

# Xerophytic Flora of Ballari District

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## Abstract:

The vegetation of Ballari falls under dry deciduous and scrub with arid, and semiarid condition, less rainfall and high temperature. The current study enumerates about 33 xerophytic plants which contains 21 families, Solanaceae is the most dominant family with 5 species (29.4%) followed by Euphorbiaceae with 3 species (17.6%) and Rhamnaceae with 3 species (17.6%) from the study area which shows diverse wealth values such as medicinal properties, ornamental significance, xerophytic adaptations.

**Keywords** — Succulents, Xerophytic flora, Arid, Diversity, Ballari District

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## Introduction: Xerophytes are a fascinating group of flora that have adapted to survive in arid and semi-arid regions environment (Anjali Mehra 2022).

One of the most distinctive features of xerophytes is their array of structural and physiological adaptations that minimize water loss and maximize water uptake. These adaptations are essential for their survival in habitats where other plants would quickly perish. Among the most notable adaptations is the development of thick, waxy cuticles on leaves and stems, reduced leaf surface area, needle-like, or even absent, significantly reduces water loss through transpiration (Fatima *et al.* 2018). Presence of specialized cells and tissues that store water possess fleshy leaves or stems that can hold substantial amounts of water and store in their thick, ribbed stems, allowing them to endure prolonged periods of drought.

The ecological significance of xerophytic plants cannot be overstated. They play a crucial role in stabilizing soil and preventing erosion in their arid habitats, provide essential resources for various desert-dwelling animals, including food and shelter. Many xerophytes are also of great medicinal and cosmetic properties and economically importance to humans.

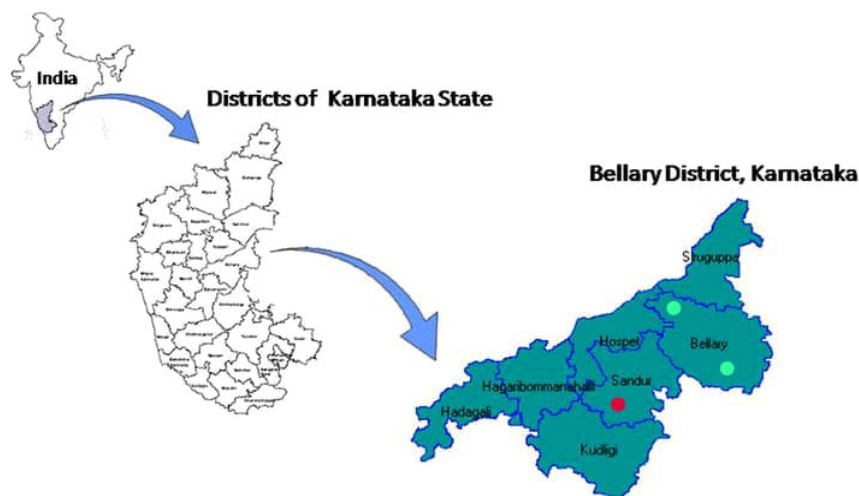
## Materials and Methods:

### Study Area –

Ballari district located in the state of Karnataka, India. It is situated in the eastern part of Karnataka, bordering Andhra Pradesh to the east. The geographical coordinates of Ballari district are 15.1394° N latitude and 76.9214° E longitude. The district has rich mineral resources and semi-arid to arid climate, hot summers and 600 mm rainfall. This climatic condition imposes severe water stress on plants, necessitating adaptations for water conservation and survival.

The natural vegetation in Ballari includes scrublands, thorn forests, and dry deciduous forests, which are typical habitats for xerophytic species. Current survey has been carried out from January 2023-June 2024. The collected plants are identified with the aid of flora (Cook, 1903 – 1958; Gamble, 1915 – 1934; Saldanha & Nilcolson, 1976; Sing, 1988; Saldanha, 1984 – 1996; Seetharam *et al.*, 2000; Kotresha & Sidanand Kambar, 2016;

Seetharam et al., 2018; Yoganarasimhan et al., 2018). The plant names were updated using the plant list. The plants collected were subjected to chemical treatment for killing, fixing and made herbarium accordingly, indicating the conservation status as per IUCN red list of threatened species.



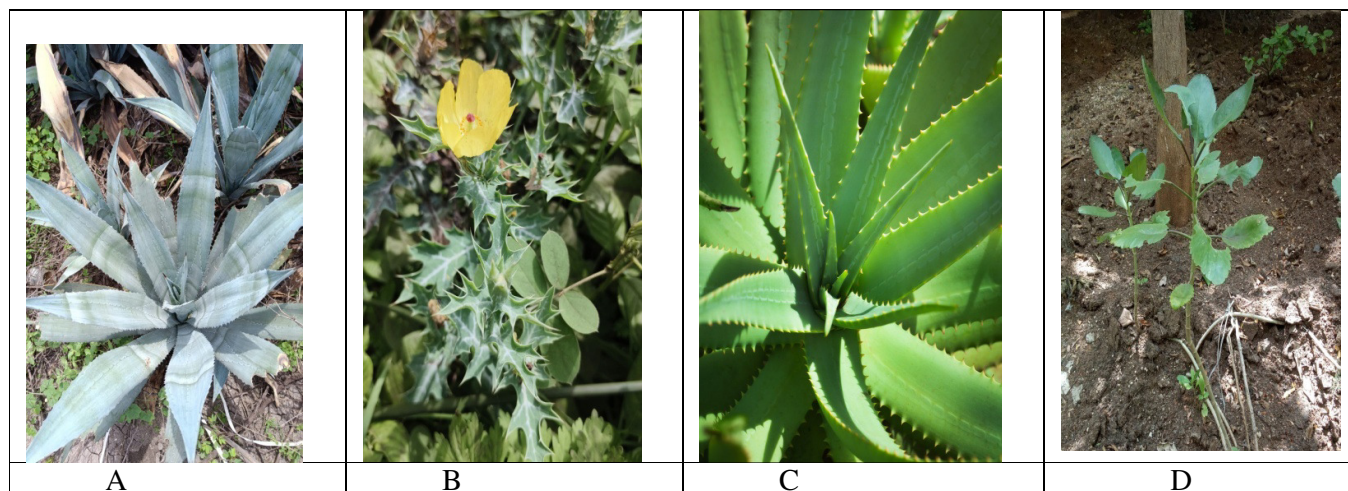
(fig 1) map of 1. india 2. karnataka 3. ballari district

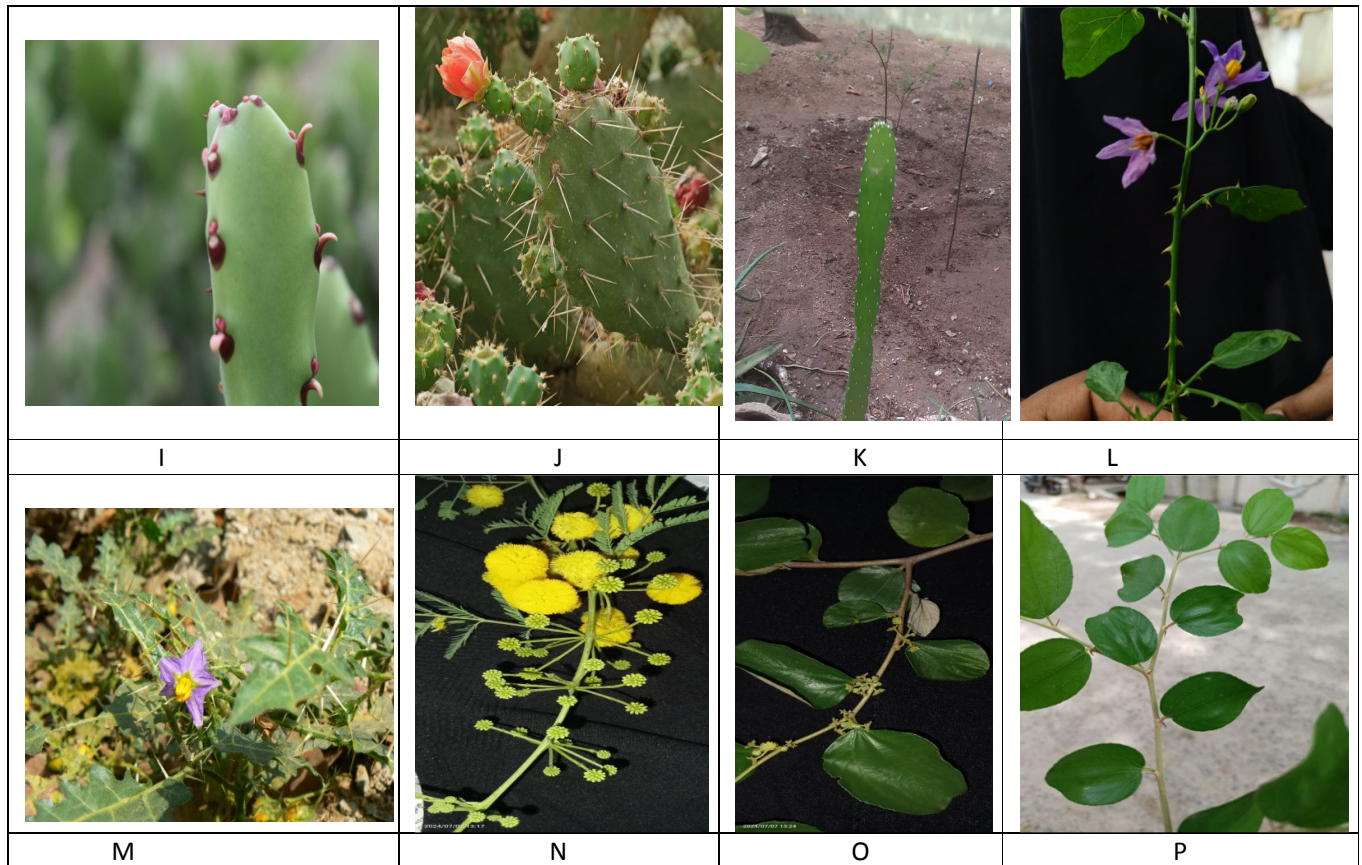
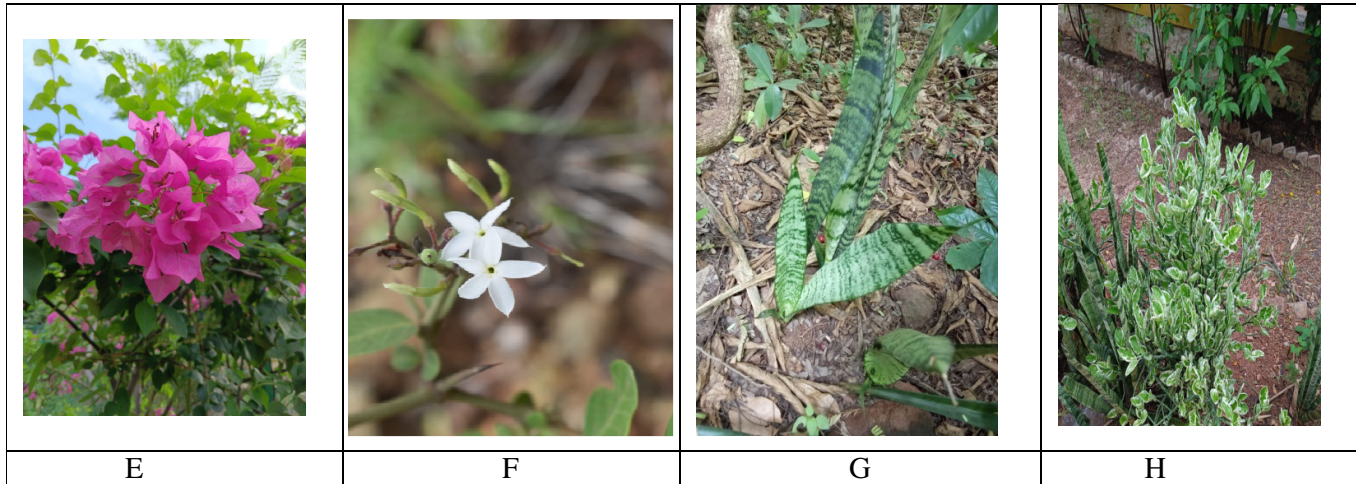
SL NO	NAME OF SPECIES	Family	Vernacular name	IUCN	Habit	Life forms	Habitat	Uses
1	<i>Agave americana L.</i>	Agaveceae	Raam kanta	LC	S	P	Semiarid	Anti-inflammatory
2	<i>Argemone mexicana L.</i>	Papaveraceae	Arashina dhatura	NA	H	P	Roadside	Skin disease
3	<i>Aloevera (L.) Burm.f.</i>	Xanthorrhoeaceae	Lolesara	NA	H	P	Arid	Anti cancer , Anti oxidant
4	<i>Barleria cristata L.</i>	Acanthaceae	Patika	LC	S	P	dry land	Anti-inflammatory
5	<i>Bryophyllum pinnatum (Lam.) Oken</i>	Crassulaceae	Life plant	NA	H	P	Gardenescape	Epilepsy
6	<i>Bougainvillea spectabilis willd.</i>	Nyctaginaceae	Kagaada hoo	LC	CS	P	Roadside	Anti diabetic Ant bacterial
7	<i>Carissa caranda L.</i>	Apocynaceae	Kavala	NA	S	P	Western ghats	Indigestion
8	<i>Carissa spinarum L.</i>	Apocynaceae	Karichi	LC	S	P	Tropical africa	Chest complaints rabies
9	<i>Cissus quadrangularis L.</i>	Vitaceae	sanduballi	LC	S	P	Waste lands	Anti-inflammatory
10	<i>Cressa cretica L.</i>	Convolvulaceae	Mullummaddugida	LC	S	P	Sandy or muddy	Constipation ulcers
11	<i>Dracaena trifasciata (PRAIN) Mabb.</i>	Asparagaceae	Goddumanji	NA	SS	P	west central africa	Filter indoor air
12	<i>Euphorbia lactea</i>	Euphorbiaceae	Mottled spruge	DD	ES	P	Indian subcontinent	Tumors
13	<i>Euphorbia tithymaloides L.</i>	Euphorbiaceae	Devils backbone	LC	S	P	Waste lands	Toothache ringworms
14	<i>Flueggea leucopyrus Willd.</i>	Euphorbiaceae	Hooli	LC	T	P	Wet tropical biome	Acute and chronic wounds
15	<i>Lepidogathis Cristata Willd.</i>	Acanthaceae	Gantukaalugedde	NA	H	P	Karnataka	Mouth ulcers
16	<i>Limonia acidissima L.</i>	Rutaceae	Belada mara	NA	S	P	India Bangladesh	Insect bite sore throat

17	<i>Opuntia Elatior Mill.</i>	Cactaceae	Shappathi kalli	LC	S	P	Kerala Odisha	Analgesic Anticancerous
18	<i>Opuntia monacantha (Willd.)</i>	Cactaceae	Jamudu	VU	T	P	Lowland forest	Diabetes
19	<i>Pithecellobium dulce (Robx.) Benth.</i>	Fabaceae	Seeme hunase	LC	S	A	Mexico	Chornic diarrhea
20	<i>Portulaca grandiflora Hook.</i>	Portulacaceae	Moss Rose	LC	S	A	Southern Brazil	Antioxidant Antibacterial
21	<i>Portulaca oleracea L.</i>	Portulacaceae	Dodda goni soppu	LC	ST	A	Gardens Croplands	Antiseptic
22	<i>Prosopis juliflora (Sw.) DC.</i>	Fabaceae	Ballari jali	LC	S	P	Mexico and	Asthma
23	<i>Sarcostemma Viminale L.</i>	Apocynaceae	Braahmi	LC	H	P	West Bengal	Hypothermic Antidode
24	<i>Solanum erianthum D. Don</i>	Solanaceae	Kadusonde	LC	H	P	Shrublands	Malaria and leprosy
25	<i>Solanum nigrum L.</i>	Solanaceae	Kaaki	LC	T	P	Wooded areas	Anti oxidant Anti pyretic
26	<i>Solanum torvum Sw.</i>	Solanaceae	Chunde	NA	S	P	Roadside	Anemia Hypertension
27	<i>Solanum trilobatum L.</i>	Solanaceae	Kakamunji	NA	S	P	wastelands	Respiratory issues
28	<i>Solanum virginianum L.</i>	Solanaceae	kanta kaari	NA	S	P	Roadsides	Epilepsy Migrane
29	<i>Tribulus terrestries L.</i>	Zygophyllaceae	Neggele mullu	LC	H	P	South Eurasia	Heart problems skin
30	<i>Vachellia nilotica (L.)</i>	Mimosidaceae	Gobbalimara	LC	T	P	Semiarid	Anti malarial
31	<i>Ziziphus mauritiana Lam.</i>	Rhamnaceae	Bare	LC	ST	P	Grasslands	Wound healing
32	<i>Ziziphus nummularia (Burm. F.) Wight &amp; Walk</i>	Rhamnaceae	Mulluhannu	LC	S	P	Hillsides	Indigestion Inflammation
33	<i>Ziziphus oenoplea L.</i>	Rhamnaceae	Barige	LC	S	P	Decidious forest	Antihepatotoxic Antiulcer

\*Note: IUCN STATUS - LC =Least concern, VU = vulnerable NA = Not applicable DD =Data deficient; HABIT – H = Herb, S = Shrub, T = Tree; LIFE FORMS – A= Annual, P = Perennial

**TABLE 1: XEROPHYTIC FLORA OF BALLARI DISTRICT**

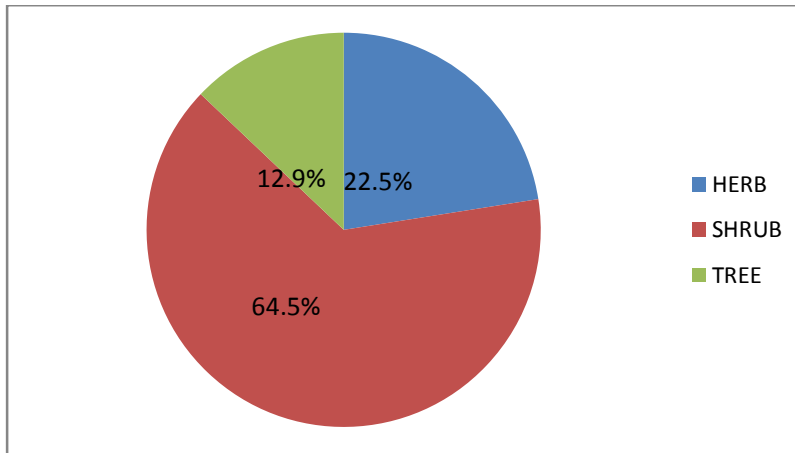




A) *Agave Americana* L. B) *Argemone mexicana* L. C) *Aloe vera* (L.) Burm.f.  
D) *Bryophyllum pinatum* (Lam.) Oken E) *Bougainvillea spectabilis* Willd.  
F) *Carissa spinarum* L. G) *Dracaena trifasciata* (Prain) Mabb. H) *Euphorbia tithymaloides* L. I) *Euphorbia lactea*  
J) *Opuntia elatior* Mill. K) *Opuntia monacantha* (Willd.) L) *Solanum trilobatum* L. M) *Solanum virginianum* L.  
N) *Vachellia nilotica* (L.) O) *Ziziphus mauritiana* Lam. P) *Ziziphus oenoplea* L.

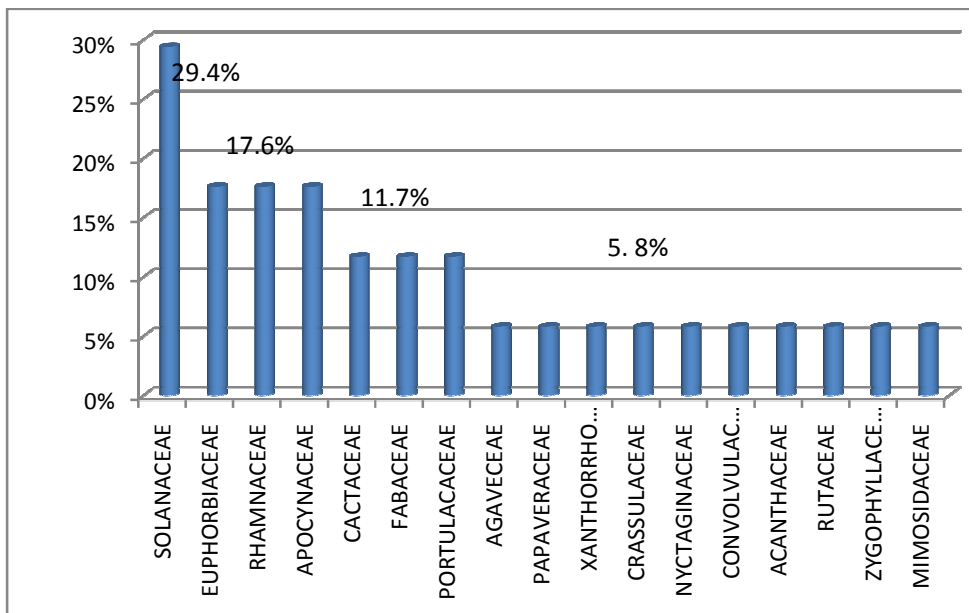
## Results and Discussion

Habit wise analysis shows Shrubs with 20 species (64.5%) followed by Herbs with 7 species (22.5%) , Trees with 4 species (12.9%) . ( FIG 2)



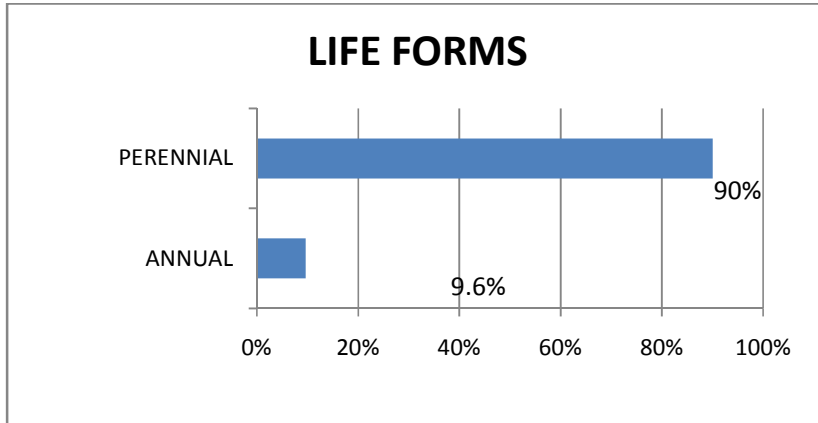
**FIG 2** Habit of xerophytes of Ballari district

Among families , Solanaceae is the most dominant family with 5 species (29.4%) followed by Euphorbiaceae with 3 species (17.6%) and Rhamnaceae with 3 species (17.6%) , Apocynaceae 3 species (17.6%) , Cactaceae 2 species (11.7%) , Fabaceae 2 species (11.7%) , Portulacaceae 2 species (11.7%) , Acanthaceae (11.7%), Agavaceae , Papaveraceae , Xanthorrhoeaceae , Crassulaceae , Nyctaginaceae , Convolvulaceae , Acanthaceae , Rutaceae , Zygophyllaceae , Mimosidaceae , Vitaceae with 1 species (5.8%) ( FIG 3)



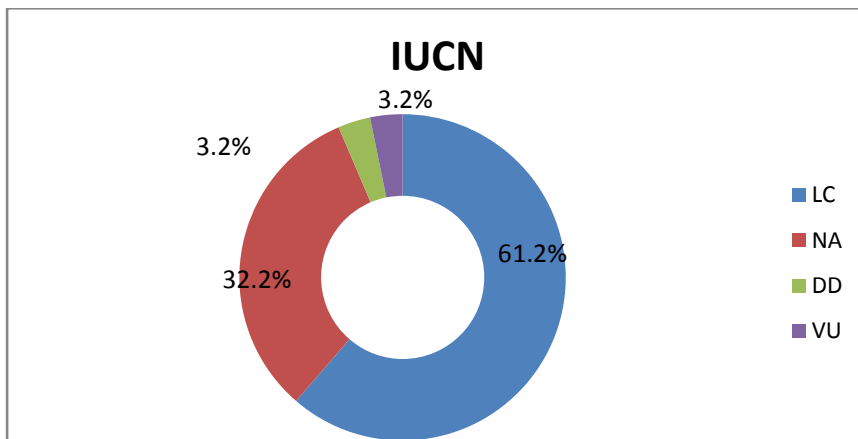
**FIG 3**Families of xerophytes

Followed by life forms of xerophytes most of them are perennial 30 species (90%) and few are annual 3 species (9.6%)



**FIG 4** Life forms of xerophytes

Among these species this shows the IUCN RED LIST STATUS OF XEROPHYTES as per research most of the collected species belongs to LC with 21 species (61.2%) followed by NA with 10 species (32.2%), DD & VU with 1species(3.2%).



**FIG 5** Chart showing IUCN STATUS

LC = Least concern, NA = Not applicable, DD= Data deficient, VU = vulnerable

**Conclusion:**

The floristic study of xerophytes of ballari district reveals the collection of 31 species which belongs to 19 families. These plants are considered as xerophytes on based on their xerophytic adaptations and this can survive in the climatic conditions of Ballari distrcet which is arid semiarid with less rainfall. Thus, present report focuses on the identification and documentation of xerophytic plants of ballari district. Which provides the researcher with immense knowledge about the study done. The documented species shows diverse wealth values such as medicinal properties, ornamental significance, xerophytic adaptations.

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## Reference:

- [1] Khan, A., Mehmood, S., & Khan, R. A. (2017). Ethnobotanical study of some wild herb medicinal Xerophytes of district Bannu, Khyber Pakhtunkhwa, Pakistan. *J. Wildl. Ecol*, 1, 37-51.
- [2] BiBi, H., Afzal, M., Muhammad, A., Kamal, M., Sohail, U. I., & Khan, W. (2014). Morphological and anatomical studies on selected Dicot xerophytes of District Karak, Pakistan. *Am. Eurasian J. Agric. Environ. Sci*, 14, 1201-1212.
- [3] Raj, J., & Kumar, S. (2021). Ethnopediatric practices used in child health care with xerophytic medicinal plants by Rural people of Taranagar tehsil in Rajasthan, India. *Journal of Natural Remedies*, 22(1 (2)), 1-11.
- [4] Kamath, A. D. (2010). Phytochemical screening of selected Xerophytes of Ramdurg region of Belgavi District, Karnataka State.
- [5] Naik, M. R., & Krishnamurthy, Y. L. (2012). Xerophyte *Caralluma stalagmifera* var. *longipetala* (Asclepiadaceae): a new record to the flora of Karnataka, India. *Journal of Threatened Taxa*, 4(6), 2656-2659.
- [6] Acharya, S. K. Characteristics of Xerophytic Plants in Desert Regions.
- [6] Speirs, D. C. (1980). The Evolution of Succulent Xerophytes. *The National Cactus and Succulent Journal*, 35(3), 56-59.
- [7] Chowdhury, N. P. (1959). Observation on the structure and ecology of a xerophytic Selaginella from India 1: 5. *Bryopteris Baker. (L.). J. Jpn. Bot*, 17, 101-119.
- [8] Khan, R. A., Shakir, S. K., Khan, A., Mehmood, S., & Subhan, M. (2018). Evaluation of antimicrobial activity of some important xerophytes. *Mycopath*, 14(1&2)
- [9] Bibi, H., Afzal, M., Kamal, M., Sohail, I. U., Khan, S. M., Sher, A. A., ... & Ur Rahman, I. (2015). Morphological and anatomical characteristics of selected dicot xerophytes of district Karak, Khyber Pakhtunkhwa, Pakistan. *Middle-East J. Sci. Res*, 23(4), 545-557.
- [10] Patnaik, P., Abbasi, T., & Abbasi, S. A. (2022). Production of Vermicompost by Utilizing the Leaves of the Hazardous Xerophyte *Prosopis juliflora*. *Waste and Biomass Valorization*, 1-12.