

# Traditional Treatment of Parkinson's: Medicinal Plants Effective for Parkinson's in Traditional Iranian Medicine

Surena Nazarbaghi<sup>1</sup> , Pouya Parsaei<sup>2</sup>  

<sup>1</sup>Department of Neurology, School of Medicine, Urmia University of Medical Sciences, Urmia, Iran

<sup>2</sup>Department of Food Hygiene, Shahrekord Branch, Islamic Azad University, Shahrekord, Iran. Email: [Pouyaparsaei@yahoo.com](mailto:Pouyaparsaei@yahoo.com)

| Article Info  | ABSTRACT  |
|---|---|
| <b>Article type:</b><br>Review Article  | <b>Objective:</b> Parkinson's disease (PD) is a chronic, progressive neurological disorder characterized by the degeneration of dopaminergic neurons in the substantia nigra, a region of the brain responsible for motor control. Following Alzheimer's disease, Parkinson's is the second most prevalent neurodegenerative disorder. Despite the availability of various pharmacological treatments, these medications often exhibit side effects and may have varying efficacy and duration of action. To address the limitations of conventional therapies, this review aims to identify the most promising medicinal plants traditionally employed in the management of Parkinson's disease.   |
| <b>Article History:</b><br>Received: 2024/04/11<br>Revised: 2024/07/31<br>Accepted: 2024/11/31<br>Published Online: 2024/12/30  | <b>Methods:</b> This review employed a comprehensive search strategy to identify relevant literature on the use of medicinal plants for Parkinson's disease. Authoritative scientific databases, including Web of Science, PubMed, Scopus, and Google Scholar, were systematically searched using the following keywords: 'medicinal plants,' 'traditional medicine,' 'Parkinson's,' and 'neurology.' Irrelevant articles were excluded from the review process.  |
|  <b>Correspondence to:</b><br>Pouya Parsaei  | <b>Results:</b> Traditional Iranian medicine incorporates a diverse array of medicinal plants for the management of Parkinson's disease. Notable examples include <i>Nigella sativa</i> (black cumin), <i>Boswellia serrata</i> (frankincense), <i>Thymus vulgaris</i> (thyme), <i>Hypericum perforatum</i> (St. John's wort), <i>Zingiber officinale</i> (ginger), <i>Heracleum persicum</i> (Persian hogweed), <i>Curcuma longa</i> (turmeric), <i>Cinnamomum verum</i> (cinnamon), <i>Olea europaea</i> (olive), <i>Camellia sinensis</i> (tea), <i>Prunus domestica</i> (plum), <i>Ficus carica</i> (fig), <i>Echium amoenum</i> (Iranian borage), <i>Prunus dulcis</i> (almond), <i>Lavandula angustifolia</i> (lavender), and various <i>Scutellaria</i> species. |
| <b>Email:</b><br><a href="mailto:Pouyaparsaei@yahoo.com">Pouyaparsaei@yahoo.com</a>   | <b>Conclusion:</b> While medicinal plants may offer potential benefits as adjunctive therapies for Parkinson's disease, further research is warranted to establish their efficacy and safety. Current studies on these plants are limited in scope, and additional evidence is required to draw definitive conclusions regarding their role in the management of Parkinson's.   |
|   | <b>Keywords:</b> Neurology, Parkinson's, Medicinal Plants, Traditional Treatment, Iran  |
| <b>➤ How to cite this paper</b><br>Nazarbaghi S, Parsaei P. Traditional Treatment of Parkinson's: Medicinal Plants Effective for Parkinson's in Traditional Iranian Medicine. Plant Biotechnology Persa. 2025; 7(1): 76-82. DOI: 10.61186/pbp.7.1.4 |   |

## Introduction

Parkinson's disease (PD) is a chronic, progressive neurological disorder characterized by the degeneration of dopaminergic neurons in the substantia nigra, a brain region crucial for motor control [1]. These neurons produce dopamine, a neurotransmitter essential for planning and executing voluntary

movements [2]. For reasons not fully understood, dopaminergic neurons in the substantia nigra gradually degenerate in individuals with PD. When approximately 80% of dopamine-producing neurons are lost, PD symptoms become evident [3]. The depletion of dopamine results in a range of motor symptoms, including tremor, bradykinesia, rigidity, and

postural instability [3]. Additional symptoms may encompass a reduction in facial expressions, decreased blinking, impaired fine motor skills (e.g., tying shoelaces, buttoning shirts), micrographia, balance and postural difficulties, increased risk of falls, slow and monotonous speech, dysphagia, drooling, fatigue, and foot pain [3].

A definitive diagnosis of Parkinson's disease (PD) is typically based on a comprehensive assessment of clinical features. While there is no single definitive test, the diagnosis is primarily made based on the presence of cardinal Parkinsonian symptoms [4]. In addition to pharmacological interventions, a multidisciplinary approach to managing PD is often recommended, incorporating physiotherapy, occupational therapy, and speech therapy to address motor symptoms, gait disturbances, speech difficulties, muscle rigidity, and cognitive function. Lifestyle modifications, including a healthy diet and regular exercise, can also play a supportive role [5]. Pharmacological interventions for PD primarily focus on increasing dopamine levels in the brain or targeting other neurotransmitters involved in the disease. Levodopa, a precursor to dopamine, is considered the most effective medication for PD. However, prolonged use of Levodopa may lead to motor complications, such as dyskinesia, limiting its early use [6].

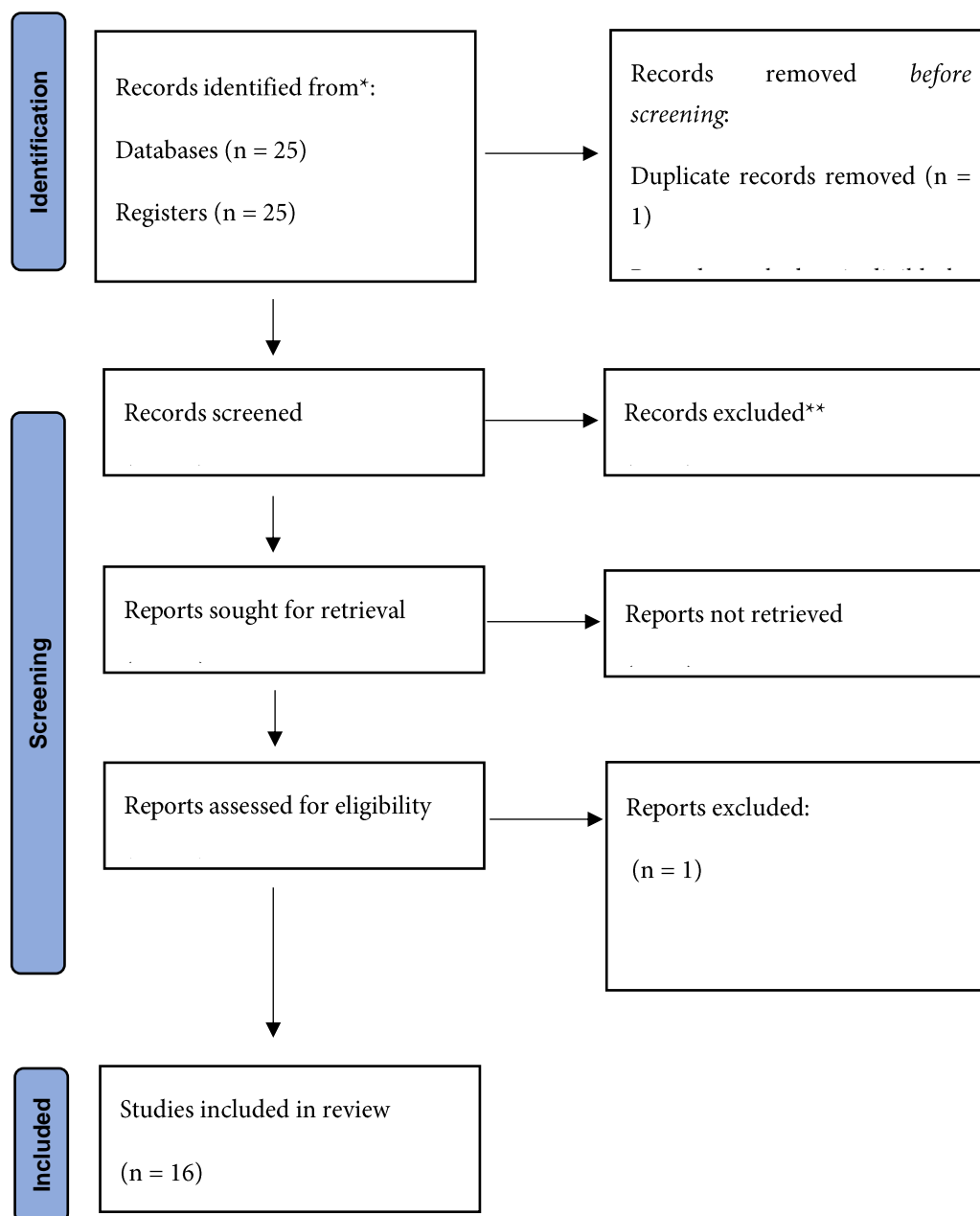
Medicinal plants have historically played a significant role in the management of Parkinson's disease within the framework of traditional medicine. These plants contain bioactive compounds, including antioxidants, flavonoids, and alkaloids, which may offer neuroprotective effects by mitigating oxidative stress, a critical factor in the progression of Parkinson's disease. The antioxidant and anti-inflammatory properties of medicinal plants may contribute to alleviating the symptoms of Parkinson's disease [7]. Additionally, these plants have been demonstrated to exert positive effects on the central nervous system [8]. Therefore, the integration of medicinal plants as a complementary approach to Parkinson's disease management may offer a natural and effective strategy for mitigating the symptoms of this condition.

## Methods

This systematic review employed a comprehensive search strategy to identify relevant literature on the use of medicinal

plants for Parkinson's disease. Authoritative scientific databases, including Web of Science, PubMed, Scopus, and Google Scholar, were systematically searched using the following keywords: 'medicinal plants,' 'traditional medicine,' 'Parkinson's,' 'neurology,' 'herbal extracts,' and 'neurodegenerative.' Both Persian and English language searches were conducted to ensure comprehensive coverage.

Following the initial search, a preliminary screening process was implemented to exclude articles that were clearly irrelevant to the study topic or did not meet the inclusion criteria. These criteria included the requirement for articles to focus on the use of medicinal plants for Parkinson's disease and to provide sufficient data for analysis. The remaining articles underwent a more detailed review, and those that met the inclusion criteria were thoroughly analyzed to inform the development of this review article (Figure 1).



**Figure 1.** Flowchart of Search Strategy

## Results

This review identified a range of medicinal plants traditionally employed in Iranian medicine for the management of Parkinson's disease. Notable examples include *Nigella sativa* (black cumin), *Boswellia serrata* (frankincense), *Thymus vulgaris* (thyme), *Hypericum perforatum* (St. John's wort), *Zingiber officinale* (ginger), *Heracleum persicum* (Persian hogweed), *Curcuma longa* (turmeric), *Cinnamomum verum* (cinnamon), *Olea europaea* (olive), *Camellia sinensis* (tea),

*Prunus domestica* (plum), *Ficus carica* (fig), *Echium amoenum* (Iranian borage), *Prunus dulcis* (almond), *Lavandula angustifolia* (lavender), and various *Scutellaria* species. Table 1 provides a comprehensive overview of these medicinal plants and their potential applications in the management of Parkinson's disease.

**Table 1.** Medicinal Plants Effective Against Parkinson's Disease in Traditional Iranian Medicine.

| Persian name   | Scientific name               | Herbal family | English name        | Bioactive compounds             | Ref. |
|----------------|-------------------------------|---------------|---------------------|---------------------------------|------|
| Siahdaneh      | <i>Nigella sativa</i>         | Ranunculaceae | Black Cumin         | Thymoquinone, nigelidine        | [9]  |
| Kondor         | <i>Boswellia serrata</i>      | Burseraceae   | Indian Frankincense | Bosolic acid, beta-bosolic acid | [10] |
| Avishan        | <i>Thymus vulgaris</i>        | Lamiaceae     | Thyme               | Thymol, Carvacrol               | [11] |
| Gole raei      | <i>Hypericum perforatum</i>   | Hypericaceae  | St. John's Wort     | Hyperforin, hypericin           | [12] |
| Zangabil       | <i>Zingiber officinale</i>    | Zingiberaceae | Ginger              | Gingerol, Shugaol               | [13] |
| Golpar         | <i>Heracleum persicum</i>     | Apiaceae      | Persian Hogweed     | Coumarins, flavonoids           | [14] |
| Zardchobeh     | <i>Curcuma longa</i>          | Zingiberaceae | Turmeric            | Curcumin, Demotoxic Curcumin    | [15] |
| Darchin        | <i>Cinnamomum verum</i>       | Lauraceae     | Cinnamon            | Cinnamaldehyde, epicatechin     | [16] |
| Zeytoun        | <i>Olea europaea</i>          | Oleaceae      | Olive               | Oleuropein, hydroxytyrosol      | [17] |
| Chay           | <i>Camellia sinensis</i>      | Theaceae      | Tea                 | Catechins, L-theanine           | [18] |
| Alou           | <i>Prunus domestica</i>       | Rosaceae      | Plum                | Anthocyanins, phenolic acids    | [19] |
| Anjir          | <i>Ficus carica</i>           | Moraceae      | Fig                 | Flavonoids, phenolic acids      | [20] |
| Gavzaban       | <i>Echium amoenum</i>         | Boraginaceae  | Echium              | Pyridine alkaloids, flavonoids  | [21] |
| Badan derakhti | <i>Prunus dulcis</i>          | Rosaceae      | Almond              | Vitamin E, phenolic acids       | [22] |
| Ostokhodous    | <i>Lavandula angustifolia</i> | Lamiaceae     | Lavender            | Linalool, linalyl acetate       | [23] |

|             |                                |           |                 |                   |      |
|-------------|--------------------------------|-----------|-----------------|-------------------|------|
| Scutellaria | <i>Scutellaria baicalensis</i> | Lamiaceae | Baikal Skullcap | Baikalin, Bakalin | [24] |
|-------------|--------------------------------|-----------|-----------------|-------------------|------|

## Discussion

Currently, there is no definitive cure for Parkinson's disease, and treatment primarily focuses on managing symptoms and improving quality of life. A multi-faceted approach, including medication, dietary modifications, and lifestyle changes, is often recommended. While there is no definitive cure, various treatments, such as pharmacological interventions, surgical procedures, and complementary therapies, can provide relief from Parkinson's symptoms [25]. The therapeutic potential of medicinal plants for Parkinson's disease has been explored to a limited extent, primarily within the context of Ayurveda, an ancient Indian medical system. While medicinal plants may not offer a definitive cure, they may contribute to alleviating secondary symptoms, such as dementia and cognitive impairment, and promoting overall well-being [26].

The bioactive compounds present in these medicinal plants may exert neuroprotective effects by inhibiting microglial activation and reducing inflammation associated with dopaminergic neuron degeneration. These compounds may also exert anti-Parkinsonian effects through the inhibition of pro-inflammatory factors or the generation of dismutases. Herbal extracts can be formulated as single or multi-herb preparations for the potential treatment of Parkinson's disease [26].

The anti-Parkinsonian effects of medicinal plants are mediated by their bioactive compounds, including antioxidants, flavonoids, alkaloids, and terpenes [27]. These compounds exert their effects through diverse mechanisms, with a primary focus on reducing oxidative stress and protecting dopaminergic neurons from free radical damage, a key factor in Parkinson's disease progression [27]. Additionally, the anti-inflammatory properties of certain medicinal plants may contribute to mitigating neuroinflammation and preventing neuronal death [28]. Furthermore, some plants may improve motor function in Parkinson's patients by increasing dopamine levels or modulating the GABAergic or cholinergic systems [29]. Collectively, these mechanisms enable medicinal plants to alleviate symptoms and potentially delay the progression of Parkinson's disease.

## Conclusion

Medicinal plants with therapeutic properties may offer a promising complementary approach to the management of Parkinson's disease. These plants can potentially mitigate symptoms and improve patient outcomes through various mechanisms, including the reduction of oxidative stress, inhibition of neuroinflammation, augmentation of dopamine levels, and enhancement of central nervous system function. While preliminary evidence suggests the potential benefits of these plants in controlling and treating Parkinson's symptoms, further rigorous clinical research is warranted. Larger-scale studies with well-designed methodologies are necessary to confirm the efficacy and safety of these herbal treatments. Until more definitive scientific evidence is available, the use of medicinal plants for Parkinson's disease should be approached with caution and under the guidance of healthcare professionals to minimize the risk of interactions with conventional medications and potential adverse effects.

## Statements and Declarations

### Funding support

The authors did not receive support from any organization for the submitted work

### Competing interests

The authors have no competing interests to declare that are relevant to the content of this article.

### Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki.

### Consent to participate

Informed consent was obtained from all individual participants included in the study.

### Author contributions



SN: Conceptualization, the original draft writing, investigation, writing including reviewing and editing and investigation and formal analysis; PP: Conceptualization, supervision, and project administration; PP and SN Conceptualization, the original draft writing, investigation, writing including reviewing and editing

## Acknowledgments

The authors would like to express their gratitude to the clinical research development unit of Imam Khomeini Hospital, Urmia University of Medical Sciences, for English editing.

## References

1. Radhakrishnan DM, Goyal V. Parkinson's disease: A review. *Neurology India*. 2018 Mar 1;66(Suppl 1)
2. . DOI: 10.4103/0028-3886.223610.
3. Kalia LV, Lang AE. Parkinson's disease. *The Lancet*. 2015 Aug 29;386(9996):896-912. DOI: 10.1016/S0140-6736(14)61393-3.
4. Davie CA. A review of Parkinson's disease. *British Medical Bulletin*. 2008 Jun 1;86(1):109-27. DOI: 10.1093/bmb/ldn013.
5. Dauer W, Przedborski S. Parkinson's disease: mechanisms and models. *Neuron*. 2003 Sep 11;39(6):889-909. DOI: 10.1016/S0896-6273(03)00568-3.
6. Rao SS, Hofmann LA, Shakil A. Parkinson's disease: diagnosis and treatment. *American Family Physician*. 2006 Dec 15;74(12):2046-54. DOI: 10.1016/j.jpsychores.2004.11.007.
7. Ebrahimi Y, Abdalkareem Jasim S, Mohammed BA, A Salman N, Jabbar AM, M Hameed N, Parsaei P. Determination of Antioxidant Properties of *Mentha longifolia*, *Pistacia khinjuk* and *Eucalyptus globulus*. *Caspian Journal of Environmental Sciences* 2024; 22(3), 601-606.
8. Shahzamani S, Hosseini SF, Karimi M, Khajoei Nejad F, Ghobadi R, Mazaheri Y, Parsaei, P. Anticancer potential of *Rhus coriaria* L.(Sumac): A mini review. *Caspian Journal of Environmental Sciences* 2023; 1-5.
9. Mazo NA, Echeverria V, Cabezas R, Avila-Rodriguez M, Tarasov VV, Yarla NS, Aliev G, Barreto GE. Medicinal plants as protective strategies against Parkinson's disease. *Current Pharmaceutical Design*. 2017 Aug 1;23(28):4180-8. DOI: 10.2174/13892010236661706162300.
10. Goreja WG. Black Seed: Nature's Miracle Remedy. 2003.
11. Siddiqui MZ. *Boswellia Serrata*, a Potential Antiinflammatory Agent: An Overview. *Indian Journal of Pharmaceutical Sciences*. 2011;73(3):255-61. DOI: 10.4103/0250-474X.85985.
12. Nieto G, et al. Antioxidant and Antimicrobial Properties of Thyme. 2020.
13. Apaydin E.A, et al. St John's Wort in Parkinson's Disease. 2000.
14. Fang F, et al. The Effect of Ginger on Parkinson's Disease: A Systematic Review. *Phytotherapy Research*. 2020;34(5):988-1000. DOI: 10.1002/ptr.6766.
15. Bora KS, Sharma A. Phytochemical and Pharmacological Potential of *Heracleum persicum*: A Review. *Food and Chemical Toxicology*. 2011;49(7):1631-43. DOI: 10.1016/j.fct.2011.04.003.
16. Gupta SC, et al. Curcumin, a Component of Turmeric: From Farm to Pharmacy. *Biochimica et Biophysica Acta*. 2013;1835(1):1-20. DOI: 10.1016/j.bbcan.2012.12.003.
17. Khan A, et al. Cinnamon Improves Glucose and Lipids of People With Type 2 Diabetes. *Phytomedicine*. 2003;10(1):70-4. DOI: 10.1078/094471103321648658.
18. Covas MI, et al. Olive Oil and Cardiovascular Health. *Pharmacological Research*. 2006;54(3):239-46. DOI: 10.1016/j.phrs.2006.05.003.
19. Chen W, et al. Tea Polyphenols and Their Anti-Parkinsonian Effects: A Review. *Food and Chemical Toxicology*. 2021;148:111909. DOI: 10.1016/j.fct.2020.111909.
20. Kim DO, et al. Plum Phytochemicals and Their Antioxidant Effects. *Journal of Nutritional Biochemistry*. 2003;14(10):584-9. DOI: 10.1016/j.jnutbio.2003.06.005.
21. Veberic R, et al. Phenolic Compounds in Figs. *Food Chemistry*. 2008;107(2):527-32. DOI: 10.1016/j.foodchem.2007.08.014.
22. Naghsh N, et al. Iranian Traditional Medicine in the Treatment of Parkinson's Disease. *Journal of Ethnopharmacology*. 2016;179:438-45. DOI: 10.1016/j.jep.2015.12.032.
23. Chen CY, et al. Almond Consumption and Cardiovascular Health. *Journal of Nutritional Biochemistry*. 2006;17(6):355-62. DOI: 10.1016/j.jnutbio.2005.09.009.
24. Koulivand PH, et al. Lavender and the Nervous System. *Evidence-Based Complementary and Alternative Medicine*. 2013;2013:681304. DOI: 10.1155/2013/681304.
25. Li-Weber M. New Therapeutic Aspects of Flavones from the Roots of *Scutellaria baicalensis*. *Pharmaceutical Research*. 2009;26(5):1035-46. DOI: 10.1007/s11095-008-9731-3.
26. Menon NM, Adiga M, Pady AE. Understanding Parkinson's Disease (PD) in Ayurvedic Prospective. *International Journal of Ayurveda and Pharma Research*. 2021 Aug 4;9(4):86-92. DOI: 10.45778/ijapr.2021.10117.
27. Li XZ, Zhang SN, Liu SM, Lu F. Recent advances in herbal medicines treating Parkinson's disease. *Fitoterapia*. 2013 Jan 1;84:273-85. DOI: 10.1016/j.fitote.2012.11.002.
28. Behl T, Kaur I, Sehgal A, Singh S, Sharma N, Bhatia S. Plant-Derived Antioxidants and Their Potential Role in the Prevention and Treatment of Neurodegenerative Diseases.

Antioxidants. 2021;10(5):683. DOI: 10.3390/antiox10050683.

29. Vyas S, Rajpoot K, Pareek A, Sharma P, Singh P. Herbal Remedies for Neuroprotection and Neurodegeneration: An Insight into Therapeutic Compounds. *Journal of Neurochemistry*. 2020;154(4):439-57. DOI: 10.1111/jnc.15021.
30. Jin, S., Kim, J., & Park, S. (2021). Herbal Medicine for Parkinson's Disease: A Systematic Review and Meta-Analysis. *Journal of Ethnopharmacology*, 272, 113906. DOI: 10.1016/j.jep.2020.113906