

CHAPTER 8

Nature's shield against Parkinson's diseases

Gireesh Tripathi¹, Sethu R², Nibedita Jena³, Ramandeep Kaur⁴, Sugimani Marndi³ and Bhagwati Prashad Sharma^{5*}

¹Department of Pharmacy, Shri Krishna University, Village Chowka Sagar Road, Chhatarpur, Madhya Pradesh, India

²Department of Dravyaguna Vijnana, Ahalia Ayurveda Medical College, Palakkad, Kerala, India

³Ambika Prasad Research Foundation, Odisha, India

⁴Department of Biology (Science), Shri Guru Harkrishan Public Senior Secondary School, CKD Branch, Ajnala, Punjab, India

⁵Department of Botany, Sidharth Government College, Nadaun, Himachal Pradesh, India

*Email-Id: bp76sharma@gmail.com



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Abstract

Present study explored nature's potential in supporting Parkinson's disease management through a diverse range of medicinal plants traditionally valued for their neuroprotective properties. Drawing from ethnobotanical and contemporary scientific literature, the compiled data highlighted key species, such as *Withania somnifera* (Ashwagandha), *Bacopa monnieri* (Brahmi), *Curcuma longa* (Haldi) and *Mucuna pruriens* (Baidanka), their common uses and traditional modes of administration. By integrating herbal knowledge across cultures, current work provided a foundational guide to botanical resources that may offer complementary support in Parkinson's care, emphasizing their historical relevance and documented therapeutic promise which can be further validated by utilizing several advanced biotechnological approaches into novel healthcare formulations.

Keywords: Contemporary, ethnobotanical, neuroprotective, therapeutic promise

Introduction

Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized primarily by motor dysfunctions such as tremors, rigidity and bradykinesia, along with a wide range of non-motor symptoms that significantly impact quality of life (Williams's-Gray and Worth, 2020; Radad *et al.*, 2023). As one of the most common movement disorders worldwide, its rising prevalence has intensified the search for therapeutic strategies that not only alleviate symptoms but also address underlying neurobiological processes (Sarkar *et al.*, 2016; Luo *et al.*, 2025). While modern pharmacological treatments offer important benefits, they often come with limitations including reduced efficacy over time and potential side effects prompting growing interest in complementary approaches (Deuel and Seeberger, 2020; Gupta, 2023). Across many cultures, medicinal plants have long been used to support neurological health, with traditional systems of medicine documenting a rich variety of botanicals believed to possess antioxidative, anti-inflammatory, neuroprotective or dopaminergic properties. Recent scientific studies have begun to investigate these plants in greater depth, revealing bioactive compounds with potential relevance to PD pathways. This intersection of ancient knowledge and modern research provides a promising landscape for exploring how natural resources may contribute to holistic management strategies. The present study introduces a selection of medicinal plants historically associated with neurological well-being and examines their traditional modes of preparation and use. By presenting botanical descriptions alongside cultural context and cited literature, the chapter offers an accessible guide for understanding nature's potential role as a supportive shield against Parkinson's disease. While not a replacement for medical treatment, these plants represent valuable components of the broader dialogue on integrative approaches to neurological health.

Methodology

A comprehensive survey of existing literature and databases, including PubMed and Scopus, was conducted to investigate the ethnomedicinal plants traditionally employed by the local community for Parkinson's diseases, utilizing keywords related to their pharmacological potential and herbal remedies, while identifying plant species according to relevant floral references (Hajhashemy *et al.*, 2025; Kumar, 2025).

Results and discussion

Present survey of medicinal plants traditionally associated with neurological health revealed a diverse collection of species spanning multiple botanical families, cultural systems of medicine and modes of preparation. A total of seventeen plants were compiled, each historically recognized for contributions to general well-being and supported by varying degrees of contemporary scientific interest (Table 1; Figures 1 & 2). Their traditional formulations ranged from decoctions, powders and infusions to raw or minimally processed plant parts, illustrating the breadth of ethnomedicinal practices employed across different regions. A prominent pattern observed in the results is the wide representation of species known for their long-standing cultural importance. Plants such as *Withania somnifera* (Ashwagandha), *Bacopa monnieri*, *Curcuma longa* and *Mucuna pruriens* hold established positions in traditional healing systems, particularly Ayurveda and other Asian medicinal

traditions. Their modes of administration commonly powders mixed with milk, decoctions or herbal tonics reflect preparation techniques designed to enhance absorption or preserve bioactive constituents, as noted historically.

Table 1: List of medicinal plants used against Parkinson's disease

Botanical name	Common name	Family	Mode of administration	Sources
<i>Asparagus racemosus</i> Willd.	Shatavari (S)	Asparagaceae	The fresh juice of the root is consumed typically in a dose of 10-20 ml.	Banjari <i>et al.</i> , (2018)
<i>Atropa belladonna</i> L.	Deadly nightshade (E)	Solanaceae	Oral administration of tincture, or a powder prepared from the leaves or roots.	Kempster and Ma, (2022)
<i>Bacopa monnieri</i> (L.) Wettst.	Brahmi (S)	Plantaginaceae	Administered orally, often in the form of a powder or syrup and historically it was consumed with ghee to enhance its absorption.	Srivastav <i>et al.</i> , (2017)
<i>Camellia sinensis</i> (L.) Kuntze	Tea tree (E)	Theaceae	Administered as a tea infusion made from its dried leaves and consumed.	Srivastav <i>et al.</i> , (2017)
<i>Crocus sativus</i> L.	Saffron (E)	Iridaceae	Saffron stigmas are often incorporated into the diet as a spice or brewed as a	Hajhashem y <i>et al.</i> , (2025)

			tea for oral consumption.	
<i>Curcuma longa</i> L.	Turmeric (E)	Zingiberaceae	Prepared a turmeric tea by mixing the powder or grated fresh root with hot water or milk often with a pinch of black pepper to aid absorption is consumed orally.	Patel <i>et al.</i> , (2022)
<i>Gastrodia elata</i> Blume	Potato orchid (E)	Orchidaceae	The raw or dried tubers are boiled in water, then the liquid is consumed, typically 300-400 ml twice daily.	Haxhiu <i>et al.</i> , (2025)
<i>Ginkgo biloba</i> L.	Silver apricot (E)	Ginkgoaceae	Oral consumption of tonic.	Mohebbi <i>et al.</i> , (2023)
<i>Hyoscyamus niger</i> L.	Stinking nightshade (E)	Solanaceae	The seeds or dried leaves are ground into a powder, which is then administered orally.	Banjari <i>et al.</i> , (2018)
<i>Lepidium meyenii</i> Walp.	Maca (E)	Brassicaceae	The hypocotyl root is consumed after being dried and then processed, often by boiling in water to make a juice.	Banjari <i>et al.</i> , (2018)
<i>Mucuna pruriens</i> (L.) DC.	Velvet bean (E)	Fabaceae	Administered orally as a powder made from its seeds,	Khazdair <i>et al.</i> , (2021)

			which is mixed with water or milk, then consumed as a beverage.	
<i>Nigella sativa</i> L.	Black cumin (E)	Ranunculaceae	Whole seeds and oil are orally administered.	Khazdair <i>et al.</i> , (2021)
<i>Pueraria montana</i> var. <i>lobata</i> (Willd.) Maesen & S.M. Almeida ex Sanjappa & Predeep	Japanese arrowroot (E)	Fabaceae	Administered orally as a decoction or powder of root.	Haxhiu <i>et al.</i> , (2025)
<i>Reynoutria compacta</i> (Hook.f.) Nakai	Asiatic knotweed (E)	Polygonaceae	The rhizome and dried roots are used to make a decoction for oral consumption.	Wang <i>et al.</i> , (2011)
<i>Scutellaria baicalensis</i> Georgi	Chinese skullcap (E)	Lamiaceae	The dried roots decoction is administered orally.	Li <i>et al.</i> , (2016)
<i>Vicia faba</i> L.	Broad bean (E)	Fabaceae	Consumed the beans after boiling or cooking.	Ruhela <i>et al.</i> , (2025)
<i>Withania somnifera</i> (L.) Dunal	Ashwagandha (H)	Solanaceae	Administered orally in the form of a finely sieved root powder, often mixed with ghee, milk, water or honey.	Rajasankar <i>et al.</i> , (2009)

(E: English; H: Hindi)

Another notable trend is the inclusion of species from diverse ecological regions such as *Ginkgo biloba*, *Gastrodia elata* and *Reynoutria compacta* underscoring that botanical knowledge relevant to neurological wellness is not confined to a single culture. Although these plants emerge from unique traditions ranging from Traditional Chinese Medicine to European herbalism, the convergence of interest in their potential roles in neuroprotection highlighted the global nature of herbal knowledge. Moreover, many of these plants are

recognized for their rich phytochemical profiles, which have drawn increasing attention in modern studies exploring antioxidant, anti-inflammatory or neuromodulatory properties. The results emphasized the richness of ethnobotanical traditions and the broad interest in plants associated with neurological support. While historical uses do not substitute for clinical validation, they serve as an important foundation for ongoing scientific investigation.

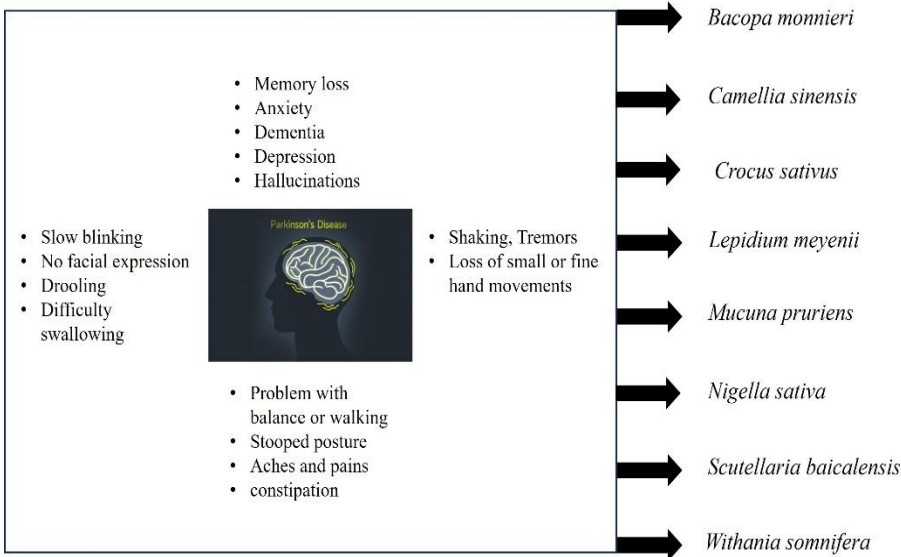


Figure 1: Some common medicinal plants effective against Parkinson's disease

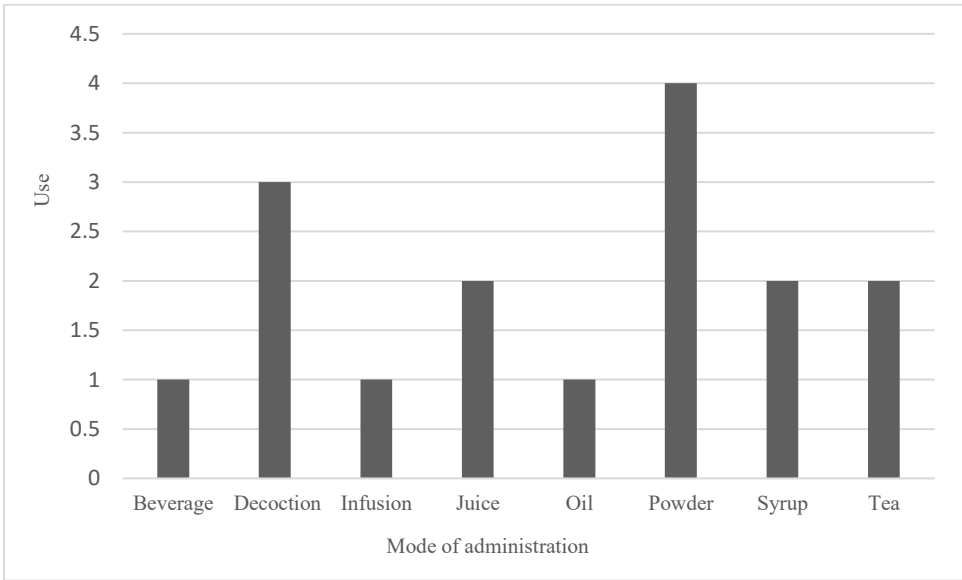


Figure 2: Medicinal plants used in different forms

Biotechnological approaches

Biotechnological strategies offer innovative avenues for Parkinson's disease management by targeting neurodegeneration therapies including, stem cell therapy, gene therapy, CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats)/Cas9 and genome editing, neuroprotective biologics. These approaches can offer potential for disease-modifying interventions and personalized PD management.

Conclusion

The present study of medicinal plants traditionally associated with neurological health revealed a rich and culturally diverse foundation of knowledge that continues to inspire contemporary scientific interest. The recent study on modes of administration and traditional practices offered better knowledge into the ways in which cultural practices have shaped the understanding of botanical remedies. As modern research continues to explore their phytochemical properties and potential roles in neurological support, these plants stand as meaningful bridges between ancestral wisdom and emerging scientific inquiry for sustainable health well-being.

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