International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 20s, 2025
https://www.theaspd.com/ijes.php

Ethnomedicinal survey: A review on plants and their therapeutic uses in North India

Bhumika Arora[1], Kamaldeep Kaur[2*]
[1,2*] Department of Botany, Akal University, Bathinda 151302, Punjab, India

***Corresponding author: Kamaldeep Kaur**
kaurkamaldeep281@gmail.com

Abstract
Traditional medicine in India is one of the oldest therapeutic systems in the world. It mainly comprises medicinal and aromatic plants. In North India, these plants have been widely used for therapeutic benefits since ancient times. They also hold a significant place in Indian religion. Various studies have shown that many plants possess antimicrobial, anti-diabetic and anti-inflammatory properties. This review provides an overview of the current knowledge on various medicinal plants of India that have medicinal value in curing various diseases. It also focuses on the research from previous studies conducted on ethnobotanical knowledge & highlights the importance of preserving and establishing traditional medicinal knowledge to make it more widely accessible and to use it for the betterment of mankind. Herbal remedies made from these medicinal plants are widely used in India. The use of these plants is validated by research publications that cite their ethnobotanical applications, mechanisms of action and significant active principles, in naturally occurring medicines.
Keywords: Diseases, ethnobotany, medicinal plants, north india, traditional remedies

INTRODUCTION

India has extensive historical knowledge of ethnobotany. Old Indian literature such as the Rigveda, Charak Samhita, Sushrut Samhita and Ayurveda have extensive knowledge of the use of plants as medicines. At the end of the 19th century, Leopold Glueck, a German doctor working in Sarajevo, was the first person to investigate the emic perspective of the plant world. His published work on the traditional medicinal applications of plants carried out by rural Bosnians in 1986 may be regarded as the current ethnobotanical work (Petran et al., 2020).
The term "ethnomedicine" encompasses all aspects of a person's health, including both clinical and non-clinical activities that reflect their unique health needs. This includes all of their abilities, skills and techniques. Ethnomedicine encompasses the entire range and distribution of health-related experiences, discursive information and practices across various human populations. It is imperative to acknowledge the pivotal role that the disciplines of biology and ethnobotany play in comprehending indigenous communities and their connection with the environment. These disciplines provide a powerful tool for documenting the impact of traditional practices & behaviors by leveraging cultural and biological knowledge. Ethno-medicinal plants are the primary source of new drug discovery and development, often coming from local herbal healers. For many years, ethnobotanical research has greatly contributed to the creation of novel drugs. Traditional medicine is rapidly regaining popularity in today's society as means to cure common diseases and illnesses. Plants have the potential to carry large quantities of physiologically active compounds with important medicinal properties and are used to develop various remedies to treat diseases such as diabetes, depression and many others.
Moreover, the preservation of traditional and indigenous knowledge is of utmost importance, as it is a critical source of ethnomedicines for many people living in impoverished nations. It is inspiring to know that even in today's modern world, a significant number of individuals in rural areas- both domestically and globally, continue to rely on traditional medicine for their essential healthcare needs. So, it is our responsibility to ensure that the traditional knowledge of tribal communities is protected and sustained, not only in our own country but throughout the world. Additionally, utilizing traditional medicines to treat illnesses and studying traditional uses of medicinal plants embrace tremendous promise as potential sources of useful medical drugs that were previously inaccessible or unknown to the general public.
Recent investigations in India have uncovered several tribal populations, ethnomedicinal practices and expertise (Koti & Kotresha, 2021). Moreover, many studies are conducted on the identification, preservation & documentation of traditional knowledge of medicinal plants and their therapeutic uses.
Further, ethnomedicinal survey on the use of medicinal plants was conducted by Rani (2019), in the Jind district of Haryana. She collected data based on interviews and revealed 58 species, belonging to 56 genera & 29 families.

These medicinal plants are used in the treatment of major and minor diseases such as kidney disorder, leprosy, pneumonia, dyspepsia, eye disorder, fever, cold, asthma, piles, skin diseases, scorpion bite, indigestion *etc.*
Chauhan and his colleagues (2020), illustrated ethnobotanical uses of medicinal plants among the rural people of Pabbar valley in Shimla district, Himachal Pradesh. They carried out an ethnobotanical survey and gathered information from 92 informants via interviews & semi-structured questionnaire. They reported 61 plant species belonging to 34 families which were used to cure various ailments such as cold, cough, fever, reproductive problems, wounds, skin problems and diarrhoea. Moreover, Kaur et al. (2020), illustrated the use of medicinal plants for traditional health care benefits in Talwandi Sabo, Bathinda district, Punjab. They reported 88 medicinal plant species for the treatment of 60 ailments viz., gastrointestinal problems, respiratory problems, skin problems, dental problems *etc.* Furthermore, an ethnomedicinal survey on the traditional use of medicinal plants was conducted in Charkhi Dadri district, Haryana. The authors reported 90 medicinal plants belonging to 41 different families. They also reported that majority of plants were herbs and maximum number of plants belongs to family Leguminosae. These medicinal plants are used in the treatment of 64 different ailments (Yadav et al., 2021).
In addition, Kumar and his colleagues (2022), conducted an ethnobotanical survey on medicinal plants in Hisar district, Haryana. They reported 41 medicinally important indigenous plants belonging to 27 families having various therapeutic uses to cure different ailments. According to their reports, the majority of medicinal plants belong to families Cucurbitaceae, Fabaceae, Asteraceae, Euphorbiaceae, Solanaceae, Lamiaceae *etc.* Along with this they also concluded that the leaves of most of the medicinal plants have maximum ethnomedicinal value. Gautam & Adhikari (2023), give documentation on the ethnobotanical survey of medicinal plants of Harike Wildlife Sanctuary, Punjab. They reported a total of 85 species from 51 families, which helps to cure near about 40 health ailments when taken in different forms such as juice, orally *etc.* In the same year another ethnobotanical survey on medicinal plants from Jind district, Haryana was conducted by Anshu and his co-workers. They surveyed in Jind district and revealed 73 medicinally important plants that are used in the treatment of various ailments. Recently, another study was conducted by Bhatt and their co-workers (2024), in Uttarakhand. They reported a total of 100 medicinally important plants belongs to 94 genera and 57 families, which were used to cure human ailments such as skin disorders and health related issues.

Ethnomedicinal plants used to cure common diseases
Dendrobium is a large genus belongs to family Orchidaceae. It is an ancient herb rich in bioactive compounds, holds enormous promise for the treatment of liver-related ailments. However, to unlock its full potential, there is an urgent need to investigate the underlying mechanisms and pharmacokinetics. This comprehensive review highlights the herb's including *Dendrobium nobile* Lindl., *Dendrobium huoshanense* Z.Z. Tang & S.J. Cheng, *Dendrobium chrysotoxum* Lindl., *Dendrobium fimbriatum* Hook., *Dendrobium officinale* Kimura & Migo, remarkable versatility in medicine, which helps to cure liver tumors, hepaptis, gall stones, cholecystitis and also improve lipid metabolism (Fu et al., 2023). Meanwhile, silymarin, a useful compound derived from *Silybum marianum* (milk thistle) seeds & fruits, has been used to cure liver disorders and also control blood glucose level. Further, Eurosil 85 (derived oral formulation of silymarin), has enhanced the compound's oral bio-availability, making it even more effective for treating diabetes, cirrhosis and liver health, without any adverse side effects (Gillessen & Schmidt, 2020). Moreover, phytoalexins viz., capsidiol, isoflavones, flavonoids, brassinin, resveratrol, sakuranetin, pterostilbene naturally occurring compounds derived from *Capsicum annuum* L., *Cicer arietinum* L., *Pistacia vera* L., *Arachis hypogea* L., *Malus domestica* (Suckow) Borkh., *Brassica oleracea* var. *botrytis* L., *Vitis vinifera* L., *Juglans regia* L., *Prunus amygdalus* Batsch *etc* have tremendous potential for treating lung cancer, brain damage, skin cancer, diabetes, heart related issues and also have anti-inflammatory & anti-oxidant properties (Thirumal & Balasubramanium, 2023) (Table 1).
Another study revealed that *Spinacia oleracea* have been used in evaluating their ethnobotanical, pharmacological, physiochemical and phytochemical properties. This plant is rich in constituents such as flavonoids, tannic acid and alkaloids which make them a veritable powerhouse of medicinal potential. The extract derived from these plant has been shown to possess anti-inflammatory, anti-obesity, laxative, anti-cancerous, antioxidant properties. It is also helpful in the prevention of various ailments such as asthma, sore throat, sore eye, vomiting, cold, sneezing, joint pain, leprosy, jaundice *etc* (Akbari et al., 2024).

Several other plants, such as *Withania somnifera* and *Swertia chirata* have also been found to possess significant medicinal values. However, to harness their benefits, these plants need to undergo a rigorous process of extraction, standardization and various testing. *Swertia chirata* a medicinal plant which constitute various bioactive compounds such as swechirin, gentianine, amarogentin, swertiamarin, ursolic acid *etc* and is also used in the treatment of various health related issues such as malaria, chronic fever, anemia, asthma, liver problems, Covid-19 *etc.* Likewise, *Withania somnifera,* another well-known medicinal plant increase energy, vital fluids, muscle fat, endurance strength, stimulate health, counteract weakness *etc* (Jadhav et al., 2022).
Another study was conducted in Himachal Pradesh, which reveals therapeutic importance of some medicinal plants such as *Aconitum rotundifolium* (plant juice), *Adiantum capillus* (leaves decoction), *Aegle marmelos* (leaves and fruit decoction), *Ajania tibetica* (leaves and flowers), *Aloe vera* (leaves pulp), *Argemone mexicana* (plant yellow sap), *Bauhinia variegata* (leaves juice), *Emblica officinalis* (fruit powder), *Terminalia chebula* (fruit powder) *etc* which are used in the treatment of jaundice (Kala, 2006; Singh & Lal, 2008; Kumar & Paul, 2009; Kumar & Choyal, 2012; Raghuvanshi et al., 2021). Further, another study was conducted in India on traditional and pharmacological importance of *Oroxylum indicum* which helps to treat various human disorders viz., throat infection, piles, abdominal pain, ulcer, bronchitis *etc* (Kalaivani et al., 2024) (Table 1).

Ethnomedicinal plants used to cure skin diseases

Several plants, such as *Juglans regia, Teucrium polium, Arctium minus* and *Cornus mas* have been recognized for their valuable medicinal properties & are used in the development of modern drugs. The extracts obtained from these plants are standardized and are tested by using a combination of traditional knowledge and contemporary techniques, which are used in the treatment of skin related issues such as sunstroke, phytoallergy, sunburn, dermatitis and skin cancer (Altay & Karahan, 2017). Another study conducted by Tsioutsiou et al., 2022, on the medicinal plants, used traditionally for skin related issues in South Balkan and East Mediterranean region. They reported various commonly used plant species viz., *Plantago major* L., *Hypericum perforatum* L., *Sambucus nigra* L., *Ficus carica* L., *Matricaria chamomilla* L., *Urtica dioica* L., which are used to treat various skin infections such as wounds, burn, boils, haemorrhoids, abscesses, furuncles *etc.*
The traditional healing practices of the indigenous inhabitants of the Pangi valley hold the key to cure various skin-related issues. In a comprehensive study carried out by Dey et al., (2023), documented some of the important ethnomedicinal plants such as *Aesculus indica* (Wall. ex Cambess.) Hook, *Arctium lappa* L., *Berberis aristata* DC, *Caltha palustris* L., *Bergenia ciliata* (Haw.) Sternb., *Geranium nepalense* Sweet, *Viola biflora* L. *etc,* used by these inhabitants to treat skin issues, including wounds, boils, cuts, burns, itching, pimples, skin eruption, leukoderma, eczema, pus removal, injuries and even skin pigmentation. Moreover, *Achillea millefolium* L., commonly referred to as common yarrow, is a plant that belongs to the Asteraceae family. This plant is endowed with several essential oils and phenolic compounds, monoterpenes, sesquiterpenes, lactones, amino acids, fatty acids, succinic acids, ascorbic acid and folic acid. Research has proven the effectiveness of this plant in treating various skin ailments owing to its disinfectant, antibacterial, antioxidant, anthelmintic, antimicrobial and anti-inflammatory properties. Yarrow has been used in traditional medicine to treat acne, eczema, neurodermatitis and urticaria, due to its wound-healing and anti-inflammatory properties, which are due to the presence of chamazulene (chemical compound). Chamazulene helps to enhance regenerative processes, provide an anesthetic effect, adsorb various poisons, weaken allergic reactions, promotes scarring and soften the skin (Shah & Peethambaran, 2018). Similarly, Berganayeva et al., 2023, reported many medicinal plants such as *Cinchorium intybus, Acorus calamus, Agropyron millefolium, Artemisia absinthium, Capsella bursa-pastoris, Equisetum arvense, Glycyrrhiza glabra, Juglens regia etc,* the flora of Kazakhstan, which are used to cure various skin diseases viz., swelling, redness, skin itching and also have wound-healing, antioxidant & astringent properties (Table 1).

Ethnomedicinal plants used in the treatment of cancer

Several natural herbs and compounds have shown potential in treating various cancer such as skin cancer, liver cancer, breast cancer *etc.* For instance, *Selaginella bryopteris* extract (SBE) has illustrated promising results in treating liver cancer in humans and animals. It induces apoptosis, reduces indicators in rats and enhances antioxidants. The bioactive components and molecular analysis of SBE support its potential as a therapy for hepatocellular carcinoma (HCC), pending safety validation (Pal et al., 2022). Additionally, picrosides from *Picrorhiza kurroa* have anti-inflammatory and antioxidant properties that can prevent oncogenesis. Picrosides have

been found to possess therapeutic properties against diverse cancers. Their effects on apoptosis, signal transduction, cell cycle and detoxifying enzymes make them an essential therapy for cancer patients (Soni & Grover, 2019).

A study examining the efficacy of different herbs on cancer patients found that *Curcuma longa* L. had the greatest user satisfaction ratings (i.e., 50%), while *Prunus armeniaca* L. seeds have the highest user ratings (i.e., 100%). Interestingly, there was no significant difference in efficacy among the regularly used herbs. In addition, lower socioeconomic class and cancer patients were found to benefit from herbal therapy. The study found that patients who had cancer for more than a year experienced worse side effects, possibly due to the prolonged use of herbal therapy. These findings highlight the importance of carefully selecting herbs and monitoring their usage in cancer patients to minimize the risk of negative side effects (Aboufaras et al., 2023). Similarly, Chandra et al., 2023 reported various medicinally important plant species having efficacy against different cancers such as *Ajuga parviflora* leaves extract (human chronic myelogenous leukaemia), *Aloe vera* leaves extract (breast cancer), *Artemisia herba-alba* leaves extract (brain tumors), *Taxus baccata* whole plant extract (gastric and pancreatic cancer), *Tinospora cordifolia* stem extract (breast, brain and vaginal cancer) *etc.* Moreover, Akshatha et al., 2025, conducted study on different plant species such as grape (*Vitis vinifera* L.), soybean (*Glycine max* (L.) Merr.), green tea (*Camellia sinensis* (L.) Kuntze), garlic (*Allium sativum* L.), olive (*Olea europaea* L.) and pomegranate (*Punica granatum* L.) to treat colorectal cancer (Table 1).

Ethnomedicinal plants used to cure diabetes

Diabetes mellitus is a complex metabolic condition with various causes that lead to persistent hyperglycaemia, as well as problems in protein, fat and carbohydrate metabolism that affect insulin production and action. However, natural remedies from medicinal plants can be used to combat this condition. *Allium cepa, Aloe vera, Momordica charantia, Ocimum tenuiflorum, Panax ginseng, Cinnamomun verum, Psidium guajava, Brassica juncea, Capsicum annuum* are some of the medicinal plants that exhibit anti-diabetic activity due to presence of rich profile of phytochemical constituents such as allicin, cysteine, sulfoxide, s-allyl cysteine sulfoxide, cyaniding glycosides, quercetin, flavonoids, sterols, phenols, prostaglandins, lignin, saponins, anthraquinones, alkaloids, glycosides, steroids, phenolics and tannins (Pillalamarri et al., 2023). Similar study was carried out by Jacob & Narendhirakannan, 2019 on the role of medicinal plants in the management of diabetes mellitus. They reported various commonly used plant species such as *Aegle marmelos, Coriandrum sativum, Zingiber officinale, Syzygium cumini, Murraya koenigii, Phyllanthus emblica, Cinnamomum verum, Momordica charantia, Allium sativum, Ocimum tenuiflorum etc* which provide strong defense against the damage caused due to reactive oxgen species in diabetic animals and humans.

Kiba et al. (2023), conducted a detailed study on the hydro-ethanolic leaf extract of *Koenigia polystachya* (HELeKP) to evaluate its potential as an acute oral toxicity, antioxidant, *in-vitro* and *in-vivo* antidiabetic agent against beta-cell damage in experimentally induced diabetes mellitus. The study utilized various assays, including NO (Nitric oxide), DPPH (2,2-diphenyl-1-picrylhydrazine), superoxide radical scavenging activity, ABTS [2,2′-azino bis-(3-ethylbenzothiazoline-6-sulfonic acid)] and H_2O_2 (Hydrogen peroxide) assay to estimate the *in-vitro* antioxidant potential of HELeKP. The results from this study indicate that HELeKP has a promising potential as an antioxidant & antidiabetic agent, making it a valuable therapeutic agent for treating diabetes mellitus and related conditions (Table 1).

Ethnomedicinal plants used to cure gastrointestinal (GI) problems

There are several medicinal plants which are used for multifaceted purposes such as food, medicine *etc*. The gastrointestinal tract plays a vital role in the human body but is susceptible to various diseases. Moreover, a study on ethnomedicinal evaluation of medicinal plants used against gastrointestinal diseases were reported by Tariq et al., 2015. They reported various medicinally important plant species which are used to cure digestive issues such as *Albizia lebbeck, Carum copticum, Mentha longifolia, Punica granatum* (cure diarrhoea), *Phyllanthus emblica, Acacia nilotica* (cure dysentry), *Citrullus colocynthis, Opuntia dillenii* (constipation), *Foeniculum vulgare, Coriandrum sativum, Anethum sowa, Withania coagulans* (abdominal pain), *Melia azedarach, Datura stramonium* (intestinal worms) *etc.* Natural remedies from medicinal plants can relieve from such conditions. The inhabitants of Kishtwar plateau, located in the Jammu and Kashmir region of India, have relied on the use of wild medicinal herbs found in the valleys and hill-tops of their region for treating gastrointestinal ailments. To identify the most effective medicinal plant species for treating GI disorders, a thorough study was conducted based on traditional

knowledge. The study revealed a total of 40 plant species from 27 families that can be used to treat various GI ailments. Among these species, *Mentha longifolia* was found to have the highest use value (UV) of 0.87, while *Carpesium abrotanoides* had a minimum UV of 0.03. The study highlights the potential of these traditional medicinal plants and their efficacy in treating various GI ailments viz., constipation, diarrhoea, abdominal ulcers, kill intestinal worms, indigestion, stomach ache, bowl movement, bile disorder, dysentery, acidity, dyspepsia, hemorrhoid *etc* providing a basis for the preparation of natural remedies. Several medicinal plants, including *Mentha longifolia, Elwendia persica, Plantago lanceolata, Artemisia maritima, Ziziphus jujuba, Bupleurum falcatum and Dioscorea deltoidea* have the highest fidelity levels and use values, making them more important in curing gastrointestinal disorders (Thakur et al., 2020).

Moreover, another study was conducted by Ganesh & Prasad (2022) and they reported a total of 22 plant species from 17 families that were locally used for treating various gastrointestinal disorders, including diarrhoea, dysentery, gastritis, food poisoning, ulcers, stomach aches, jaundice, kidney stones & vomiting. Out of these most commonly used medicinal plants were *Ardisia solanacea, Asparagus racemosus, Dendrophthoe falcata, Eclipta alba, Jatropha curcas and Thottea siliquosa* which have been used for generations to treat gastrointestinal problems due to their medicinal importance. The study also highlights the potential of natural remedies from medicinal plants in treating gastrointestinal disorders, offering a safe and effective alternative to conventional treatments.

Elmaghraby et al., 2023 carried out a study on the integrated traditional herbal medicine in the treatment of gastrointestinal disorders among the Eastern region Saudi population. The aim of this study was to evaluate the level of awareness within the Saudi population concerning the appropriate use and potential adverse effects of commonly utilized herbs for the management of gastrointestinal (GI) ailments such as diarrhoea, constipation, bowel syndrome, gastritis, inflammatory bowl disease and gastric ulcers. They also reported most commonly used herbal plants including chamomile (*Matricaria chamomilla* L.), mint (*Mentha piperita* L.), anise (*Pimpinella anisum* L.), parsley (*Petroselinum crispum* (Mill) Fuss), myrrh (*Commiphora myrrha* (Nees) Engl.), blackseed (*Nigella sativa* L.) which are used for the treatment of GI disorders (Table 1).

Ethnomedicinal plants used to cure viral infections

The rapid increase of COVID-19 has incited the research into Ayurvedic therapies and its beneficial effects. In particular, the phytoconstituents of Ashwagandha (*Withania somnifera* (L.) Dunal), Shatavari (*Asparagus racemosus* Willd.) and Guduchi (*Tinospora cordifolia* (Thunb.) Miers) plants were studied using pharmacology and are also used to determine their anti-SARS-CoV-2 potential. The study identified about 31 phytoconstituents, highlighting the potential of ayurvedic rasayana as an adjunct treatment for COVID-19 (Borse et al. 2021). In another study, research into dengue drugs focused on targeting DENV's NS2B-NS3pro enzyme was carried out. Moreover, bioflavonoids of *Azadirachta indica* such as kaempferol-3-O-rutinoside and rutin *etc*, are used for the treatment of dengue by inhibiting viral infection against DENV-2 (Dwivedi et al., 2021). Overall, the COVID-19 pandemic has posed a serious threat to world health.

Moreover, based on computational analysis, some of the natural compounds act as potential agents that show promising effects against SARS-CoV-2 virus, interaction with host receptors for instance, curcumin (from *Curcuma longa* L.) & catechin (from *Camellia sinensis* (L.) Kuntze) and also some of the natural compounds obtained from neem (*Azadirachta indica*) and tulsi (*Ocimum sanctum*) (Kumar, 2020; Jena et al., 2021). In addition to this an Ayurvedic herb i.e., Yashtimadhu (*Glycyrrhiza glabra* L.), was investigated for the prevention against COVID-19 via molecular docking. The study reported the efficacy of this herb through inhibiting SARS-CoV-2 key proteins and human receptors (Maurya, 2021) (Table 1).

Conclusion

The main focus of this systematic review is on the traditional medicinal practices followed by local populations in remote areas of North India. The review also compiles various prior scientific studies about the pharmacological properties of various medicinal plants and their bioactive elements. Understanding the traditional use of medicinal plants can lead to more effective application of herbal remedies in the future. Most of the recently studied plants have at least a few noteworthy medicinal properties that are consistent with most accepted theories. Drawing back at the historical use of plants for treating various ailments can also be useful in future medical research projects that might lead to significant breakthroughs. Additionally, studying traditional knowledge can help to preserve rapidly disappearing medicinal plants local information and their therapeutic

uses for future generations. On the basis of growing resistance of bacteria to standard treatments, the current role of plants in treating skin or wound infections, acute infections and viral diseases, including COVID-19, is becoming increasingly significant. Rather than isolating a single alkaloid from plants, using the plant as a whole, in its natural form, allows for the beneficial synergistic action of naturally occurring alkaloid groups, without the associated side effects. The effectiveness of plant extracts, like *Geranium nepalense* Sweet and *Viola biflora* L. have showed excellent results, both *in vitro* and *in vivo*, in the treatment of skin infections. Therefore, understanding the knowledge of medicinal plants, lays the foundation for pharmacological research.

List of abbreviations
COVID-19- Coronavirus disease
HCC- Hepatocellular carcinoma
NO- Nitric oxide
DPPH- 2,2-diphenyl-1-1 picrylhydrazine
ABTS- 2,2′-azino bis-(3-ethylbenzothiazoline-6-sulfonic acid
H_2O_2- Hydrogen peroxide
UV- Use Value
GI- Gastrointestinal
DENV- Dengue Virus
SARS-CoV-2- Severe Acute Respiratory Syndrome Coronavirus-2
SBE- *Selaginella bryopteris* Extract

Declarations
Funding: This research has not received any external funding
Conflicts of interest: In this article, the authors affirm that there are no conflicts of interest.
Competing interests: Not applicable
Availability of data and materials: Not applicable
Ethics approval and consent to participate: Not required for this study

Acknowledgement
The authors are very grateful to express gratitude to Vice Chancellor of Akal University, for providing the necessary facilities for finalizing this research work.

References
1. Aboufaras, M., Selmaoui, K., & Ouzennou, N. (2023). Efficacies and side effects of medicinal plants used by patients with cancer in Morocco: A retrospective treatment-outcome study. *Journal of Ethnopharmacology*, *301*, 115783.
2. Akbari, F., Mollaei, M., Argani, P., Daneshfard, B., & Derakhshan, A. R. (2024). *Spinacia Oleracea*: Exploring the therapeutic potential in persian medicine and modern pharmacology. *Current Drug Discovery Technologies*, *21*(6), 12-28.
3. Akshatha, S. J., Anusha, S. N., & Prasad, A. M. (2025). New insights on anti-colorectal cancer effects of plant-based bioactive compounds. In *Plant Derived Bioactive Compounds in Human Health and Disease*. CRC Press.
4. Altay, V., & Karahan, F. (2017). Medicinal plants used to sunstroke and sunburn treatment in anatolian traditional medicine. *Erzincan University Journal of Science and Technology*, *10*(1), 124-137.
5. Anshu, Rajesh Y., & Ram Prakash P. (2023). Floral diversity and ethnobotanical study at Jind (Haryana) of Northern India. *Annals of Biology, 39*(1), 98-101.
6. Berganayeva, G., Kudaibergenova, B., Litvinenko, Y., Nazarova, I., Sydykbayeva, S., Vassilina, G., Izdik, N., Dyusebaeva, M. (2023). Medicinal plants of the flora of kazakhstan used in the treatment of skin diseases. *Molecules*, *28*(10), 4192.
7. Bhatt, S., Kumar, A., Arunachalam, A., & Arunachalam, K. (2024). Ethnomedicinal diversity and traditional knowledge system of the jaunsari tribe in Uttarakhand, Western Himalaya. *Proceedings of the National Academy of Sciences, India Section B: Biological Sciences*, *94*(1), 177-192.

8. Bojjangada, A. G., & Prasad, A. G. D. (2021). Diversity of ethnomedicinal plants and their therapeutic uses in Western Ghats region of Kodagu district, Karnataka, India. *Environmental Sciences*, *9*(2), 209-224.
9. Borse, S., Joshi, M., Saggam, A., Bhat, V., Walia, S., Marathe, A., & Tillu, G. (2021). Ayurveda botanicals in COVID-19 management: An insilico multi-target approach. *Plos One*, *16*(6),1-29.
Chandra, S., Gahlot, M., Choudhary, A. N., Palai, S., de Almeida, R. S., de Vasconcelos, J. E. L., dos Santos, F. A. V., de Farias, P. A. M., & Coutinho, H. D. M. (2023). Scientific evidences of anticancer potential of medicinal plants. *Food Chemistry Advances*, *2*, 100239.
10. Chauhan, P., Nigam, A., & Santvan, V. K. (2020). Ethnobotanical uses of medicinal plants among the rural people of Pabbar valley in district Shimla, Himachal Pradesh, India. *Plant Archives*, *20*, 3707-37019.
11. Dey, P., Kumar, R., Yadav, K., Tripathi, S., & Agnihotri, P. (2023). Documentation of ethnomedicinal plants for the treatment of skin diseases from Pangi valley, Western Himalaya. *Plant Science Today*, *10*(2), 217-222.
12. Dwivedi, V. D., Bharadwaj, S., Afroz, S., Khan, N., Ansari, M. A., Yadava, U., Tripathi, R. C., Tripathi, I. P., Mishra, S. K., & Kang, S. G. (2021). Anti-dengue infectivity evaluation of bioflavonoid from *Azadirachta indica* by dengue virus serine protease inhibition. *Journal of Biomolecular Structure and Dynamics*, *39*(4), 1417-1430.
13. Elmaghraby, D. A., Alsalman, G. A., Alawadh, L. H., Al-Abdulqader, S. A., Alaithan, M. M., & Alnuwaysir, B. I. (2023). Integrated traditional herbal medicine in the treatment of gastrointestinal disorder: The pattern of use and the knowledge of safety among the Eastern region Saudi population. *BMC Complementary Medicine and Therapies*, *23*(1), 1-12.
14. Fu, X., Chen, S., Xian, S., Wu, Q., Shi, J., & Zhou, S. (2023). Dendrobium and its active ingredients: Emerging role in liver protection. *Biomedicine and Pharmacotherapy*, *157*, 114043.
15. Gautam, S., & Adhikari, B. S. (2023). Ethnobotanical documentation of Harike Wildlife Sanctuary (Ramsar site), Punjab: A case study. *Ethnobotany Research and Applications*, *25*, 1-25.
16. Gillessen, A., & Schmidt, H. H. J. (2020). Silymarin as supportive treatment in liver diseases: A narrative review. *Advances in Therapy*, *37*(4), 1279-1301.
17. Jacob, B., & Narendhirakannan, R. T. (2019). Role of medicinal plants in the management of diabetes mellitus: A review. *3 Biotech*, *9*, 1-17.
18. Jadhav, S. V., Mundada, P. S., Ahire, M. L., Patil, D. N., & Gurme, S. T. (2022). *Swertia chirata* (Chirata) and *Withania somnifera* (Ashwagandha). In *Herbs, Shrubs and Trees of Potential Medicinal Benefits*. CRC Press.
19. Jan, M., Mir, T. A., & Khare, R. K. (2022). Traditional use of medicinal plants among the indigenous communities in Baramulla district, Jammu and Kashmir, India. *Nordic Journal of Botany*, *2022*(6), e03387.
20. Jena, A. B., Kanungo, N., Nayak, V., Chainy, G. B. N., & Dandapat, J. (2021). Catechin and curcumin interact with S protein of SARS-cov2 and ACE2 of human cell membrane: insights from computational studies. *Scientific Reports*, *11*(1), 2043.
21. Kala, C. P. (2006). Medicinal plants of the high-altitude cold desert in India: Diversity, distribution and traditional uses. *International Journal of Biodiversity Science, Ecosystem Services and Management, 2,* 43-56.
22. Kalaivani, T., Kanagam, N., & Rajasekaran, C. (2025). Traditional and pharmacological values of *Oroxylum indicum*. In *Bioprospecting of Ethnomedicinal Plant Resources*. Apple Academic Press.
23. Kataria, N. (2017). An ethnobotanical study of medicinal plants in Jhajjar district of Haryana. *Bioinformatics and Biology Insights, 2*, 7-12.
24. Kaur, K., Kaur, A., & Thakur, S. (2020). Use of medicinal plants in traditional health care practices: A case study in Talwandi Sabo, Bathinda district, Punjab (India). *Current Botany*, *11*, 75-86.
25. Kiba, A., Saha, D., & Das, B. K. (2023). Exploration of the anti-diabetic potential of hydro-ethanolic leaf extract of *Koenigia polystachya* L.: An edible wild plant from Northeastern India. *Laboratory Animal Research*, *39*(1), 1-10.
26. Koti, M., & Kotresha, K. (2021). Medicinal plants of yadahalli Chinkara Wildlife Sanctuary, Bangalkot, Karnataka, India. *Gorteria*, *34*(4), 11-20.
27. Kumar, A. H. (2020). Molecular docking of natural compounds from tulsi (*Ocimum sanctum*) and neem (*Azadirachta indica*) against SARS-cov-2 protein targets. *Biology, Engineering, Medicine and Science Reports, 6*(1), 11-13.
28. Kumar, N., & Choyal, R. (2012). Traditional use of some plants of Hamirpur district of Himachal Pradesh for the treatment of jaundice, hepatitis and other liver disorders. *International Journal of Theoretical and Applied Sciences, 4,* 201-205.

29. Kumar, S., & Paul, R. (2009). Ethnomedicinal plants used for jaundice in Kangra district (Himachal Pradesh). *Jounal of Plant Development Sciences, 1,* 35-39.
30. Kumar, S., Raj, J., & Chand R. (2022). An ethnobotanical study of important medicinal plants in Hisar district of Haryana, India. *International Journal of Health Sciences*, *6*, 11195-11200.
31. Maurya, D. K. (2021). Evaluation of Yashtimadhu (*Glycyrrhiza glabra*) active phytochemicals against novel Coronavirus (SARS-cov-2). *Austin Journal of Pharmacology and Therapeutics, 9*(6), 1153.
32. Pal, L. C., Gautam, A., Pande, V., & Rao, C. V. (2022). Anticancer property of *Selaginella bryopteris* (L.) Bak. against hepatocellular carcinoma *in vitro* and *in vivo*. *Phytomedicine Plus*, *2*(1), 100201.
33. Petran, M., Dragos, D., & Gilca, M. (2020). Historical ethnobotanical review of medicinal plants used to treat children diseases in Romania (1860s–1970s). *Journal of Ethnobiology and Ethnomedicine*, *16*(1), 1-33.
34. Pillalamarri, M., Lolla, S., Mogili, K., Archana, O., Arkala, M., Bharathi, P. D., & Kothmiri, S. (2023). Evaluation of anti-diabetic activity by using traditional medicinal plants. *European Chemical Bulletin, 12*(5), 6400-6406.
35. Raghuvanshi, D., Dhalaria, R., Sharma, A., Kumar, D., Kumar, H., Valis, M., Kuca, K., Verma, R., & Puri, S. (2021). Ethnomedicinal plants traditionally used for the treatment of jaundice (icterus) in Himachal Pradesh in Western Himalaya- A review. *Plants*, *10*(2), 232.
36. Rani, J. (2019). Ethnobotanical survey and traditional uses of medicinal plants in Jind district of Haryana India. *Plant Archives*, *19*(1), 1241-1247.
37. Shah, R., & Peethambaran, B. (2018). Anti-inflammatory and anti-microbial properties of *Achillea millefolium* in acne treatment. In *Immunity and Inflammation in Health and Disease*. Academic Press.
38. Singh, K. N., & Lal, B. (2008). Ethnomedicines used against four common ailments by the tribal communities of Lahaul-Spiti in Western Himalaya. *Journal of Ethnopharmacology, 115,* 147-159.
39. Soni, D., & Grover, A. (2019). "Picrosides" from *Picrorhiza kurroa* as potential anti-carcinogenic agents. *Biomedicine and Pharmacotherapy*, *109*, 1680-1687.
40. Tariq, A., Mussarat, S., Adnan, M., Abd_Allah, E. F., Hashem, A., Alqarawi, A. A., & Ullah, R. (2015). Ethnomedicinal evaluation of medicinal plants used against gastrointestinal complaints. *BioMed Research International*, *2015*(1), 892947.
41. Thakur, S., Tashi, N., Singh, B., Dutt, H. C., & Singh, B. (2020). Ethnobotanical plants used for gastrointestinal ailments by the inhabitants of Kishtwar plateau in Northwestern Himalaya, India. *Indian Journal of Traditional Knowledge, 19*(2), 288-298.
42. Thirumal, S., & Balasubramanium, D. (2023). Phytoalexins: Defend systems of plants and pharmacological potential - An updated review. *International Journal of Engineering Technology and Management Studies, 7*(4), 319-326.
Tsioutsiou, E. E., Amountzias, V., Vontzalidou, A., Dina, E., Stevanović, Z. D., Cheilari, A., & Aligiannis, N. (2022). Medicinal plants used traditionally for skin related problems in the South Balkan and East Mediterranean region- A review. *Frontiers in Pharmacology*, *13*, 936047.
43. Yadav, S. S., Rao, A. S., Sheoran, A., Singh, N., Nandal, A., Bhandoria, M. S., Ganaie, S. A., & Bansal, P. (2021). An ethnomedicinal survey of traditionally used medicinal plants from Charkhi Dadri district, Haryana: An attempt towards documentation and preservation of ethnic knowledge. *Indian Journal of Traditional Knowledge*, *20*(2), 436-450.

Table 1. Different medicinal plants used to treat various ailments

Botanical Name	Different Biological terms	Ailment Category	Reference
***Dendrobium nobile* Lindl.**	Liver tumors, hepatitis, gall stones, cholecystitis, lipid metabolism	**COMMON DISEASES**	Fu et al., 2023
***Dendrobium huoshanense* Z.Z. Tang & S.J. Cheng**			
***Dendrobium chrysotoxum* Lindl.**			
***Dendrobium fimbriatum* Hook.**			
***Dendrobium officinale* Kimura & Migo**			
***Silybum marianum* (L.) Gaertn.**	Diabetes, cirrhosis, liver health, blood glucose level		Gillessen & Schmidt, 2020

***Capsicum annuum* L.**	Lung cancer, brain damage, diabetes, inflammation, heart-related issues		Thirumal & Balasubramanium, 2023
***Cicer arietinum* L.**			
***Pistacia vera* L.**			
***Arachis hypogea* L.**			
***Malus domestica* (Suckow) Borkh.**			
***Brassica oleracea var. botrytis* L.**			
***Vitis vinifera* L.**			
***Juglans regia* L.**			
***Prunus amygdalus* Batsch**			
***Oroxylum indicum* (L.) Vent.**	Throat infection, piles, abdominal pain, ulcer, bronchitis		Kalaivani et al., 2024
***Spinacia oleracea* L.**	Antioxidant, laxative, diuretic, antipyretic, carminative, inflammatory properties, asthma, sore throat, vomiting, joint pain, jaundice		Akbari et al., 2024
***Withania somnifera* (L.) Dunal**	Asthma, malaria, chronic fever, increase energy, stimulate health		Jadhav et al., 2022
***Swertia chirata* L.**			
***Aconitum rotundifolium* Kar. & Kir.**	Jaundice		Kala, 2006; Singh & Lal, 2008; Kumar & Paul, 2009; Kumar & Choyal, 2012; Raghuvanshi et al., 2021
***Emblica officinalis* L.**			
***Terminalia chebula* Retz.**			
***Adiantum capillus* L.**			
***Aegle marmelos* (L.) Correa**			
***Aloe vera* (L.) Burm.f.**			
***Argemone mexicana* L.**			
***Bauhinia variegata* (L.) Benth.**			
***Ajania tibetica* (Hook.f. & Thomson ex C.B.Clarke) Tzvelev**			
***Juglans regia* L.**	Sunstroke, sunburn, phytoallergy, dermatitis, skin cancer	**SKIN RELATED ISSUES**	Altay & Karahan, 2017
***Teucrium polium* L.**			
***Arctium minus* (Hill) Bernh.**			
***Cornus mas* L.**			
***Plantago major* L.**	Wounds, boils, burn, haemorrhoids, abscesses, furuncles		Tsioutsiou et al., 2022
***Hypericum perforatum* L.**			
***Sambucus nigra* L.**			
***Ficus carica* L.**			
***Mattricaria chamomilla* L.**			
***Urtica dioica* L.**			
Aesculus indica (Wall. ex Cambess.) Hook	Wounds, boils, cuts, burns, itching, pimples, skin eruption, leukoderma, eczema, pus removal, injuries, skin pigmentation		Dey et al., 2023
***Arctium lappa* L.**			
***Berberis aristata* DC.**			
***Caltha palustris* L.**			
***Bergenia ciliata* (Haw.) Sternb.**			
***Geranium nepalense* Sweet**			
***Viola biflora* L.**			
***Achillea millefolium* L.**	Acne, eczema, neurodermatitis, urticaria, promotes scarring, soften the skin		Shah & Peethambaran, 2018
***Cinchorium intybus* L.**	Swelling, redness, skin itching, wound-healing, antioxidant & astringent properties		Berganayeva et al., 2023
***Acorus calamus* L.**			
***Agropyron millefolium* L.**			

***Artemisia absinthium* L.**			
***Capsella bursa-pastoris* (L.) Medik.**			
***Equisetum arvense* L.**			
***Glycyrrhiza glabra* L.**			
***Juglens regia* L.**			
***Selaginella bryopteris* (L.) Baker**	Liver cancer	**CANCER**	Pal et al., 2022
***Picrorhiza kurroa* Royle ex Benth.**	Cancer		Soni & Grover, 2019
***Curcuma longa* L.**	Anticancerous property		Aboufaras et al., 2023
***Prunus armeniaca* L.**			
***Ajuga parviflora* Benth.**	Human chronic myelogenous leukaemia		Chandra et al., 2023
***Aloe vera* (L.) Burm.f.**	Breast cancer		
***Artemisia herba-alba* Asso**	Brain tumors		
***Taxus baccata* L.**	Gastric and pancreatic cancer		
***Tinospora cordifolia* (Thunb.) Miers**	Breast, brain and vaginal cancer		
***Vitis vinifera* L.**	Colorectal cancer		Akshatha et al., 2025
***Glycine max* (L.) Merr.**			
***Camellia sinensis* (L.) Kuntze**			
***Allium sativum* L.**			
***Olea europaea* L.**			
***Punica granatum* L.**			
Allium cepa L.	Anti-diabetic property	**DIABETES**	Pillalamarri et al., 2023
Momordica charantia L.			
Aloe vera (L.) Burm.f.			
Ocimum tenuiflorum L.			
Panax ginseng C.A.Mey.			
Cinnamomun verum J.Presl			
Psidium guajava L.			
Brassica juncea (L.) Czern.			
Capsicum annuum L.			
Aegle marmelos (L.) Correa	Manage diabetes mellitus		Jacob & Narendhirakannan, 2019
Coriandrum sativum L.			
Zingiber officinale Roscoe			
Syzygium cumini (L.) Skeels.			
Murraya koenigii (L.) Spreng.			
Phyllanthus emblica L.			
Cinnamomum verum J.Presl			
Momordica charantia L.			
Ocimum tenuiflorum L.			
Allium sativum L.			
Koenigia polystachya (Wall. ex Meisn.) T.M.Schust. & Reveal	Cure diabetes		Kiba et al., 2023
Albizia lebbeck (L.) Benth.	Diarrhoea	**GASTROINTESTINAL ISSUES**	Tariq et al., 2015
Carum copticum L.			
Mentha longifolia (L.) Huds.			
Punica granatum L.			
Phyllanthus emblica L.	Dysentry		
Acacia nilotica (L.) Willd. ex Delile			
Citrullus colocynthis (L.) Schrad.	Constipation		

Opuntia dillenii **(Ker Gawl.) Haw.**			
Foeniculum vulgare **Mill.**	Abdominal pain		
Coriandrum sativum **L.**			
Anethum sowa **L.**			
Withania coagulans **(Stocks) Dunal**			
Melia azedarach **L.**	Intestinal worms		
Datura stramonium **L.**			
Mentha longifolia **(L.) Huds.**	Constipation, diarrhoea, abdominal ulcers, kill intestinal worms, indigestion, stomach ache, bowl movement, bile diorder, dysentry, acidity, dyspepsia, hemorrhoid		Thakur et al., 2020
Elwendia persica **(Boiss.) Pimenov & Kljuykov**			
Plantago lanceolata **L.**			
Artemisia maritima **L.**			
Ziziphus jujuba **Mill.**			
Bupleurum falcatum **L.**			
Dioscorea deltoidea **Wall. ex Griseb.**			
Ardisia solanacea **Roxb.**	Diarrhoea, dysentery, gastritis, food poisoning, ulcers, stomach aches, jaundice, kidney stones, vomiting		Ganesh & Prasad, 2022
Asparagus racemosus **Willd.**			
Dendrophthoe falcata **(L.f.) Ettingsh**			
Eclipta alba **(L.) L.**			
Jatropha curcas **L.**			
Thottea siliquosa **(Lam.) Ding Hou**			
Matricaria chamomilla **L.**	Diarrhoea, constipation, bowel syndrome, gastritis, inflammatory bowl disease, gastric ulcers		Elmaghraby et al., 2023
Mentha piperita **L.**			
Pimpinella anisum **L.**			
Petroselinum crispum **(Mill) Fuss**			
Commiphora myrrha **(Nees) Engl.**			
Nigella sativa **L.**			
Withania somnifera **(L.) Dunal**	Treat COVID-19 and determine anti-SARS-CoV-2 potential	**VIRAL INFECTIONS**	Borse et al., 2021
Tinospora cordifolia **(Thunb.) Miers**			
Asparagus racemosus **Willd.**			
Azadirachta indica **A. Juss.**	Treat dengue by inhibiting viral infection against DENV-2		Dwivedi et al., 2021
Curcuma longa **L.**	Effective against SARS-CoV-2 virus interaction		Jena et al., 2021
Camellia sinensis **(L.) Kuntze**			
Azadirachta indica **A. Juss.**			Kumar, 2020
Ocimum sanctum **Linn**			
Glycyrrhiza glabra **L.**	Treat COVID-19 and inhibit SARS-CoV-2 key proteins		Maurya, 2021