Discovery

To Cite:
Sangale P, Mir SR. Assessment of floristic diversity from Kamshet and Adjoining regions of Maval Tehsil, Maharashtra, India. *Discovery* 2026; 62: e10d3249
doi: https://doi.org/10.54905/disssi.v62i340.e10d3249

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Peer-Review History
Received: 30 August 2025
Reviewed & Revised: 16/September/2025 to 27/March/2026
Accepted: 09 April 2026
Published: 18 April 2026

Peer-Review Model
External peer-review was done through double-blind method.

Discovery
pISSN 2278–5469; eISSN 2278–5450

Assessment of floristic diversity from Kamshet and Adjoining regions of Maval Tehsil, Maharashtra, India

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ABSTRACT

The present study investigates the floristic diversity of Kamshet and the surrounding regions of Maval Tehsil in Pune District, Maharashtra, India. Detailed field surveys were conducted during 2024–2025 across varied ecosystems, including forests, grasslands, roadside habitats, plateaus, and mountainous areas. Plant specimens collected during the survey were identified and authenticated using standard floras and taxonomic manuals. A total of 123 plant species belonging to 108 genera and 49 families were recorded, demonstrating significant taxonomic diversity. The families with the greatest species representation were Poaceae, Apocynaceae, Fabaceae, Convolvulaceae, Acanthaceae, Colchicaceae, Amaranthaceae, Araceae, and Asteraceae. Life form analysis revealed the presence of trees, shrubs, herbs, and climbers, with several species identified as endemic to the Western Ghats biodiversity hotspot. Biodiversity loss is a serious global concern, with current extinction rates estimated to be significantly higher than natural background levels, primarily due to anthropogenic pressures such as deforestation, habitat fragmentation, mining, and industrialization. The results of the present study emphasize the ecological significance of the region and reinforce the necessity for conservation prioritization. This baseline floristic assessment contributes valuable data for regional biodiversity documentation and provides a scientific foundation for conservation planning and sustainable management in Maval Tehsil. Furthermore, the documented plant diversity holds potential significance for traditional healthcare practices and future ethnobotanical studies.

Keywords: Floristic diversity, Kamshet, Endemic species, Biodiversity Conservation

1. INTRODUCTION

Plant taxonomy plays an important role in the identification and classification of species (Barkley et al., 2004). Both floristic and taxonomic studies provide valuable information regarding various aspects of an ecosystem, such as the distribution, nomenclature, ecology, and utility of plant species in a given area (Grime et al., 2014; Haq et al., 2023). Floristic diversity is an essential component of ecosystems, reflecting the composition of local flora and the variety of plant species present in a specific region (Hua et al., 2022; Qian et al., 2021). India is recognized as one of the twelve

mega biodiversity countries in the world and ranks sixth in terms of biodiversity richness. It includes four major terrestrial biodiversity hotspots: The Western Ghats, the Himalaya, Indo-Burma, and Sundaland (Wani & Pant, 2025). Botanical assessments, such as structural analysis of vegetation and floristic composition, are crucial for identifying key elements of plant biodiversity, conserving commercially important and threatened species, and supporting the management of protected areas (Wani & Pant, 2025; Anwar et al., 2019). Floristic studies are not merely traditional approaches; they are fundamental to understanding regional biodiversity and mitigating the impacts of anthropogenic disturbances. Such studies support a wide range of modern botanical research, including molecular taxonomic investigations of important genera, which require accurate species identification based on comprehensive floristic knowledge (Wagensommer, 2023). Efficient management and conservation of biodiversity depend on a thorough understanding of the diversity and composition of taxa contributing to the floristic richness of a region. Thus, floristic studies have played a significant role in botanical research, both historically and in contemporary times (Wagensommer, 2023; Wagensommer et al., 2014). Such studies are essential for documenting the complete plant diversity of any geographic region (Noss, 1983). In the absence of comprehensive floristic investigations, scientific understanding of plant distribution, composition, and community structure remains limited (Kier et al., 2005). Scientific documentation of vegetation parameters in biogeographical regions provides fundamental data for designing conservation strategies and biodiversity management policies. (Haq et al., 2023). However, the diversity, productivity, and resilience of forest ecosystems in the Western Ghats are increasingly threatened by a range of factors, including anthropogenic pressures such as overexploitation of forest resources and the spread of invasive species, as well as environmental factors and fire incidents (Haq et al., 2020). Therefore, floristic assessment and ecosystem-level conservation of forest vegetation are of critical importance. The findings of the present study can contribute to sustainable biodiversity management and habitat restoration, particularly in invaded habitats of Maval Tehsil in Pune District, Maharashtra.

2. MATERIALS AND METHODS

Study Area

In the present study, Kamshet and its adjoining regions in Maval Tehsil, Pune District, Maharashtra, were selected as the study area (Figure 1). The village of Kamshet is situated near the Sahyadri Mountains of the Western Ghats, at approximately 18.7630° N latitude and 73.5570° E longitude.

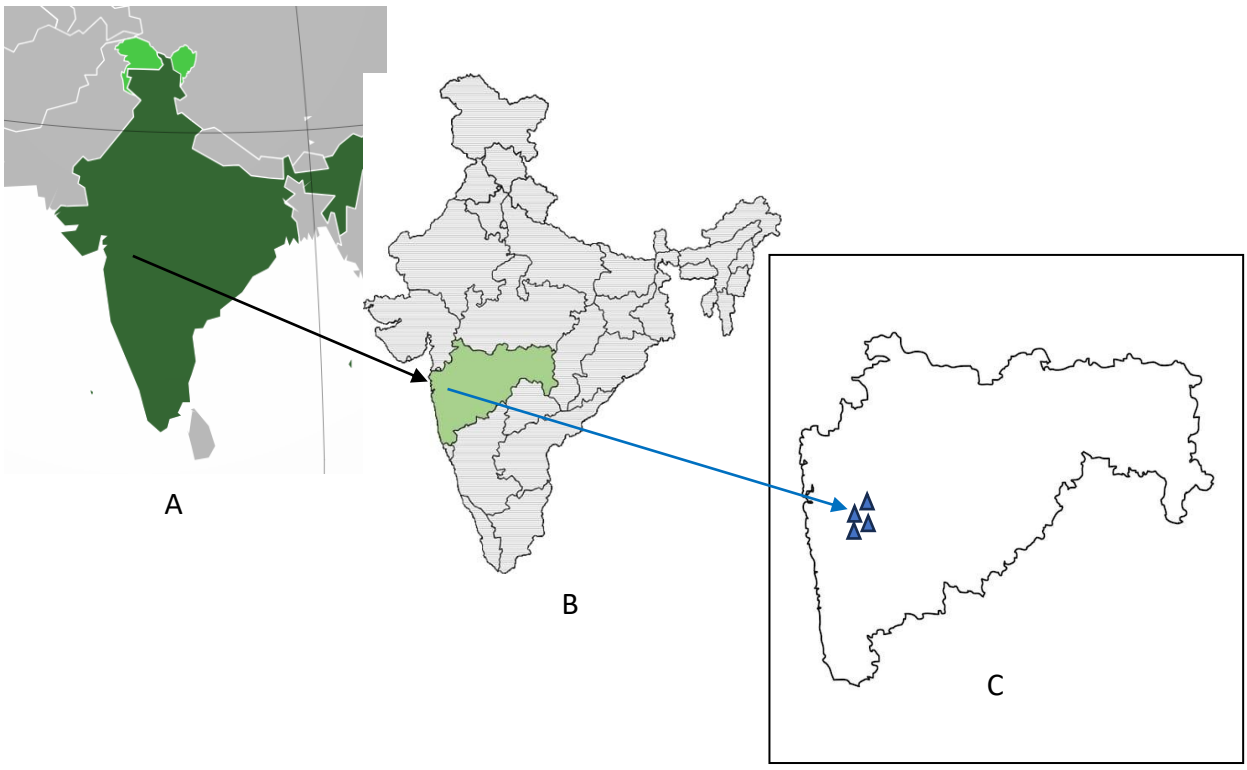

Figure 1. Distributional map of study area: Kamshet and adjoining regions of Maval tehsil in Pune district, Maharashtra, India.

Heavy rainfall during the monsoon season and the presence of historical sites such as Lohgad and Visapur forts, as well as ancient caves, make the area well known for its tourism significance (Kulkarni et al., 2015). The region is characterized by high mountains and steep gorges, which support a wide range of vegetation, including dense forests, and serve as a rich reservoir of endemic plant species (Smrithy et al., 2025; Saste & Bhagat, 2024).

Field survey and Data analysis

Thorough field surveys were carried out regularly from 2023 to 2025 to obtain detailed information on the study area (Magar et al., 2023). Field data were collected from various localities within the research region. During each field visit, detailed observations of plant specimens were systematically recorded (Sangale et al., 2025a). Plant specimens were collected and identified using standard taxonomic literature, floras, and manuals (Yadav & Sardesai, 2002; Singh & Karthikeyan, 2000; Singh et al., 2000). The identification of specimens was further authenticated by comparison with collections available at the Botanical Survey of India (BSI) herbarium, and voucher specimens were prepared accordingly. The collected specimens were processed following standard herbarium techniques (Deshpande et al., 2019). Botanical names were verified and updated in accordance with current nomenclature using authoritative databases such as IPNI (2024), the IUCN Red List (2024), and Plants of the World Online (POWO, 2025). The recorded data were systematically organized in tabular form, including scientific name, family, vernacular name, habitat, distribution pattern, and conservation status (More et al., 2025; Sangale et al., 2025a). All collected information was cross-checked with available literature to ensure accuracy and reliability (Agharkar, 1953; Chopra et al., 1969; Jain, 1991; More et al., 2024).

Table 1. Checklist of taxa reported in Kamshet and adjoining regions of Maval Tehsil.

Scientific Name	Family	Vernacular name (common)	Habitat	Pattern of distribution	Conservation status
Achyranthes aspera L.	Amaranthaceae	Apamarga	Shrub	Roadsides	Common
Aegle marmelos (L.) Corr.	Rutaceae	Bel / Bael	Tree	Roadside	Least Concern
Ageratum conyzoides L.	Asteraceae	Billygoat weed	Shrub	Roadside	Invasive weed
Alternanthera sessilis (L.) DC.	Amaranthaceae	Chibukata	Herb	Roadsides	Common
Alysicarpus pubescens J.S.Law	Fabaceae	One leaf clover	Herb	Grassland	Least Concern
Alysicarpus tetragonolobus Edgew.	Fabaceae	Winged bean / Kotro	Herb	Grassland	Common
Amorphophallus bulbifer (Roxb.) Blume.	Araceae	Voodoo lily / Suran	Herb	Forest	Vulnerable
Amorphophallus commutatus (Schott) Engl	Araceae	Naagphani	Herb	Forest	Least Concern
Anagallis arvensis L.	Primulaceae	Scarlet pimpernel	Herb	Plateaus	Least Concern
Andrographis lineata Wallich ex Nees.	Acanthaceae	Andrographis sp.	Herb	Roadside	Common
Andropogon pumilus Roxb.	Poaceae	Andropogon sp.	Herb	Grassland	Common
Arisaema flavum (Forssk.) Schott	Araceae	Satuwa / wild arum	Herb	Moist forest	Vulnerable
Arisaema murrayi (J.Graham.) Hook	Araceae	Cobra lily	Herb	Forest	Vulnerable
Aristida adscensionis L.	Poaceae	Threeawn	Herb	Grassland	Common
Asparagus racemosus Willd.	Asparagaceae	Wild Shatavari	Climber	Roadside	Least Concern
Atalantia racemosa Wight ex Hook.	Rutaceae	Makadlimbu	Shrub	Forest	Rare/Endemic

Bambusa vulgaris McClure	Poaceae	Bamboo	Tree	Forest	Least Concern
Barleria cristata Lam.	Acanthaceae	Philippine violet / Barleria	Shrub	Forest	Least Concern
Barleria prionitis L.	Acanthaceae	Porcupine flower	Shrub	Forest	Least Concern
Bigonea crenata Dryand.	Bignoniaceae	Bharangi	Herb	Rocky slope	Least Concern
Bombax ceiba L.	Malvaceae (Bombacaceae)	Semal / Silk cotton tree	Tree	Forest	Rare/Endemic
Butea monosperma (Lam.) Kuntze	Fabaceae	Palash	Tree	Forest	Least Concern
Calotropis gigantea (L.) Ait.	Apocynaceae	Akanda / Giant milkweed	Shrub	Roadside	Common
Canscora diffusa (Vahl) R.Br.ex.Roem.& Schult.	Gentianaceae	Kilwar	Herb	Roadside	Least Concern
Capillipidium assimile (Steud.)	Poaceae	Mountain scented top	Herb	Grassland	Common
Caralluma adscendens (Roxb.) Haw.	Apocynaceae	Shindadmakad	Herb	Rocky slopes	Least Concern
Carissa carandas L.	Apocynaceae	Karvand	Shrub	Forest	Least Concern
Carvia Callosa Nees.	Acantheaceae	Karvi	Shrub	Forest	Least Concern
Celosia argentea L.	Amaranthaceae	Kombada	Herb	Roadside	Common
Ceropegia bulbosa Roxb.	Apocynaceae	Kandilpushpi	Climber	Rocky slopes	Critical Endangered
Ceropegia sahyadrica Ansari & B.G.P.Kulk.	Apocynaceae	Kandilpush	Shrub	Rocky slopes	Endemic/Critical Endangered
Chloris barbata L.	Poaceae	Swollen fingergrass	Herb	Grassland	Common
Chlorophytum tuberosum (Roxb.) Baker	Asparagaceae	Safed musli-like	Herb	Hilly slop	Vulnerable
Chrysopogon aciculatus (Retz.) Trin.	Poaceae	Lovegrass	Herb	Grassland	Common
Clematis gouriana Roxb. Ex. DC	Ranunculaceae	Traveller's joy	Herb	Roadside	Least Concern
Clerodendrum serratum (L.) Moon	Verbenaceae	Bharangi	Herb	Forest	Least Concern
Colobrokea oppositifolia L.		Bhanman	Shrub	Forest	Vulnerable/ Endemic
Commelina communis L.	Commelinaceae	Keni	Herb	Grassland	Common
Crinum latifolium L.	Amaryllidaceae	Crinum lily	Herb	Hilly slop	Threatened
Crotalaria retusa L.	Fabaceae	Rattlepod	Herb	Grassland	Least Concern
Curculigo orchioides Gaertn	Hypoxidaceae	Kali musli	Herb	Moist forest	Least Concern
Curcuma pseudomontana Graham	Zingiberaceae	Wild turmeric	Herb	Forest	Least Concern
Cymbopogon distans (Nees) Wats.	Poaceae	Citronella grass	Herb	Grassland	Common
Cynodon dactylon (L.) Pers.	Poaceae	Bermuda grass / Doob	Herb	Grassland	Common

Digitaria biformis Willd.	Poaceae	Crabgrass-like	Herb	Grassland	Common
Digitaria stricta Roth ex Roem. & Schult.	Poaceae	Finger grass	Herb	Grassland	Common
Dioscorea oppositifolia L. var. tomentosa	Dioscoreaceae	Jangali Batata	Climber	Forest	Least Concern
Drimia indica (Roxb.) Jessop	Asparagaceae	Raan kanda	Herb	Hilly slop	Least Concern
Drosera indica L.	Droseraceae	Sundew	Herb	Wetlands	Threatened /Endemic
Echinochloa colonum (L.) Link	Poaceae	Jungle rice	Herb	Grassland	Common
Elaeagnus conferta Roxb.	Elaeagnaceae	Amboli	Tree	Forest	Endangered/ Endemic
Ensete superbum Cheesman	Musaceae	Wild banana	Shrub	Forest	Endangered/ Endemic
Eragrostis gangetica (Roxb.) Steud.	Poaceae	Lovegrass	Herb	Grassland	Common
Eriocaulon buergerianum Korn.	Eriocaulaceae	Pipewort	Herb	Marshy/ aquatic	Vulnerable
Erythrina variegata L.	Fabaceae	Indian coral tree	Tree	Forest	Rare
Exacum lawii C. B. Clarke	Gentianaceae	Chirayat	Herb	Rocky laterite	Vulnerable
Ficus racemosa L.	Moraceae	Cluster fig / Gular	Tree	Forest	Least Concern
Gloriosa superba L.	Colchicaceae	Agnishikha	Shrub	Forest	Endangered /Endemic
Gnidia glauca (Fresen.) Gilg	Thymelaeaceae	Piwala	Shrub	Forest	Rare
Habenaria grandifloriformis Blatt. & McCann	Orchidaceae	Amari bahuli	Herb	Pleateau	Vulnerable /Endemic
Habenaria heyneana Lindl.	Orchidaceae	Toothbrush orchid	Herb	Pleateau/ marshy	Rare
Hemidesmus indicus (L.) R.Br.	Apocynaceae	Anantamul	Climber	Forest	Least Concern
Heteropogon contortus (L.) P.Beauv.	Poaceae	Tanglehead	Herb	Grassland	Common
Holarrhena antidysenterica (L.) Wall ex Decne.	Apocynaceae	Kutaja	Tree	Forest	Threatened
Holarrhena pubescens Wall. ex G.Don	Apocynaceae	Kurchi	Tree	Forest	Least Concern
Impatiens balsamina L.	Balsaminaceae	Terda	Herb	Forest	Least Concern
Impatiens dalzellii Hook & Thomson	Balsaminaceae	Terda	Herb	Forest	Threatened/Endemic
Indigofera cordifolia L.	Fabaceae	Indian indigo	Herb	Grassland	Common
Iphigenia indica (L.) A.Gray ex Kunth	Colchicaceae	Ranlasani	Herb	Hilly slop	Vulnerable

Iphigenia magnifica Ansari & R. S. Rao	Colchicaceae	Ranlasani	Herb	Hilly slop	Vulnerable
Iphigenia pallida Baker	Colchicaceae	Ranlasani	Herb	Hilly slop	Endangered/Endemic
Ipomoea carnea L.	Convolvulaceae	Pink morning glory	Climber	Roadside	Invasive species
Ipomoea indica (Burm.) Merr.	Convolvulaceae	Blue morning glory	Climber	Roadside	Invasive species
Ipomoea marginata (Desr.) Verdc.	Convolvulaceae	Ipomoea sp.	Climber	Roadside	Invasive species
Ipomoea obescura (L.) Ker Gawl	Convolvulaceae	White morning glory	Climber	Roadside	Invasive species
Ipomoea quamoclit L.	Convolvulaceae	Cypress vine / Heen-malli	Climber	Roadside	Common
Isachne miliacea Roth	Poaceae	Swamp millet	Herb	Grassland	Least Concern
Ischaemum rugosum Salisb.	Poaceae	Satintail / Rice field grass	Herb	Grassland	Least Concern
Jasminum malabaricum Wight	Oleaceae	Raan Mogra	Shrub	Forest	Rare/ Endemic
Juncus articulatus L.	Juncaceae	Jointed rush	Shrub	Aquatic / wetland	Least Concern
Juncus maritimus Lam. (J. maritimus)	Juncaceae	Sea rush	Shrub	Aquatic / wetland	Least Concern
Lantana camera L.	Verbenaceae	Tantani	Shrub	Roadside	Invasive species
Ledebouria revoluta (L.f.) Jessop	Asparagaceae	Indian squill / Ledebouria	Herb	Hilly Slope	Least Concern
Leea indica (Burm. f.) Merr.	Vitaceae	Leea	Shrub	Forest	Least Concern
Leucas longifolia Benth	Lamiaceae	Thumba	Herb	Roadside	Least Concern
Madhuca indica J.F. Gmel.	Sapotaceae	Mahua	Tree	Forest	Endemic/ Rare
Mangifera indica L.	Anacardiaceae	Mango	Tree	Roadside	Least Concern
Memecylon umbellatum Burm. f.	Melastomataceae	Ironwood / Memecylon	Tree	Forest	Endemic / Rare
Momordica dioica Roxb. ex Willd	Cucurbitaceae	Spiny gourd / Kakrol	Climber	Forest	Least Concern
Murdannia semiteres (Dalzell) Santapau	Commelinaceae	Kilwar	Herb	Wetlands, marshy	Vulnerable
Nerium oleander Linn.	Apocynaceae	Oleander	Shrub	Roadside	Common
Ocimum tenuiflorum L.	Lamiaceae	Tulsi	Herb	Roadside	Least Concern
Oryza rufipogon Griff.	Poaceae	Wild rice	Herb	Marshy land	Threatened
Oxalis stricta L.	Oxalidaceae	Sour grass / Oxalis	Herb	Aquatic	Common
Oxystelma esculentum (L.f.) Sm.	Apocynaceae	climbing milkweed	climber	Deciduous forest	Least Concern
Panicum maximum Jacq	Poaceae	Guinea grass	Herb	Marshy land	Common
Pergularia daemia L.	Apocynaceae	Swet dudhani	Climber	Roadside	Common

Phyllanthus emblica L. (Emblica officinalis)	Phyllanthaceae	Amla / Indian gooseberry	Tree	Roadside	Least Concern
Phyllanthus niruri L.	Phyllanthaceae	Bhui amla / Chanca piedra	Herb	Roadside	Common
Pimpinella diversifolia DC.	Apiaceae	Dongarjira	Herb	Hilly slop	Least Concern
Pinda concanensis (Dalzell) P.K.Mukh. & Constance	Apiaceae	Konkan pinda	Shrub	Pleateau	Endangered/Endemic
Piper nigrum L.	Piperaceae	Black pepper	Climber	Forest	Threatened
Plumeria alba L.	Apocynaceae	Frangipani	Tree	Roadside	Common
Rauvolfia serpentina (L.) Benth ex Kurz.	Apocynaceae	Sarpagandha	Climber	Forest	Vulnerable
Saccharum officinarum L.	Poaceae	Wild sugarcane	Herb	Marshy land	Least Concern
Santalum album L.	Santalaceae	Sandalwood	Tree	Forest	Vulnerable
Setaria glauca (L.) P. Beauv	Poaceae	Yellow foxtail	Herb	Roadside	Common
Setaria verticillata (L.) P. Beauv.	Poaceae	Bristly foxtail	Herb	Roadside	Common
Smithia purpurea Hook.	Fabaceae	Barka	Herb	Rocky Plateaus	Least Concern
Smithia sensitive Aiton	Fabaceae	sensitive smithia	Herb	Grasslands,	Least Concern
Solanum anguivi Lam.	Solanaceae	African bitterberry	Herb	Roadside	Common
Sorghum halepense (L.) Pers	Poaceae	Johnson grass	Herb	Roadside	Invasive species
Sphaeranthus indicus L.	Asteraceae	Gorakhmundi	Herb	Paddy rice field	Least Concern
Sterculia foetida L.	Malvaceae	Java olive / Wild almond	Tree	Forest	Least Concern
Syzygium cumini (L.) Skeels.	Myrtaceae	Jamun / Java plum	Tree	Forest	Least Concern
Tamarindus indica L.	Fabaceae	Tamarind	Tree	Roadside	Least Concern
Tectona grandis L.	Lamiaceae (Verbenaceae historically)	Teak/ Saag	Tree	Forest	Least Concern
Tephrosia purpurea (L.) Pers.	Fabaceae	Unhali	Herb	Roadside	Common
Terminalia arjuna Roxb. Ex. DC. Wight & Arn.	Combretaceae	Arjun	Tree	Forest	Vulnerable
Terminalia bellirica (Gaertn.) Roxb.	Combretaceae	Bahera	Tree	Forest	Threatened
Tinospora cordifolia (Wild) Miers	Menispermaceae	Guduchi	Climber	Roadside	Least Concern
Trichodesma indicum L.	Boraginaceae	Indian borage	Herb	Roadside	Common
Tricholepis amplexicaulis C.B.Clarke	Asteraceae	Thistle	Herb	Grassland	Common
Tylophora indica (Burm.	Apocynaceae	Tylophora sp.	Climber	Forest	Critical Endangered

f.) Merr.					
Vigna khandalensis (Santapau) Sundararagh. & Wadhwa	Fabaceae	Raanmung	Shrub	Roadside	Rare/Endemic
Vigna vexillata (L.) A.Rich.	Fabaceae	Wild cowpea	Shrub	Roadside	Least Concern
Vitex negundo L.	Lamiaceae	Nirgundi / Chaste tree	Shrub	Roadside	Least Concern
Woodfordia fruticosa L. Kurz	Lythraceae	Dhataki / Fire flame bush	Shrub	Forest	Endemic/ Vulnerable
Zizyphus jujube Mill.	Rhamnaceae	Bor	Tree	Roadside	Least Concern

3. RESULTS

The ecosystems and vegetation patterns of Kamshet and the surrounding regions exhibit considerable variation in habitat and vegetation. The grasses, sedges, orchids, legumes, lianas, climbers, and several unique trees dominate the plains, mountains, and plateau regions. In the present survey, a total of 123 species belonging to 108 genera and 49 families were recorded. All reported taxa (genera, species, and infraspecific taxa) were arranged alphabetically under their respective families following standard taxonomic treatment (Rahangdale and Rahangdale, 2017). The recorded species were classified into major clades according to the APG IV system, including Monocots, Eudicots, Core Eudicots, Rosids, Eurosids I, Eurosids II, Asterids, Euasterids I, and Euasterids II, along with some unplaced groups. Detailed information is provided in Table 1 & Table 2, including botanical name, common name, family, habit, distribution pattern, and conservation status.

Table 2. Classification of the families by the APG IV major clades, along with species belonging to each family

APG IV Clades	**Families Names**	**Number of Species per families**
Monocots	Araceae, Asparagaceae, Commelinaceae, Hypoxidaceae, Juncaceae, Musaceae, Orchidaceae, Poaceae, Zingiberaceae, Amaryllidaceae, Colchicaceae (note below)	2, 4, 2, 1, 2, 1, 2, 12, 1, 1, 3
Eudicots	Ranunculaceae	1
Core Eudicots	Moraceae, Oxalidaceae	1, 1
Rosids (Fabids/Eurosids I)	Fabaceae, Rhamnaceae	5, 1
Rosids (Malvids/Eurosids II)	Malvaceae, Rutaceae, Vitaceae, Elaeagnaceae, Lythraceae, Thymelaeaceae	2, 2, 1, 1, 1, 1
Asterids (Lamiids/Euasterids I)	Acanthaceae, Apiaceae, Apocynaceae, Boraginaceae, Convolvulaceae, Lamiaceae, Oleaceae, Verbenaceae, Gentianaceae	4, 2, 11, 1, 5, 3, 1, 3, 2
Asterids (Campanulids/Euasterids II)	Asteraceae, Combretaceae, Cucurbitaceae, Melastomataceae, Myrtaceae, Sapotaceae, Solanaceae	3, 2, 1, 1, 1, 1, 1
Unplaced/Other	Droseraceae, Eriocaulaceae, Menispermaceae, Piperaceae, Primulaceae, Phyllanthaceae, Santalaceae, Dioscoreaceae	1, 1, 1, 1, 1, 2, 1, 1

The taxonomic distribution of species in the dataset reveals that 11 families represent monocotyledons and exhibit relatively high species richness, indicating their dominance in the study area. The family Poaceae shows the highest representation among monocots, with 12 species, highlighting the ecological abundance of grasses in the region. Other monocot families, such as Asparagaceae, Orchidaceae, and Amaryllidaceae, contribute moderately to species diversity, reflecting a range of ecological conditions that support both terrestrial and specialized taxa. Within the basal eudicots, Ranunculaceae is minimally represented, with only one species. Among the core eudicots, Moraceae and Oxalidaceae are each represented by a single species, indicating limited occurrence in the region. The

major clade Rosids is further divided into Eurosids I and Eurosids II. In Eurosids I, Fabaceae (5 species) and Rhamnaceae (1 species) are represented. Eurosids II comprises six families, including Malvaceae and Rutaceae (2 species each), while Vitaceae, Elaeagnaceae, Lythraceae, and Thymelaeaceae are each represented by a single species. The Asterids represent a highly evolved and widely distributed clade in the study area. Within Euasterids I, Apocynaceae (11 species) and Convolvulaceae (5 species) are particularly dominant, while families such as Lamiaceae, Verbenaceae, and Acanthaceae show moderate representation. In Euasterids II, Asteraceae (3 species) and Combretaceae (2 species) are comparatively well represented. Additionally, several families, including Droseraceae, Piperaceae, Phyllanthaceae, and Dioscoreaceae, fall under unplaced or other groups, each represented by one or two species. These taxa may represent relatively less common or evolutionarily distinct lineages within the APG IV classification system.

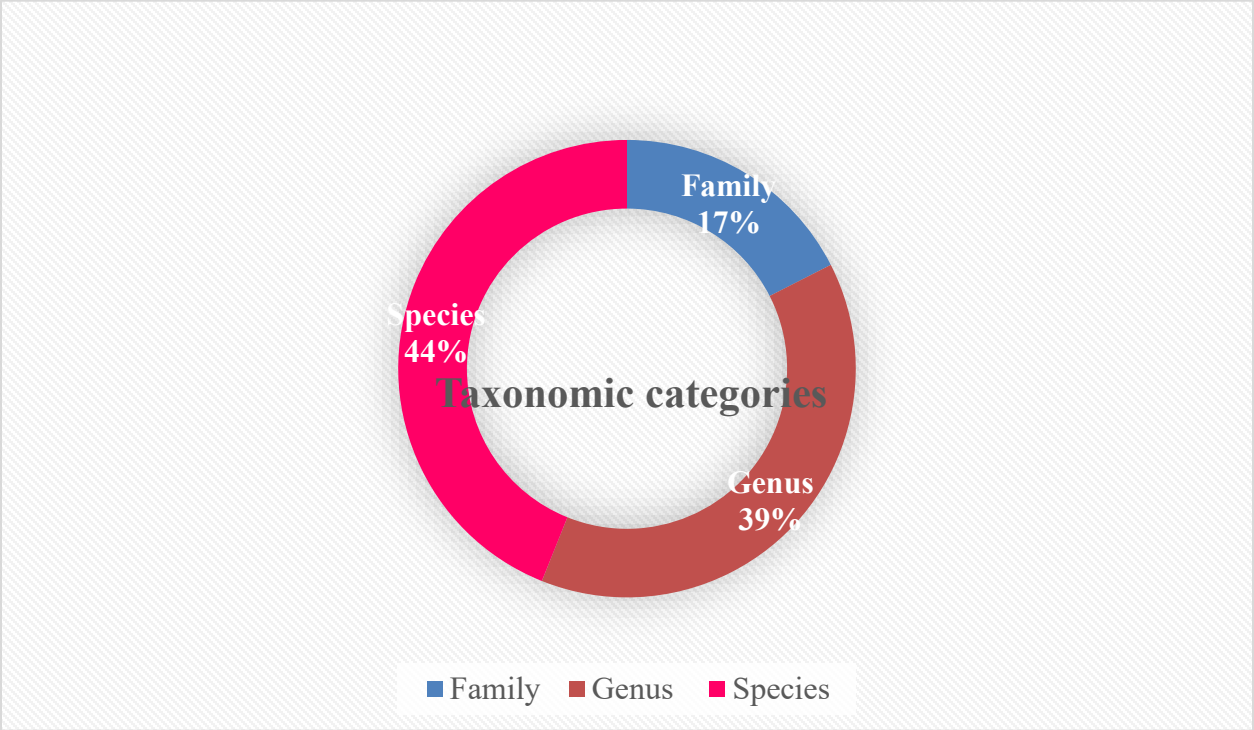

Figure 2. Shows the total % of families across the genus % and their species%

The taxonomic hierarchy, including family, genus, and species levels, has been used to treat all species systematically. Following the taxonomic hierarchy, a total of 123 species (44%), 108 genera (39%), and 49 families (17%) were reported (Figure 2).

The most specious families (Figure 3) and frequently or abundantly observed taxa in this study area were the Poaceae (17 species), Apocynaceae (14 species), Fabaceae (10 species), Convulvulaceae (5 species), Asparagaceae (4 species), Colchicaceae (4 species), Acanthaceae (4 species), Araceae (4 species), Lamiaceae (3 species) and Asteraceae (3 species). Data from Figure 4. Poaceae family has recorded the highest number of species (17), followed by Apocynaceae (14), Fabaceae (10), Convulvulaceae (5), Colchicaceae (4), Araceae (4), Acanthaceae (4), Asparagaceae (4), Amaranthaceae (3), Lamiaceae (3), Asteraceae (3), Commelianaceae (2), Verbenaceae (2), Balminaceae (2), Phyllanthaceae (2), Apiaceae (2), Ochidaceae (2), Rutaceae (2), Malvaceae (2), Gentiniaceae (2), Combretaceae (2), Juncaceae (2), and remaining members of each family found (1) species respectively.

Distribution patterns of plant species across different growth habits (Figure 5) include herbs, shrubs, climbers, and trees in Kamshet and the surrounding areas. Herbs are the dominant group with 62 species (50%), suggesting that the area is home to a wide variety of herbaceous vegetation. A total of 24 shrub species (20%) were recorded, indicating moderate representation and the presence of intermediate vegetation strata. The arboreal component, which contributes to the structural integrity of the ecosystem, is reasonably well developed, with 21 tree species (17%). Climbers represent the least abundant group, comprising 16 species (13%).

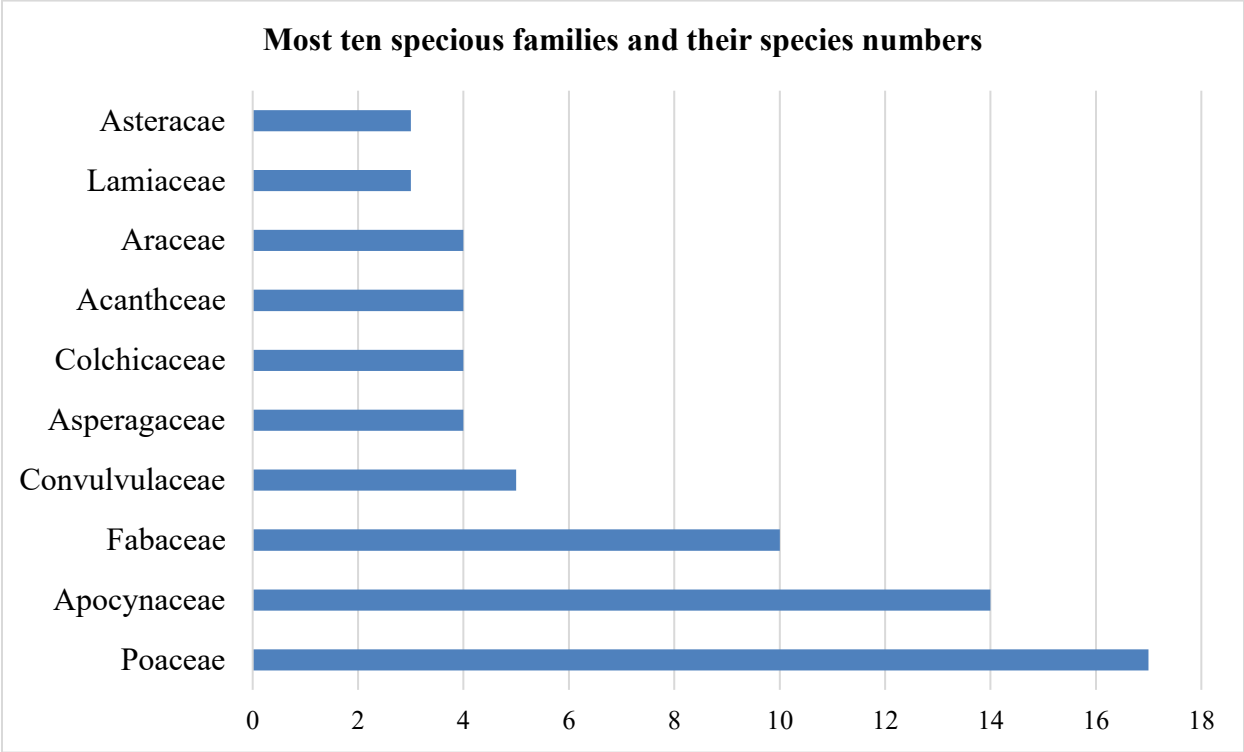

Figure 3. Showing the most specious families across species numbers.

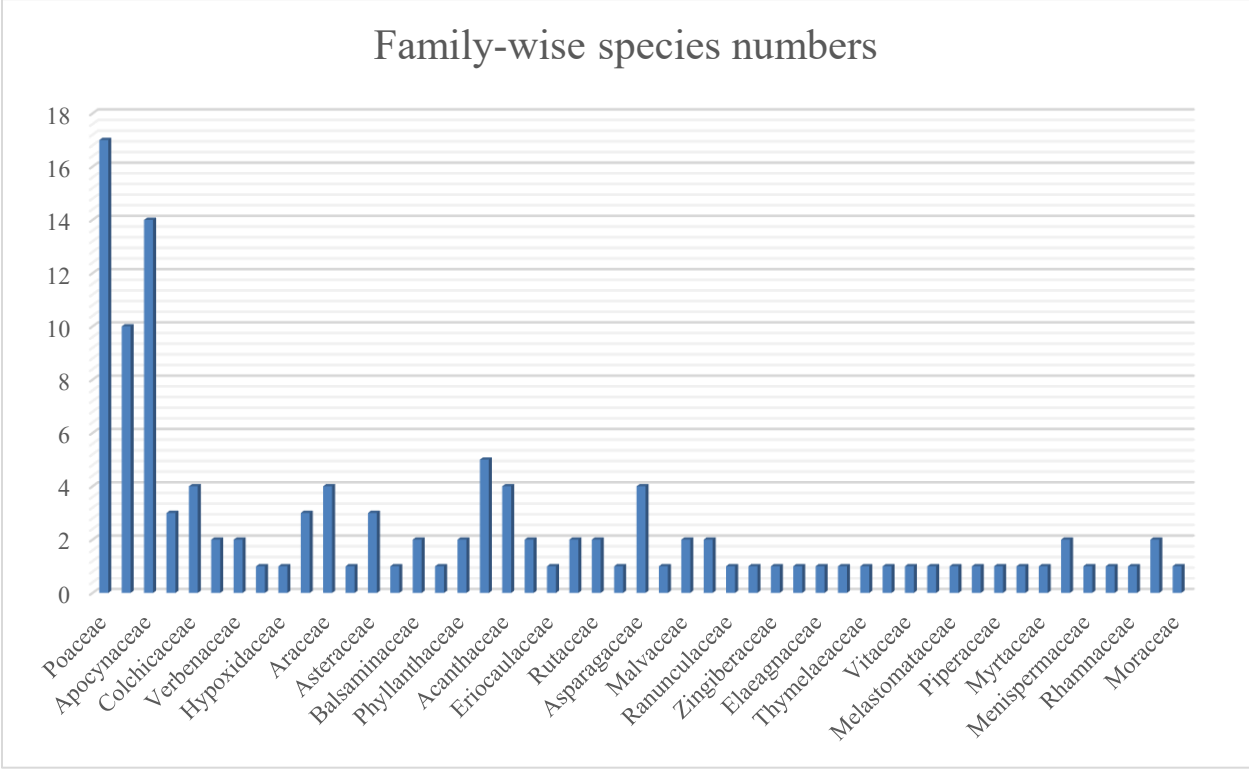

Figure 4. Shows the total number of families and their species.

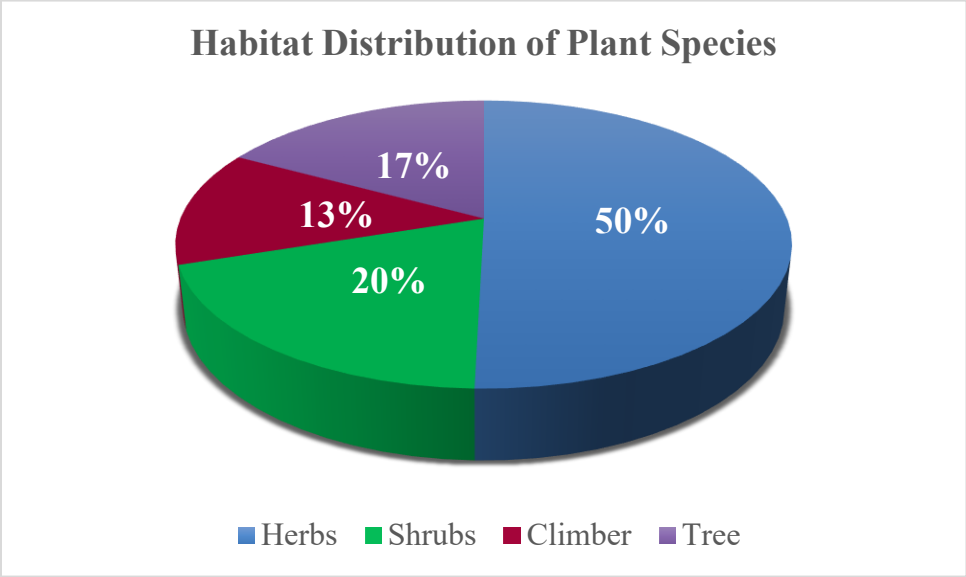

Figure 5. Habitat distribution of plant species and their numbers

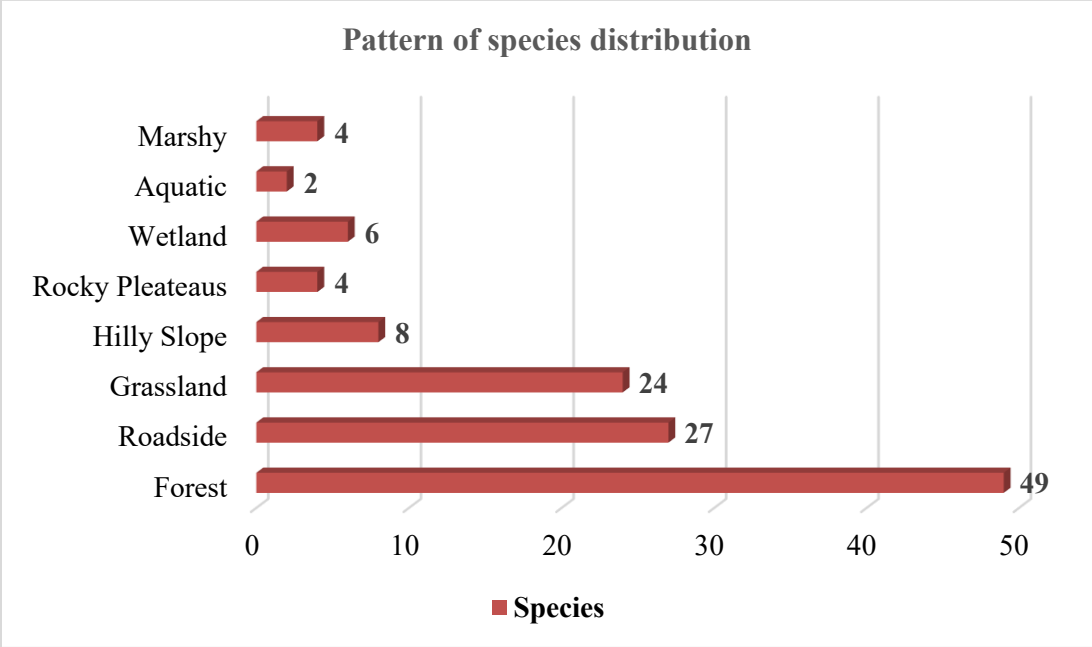

Figure 6. Pattern of species distribution from the study areas.

Table 3. Status of threatened plants and the number of species from the study areas.

Threatened Category	Number of Species	Percentage (%)
Least Concern	62	35.84%
Common	41	23.70%
Endemic	17	9.83%
Vulnerable	18	10.40%
Rare	10	5.78%
Endangered	7	4.05%
Critically Endangered (CR)	4	2.31%
Threatened	6	3.47%
Invasive species	8	4.62%

Data obtained from Figure 6 indicate that Kamshet and the surrounding regions of Maval Tehsil display distinct patterns of species distribution influenced by geographical location, climate, rainfall, and habitat diversity. A total of 123 species were documented across various habitats, including wetlands, marshy areas, rocky plateaus, roadsides, grasslands, hilly slopes, and forests. The highest number of species was recorded in forest habitats (49 species), followed by roadside or barren areas (27 species) and grasslands (24 species). Comparatively lower species richness was observed in hilly slopes or mountainous areas (8 species), wetlands (6 species), rocky plateaus (4 species), marshy areas (4 species), and aquatic habitats (2 species).

Kamshet and the surrounding regions of Maval Tehsil are rich in biodiversity and exhibit a high degree of endemism associated with the Western Ghats of Maharashtra. Previous taxonomic studies have reported a large number of indigenous and threatened plant species from these areas. However, a significant portion of biodiversity in these areas has recently declined due to high levels of exploitation and various anthropogenic activities. As a result, numerous plant species in these areas are at risk of extinction, highlighting the urgent need to conserve endemic and threatened taxa before they disappear. Data derived from Table 3 indicate that, in these areas, the majority of recorded species fall under the Least Concern category, with 62 species (35.84%), followed by Common species (41 species; 23.70%), Endemic species (17 species; 9.83%), Vulnerable species (18 species; 10.40%), Rare species (10 species; 5.78%), Threatened species (6 species; 3.47%), Endangered species (7 species; 4.05%), Critically Endangered species (4 species; 2.31%), and Invasive species (8 species; 4.62%), respectively.

4. DISCUSSION

Western Ghats is a plant biodiversity hotspot. This region has a large number of naturally occurring endangered and threatened plants (Auti et al., 2020). It is estimated that nearly 47,513 plant species, accounting for approximately 11.4% of the world's flora, are found in India (Singh & Dash, 2014 Approximately 43% of angiosperms have been identified and documented as medicinal plants (Pushpangadan, 1995; Upadhyay et al., 2007). The diversity of native and endemic medicinal plants has played a significant role in the use of herbal and traditional remedies among forest-dwelling communities (More et al., 2025; Sangale et al., 2025b; Samudra and Shinde, 2021). Some areas of Western Ghats are particularly important as they serve as habitats for numerous threatened species, many of which are listed as endangered by the IUCN (Gunawardene et al., 2007; Bharucha et al., 2010). Previously abundant plant species have been subjected to continuous exploitation, resulting in the extinction of some species and placing many others at risk of extinction (Sangale et al., 2025b). With the increasing demand from pharmaceutical industries and the growing use of herbal remedies, several plant species have become threatened and may require classification as endangered or even critically endangered. Therefore, it is essential to take urgent measures to conserve plant diversity and ensure their protection through appropriate legal frameworks (Mehta et al., 2020).

5. CONCLUSION

Nowadays, the rapid growth of the human population has increased, resulting in an accelerated search for new plant resources. Additionally, the areas are rich in natural plant diversity, which s serves a variety of purposes, including food, fiber, fodder, medicine, spices, and dyes. The present investigation was undertaken to survey and document endemic, endangered, and native plant species in Kamshet and its adjoining regions in Maval Tehsil in the Western Ghats. These regions are increasingly impacted by anthropogenic disturbances, which has led to the inclusion of several species under the rare, endangered, and threatened (RET) category. To date limited studies have been conducted on the systematic collection and documentation of the floristic plant diversity in this region; therefore, it is necessary to establish and maintain a detailed plant database for the benefit of future generations.

Acknowledgement

The author sincerely thanks the authorities, Principal, and Head of the Department of Botany, Prof. Ramkrishna More Arts, Commerce and Science College, Akurdi, Pune. The author is also thankful to the Department of Forest, Pune Division, for providing guidance and permission for this study.

Author Contributions

This manuscript has been read and approved by all the authors. Each of the authors believes that this manuscript represents honest work done by us.

Informed consent

Not applicable.

Conflicts of interests

The authors declare that they have no conflicts of interest, competing financial interests or personal relationships that could have influenced the work reported in this paper.

Ethical approval & declaration

In this article, as per the plant regulations followed in the Department of Botany, Prof. Ramkrishna More Arts, Commerce, and Science College, Akurdi, Pune, and Savitribai Phule Pune University, Pune. The ethical guidelines for plants and plant materials are followed in this study for species collection and identification.

Funding

This study has received funding under the CSMNRF fellowship, by Chhatrapati Shahu Maharaj Research Training and Human Development Institute, Pune, Maharashtra. India. (File No. CSMNRF 2023/2024-25/1773).

Data and materials availability

Data that support the findings of this study are embedded within the manuscript.

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