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Vegetation Diversity and Multifunctional Plant Resources in the Semi-Arid Landscapes of Shekhawati, Rajasthan, India

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Abstract— *Dryland plant diversity is often described only in terms of species richness. However, plants also provide important resources to local communities. The present study evaluted the functional ethnobotanical diversity of the Shekhawati region of Rajasthan, including Churu, Sikar and Jhunjhunu. The study focuses on three major plant uses: medicinal plants, edible fruits and livestock forage. The checklist contains 35 species belonging to 21 families. Medicinal use was recorded for 18 species. Eleven species were reported as fruit or edible plants, while 10 species were used as forage. Four species had more than one recorded use. Poaceae was the most represented family in the functional dataset. Medicinal uses were reported as traditional or ethnobotanical uses. The study showed that plant diversity in Shekhawati has both ecological and livelihood value. Medicinal plants supported traditional healthcare. Edible plants provided food resources and forage plants support livestock. Multipurpose species are especially imperative because they provide more than one benefit. Functional plant provided useful information in addition to conventional floristic studies. They helped in documenting traditional knowledge, identifying important plant resources and planning community-based conservation. This approach is particularly useful for the semi-arid landscapes of Shekhawati, where plant resources are closely linked with local livelihoods.*

Keywords— ***Shekhawati, ethnobotany, functional biodiversity, medicinal plants, wild edible plants, forage, Rajasthan, traditional knowledge, drylands.***

I. INTRODUCTION

Plant diversity is important in dryland ecosystems. Its value is not limited to the number of species present. Plants provide food, fodder, medicines and other useful materials. They also help maintain soil stability, habitat structure and important ecological processes. Recent biodiversity assessments highlight the close relationship between biodiversity, ecosystem functions and human well-being (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services [IPBES], 2019; Convention on Biological Diversity [CBD], 2022). Therefore, plant inventories should consider both species composition and human use. Information on plant use can provide additional knowledge for conservation planning (Antonelli et al., 2023). Land-use change is also an important cause of biodiversity loss. Linking plant inventories with management needs is therefore necessary (Newbold et al., 2015).

Shekhawati is in northeastern Rajasthan. It includes the districts of Churu, Sikar and Jhunjhunu. The region has a semi-arid climate. Vegetation is affected by limited seasonal moisture, high temperature, grazing and changes in land use. Local communities have a long history of using plant resources. Recent research recorded 38 useful forest plants from Shekhawati (Goswami and Bhadauria, 2026). Kumari et al. (2022) reported 18 medicinal plant species belonging to 14 families from the region. Ethnobotanical knowledge has also been documented from the Narhar

Forest area of Jhunjhunu (Rajbala and Khan, 2022). These studies showed that plants remain important in the daily life of local communities.

The eastern Thar region also supports considerable plant diversity. A recent study from Tal Chhapar Wildlife Sanctuary recorded a diverse flora and highlighted the conservation importance of the area (Singh and Ilyas, 2025). Such habitats are important for both plant diversity and local resource use. Food plants form another important part of the regional plant resource base. Wild edible plants provide food during seasons. They also add variety to rural diets. Peddi et al. (2023) documented 148 wild edible fruit plants from Rajasthan. Earlier studies from other parts of India have also reported the contribution of wild edible plants to dietary diversity and rural food security (Bhatia et al., 2018; Chauhan et al., 2018). Recent research has further reported nutritional value in several underutilized wild fruits of Rajasthan (Yadav et al., 2025).

Livestock is closely linked with vegetation in semi-arid regions. Grasses, herbs, shrubs and trees can provide forage for domestic animals. Some species are grazed directly and others are collected as fodder. Forage value, however, cannot be judged only by the presence of a species. Biomass production and nutritional quality are also important (Kumar et al., 2018). In the present study, forage plants are therefore treated as a documented use category.

Most floristic studies mainly describe species, genera and families. These studies are important for plant diversity significance. However, they provide limited information about the practical value of individual species. A functional approach identifies plants that provide medicinal, food or forage resources. It can also identify species with several uses. These multipurpose plants may have importance for local communities. Global plant assessments underline the need for reliable plant information for conservation and sustainable use (Royal Botanic Gardens, Kew, 2023). The present study examined the functional plant resources of Shekhawati. It focuses on three major use categories: medicinal plants, edible or fruit-producing plants and forage plants. The study also considers plant families, life forms and multipurpose species.

II. MATERIALS AND METHODS

The study area covered the Shekhawati region of northeastern Rajasthan. Churu, Sikar and Jhunjhunu were considered as a single regional unit. The region was analysed as a combined landscape because the three districts share similar semi-arid environmental conditions and plant-use traditions. The geographical coordinates of the study region were recorded using the available district-level spatial information. Regional ethnobotanical and plant-use literature was also consulted. These sources provided information on medicinal, edible and forage uses of plants. Three principal use categories were analyzed: medicinal, fruit/edible and forage. Fruit/edible status referred to documented consumption or edible-fruit value. The forage plants referred to established livestock-feed use in the studied area. The functional breadth was calculated as the number of these three functions assigned to each species. Species counts were summarized by family, life form and functional category. Multipurpose species were defined as species with at least two recorded functions. Percentages were calculated using the 35-species functional checklist as the denominator.

III. RESULTS

The functional checklist contains 35 species distributed across 21 families. Herbs were the largest life-form class (12 species), followed by trees (9, including tree/shrub records), shrubs and herbaceous grasses. Poaceae was the most represented family with six species, followed by Apocynaceae and Fabaceae with three species each. This family structure reflected the importance of grasses, woody dryland plants and multipurpose taxa in the selected functional inventory. Medicinal use was the largest recorded function, involving 18 species (51.4%). Fruit/edible use involved 11 species (31.4%), whereas forage value was recorded for 10 species (28.6%). Four species (4 of 35, 11.4%) had at least two recorded functions (*Balanites aegyptiaca, Prosopis cineraria, Salvadora persica* and *Ziziphus nummularia*). The multifunctionality is consistent with the wider literature on useful dryland plants. Earlier work from Churu has reported *Prosopis cineraria* among medicinal trees of Sardarshahr (Pareek et al., 2024). Arya et al., 2016 study concluded that *Salvadora persica* demonstrate its adaptation and multiple-use importance in arid Rajasthan.

Eighteen species were recorded as medicinal in the functional checklist. This value closely corresponds to the independent Shekhawati survey of Kumari et al. (2022), which identified 18 medicinal species from 14 families. The result is supported by the 2026 Shekhawati forest-flora study (Goswami and Bhadauria, 2026) and the Jhunjhunu-focused study of Rajbala and Khan (2022). Eleven species in the functional checklist were classified as fruit resources. Peddi et al. (2023) provided the principal evidence base for this category. Indian dryland and rural communities resulted that wild edible plants act as seasonal food supplements and contribute to household resilience (Bhatia et al., 2018; Chauhan et al., 2018). Yadav et al. (2025) showed the nutritional value of selected underutilized wild fruits from Rajasthan. Ten species were recorded as forage

resources. The forage category demonstrates that plant biodiversity contributes to livestock-supporting ecosystem functions. Quantitative fodder studies emphasize the need to measure biomass and nutritional characteristics (Kumar et al., 2018).

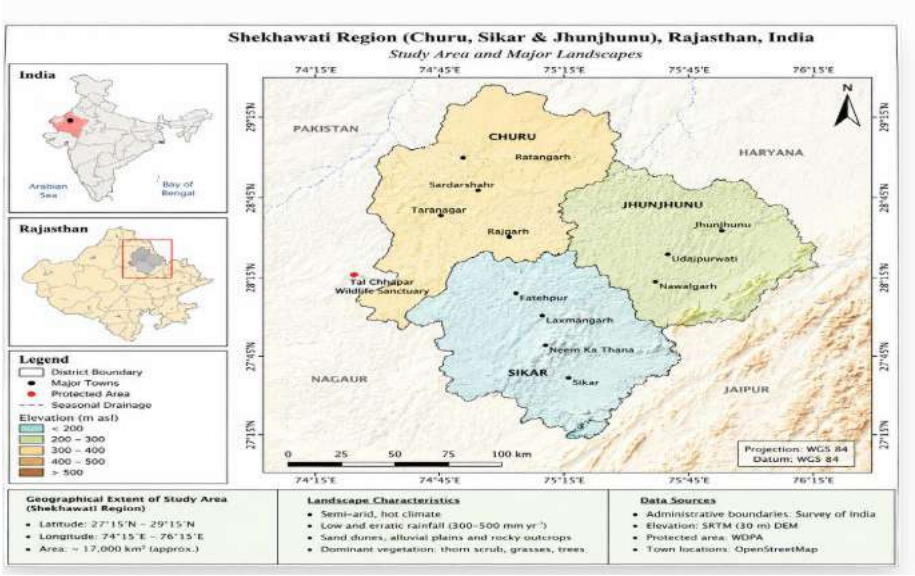

Fig.1: Study area

Table 1. Functional plant checklist of Shekhawati

Sr No.	Botanical name	Common / local name	Family	Growth form	Primary documented function	Documented use / ecological resource role	References
1	*Abutilon indicum*	Indian mallow	Malvaceae	Shrub	Medicinal	Traditional use for ulcers, fever, urinary and gastrointestinal complaints; anti-inflammatory use reported	Kumari et al. (2022)
2	*Vachellia nilotica*	Babul / Kikar	Fabaceae	Tree	Forage	Fodder/forage resource	Kumawat and Mishra (2020); Chand et al. (2015)
3	*Achyranthes aspera*	Chirchita / Prickly chaff flower	Amaranthaceae	Herb	Medicinal	Traditional use for respiratory complaints, dysentery, skin disorders, bleeding and bites	Kumari et al. (2022)
4	*Balanites aegyptiaca*	Hingot / Desert date	Zygophyllaceae	Tree	Medicinal; edible fruit	Traditional medicinal use for skin disorders, wounds and liver/spleen complaints; fruits are also reported as edible	Kumari et al. (2022); Peddi et al. (2023)
5	*Bidens biternata*	Spanish needle	Asteraceae	Herb	Medicinal	Folk use as anti-inflammatory, febrifuge, diuretic and wound-healing plant	Kumari et al. (2022)
6	*Calotropis procera*	Aak / Calotropis	Apocynaceae	Shrub	Medicinal	Traditional use for diarrhoea, asthma and headache; latex and roots	Kumari et al. (2022)

Sr No.	Botanical name	Common / local name	Family	Growth form	Primary documented function	Documented use / ecological resource role	References
						are reported in traditional practice	
7	*Capparis decidua*	Kair	Capparaceae	Shrub	Edible fruit	Fruit used as a wild edible resource	Peddi et al. (2023)
8	*Carissa spinarum*	Karonda	Apocynaceae	Shrub	Edible fruit	Edible fruit resource	Peddi et al. (2023)
9	*Cenchrus ciliaris*	Dhaman grass	Poaceae	Grass herb	Forage	Important perennial grass used as livestock forage	Kumawat and Mishra (2020)
10	*Cenchrus setigerus*	Birdwood grass	Poaceae	Grass herb	Forage	Perennial grass recognized as a forage resource	Kumawat and Mishra (2020); Chand et al. (2015)
11	*Citrullus colocynthis*	Indrayan / Bitter apple	Cucurbitaceae	Climber	Medicinal	Traditional use for digestive complaints and stomach disorders; fruit and seeds are used	Kumari et al. (2022)
12	*Cleome viscosa*	Bagra / Wild mustard	Cleomaceae	Herb	Medicinal	Traditional use for fever, indigestion, blood-related complaints, uterine complaints and earache	Kumari et al. (2022)
13	*Cordia dichotoma*	Lasora	Boraginaceae	Tree	Edible fruit	Fruit used as a wild edible resource	Peddi et al. (2023)
14	*Cordia sinensis*	Lasoda / Cordia	Boraginaceae	Tree	Edible fruit	Fruit used as a wild edible resource	Peddi et al. (2023)
15	*Crotalaria burhia*	Saniya	Fabaceae	Undershrub	Medicinal	Traditional use for gout, eczema, wounds, pain, gastrointestinal disorders and rheumatism	Kumari et al. (2022)
16	*Cynodon dactylon*	Doob grass	Poaceae	Grass herb	Forage	Grass resource used for livestock feeding	Kumawat and Mishra (2020)
17	*Dichanthium annulatum*	Marvel grass	Poaceae	Grass herb	Forage	Perennial grass used as livestock forage	Kumawat and Mishra (2020); Chand et al. (2015)
18	*Euphorbia hirta*	Dudhi	Euphorbiaceae	Herb	Medicinal	Traditional use for diarrhoea, dysentery, respiratory ailments, skin disorders and fever	Kumari et al. (2022)
19	*Ficus benghalensis*	Banyan	Moraceae	Tree	Edible fruit	Fruits recorded as an edible plant resource	Peddi et al. (2023)
20	*Lasiurus sindicus*	Sewan grass	Poaceae	Grass herb	Forage	Characteristic arid-zone grass used as livestock forage	Kumawat and Mishra (2020); Chand et al. (2015)
21	*Leptadenia pyrotechnica*	Khimp	Apocynaceae	Shrub	Medicinal	Traditional use for constipation,	Kumari et al. (2022)

Sr No.	Botanical name	Common / local name	Family	Growth form	Primary documented function	Documented use / ecological resource role	References
						dysmenorrhoea and gastrointestinal complaints	
22	*Leucas aspera*	Thumbai	Lamiaceae	Herb	Medicinal	Traditional use for fever, respiratory and skin disorders and snake-bite applications	Kumari et al. (2022)
23	*Leucas urticifolia*	Leucas	Lamiaceae	Herb	Medicinal	Ethnomedicinal use for skin ailments, fever, respiratory and urinary disorders	Kumari et al. (2022)
24	*Mollugo cerviana*	Thread-stem carpetweed	Molluginaceae	Herb	Medicinal	Traditional use for jaundice, gout and rheumatism; also used as a diaphoretic	Kumari et al. (2022)
25	*Mollugo nudicaulis*	Naked-stem carpetweed	Molluginaceae	Herb	Medicinal	Traditional use of leaves for whooping cough and jaundice	Kumari et al. (2022)
26	*Panicum turgidum*	Taman / Desert panic grass	Poaceae	Grass herb	Forage	Perennial desert grass used as livestock forage	Kumawat and Mishra (2020); Chand et al. (2015)
27	*Pedalium murex*	Bada gokhuru	Pedaliaceae	Herb	Medicinal	Traditional use for digestive complaints, ulcers, fever, wounds and general debility	Kumari et al. (2022)
28	*Peristrophe bicalyculata*	Panicled peristrophe	Acanthaceae	Herb	Medicinal	Traditional use for fever, cough, colds, snake poisoning and bone/sprain complaints	Kumari et al. (2022)
29	*Phyllanthus emblica*	Amla / Indian gooseberry	Phyllanthaceae	Tree	Edible fruit	Fruit is an important edible resource	Peddi et al. (2023)
30	*Prosopis cineraria*	Khejri / Kandi	Fabaceae	Tree	Edible fruit; forage	Pods/fruit used as food resource; foliage and other biomass contribute to livestock feeding	Peddi et al. (2023); Kumawat and Mishra (2020); Chand et al. (2015)
31	*Salvadora persica*	Jal / Peelu	Salvadoraceae	Tree / shrub	Edible fruit; forage	Fruits used as an edible resource; foliage can serve as livestock forage	Peddi et al. (2023); Kumawat and Mishra (2020); Chand et al. (2015)
32	*Tribulus terrestris*	Gokhuru	Zygophyllaceae	Herb	Medicinal	Traditional Ayurvedic and folk use for urinary	Kumari et al. (2022)

Sr No.	Botanical name	Common / local name	Family	Growth form	Primary documented function	Documented use / ecological resource role	References
						complaints and as a diuretic	
33	*Tridax procumbens*	Tridax daisy	Asteraceae	Herb	Medicinal	Traditional use for wounds, skin infections and diabetes-related complaints	Kumari et al. (2022)
34	*Ziziphus mauritiana*	Ber	Rhamnaceae	Tree / shrub	Edible fruit	Edible fruit resource	Peddi et al. (2023)
35	*Ziziphus nummularia*	Jhar ber / Pala	Rhamnaceae	Shrub	Edible fruit; forage	Fruit is edible; foliage and/or plant biomass are used as forage	Peddi et al. (2023)

Table 2. Summary of functional categories

Functional category	Species	Percentage of checklist
Medicinal	18	51.4%
Fruit/edible	11	31.4%
Forage	10	28.6%
Multipurpose (≥2 recorded functions)	4	11.4%

Table 3. Leading families in the functional checklist

Family	Species
Poaceae	6
Apocynaceae	3
Fabaceae	3
Asteraceae	2
Euphorbiaceae	2
Molluginaceae	2
Rhamnaceae	2
Lamiaceae	2

IV. DISCUSSION

The present study is consistent with broader biodiversity assessments that recognize the importance of linking ecosystems, species and human well-being (IPBES, 2019; Convention on Biological Diversity, 2022). In the Shekhawati context, it is useful because semi-arid landscape supports medicinal, edible and livestock-related uses. *Balanites aegyptiaca, Prosopis cineraria, Salvadora persica* and *Ziziphus nummularia* link biodiversity conservation with several livelihood functions at once (Arya et al., 2016; Pareek et al., 2024).

The medicinal category contained more than half of the species in the functional checklist. This should not be interpreted as medicinal plants dominating the complete flora rather it reflects the deliberate selection of a documented-use subset. The pattern is nevertheless consistent with the strong ethnomedicinal literature from Shekhawati and Rajasthan (Kumari et al., 2022; Rajbala and Khan, 2022; Goswami and Bhadauria, 2026). Previous studies have documented traditional plant use together with phytochemical or pharmacological investigation, including work on plants of the Aravalli region (Babel et al., 2018; Arora and Meena, 2018; Parihar, 2017).

An important methodological distinction is needed between ethnobotanical evidence and pharmacological validation. A traditional use documents cultural practice. It does not establish clinical efficacy, safe dosage or mechanism. The traditional use is supported by the wider medicinal-plant literature, which increasingly combines ethnobotanical documentation with laboratory validation rather than treating traditional claims as clinical proof (Babel et al., 2018; Murugesu et al., 2021; Satruhan et al., 2023). Medicinal plants also require conservation attention because demand can increase harvesting pressure. The need for conservation is especially clear where useful species are threatened or restricted. Parihar (2017) demonstrated the conservation relevance of the medicinal and threatened *Ceropegia bulbosa* in western Rajasthan. Previous studies on *Ficus* and *Acacia* also illustrated the combined medicinal and ecological value of woody plants (Sandeep et al., 2018; Satruhan et al., 2023).

The 11 edible species showed that plant biodiversity contributes to food resources as well as healthcare. Peddi et al. (2023) documented 148 wild edible fruit plants across Rajasthan. Bhatia et al. (2018) and Chauhan et al. (2018) showed that wild edible plants can contribute to dietary diversity and livelihood resilience in Indian rural communities. Recent biochemical work on Rajasthan wild fruits further supports their nutritional significance (Yadav et al., 2025). The conservation implication is subtle. Edible plants should not be protected only because they are useful to people. Their ecological role, regeneration and harvesting regime must also be considered. Community monitoring of fruiting seasons and sustainable harvest limits could therefore connect food use with conservation.

The forage category contains ten species and highlights an often-underrepresented component of plant biodiversity research. In drylands, livestock depend on spatially and seasonally variable forage resources. Kumar et al. (2018) studied the forage value through yield and nutritional parameters. Multipurpose plants occupy an important position between biodiversity conservation and rural development. Recent studies of arid-region woody plants illustrate this multifunctionality. *Prosopis cineraria* has been examined in relation to arid agroforestry and soil functions in Churu (Pareek et al., 2024). Plants such as *Murraya koenigii* and *Ficus* species demonstrate how individual plants can combine food, cultural and medicinal roles (Patil et al., 2024; Murugesu et al., 2021). Comparable multifunctionality studied in *Ailanthus excelsa* in semi-arid regions (Pal et al., 2023). However, multipurpose species experience disproportionate human pressure. Conservation plans should therefore distinguish between abundance and use intensity.

The functional perspective fits well with contemporary biodiversity policy, which increasingly emphasizes ecosystem services, sustainable use and participation of local communities (IPBES, 2019; Convention on Biological Diversity, 2022). For Shekhawati, conservation should not be confined to formally protected sites. Village commons, grazing lands, agricultural margins, scrublands and remnant natural vegetation can all maintain useful plant populations and ecological connectivity.

V. CONCLUSION

The 35-plant species functional checklist shows clear links between plant diversity and local resource use. Medicinal use was recorded for 18 species. Eleven species had edible or fruit value. Ten species were used as forage. Four species had at least two recorded functions. These findings show that plants contribute to several aspects of rural life. Medicinal species support traditional healthcare. Edible plants provide seasonal food resources. Forage species support livestock production. Multipurpose species are especially important because a single plant can provide more than one benefit. The conservation value of these plants is therefore both ecological and social. Protecting important plant populations help to maintain biodiversity and local resource functions at the same time.

REFERENCES

[1] Antonelli, A., Govaerts, R., Nic Lughadha, E., Onstein, R. E., Smith, R. J., Zizka, A. (2023). Why plant diversity and distribution matter. *New Phytologist, 240*(4), 1331–1336.

[2] Arora, S., and Meena, S. (2018). Analysis of bioactive constituents from *Ceropegia bulbosa* Roxb. var. *bulbosa*: An endangered medicinal plant from Thar Desert of Rajasthan, India. *Journal of Pharmacognosy and Phytochemistry, 7*(1), 2242–2247.

[3] Arya, R., Lohara, R. R., Meena, R. L. (2016). Survival and biomass production of *Salvadora persica* on various types of salt affected soils under arid conditions in Rajasthan and Gujarat. *Annals of Arid Zone, 53*(1).

[4] Babel, S., Gupta, R., Sachihar, L. (2018). Phytochemical analysis of plant resources having antimicrobial properties obtained from Aravalli Hills of Rajasthan, India. *International Journal of Current Microbiology and Applied Sciences, 7*(3), 1121–1125.

[5] Bhatia, H., Sharma, Y. P., Manhas, R. K., Kumar, K. (2018). Traditionally used wild edible plants of district Udhampur, J&K, India. *Journal of Ethnobiology and Ethnomedicine, 14*, Article 73.

[6] Chand, P., Sirohi, S., Sirohi, S. K., & Chahal, V. P. (2015). Estimation of demand and supply of livestock feed and fodder in Rajasthan: A disaggregated analysis. *Indian Journal of Animal Sciences, 85*(11), 1229–1234.

[7] Chauhan, S. H., Yadav, S., Takahashi, T., Luczaj, L., D'Cruz, L., Okada, K. (2018). Consumption patterns of wild edibles of the Vasavas: A case study from Gujarat, India. *Journal of Ethnobiology and Ethnomedicine, 14*, Article 57.

[8] Convention on Biological Diversity. (2022). *Kunming–Montreal global biodiversity framework*. United Nations Environment Programme.

[9] Deora, G. S., Rathore, M. S. (2018). Traditional health care and nutritional practices in mother-child health care systems in the tribal dominated areas of Rajasthan, India. *Annals of Plant Sciences, 7*(2), 2047–2055.

[10] Goswami, R., Bhadauria, S. (2026). Ethnobotanical survey of forest flora in the Shekhawati region of Rajasthan: Traditional knowledge and its role in local healthcare and daily life. *Indian Forester, 152*(2).

[11] Govaerts, R., Nic Lughadha, E., Black, N., Turner, R., Paton, A. (2021). The World Checklist of Vascular Plants, a continuously updated resource for exploring global plant diversity. *Scientific Data, 8*, Article 215.

[12] Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. (2019). *Global assessment report on biodiversity and ecosystem services*. IPBES Secretariat.

[13] Kumar, R., Kumar, D., Datt, C., Makarana, G., Yadav, M. R., Birbal. (2018). Forage yield and nutritional characteristics of cultivated fodders as affected by agronomic interventions: A review. *Indian Journal of Animal Nutrition, 35*(4), 373–385.

[14] Kumari, S., Khan, A., Pareek, A. (2022). An ethno-botanical survey of important medicinal plants in the Shekhawati region of Rajasthan, India. *International Journal of Botany Studies, 7*(3), 126–135.

[15] Kumawat, R. N., & Misra, A. K. (2020). An estimation of feed and fodder availability in the arid Rajasthan. *Indian Journal of Animal Sciences, 90*(2), 251–255.

[16] Murugesu, S., Selamat, J., Perumal, V. (2021). Phytochemistry, pharmacological properties, and recent applications of *Ficus benghalensis* and *Ficus religiosa*. *Plants, 10*, Article 2749.

[17] Newbold, T., Hudson, L. N., Hill, S. L. L., Contu, S., Lysenko, I., Senior, R. A., Börger, L., Bennett, D. J., Choimes, A., Collen, B., Day, J., De Palma, A., Díaz, S., Echeverria-Londoño, S., Edgar, M. J., Feldman, A., Garon, M., Harrison, M. L. K., Alhusseini, T., ... Purvis, A. (2015). Global effects of land use on local terrestrial biodiversity. *Nature, 520*, 45–50.

[18] Pal, V., Sharma, V., Gour, V. S. (2023). *Ailanthus excelsa* Roxb. in India: A multipurpose "tree of heaven" for semi-arid regions. *Forests, Trees and Livelihoods, 32*(4), 268–283.

[19] Pareek, L., Yadav, S., Tripathi, S. L., Swami, S. (2024). Medicinal trees of Sardarshahr in Churu: The Rajasthan Thar Desert region. *International Journal of Pharmacognosy, 11*(12), 681–686.

[20] Parihar, S. (2017). In vitro conservation protocol of *Ceropegia bulbosa*: An important medicinal and threatened plant species of western Rajasthan. *Plant Science Today, 4*(1), 21–26.

[21] Patil, R., Mandlik, S., Mandlik, D. (2024). *Murraya koenigii* (curry tree): A review of its phytochemistry, ethnomedicinal uses, and pharmacology with respect to molecular mechanisms. *Current Traditional Medicine, 10*(5), 73–97.

[22] Peddi, H. K., Deroliya, P. K., Kumar, R., & Arigela, R. K. (2023). *Wild edible fruits of Rajasthan*. Ambika Prasad Research Foundation.

[23] Rajbala, Khan, J. B. (2022). An ethno-botanical study of medicinal plants in Narhar Forest Area (Ranilo Johad) of Jhunjhunu (Rajasthan). *International Journal of Food and Nutritional Sciences, 11*(10), 4977–4989.

[24] Royal Botanic Gardens, Kew. (2023). *State of the world's plants and fungi 2023*. Royal Botanic Gardens, Kew.

[25] Sandeep, Kumar, A., Dimple, Tomer, V., Gat, Y., & Kumar, V. (2018). *Ficus religiosa*: A wholesome medicinal tree. *Journal of Pharmacognosy and Phytochemistry, 7*(4), 32–37.

[26] Satruhan, Patel, A., Patel, D. K. (2023). A review on a medicinal tree *Acacia nilotica* Linn. *Journal of Pharmacognosy and Phytochemistry, 12*(6), 345–348.

[27] Singh, S., Ilyas, O. (2025). An updated floral diversity of Tal Chhapar Wildlife Sanctuary, Rajasthan, India. *Journal of Threatened Taxa, 17*(11), 27806–27821.

[28] Yadav, M. K., Vijayan, A. S., Meena, N. K., Chhipa, H., Kumar, A., Nagar, B., & Sharma, A. (2025). Morphological and biochemical traits of some selected underutilised wild edible fruits used by the Sahariya—A PVTG of Rajasthan. *Indian Journal of Traditional Knowledge, 24*(1), 53–62.