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Documentation of Weed species from Sakti District, Chhattisgarh, India

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KEYWORDS

Weed diversity, agroecosystem, Sakti district, Chhattisgarh, floristic composition, weed management, biodiversity

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Abstract

The present study investigates the diversity and distribution of weed flora in the agricultural and nonagricultural landscapes of Sakti district, Chhattisgarh, India. Systematic field surveys were conducted across various locations representing both irrigated lowland and rainfed upland farming systems during 2023–2024. Quadrat sampling and monthly observations were employed to document seasonal variations and species composition. A total of 72 weed species belonging to multiple families were recorded, indicating rich floristic diversity in the study area. Dominant families included Asteraceae, Poaceae, Fabaceae, Amaranthaceae, and Cyperaceae, reflecting their high adaptability, reproductive efficiency, and ecological amplitude. The study highlights that weeds exhibit significant variation in distribution due to differences in soil moisture, cropping patterns, and anthropogenic disturbances. Several invasive and noxious species such as *Parthenium hysterophorus, Chromolaena odorata, Lantana camara, Cyperus rotundus,* and *Cynodon dactylon* were found to be widely distributed, posing serious threats to crop productivity and native biodiversity. In addition to their negative impacts, many weed species were found to possess medicinal properties, indicating their potential ethnobotanical importance. The findings emphasize that understanding weed diversity is crucial for developing effective and sustainable weed management strategies. Proper identification, monitoring, and ecological assessment of weeds can help minimize crop losses and enhance agricultural productivity while conserving biodiversity. This study provides baseline data for future ecological and agronomic research in the region.

Introduction

The study focuses on the assessment of weed diversity in the agricultural and nonagricultural landscapes of the Sakti region. Weeds play a crucial role in agro ecosystems, influencing crop yield, soil health, and overall farm productivity. Understanding the diversity and distribution of weeds in a specific region is essential for developing effective weed management strategies and promoting sustainable farming practices. Weeds are the unwanted plants that are the most underestimated crop pests. Weed is a plant growing where it is not desired (Chaudhary et al., 2025). Weeds are unsightly, useless, injurious plants and are

unwanted plants but all unwanted plants may not be true weeds. The beginning of weed production represents a serious constraint to worldwide agriculture but when left uncontrolled they can cause over 80% yield loss (Cousens and Mortimer, 1995). The weed flora of the agriculture field has a large ecological amplitude, so they multiply and flourish well even in different environmental conditions. Since weeds have unique potentialities for adaptation they survive almost in any environment. Weed plants are pioneer of land that increases the diversity of plants and agricultural land by utilizing the environmental potential. The diversity of plants increases by different cropping system and maximizes crop production. Study of weed biology was started at early 1930s. A study was performed by Pavlychenko (1937), and described the significance of weed and crop interaction. In northeast Bell et al. in 1962 published a series of "The Biology of Canadian Weeds", including more than 100 weed species to support the significance of weed in early 1970s (Bhowmik, 1997).

Many weeds has medicinal properties like like diuretic, dysentery, hepatoprotective enhances hair growth, sedative, antimelanogenic, hepatitis, respiratory analeptic, antihelmintic, asthma, hair loss, joint swelling, paralysis, baldness, itches, ulcer, bilious, cataract, rheumatism, cold, blood disorder, skin diseases, elephantiasis, fever, asthma, snake bite, influenza, kidney disease, night blindness, menstrual pain, larvicidal activity, hemorrhoids, ulcer, fever, nasal congestion, abdominal pain, nervous and heart disease, cough, malaria, worm, respiratory disease, tuberculosis, gastric disorder, headache, diarrhea, toothache, anxiolytic, hepatoprotective, antiulcer, anticancer, antimicrobial, antinociceptive, hypolipedemic, abortificient, chicken pox, bronchitis, intestinal helminthiasis, antiperiodic (Chouhan et al., 2025; Chaudhary and Khalkho 2025; Prakash and Khalkho 2025)

Materials and Methods

The present study was conducted in selected agricultural and nonagricultural fields at various locations of Sakti district, Chhattisgarh, India. The district is characterized by diverse agricultural landscapes comprising both wet (irrigated lowland) and dry (rainfed upland) farming systems. Prior to field surveys, detailed information regarding land use patterns, cropping practices, and irrigation status was collected to avoid difficulties during sampling and data collection. Special attention was given to the classification of land types, soil moisture conditions, and accessibility of sites. This approach ensured systematic coverage of representative fields and improved the accuracy and reliability of observations recorded during the study. A systematic field survey was conducted through frequent visits and repeated quadrat sampling over a period of one and a half years (2023–2024) to record weed diversity and distribution. Surveys were carried out monthly to capture seasonal variations in weed occurrence (Chaudhary et al., 2025).

Clear and detailed photographs of weed plants were taken during field surveys using a mobile phone camera. Images were captured from both near and distant views to document the overall habit and growth form of each weed species. Special emphasis was given to photographing diagnostic characters such as leaves, stems, flowers, fruits, and inflorescences, which are essential for accurate identification. Photographs were taken from multiple angles and at different growth stages to avoid misidentification. These visual records served as important supporting material for taxonomic confirmation and future reference during laboratory identification and documentation (Khalkho and Rai 2020).

Weeds were identified and confirmed from (8) and (10).

Result and Discussion

Scientific name	Family	Local name	Place of collection
***Acmella radicans* (Jacq.) R.K.Jansen**	Asteraceae	White spot flower	Kirari
***Achyranthes aspera* L.**	Amaranthaceae	Devil's horsewhip	Dabhara nawapara
***Acmella oleracea* (L.) R.K. Jansen**	Asteraceae	Buzz buttons	Gopalpur, chandrapur
***Ageratum conyzoides* L.**	Asteraceae	Chick weed	Sukhada
***Alternanthera sessilis* (L.)R.Br.**	Amaranthaceae	Sessile joyweed	Chandrapur
***Alternanthera philoxeroides* (mart.) griseb**	Amaranthaceae	Alligator weed	Gopalpur, chandrapur
***Alysicarpus monilifer* (L). DC**	Fabaceae	Moneyworts	Kharsia
***Argemone mexicana* L.**	Papaveraceae	Prickly poppy	Saposh
***Amaranthus spinosus* L.**	Amaranthaceae	Spiny pigweed	Kirari
***Andrographis paniculata* (Burm.f.) Nees**	Acanthaceae	Green chiretta	Gobra
***Antigonon leptopus* Hook. & Arn.**	Polygonaceae	Queen's wreath	Malkharauda
***Barleria buxifolia* L.**	Acanthaceae	Box leaved Barleria	Sukhada
***Bidens pilosa* L.**	Amaranthaceae	Cobblers pegs	Hasaud
***Blumea lacera* (Burm.f.) DC.**	Asteraceae	Kukraundha	Ghughri chhapora
***Calotropis procera* (Aiton) W.T. Aiton**	Apocynaceae	Giant milkweed	Jetha
***Cardamine flexuosa* With.**	Brassicaceae	Wood bitter-cress	Gopalpur, chandrapur
***Celosia argentea* L.**	Amaranthaceae	Plumed cockscomb	Saposh
***Centella asiatica* (L.) Urban**	Apiaceae	Indian pennywort	Kirari
***Chromolaena odorata* (L.) R.M. King & H. Rob.**	Asteraceae	Jack in the Bush	Gobra
***Cleome viscosa* L.**	Cleomaceae	Tick weed	Hasaud
***Coldenia procumbens* L.**	Boraginaceae	Creeoing coldenia	Chandrapur
***Coelachne simpliciuscula* (Wight & Arn. ex Steud.) Munro**	Poaceae	Small Marsh Millet	Sukhada
***Commelina benghalensis* L.**	Commelinaceae	Tropical spiderwort	Gopalpur, chandrapur

***Croton bonplandianus* Baill.**	Euphorbiaceae	Railway weed	Ghughri chhapora
***Cullen corylifolium* (L.) Medik**	Fabaceae	Bakuchi	Bhudanpur
***Cynodon dactylon* (L.) Pers.**	Poaceae	Bermuda grass	Gopalpur, chandrapur
***Cyperus compressus* L.**	Cyperaceae	Annual sedge	Kharsia
***Cyperus difformis* L.**	Cyperaceae	Rice sedge	Kirari
***Cyperus eragrostis* Lam.**	Cyperaceae	Umbrella sedge	Malkharauda
***Cyperus rotundus* L.**	Cyperaceae	Nutgrass	Hasaud
Dactyloctenium aegyptium	Poaceae	Crowfoot grass	Sukhada
***Dentella repens* (L.) J.R.Forst**	Rubiaceae	Creeping lickstoop	Ghughri chhapora
***Digitaria sanguinalis* (L.)**	Poaceae	Hairy crabgrass	Jetha
***Echinochloa colona* (L.) Link**	Paniceae	Jungle rice	Saposh
***Eclipta prostrata* (L.) L.**	Asteraceae	False Daisy	Bhudanpur
***Eleusine indica* (L.) Gaetn.**	Poaceae	Wiregrass	Kharsia
***Euphorbia hirta* L.**	Euphorbiaceae	Snakeweed	Chandrapur
***Euphorbia nutans* Lag.**	Euphorbiaceae	Eyebane	Gopalpur, chandrapur
***Euphorbia prostrata* Aiton.**	Euphorbiaceae	Dodhak	Gobra
***Evolvulus alsinoides* (L.) L.**	Convolvulaceae	Dwarf morning glory	Kirari
***Grangea maderaspatana* (L.) L. Poir**	Asteraceae	Madras carpet	Malkharauda
***Grona triflora* (L.) H. Ohashi & K. Ohashi**	Fabaceae	Creeping tick trefoil	Ghughri chhapora
***Hygrophila auriculata* Schumach.**	Acanthaceae	Gokulakanta	Adbhar
***Indigofera linnaei* Metcalf.**	Fabaceae	Birdsvilli indigo	Gobra
***Ipomoea triloba* L.**	Convolvulaceae	Littlebell	Gopalpur, chandrapur
***Lantana camara* L.**	Verbenaceae	Red or yellow sage	Bhudanpur
***Leonotis nepetifolia* (L.) R.Br.**	Lamiaceae	Christmas Candlestick	Ghughri chhapora
***Lindernia crustacea* (L.) F.Muell.**	Linderniaceae	Brittle false Pimpernel	Jetha

***Ludwigia perennis* L.**	Onagraceae	Evening Primrose	Malkharauda
***Mesosphaerum suaveolens* (L.) Kuntze**	Lamiaceae	Pignut	Adbhar
***Mimosa pudica* L.**	Fabaceae	Touch me not	Hasaud
***Oldenlandia herbacea* (L.) Roxb.**	Rubiaceae	Wild coriander	Kharsia
***Oxalis corniculata* L.**	Oxalidaceae	Creeping wood sorrel	Gopalpur, chandrapur
***Parthenium hysterophorus* L.**	Asteraceae	Congress grass	Saposh
***Persicaria lapathiflolia* (L.) Delarbre**	Polygonaceae	Pale persicaria	Kirari
***Phyla nodiflora* (L.) Greene**	Verbenaceae	Frogfruit	Chandrapur
***Phyllanthus niruri* L.**	Phyllanthaceae	Shatter stone	Sukhada
***Portulaca quadrifida* L.**	Portulacaceae	Chicken weed	Gobra
***Rungia muralis* Royle ex Nees**	Acanthaceae	Wall rungia	Ghughri chhapora
***Scorzonera humilis* L.**	Asteraceae	Viper's grass	Adbhar
***Senna tora* (L.) Roxb.**	Fabaceae	Sicklepod	Malkharauda
***Setaria verticillata* (L.) P.Beauv**	Poaceae	Bristly foxtail	Gopalpur, chandrapur
***Sida acuta* Burm.f.**	Malvaceae	Wireweed	Gobra
***Sida cordifolia* L.**	Malvaceae	Flannel weed	Jetha
***solanum virginianum* L.**	Solanaceae	Yellow fruit nightshade	Kirari
***Spermacoce ocymoides* Burm. f.**	Rubiaceae	Basil like button weed	Sukhada
***Torenia crustacea* (L.) Cham. & Schltdl.**	Linderniaceae	Malaysian false pimpernel	Saposh
***Trianthema portulacastrum* L.**	Aizoaceae	Black pigweed	Kharsia
***Tridax procumbens* L.**	Asteraceae	Coat button daisy	Chandrapur
***Urochloa ramosa* (L.) T.Q. Nguyen**	Poaceae	Dixie signalgrass	Gopalpur, chandrapur
***Xanthium strumarium* L.**	Asteraceae	Rough cocklebur	Kirari

Discussion and Conclusion

The present investigation revealed a rich diversity of weed flora in the study area, with 72 species distributed across multiple taxonomic families. The dominance of families such as Asteraceae, Poaceae, Fabaceae, Amaranthaceae, and Cyperaceae is consistent with earlier floristic studies, as these families are well known for their ecological adaptability, high reproductive capacity, and efficient dispersal mechanisms. The predominance of Asteraceae and Poaceae indicates their ability to thrive under varied environmental conditions, particularly in disturbed and agricultural habitats. Similar findings have been reported in other agroecosystems, where these families contribute significantly to weed diversity and dominance.

The present study provides a comprehensive account of the weed flora occurring across different localities of the study area, highlighting considerable diversity in terms of species composition, family representation, and spatial distribution. The documentation of a wide range of weed species belonging to numerous genera and families reflects the heterogeneous nature of habitats, including agricultural fields, fallow lands, roadsides, wastelands, and semi-natural ecosystems. Such diversity is indicative of favorable climatic conditions, variable soil types, and continuous anthropogenic disturbances that facilitate the establishment and persistence of weeds. Among the recorded taxa, families such as Asteraceae, Poaceae, Amaranthaceae, Fabaceae, and Cyperaceae were found to be dominant. The dominance of these families can be attributed to their efficient reproductive strategies, rapid growth, high seed production, and strong adaptive potential under diverse environmental conditions. Grasses and sedges, in particular, showed wide distribution across collection sites, emphasizing their ecological importance and competitive advantage in disturbed and cultivated habitats. The frequent occurrence of annual and perennial weeds further suggests their role in altering crop growth dynamics and nutrient availability. Several invasive and noxious weed species, including *Parthenium hysterophorus*, *Chromolaena odorata*, *Lantana camara*, *Cyperus rotundus*, and *Cynodon dactylon*, were commonly observed throughout the study area. The widespread presence of these species underscores their aggressive colonizing ability and highlights the ecological and economic threats they pose to agricultural productivity and native plant diversity. Their dominance may lead to reduced crop yields, displacement of indigenous flora, and long-term degradation of soil quality if left unmanaged.

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