

## SUPPLEMENT TO THE FLORA OF NORTH-EAST RAJASTHAN FROM ALWAR DISTRICT

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During the study of the flora of Alwar district of Rajasthan, about 20 species of angiosperms have been collected which are not reported in the Flora of North-East Rajasthan and other floristic studies of this region. The tree species *Cordia vestita*, *Erythrina suberosa*, *Hymenodyction excelsum* and *Stereospermum colais*, a woody climber, *Millettia extensa*, and an annual herb, *Sopubia delphinifolia*, are the rare species, which grow in the core area of the Sariska Tiger Project. *Carthamus oxycantha* and *Parthenium hysterophorus* are the exotic species, which have become an integral part of the natural flora of this region. A white flowered variety of *Solanum surratense* has been reported for the first time from Rajasthan.

**Keywords :** Flora; Kalighati valley; N-E Rajasthan; Sariska tiger project; Water channels.

### Introduction

Rajasthan is one of the largest states of India with an area of 342,274 km<sup>2</sup>. It is, therefore, very difficult for an individual to study the complete flora of the Rajasthan. Bhandari has extensively explored the flora of Jodhpur, Barmer and Jaisalmer districts<sup>1</sup>. The flora of North-East Rajasthan which includes Jaipur, Alwar, Bhartpur and Dausa districts has also been studied by Sharma and Tiagi<sup>2</sup>. The flora of the Keoladev National Park has also been studied<sup>3</sup>. The floristic studies in the Sariska Tiger Project have been carried out by Parmar<sup>4</sup>. While working on the flora of Alwar district, the author has collected many species of angiosperms, which have not been reported in the Flora of the North-East Rajasthan.

### Study area and Methods

Alwar district is located in the North-East Rajasthan between latitude 27° 5' to 28° 10' N and longitude 76° 10' E to 70° 15' E. The district possesses various types of habitats such as hilly topography which includes the Aravalli hills (the Sariska Tiger Project and adjacent hilly areas) and large lakes such as the Silisade, Jaisamand and Mangalsar lakes in Alwar and Rajgarh sub-divisions. The Behror and Kishangarh sub-divisions have mainly plain areas with soil varying from loam to sandy loam. The soil of the agriculture fields near Alwar city have 8.7 pH and 0.24 mV conductivity. The district receives 650 mm annual rainfall mainly during the months of July to September. The summers are very hot with maximum temperature rising to 48°C and the winters are very cold with minimum temperature sometimes nearing freezing point.

The plant specimens collected were identified with the help of the local floras<sup>2,5-7</sup>. Some plant specimens were identified with the help of the scientists of the Arid Zone Circle, Botanical Survey of India, Jodhpur and the

National Botanical Research Institute, Lucknow. All the plant specimens examined were deposited in the herbarium of Raj Rishi College, Alwar.

### Caryophyllaceae

*Arenaria serpyllifolia* Linn. Sp. Pl. 423, 1753. Maheshwari, Fl. Del. 69, 1963.

An annual, prostrate, much branched, tufted herb. Stem pubescent, grooved and wiry. Leaves 0.6 to 0.7 cm x 4 to 0.5 cm across, opposite, sessile, ovate, entire, acuminate, ciliate. Flowers white, pedicel long. Sepals lanceolate, ciliate. Petals membranous, Stamens 5. Style 3. Capsule ovoid. Seed many, small, black, tubercled.

It grows in moist soil along the water channels.

Fl. & Fr. February - March

### Malvaceae

*Sida acuta* Brum. F. Fl. Ind. 147, 1768; Bhandari, Fl. Ind. Desert 71, 1978.

A small much branched under shrub. Branches smooth or with minute stellate hairs. Leaves 2.5 to 8.2 cm long, lanceolate, oblong rounded at the base, crenate-serrate, acute or obtuse, glabrous. Stipules linear, longer than the petiole, veined, ciliate. Corolla twice as long as the calyx, yellow. Carpels 5, rugose, 2-awned. Seeds smooth, glabrous but pubescent around hilum.

It grows along roadsides and in wastelands.

Fl. & Fr. September-October.

### Combretaceae

*Anogeissus sericea* Brandis var. *nummularia* King ex Duthie FUGP 1:313, 1960; Scott in Kew Bull. 33:559, 1979.

Small trees, branches stiff, not pendulous, silky pubescent. leaves 1.5-2.0 cm long and 1.2-1.7 cm broad, apex obtuse or mucronulate, nerves 4-5, veins inconspicuous above prominent below, arcuate. Flowers in axillary and terminal, solitary pedunculate heads yellow

to brownish-yellow. Calyx persistent, thick. Fruit 3.5 x 6.5 mm, glabrous, wings cordate at the base.

It grows near Bharathari in the disturbed areas in the Sariska Tiger Project.

Fl. & Fr. January.

### Papilionaceae

*Crotalaria hirsuta* Willd. Sp. Pl. 3:978; Hook. f. Fl. Brit. India 2: 68, 1879.

An annual sub-erect or prostrate herb. Branches 28 cm long, cylindrical, many branches arise from the base of the stem. Stipules small, linear, persistent. Leaves sessile, simple. 3.5 x 2.0 cm across, membranous, ovate, entire, acute. Racemes 2 to 3 flowered. Bracts minute, lanceolate. Corolla yellow. Pods oblong, 1.4 cm long, finely downy, 6-seeded.

It grows at the top of hills in rainy seasons.

Fl. & Fr. September-October.

*Dalbergia paniculata* Roxb. Baker in Hook. f. Fl. Brit. India 2:236, 1876; Duthie, FUGP 1: 265, 1903.

A tall deciduous tree, the ultimate branches silky pubescent. Leaves 7.5-15 cm long. Leaf-lets 11-15, 2.5-5.0 cm long, turning black on drying, ovate, obovate, rounded at the base and often emarginate at the apex, subcoriaceous, glaucous beneath.

It grows in valley and at the base of hill slopes in the Sariska Tiger Project.

Fl. & Fr. March-April.

*Erythrina suberosa* Roxb. Fl. Ind. 3:253, 1832; Duthie, FUGP 1:219-220, 1960.

A medium sized tree with deeply cracked bark and white or pale yellow prickles. Leaves pinnate, trifoliolate. Leaf-lets 10-15 x 10-15 cm, rhomboid-ovate, pubescent below. Stipules linear-lanceolate. Flowers in terminal racemes, present at the end of branches, scarlet. Pods 6-15 x 0.3-0.8 cm, straight, terete, tapering at the ends, 2-5 seeded.

A single tree is growing in the Karna-ka-bas in the Sariska Tiger Project.

Fl. & Fr. April-May.

*Medicago lupulina* Linn. Yadav<sup>8</sup>

*Millettia extensa* Benth. in Miq. Pl. Jungh. 249, 1852; FBI 2:109, 1876; *M. auriculata* Duthie, FUGP 1:227, 1960

A large woody climber, with finally downy branches. Leaves imperipinnate. Leaf-lets 7-11, 7-16 x 4-8 cm, obovate or ovate-oblong, obtuse, appressed silky on both sides, stipulate. Flowers in dense axillary 0-30 cm long, slender racemes near the end of branches, dull white. Bracts small linear. Calyx and corolla silky. Pods 8-14 x 2.5-3.5 cm, linear, oblong, flat, woody, clothed with reddish brown tomentum, many seeded, sutures thickened.

It grows along the water channels and at the base of north facing hill slope in the Sariska Tiger Project.

Fl. & Fr. August-September.

*Psoralea corylifolia* Linn. Sp. Pl. 764, 1753; Maheshwari, Fl. Del. 119, 1963.

An erect, annual, upto 1.0 m high herb. Branches ribbed, covered with adpressed hairs, herbaceous. Stipules ovate, ovate-lanceolate, acuminate, hairy. Leaves mostly unifoliolate, however, at the upper end of branches one or two leaves were with one lateral leaf-let, while one is pinnately trifoliolate; terminal leaf-let large; leaf-lets ovate or roundish, repand toothed, firm, glabrescent, both sides with conspicuous black glandular dots. Flowers 10-30, in dense long peduncled heads. Calyx five lobed, lobes lanceolate, the lowest largest, gland dotted, adpressedly hairy. Corolla little exerted while with purple tipped keel. Petals with long claws. Pods small, sub-blobose, black, marked by ridges and depressions, glabrous, one seeded.

It is a rare plant and a tuft of plants of this species was growing in wasteland near the Sagar, Alwar.

Fl. & Fr. November-December.

*Tephrosia collina* var. *lanuginocarpa* Sharma.

Yadav<sup>9</sup>.

### Ehretiaceae

*Cordia vestita* (DC.) Hook. f. 7 Thomas in Journ. Linn. Soc. Bot. 2: 128, 1858; Duthie FUGP 1:529, 1960.

A small, deciduous tree, with a low rounded crown and greenish-grey bark exfoliating in large woody flakes. Branches densely grey tomentose when young. Leaves coriaceous 7.5-15.0 cm x 6-13 cm orbicular broadly ovate or obovate, rounded at apex and rounded or cuneate at the base, scabrous above and clothed with dense grey pubescence. Drupes ellipsoidal, acute, supported by the cup shaped or companulate, ribbed, persistent calyx.

It grows on the hill slopes in the core area of the Sariska Tiger Project.

Fl. & Fr. March-April.

### Asteraceae

*Carthamus oxycantha* M. Bieb. Fl. Tour. Cauc. 282, 1808; Maheshwari, Fl. Del. 200, 1963

An introduced, obnoxious weed. Stem and branches puberulous, white. Leaves rigid, margin spinose. Heads yellow. Bracts multiserrate. Achenes smooth, compressed and polished.

It grows along roadsides and in agriculture fields after the harvest of rabi crops in Kotkasim, Alwar.

Fl. & Fr. April-May.

*Parthenium hysterophorus* Linn. Sp. Pl. 988, 1753; Raizada, Suppl. FUGP 127, 1976.

This is a recently introduced, obnoxious, perennial herbaceous weed. It grows gregariously in wastelands, on roadsides, and along water drains in the Alwar city. It is gradually spreading towards the rural areas along water channels in irrigated fields.

Fl. & Fr. Throughout the year.

**Convolvulaceae**

*Convolvulus arvensis* Linn. Sp. Pl. 153, 1753; Maheshwari, Fl. Del. 239, 1963.

A creeping, twinning, glabrous herb. Leaves ovate or oblong-lanceolate, base auriculate, hastate. Flowers pink, solitary axillary, funnel shaped, on long peduncles. Capsule globose, glabrous.

It is a common winter season weed of agricultural fields.

Fl. & Fr. February- March.

*Volvolvopsis nummularia* (Linn.) Roberty in Candollea 14:28, 1952; Raizada in Ind. For. 9:4453, 1968.

A small, prostrate, branched, perennial herb. Stem green, pilose, rooting at nodes. Leaves alternate, exstipulate, petiolate, simple, cordate or orbicular, 1.5-1.4 cm across rounded at apex, glabrous. Inflorescence solitary, axillary. Sepals 5, oblong-lanceolate, unequal, ciliate. Corolla white, funnel shaped. Stamens 5, filaments filiform. Ovary bicarpellary. Style linear-filiform free to the base, each deeply cleft. Stigma 2, linear filiform. Capsule ovoid, 4 seeded.

It grows commonly in wastelands, fallow fields and on roadsides in Alwar.

Fl. & Fr. September- November.

**Solanaceae**

*Solanum surattense* (a white flowered variety) Burm. F. Fl. Ind. 57, 1768; Maheshwari, Fl. Del. 245, 1963.

For the first time, two plants of *Solanum surattense* with pure white flowers were found along a roadside near Umrain village in Alwar districts of Rajasthan. The important difference observed in these plants from blue-flowered variety, was the grass green colour of the stem and branches of the latter variety. After the death of these plants no plant with white flowers was located.

Fl. & Fr. January- April.

**Scrophulariaceae**

*Antirrhinum orontium* Linn. Sp. Pl. 617, 1753; Maheshwari, Fl. Del. 250, 1963.

An erect, annual herb. Stem slender, very less branched, ribbed and glabrous. Leaves lower opposite and upper alternate, 2.0-3.5 cm long, linear, narrow, entire. Flowers solitary, axillary, white or pinkish. Corolla bilipped, gibbous at the base. Capsule obliquely ovoid, pubescent, included in persistent calyx. Calyx longer than the capsule.

It grows on the upper part of hill slopes in rainy season.

Fl. & Fr. February-April.

*Sopubia delphinifolia* (Linn.) G. Don, Gen. Hist. 4:560, 1837; Duthie, FUGP 2:32, 1960.

Erect small annual herb. Stem quadrangular, purplish, glabrous, Leaves 2.5-5.0 cm long, pinnatisect,

segments filiform, distant, often divided again. Flowers 2.5-3.5 cm long, axillary, solitary, passing into terminal racemes. Bracteoles filiform. Calyx campanulate, 10 nerved, strongly ribbed below, teeth linear, subulate, erect. Corolla tube ventricose in upper region, purple or rose coloured. Capsules 5-8 mm long, oblong. Seeds oblong-ellipsoidal.

It grows in moist places near the ponds in rainy season in the core area of the Sariska Tiger Project.

Fl. & Fr. August-September.

**Rubiaceae**

*Hymenodictyon excelsum* (Roxb.) Wall. in Roxb. Fl. Ind. 2:149, 1824; Duthie, FUGP 1:337, 1960.

A small deciduous tree 4-12 m high. Bark of stem rough and furrowed. Branches have smooth bark. Leaves 10-22 cm x 5.5-12 cm, elliptic-oblong, abruptly acuminate and narrowed in to a petiole. Stipules oblong, broad based, glandular serrate, caducous. Flowers cymed along the rachis of spiciform axillary and terminal, pubescent racemes, white or grey. Pedicels 1-2 mm long. Corolla lobes 5, valvate.

It grows on the hill slopes in the Kalighati valley in the Sariska Tiger Project.

Fl. & Fr. September.

**Bignoniaceae**

*Stereospermum colais* (Buch.-Ham. ex Dill.) Mabblerley in Taxon 27: 553, 1979; *Stereospermum suaveolens* (Roxb.) DC. Prodr. 9:211, 1845; Duthie, FUGP 2:45, 1960.

A deciduous tree, 10-20 m high, young shoots viscous hairy. Leaf rachis up to 30 cm long. Leaflets 7-9, 8-20 cm x 6-10 cm, broadly elliptic, entire, main veins 6-8 pairs, serrulate, acute or acuminate, rough above and hairy below. Flowers in lax, trichotomous, viscid panicles. Calyx 1 cm long, campanulate, viscid, 5 lobed. Corolla dull purple, two lipped, lobes rounded, three lower larger than the two upper. Capsule 30-60 cm x 1.0-2.5 cm long cylindrical, 4 angled, tubercled. Seeds winged at each end.

It grows along the water channels in the Kalighati valley in the Sariska Tiger Project.

Fl. April - May & Fr. July.

**Lamiaceae**

*Nepeta hindostana* (Roth.) Haines, Bot. Bih. & Or. 744, 1922; Maheshwari, Fl. Del. 290, 1963.

A hairy herb, with several branches from the base of stem. Branches quadrangular grooved. Petiole 2.5-4.2 cm long. Leaves 2.5-6.5 cm across, ovate, coarsely crenate-serrate, acute. Flowers in stalked, axillary cymes forming dense spiciform thyrses at the top. Corolla bluish-purple. Nutlets brown.

It was growing on the roadside on way to Silisade lake.

Fl. & Fr. October- November.

**Euphorbiaceae**

*Bridelia squamosa* (Lam.) Gehrm. in Engl. Bot. Jahrb. 41

Biebl. 95:308, 1908; Santapau in J. Bombay Nat. Hist. Soc. 50; 308, 1951.

A moderate sized deciduous tree with grey bark. Leaves 8.5-30 cm x 6-11 cm across, ovate-elliptic or elliptic-oblong, obtuse or subacute, finely pubescent beneath. Stipules ovate, triangulate. Flowers dioecious, in axillary long terminal panicles, greenish white spikes exceeding leaves. Stamens monoadelphous. Drupes fleshy, globose, seated on the persistent calyx, purplish black at maturity.

It grows in the valley along water channels in the Sariska Tiger Project.

Fl. & Fr. August-October.

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