

Research Article

Botanical Field Notes from Rajasthan with Records of New Plant Species

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Abstract—This study explores the flora of Rajasthan, India, with a specific focus on documenting the species records new to flora of Rajasthan and the naturalization of some garden species in the wild. We identified several species exhibiting the phenomenon of naturalization, including *Iochroma arborescens*, *Dysphania pumilio*, *Opuntia cylindrica*, *Cyperus alternifolius* and *Alternanthera philoxeroides*. These five species are new also to the flora of Rajasthan. Additionally, the naturalization of cultivated species like *Dodonaea angustifolia*, *Nerium oleander*, and *Tithonia diversifolia* is also documented. The findings highlight the importance of continuous monitoring and updating of flora to reflect changes in the plant composition of a region. The study also reports interesting plant species occurrence in the gorges of Shahabad Tehsil area in Baran District which were earlier not reported for this region. New locations of occurrence of *Borassus flabellifer* is also listed in the present paper.

Keywords— Flora of Rajasthan, Garden species, Naturalization, New Species records

1. Introduction

Rajasthan is the largest state of Indian Union, situated towards North-western side of the country. Rajasthan covers an area of 3,42,274 sq. km and lies between 23°3'-30°12'N and 69°30'-78°17'E. The Aravallis, the Vindhias and the Thar desert are important physiographic features of the state.

Rajasthan has arid and semi-arid climates. The climate of the desert towards the west of Aravallis is arid. The climate east of Aravallis is mostly semi-arid and comparatively milder. Group 5- Tropical Dry Deciduous Forests and Group 6- Tropical Thorn Forests are mainly present in Rajasthan. Group 6- Tropical Thorn Forests are mainly confined to the Thar desert area of the state, while Group 5- Tropical Dry Deciduous Forests are mainly present on Aravallis, Vindhayas and other parts of the state situated east of the Aravallis. A small patch of Group 8- Sub-tropical Broad-leaved Hill Forest is also present in Sirohi District towards upper reaches of Mt. Abu Wildlife Sanctuary [3].

After independence, human penetration is gradually increasing in the forest areas. Due to various anthropogenic activities, new species area reaching in the natural habitats of all the major forest types. Probably many species are being introduced by the migratory birds also. Once, many species were limited in the habitation areas as garden species but now they are naturalizing in wild habitats outside the human habitations. In the present paper, few issues related to this aspect are highlighted.

2. Related Work

Lots of work has been done on the flora of Rajasthan. Many important floras are available today to understand the Angiospermic 'wild floral species spectrum' of the state [1, 6, 7, 9, 10, 11, 14, 15, 18 & 20]. Though flora of Rajasthan is well documented in these floras but still new species are being reported in the state.

3. Methodology

Various micro habitats are present in the forests, protected areas and outside of forest areas. These habitats were visited from 2020 to 2024 whenever got an opportunity. Plants were observed minutely and identified with help of available floras and scattered papers [1, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 & 21]. Sites, where footfall was more, were probed intensively and extensively as more chance of occurrence of escaped species was there. Similarly, proximity of water bodies was extensively surveyed whenever got a chance as winter migratory birds may introduce some new species from other parts of the country and abroad. Where roads are bisecting the forest areas, visited during summer, rains and winter to search the new entrants in the forest area. Roadsides are much vulnerable for the entry of new species hence sufficient attention was given on such sites. Area along the traditional sheep migratory routes were surveyed as these routes are susceptible to infestation of new weeds brought by the sheep herds from the neighboring states. Similarly, eco-

tourism sites situated in the forest area were frequently visited to see and collect the new species.

5. Results and Discussion

When we study the flora of Rajasthan [6 & 14], many species are listed as cultivated or as Garden plants. The last volume of flora of Rajasthan, published by Botanical Survey of India, appeared in 1993, nearly thirty years back. During this period, status of many species have changed. Since last thirty years, many garden plant species like *Aglaiia odoratissima*, *Dodonaea viscosa*, *Nerium oleander* and *Tithonia diversifolia* have escaped in the wild and they are in the process of naturalization now. A glimpse of present status of few garden species in the wild is highlighted. During the present study, five species come across namely *Iochroma arborescens*, *Dysphania pumilio*, *Opuntia cylindrica* (syn. *Austrocylindropuntia cylindrica*), *Cyperus alternifolius* and *Alternanthera philoxeroides* which are new to flora of Rajasthan. A glimpse of above species including status of *Borassus flabellifer* is highlighted in Table 2.

In the present paper, three aspects are highlighted- (A) new plant records for Rajasthan, (B) naturalized species for the state and (C) interesting plant species confined to gorges of Shahabad area of Baran District not reported so far in the existing flora of Hadoti zone (South-east Rajasthan) [10].

(A) New plant records for Rajasthan

Iochroma arborescens (L.) J.M.H. Shaw, Family Solanaceae:

On April 26, 2024, while moving in the Mount Abu Wildlife Sanctuary, thickets of this species were seen along the road sides on the way to Sunset point. This species is profusely growing in the campus of Wildlife Division too. Many plants were seen growing here and there in the Mt. Abu town. It is an exotic, invasive and shrubby species confined to upper reaches of Mt. Abu hills in Sirohi District. It is present in moist localities as an under-storey plant.

It is a non-spinous leafy shrub, having terete stem of greyish-white color. Leaves simple, alternate, lamina elliptic, margin entire. It flowers in April at Mt. Abu. Mature fruits become visible in April-May. Inflorescence axillary, many-flowered fascicle and cauliflorous. Flowers greenish-white with yellow ting, bisexual, actinomorphic, pedicels c. 1.5 cm long. Ovary 2 celled, ovoid, style slender, stigma capitate. Berries globose, c. 5 mm long, orange when ripe.



Figure 1. *Iochroma arborescens*: Habit



Figure 2. *Iochroma arborescens*: Flowering branch



Figure 3. *Iochroma arborescens*: Fruiting branch

This species has been reported from Kerala and Tamil Nadu in India [8 & 21]. This is first records from Rajasthan.

Specimen Examined

India, Rajasthan, Sirohi District, Mt. Abu (Sun-set point road), 26/4/2024, S.K. Sharma and A. Sarsavan.

Dysphania pumilio (R. Br.) Mosyakin & Clemants, Family Amaranthaceae

On October 14, 2021, while wandering in Beed Laxmangarh Forest Block (27.828541N, 75.015286E) of Sikar Forest Division in Laxmangarh Tehsil of Sikar District, an exotic weed species *Dysphania pumilio* was seen growing intensively. Nearly 3.0 ha area was densely covered by this weed. Forest Department is developing a 'Nature park' there to enhance eco-tourism in the district.

D. pumilio plants were present in prostrate to sub-prostrate posture and densely carpeting the sandy surface. It is a spreading herb with moderately pleasant smell. Plant surface was sticky. Petiolate leaves were arranged in alternate fashion on the stem. Leaves pilosulose with gland-tipped hairs. Lamina sinuously dentate, rhomboid-ovate in shape. Flowers in compact bunches, arising in axils of leaves.



Figure 5. *Dysphania pumilio*: Habit



Figure 6. *Dysphania pumilio*: Close-up of a flowering branch

This exotic plant is native to Australia and Tasmania. Local people and forest officials were enquired about the species. They were of opinion that this species is new to the area and become visible only during last 8-10 years.

Specimen examined

India, Rajasthan, Sikar District, Beed Laxmangarh Forest Block (Laxmangarh Nature Park), 14/10/2022, S. K. Sharma & A. Sarsavan.

Opuntia cylindrica (Lam.) DC., Family Cactaceae

On August 14, 2022 and August 24, 2022, while involved in Forest Working Plan exercises at Bhim Bhadak Forest area of Jodhpur and Leela Dhora Forest Block of Barmer respectively, we came across naturally growing *O. cylindrica*. Good concentration of *O. cylindrica* was seen in more than 5.0 ha area around Bhim Bhadak Cave area. It is a stony area dominated by xerophytic species like *Acacia senegal*, *Euphorbia caducifolia*, *Prosopis juliflora* and *Ziziphus nummularia*. Due to animal movement and collision of plants due to fast wind, small, young branches (cladodes) detach from the mother plants and fall down on the ground. The cladodes, which are falling vertically on the ground and if their physiological lower end remains in contact with ground,

they start rooting and develop in a new plant. While those, falling horizontally flat on the ground or upside down, they don't start rooting and in due course of time become black in color and ultimately dehydrate and die. Due to slope, many falling branches start downward rolling movement and travel a distance. In Leela Dhora Reserve Forest, *O. cylindrica* is dotted here and there. It is a sandy flat area where *Aloe trinervis* is also growing along with *O. cylindrica*.

O. cylindrica is a small succulent shrub having thick, cylindrical green stem and cladodes. Leaves cylindrical, small, falling off quickly. Cladodes prominent, whitish-grey, equipped with up to 6 greyish spines. Flowers when old, pinkish to red. Prickly plants growing in the wild are low-heighted, up to 1.0 meter. Probably it is a recent escaped species in the wild.

Specimen examined

India, Rajasthan, Jodhpur District, Bhim Bhadak area, 14/08/2022, S. K. Sharma & A. Sarsavan.

Alternanthera philoxeroides (Mart.) Griseb., Family Amaranthaceae

On January 21, 2024, while walking in Maharana Pratap Garden, Udaipur at the western shore of Pichhola lake near Sisarma village, we came across thick growth of *A. philoxeroides* growing in the shallow water and muddy area. On February 16, 2024, while going towards Gurushikhar area in Mt. Abu Wildlife Sanctuary, this species was seen in road side pools also.

It is a perennial aquatic herb with prostrate, fistular stem, rooting at nodes. It grows in pure population and makes dense mats. This is a creeping emergent. It sprawls in water and eventually become erect and aerial. Beside shallow water, it may grow in muddy terrestrial habitat also. Plants of this species have simple, opposite and elliptical leaves with entire margins. Inflorescences axillary. Flowers whitish, papery and short-stalked.



Figure 6. *Alternanthera philoxeroides*: Plant in flowering stage

This species has been reported from Madhya Pradesh, Maharashtra, Assam, Meghalaya, Arunachal Pradesh, Bihar, Haryana, Himachal Pradesh, Karnataka, Kerala, Odisha, Tamil Nadu, Telangana, Uttarakhand, Uttar Pradesh and West Bengal [16, 17 & 19]. Rajasthan is a new state in this list.

It is an invasive weed hence timely action is needed to pose a check on the spread of the species in water bodies, especially in lakes of Udaipur, as all are inter connected.

Specimen examined

India, Rajasthan, Udaipur District, 21/01/2024, S. K. Sharma & A. Sarsavan.

Cyperus alternifolius Rottb., Family Cyperaceae

It is a perennial herb which is native to Madagascar and parts of Africa. *C. alternifolius*, also known as the umbrella plant, is a popular garden plant known for its architectural form. Its most distinctive feature is the cluster of long, slender, leaf-like bracts that radiate from the top of the stem, resembling the spokes of an open umbrella. These bracts are typically vibrant green, though some cultivars boast variegated patterns. Stem is triangular, smooth and green. Below the "umbrella," the stem is often bare, emphasizing the plant's upward growth. While not true leaves, the bracts are flat and linear, creating a lush, textured canopy.



Figure 8. *Cyperus alternifolius*: Densely growing in the bed of Ayad River



Figure 9. *Cyperus alternifolius*: Growing making a dense bunch

C. alternifolius has dotted in the Ayad River up to long distance, particularly within Udaipur city limits. While the species is now dispersed at various localities in the riverbed from Swaroopsagar to Udaisagar. Its highest concentration is present near UIT Circle (24.596680N, 73.687008E). This sedge is likely an escapee from some nearby houses, which was first observed in the river after 2010. Prior to this, surveys conducted between 1986 and 1988, as well as in 1992, failed to record its presence in the Ayad River. It is

therefore estimated that the species has entered to the river ecosystem sometime between 1995 and 2000. This demonstrates the plant's adaptability and its potential to spread in various environments beyond cultivation. Its ability to flourish in a natural setting like the Ayad River suggests it could become invasive in wet and moist areas.

Specimen examined

India, Rajasthan, Udaipur District, Ayad River bed area, 28/06/2024, S. K. Sharma & A. Sarsavan.

(B) Naturalized species

Many species have been recorded as garden, cultivated, escaped or planted species in the state of Rajasthan. So far nothing is known about their status in the wild. Once, they were considered as garden plants but during present study we found them growing in forest and wasteland area, where they are regenerating their own. Presently they have naturalised in various localities across the state. Previous status of five species is shown in table 1.

Table 1: Previous status of five species which are now naturalised/naturalizing in the wild

Species and family	Local Name	Habit	Known previous status
<i>Borassus flabellifer</i> (Arecaceae)	Taal mirch	Tree	Reported but status not given [6]
<i>Aglaiia odoratissima</i> (Meliaceae)	Daula	Tree	Reported as a cultivated species [7, 14], reported but status not given [6] and also reported in wild [7]
<i>Nerium oleander</i> (Apocynaceae)	Kaner, Kanveri	Shrub	Reported as a cultivated/planted/escaped species [7, 14, 10, 15, 20] and reported but status not given [6, 18]
<i>Dodonaea angustifolia</i> (Sapindaceae)	Relia	Shrub	Naturalized as an escape in reserved area of Rajasthan University, Jaipur [11], reported as cultivated/garden/planted species [11, 14, 10, 18] and reported but status not given [6]
<i>Tithonia diversifolia</i> (Asteraceae)	Not any	Herb	Reported cultivated in garden [18]

Above five species are now penetrating in various natural ecosystems. Except *Tithonia diversifolia* well-developed patches and stretches of rest four species can be seen in different parts of the state. Present status of these species in certain localities is presented below:

Borassus flabellifer L., Family Arecaceae

It is native to many Asian countries including India. Recently, few dotted individuals of *B. flabellifer* have been reported from four localities of Rajasthan namely Bansi, Velaniaya, Rishabhdeo and Salumbar [12]. From April 4, 2023 to April 5, 2023, while surveying biodiversity of Dholpur District in eastern Rajasthan, a dense big patch of *B. flabellifer* was seen in the Jhiri Forest Block near Gironia village. This is the densest and biggest sized natural grove of *B. flabellifer* in Rajasthan. This palm is relatively more visible in Karoli and

Dholpur Districts. Few locations, where palm is growing in the wild are shown below:

Table 2: Occurrence of *B. flabellifer* in the new areas of Rajasthan

District	Location	Number of adult trees	Natural regeneration
Karoli	Dalapura (Basai)	2	Absent
	Karoli (Radgaya Talab)	1	Absent
	Karoli (Collector office)	2	Absent
	Langra	4	Absent
	Najir-ki-Mandi (Khorli village)	2	Absent
Dholpur	Village Reechhara (Range Sarmathura)	2	Absent
	Jhiri Forest Block (Near Gironia village)	Dense, big-sized grove	Present

Isolated trees of this species are unable to produce seeds at many places because *B. flabellifer* is a dioecious species with male and female flowers on separate plants. Since trees of both the sexes are not available at many places, hence natural seed production is not possible. When there are no seeds, natural regeneration is not possible. Where trees are growing in isolation, or inter tree distance between male and female trees is more, natural regeneration of species is absent, hence patch formation is not becoming possible. While in Jhiri Block, trees of both the sexes are growing in the grove where inter tree distance is varying 10 to 100 m, which is a suitable condition for seed production. Therefore, natural regeneration is going on and individuals of all age groups and heights are visible there. This process is helping to create a patch of the species. Such groves are generally encountered in the coastal areas of South India.

Aglaia odoratissima Blume, Family Meliaceae

It is an opinion of the botanists that *Aglaia odoratissima* is probably a planted species in Rajasthan [14]. So far it is reported from Mt. Abu area only [5 & 14]. During our surveys, we found this species present in the wild in many localities in southern Aravallis in the hilly wet streams. Few trees of this species are present in Kamalnath- Shani Deo stream in Kamalnath Reserve Forest of Jhadol Tehsil in Udaipur (North) Forest Division. This is a north facing hilly stream having better moisture regime. Till 1995-98, the stream was perennial but now it became seasonal and *A. odoratissima* are suffering from 'stag horning'.

Thousands of individuals of different heights and ages are growing in Ambagall-ka-Nallah (24.319795N, 73.403176E) of same forest block. Ambagall-ka-Nallah is a west facing perennial hilly stream. This species is present in most of wet streams of Kamalnath Reserve Forest. Best natural regeneration of the species can be seen in Ambagall-ka-Nallah. The canopy density of species in Ambagall-ka-Nallah is varying from 0.8 to 1.0 at different places.

'Ambagall-ka-Nallah', 'Kundeshwar' and 'Kukdeshwar' groves of Udaipur District are the greenest area of the district, which remains green, dense and wet even in the summers also. Perennial streams are present in these localities along with waterfalls.

Nerium oleander L., Family Apocynaceae

According to state flora of Rajasthan *N. oleander* is a cultivated species in Rajasthan [14], but during our present study, we found it growing in the wild extensively in the streams of different forested areas of Rajasthan. Few well-known localities are listed below:

Table 3: Natural occurrence of *N. oleander* in Rajasthan

District	Location	Habitat*	Growing pattern**
Udaipur	Jhameshwar Mahadeo stream (Forest Range Kurabad)	1	1
	Jhadoli-ki-Nal [Range Deola, Udaipur (North) Division]	1	1
	Ukhaliyat [Range Deola, Udaipur (North) Division]	1	1
	Ghatanadi [Range Deola, Udaipur (North) Division]	1	1
	Bokan Reserve Forest Block (Naka-Surajgarh, Range Gogunda)	2	1
	Baghdarah stream (Near Parola village, Bagdhara Conservation Reserve, Forest Range Sajjangarh)	1	1
	Village Kanveriya (Tehsil Kotra, Forest Range Ogna)	1	1
	Village Ambavi (Naka Padawali, Forest Range Ogna)	1	1
	Magga-ki-Mal (Range Bokhada, Tehsil Gogunda)	1	1
	Kukdeshwar Mahadeo stream, Rama Forest Block, Forest Range Udaipur (East)	1	1
Rajsamand	Near Nag Bavsi (Forest Range Jhilwara)	2	2
	Streams between Sayra and Kumbhalgarh	1	1,2
Alwar	Bhangarh stream, near Bhangarh ruins, Sariska Tiger Reserve	1	1
	Bandipul stream (Sariska Tiger Reserve)	2	1
Baran	Kundakhoh gorge (Forest Range Shahabad)	1	1
Pali	Near Malgarh Chowki (Forest Range Sadari, Kumbhalgarh Wildlife Sanctuary)	1	2

*1= Perennial stream in the valley, 2= Semi-perennial stream in the valley,

**1= Growing densely, making continuous thickets, 2= Growing in patches

On the basis of corolla and corolla-color of *N. oleander*, five variants are seen in India namely, 'album' (white-flowered, single), 'carnea' (flowers carmine-red, single), 'roseum' (pink-flowered, single), 'carneum flore-pleno' (flowers salmon-pink, double), and 'variegatum plenum' (flowers carmine-pink, double) [2]. Variant 'roseum' has been naturalized in many forest streams of Rajasthan as shown in table 3. This variant of *N. oleander* species is present in moist and wet streams of Aravallis and Hadoti zone of Rajasthan but absent in the dry streams of western part of the state.

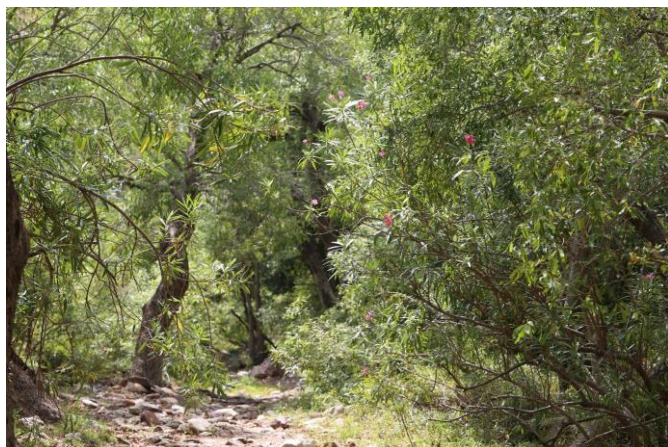


Figure 10. *Nerium oleander*: Densely growing in Kukdeshwar stream

Few streams in southern Rajasthan are supporting thick growth of *N. oleander*. When in flowering stage, riverine landscape becomes picturesque. In Rajasthan, naturalised *N. oleander* produces fruits and viable seeds in good quantity which initiates natural regeneration in the streams. Besides wind, dispersal of seeds is done by water also.

***Dodonaea angustifolia* L.f., Family Sapindaceae**

D. angustifolia is an evergreen shrub which belongs to Sapindaceae family. According to state flora of Rajasthan, it is a cultivated species in Rajasthan which is planted in the gardens as a hedge plant [14]. This species has escaped in many forest areas of Udaipur District and has naturalized there. Few locations are as follows:

Table 4: Localities where *D. angustifolia* growing naturally

Forest Division	Forest Range	Location	Present status
Udaipur (North)	Gogunda	Bansda Protected Forest Block (24.739375N, 73.556758E)	Extensively growing in this forest block, has occupied a big area, about 200 hectares on the hill slopes. Due to height, air current is fast and samara fruits are being dispersed far away. Run off is also helping seed dispersal towards newer areas in down slope.
Udaipur (North)	Udaipur (East)	Near Ghasiyar temple in Jhindoli Reserve Forest Block (24.711509N, 73.637639E)	Nearly 1.0-hectare area is affected. <i>Dodonaea angustifolia</i> is growing thinly but scattered dense patches are also present.
Udaipur (South)	Ogna	Ramkunda Reserve Forest Block (24.479198N, 73.318096E)	Forest area just before the Ramkunda temple, east of road is affected by <i>D. angustifolia</i> . It is a bamboo forest area having good moisture conditions. Nearly 2.0 hectare area is affected.
Udaipur (North)	Udaipur (East)	Area west of <i>Mayara-ki-Gupha</i> in Badgaon Tehsil (24.768705N, 73.572500E)	Area more than 50.0 hectare has been occupied by the thick growth of <i>D. angustifolia</i> . In future, this species may affect surrounding forest area. Before the year 2000, this species was absent in this zone

Udaipur (Wildlife)	Sajjangarh (Wildlife)	Area near Cloud-9 building (24.599672N, 73.650668E)	This area is close to Sajjangarh Wildlife Sanctuary. A patch about 0.5 hectare has developed within the natural forest.
Udaipur (South)	Parsad	Zawar town	A good patch has developed north of Zawar-Tidi road near Zawar town



Figure 11. Thickets of *Dodonaea angustifolia*, cladding hill slopes in Bansda Protected Forest Block

***Tithonia diversifolia* (Hemsl) A. Gray, Family Asteraceae**

On March 7, 2024, while tracking in Sitamata Wildlife Sanctuary, we came across many *T. diversifolia* plants along the bank of ‘hot water stream’ and ‘cold water stream’ near Valmiki Ashram. More than one dozen plants of different heights were growing on the sandy banks of both the perennial streams. Since many plants were in flowering stage hence they were visible from far distance.

T. diversifolia is a yellow-flowered robust annual, which is unbranched or sparsely-branched herbaceous species. Stem more or less woody. Flowers develop in a big-sized head(s), present on the tip of the stem or branches. Height of few plants, growing in Sitamata Sanctuary were up to 2.0 m. From distance, they were looking like sun flower plant (*Helianthus annuus*) but 3 or 5 lobed leaves with dentate/serrate margins were characteristic. This is an ornamental species [18]. which has now escaped in the wild.



Figure 4. *Tithonia diversifolia* growing on the bank of ‘cold water stream’ in Sitamata Wildlife Sanctuary

Now two species of *Tithonia* genus are known from Rajasthan namely, *T. rotundifolia* and *T. diversifolia*. According to existing literature [14], *T. rotundifolia* is a cultivated orange-flowered species in Rajasthan but this species has naturalized in Mt. Abu and Sajjargarh Wildlife Sanctuaries. During rainy season, this species can be seen in the wild growing extensively towards upper reaches of the hills of both the sanctuaries. Entry of *T. diversifolia* is new in the state's forest area. This species was not present up to 2022 in the Valmiki Ashram area. This is a new entrant in the Sanctuary area.

(C) Interesting Plants of Gorges of Shahabad, Baran District

“Shahabad Landscape” of Baran District is known as “Land of gorges”. Locally a gorge is called “khoh”. Many famous gorges are there in Shahabad zone like Kunda khoh, Sukha khoh, Madho khoh, Heera khoh, Bans khoh, Telni or Pukar khoh, Kalapani khoh, Pindasal khoh, Bhent khoh, Bhentra khoh, Peepia khoh, Aar khoh, Tapka khoh etc. Soorpa khoh of Shergarh Wildlife Sanctuary is also well known [13]. The gorges of Baran District, especially of Shahabad Tehsil, possess a special micro climate, hence their biota is rich in many respects. They need intensive and extensive exploration. Many new species, including endemic ones may occur there. The endemic fern *Selaginella rajasthanensis* is confined to Kunda Khoh gorge near to Shahabad fort [4]. Central Indian elements are also common over here. During our expedition in Khohs of Shahabad, many interesting species were seen like *Litsea glutinosa* in Lalokha Bhadka Khoh (25.237801N, 77.155865E), *Pterospermum aceriofolium* in Bhent khoh (25.173147N, 77.174339E); *Butea monosperma* var. *lutea*, *Commiphora gileadensis*, *Cyphostemma auriculatum* (*Vitis auriculata*), *Spondias pinnata*, *Erythrina suberosa sublobata* and *Sauromatum pedatum* in and around Kunda Khoh gorge. Few plants of *Sauromatum pedatum* were also seen in Shahabad fort area. The species listed above have not been reported so far in this area [10].

6. Conclusion and Future Scope

As many as five new species namely, *Iochroma arborescens*, *Dysphania pumilio*, *Opuntia cylindrica*, *Cyperus alternifolius* and *Alternanthera philoxeroides* have been added to the flora of Rajasthan. They are naturally growing in the wild habitats of Rajasthan. Besides this, the naturalization process of three garden species namely, *Dodonaea angustifolia*, *Nerium oleander*, and *Tithonia diversifolia* is visible in different localities in the state. *D. angustifolia* is spreading in Udaipur District while *N. oleander* is trespassing the different localities of Udaipur, Rajsamand, Alwar, Baran and Pali Districts. *T. diversifolia* is a relatively a new entrant and its spread is confined to a very small area. *Borassus flabellifer* is a rare palm in Rajasthan. It is fairly dotted in certain parts of Karoli and Dholpur Districts. A big patch of this species has been seen in Dholpur District

Forest areas of Rajasthan need continuous probe in the present and future. New species are entering the state in

different habitats. A vigil is needed on the new entrants and on the naturalized or and naturalizing species. If any species has a potential threat like *Lantana camara* and *Prosopis juliflora* to the wild habitats, proper management practices should be started by the Forest Department and other agencies to check the further spread of the species in the natural ecosystems of the state.

Data Availability

None

Conflict of Interest

The authors declare no competing interests.

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