826 and K 9162 belong to the field of cereal phytochemistry [14]. They contain phenolic acids, flavonoids, sterols, alkylresorcinols, tocopherols and tocotrienols, which constitute the majority of the bioactive profile and are mainly responsible for their nutritional value rather than for their traditional value in herbal medicine.

Study material	Major compound classes	Dominant bioactive emphasis	Principal application relevance
Ocimum tenuiflorum leaves	Phenolics, flavonoids, terpenoids, triterpenes, volatile oils	Broad-spectrum medicinal activity	Herbal therapeutics, antioxidant and antimicrobial formulations
Madhuca indica flower	Flavonoids, saponins, steroids, triterpenoids, glycosides, fatty acids	Nutritional-pharmacological dual value	Traditional medicine and functional nutraceuticals
Wheat genotype HI 8826	Phenolic acids, flavonoids, sterols, tocols, fiber-associated bioactives	Nutritional and biofortification significance	Functional foods and health-oriented breeding
Wheat genotype K 9162	Phenolic acids, antioxidant-associated cereal	Genotype-linked nutraceutical potential	Breeding and antioxidant quality

	phytochemicals		evaluation

Table 3: Dominant bioactive emphasis, Source: https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/bioactive-compound

4.2 Antioxidant potential across selected materials

Of the chosen materials, tulsi and mahua have a very clear medical antioxidant value. This is because their extracts contain a lot of redox-active phytochemicals which have been associated with reducing oxidative stress and free radicals. In contrast, the antioxidant capacity of wheat genotypes is mainly related to phenolic acids and related polyphenolics in the grains. "They are really good for long term weight loss, heart health and for designing functional foods."

4.3 Therapeutic application mapping

Tulsi as a medicine has the widest spectrum of effects such as anti-inflammatory, antimicrobial, anti-diabetic, wound healing and restorative. Madhuca indica is well known for its anti-inflammatory, hepatoprotective, antidiabetic, wound healing and restorative property [15]. However, wheat genotypes are more closely linked with cardioprotective and nutraceutical potential due to whole-grain polyphenolics and antioxidant-related health benefits. This indicates that tulsi and mahua are best suited as direct phytotherapeutic resources whereas HI 8826 and K 9162 are best suited as bioactive cereal genotypes for preventive nutrition and value-added breeding. Madhuca indica is known for its anti-inflammatory, hepatoprotective, anti-diabetic, wound healing and restorative properties. However, wheat genotypes are more associated with the cardioprotective and nutraceutical potential through whole-grain polyphenolics and antioxidants [16]. So, tulsi and mahua are better as direct phytotherapeutic resources while HI 8826 and K 9162 as bioactive grain genotypes for preventive nutrition and breeding for added value.

In the context of drug delivery, tulsi and mahua can be seen as more suitable for direct phytopharmaceutical development, even if the idea is kinda overlapping at times. They hold bioactive compounds with rather clear medicinal relevance, and their extracts or isolated compounds could be turned into topical, oral, or nano based delivery systems, meant for antioxidant, anti-inflammatory, antimicrobial, wound healing, and metabolic applications. Wheat genotypes, however, seem more relevant for nutraceutical delivery and functional food style health support, where bioactive cereal compounds may help with preventive healthcare rather than acting like a direct therapeutic drug action.

Study material	**Drug delivery relevance**	**Possible formulation direction**
Ocimum tenuiflorum leaves	Rich in phenolics, flavonoids, terpenoids and triterpenes with therapeutic potential	Herbal extract formulations, nanoemulsions, phytosomes, topical gels
Madhuca indica flower	Contains flavonoids, saponins, glycosides and triterpenoids useful for medicinal applications	Oral herbal formulations, wound healing preparations, encapsulated extracts
Wheat genotypes HI 8826 and K 9162	Source of phenolic acids, sterols and antioxidant compounds for preventive nutrition	Functional foods, nutraceutical powders, cereal-based bioactive delivery

Table 4: Drug delivery relevance of selected bioactive materials

5. Research Gaps and Future Plans

5.1 Genotype proof in wheat necessary

One of the major challenges of the present research is the lack of specific phytochemical datasets of the selected wheat genotypes HI 8826 and K 9162. This is a big problem because wheat phytochemical profiles vary greatly with genotype, environment and management factors. Controlled comparative studies measuring the quantity of phenolic acids, flavonoids, tocols, sterols and antioxidants in these lines are definitely needed to confirm genotype-specific.

5.2 Standardisation of extraction and measurement required

Another big problem is that different studies on medicinal plants and cereals used different extraction methods, solvent systems and antioxidant tests making it hard to compare the results of different studies [17]. Standardised extraction, chromatographic quantification and validated in vitro and in vivo correlation models are required to enhance the process consistency and to set up exacting phytochemical standards for Ocimum tenuiflorum, Madhuca indica and wheat genotypes.

Extraction method	**Solvent use**	**Time required**	**Temperature**	**Yield potential**	**Suitability for heat-labile comp**	**Cost**	**Scalability**

					ounds		
Maceration	High	Long	Room temperature	Moderate	Good	Low	Good
Percolation	Moderate	Moderate	Room temperature	Moderate to high	Good	Low to moderate	Good
Soxhlet extraction	Moderate to high	Long	High	High	Poor to moderate	Moderate	Good
Ultrasound-assisted extraction	Low to moderate	Short	Low to moderate	High	Very good	Moderate	Moderate
Microwave-assisted extraction	Low	Very short	High	High	Poor to moderate	Moderate to high	Moderate
Reflux extraction	Moderate	Moderate	High	High	Poor	Moderate	Good

Table 5: Comparative checkerboard of plant extraction methods, Source: https://pmc.ncbi.nlm.nih.gov/articles/PMC7398001/

Raw plant material → Cleaning and drying → Grinding into coarse powder → Weighing of sample → Extraction with selected solvent → Filtration → Concentration of filtrate → Drying of extract → Collection and storage of crude extract

The dried plant material was washed, powdered and extracted by selected method using solvent. The extract was then filtered, concentrated, dried and stored for further phytochemical screening and quantitative analyses. This workflow was used to provide crude extracts for qualitative and quantitative evaluation of bioactive constituents

5.3 Manufacturing of pharmaceutical, nutraceutical and functional foods

Future study should go beyond qualitative screening and focus on making pharmaceutical leads, nutraceutical formulations and functional foods based on bioactive compounds that have been proven to work. Tulsi and mahua have a great potential for development of phytopharmaceuticals and plant products. In contrast, wheat could be produced with better nutritional value and health benefits by using HI 8826 and K 9162 for wheat breeding. Adding metabolomic profiling, bioavailability studies, and product-oriented study to these selected materials will be more useful for medicine and business.

Phytochemical class	Ocimum tenuiflorum (Krishna tulsi)	Madhuca indica flower	Wheat genotypes (HI 8826, K 9162)
Alkaloids	Present	Not specified	Not specified
Flavonoids	Present	Present	Present
Tannins	Present	Not specified	Not specified
Saponins	Present	Present	Not specified
Terpenoids	Present	Present	Not specified
Steroids	Present	Present	Present
Glycosides	Present	Present	Not specified
Phenols / phenolic acids	Present	Not specified	Present
Triterpenoids	Present	Present	Not specified
Tocopherols / tocotrienols	Not specified	Not specified	Present

Table 6: Qualitative phytochemical constituents reported in the selected plant materials, Source: DOI:10.22270/jddt.v11i2.4609

Future formulation studies should also look at how the chosen phytochemicals act across different drug delivery systems, because otherwise it kind of stays vague. Things like solubility, encapsulation efficiency, release profile, stability, permeability, and toxicity ought to be checked in advance, before any clinical or commercial route. Also, the pairing of phytochemical screening with formulation science can help turn traditional medicinal plants into more standardized, safer and effective phytopharmaceuticals.

6. Conclusion

The selected materials reveal that the quantity of phytochemicals is closely correlated with the medicinal and nutraceutical value, but their utilisation is different. Ocimum tenuiflorum is the most useful material for drug research as it contains many phenolics, flavonoids, terpenoids and triterpenes which have antioxidant, anti-inflammatory, antibacterial, anti-diabetic and liver-protecting properties. The flower of Madhuca indica has a nutritional and phytochemical composition which also acts as a potent medicine. It can be used to boost antioxidant, healing and metabolic health.

On the other hand, wheat varieties HI 8826 and K 9162 are more important for functional foods and nutraceuticals. This is due to the presence of phenolic acids, sterols, tocols and other bioactives that may help protect from chronic diseases and improve long term health. Hence, tulsi and mahua are better suited as direct phytotherapeutic resources. Wheat genotypes, on the other hand, are promising for validation of genotype-specific phytochemicals and breeding for health.

From a drug delivery view point, the chosen plant materials might work as rather hopeful sources of natural therapeutic molecules, sort of, but they still depend on what you can actually do in practice. Their real value really lies in improving bioavailability, long term stability, and controlled release, usually via the right formulation strategies, not only in theory. So, in future studies, it would be good to connect phytochemical validation with more modern drug delivery technologies, like nanoformulations and encapsulation systems, plus also standardized herbal dosage forms.

Overall, the study suggests that the integration of medicinal plant pharmacology with cereal-based bioactive research is increasingly gaining importance for the improvement of future pharmaceutical, nutraceutical and functional food applications.

Reference

1. Bhattarai, K., Bhattarai, R., Pandey, R. D., Paudel, B., & Bhattarai, H. D. (2024). A comprehensive review of the phytochemical constituents and bioactivities of *Ocimum tenuiflorum*. *The Scientific World Journal, 2024*, Article 8895039. https://doi.org/10.1155/2024/8895039
2. Chatterjee, A., & Sarkar, B. (2025). Phytochemical profiling and in silico molecular interactions of the bioactivity-guided fractions of *Ocimum tenuiflorum* L.: A comprehensive report of antioxidant, anti-inflammatory, and anti-mutagenic properties. *Chemistry & Biodiversity*. https://doi.org/10.1002/cbdv.202500349
3. *Ocimum tenuiflorum* - IMPPAT. (n.d.). Indian Medicinal Plants, Phytochemistry and Therapeutics. https://cb.imsc.res.in/imppat/phytochemical/Ocimum%20tenuiflorum
4. *Ocimum tenuiflorum* phytochemical profiles. (2024). *GSC Biological and Pharmaceutical Sciences*. https://gsconlinepress.com/journals/gscbps/sites/default/files/GSCBPS-2024-0055.pdf
5. *Phytochemical analysis and antimicrobial activity of Ocimum* species. (2018). *Global Research Online*. https://globalresearchonline.net/journalcontents/v53-2/05.pdf
6. Joshi, B. S., & colleagues. (2023). *Madhuca indica*: A review on the phytochemical and pharmacological aspects. *Pharmaceutical Chemistry Journal, 57*(2), 284–295. https://doi.org/10.1007/s11094-023-02878-1
7. Patel, P. K., Prajapati, N. K., & Dubey, B. K. (2012). *Madhuca indica*: A review of its medicinal property. *International Journal of Pharmaceutical Sciences and Research, 3*(5), 1285–1293. http://dx.doi.org/10.13040/IJPSR.0975-8232.3(5).1285-93
8. *Madhuca indica* - review page. (2025). *International Journal of Pharmaceutical Sciences and Research*. https://ijpsr.com/bft-article/madhuca-indica-a-review-of-its-medicinal-property/
9. Adom, K. K., Sorrells, M. E., & Liu, R. H. (2003). Phytochemical profiles and antioxidant activity of wheat varieties. *Journal of Agricultural and Food Chemistry, 51*(26), 7825–7834. https://doi.org/10.1021/jf030404l
10. Zhu, Q., et al. (2022). A comprehensive review of wheat phytochemicals: From farm to fork and beyond. *Comprehensive Reviews in Food Science and Food Safety*. https://doi.org/10.1111/1541-4337.12960
11. Bioactive phytochemicals and antioxidant properties of the grains and sprouts of colored wheat genotypes. (2018). *Molecules*. https://doi.org/10.3390/molecules23092282
12. Comparison of antioxidant activities of different colored wheat genotypes. (2010). *Journal of Agricultural and Food Chemistry*. https://doi.org/10.1021/jf101700s
13. Anthocyanins and phenolic compounds in colored wheat grain. (2025). *PMC*.

https://pmc.ncbi.nlm.nih.gov/articles/PMC12187999/
14. Ancient wheat diet delays diabetes development in a type 2 diabetes model. (2015). *PMC*. https://pmc.ncbi.nlm.nih.gov/articles/PMC16554459/
15. A novel wheat variety with elevated content of amylose and resistant starch. (2011). *PMC*. https://pmc.ncbi.nlm.nih.gov/articles/PMC3162347/
16. Phytochemical profiles and antioxidant activity of wheat varieties. (2003). *PubMed*. https://pubmed.ncbi.nlm.nih.gov/14664553/
17. Phytochemical profiling and in silico molecular interactions of the bioactivity-guided fractions of *Ocimum tenuiflorum* L.: A comprehensive report of antioxidant, anti-inflammatory, and anti-mutagenic properties. (2025). *PubMed*. https://pubmed.ncbi.nlm.nih.gov/40694623/