IJP (2025), Vol. 12, Issue 3 **(Review Article)**

Received on 03 March 2025; received in revised form, 18 March 2025; accepted, 26 March 2025; published 31 March 2025

A SYSTEMATIC ETHNOPHARMACOLOGICAL REVIEW ON *VERNONIA CINEREA* (L) LESS

B. P. Meghana *, D. M. Sinchana, T. Balasubramanian, C. N. Varsha and S. U. Tejas

Department of Pharmacology, Bharathi College of Pharmacy, Bharathinagara, Maddur Taluk, Mandya - 571422, Karnataka, India.

Keywords:

Asteraceae, Terpenoids- terpene lactone, Megastigmane, Antioxidant, Nephroprotective activities

Correspondence to Author:
B. P. Meghana

Assistant Professor,
Department of Pharmacology,
Bharathi College of Pharmacy,
Bharathinagara, Maddur Taluk,
Mandya - 571422, Karnataka, India.

E-mail: meghanamaadu5@gmail.com

ABSTRACT: *Vernonia cinerea* is a plant with traditional uses in various cultures for its medicinal properties. It has been used to treat digestive disorders, respiratory infections and skin conditions. Scientific studies have shown that, it possesses antioxidant, antimicrobial, and anti-inflammatory properties, making it a promising candidate for the development of new drugs or natural remedies. A comprehensive literature review indicates that terpenoids, particularly sesquiterpene lactones, are the predominant secondary compounds found in *V. cinerea*. Various terpenoids, including C11-terpene lactone, megastigmane, and triterpenes, have been identified. Additionally, steroids, flavonoids, phenolic compounds. Studies have revealed that *Vernonia cinerea* possesses potent antioxidant, antimicrobial, antifungal, analgesic, antipyretic and anti-inflammatory properties. Overall, the future of *Vernonia cinerea* in the field of medicine appears bright, and further research efforts should be directed towards unlocking its full therapeutic potential. So, it is time to appreciate this plant and use it to its full potential. However, in-depth studies are needed on the clinical use of *Vernonia cinerea* against human diseases. Besides, detailed toxicological analysis is also to be performed for its safe and efficacious use in preclinical and clinical studies as a health-promotiong herbaccount of pharmacognostical and phytochemical updated profile.

INTRODUCTION: *Vernonia cinerea* (L) Less. (Asteraceae) also known as purple fleabane and it is an annual (or) perennial herbaceous plant. It is mainly found in tropical areas, particularly in Southeast Asia, South America, and And India [1]. The stems are ribbed, smooth or puberulus and leaves are ovate, acute at both ends. Thinly hairy below; petiole 1-2cm long, slender. Flowers 5-10, similar; corolla 3mm long, glabrous. achenes 1.5mm long, hairy; outer pappus 1mm long, setaceous, inner 3mm long heads 5×3mm, in terminal corymbose cymes, peduncled; outer bracts minute, inner oblong, acute, cuspidate, hairy [2]. *V. cinerea* grows mostly in sunny or slightly shaded habitats, in general corresponding with young secondary vegetation, roadsides, wastelands, distributed areas, cultivated land and other anthropogenic habitats.

V. cinerea reproduces and spread by seeds which are adapted to wind dispersal. In addition, seeds may be secondarily dispersed as a contaminant in pasture seeds, crop seeds, and in agricultural machinery [3]. It is a plant with traditional uses in various cultures for its medicinal properties.

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.IJP.12(3).197-03

Article can be accessed online on: www.ijpjournal.com

DOI link: https://doi.org/10.13040/IJPSR.0975-8232.IJP.12(3).197-03

It has been used to treat digestive disorders, respiratory infections and skin conditions. Scientific studies have shown that. It possesses antioxidant, antimicrobial, and anti-inflammatory properties, making it a promising candidate for the development of new drugs or natural remedies. In recent years, there has been a growing interest in exploring the potential of natural compounds for therapeutic purposes. Due to its wide range of medicinal properties, *Vernonia cinerea* holds great promise in the flied of medicine. Its antimicrobial and anti-inflammatory properties make it a potential candidate for treating various infections and inflammatory diseases. Additionally, its antioxidant properties suggest that it could have a role in preventing oxidative stress-related conditions. As researchers continue to study this plant, it may unlock new possibilities for drug development and improve healthcare [4]. It is also used as folk medicine by the people of nepal [5].

FIG. 1: ***VERNONIA CINEREA***

Vernacular Names:

Hindi: Sahadevi, Sadodi, Daudotpala

English: Purple Fleabane, Fleabane

Kannada: Sahadevi, Karehindi

Tamil: Sirusengalaneer

Punjab: Sehdei

Telugu: Gariti kamini, Gariti kamma, Sahadevi chettu

Gujarat: Sadoree, Sadodee

Oria: Poka sungo

Sanskrit: Sahadevi

Marathi: Sahadevi

Malayalam: Pirina, Poovamkurunthala, Puvamkozhinjal, Puvankurunal

Taxonomical Classification [6]:

Rank	Scientific name	Commom name
Kingdom	Plantae	Plants
Subkigdom	Tracheobionta	Vascular plants
Super division	Spermatophyta	Seed plants
Division	Magnoliophyta	Flowering plants
Class	Mangnoliopsida	Dicotyledons
Subclass	Asteridae	-
Order	Asterales	-
Family	Asteraceae/compositae	Aster family
Genus	Vernonia	Ironweed
Species	Vernonia cinerea Less.	Little ironweed

MORPHPLOGY:

Macroscopic Characters: Macroscopically, *Vernonia cinerea* appears as an erect, branched herb with a cylindrical, slightly hairy stem, simple alternate leaves that are typically lanceolate in shape, and small, purple or pinkish-violet flower heads arranged in a flat-topped panicle.

Stem: The stem is slender, measuring 15-17 cm in height. It is cylindrical, ribbed, and grooved, with a slightly pubescent texture. The stem can range from 1-8 mm thick and is more or less glabrous. The basal part of the branches is greenish-brown, while the upper part is dark green and supports a number of flowers. The stem has a short fracture.

Leaves: The petioles vary in length, ranging from 6-13 mm. The leaves are between 2.5-5.0 cm long and can be irregular in shape, either broadly elliptic or lanceolate. They are membranous to somewhat leathery, with either obtuse or acute tips and sometimes a short mucronate tip. The leaves are more or less pubescent on both sides, with edges that are either irregularly toothed or shallowly crenate-serrate.

Flowers: The flowers are pinkish-purple, forming small heads that are 6 mm in diameter. These flowers are arranged in loose, rounded or flat-topped corymbs, each with around 20 flowers. The corymbs are terminal, and each flower head has a small, linear bract beneath it, along with smaller bracts at the forks of the peduncles.

Fruits: The fruits are achenes, 1.25 mm long, oblong, and terete, narrowing slightly at the base. They are covered in fine, white, appressed hairs.

Root: The root is 5-12 cm long and 1-7 mm thick. It tapers gradually and is oblique, with a few rootlets. The outer surface is a dull brown, and it has a short fracture.

Flowering and Fruiting Time: The plant flowers during the rainy season, and its fruiting period occurs in the winter [6].

Microscopic Characters: The leaves of the plant have a distinct odor and may be either obtusely or acutely toothed, with their size and shape varying. The flowers are bisexual, containing both male and female reproductive organs. After blooming and pollination, the flowers develop into small, dry capsules filled with numerous tiny seeds. These seeds are small and lightweight, making them easy to be carried by the wind or animals to new locations for germination. The seeds are also known for their ability to remain dormant for long periods, allowing them to endure harsh environmental conditions. Furthermore, the plant's robust root system enables it to thrive in various soil types while providing stability against strong winds or heavy rainfall [7].

TABLE 1: QUANTITATIVE MICROSCOPY OF *V. CINEREA* LEAF [7]

S. no.	Leaf Constants	Values
1	Stomatal Index	25.18
2	Pallisade ratio	7.83
3	Vein-islet Number	7.00
4	Vein termination Number	13.00

Phytochemistry: A comprehensive literature review indicates that terpenoids, particularly sesquiterpene lactones, are the predominant secondary compounds found in *V. cinerea*. Various terpenoids, including C11-terpene lactone, megastigmane, and triterpenes, have been identified. Additionally, steroids, flavonoids, phenolic compounds, and other substances have been isolated through different extraction methods from various parts of the plant, such as roots, flowers, stems, and leaves. In total, approximately 92 chemical constituents have been isolated and structurally characterized to date [8].

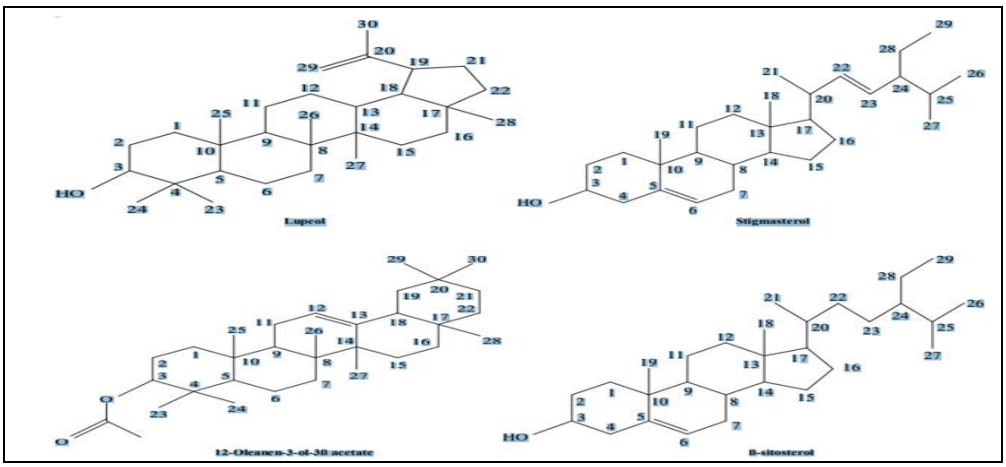

FIG. 1: THE STRUCTURES OF THESE COMPOUNDS, IDENTIFIED THROUGH NMR ANALYSIS

Pharmacological Activities: The leaves of *Vernonia cinerea* are consumed as a potherb, and the fresh juice is used to treat amoebiasis. A poultice made from the leaves is applied to conditions such as humid herpes, eczema, ringworm, and to aid in the removal of Guinea worms. The root, being bitter, is used as an anthelmintic and is helpful in treating diarrhea and stomach-aches. The flowers are utilized for conditions like conjunctivitis and fever. The seeds are commonly used as an anthelmintic, especially effective against roundworms and threadworms. They are also beneficial in treating leucoderma, psoriasis, and other chronic skin diseases. Therefore, this plant was chosen for screening its antibacterial and antifungal activities against a range of gram-positive, gram-negative, and fungal microorganisms [19]. Recently, the various pharmacological properties of the extracts and isolated compounds of *V. cinerea* have been studied *in-vitro* and *in-vivo*.

Antioxidant Activity: Multiple studies have indicated that *V. cinerea* demonstrates notable antioxidant activity. Various methods, including the DPPH and ABTS radical scavenging assays, have been employed to evaluate its effects. One such study found that an ethanol extract of V. cinerea exhibited an antioxidant activity of 16.48 mg gallic acid per gram of extract [12]. Other studies also show that the methanol extract of leaves and flowers inhibits DPPH by about 70% [13] and the IC_{50} value for DPPH scavenging by the stembark and leaf extract was determined to be 82 ± 3.40 µg/mL [14]. Several compounds isolated from V. cinerea exhibit potential antioxidant properties. For instance, lupeol, gallic acid, and quercetin demonstrated IC_{50} values of 30, 0.62, and 0.53 µg/mL, respectively, against DPPH activity [15, 16]. The leaf extract of *V. cinerea* demonstrated antioxidant activity, with a value of 117.71 ± 15.02 µM Trolox equivalents per 100 mg of dry extract [17]. A recent study explored a modern technique for extracting nitrates from *V. cinerea* whole plants using microwave-assisted extraction [18].

Anti-Inflammatory Activity: A methanol extract from the *Vernonia cinerea* plant reduced swelling in both short-term (carrageenan, histamine, and serotonin-induced rat paw edema) and long-term (cotton pouch-induced granuloma) tests [20]. Its activity was dose-dependent, with higher doses leading to greater inhibition of inflammation [21]. Additional research is needed to explore the mechanisms of action and establish the optimal dosage for optimal anti-inflammatory benefits [22].

These results indicate that the methanol extract could serve as a promising natural treatment for both acute and chronic inflammation. It inhibit the production of pro-inflammatory cytokines, alter immune cell function, or block the signaling pathways responsible for inflammation [23]. It would also be important to examine the potential side effects and toxicity of the methanol extract, as well as its long-term impact on inflammation and overall health [24]. "These studies would offer important information on the extract's long-term impact on inflammation and general health, aiding in the assessment of its safety and effectiveness as a potential treatment [25]. Furthermore, exploring the ideal dosage and administration techniques would help enhance its therapeutic effects while reducing potential risks [26]. This would offer important insights into the treatment's safety profile, helping to reduce potential risks for patients with rheumatoid arthritis [27].

Antimicrobial Activity: Saponins found in flower extracts and flavonoids present in leaf and flower extracts have demonstrated antimicrobial properties. The hexane and crude flower extracts exhibit the strongest inhibition against *B. cereus, E. aerogenes,* and *S. aureus,* while the leaf extracts show activity against B. cereus and *E. aerogenes* but not against *S. aureus*. Ether extracts also display antibacterial effects against *B. cereus*, *E. aerogenes*, and *S. aureus*.

The antibacterial effects of various plant extracts against both gram-positive and gram-negative bacteria vary, with methanolic extracts showing the highest antibacterial activity, followed by hexane extracts. The entire plant demonstrates significant antibacterial activity against *E. coli* and *Klebsiella pneumoniae*. This activity can be assessed using the agar disk diffusion method. Extracts of the whole plant, including petroleum ether, chloroform, acetone, methanol, and ethanol, show antibacterial properties, with petroleum ether and ethanolic extracts displaying the most notable effects [40].

Anti-Tumor Activity: The extract of *Vernonia cinerea* significantly inhibited the growth of lung tumors and increased the lifespan of C57BL/6 mice. In the treated animals, there was a substantial reduction in levels of lung collagen, hydroxyproline, uronic acid, hexosamine, serum sialic acid, γ-glutamyltransferase (GGT), and vascular endothelial growth factor (VEGF) [28]. The findings indicate that Vernonia cinerea reduced the production and expression of proinflammatory cytokines, including TNF-α, IL-1b, IL-6, and GM-CSF. This suggests that Vernonia cinerea may have anti-inflammatory properties and could potentially inhibit melanoma cell metastasis. However, further research is required to understand the mechanisms involved and assess its potential for cancer therapy [29]. The extract of *Vernonia cinerea* could transform cancer treatment by slowing tumor growth, extending lifespan, and minimizing side effects [30]. VC-DCM holds promise as a potential cancer treatment by targeting cancer cells and inducing apoptosis. Additionally, it could offer an alternative option for patients who are resistant to conventional chemotherapy drugs [31].

Antipyretic Activity: *Vernonia cinerea*, a plant with potential medicinal benefits, contains bioactive compounds, flavonoids, and alkaloids that have been found to help reduce fevers and alleviate symptoms [32]. These compounds could contribute to the creation of new antipyretic medications for fever. Additionally, *Vernonia cinerea* shows potential for anti-inflammatory and analgesic effects, positioning it as a promising option for managing pain and inflammation [33]. Exploring the medicinal properties of *Vernonia cinerea* further could open up new possibilities for drug development and enhance healthcare outcomes. Beyond its potential as a source of painkillers and fever-reducing medications, *Vernonia cinerea* also exhibits antioxidant properties that may help prevent diseases associated with oxidative stress. Thus, ongoing research on *Vernonia cinerea* may reveal additional potential benefits and further the progress of modern medicine [35].

Analgesic Activity: The traditional use of *Vernonia cinerea* leaf in treating malaria hints at its potential for other medicinal benefits, making it a promising candidate for further investigation in pain management and other therapeutic areas. A study on individuals with chronic pain showed that an extract from *Vernonia cinerea* leaves significantly alleviated pain and enhanced their quality of life. This indicates that *Vernonia cinerea* leaves could serve as a natural alternative to traditional pain medications, providing relief for those experiencing different types of pain. Besides its role in pain management, *Vernonia cinerea* leaf extract has also demonstrated potential in other therapeutic areas. Early research suggests it may have anti-inflammatory effects, which could be helpful for conditions like arthritis or inflammatory bowel disease. Research has also demonstrated that the extract possesses antioxidant properties, suggesting it could serve as a natural treatment for diseases associated with oxidative stress. However, further studies are necessary to fully understand the mechanisms at play and to explore its potential therapeutic uses [36].

Nephroprotective Activity: An experiment involving rats exposed to cisplatin demonstrated that extracts of *Vernonia cinerea* can aid in repairing damaged kidneys and prevent further deterioration. These results highlight the potential therapeutic value of *Vernonia cinerea* extracts for treating renal injury [37]. More investigation is required to identify the specific compounds responsible for the nephroprotective effects observed in *Vernonia cinerea* extracts, as well as to explore the mechanisms through which these extracts impact kidney function. These findings underscore the potential of plant extracts as a promising source for developing new treatments for kidney-related diseases. Using this new information, targeted medications could be developed to alter these pathways, offering individuals with kidney issues more effective and safer treatment options [38].

Protective Activity: The study examined the radioprotective impact of *Vernonia cinerea* extract on BALB/c mice. The results revealed that administering *Vernonia cinerea* extract (20 mg/kg body weight, intraperitoneally) enhanced the white blood cell count, bone marrow cellularity, and the number of -esterase-positive cells in the control group [39]. Treatment with *Vernonia cinerea* notably improved the antioxidant status in animals by increasing the activities of enzymes such as

superoxide dismutase (SOD), catalase (CAT), and glutathione peroxidase (GPx), as well as boosting the levels of reduced glutathione (GSH) in irradiated animals [40]. This treatment approach could benefit cancer patients. Additionally, the antioxidants found in *Vernonia cinerea* extract have been shown to protect healthy cells from radiation therapy-induced damage, potentially reducing treatment side effects [11].

CONCLUSION: The plant *Vernonia cinerea* Less. Belonging to Asteraceae family, is a ethnomedicinal plant found throughout India. Its pharmacological properties have shown positive results. Further research and clinical trials are needed to fully explore its therapeutic benefits and develop it into a reliable source of medication for various ailments. Studies have revealed that *Vernonia cinerea* possesses potent antioxidant, antimicrobial, antifungal, analgesic, antipyretic and anti inflammatory properties, which supports this conclusion. Overall, the future of *Vernonia cinerea* in the field of medicine appears bright, and further research efforts should be directed towards unlocking its full therapeutic potential. So, it is time to appreciate this plant and use it to its full potential.

ACKNOWLEDGMENT: I sincerely thank to department of pharmacology, Bharathi college of Pharmacy for motivated and guided during review process.

CONFLICT OF INTEREST: No conflict of interest.

REFERANCES:

1. Dagawal M and Tarekar D: Pharmacognostic studies of *Vernonia cinerea* (L.) Leaves antismoking plant. World Journal Pharm Res 2017; 6(1): 875-82.
2. Zakir M, Khanam S and Kazmi MH: Ethno-pharmacology of Sahdevi (*Vernonia cinerea* Less.)-An important but lesser known drug of Unani System of Medicine. Cell Med 2020; 10(4): 26-1.
3. Theja DD and Nirmala S: A review of *Vernonia cinerea* L. ethno-medicinal uses and pharmacology shows that it could be a useful plant for medical purposes. Intelligent Pharmacy 2024; 2(5): 662-71.
4. Haque MA, Hassan MM, Das A, Begum B, Ali MY and Morshed H: Phytochemical investigation of *Vernonia cinerea* (family: Asteraceae). Journal of Applied Pharmaceutical Science 2012; 79-83.
5. Singh A, Saharan VA, Kumawat IC, Khatri A and Bhandari A: A pharmacognostical study of *Vernonia cinerea* Less (Asteraceae) and evaluation of anti-inflammatory and antibacterial activities of stem. Egyptian Pharmaceutical Journal 2014; 13(2): 104-12.
6. Haque MA, Hassan MM, Das A, Begum B, Ali MY and Morshed H: Phytochemical investigation of *Vernonia cinerea* (family: Asteraceae). Journal of Applied Pharmaceutical Science 2012; 79-83.
7. Traditional Uses, Phytochemistry, and Pharmacological Activities of *Vernonia cinerea* (L.) Less.: An Updated Review Trang NM, Vinh LB, Phong NV, Yang SY.
8. Traditional Uses, Phytochemistry, and Pharmacological Activities of *Vernonia cinerea* (L.) Less.: An Updated Review. Nutrients 2024; 16(9): 1396.
9. Pukumpuang W, Thongwai N and Tragoolpua Y: Total phenolic contents, antibacterial and antioxidant activities of some Thai medicinal plant extracts. J Med Plant Res 2012; 6: 4953–4960.
10. Danish Rizvi SM, Biswas D, Arif JM and Zeeshan M: *In-vitro* antibacterial and antioxidant potential of leaf and flower extracts of *Vernonia cinerea* and their phytochemical constituents. Int J Pharm Sci Rev Res 2011; 9: 164–169.
11. Naowaboot J, Wannasiri S and Pannangpetch P: *Vernonia cinerea* water extract improves insulin resistance in high-fat diet–induced obese mice. Nutrition Research 2018; 56: 51-60.
12. Sonibare MA, Aremu OT and Okorie PN: Antioxidant and antimicrobial activities of solvent fractions of *Vernonia cinerea* (L.) Less leaf extract. Afr. Health Sci 2016; 16: 629–639.
13. Luetragoon T, Sranujit RP, Noysang C, Thongsri Y, Potup P, Somboonjun J, Maichandi N, Suphrom N, Sangouam, S and Usuwanthim K: Evaluation of anti-inflammatory effect of *Moringa oleifera* Lam. and *Cyanthillium cinereum* (Less) H. Rob. Lozenges in volunteer smokers. Plants 2021; 10:1336.
14. Monton C, Kittiratpattana P, Nakyai S, Sutapakul T, Navabhatra A, Wunnakup T, Chankana N and Suksaeree J: Microwave-assisted extraction of *Clausena anisata* leaves and *Vernonia cinerea* whole plants to maximize nitrate content: Optimization approach, antioxidant activity, and cytotoxicity. Adv Tradit Med 2022; 22: 697–711.
15. Somasundaram A, Velmurugan V and Senthilkumar GP: *In-vitro* Antimicrobial Activity of *Vernonia cinerea* (L) Less. Pharmacologyonline 2010; 960: 957-60.
16. Iwalewa EO, Iwalewa OJ and Adeboye JO: Analgesic, antipyretic, anti-inflammatory effects of methanol, chloroform and ether extracts of *Vernonia cinerea* less leaf. Journal of Ethnopharmacology 2003; 86(2-3):229-34.
17. Lestari S, Aryani RD and Palupi D: Pengaruh ketinggian tempat tumbuh terhadap kandungan fitokimia dan antioksidan ekstrak akar sawi langit (*Vernonia cinerea* L.). Biotropic: The Journal of Tropical Biology 2021; 5(2): 84-93.
18. Lestari S, Aryani RD and Palupi D: Pengaruh ketinggian tempat tumbuh terhadap kandungan fitokimia dan antioksidan ekstrak akar sawi langit (Vernonia cinerea L.). Biotropic: The Journal of Tropical Biology 2021; 5(2): 84-93.
19. Taechowisan T, Singtotong C and Phutdhawong WS: Antibacterial and antioxidant activities of acetogenins from streptomyces sp. ve2; an endophyte in *Vernonia cinerea* (L.) Less. Journal of Applied Pharmaceutical Science 2016; 6(8): 067-72.
20. Haque MA, Abdullah CS, Romana B, Rafique MB, Zia-ulHuda GM, Hossain SF and Begum B: Evaluation of anti-diarrheal and anti-diabetic activities of the stem, barks and leaves of the plant *Vernonia cinerea* (Family: Asteraceae).

Journal of Applied Pharmaceutical Science 2013; 3(1): 069-72.
21. Acharya R, Sharma B, Singh R and Jain P: Phytochemical and High-Performance Liquid Chromatography Analysis of Extract of *Vernonia cinerea*. Journal of Drug Delivery and Therapeutics 2019; 9(1): 229-32.
22. Lestari S, Aryani RD and Palupi D: Pengaruh ketinggian tempat tumbuh terhadap kandungan fitokimia dan antioksidan ekstrak akar sawi langit (*Vernonia cinerea* L.). Biotropic: The Journal of Tropical Biology 2021; 5(2): 84-93.
23. Haque MA, Abdullah CS, Romana B, Rafique MB, Zia-ulHuda GM, Hossain SF and Begum B: Evaluation of anti-diarrheal and anti-diabetic activities of the stem, barks and leaves of the plant *Vernonia cinerea* (Family: Asteraceae). Journal of Applied Pharmaceutical Science 2013; 3(1): 069-72.
24. Chen X, Zhan ZJ and Yue JM: Sesquiterpenoids from *Vernonia cinerea*. Natural Product Research 2006; 20(2): 125-9.
25. Kasanab VK and Horec SK: Spasmodic response and neurogenic mechanism of water extract of *Vernonia cinerea* (L.) Less on rat duodenum. Journal of Applied Pharmaceutical Science 2012; 2(9): 045-9.
26. Gupta M, Mazumder UK, Manikandan L, Haldar PK, Bhattacharya S and Kandar CC: Antibacterial activity of Vernonia cinerea. Fitoterapia 2003; 74(1-2): 148-50.
27. Wu H and Pan Y: First report of powdery mildew caused by *Podosphaera xanthii* on *Vernonia cinerea* in China. Plant Disease 2023; 107(12): 4024.
28. Thiagarajan VR, Shanmugam P, Krishnan UM and Muthuraman A: Ameliorative effect of Vernonia cinerea in vincristine-induced painful neuropathy in rats. Toxicology and Industrial Health 2014; 30(9): 794-805.
29. Pratheesh Kumar P and Kuttan G: *Vernonia cinerea* L. scavenges free radicals and regulates nitric oxide and proinflammatory cytokines profile in carrageenan induced paw edema model. Immunopharmacology and Immunotoxicology 2009; 31(1): 94-102.
30. Brown SE, Been BO and McLaughlin WA: First report of lethal yellowing group (16Sr IV) of phytoplasmas in *Vernonia cinerea* in Jamaica. Plant Disease 2008; 92(7): 1132-.
31. Misra TN, Singh RS, Upadhyay J and Srivastava R: Chemical constituents of *Vernonia cinerea*. Isolation and structure elucidation of a new pentacyclic triterpenoid. Journal of Natural Products 1984; 47(5): 865-7.
32. Sonibare MA, Aremu OT and Okorie PN: Antioxidant and antimicrobial activities of solvent fractions of *Vernonia cinerea* (L.) Less leaf extract. African Health Sciences 2016; 16(2): 629-39.
33. Pandey G, Kasana VK and Hore SK: Spasmodic response and neurogenic mechanism of water extract of *Vernonia cinerea* (L.) Less. on rat duodenum. Planta Medica 2011; 77(12): PM167.
34. Goyal PK, Verma SK and Sharma AK: Antilithiatic potential of *Vernonia cinerea* against calcium oxalate calculi in experimental rats. J Phytopharmacol 2017; 6(2): 149-55.
35. Pratheeshkumar P and Kuttan G: Antimetastatic potential of vernolide-A, a sesquiterpenoid from *Vernonia cinerea* L. Human & Experimental Toxicology 2012; 31(1): 66-80.
36. Prabha JL. Therapeutic uses of *Vernonia cinerea*-A short review. International Journal of Pharmaceutical and Clinical Research 2015; 7(4): 323-5.
37. Chaikoolvatana A, Ayuthaya ND, Suthipinittharm P, Chaikoolvatana C, Saisingh N and Manwong M: Development and evaluation of the effectiveness of *Vernonia cinerea* (VC) cookies for smoking cessation. Journal of Health Research 2017; 31(1): 23-32.
38. Maheshwari P, Songara B, Kumar S, Jain P, Srivastava K and Kumar A: Alkaloid production in *Vernonia cinerea*: Callus, cell suspension and root cultures. Biotechnology J Healthcare Nutrition Technology 2007; 2(8): 1026-32.
39. Talukdar T: Taxonomic significance of Cyspsela in *Vernonia anthelmintica* Willd. and *V. cinerea* Less.(Asteraceae; tribe–Vernonieae): Structural manifestations. Plant Science Today 2015; 2(4): 107-15.

How to cite this article:
Meghana BP, Sinchana DM, Balasubramanian T, Varsha CN and Tejas SU: A systematic ethnopharmacological review on *Vernonia cinerea* (L) less. Int J Pharmacognosy 2025; 12(3): 197-03. doi link: http://dx.doi.org/10.13040/IJPSR.0975-8232.IJP.12(3).197-03.