

Chapter 6

Ethnomedicinal plants used to treat epilepsy

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Abstract: Epilepsy is a long-term neurological disorder that affects millions of people around the world. This problem is especially serious in low- and middle-income countries, where access to modern antiepileptic drugs is limited. This chapter lists 30 medicinal plant species from 25 botanical families, including *Bacopa monnieri*, *Centella asiatica*, *Withania somnifera*, *Datura stramonium* and *Zingiber officinale*. These plants have traditionally been used to manage epileptic seizures in various cultures and locations. The most commonly used parts of the plants are roots, leaves, bark, seeds and rhizomes. They are often prepared as decoctions, fresh juices, powders and infusions, with most being taken orally. Important chemical compounds such as alkaloids, flavonoids and terpenoids found in these plants are thought to contribute to their ability to prevent seizures. This collection of traditional knowledge provides a solid basis for future research aimed at creating new, safe and affordable treatments for epilepsy.

Keywords: Antiepileptic drug, chemical compound, future research, neurological disorder, seizure

Introduction

Epilepsy is one of the oldest and most widespread neurological disorders known to humanity (Rocha *et al.*, 2013; Kaculini *et al.*, 2021). It is marked by recurrent, unprovoked seizures, resulting from abnormal electrical activity in the brain (Stafstrom and Carmant, 2015; Brunak, 2024). About 50 million people around the globe are affected, making it one of the most common neurological conditions out there. Shockingly, nearly 80% of those living

with epilepsy are in developing and low-income countries, where access to modern healthcare and antiepileptic drugs (AEDs) is often severely limited (Birbeck, 2010; Chen *et al.*, 2023). Despite significant advances in modern neurology, many people with epilepsy still struggle with poor seizure control, unbearable side effects from medications and the financial burden of long-term treatment (Wahab, 2010). This has led many communities to explore alternative therapies rooted in traditional medicine (Sarma *et al.*, 2016). For centuries, indigenous healers, folk practitioners and traditional medicine systems like Ayurveda, Unani and various ethnobotanical practices across Africa, Asia and Latin America have turned to a wide variety of medicinal plants to help manage epileptic seizures (Mekonnen *et al.*, 2022). Plants such as *Bacopa monnieri*, *Withania somnifera*, *Centella asiatica* and *Ocimum tenuiflorum* have been key players in Ayurvedic medicine, celebrated for their neuroprotective, adaptogenic and anticonvulsant properties (Dcruz and Andrade, 2022; Ghosh *et al.*, 2023). Likewise, plants like *Datura stramonium*, *Calotropis procera*, *Ricinus communis* and *Citrullus colocynthis* showcase the rich ethnopharmacological knowledge found in various cultures (Tadesse *et al.*, 2025). These plants are used in many forms like decoctions, fresh juices, powders, infusions and seed oils extracted from different parts of the plant, including roots, leaves, bark, seeds and rhizomes (Awoke *et al.*, 2024; Figure 1). Most of these remedies are taken orally, highlighting the depth and complexity of traditional antiepileptic treatments. The systematic documentation and scientific validation of ethnomedicinal plants used for managing epilepsy is incredibly important. Not only does it help preserve valuable indigenous knowledge that's fading away, but it also opens up exciting possibilities for discovering new antiepileptic compounds (Sinoriya and Gaurav, 2024). Research into these traditional plants has shown they contain bioactive compounds like alkaloids, flavonoids, terpenoids and saponins that may help regulate neurotransmitter systems, lower neuronal excitability and provide anticonvulsant effects similar to those of conventional medications (Jangra *et al.*, 2022). The present study offers a thorough collection of 30 ethnomedicinal plant species from 25 different botanical families known for their antiepileptic properties. The goal is to connect traditional wisdom with modern pharmacological research and inspire more preclinical and clinical studies that could lead to the creation of safer, more effective and affordable treatments for epilepsy.

Methodology

The present study has been constructed through a thorough review of existing literature and field documentation. Information pertinent to the subject was

gathered from peer-reviewed research articles, ethnobotanical studies, traditional medicinal literature and scientific databases that concentrate on plants utilized in the treatment of epilepsy. Data concerning botanical classification, family, utilized plant parts, preparation methods and documented therapeutic uses were assembled and verified. Furthermore, field visits were undertaken to observe and document selected plant species in their natural habitats and photographic records were taken to ensure accurate identification and authenticity of the documented taxa (Jena *et al.*, 2025; Kumar, 2025; Sahu *et al.*, 2026).

Results and discussion

The current investigation explored 30 different ethnomedicinal plant species from 25 botanical families that are traditionally used to manage epilepsy across various cultures and regions (Table 1). The Solanaceae family stood out as the most significant, featuring three species like *Datura stramonium*, *Solanum sisymbriifolium* and *Withania somnifera*. Following closely were the Apocynaceae family with *Calotropis procera* and *Carissa spinarum* and the Apiaceae family, which included *Centella asiatica*, *Coriandrum sativum* and *Elwendia persica*. The present study highlights the rich botanical diversity found in traditional approaches to epilepsy treatment. Analysis of plant parts utilized that roots were the most commonly employed part, seen in species like *Achyranthes aspera*, *Asparagus racemosus*, *Cardiospermum halicacabum* and *Pavetta indica*. Leaves, bark, seeds and rhizomes followed in usage. The preference for roots likely stems from their higher concentrations of bioactive phytochemicals. The most common methods of preparation were decoctions and fresh juices, as noted with *Boerhavia diffusa*, *Cassia fistula*, *Clerodendrum infortunatum* and *Oroxylum indicum*. Oral administration was the overwhelmingly preferred method for nearly all the species documented, indicating a traditional understanding of how to effectively deliver these remedies to the central nervous system.

Table 1: List of plants traditionally used to treat epilepsy

Botanical name	Common name	Family	Parts/mode of use	Sources
<i>Allium sativum</i> L.	Garlic (E)	Amaryllidaceae	Rhizome/Juice is consumed orally.	Chanda and Dikshit, (2023); Savairam <i>et al.</i> , (2023)

<i>Asparagus racemosus</i> Willd.	Shatavari (H)	Asparagaceae	Root/ Fresh juice is consumed on an empty stomach.	Kaur <i>et al.</i> , (2023)
<i>Achyranthes aspera</i> L.	Prickly chaff flower (E)	Amaranthaceae	Root/ The powder is taken orally mixed with a liquid, often honey or warm water, twice a day.	Bhosale <i>et al.</i> , (2011); Gupta <i>et al.</i> , (2025)
<i>Bacopa monnieri</i> (L.) Wettst.	Jalbrahmi (H)	Plantaginaceae	Whole plant/ 8-16 ml of infusion is consumed orally.	Jangra <i>et al.</i> , (2022)
<i>Boerhavia diffusa</i> L.	Punarnava (H)	Nyctaginaceae	Leaf/The juice or decoction is administered orally.	Kaur and Goel, (2011); Kaur H. (2019)
<i>Calotropis procera</i> (Aiton) W.T.Aiton	Rubber bush (E)	Apocynaceae	Leaf/Warmed leaves are applied externally.	Obese <i>et al.</i> , (2021)
<i>Cardiospermum halicacabum</i> L.	Balloon vine (E)	Sapindaceae	Root/ Decoction is used for oral consumption.	Suresh <i>et al.</i> , (2023)
<i>Carissa spinarum</i> L.	Wild karanda (E)	Apocynaceae	Root bark/Decoction is administered orally.	Sharma <i>et al.</i> , (2023)
<i>Cassia fistula</i> L.	Golden shower tree (E)	Fabaceae	Bark/ Decoction is consumed orally.	Singh <i>et al.</i> , (2023)
<i>Centella asiatica</i> (L.) Urb.	Indian pennywort (E)	Apiaceae	Leaf/The powder is taken with milk, honey or ghee to enhance cognitive and nerve-strengthening properties.	Rivadenezy ra-Dominguez <i>et al.</i> , (2023)
<i>Citrullus colocynthis</i> (L.) Schrad.	Wild gourd (E)	Cucurbitaceae	Fruit pulp/Extracts of the fruit pulp are	Li <i>et al.</i> , (2022)

			administered orally.	
<i>Clerodendrum infortunatum</i> L.	Hill glorybower (E)	Lamiaceae	Leaf/ Fresh juice is taken orally.	Debnath <i>et al.</i> , (2024)
<i>Coriandrum sativum</i> L.	Coriander (E)	Apiaceae	Leaf/ A small quantity of fresh concentrate juice is taken orally.	Pant <i>et al.</i> , (2021)
<i>Datura stramonium</i> L.	Thornapple (E)	Solanaceae	Leaf/ Dried leaves are traditionally smoked and decoctions made by boiling leaves are consumed orally.	Sharma <i>et al.</i> , (2013); Dev <i>et al.</i> , (2025)
<i>Duhaldea cappa</i> (Buch.-Ham. ex D. Don) Pruski & Anderb.	Fragrant inula (E)	Asteraceae	Root/ The decoction is administered orally.	Shu <i>et al.</i> , (2024)
<i>Elwendia persica</i> (Boiss.) Pimenov & Kljuykov	Black cumin (E)	Apiaceae	Dried seeds	Sinoriya and Gaurav, (2024)
<i>Ficus platyphylla</i> Delile	Gutta-percha tree (E)	Moraceae	Stem bark	Chindo <i>et al.</i> , (2024)
<i>Lobelia nicotianifolia</i> Roth	Wild tobacco (E)	Campanulaceae	Leaf/ Dried leaves are used to prepare infusions taken orally.	Tamboli <i>et al.</i> , (2012)
<i>Martynia annua</i> L.	Tiger's claw (E)	Martyniaceae	Leaf/ Taken directly for oral consumption.	Gupta and Deogade, (2018)
<i>Ocimum tenuiflorum</i> L.	Tulsi (H)	Lamiaceae	Leaf/ Fresh juice administered orally in doses of 10-20 ml.	Shaik <i>et al.</i> , (2019)
<i>Oroxylum indicum</i> (L.) Kurz (Plate 1)	Indian trumpet flower (E)	Bignoniaceae	Bark/ Decoctions are taken orally.	Dhanasekaran <i>et al.</i> , (2021)
<i>Pavetta indica</i> L.	Indian pellet shrub (E)	Rubiaceae	Root bark/ 10-15 grams of dried root bark is boiled down to	Sharma <i>et al.</i> , (2013)

			100 ml and consumed.	
<i>Prosopis cineraria</i> (L.) Druce	Khejri tree (E)	Fabaceae	Stem bark/ Decoction or powder is administered orally.	Vyas <i>et al.</i> , (2020)
<i>Punica granatum</i> L.	Pomegranate (E)	Lythraceae	Seed/ Extract consumed orally.	Mehrzadi <i>et al.</i> , (2015)
<i>Ricinus communis</i> L.	Castor bean (E)	Euphorbiaceae	Seed/ Oil or extract from seeds is used to treat epileptic seizures.	Sharma <i>et al.</i> , (2013)
<i>Solanum sisymbriifolium</i> Lam.	Sticky nightshade (E)	Solanaceae	Fruits/ The ripe, edible berries are orally consumed.	Chauhan <i>et al.</i> , (2011)
<i>Viscum album</i> L.	Common mistletoe (E)	Santalaceae	Leaf or stem/ Tea or decoctions are taken orally.	Liu <i>et al.</i> , (2017)
<i>Withania somnifera</i> (L.) Dunal	Ashwagandha (H)	Solanaceae	Root/ Powder is taken orally with cow's milk and ghee.	Kalra <i>et al.</i> , (2024)
<i>Zingiber officinale</i> Roscoe	Ginger (E)	Zingiberaceae	Rhizome/ Fresh ginger juice is mixed with other substances, such as honey or rock salt and taken orally.	Jangra <i>et al.</i> , (2022)
<i>Ziziphus jujuba</i> Mill.	Red date (E)	Rhamnaceae	Fruit/ The dried fruit is often boiled in water to create a soothing tea, consumed for its calming and anticonvulsant effects.	Liu <i>et al.</i> , (2017)

(E: English; H: Hindi)

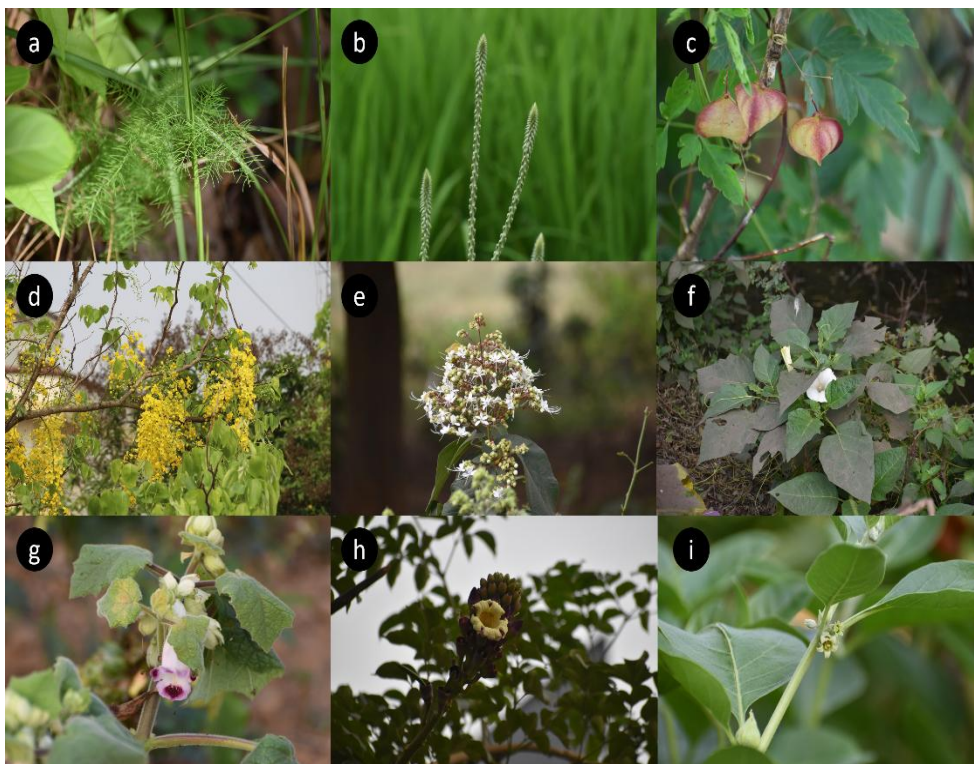


Plate 1: Some common plants used against epilepsy; a) *Asparagus racemosus*, b) *Achyranthes aspera*, c) *Cardiospermum halicacabum*, d) *Cassia fistula*, e) *Clerodendrum infortunatum*, f) *Datura stramonium*, g) *Martynia annua*, h) *Oroxylum indicum* and i) *Withania somnifera*

Several well-documented plant species have solid pharmacological profiles that support their traditional uses. For instance, *Bacopa monnieri* is known for its bacosides, which help regulate GABA and serotonin levels in the brain (Banerjee *et al.*, 2021). Meanwhile, *Withania somnifera* and *Centella asiatica* have shown impressive neuroprotective and anticonvulsant effects in studies (Jiang *et al.*, 2025). *Ziziphus jujuba*, with its flavonoids and saponins, is also recognized for boosting GABA activity, reinforcing its reputation as a soothing tea for seizures (Popstoyanova *et al.*, 2024; Ruan *et al.*, 2024). On the flip side, some plants like *Datura stramonium* and *Ricinus communis* raise significant safety concerns due to their toxic compounds, such as tropane alkaloids and ricin (Cinelli and Jones, 2021; Pawar *et al.*, 2025). The present study highlights the critical need for thorough safety assessments alongside pharmacological research. These findings emphasize the vast therapeutic potential of ethnomedicinal plants as promising sources for new

anticonvulsant treatments and strongly support the idea of blending traditional wisdom with modern scientific inquiry.

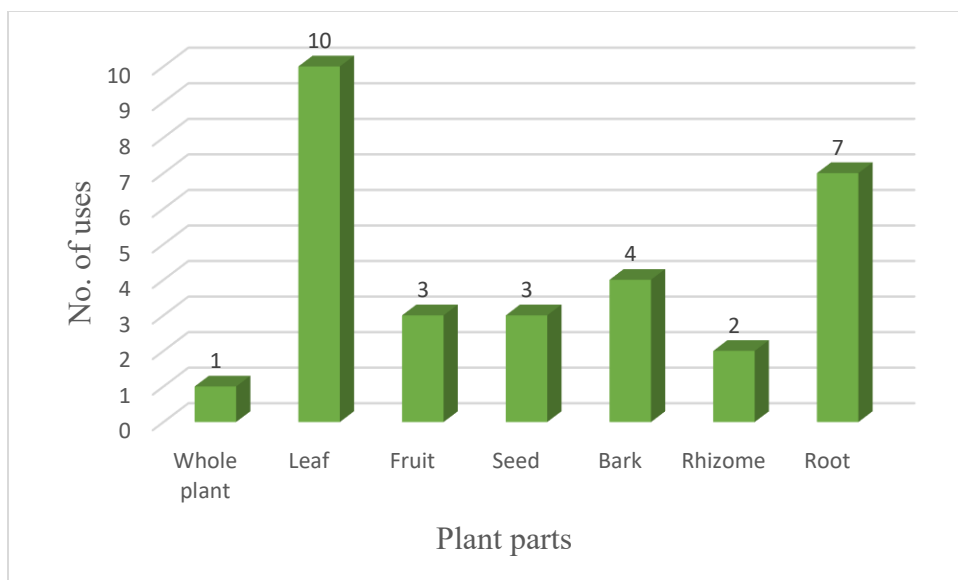


Figure 1: Therapeutic effects of plant parts against epilepsy through various modes of administration

Conclusion

The present study explored 30 ethnomedicinal plant species that showed great promise for managing epilepsy. Notably, *Bacopa monnieri*, *Withania somnifera* and *Centella asiatica* have demonstrated strong anticonvulsant effects. While there are some toxicological concerns with certain species, such as *D. stramonium*, these plants represent a rich source of indigenous knowledge that warrants more pharmacological research for developing safe and effective antiepileptic drugs.

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