

Weed Species Diversity and Their Medicinal Uses in the Holy Cross College Campus, Nagercoil, Kanyakumari District, Tamilnadu

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ABSTRACT

The 2025 survey of Holy Cross College campus in Nagercoil documented 134 weed species across 38 families, identifying Poaceae (23 species), Acanthaceae, Asteraceae, and Malvaceae as the most dominant groups. The findings highlight that 90% of these species, holds significant medicinal value for treating various ailments, while simultaneously supporting ecological health through soil stabilization and nutrient cycling. By establishing a link between environmental adaptability and bioactive potential, the study redefines weeds as vital biodiversity assets rather than unwanted plants. Ultimately, this research provides a baseline for future phytochemical and pharmacological studies, advocating for the sustainable conservation and utilization of weed flora within educational and semi-urban ecosystems.

Keywords: Weed diversity, Medicinal plants, Holy Cross College, Nagercoil, Poaceae, Asteraceae, Ethnobotany, Plant families, Biodiversity conservation, Traditional medicine, Phytochemical potency.

1 Introduction

A weed is scientifically defined as any plant that grows aggressively in a location where it is not intentionally cultivated, often competing with desirable crops for essential resources (Zimdahl, 2018). These species are characterized by their high reproductive capacity, rapid seed germination, and the ability to thrive in disturbed or harsh environmental conditions (Bhowmik, 2014). While traditionally viewed as agricultural pests, weeds are increasingly recognized as "pioneer species" that play a vital role in soil stabilization and nutrient cycling within ecosystems (Altieri, 1999). Furthermore, many common weeds serve as a primary source of phytochemicals and secondary metabolites, making them indispensable in traditional and folk medicinal practices across the globe (Santhosh et al., 2021). According to historical documentation, more than 8,000 plant species are utilized within traditional and folk medicinal frameworks (Ambasta et al., 1986). This vast botanical variety is a direct result of India's diverse climatic and soil conditions, which support a wide array of life forms ranging from Himalayan alpine zones to the southern coasts of

Kanyakumari. Every district contributes unique floristic wealth that is essential for the health and economic stability of local communities (Srinivasan et al., 2022).

Kanyakumari District, positioned at the southernmost edge of the Indian peninsula, serves as a unique ecological junction where the Western Ghats meet the sea. The region's tropical climate, marked by high humidity and significant precipitation, fosters the growth of highly varied vegetation. Within this environment, the Holy Cross College campus in Nagercoil acts as a micro-ecosystem, featuring diverse habitats such as fallow lands, gardens, shaded groves, and lawns. These areas host a dense population of herbaceous plants, particularly weeds, which have been noted for their high resilience and value in rural and semi-urban life within the district (ResearchGate,2015). Research indicates that many of these species are rich in bioactive compounds used for centuries in traditional healing practices, as highlighted by Parrotta (2001) and Siddalinga Murthy and Vidyasagar (2013). Such species are increasingly recognized as primary sources of basic medical care in various Indian states, including coastal regions (Samal et al., 2024).

Investigating weed populations within institutional grounds like college campuses offers a localized perspective on biodiversity and sustainable resource management. These campuses effectively function as miniature versions of the surrounding regional ecosystem. Documenting the flora in these settings is multi-functional: it cultivates botanical literacy among students, supports conservation efforts, and assists in the identification of phytochemical resources. Studies in other major Indian university campuses have demonstrated that urban institutional environments can maintain a significant diversity of important common medicinal plants (Verma et al., 2008).

The current research, titled “Weed Species Diversity and Its Medicinal Uses in Holy Cross College Campus, Nagercoil, Kanyakumari District, Tamil Nadu,” focuses on three core objectives: documenting the various weed species across campus habitats, cataloging their medicinal applications based on established literature, fostering a greater appreciation for these overlooked plants. Ultimately, this study supports the broader national and global mission of documenting biodiversity and promoting the sustainable use of natural plant resources.

2 Materials and Methods

2.1 Study Area

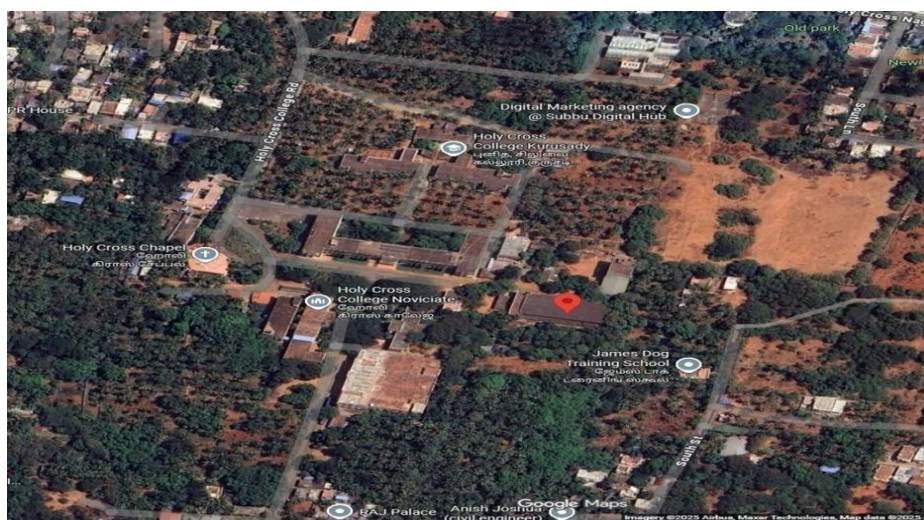
The present study on Weed Species Diversity and Its Medicinal Uses was carried out in the Holy Cross College Campus, Nagercoil, located in Kanyakumari District, Tamil Nadu (Latitude: 8°10' N; Longitude:77°26'E). The campus extends over an area of approximately

22 acres and comprises botanical gardens, cultivated plots, lawns, waste lands, roadsides, and shaded areas that support a rich diversity of herbaceous flora (Plate1and2). The region experiences a tropical humid climate with an average temperature ranging between 24°C and 33°C and an average annual rainfall of about 1400 mm. The study was conducted from June to September 2025, which corresponds to the southwest monsoon period favouring luxuriant weed growth.

Plate1: Aerial View of Holy Cross College Campus



Plate2: Google Map Image of Holy Cross College Campus



2.3 Survey and Collection of Plant Specimens

A systematic field survey was undertaken to record the weed flora from various habitats within the college campus from June 2025 to September 2025. Surveys were conducted once every week during the study period to observe seasonal variations and ensure proper identification of species. Representative specimens of all weed species were collected

using standard herbarium techniques (Jain and Rao, 1977). Each specimen was pressed, dried, mounted, and labelled with relevant field data such as date, habitat, locality, and collector's name.

2.4 Identification and Classification

Collected specimens were identified with the help of regional floras, including The Flora of the Presidency of Madras (Gamble, 1935) and The Flora of Tamil Nadu (Nair and Henry, 1983–1989). The scientific names were verified and updated using Plants of the World Online (POWO) and The Plant List to ensure nomenclatural accuracy.

2.5 Documentation of Medicinal Uses

Information on the ethnomedicinal uses of the recorded weed species was collected through a literature survey. Standard references such as Wealth of India (CSIR, 1948 - 1976), Indian Medicinal Plants (Kirtikar and Basu, 1935), and Medicinal Plants of India (Pullaiah, 2006) were used. The medicinal uses were categorized based on their therapeutic applications, such as treatment for skin diseases, wounds, fevers, digestive disorders, and respiratory ailments.

2.6 Data Analysis

All data were tabulated and analyzed and graphical representations were prepared to depict the dominant families, and major medicinal categories.

3 Results and Discussion

3.1 Weed Diversity in the Study Area

The investigation conducted on the weed flora at the Holy Cross College Campus in Nagercoil identified a significant diversity of herbaceous plants thriving across various microhabitats. Throughout the study period, which spanned from June to September 2025, a total of 134 weed species representing 38 families were documented (Table: 1). This high level of diversity is a testament to the region's rich floristic composition, supported by its tropical climate, fertile soil, and high humidity.

Among the recorded groups, the family Poaceae (grasses) was the most dominant with 23 species, followed by Acanthaceae, Asteraceae, and Malvaceae (10 species each), Fabaceae (8 species), and Amaranthaceae (6 species). Other families that made significant contributions to the campus flora included Euphorbiaceae, Lamiaceae, Rubiaceae, and Convolvulaceae (Graph:1). This pattern of family-wise dominance indicates that the majority of these species are exceptionally well-adapted to open, disturbed, and moisture-retaining environments, including lawns, gardens, wastelands, and shaded corners.

Table: 1 List of Plants with Botanical Name, Family and Uses

S. No	Botanical Name	Family	Uses
1	<i>Andrographis paniculata</i> (Burm.f.) Wall. ex Nees	Acanthaceae	Anti-inflammatory, Anti-microbial, Antiviral, Anti-cancer potential and Blood sugar regulation. Fever and Malaria management
2	<i>Asystasia gangetica</i> (L.) T. Anderson	Acanthaceae	Asthma, Rheumatism, Stomachache and Diabetes, Anthelmintic
3	<i>Barleria buxifolia</i> L.	Acanthaceae	Antidiabetic effects, Gastroprotective properties, Analgesic effects, Antibacterial properties
4	<i>Barleria cristata</i> L.	Acanthaceae	Boils, Bee and Snake bites, Asthma, Leprosy, Cough, Jaundice, and Toothaches.
5	<i>Barleria strigosa</i> Willd.	Acanthaceae	Antidiabetic Anti ulcer, Antiseptic and Wound healing properties
6	<i>Barleria prionitis</i> L.	Acanthaceae	Dental problems, Fights oral Infections and Strengths gums, Wound healing, Treat skin disease and Reduce swelling
7	<i>Justicia glauca</i> Rottl.	Acanthaceae	Anti-Inflammatory, Respiratory relief, Digestive acid, Anticancer problems and Antioxidant
8	<i>Justicia simplex</i> D.Don	Acanthaceae	Anti-bacterial and Anti-fungal properties, Wound healing and Potential anti-cancer activity
9	<i>Ruellia prostrata</i> Poir.	Acanthaceae	Anti-inflammatory and Pain relief, Joint pain, Localized pain antimicrobial, Antifungal, Treat skin infections ringworm, Cough, Cold and Astma, Urinary and Reproductive uses.
10	<i>Ruellia tuberosa</i> L.	Acanthaceae	Kidney and Bladder issues, Diuretic, Anti-inflammatory, Gonorrhea, Syphilis, Diabetes, Antioxidant and Antimicrobial.
11	<i>Gisekia pharnaceoides</i> L.	Aizoaceae	Diarrhoea, acting as purgative and taenicide

12	<i>Mollugo pentaphylla</i> L.	Aizoaceae	Skin conditions, Stomach issues and Earaches
13	<i>Trianthema portulacastrum</i> L.	Aizoaceae	Edema, dropsy, Jaundice, Rheumatism, Wound healing, Liver protection, digestive issues and Urinary problems
14	<i>Aerva lanata</i> (L.) Juss. ex Schult.	Amaranthaceae	Kidney and Bladder stones, Diabetes, Coughs and Diarrhea
15	<i>Alternanthera caracasana</i> Kunth	Amaranthaceae	Dysentery, Diarrhea and Fever
16	<i>Alternanthera sessilis</i> (L.) DC.	Amaranthaceae	Anti-inflammatory, Diuretic, Eye diseases, Wound healing, Diarrhea, Dysentery, Asthma, Fever, Hepatitis, and Some viral diseases
17	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Laxative, Diuretic and Antipyretic
18	<i>Amaranthus viridis</i> L.	Amaranthaceae	Analgesic, Antipyretic, Fever, Diuretic, Laxative, Anti inflammatory, Antidiabetic, Anti oxidants, Anti cancer and Anti microbial
19	<i>Digera muricata</i> (L.) Mart.	Amaranthaceae	Prophylactic, Anti-microbial, Anti-oxidant, Anti-diabetic, Anti-testicular, Anthelmintic, Allelopathic and Defensive effects.
20	<i>Gomphrena serrata</i> L.	Amaranthaceae	Respiratory relief and Anti-Inflammatory
21	<i>Centella asiatica</i> (L.) Urban.	Apiaceae	Anti-oxidant, Anti-inflammatory and Wound healing.
22	<i>Hydrocotyle vulgaris</i> L.	Apiaceae	Fevers, Wounds, Skin diseases, Digestive issues, and Respiratory ailments like colds and coughs.
23	<i>Catharanthus roseus</i> (L.) G. Don	Apocynaceae	Leukemia, Hodgkin' and Breast cancer
24	<i>Acanthospermum hispidum</i> DC.	Asteraceae	Fever, Skin ailments, Infectious disease and Pain
25	<i>Ageratum conyzoides</i> L.	Asteraceae	Wounds, Skin infections and Fever, Antibacterial, Anti-inflammatory and Pain-

			relieving properties
26	<i>Chromolaena odorata</i> (L.) R.M. King & H. Rob.	Asteraceae	Heal wounds and Stop bleeding
27	<i>Cyathillium cinereum</i> (L.) H. Rob.	Asteraceae	Antibacterial, Anti-inflammatory and Antioxidant properties
28	<i>Ecliptaalba</i> (L.) Hassk.	Asteraceae	Enhances hair growth and Liver protection, Anti-inflammatory, Antibacterial and Antioxidant properties
29	<i>Parthenium Hysterophorus</i> L.	Asteraceae	Skin disorders, Fever and Wounds
30	<i>Sphagneticola trilobata</i> (L.) Pruski	Asteraceae	Anti-inflammatory, Analgesic, Antidiabetic, Antioxidant, Wound healing, and Antimicrobial.
31	<i>Synedrella nodiflora</i> (L.) Gaertn.	Asteraceae	Antimicrobial, Anti-inflammatory and Antioxidant properties
32	<i>Tridax procumbens</i> L.	Asteraceae	Woundhealing, Diarrhea, Dysentery, Bronchial catarrh, head ache, Liver disease, Anti diabetic, Anti bacterial and Anti inflammatory
33	<i>Vernonia albicans</i> DC.	Asteraceae	Treating filariasis, Eye infections, Wounds healing, Viral fevers, Tonsillitis, Dysentery, Urinary problems, Antimicrobial, Antioxidant and Anti-inflammatory
34	<i>Buglossoides arvensis</i> (L.) I.M. Johnst.	Boraginaceae	Diuretic, Anti-inflammatory and Anti-neuroinflammation.
35	<i>Heliotropium indicum</i> L.	Boraginaceae	Anti-inflammatory, Wound-healing, Antibacterial properties, Skin disorders, Fevers, Poisonous bites, Stomachaches, Diarrhea, Anti-tumor and Anti-inflammatory.
36	<i>Cleome rutidosperma</i> DC.	Cleomaceae	Analgesic, Antiinflammatory, Anti microbial, Anti oxidant, Wounds and Skin condition, Ear aches Deafness, Respiratory issues and Parasitic infection.

37	<i>Cleome viscosa</i> L.	Cleomaceae	Anthelmintic, Antiseptic, Carminative, and Febrifuge, Malarial fevers, Blood disorders and Skin diseases.
38	<i>Gynandropsis pentaphylla</i> (L.) DC.	Cleomaceae	Pain, Inflammation, Parasitic infections and Skin conditions.
39	<i>Commelina benghalensis</i> L.	Commelinaceae	Burns, Leprosy, Fever, Eye ailments, Laxative, Emollient and Demulcent.
40	<i>Commelina clavata</i> C.B.Clarke	Commelinaceae	Hypertension, Infertility, Sore throats and Burns.
41	<i>Cyanotis axillaris</i> (L.) D.Donex Sweet	Commelinaceae	Ascites, Abscesses, Fever, Ear infections, Tympanitis, Worms, Inflammation, Antifungal and Antimalarial.
42	<i>Evolvulus alsinoides</i> (L.) L.	Convolvulaceae	Memory-enhancing, Neuroprotective, Cough, Cold, fever, Dementia, anxiety, anti-inflammatory, antioxidant and cardiovascular.
43	<i>Evolvulus nummularius</i> (L.)L.	Convolvulaceae	Wound healing, anti-inflammatory, antibacterial, anthelmintic and sedative.
44	<i>Ipomoea cairica</i> (L.) Sweet.	Convolvulaceae	Inflammation, rheumatism, liver complaints, antimicrobial, antioxidant, neuroprotective, body rashes and purgative.
45	<i>Ipomoea triloba</i> L.	Convolvulaceae	Antibacterial, anti-diarrheal, and wound-healing.
46	<i>Merremia tridentata</i> (L.) Hallier f.	Convolvulaceae	Rheumatism, joint stiffness, inflammation, piles, swelling, urinary affections, laxative, anti-inflammatory, anti-arthritis, and anti-diabetic.
47	<i>Bryophyllum pinnatum</i> (Lam.) Oken	Crassulaceae	Renal failure and type II diabetes.
48	<i>Coccinia grandis</i> (L.) Voigt.	Cucurbitaceae	Anti-diabetic, antioxidant, skin diseases, jaundice, asthma and bronchitis.
49	<i>Cyperus rotundus</i> L.	Cyperaceae	Indigestion, diarrhea, bloating. painful periods, menstrual irregularities, fevers, wounds, weight management and diabetes.
50	<i>Fimbristylis</i> sp	Cyperaceae	Rheumatism, cough and bronchitis
51	<i>Kyllinga nemoralis</i>	Cyperaceae	Antivenom for snakebites, diabetes and skin

	(J.R.Forst. &G.Forst.) Dandyex Hutch. & Dalziel		issues like pruitus.
52	<i>Eriocaulon cinereum</i> R.Br.	Eriocaulaceae	Febrifuge, fevers and immune support.
53	<i>Acalypha indica</i> L.	Euphorbiaceae	Skin ailments, coughs, wounds healing, and alleviating gastrointestinal problems
54	<i>Acalypha ciliata</i> Forssk.	Euphorbiaceae	Diuretic, anti-diarrheal and anthelmintic agent.
55	<i>Croton bonplandianus</i> Baill.	Euphorbiaceae	Liver disorders, constipation, skin diseases, and hypertension
56	<i>Euphorbia heterophylla</i> L.	Euphorbiaceae	Bronchitis, asthma, skin diseases, gonorrhea, and gynecological disorders.
57	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Diarrhea, dysentery, asthma, bronchitis skin conditions like wounds and boils.
58	<i>Euphorbia notoptera</i> Boiss.	Euphorbiaceae	Wound healing, antimicrobial activity, anti- inflammatory, skin diseases, purgative, antivenom.
59	<i>Euphorbia thymifolia</i> L.	Euphorbiaceae	Worm infections, diarrhea, dysentery, asthma, bronchitis, skin diseases, wounds, laxative, antiviral, antioxidant, and anti-inflammatory.
60	<i>Alysicarpus monilifer</i> (L.)DC.	Fabaceae	Anti-inflammatory, skin diseases, fever, jaundice, kidney stones, antidote for snake bites, diuretic, eye and ear ailments and wound healing.
61	<i>Crotalaria pallida</i> Aiton.	Fabaceae	Urinary problems, fever, swelling of joints, anti-parasitic for intestinal worms, antioxidant, antibacterial, and anti-inflammatory.
62	<i>Crotalaria verrucosa</i> L.	Fabaceae	Fevers, indigestion, skin diseases, stomach pain, wounds, snakebites, and oral/throat disorders.
63	<i>Desmodium triflorum</i> (L.)DC.	Fabaceae	Dysentery, diarrhea, coughs, wounds, skin sores, fever, anti-inflammatory, stomach ache

			and indigestion.
64	<i>Indigofera linnaei</i> Ali.	Fabaceae	Digestive disorders, pain and inflammation, skin disorders, neurological disorders
65	<i>Indigofera prostrata</i> Willd.	Fabaceae	Digestive disorders, pain and inflammation, skin disorders, respiratory issues, infectious diseases and nervous disorder
66	<i>Rhynchosia minima</i> (L.)DC.	Fabaceae	Respiratory problems, chest pain, diarrhea, dysentery, anti-inflammatory, antioxidant properties, skin infections, hemorrhoids, and joint pain.
67	<i>Tephrosia purpurea</i> (L.) Pers.	Fabaceae	Liver disorders, skin conditions, asthma, bronchitis, anti-inflammatory, antioxidant and anti-diabetic.
68	<i>Enicostemma littorale</i> Blume	Gentianaceae	Anti-diabetic, fever, rheumatism, skin disorders, antimicrobial, antioxidant and anti-inflammatory
69	<i>Leucas aspera</i> (Willd.) Link	Lamiaceae	Antipyretic, anti-inflammatory, insecticide and psoriasis.
70	<i>Ocimum americanum</i> L.	Lamiaceae	Colds, fevers, stomach problems, diabetes, tuberculosis, antimicrobial, anti-inflammatory and antioxidant
71	<i>Ocimum basilicum</i> L.	Lamiaceae	Coughs, bronchitis, gastrointestinal problems, antioxidant, anti-inflammatory, antimicrobial, digestion, stress, and wound healing.
72	<i>Abutilon indicum</i> (L.) SW.	Malvaceae	Diarrhea, diabetes, inflammation, wound healing, laxative, diuretic, and analgesic properties.
73	<i>Corchorus aestuans</i> L.	Malvaceae	Headaches, pneumonia, stomach issues and various skin infections
74	<i>Pavonia zeylanica</i> (L.) Cav.	Malvaceae	Indigestion, diarrhea, scabies arthritis, joint pain and muscular sprains.
75	<i>Sida acuta</i> Burm.f.	Malvaceae	Fever, malaria, headaches, liver disorders and rheumatic conditions

76	<i>Sida cordata</i> (Burm. f.) Borss. Waalk.	Malvaceae	Wounds, piles, anti-diabetic, anthelmintic, hepatoprotective, and antioxidant.
77	<i>Sida cordifolia</i> L.	Malvaceae	Arthritis, rheumatism, joint pain, Parkinson's disease, ashtma, bronchitis, cough and nasal congestion
78	<i>Sida rhombifolia</i> L.	Malvaceae	Stomach and liver disorders, kidney stones, skin issues, wounds, fever, cough, cold, inflammation, anti-inflammatory, antioxidant, antimicrobial, and analgesic.
79	<i>Triumfetta rhomboidei</i> Jacq.	Malvaceae	Anti-inflammatory, anti-diabetic, antioxidant, anti-ulcer properties, skin disorders, wounds, dysentery, diarrhea, stomach ulcers, arthritis, cancer and diuretic.
80	<i>Urena lobata</i> L.	Malvaceae	Anti-inflammatory, antioxidant, antidiabetic, antimicrobial, gonorrhea, diarrhea, fevers, wounds and rheumatism.
81	<i>Waltheria indica</i> L.	Malvaceae	Coughs, dysentery, diarrhea, inflammation, wounds, and ulcers.
82	<i>Mimosa pudica</i> L.	Mimosaceae	Wound healing and skin disease
83	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Diuretic, renoprotective, laxative properties, asthma, constipation, cough and detoxifying body
84	<i>Boerhavia erecta</i> L.	Nyctaginaceae	Diuretic, stomachic, expectorant, asthma, coughs, febrifuge, laxative, jaundice, skin disorders and gonorrhea.
85	<i>Biophytum sensitivim</i> (L.) DC	Oxalidaceae	Asthma, diabetes, skin problems, anti-inflammatory, anti-diabetic, antioxidant, insomnia, convulsions, tumors and wound healing.
86	<i>Oxalis corniculata</i> L.	Oxalidaceae	Fever, diarrhea, parasitic worms, warts, boils, anti-inflammatory, astringent, diuretic, wound healing, poultices for snake bites, and

			headaches.
87	<i>Oxalis triangularis</i> A.St.Hil.	Oxalidaceae	Cuts, rashes, fevers, mouth sores and urinary tract infections
88	<i>Passiflora foetida</i> L.	Passifloraceae	Fever, skin issues, anxiety, insomnia coughs and digestive problems
89	<i>Pedaliium murex</i> L	Pedaliaceae	Impotence, nocturnal emissions, gonorrhea and leucorrhoea in women.
90	<i>Phyllanthus maderaspatensis</i> L.	Phyllanthaceae	Liver health, kidney health, anti-inflammatory, analgesic, fever and infections, anti-microbial, skin health, detoxification, nervous system and general health
91	<i>Phyllanthus niruri</i> L.	Phyllanthaceae	Gallstones, diuretic, inflammatory, anti microbial, and digestive disorders.
92	<i>Phyllanthus virgatus</i> G. Frost.	Phyllanthaceae	Skin problems, infections, liver and urinary tract disorders, antioxidant and antimicrobial properties.
93	<i>Rivina humilis</i> L.	Phytolacaceae	Wounds, skin diseases, respiratory and reproductive issues, antimicrobial, antioxidant and anti-inflammatory.
94	<i>Peperomia pellucida</i> (L.) Kunth	Piperaceae	Anti-inflammatory, analgesic, swelling, pain, headaches, mental fatigue, anti-microbial and antioxidant, urinary and reproductive health
95	<i>Bacopa monnieri</i> (L.) Wettst.	Plantaginaceae	Memory enhancement, neuroprotective: anti-anxiety and ADHD Support
96	<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Digestive problem, inflammation and skin issues.
97	<i>Agrostis gigantea</i> Roth.	Poaceae	Allergy tester and anti- cancer
98	<i>Apluda mutica</i> L.	Poaceae	Diarrhea and mouth sores in cattle. Diuretic, fevers, anti-inflammatory, anti-diabetic and antibacterial.
99	<i>Aristida hystrix</i> L.f	Poaceae	Cough, colds, skin ailments, stomach pain and digestive problem.

100	<i>Aristida adscensionis</i> L.	Poaceae	Skin disease, dysentery, gastrointestinal issues, menopausal symptoms.
101	<i>Arthraxon castratus</i> (Griff.) V.Naray.ex. Bor.	Poaceae	Anti-inflammatory and anti- cancer
102	<i>Axonopus compressus</i> (Sw.) P. Beauv.	Poaceae	Fever, colds, stomach problems, diabetes, antioxidant, hemorrhoids and antimalarial.
103	<i>Brachiaria distachya</i> (L.) Stapf.	Poaceae	Jaundice and kidney disorder.
104	<i>Brachiaria ramosa</i> (L.) Stapf.	Poaceae	Laxative, anti-allergic, indigestion and anti-inflammatory.
105	<i>Brachiaria setigera</i> (Retz.) C.E. Hubb.	Poaceae	Infectious diseases in livestock
106	<i>Chloris barbata</i> Sw.	Poaceae	Anti-inflammatory, wound healing, diuretic, fever, skin ailment and antioxidant.
107	<i>Cynodon dactylon</i> (L.) Pers	Poaceae	Diarrhea, dysentery, skin problems, cough, bronchitis, diabetes, pain, fever, inflammatory disorders, wound healing, antimicrobial and anti-inflammatory.
108	<i>Dactyloctenium aegyptium</i> (L.) P.Beauv.	Poaceae	Wounds and skin infections, diarrhea, ulcers, anti puritic, urinary ailments, skin condition and small pox treatment.
109	<i>Echinochloa colona</i> (L.) Link	Poaceae	Antidiabetic, antiulcer, antiseptic and wound healing.
110	<i>Ehrharta erecta</i> Lam.	Poaceae	Fodder grass for livestock
111	<i>Eleusine indica</i> (L.) Gaertn.	Poaceae	Anti-inflammatory, diuretic, antioxidant agent, rheumatism, inflammation, fever, jaundice, digestive issues, antimicrobial activity and wound healing.
112	<i>Eleusine indica</i> (L.) Gaertn.	Poaceae	Diuretic, anti-inflammatory, wound healing, pain relief and skin conditions
113	<i>Heteropogon contortus</i> (L.) P.Beauv.exRoem	Poaceae	Toothache, snakebites, measles, burns, wounds, rheumatism and diuretic.

	&Schult		
114	<i>Melinis repens</i> (Willd.) Zizka	Poaceae	Diabetes, enrich blood, reduce swelling and gonorrhea
115	<i>Paspalidium flavidum</i> (Retz) A.Camus	Poaceae	Hepatoprotective, gastroprotective, antioxidant and diuretic
116	<i>Pennisetum polystachion</i> (L.) Schult	Poaceae	Auria, blennorrhoea, painkiller, antioxidant and anti-inflammatory.
117	<i>Perotis indica</i> (L.) Kuntze.	Poaceae	Skin diseases, wounds and ulcers.
118	<i>Setaria palmifolia</i> (J.Konig) Stapf	Poaceae	Diarrhea, fever, toothache, irregular menstruation and postpartum.
119	<i>Themeda cymbaria</i> (Roxb.) Hack.	Poaceae	Mouth ulcers, indigestion, eczema, urinary disorders, cuts and wounds
120	<i>Polygala arvensis</i> Willd.	Polygonaceae	Fever, dizziness, asthma and diabetes
121	<i>Polygala erioptera</i> DC.	Polygonaceae	Gastrointestinal disorders and obesity- relates issues.
122	<i>Portulaca oleracea</i> L.	Portulacaceae	Dysentery, gastritis, burns, fungal infection, dysuria and kidney issues.
123	<i>Oldenlandia corymbosa</i> L.	Rubiaceae	Liver and skin disease infections and anti-inflammation
124	<i>Oldenlandia umbellata</i> L.	Rubiaceae	Asthma, bronchitis, poisonous bites, ulcers, antibacterial, anti-inflammatory, and antioxidant.
125	<i>Richardia scabra</i> L.	Rubiaceae	Skin diseases, wound healing and urinary tract Infections.
126	<i>Spermacoce hispida</i> Linn.	Rubiaceae	Wound healing, diabetes, inflammation, stomach problems, urinary issues, liver diseases, antioxidant, antibacterial, and anti-cancer.
127	<i>Physalis minima</i> L.	Solanaceae	Anti-inflammatory, analgesic, diuretic, inflammation, fever, digestive issues, anti-ulcer, anti-fertility, and anti-microbial.
128	<i>Solanum nigrum</i>	Solanaceae	Liver disorders, dermatitis, eczema, fevers,

	Linn.		stomach ulcers, asthma, inflammation and digestive issues.
129	<i>Cardiospermum halicacabum</i> L.	Sapindaceae	Anti-inflammatory, Analgesic, Antioxidant, Antimicrobial, Arthritis, Rheumatism, Eczema, Ringworm and Muscle aches.
130	<i>Bacopa monnieri</i> (Linn.) Pennell	Scrophulariaceae	Improve memory and Focus, reduce Anxiety, Antioxidant, Epilepsy, Alzheimer's disease, Anti-inflammatory and Antidepressant.
131	<i>Scoparia dulcis</i> L.	Scrophulariaceae	Diabetes, Skin issues, Gastrointestinal problems, Antioxidant, Anti-inflammatory, Fevers, Kidney stones and Snakebites
132	<i>Pilea microphylla</i> L.	Urticaceae	Antioxidant, Antimicrobial, Menstrual pain relief, Dysmenorrhea and Skin conditions
133	<i>Pouzolzia auriculata</i> Wight	Urticaceae	Cold, cough, Pain relief and Skin inflammation
134	<i>Tribulus terrestris</i> L.	Zygophyllaceae	Anti-diabetic, Antimicrobial, Antiviral, and Anti-inflammatory, Antioxidant and Kidney stones.

Grasses, specifically, were observed occupying nearly every open space across the campus. The ecological dominance of the Poaceae family is significant, as these species act as pioneer colonizers with extensive root systems that aid in soil binding and moisture retention. Their ability to produce high seed volumes and achieve rapid vegetative growth ensures their success in frequently disturbed environments. Additionally, families like **Asteraceae** and **Fabaceae**, which are rich in herbaceous weeds, are recognized for both their ecological resilience and their medicinal importance.

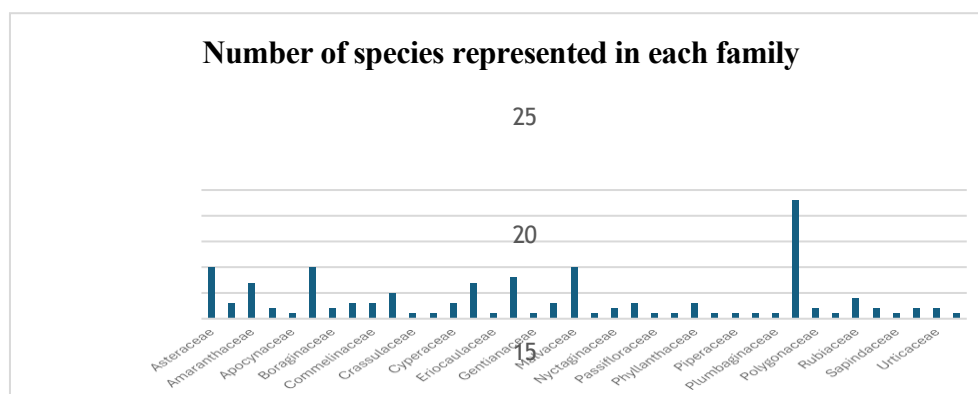
The diverse array of habitats within the college-including shaded groves, open grounds, flower beds, roadside patches, and neglected corners-creates specific micro-niches that support various weed communities. Certain species, such as *Tridax procumbens*, *Ageratum conyzoides*, and *Euphorbia hirta*, were found to be cosmopolitan, appearing throughout the entire campus. In contrast, species like *Centella asiatica* and *Peperomia pellucida* showed a clear preference for shaded, moist environments. This broad ecological adaptability highlights the highly dynamic and resilient nature of the campus weed vegetation.

3.2 Family-wise Distribution and Ecological Significance

The dominance of the Poaceae family at the Holy Cross College campus signifies the unique ability of grasses to flourish in nutrient-poor and disturbed soils, where they form dense mats that act as early colonizers and prevent soil erosion. Beyond their ecological role, grass species such as *Cynodon dactylon*, *Eleusine indica*, and *Pennisetum polystachion* are documented for their anti-inflammatory, antidiabetic, and wound-healing medicinal properties. This family-wise dominance varies by geography; for instance, a study by Dangwal et al. (2011) at the S.R.T. Campus in Uttarakhand, India, found Asteraceae to be the leading family, followed by Fabaceae and Amaranthaceae. Similarly, research at the Narasinha Dutt College campus in Howrah reported Asteraceae as the dominant group, followed by Amaranthaceae, Euphorbiaceae, Poaceae, and Scrophulariaceae (Pampa Chakraborty et al., 2020).

The Acanthaceae family, represented on campus by species like *Andrographis paniculata*, *Asystasiagangetica*, and *Barleria prionitis*, serves a dual role as shade-loving herbs that thrive under tree canopies and along moist drainage lines, while being traditionally used to treat fever and respiratory infections. Meanwhile, the Asteraceae family—including *Eclipta alba*, *Tridax procumbens*, and *Ageratum conyzoides*—flourishes in sunlit areas and drought conditions, acting as soil stabilizers and sources of antibacterial and antioxidant compounds. The Fabaceae family provides vital ecological services through nitrogen-fixing, which enriches the soil, while species such as *Tephrosia purpurea* and *Desmodium triflorum* offer therapeutic benefits for liver disorders and skin infections.

Furthermore, the Malvaceae family, featuring hardy perennials like *Sida acuta* and *Abutilon indicum*, contributes significantly to the flora across both moist and dry soils, with traditional applications for arthritis and diabetes. Ultimately, the distribution pattern of these families reflects a sophisticated interaction between ecological adaptation and ethnomedicinal value, representing a balanced mix of hydrophytic weeds in moist, shaded zones and xerophytic species in open, dry patches.

Graph:1 Species Richness in each Family

Diversity Pattern and Habitat Association

The weed flora in the study area exhibited distinct habitat preferences, reflecting a high degree of adaptability to various anthropogenic environments. Open lawns were primarily dominated by hardy species like *Tridax procumbens* and *Cynodon dactylon*, while moist, shaded zones—particularly those near drainage lines—provided the necessary conditions for *Centella asiatica*, *Peperomia pellucida*, and *Commelina benghalensis*. In contrast, cultivated and semi-managed garden patches were home to *Amaranthus viridis*, *Alternanthera sessilis*, and *Boerhavia diffusa*. The dry, fallow lands supported resilient species such as *Cleome viscosa* and *Sida acuta*, which are capable of withstanding intense sunlight and severe water scarcity. This variation across specific microhabitats demonstrates a balanced coexistence of both annual and perennial weeds, highlighting their ability to thrive within diverse ecological niches.

3.3 Medicinally Important Weeds

Of the 134 recorded species identified in the study area, nearly 90% possess documented medicinal properties (Table1), serving as a vital foundation for Ayurveda, Siddha, Unani, and various folk medicine systems. These plants are frequently utilized to treat a wide range of ailments, including respiratory disorders, gastrointestinal problems, skin diseases, and persistent fevers. Within the family Acanthaceae, species such as *Andrographis paniculata* are essential for managing liver disorders and diabetes, while *Barleria prionitis* is valued for its anti-inflammatory and wound-healing properties. Similarly, Asteraceae members like *Tridax procumbens* and *Eclipta alba* offer significant hepatoprotective effects, and *Chromolaena odorata* is relied upon for its ability to rapidly stop bleeding. Amaranthaceae species, including *Amaranthus spinosus* and *Aerva lanata*, provide diuretic benefits for kidney and urinary disorders, while Poaceae weeds like *Cynodon dactylon* are highly regarded for their antidiabetic and anti-inflammatory uses.

According to research reported by Rajeev Kumar Yadav and Nisha Verma (2020) at Bareilly College, Uttar Pradesh, India, Fabaceae species such as *Tephrosia purpurea* and *Crotalaria verrucosa* are effective in treating liver disorders, fevers, and various skin conditions. This therapeutic diversity extends to the Euphorbiaceae family, where *Euphorbia hirta* and *Acalypha indica* are used against asthma and bronchitis, and the Malvaceae family, where *Sida cordifolia* and *Urena lobata* are applied to treat arthritis and inflammation. Furthermore, aromatic Lamiaceae species like *Ocimum basilicum* and *Leucas aspera* provide antimicrobial and antioxidant activities for respiratory health. Because many of these medicinal weeds are abundant and grow year-round, they represent a highly accessible source for community-based traditional medicine, highlighting the immense, often overlooked therapeutic wealth contained within neglected regional flora.

Agricultural weeds are increasingly recognized as a significant resource in ethnopharmacology, with a notable correlation existing between weed families and those used for medicinal purposes (Stepp & Moerman, 2001). Beyond their role as pests, many weeds possess biomedical importance, serving as a primary source for the development of modern pharmaceuticals (Ali et al., 2021; Stepp, 2004). Specifically, species within the Asteraceae family found in agricultural settings have been identified for their high medicinal value (Jayasundera et al., 2021). These plants are often viewed as culturally and cognitively important resources by local farmers, rather than mere competition for crops (Cruz-Garcia & Price, 2012). Furthermore, certain weeds contribute to the economic and ecological health of farmland by repelling insect pests through their natural scents (Ekwealor et al., 2019). The presence of weeds may even act as a beneficial stressor for cultivated medicinal herbs, potentially increasing the production of secondary medicinal metabolites (Carrubba, 2017). Despite being overlooked in traditional pharmacopeias, weeds represent a critical, readily available resource for medicinal and nutritional needs (Sahrawat et al., 2020; Stepp, 2004).

3.4 Implications for Conservation and Education

Weeds are recognized as an essential source of medicine for indigenous people, playing a vital role in local healthcare and traditional knowledge systems (Ekwealor et al., 2019). Beyond medicinal value, weeds are significant for maintaining biological diversity within crop fields, providing necessary resources for various insect and bird populations (Marshall et al., 2003). In the context of sustainable farming, conservation agriculture (CA) aims to enhance sustainability without compromising land productivity, though it significantly influences how weed populations behave (Chauhan et al., 2012). Research suggests that conservation tillage technologies can actually increase the biodiversity of field

weeds, which contributes to a more resilient ecosystem (Winkler et al., 2022). Furthermore, the use of allelopathic traits from specific crops can be integrated with common control strategies to manage weed inhibition effectively within these conservation systems (Singh et al., 2014). However, weed management remains a complex challenge in conservation agriculture because high amounts of crop residue can make traditional mechanical weed control much harder to achieve (Basch et al., 2020). Ultimately, finding a balance through sustainable management is an important task, as changing weed dynamics require the fabrication of new and adaptive management options (Bajwa, 2014).

4 Summary and Conclusion

The research titled “Weed Species Diversity and Its Medicinal Uses in Holy Cross College Campus, Nagercoil, Kanyakumari District, TamilNadu” offers a detailed documentation of weed flora and their ethnomedicinal importance within the campus ecosystem. Identifying a total of 134 weed species across 38 families, the study reflects the region's rich floristic diversity, with Poaceae (23 species), Acanthaceae (10), Asteraceae (10), Malvaceae (10), and Fabaceae (8) emerging as the dominant families. This distribution suggests these families are exceptionally well-adapted to the campus's tropical, humid climate and varied microhabitats, ranging from lawns and drainage lines to shaded groves and wastelands.

Crucially, the study found that approximately 90% of these recorded weeds possess recognized medicinal properties, serving as traditional remedies for ailments such as respiratory disorders, digestive issues, skin diseases, and chronic inflammation. Families like Asteraceae, Acanthaceae, and Euphorbiaceae are notably rich in pharmacologically active species, with plants such as *Andrographis paniculata*, *Tridax procumbens*, and *Cynodon dactylon* being staples of folk and Ayurvedic medicine. Beyond their therapeutic value, these weeds are ecologically significant, helping to stabilize soil, conserve moisture, and support local pollinators. The link between their ecological dominance and medicinal value further suggests that the stress-tolerance mechanisms of these plants contribute to the production of potent bioactive compounds.

Ultimately, this study achieves its goal of reframing "weeds" as valuable reservoirs of phytochemicals rather than mere agricultural nuisances. By providing essential baseline data for future research in phytochemistry and pharmacognosy, the findings highlight the importance of educating students and the community on the ecological roles of these plants. Promoting such awareness is vital for the sustainable utilization and conservation of these overlooked resources, aligning with the broader objectives of environmental education and

biodiversity preservation.

References

1. Gamble, J.S., 1957, Flora of the Presidency of Madras, Adlard & Sons Ltd., London. (2):1 - 408.
2. Nair, N.C., Ambrose Nathaniel Henry., G. R., Kumari. & V. Chithra, 1983-1989, Flora of Tamil Nadu, India: Series 1: Analysis, Coimbatore: Botanical Survey of India (Department of Environment); 3 vols.
3. Pulliah. T., 2006, Encyclopaedias of world medicinal plants (vol 4), Regency Publications, New Delhi,
4. Dangwal L.R., Antima Sharma, Amandeep Singh, C.S. Rana & Tajinder Singh, 2011, Weed flora of S.R.T. Campus Badshahi Thaul Tehri Garhwal (H.N.B. Garhwal Central University, Uttarakhand), India, Pak. J. WeedSci.Res.17(4):387 - 396.
5. Pampa Chakraborty, Aditi Saha, Subhajit Bandyopadhyay & Tenzing Ngoden Bhutia, 2020, A Contribution to the medicinal weeds growing in the campus of narasimha Dutt College, Howrah, Journal of Commerce, Arts and Science, 3(1): 35 - 45.
6. Rajeev Kumar Yadav and Nisha Varma, 2020, Medicinal uses of common weed plants from Bareilly college, Bareilly campus, Uttar Pradesh, India, Plant Archives, 20(2), 3803 - 3808.
7. Ambasta, S.P., Ramachandran, K., Seth, K., & Rani, R. (1986). *The useful plants of India*. Publications & Information Directorate, Council of Scientific & Industrial Research. <https://nsl.niscpr.res.in/>
8. Parrotta, J. A. (2001). *Healing plants of peninsular India*. CABI Publishing. <https://archive.org/details/healingplantsofp0000parr>
9. ResearchGate. (2015). *Ethnobotanical survey of weeds in Kanyakumari district, Tamil Nadu*. https://www.researchgate.net/publication/327244795_Ethnobotanical_survey_of_medicinal_plants_in_Kanyakumari_District
10. Samal, I. P., Jena, S., & Mohanty, S. (2024). Study of medicinal and allelopathic effect of different weeds: A review. *Plant Science Today*, 11(1). <https://doi.org/10.14719/pst.2845>
11. Siddalinga Murthy, S.M., & Vidyasagar, G.M. (2013). Medicinal weed flora of sugarcane fields of Bidar district, Karnataka, India. *International Journal of Pharmacy and Pharmaceutical Sciences*, 5(2), 342 - 345. <https://innovareacademics.in/journals/index.php/ijpps/article/view/2892>
12. Srinivasan, R., Natarajan, D., & Kanimozhi, D. (2022). Ethnobotanical investigation of therapeutic plants in Tamil Nadu, India. *Acta Biologica Slovenica*, 65(1).

<https://doi.org/10.14720/abs.65.1.15758>

13. Verma, A. K., Kumar, M., & Bussmann, R. W. (2008). Medicinal plants in an urban environment: The medicinal flora of Banaras Hindu University, Varanasi, Uttar Pradesh. *Ethnobotany Research and Applications*, 6, 245 - 262.
<https://ethnobotanyjournal.org/index.php/era/article/view/174>
14. Ali, M.F., Jamil, M.A., & Adnan, M. (2021). Bio-medical importance of agronomic weeds: An overview. *International Journal of Pharmacy & Biomedical Research*.
https://www.researchgate.net/publication/351656082_Bio-medical_importance_of_agronomic_weeds_An_overview
15. Carrubba, A. (2017). Weed and weeding effects on medicinal herbs. In *Medicinal plants and environmental challenges*. Springer. https://www.researchgate.net/publication/313833770_Weed_and_Weeding_Effects_on_Medicinal_Herbs
16. Cruz-Garcia, G. S., & Price, L. L. (2012). Weeds as important vegetables for farmers. *Acta Societatis Botanicorum Poloniae*. <https://agro.icm.edu.pl/agro/element/bwmeta1.element.agro-220045d6-84d4-469d-8302-69f2913e6423>
17. Ekwealor, K.U., Echereme, C.B., & others. (2019). Economic importance of weeds: A review. *Asian Plant Research Journal*.
<https://doc.send2pub.com/api/v1/article/pdf/2019/6/28/5d15cb267e780.pdf>
18. Jayasundera, M., Florentine, S., & others. (2021). Medicinal value of three agricultural weed species of the Asteraceae family: A review. *Pharmacognosy Journal*.
https://www.researchgate.net/publication/350523450_Medicinal_Value_of_Three_Agricultural_Weed_Species_of_the_Asteraceae_Family_A_Review
19. Sahrawat, A., Rahul, S. N., Singh, S. K., & Patel, S. (2020). The potential benefits of weeds: A comparative study: A review. *International Journal of Chemical Studies*.
https://www.academia.edu/43207005/The_potential_benefits_of_weeds_A_comparative_study_A_review
20. Stepp, J. R. (2004). The role of weeds as sources of pharmaceuticals. *Journal of Ethnopharmacology*. https://www.researchgate.net/publication/8447814_The_role_of_weeds_as_sources_of_pharmaceuticals
21. Stepp, J.R., & Moerman, D. E. (2001). The importance of weeds in ethnopharmacology. *Journal of Ethnopharmacology*. https://www.researchgate.net/publication/11883398_The_importance_of_weeds_in_ethnopharmacology
22. Bajwa, A.A. (2014). Sustainable weed management in conservation agriculture. *Crop Protection*. <https://doi.org/10.1016/j.cropro.2014.07.014>

23. Basch, G., Teixeira, F., & Duiker, S. W. (2020). Weed management practices and benefits in Conservation Agriculture systems. *Advances in Conservation Agriculture*. <https://doi.org/10.19103/AS.2019.0065.11>
24. Chauhan, B.S., Singh, R.G., & Mahajan, G. (2012). Ecology and management of weeds under conservation agriculture: A review. *Crop Protection*. <https://doi.org/10.1016/j.cropro.2012.03.010>
25. Ekwealor, K.U., Echereme, C.B., et al. (2019). Economic importance of weeds: A review. *Asian Plant Research Journal*. <https://doc.send2pub.com/api/v1/article/pdf/2019/6/28/5d15cb267e780.pdf>
26. Marshall, E.J.P., Brown, V.K., Boatman, N.D., et al. (2003). The role of weeds in supporting biological diversity within crop fields. *Weed Research*. <https://onlinelibrary.wiley.com/doi/abs/10.1046/j.1365-3180.2003.00326.x>
27. Singh, V.P., Barman, K.K., Singh, R., & Sharma, A.R. (2014). Weed management in conservation agriculture systems. *Conservation Agriculture*. https://link.springer.com/chapter/10.1007/978-3-319-11620-4_11
28. Winkler, J., Dvořák, J., Hosa, J., Martínez Barroso, P., et al. (2022). Impact of conservation tillage technologies on the biological relevance of weeds. *Land*. <https://www.mdpi.com/2073-445X/11/10/1653>