

# **Ipomoea Sagittifolia Burm.f. – New Record for Rajasthan and Note on Family Convolvulaceae of Todgarh-Raoli Wildlife Sanctuary, Rajasthan**

**C. S. Purohit**

Botanical Survey of India, Andaman and Nicobar Regional Centre, Port Blair, India

Corresponding author e-mail address: [chandansinghpurohit@yahoo.com](mailto:chandansinghpurohit@yahoo.com)

## **ABSTRACT**

Present paper deals with 28 species belonging to 6 genera of family Convolvulaceae collected from this sanctuary. Out of these, one species *Ipomoea sagittifolia* is reported first time and addition for flora of Rajasthan. Eleven species are reported first time and addition for flora of Aravalli range. Three genera i.e. *Argyrea*, *Merremia* and *Rivea* are first time report and generic addition for flora of Todgarh-Raoli wildlife sanctuary and 25 plant species are addition for flora of Todgarh-Raoli wildlife sanctuary.

**Keywords :** Addition, Convolvulaceae, Rajasthan, Aravalli, Todgarh-Raoli wls

## **I. INTRODUCTION**

Convolvulaceae is known as morning glory family with approx. 2000 species belonging to 58 genera from all over the world (Staple and Yang, 1998). India is represented 158 species belonging to 20 genera (Oudhia, 2001). Out of which 58 species belonging to 12 genera reported from Rajasthan (Shetty & Singh, 1987). In the Aravalli range, Convolvulaceae represents 30 species belonging to 8 genera (Otaghavari *et al.*, 2015). Many researcher (Sharma *et al.*, 2005; Sharma & Katewa, 2007; Jain *et al.*, 2011; Kanther & Gena, 2012; Kanther, 2013; Kanther 2018; Singh & Yadav, 2018; Purohit, 2019; Sharma, 2019; Sharma & Khandal, 2019; Tomar & Sharm, 2019; Purohit *et al.* 2020) have been reported few plants from Todgarh-Raoli wildlife sanctuary and nearby area but some workers have done remarkable works i.e.

Jain *et al.* (2007) have done work on ethno-medicinal plant of this sanctuary and reported 45 ethno-medicinal plant species belonging to 28 families including one species of family convolvulaceae i.e.

*Evolvulus alsinoides* L. Galav *et al.* (2013) reported 54 species belonging to 34 families used by tribals as ethnoveterinary medicines in the sanctuary. Kanther (2019) have done extensive work extensive vegetation of Todgarh-Raoli wildlife sanctuary and reported 301 species belonging to 84 families including with 6 species belonging to 4 genera of family convolvulaceae.

## **II. STUDY AREA**

It is situated in most fragile ecosystem of Aravallis “Todgarh-Raoli Wildlife Sanctaury” is just 110 kms in the southwest of famous city “Ajmer”. Geographically this sanctuary is situated between 73°40' – 74°10' east longitudes and 25°20' – 26°0' north latitudes, covers an area of 495.27 km<sup>2</sup> and extended in three districts viz. Rajsamand, Pali and Ajmer in the south-western part of Rajasthan State. It is one of the protected areas expressing full range of habitat of Aravalli ecosystem. It is important from Bio-geographical point of view, since it forms one of the patches of Dhok and Salar forests. It has exceptional diversity and interspersions of habitat which includes areas of Dhok, Salar, dryland, seasonal streams, cascading mountains and

newly formed sand dunes, formed on western hill aspects and fine grooves of mixed wood lands. This sanctuary makes an ecotone between hilly forests of Aravallis and Thar desert situated in the north-west. The hills of this sanctuary acts like a barrier, checking eastward extension of desert.

### III. MATERIAL AND METHODS

While working on the floristic diversity of the Todgarh-Raoli Wildlife Sanctuary (Rajasthan) during 2015 to 2019, author collected 28 plant samples of family Convolvulaceae from different locations of this sanctuary. These collected herbarium samples deposited at Botanical Survey of India, Jodhpur (BSJO). After critical study, scrutiny of literature (Clarke 1883; Blatter & Hallberg, 1920; Sharma & Tiagi, 1979; Johri, 1984; Bhandari, 1990; Shetty & Singh, 1991, Tiagi & Aery, 2007; Otaghvari *et al.*, 2015) and herbaria (BSJO, BSA, RUBL, JAC, BLAT, DCH, CAL), these plant samples identified and listed here alphabetically.

#### LIST OF PLANT SPECIES

1. *Argyrea sericea* Dalz. in Dalz. & Gibs. Bombay Fl. 169. 1861. Hook.f., Fl. Brit. India 4. 188. 1883. Raizada, Suppl. Duthie, Fl. Upper Gangetic Plain 160. 1976. Shetty & Singh, Fl. Rajasthan 2. 526. 1991. [Fig.-1]

*Taxonomic description:* A silky, large, twiners. Leaves 6.5 – 12 × 6 – 12 cm, broadly ovate-cordate strigose above, densely silky beneath, apex acute, base cordate, nerves 8 – 10 pairs. petioles up to 5 cm long, densely silky. Flowers in capitate or subcapitate cymes, 6 – 8 in a cyme; peduncles up to 8 cm long, silky. Bracts ovate, with parallel nerves. Calyx 5, densely hairy and ciliate; outer 2 linear, inner 3, elliptic oblong. Corolla pink, up to 6 cm long, tubes and bands hairy; filaments hairy at base, anthers sagittate. Berries 1.5 cm in diam., orange coloured.

*Fl. & Fr.:* Aug. – Nov.

*Status:* Endemic to Western penninsula. Rare.

*Distribution:* Ajmer; Alwar; Banswara (Kushalgarh road; Bundi (Kota dam); Jhunjhunu, Todgarh-Raoli wildlife sanctuary (Kalalia).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Kalalia, 03-Sep-18, 25°55.881'N & 74°08.473'E, 499m, C.S. Purohit 33555;

2. *Argyrea nervosa* (Burm.f.) Boj., Hort. Maurit. 224. 1837. Bhandari, Fl. Indian Desert 217. 1990. Shetty & Singh, Fl. Rajasthan 2. 559. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 352. 2007. *Convolvulus nervosa* Burm.f., Fl. Ind. 48. t. 20. f. 1. 1768. *Argyrea speciosa*, Hort. Brit. 289. 1827. Hook.f., Fl. Brit. India 4. 184. 1883. [Fig.-1]

*Taxonomic description:* A large woody climber; Stem stout, densely white pubescent when young, glabrescent. Leaves 4 – 30 × 6 – 20 cm, cordate at base, acute at apex, entire, white-tomentose beneath, petioles up to 15 cm long. Flowers in subcapitate cymes, rose purple. Peduncle up to 12 cm long, white, tomentose. Bracts large, ovate, acuminate, pubescent outside, caducous. Calyx up to 2 cm long, ovate to broadly ovate, white-tomentose outside. Corolla up to 8 cm long, infundibuliform, pubescent outside, rose-purple. Ovary glabrous. Fruit up to 1.5 cm long, globose, apiculate. Seeds 2 – 4, black or dark brown, glabrous.

*Fl. & Fr.:* Aug. – Nov.

*Distribution:* Jodhpur, Todgarh-Raoli wildlife sanctuary (Dewair).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bhim Range, Dewair, 10-Aug-16, 25°25.884'N & 73°48.017'E, 636m, C.S. Purohit 33171 (BSJO 41092, 41093).

3. *Convolvulus arvensis* L. Sp. Pl. 153. 1753. Hook.f., Fl. Brit. India 4. 219. 1883. Duthie, Fl. Upper Gangetic Plain 2. 106. 1911. Bhandari, Fl. Indian Desert 217. 1990. Singh in Shetty & Singh, Fl.

Rajasthan 2. 528. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 353. 2007. [Fig.-1]

*Taxonomic description:* A prostrate or twining, sparsely pubescent or glabrous, perennial herbs. Leaves 2 – 8 × 1 – 3 cm, ovate-oblong to lanceolate, segittate at the base, obtuse at apex, glabrous. Petiole up to 3 cm long. Flowers axillary, solitary or in 2 to 3-flowered cymes; peduncles up to 8 cm long, angular. Calyx 4 – 5 mm long, slightly unequal, oblong-elliptic, obtuse, glabrous. Corolla up to 2.5 cm long, funnel-shaped, white or pink, with hairy mid petaline bands outside. Stamens slightly unequal. Fruit capsules, up to 8 mm long, 6 mm in diam., ovoid-globose, glabrous, 4-seeded. Seeds up to 4 mm long, dark brown or black, glabrous, minutely rugose. *Fl. & Fr.:* Sept. – Mar.

*Local name:* Hiranpagi

*Distribution:* Bharatpur (Dig); Bikaner (Arjunsar, Bichhwal); Jaipur (Forest nursery); Kota; Nagaur (Merta City); Sirohi (Mount Abu), Todgarh-Raoli wildlife sanctuary (Bhanwar Bhata).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Jojawar Range, Bhanwar Bhata, 02-Mar-19, 25°44.552'N & 73°53.017'E, 366m, C.S. Purohit 38021;

**4. *Convolvulus deserti*** Hochst. & Steud. ex Baker. & Rendle in Dyer, Fl. Trop. Afr. 4(2). 164. 1905. Bhandari, Fl. Indian Desert 220. 1990. Shetty & Singh, Fl. Rajasthan 2. 530. 1991. [Fig.-1]

*Taxonomic description:* A procumbent, perennial herbs up to 40 cm high. Stem branched, branches sparsely clothed with spreading hairs. Leaves up to 3 cm long, few lower leaves up to 7 cm long, sessile, linear-oblong to spatulate, tapering at base, obtuse or subacute at apex, softly white adpressed hairy on both surfaces. Flowers in axillary, pedunculate, pinkish-white, 1 to 3-flowered clusters. Bracts up to 1 cm long, linear. Calyx up to 7 mm long, subequal, ovate-lanceolate, acuminate. Corolla up to 1 cm long, funnel-shaped; lobes pubescent along midpetaline

area. Ovary ovoid, glabrous. Fruit capsule, up to 3 mm long, glabrous, 2 to 4-seeded. Seeds up to 2 mm long, blackish-brown.

*Fl. & Fr.:* Sept. – Mar.

*Local name:* Santari

*Distribution:* Barmer; Bikaner (Lakhusar); Ganganagar (Hindumal Kot); Jaisalmer; Jodhpur; Nagaur (Near pond, Merta City), Todgarh-Raoli wildlife sanctuary (Borimada).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Jojawar Range, Borimada, 04-Mar-19, 25°39.659'N & 73°52.606'E, 478m, C.S. Purohit 38035;

**5. *Convolvulus prostratus*** Forsk. Fl. Aegypt.-Arab. 203. 1775. Shetty & Singh, Fl. Rajasthan 2. 530. 1991. *C. microphyllus* Sieb. ex Spreng. Syst. Veg. 1. 611. 1825. Hook.f., Fl. Brit. India 4. 218. 1883. Bhandari, Fl. Indian Desert 221. 1990. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 353. 2007. [Fig.-1]

*Taxonomic description:* A procumbent or prostrate, hairy or ferruginously pilose perennial herbs up to 50 cm high. Stem suffruticose at base. Leaves 2 – 6 × 0.2 – 0.9 cm, sessile, linear-oblong, oblanceolate, subacute at apex, slightly cuneate at base, entire, pilose on both surfaces. Flowers in pedunculate, axillary heads peduncle up to 2 cm long. Flower sessile or subsessile. Bracts up to 1 cm long, linear-lanceolate, acuminate, outer longer than inner ones. Calyx up to 8 mm long, lobes ovate, acuminate, densely silky hairy. Corolla up to 12 mm long, funnel-shaped, pinkish-white. Ovary glabrous, on cupular disc. Fruit capsule, up to 3 mm long, subglobose, glabrous, 4-seeded. Seeds up to 2 mm long, brownish-black, pubescent.

*Fl. & Fr.:* Aug. – Feb.

*Local name:* Sankh-pushpi

*Distribution:* Alwar (Minak forest); Banswara (Ghatol); Barmer (Balotra); Bikaner (Mahajan); Jaipur (Durgapura); Kota (Darah); Nagaur (Sri Balaji); Sirohi (Abu road), Todgarh-Raoli Wildlife Sanctuary (Dewair, Jojawar, Bagana, Gauri kund).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bhim Range, Dewair, Rajsamand, 10-Aug-16, 25°25.884'N & 73°48.017'E, 636m, C.S. Purohit 33171; Jojawar Range, 26-Nov-17, C.S. Purohit 33475; Bhim Range, Bagana, 09-Sep-18, 25°30.524'N & 73°49.849'E, 590m, C.S. Purohit 31030; Bhim Range, Gauri kund, Baghana, 06-Mar-19, 25°30.818'N & 73°49.553'E, 551m, C.S. Purohit 38048.

*Uses:* The open flowers are collected early morning and crushed with sugar; the mixture is taken daily as a brain tonic and as a laxative. Leaf-paste is taken orally with water against bone fracture.

**6. *Evolvulus alsinoides* (L.) L. Sp. Pl. ed. 2. 392. 1762; FBI 4. 220. 1883; Duthie, Fl. Upper Gangetic Plain 2. 104. 1911; Bhandari, Fl. Indian Desert 223. 1990. Shetty & Singh, Fl. Rajasthan 2. 533. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 354. 2007. [Fig.-1]**

*Taxonomic description:* A prostrate or procumbent, perennial herbs, with woody rootstock, clothed with ferruginous hairs. Leaves 1 – 3 × 0.5 – 1 cm, subsessile, oblong, elliptic, lanceolate or spatulate, obtuse, acute at apex, narrowed at base, adpressedly pilose on both surfaces. Flowers in solitary, axillary. Bracteoles up to 4 mm long, linear. Calyx up to 4 mm long, segments lanceolate, acuminate, densely hairy. Corolla 7 – 11 mm long, funnel-shaped, blue or white. Stamens inserted with in corolla-tube. Fruit capsule, globular, glabrous, 4-seeded. Seeds smooth, pale brown to black, ovoid.

*Fl. & Fr.:* Aug. – Nov.

*Distribution:* Banswara (Paloda); Barmer (Dhorimanna hills); Bharatpur (Pahartal); Bikaner (Lunkaransar); Jaipur (Amer); Jodhpur (Kailana, Machiya Biological Park); Kota (Shahabad); Nagaur (Bandi Ghati, Thanwla); Sirohi (Mount Abu), Todgarh-Raoli Wildlife Sanctuary (Bheelon ki Nal, Taheshwar Mahadev, Goramghat, Halela, Badinda gui).



Fig.1: Plants of Todgarh-Raoli wildlife sanctuary.

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Bheelon Ki Nal, Ajmer, 27-Jul-16, 25°43.229'N & 73°55.794'E, 444m, C.S. Purohit 32827 (BSJO 40459, 40460); Bijajiguda Range, Taheshwar Mahadev, Pali, 29-Jul-16, 25°49.954'N & 73°56.474'E, 426m, C.S. Purohit 32901 (BSJO 40596, 40597); Bijajiguda Range, Taheshwar Mahadev, Pali, 29-Jul-16, 25°49.954'N & 73°56.474'E, 426m, C.S. Purohit 32907 (BSJO 40608, 40609); Bhim Range, Goramghat khai, Rajsamand, 04-Aug-16, 25°38.120'N & 73°46.758'E, 476m, C.S. Purohit 33042 (BSJO 40756, 40757); Bhim Range, Halela-Badinda gui, Rajsamand, 11-Aug-16, 25°22.685'N & 73°48.007'E, 739m, C.S. Purohit 33198 (BSJO 41146, 41147); Bhim Range, Goramghat low land, Bhim Range, 14 Nov. 2017, 25°38.120'N & 73°46.758'E, 476m, C.S. Purohit 33368 (BSJO 41172); Bhim Range, Goramghat Top,

05-Sep-18, 25°39.994'N & 73°52.130'E, 943m, C.S. Purohit 33600.

*Uses:* The decoction of plant is used as a febrifuge, vermifuge and to cure dysentery. The fresh flowers with sugar are eaten as a brain tonic.

**7. *Ipomoea alba*** L. Sp. Pl. 161. 1753. Shetty & Singh, Fl. Rajasthan 2. 537. 1991. [Fig.-2, Fig.-4]

*Taxonomic description:* A large, perennial herb, twining, usually glabrous, rarely puberulent. Stems terete, with soft prickles. Leaves 7 – 15 × 4 – 9 cm, ovate, acuminate, margin entire, base cordate; petiole up to 15 cm long. Flower in axillary dichasila or helicoids cyme, 1 – 5 flowered in cyme, snow white. Peduncles up to 15 cm long, glabrous, stout, terete. Bracts caducous. Pedicel up to 12 cm long, enlarged in fruit. Calyx 5, elliptic, glabrous; outer 3 sepals up to 10 mm long, 4 – 9 mm awn on apex; inner 2 sepals up to 13 mm long, mucronate. Corolla white, salverform; tube up to 10 cm long, 5 mm in diam. Stamens exerted. Stigma bilobed. Fruit capsule, up to 3 cm long, ovoid-oblong, apiculate, 6 – 10-seeded. Seeds white or brown, up to 8 mm long, glabrous.

*Fl. & Fr.:* Aug. – Nov.

*Local name:* Moon flower.

*Distribution:* Banswara (Kushalgarh), Todgarh-Raoli Wildlife Sanctuary (Tilakheda).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Tilakheda, 01 Sept. 2018, 25°45.930'N & 73°59.203'E, 457m, C.S. Purohit 33543.

**8. *Ipomoea biflora*** (L.) Pers. Syn. Pl. 1. 183. 1805.

*Convolvulus biflorus* L. Sp. Pl. ed. 2. 2. 1668. 1763.

*Ipomoea sinensis* (Desr.) Choisy in Mem. Phys. Soc. Geneve 6. 459. 1834. *Convolvulus sinensis* Desr. In Lam. Encycle. 3. 557. 1792. Shetty & Singh, Fl. Rajasthan 2. 547. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 359. 2007. *Ipomoea calycina* (Roxb.) Benth. ex Clarke in Hook.f., Fl. Brit. India 4. 201. 1883. Duthie, Fl. Upper Gangetic Plain 2. 112. 1911. [Fig.-2, Fig.-4]

*Taxonomic description:* A tufted, twining herb, clothed with long spreading hairs. Leaves 2 – 9 × 3 – 6 cm, ovate, cordate at base, acuminate at apex, margin entire. Flowers 1 – 3, in axillary cyme. Peduncle up to 1.5 cm long. Bract up to 1 cm long, deltate-lanceolate, acute. Pedicel up to 1.5 cm long. Calyx 5, up to 10 mm long; outer 3 sepals deltate, ciliate; inner 2 sepals lanceolate. Corolla up to 2 cm long, tubular, white, midpetaline bands pubescent. Fruit capsule, up to 9 mm in diam., globose, glabrous. Seeds up to 4 mm long, puberulent, margin hairy.

*Fl. & Fr.:* August – December.

*Distribution:* Banswara (Loda village); Danpur; Jhalawar (Eklera); Pali (Ghenerao); Udaipur (Bagdora forest).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Kabradata Oran, 10 Nov. 2017, 25°42.736'N & 73°55.517'E, 445m, C.S. Purohit 33251 (BSJO 39798); Bhim Range, Kachhbali, 05-Sept.-2018, C.S. Purohit 33597.

**9. *Ipomoea cairica*** (L.) Sweet. Hort. Brit. 287. 1827.

Raizada, Suppl. Duthie, Fl. Upper Gangetic Plain 162.

1976. Bhandari, Fl. Indian Desert 225. 1990. Shetty & Singh, Fl. Rajasthan 2. 538. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 357. 2007. *Convolvulus cairicus* L. Syst. Nat. ed. 10. 922. 1759. *Ipomoea palmata* Forssk. Fl. Aegypt.-Arab. 43. 1775. Hook.f., Fl. Brit. India 4. 214. 1883. [Fig.-2]

*Taxonomic description:* A glabrous perennial twiners, herbs, with tuberous rootstock. Stem smooth. Leaves 4 – 10 × 4 – 9 cm, orbicular, deeply palmately 5 to 7-partite; segments elliptic-obovate, obtuse, mucronulate, narrowed at both ends, mucronate at apex; petioles up to 6 cm long. Flowers in 1 to 3-flowered cymes. Peduncles up to 4 cm long. Calyx up to 5 mm long, ovate. Corolla up to 7 cm long, funnel-shaped, white or purple. Stamens and style included; filaments unequal, pilose at base. Fruit capsules, up to 8 mm long, globose, glabrous, smooth. Seeds pubescent.

*Fl. & Fr.:* Throughout the year.

*Local name:* *Railway-creeper*.

*Distribution:* Bharatpur (Wair); Bikaner (Shivbari); Jodhpur (Bilara); Jhalawar (Bhawanimandi); Nagaur (Nawa); Udaipur, Todgarh-Raoli Wildlife Sanctuary (Aasan, Mewa ka Mathara, Khaimaz mata temple).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Aasan, Pali, 06-Aug-16, 25°57.117'N & 74°07.938'E, 442m, C.S. Purohit 33101 (BSJO 40923, 40924); Bhim Range, Mewa ka Mathara, 21-Nov-17, 25°26.132'N & 73°48.883'E, 754m, C.S. Purohit 33454; Jojawar Range, Khaimaz mata temple, 26-Nov-17, 25°25.622'N & 73°45.366'E, 451m, C.S. Purohit 33474.

**10. *Ipomoea carnea*** Jacq. Enum. Pl. Carib. 13. 1760. subsp. *fistulosa* (Mart. ex Choisy) Austin in Taxon 26. 237. f. 2. 1977. Bhandari, Fl. Indian Desert 225. 1990. Shetty & Singh, Fl. Rajasthan 2. 539. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 357. 2007. *Ipomoea fistulosa* Mart. ex Choisy in DC. Prodr. 9. 349. 1845. Raizada, Suppl. Duthie, Fl. Upper Gangetic Plain 163. 1976.

*Taxonomic description:* An erect or ascending, stout shrubs up to 3 m high. Stem thick, terete, fistulose, glabrescent, sparsely lenticellate with age. Leaves 7 – 22 × 5 – 15 cm, ovate or ovate-oblong, densely puberulent cordate at base, margin entire, acuminate at apex. Petiole up to 12 cm long. Flowers in 2 to few in cyme; peduncle up to 8 cm long. bracts Caducous, ovate. Pedicel up to 1.5 cm long. Calyx up to 5 mm long, ovate. Corolla up to 8 cm long, pink, darker inside, funnellform. Stamens and pistil included. ovary puberulent. Stigma 2-lobed. Fruit capsule, up to 2 cm long, pale brown, ovoid, 4-seeded. Seeds up to 1 cm long, black, pubescent.

*Fl. & Fr.:* Aug. – Dec.

*Local name:* *Nagar pan*.

*Distribution:* Alwar (Sariska Tiger Reserve); Banswara (Saina vasi village); Bikaner (Chattergarh); Jaipur (Bapunagar); Jodhpur (Pipad); Kota

(Nahargarh); Tonk (Niwai temple), Todgarh-Raoli Wildlife Sanctuary (Goramghat, Aasan, Kantaliya).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bhim Range, Goramghat, 25°38.120'N & 73°46.758'E, 476m, 04-Aug-16, , C.S. Purohit 33036 (BSJO 40747); Bijajiguda Range, Aasan, Pali, 25°57.117'N & 74°07.938'E, 442m, 06-Aug-16, , C.S. Purohit 33104 (BSJO 40917, 40918); Jojawar Range, Kantaliya, 02-Sep-18, 25°47.168'N & 73°49.906'E, 343m, C.S. Purohit 33552.

**11. *Ipomoea dichroa*** (Roem. & Schult.) Choisy in DC. Prodr. 9. 364. 1845. Bhandari, Fl. Indian Desert 226. 1990. Shetty & Singh, Fl. Rajasthan 2. 541. 1991. *Convolvulus dichrous* Roem. & Schult. Syst. Veg. 4. 263. 1819. *Ipomoea pilosa* Sweet, Hort. Brit. ed. 2. 289. 1827. *non* Houtt. 1777. Hook.f., Fl. Brit. India 4. 213. 1883. Duthie, Fl. Upper Gangetic Plain 2. 114. 1911.

*Taxonomic description:* A twining or prostrate, annual herbs, hirsute with glandular-based brownish hairs. Leaves 5 – 12 × 6 – 11 cm, broadly ovate-cordate, entire, margin ciliate, angled or 3-lobed, acute, adpressed white tomentose beneath. Petiole up to 4 cm long. Flowers in axillary, bracteate cymes. Peduncle up to 6 cm long. Bracteole up to 1 cm long, lanceolate. Calyx up to 12 mm long, lobes lanceolate, acuminate, bristly hairs outside. Corolla up to 25 mm long, tube suddenly widened at mouth, bright pink, scattered hairs outside. Fruit capsule, 8 mm in diam., globose, thinly pubescent. Seeds up to 4 mm in diam., velvety pubescent.

*Fl. & Fr.:* August – December.

*Distribution:* Banswara (Kushalgarh); Barmer (Balotra); Bikaner (Khetolai); Jaipur (Ramgarh); Jodhpur; Kota (Gubernath mahadeo); Sirohi (Mount Abu), Todgarh-Raoli wildlife sanctuary (Khejri guar, Bujarel, Tilakheda, Ganeshpura).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Khejri guar, 17-Nov-17, 25°50.348'N & 73°58.088'E, 487m, C.S. Purohit 33421;



Raoli Range, Bujarel, 31-Aug-18, 25°44.601'N & 73°58.722'E, 472m, C.S. Purohit 33486; Raoli Range, Tilakheda, Ajmer, 01 Sept. 2018, 25°45.930'N & 73°59.203'E, 457m, C.S. Purohit 33519; Raoli Range, Ganeshpura, 02-Sep-18, 25°46.504'N & 73°57.733'E, 492m, C.S. Purohit 33545.

**12. *Ipomoea eriocarpa*** R.Br. Prodr. 484. 1810. Hook.f., Fl. Brit. India 4. 204. 1883. Bhandari, Fl. Indian Desert 227. 1990. Shetty & Singh, Fl. Rajasthan 2. 541. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 358. 2007. *Ipomoea hispida* (Vahl) Roem. & Schult. Syst. Veg. 4. 238. 1819, non Zucc. 1809. Duthie, Fl. Upper Gangetic Plain 2. 113. 1911. [Fig.-2]

A prostrate or twining, annual herbs. Stem herbaceous, *Taxonomic description:* slender, terete, retorsely pubescent. Leaves 4 – 11 × 1 – 4 cm, ovate-lanceolate or hastate at base, acute at apex, entire, pilose. Petiole up to 5 cm long. Flowers sessile, in 1 to few-flowered, axillary cymes. Bracteoles linear, up to 5 mm long. Calyx upto 8 mm long; segments subequal, ovate, pilose. Corolla up to 10 mm long, funnel shaped, white with purple eye, pubescent. Fruit capsule, up to 7 mm in diam., globose, hairy, 4-seeded. Seeds up to 3 mm long, glabrous.

*Fl. & Fr.:* Aug. – Feb.

*Local name:* Nakhari, Ghia-bato.

*Distribution:* Alwar (Bala fort); Banswara (Kotharia forest); Bikaner (Khetolai); Ganganagar (Dabli); Jaipur (Ramgarh); Jodhpur; Kota (Sitabari); Nagaur (Thanwla); Sirohi (Mount Abu), Todgarh-Raoli Wildlife Sanctuary (Mangad ji maharaj).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Mangad ji maharaj temple, 18-Nov-17, 25°48.604'N & 73°59.148'E, 853m, C.S. Purohit 33433;

**13. *Ipomoea indica*** (Burm.f.) Merr. Int. Rumph. Herb. Amb. 445. 1917. Bhandari, Fl. Indian Desert 228. 1990. Shetty & Singh, Fl. Rajasthan 2. 542. 1991. *Convolvulus indicus* Burm.f., in Rumph. Herb. Amb.

7. 6. 1755. *Ipomoea leari* Paxt. in Paxton, Bot. Mag. 6. t. 267. 1839. Duthie, Fl. Upper Gangetic Plain 2. 117. 1911.

*Taxonomic description:* An erect or prostrate, herbaceous, perennial climber. Stem branched, few branches prostrate, retorsely pilose. Leaves 5 – 12 × 4 – 10 cm, orbicular, cordate at base, acuminate at apex, adpressed hairy on upper surface, densely hairy on lower surface. Petiole up to 6 cm long. Flowers in dense umbellate cyme. Peduncle up to 15 cm long. Bract linear, lanceolate. Pedicel up to 6 mm long. Calyx up to 2 cm long, linear, nearly glabrous. Corolla up to 6 cm long, blue to bluish-purple. Stamens and pistil included. Ovary glabrous. Stigma 3-lobed. Fruit capsule, up to 1 cm in diam., globose. Seeds up to 5 mm long.

*Fl. & Fr.:* Aug. – Feb.

*Local name:* Morning glory.

*Distribution:* Barmer (Haldeshwar Mahadev); Jodhpur; Sirohi (Mount Abu), Todgarh-Raoli Wildlife Sanctuary (Goramghat).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bhim Range, Goramghat, 05-Aug-16, 25°38.491'N & 73°52.022'E, 488m, C.S. Purohit 33071 (BSJO 40810, 40811).

**14. *Ipomoea nil*** (L.) Rot. Rot. Cat. Bot. 1. 36. 1797. var. *nil* Bhandari, Fl. Indian Desert 229. 1990. Shetty & Singh, Fl. Rajasthan 2. 543. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 358. 2007. [Fig.-2]

*Taxonomic description:* An annual or perennial, herbaceous twininer. Stem hirsute. Leaves 5 – 12 × 4 – 10 cm, ovate, entire, palmatifid to partite or 3-lobed, acuminate, appressed hairy. Petioles up to 12 cm long, retrorsely hirsute. Flowers in peduncled cyme, purple. Peduncle up to 15 cm long. Bract linear. Pedicel up to 6 mm long. Flowers in axillary, 1 – 5-flowered, peduncled cymes. Calyx up to 2 cm long, ovate-lanceolate, acuminate, hirsute, ciliate. Corolla up to 8 cm long, funnel shape, purple. Stamens and pistil included. Ovary glabrous. Stigma

3-lobed. Fruit capsule, up to 12 mm in diam., straw coloured, 6-seeded. Seeds 6 mm long, black.

*Fl. & Fr.:* August – November.

*Local name:* Nil Kalmi

*Distribution:* Alwar (Sariska Tiger Reserve); Banswara (Shergarh); Barmer (Dhori manna hills); Bikaner (Khajuwala); Kota; Sirohi (Mount Abu), Todgarh-Raoli wildlife sanctuary (Khodiya naka, Shree dev narayan temple, Satukheda, Aasan).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Khodiya Naka, 08-Aug-16, 25°54.234'N & 74°00.159'E, 397m, C.S. Purohit 33131 (BSJO 40874, 40875); Jojavar range, Shree Dev Narayan Temple, 12 Nov. 2017, C.S. Purohit 33315 (BSJO 39878); Raoli Range, Satukheda, 31-Aug-18, C.S. Purohit 33491; Bijajiguda Range, Aasan, 23-Feb-19, 25°57.117'N & 74°07.938'E, 442m, C.S. Purohit 31065.

**15. *Ipomoea nil*** (L.) Roth. Cat. Bot. 1. 36. 1797. var. ***himalaica*** (Clarke) Johri in Journ. Econ. Tax. Bot. 5. 432. 1984. Shetty & Singh, Fl. Rajasthan 2. 544. 1991. *Ipomoea hederaea auct. plur. non.* (L.) Jacq. 1760 var. ***himalaica*** Clarke in Hook.f. Fl. Brit. India 4. 200. 1883. [Fig.-2, Fig.-4]

*Taxonomic description:* Closely resembles to the proper species except that it bears pubescent seeds, comparatively large leaves, flowers and accrescent calyx.

*Fl. & Fr.:* August – November.

*Local name:* Kirpan bel

*Distribution:* Sawaimadhopur (Ranthambhore); Sirohi (Mount Abu), Todgarh-Raoli wildlife sanctuary (Lewa ki Nal).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Lewa ki Nal, Jhamuda, 11 Nov. 2017, 25°43.962'N & 73°54.875'E, 413m, C.S. Purohit 33284 (BSJO 39852).

**16. *Ipomoea pes-tigridis*** L. Sp. Pl.162. 1753. Hook.f., Fl. Brit. India 4. 204. 1884. Duthie, Fl. Upper

Gangetic Plain 2. 116. 1911. Bhandari, Fl. Indian Desert 230. 1990. Shetty & Singh, Fl. Rajasthan 2. 545. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 359. 2007. [Fig.-2]

*Taxonomic description:* Annual, twining herbs; stem and branches hirsute with long, spreading hairs. Leaves 3 – 9 × 4 – 11 cm, orbicular, cordate at base, palmately 5 to 7-lobed; lobes elliptic-oblong, narrowed at base, acuminate at apex. Petiole up to 8 cm long. Flowers sessile, in axillary, in 3 to 5-flowered heads, pale pink or white. Peduncle up to 10 cm long. Bract up to 2.5 cm long, oblong. Calyx up to 1.4 cm long, lobes lanceolate, hirsute, unequal. Corolla up to 4 cm long, funnel-shaped. Stamens and style included; ovary glabrous; stigma bilobed; filaments glabrous. Fruit capsules, up to 7 mm long, ovoid, glabrous, enclosed in the calyx, 4-seeded. Seeds up to 4 mm long, grey, triangular, silky-pubescent.

*Fl. & Fr.:* Aug. – Dec.

*Local name:* Panch-patia.

*Distribution:* Alwar (Sariska Tiger Reserve); Banswara (Kotharia forest); Bikaner (Chhatargarh); Jaipur (Ramgarh); Jaisalmer (Amar Sagar); Jodhpur (Kailana, Machiya Biological Park); Kota (Shahabad); Nagaur (Gotten, Merta); Sirohi (Mount Abu), Todgarh-Raoli Wildlife Sanctuary (Sadon ka Bas, Lewa ki Nal, Thoria deh).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Sadon ka Bas, Pali, 09-Aug-16, 26°00.663'N & 74°07.825'E, 418m, C.S. Purohit 33166 (BSJO 41083, 41084); Raoli Range, Lewa ki Nal, Jhamuda, 11 Nov. 2017, 25°43.962'N & 73°54.875'E, 413m, C.S. Purohit 33296 (BSJO 39833, 39834); Todgarh-Raoli wildlife sanctuary, Raoli Range, Thoria deh, 01 Sept. 2018, C.S. Purohit 33540.

*Uses:* The paste of plant applied on carbuncle and other sores. Leaf extract is taken orally with cow or goat-milk as a tonic for debility and paralytic conditions in old age.



**17. *Ipomoea quamoclit*** L. Sp. Pl. 159. 1753. Hook.f., Fl. Brit. India 2. 199. 1883. Bhandari, Fl. Indian Desert 230. 1990. Shetty & Singh, Fl. Rajasthan 2. 559. 1991. [Fig.-2]

*Taxonomic description:* An annual, glabrous twinner. Leaves 4 – 9 × 2 – 5 cm, pinnatisect to the mid rib up to 14 pairs of linear. Petiole up to 10 cm long. Flower in solitary axillary, red. Bracts minute. Calyx oblong, obtuse. Corolla up to 3 cm long. Fruit capsule, up to 6 mm long. Seeds up to 5 mm long, ovoid, blackish.

*Fl. & Fr.:* Aug. – Oct.

*Distribution:* Jodhpur, Todgarh-Raoli Wildlife Sanctuary (Dewair).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bhim Range, Dewair, 15-Aug-16, 25°25.884'N & 73°48.017'E, 636m, C.S. Purohit 33234 (BSJO 41216).

**18. *Ipomoea sagittifolia*** Burm.f. Fl. Ind. 50. 1768. [Fig.-2, Fig.-4]

*Taxonomic description:* A glabrous, twinner or trailer herbs. Leaves in variable size; leaf blade ovate-lanceolate, acute at apex, cordate at base, margin puberulous. Flowers in dense raceme. Flowers 3 cm long, lilac, or darker red-purple. Calyx 6 mm long, oblong, acute at apex, glabrous. Corolla 5 cm long, pink or white, limb salver shaped. Stamen and style included. Fruit capsule, 6 mm long, globose, glabrous. Seeds 3 mm in diam., tomentose.

*Fl. & Fr.:* August – November.

*Distribution:* Todgarh-Raoli Wildlife Sanctuary (Chappali).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bhim Range, Chappali, 24-Nov-17, 25°29.072'N & 73°49.090'E, 558m, C.S. Purohit 33466;

**19. *Ipomoea sindica*** Stapf in Kew Bull. 93. 346. 1894. Duthie, Fl. Upper Gangetic Plain 2. 113. 1911. Bhandari, Fl. Indian Desert 231. 1990. Shetty & Singh, Fl. Rajasthan 2. 547. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 359. 2007. [Fig.-2]

*Taxonomic description:* A twining or trailing, hispid, annual herbs, internodes up to 10 cm, slender. Leaves 2 – 7 × 2 – 5 cm, oblong-ovate, cordate, hastate or sagittate at base, acute at apex, entire margins. Petiole up to 3 cm long, hairy. Flowers in axillary cyme, pinkish-white. Bracts up to 7 mm long, linear, acuminate, hairy. Pedicel up to 4 mm long. Calyx up to 7 mm long, lanceolate, dilated at base. Corolla up to 8 mm long, white, infundibuliform, hairy at the tip. Fruit capsule, up to 6 mm long, ovoid, glabrous, 4-seeded. Seeds up to 4 mm long, triangular, black, grey.

*Fl. & Fr.:* August – November.

*Local name:* Rota-bel

*Distribution:* Ajmer; Alwar (Sariska Tiger Reserve); Banswara (Ghatol); Barmer (Haldeshwar); Bikaner (Bariawalafanta); Jodhpur (Mandore); Udaipur (Dabok), Todgarh-Raoli wildlife sanctuary (Goramghat, Negadia).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bhim Range, Goramghat low land, 14 Nov. 2017, 25°38.120'N & 73°46.758'E, 476m, C.S. Purohit 33373 (BSJO 41180); Raoli Range, Negadia, 31-Aug-18, 25°49.258'N & 73°59.804'E, 512m, C.S. Purohit 33483.

**20. *Ipomoea triloba*** L. Sp. Pl. 161. 1753. Shah, Fl. Gujarat 1. 475. 1978. Johri in Journ. Econ. Taxon. Bot. 5(5). 1136. 1984. Shetty & Singh, Fl. Rajasthan 2. 549. 1991.

*Taxonomic description:* An annual climber with 1–3 m high. Stem angled, up to 3.0 mm wide, milky. Leaves 5 – 10 × 3 – 7 cm, ovate, rare trilobed, cordate at base, acuminate at apex. Petiole up to 10 cm, glabrous or sometimes minutely tuberculate, glabrous or pubescent. Flowers in axillary cyme. Pedicels glabrous, up to 8 mm. Calyx up to 10 mm long, unequal, the outer ones little shorter, oblong to narrowly elliptic-oblong, glabrous or sparsely hairy on the back. Corolla 5-lobed, up to 2 cm long, funnel-shaped, glabrous, pinkish, with or without

white markings. Stamens 5, 8 mm long, ovary conical, densely pubescent. Fruit capsule, up to 10 mm in diam, depressed globose with sharp point, bristly hairy, 4-seeded. Seeds up to 3 mm long, glabrous or with a few minute hairs, hard, shiny, chocolate brown.

*Fl. & Fr.:* August – December.

*Distribution:* Bundi (Ishwari fruit garden), Todgarh-Raoli wildlife sanctuary (Bujarale).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Bujarale, Ajmer, 31-Aug.-18, 25°44.601'N & 73°58.722'E, 472m, C.S. Purohit 34486;

21. *Ipomoea turbinata* Lag. Gen. Sp. Pl. 10. 1816. Raizada, Suppl. Duthie, Fl. Upper Gangetic Plain 164. 1976. Bhandari, Fl. Indian Desert 232. 1990. Shetty & Singh, Fl. Rajasthan 2. 549. 1991. *Ipomoea muricata* (L.) Jacq. Pl. Hort. Schoenbr. 3. 40. t. 323. 1798 (1803), non Cav. 1799. Hook.f., Fl. Brit. India 4. 197. 1883. [Fig.-2, Fig.-4]

*Taxonomic description:* A large, twining herb. Stem muricated. Leaves 5 – 11 × 5 – 8 cm, ovate, cordate at base, acuminate at apex. Petiole up to 10 cm long. Flowers in solitary, axillary cyme, rose-purple or white. Peduncle up to 6 cm long. Bract up to 8 mm long, oblong, caducous. Pedicels up to 2 cm long, much thickened in fruit. Calyx up to 8 mm long, elliptic-oblong to ovate, equal, fleshy; outer sepals aristate, 4 mm long awn; inner 3 sepals apex obtuse, short awn. Corolla up to 7 mm long, salverform, rose pink or white, tube up to 4 mm long, hairy within. Stamens exerted. Pistil slightly exerted. Fruit capsule up to 2 cm long, globose, glabrous, 4-seeded. Seeds black, glabrous, trigonous.

*Fl. & Fr.:* August – December.

*Distribution:* Alwar (Sariska Tiger Reserve); Banswara (Danpur); Jaipur (Ramgarh); Jodhpur; Kota (Darah); Sirohi (Mount Abu), -Raoli wildlife sanctuary (Aasan, Kabradata).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Kabradata, Ajmer, 31 Aug.

2018, 25°42.575'N & 73°55.354'E, 464m, C.S. Purohit 33517; Bijagua Range, Aasan, 16-Nov-17, 25°57.160'N & 74°06.919'E, 422m, C.S. Purohit 33403.



Fig. 2: Ipomoea of Todgarh-Raoli wildlife sanctuary

22. *Ipomoea verticillata* Forsk. Fl. Aegypt. – Arab. 44. 1775. Bhandari, Fl. Indian Desert 232. 1990. Shetty & Singh, Fl. Rajasthan 2. 550. 1991. *Ipomoea rumicifolia* Choisy in Mem. Soc. Phys. Geneve. 6. 447. 1834 et in DC. Prodr. 9. 351. 1845. Hook.f., Fl. Brit. India 4. 207. 1883. Duthie, Fl. Upper Gangetic Plain 2. 114. 1911. [Fig.-2]

*Taxonomic description:* A prostrate, sparsely hirsute, annual herbs. Leaves 2 – 5 × 2 – 3 cm, ovate or hastate, apiculate at tip, entire, cordate at base with rounded lobes, petiole up to 8 cm long, Flowers in axillary cyme. Bracts up to 3 mm long, linear, hairy. Calyx up to 6 mm long, acute, dorsally clothed with spreading hairs. Corolla up to 9 mm long,

campanulate, white. Fruit capsule, up to 1 cm long, ovoid, glabrous, 4-seeded. Seeds up to 4 mm long, velvety.

*Fl. & Fr.:* July – Nov.

*Distribution:* Barmer (Sheo road); Jaipur (Banda); Jaisalmer (Sudasari); Jodhpur (Toleasar); Pali (Guru Pratap singh ka Guda); Sirohi (Mount Abu), Todgarh-Raoli wildlife sanctuary (Sadon ka Bas, Kot-kirana).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Sadon ka Bas, 09-Aug-16, 26°00.663'N & 74°07.825'E, 418m, C.S. Purohit 33162 (BSJO 41075, 41076); Bijajiguda Range, Kot-Kirana, 15 Nov. 2017, 25°51.770'N & 74°06.174'E, 518m, C.S. Purohit 33376 (BSJO 41185, 41186).

**23. *Merremia aegyptiaca* (L.) Urban Symb. Antill** 4. 505. 1910. Bhandari, Fl. Indian Desert 233. 1990. Shetty & Singh, Fl. Rajasthan 2. 552. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 360. 2007. *Ipomoea aegyptiaca* L. Sp. Pl. 162. 1753. *Ipomoea pentaphylla* (L.) Jacq. Collect. 2. 297. 1789. Hook.f., Fl. Brit. India 4. 202. 1883. *Merremia pentaphylla* (L.) Hall.f. in Engl. Bot. Jahrb. Syst. 16. 552. 1893. Duthie, Fl. Upper Gangetic Plain 2. 110. 1911. [Fig.-3]

*Taxonomic description:* A twinning, annual herb. Stem slender, terete, hirsute. Leaves digitately 5-foliolate; leaflets 3 – 10 × 2 – 3 cm, elliptic-oblong, acute at the base, acuminate at apex, entire, petiole up to 10 cm long, hairy. Flowers in racemose cyme, fulvous-hairy, white. Bracteoles up to 4 mm long, caduceous. Calyx up to 2.5 cm long, unequal, outer 3 sepals ovate-lanceolate, acute; inner 2 sepals ovate. Corolla up to 3 cm long, funnel shaped, white. Fruit capsule, up to 2 cm in diam., subglobose. Seeds up to 8 mm long brown, glabrous.

*Fl. & Fr.:* July – Nov.

*Local name:* Rota bel

*Distribution:* Barmer (Sela forest); Jaipur (Sambhar); Kota (Shahabad); Sirohi (Sanwada); Tonk (Kacha budha), Todgarh-Raoli wildlife sanctuary (Tilakheda, Thoria deh).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Tilakheda, 15 Nov. 2017, 25°45.930' N & 73°59.203' E, 457m, C.S. Purohit 33520; Raoli Range, Thoria deh, Richoo ka Darr, 22-Feb-19, 25°47.648'N & 73°57.759'E, 442m, C.S. Purohit 31052.

**24. *Merremia dissecta* (Jacq.) Hall.f. in Engl. Bot. Jahrb. Syst. 16. 552. 1893. Duthie, Fl. Upper Gangetic Plain 2. 110. 1911. Bhandari, Fl. Indian Desert 234. 1990. Shetty & Singh, Fl. Rajasthan 2. 553. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 361. 2007. *Convolvulus dissectus* Jacq. Obs. Bot. 2. 4. t. 28. 1767. *Ipomoea sinuata* Ortega, Hort. Matr. Dec. 7. 84. 1798. Hook.f., Fl. Brit. India 4. 214. 1883. [Fig.-3]**

*Taxonomic description:* A large, perennial, slender twiner. Stem slender, hirsute. Leaves palmately divided into 7 – 9 lobed; petiole smaller than blade. Flowers in solitary, axillary cyme. Pedicels up to 2 cm long. Calyx up to 3 cm long, mucronate. Corolla up to 4 cm long, funnel shaped, white, with purple centre. Fruit capsule, up to 2 cm in diam., globose, 4-seeded. Seeds up to 6 mm long, black, glabrous.

*Fl. & Fr.:* July – Feb.

*Distribution:* Bhilwara (near Railway Station); Churu (Sujangarh); Jaisalmer; Jodhpur (Bilara); Sirohi (Mount Abu), Todgarh-Raoli wildlife sanctuary (Kundal).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Kundal, 24-Feb-19, 26°00.140'N & 74°10.175'E, 441m, C.S. Purohit 31078.

**25. *Merremia emarginata* (Burm.f.) Hall.f. in Engl. Bot. Jhrb. Syst. 16. 552. 1893. Duthie, Fl. Upper Gangetic Plain 2. 109. 1911. Shetty & Singh, Fl. Rajasthan 2. 553. 1991. *Evolvulus emarginatus* Burm.f. Fl. Ind. 77. t. 30. f. 1. 1768. *Ipomoea reniformis* (Roxb.) Choisy in Mem. Soc. Phys. Geneve 6. 446. 1834. Hook.f., Fl. Brit. India 4. 206. 1883.**

*Taxonomic description:* Prostrate herbs, rooting on the nodes. Leaves 1 – 3 × 1 – 2.5 cm, ovate, cordate at



base, margin crenate. Flowers in axillary, solitary cymose clusters. Fruit capsule, globose, enclosed in the calyx. Seeds glabrous, dark brown.

*Fl. & Fr.:* Feb. – May.

*Local name:* Popli

*Distribution:* Todgarh-Raoli wildlife sanctuary (Kundal).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Kundal, 24-Feb-19, 26°00.140'N & 74°10.175'E, 441m.

**26. *Merremia quinquefolia*** (L.) Hall.f. in Engl. in Engl. Bot. Jahrb. Syst. 16. 552. 1893. Bhandari, Fl. Indian Desert 234. 1990. Shetty & Singh, Fl. Rajasthan 2. 554. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 362. 2007. *Ipomoea quinquefolia* L. Sp. Pl. 162, 1753. [Fig.-3]

*Taxonomic description:* A herbaceous, twinning perennial herb. Stem sparsely hairy. Leaves palmately 5-foliolate; leaflets 3 – 5 × 1 – 1.5 cm, serrate, acute at apex, margin entire, attenuated at base. Petiole up to 5 cm long. Flowers in axillary cyme. Peduncle up to 6 cm long. Bracts triangular. Calyx up to 8 mm long, oblong-ovate, glabrous. Corolla up to 2 cm long, funnel-shaped, yellow. Fruit capsule, up to 1 cm in diam., globose, 4-seeded. Seeds up to 4 mm long, ovoid, trigonous.

*Fl. & Fr.:* Aug. – Dec.

*Distribution:* Banswara (Ghantala); Jaipur (Ramgarh); Jodhpur; Pali (Sadri); Sirohi (Abu road), Todgarh-Raoli wildlife sanctuary (Gafa village).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Gafa village, 15 Nov. 2017, 25°50.091'N & 73°59.956'E, 528m, C.S. Purohit 33390 (BSJO 41208, 41209).

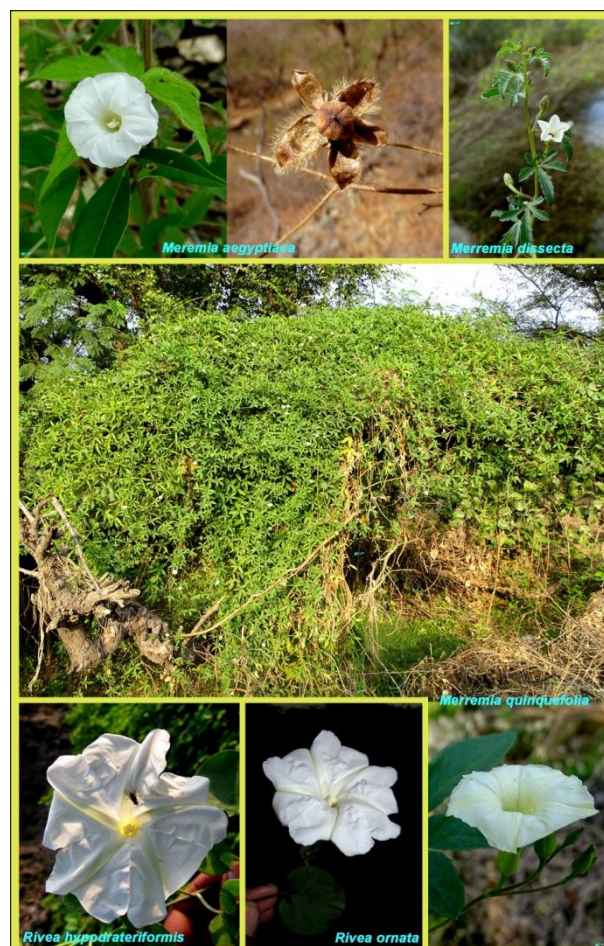


Fig. 3: Plants of Todgarh-Raoli wildlife sanctuary

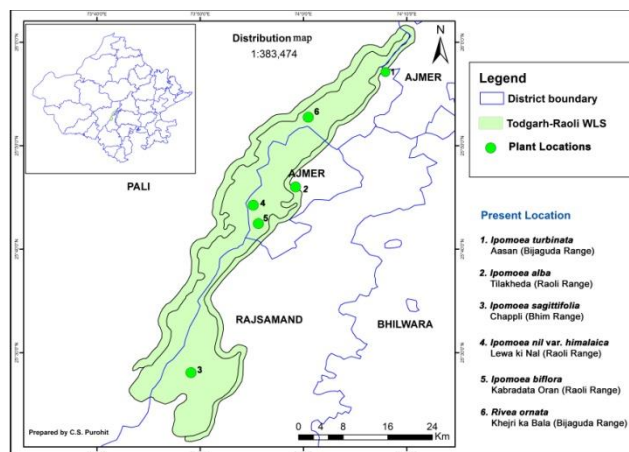


Fig. 4: Distribution map of plants of sanctuary

**27. *Rivea hypocreteriformis*** (Desr.) Choisy. in Mem. Soc. Phys. Geneve 6. 408. 1834; Hook.f., Fl. Brit. India 4. 184. 1883. Duthie, Fl. Upper Gangetic Plain 2. 119. Bhandari, Fl. Indian Desert 236. 1990. Shetty & Singh, Fl. Rajasthan 2. 557. 1991. Tiagi &

Aery, Fl. Rajasthan (S. & S. E. region) 363. 2007. [Fig.-3]

*Taxonomic description:* Large, woody, climbing shrubs, with silky pubescent branches. Leaves 2 – 7 × 3 – 6 cm, broadly ovate to orbicular, shortly acuminate or apiculate, cordate at base, sub-coriaceous, glabrous above, silky white-pubescent beneath; petioles up to 4 cm long, silky hairy, with a dark coloured gland near the apex on each side. Flowers in axillary, 2 to 3-flowered cymes. Pedicel up to 11 mm long. Calyx up to 10 mm long, segments unequal, ovate-elliptic, obtuse, silky hairy. Corolla up to 8 mm long, hypocrateriformis, white, fragrant. Stamens 5, included. Fruit capsules, 1.5 cm long, globose-ovoid, mucronate, glabrous, enclosed with in calyx, 4-seeded. Seeds up to 4 mm long, brown, glabrous.

*Fl. & Fr.:* Sept. – Dec.

*Local name:* Gwali-kakri.

*Distribution:* Alwar (Sariska Tiger Reserve); Banswara (Paloda); Barmer (Haldeshwar); Jaipur; Jodhpur (Kailana, Machiya Biological Park); Kota; Nagaur (Kuchaman); Sirohi (Vada Khoda), Todgarh-Raoli Wildlife Sanctuary (Goramghat, Kalalia).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bhim Range, Goramghat, 05-Aug-16, 25°38.491'N & 73°52.022'E, 488m, C.S. Purohit 33069; Bijajiguda Range, Kalalia, 03-Sep-18, 25°55.881'N & 74°08.473'E, 499m, C.S. Purohit 33556.

28. *Rivea ornata* Choisy in Mem. Soc. Phys. Geneve 6. 409. 1834. Hook.f., Fl. Brit. India 4. 183. 1883. Duthie, Fl. Upper Gangetic Plain 2. 120. 1911. Shetty & Singh, Fl. Rajasthan 2. 558. 1991. *Rivea ornata* Choisy var. *griffithii* Clarke in Hook.f., l.c. 4. 183. 1883. [Fig.-3, Fig.-4]

*Taxonomic description:* A twinning, woody, perennial climber. Stem branched, stout, white-tomentose. Leaves 4 – 9 × 5 – 11 cm, ovate-cordate, glabrous above, white silky-tomentose beneath while young. Petiole up to 4 cm long. Flowers in axillary cyme., white. Peduncles pubescent. Bracteoles up to 2 cm long. Calyx oblong, margin revolute. Corolla white, with yellow age. Fruit capsule, globose, glabrous brown.

*Fl. & Fr.:* Oct. – Feb.

*Distribution:* Barmer (temple hills); Jaisalmer (Gamera); Jodhpur (Massuria hills, shergarh), Todgarh-Raoli Wildlife Sanctuary (Khejri ka bala, Kermal chauraha).

*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Khejri ka bala, 01-Aug-16, 25°53.604'N & 74°02.557'E, 444m, C.S. Purohit 32966 (BSJO 40167, 40168); Jojawar range, Kermal chauraha, 12-Aug-16, 25:25.184E & 73:43.800N, 397m, C.S. Purohit 33206 (BSJO 41161, 41162).

#### IV. RESULT AND DISCUSSION

Present status of family Convolvulaceae in Todgarh-Raoli wildlife sanctuary and their comparison with Kanther's check list of this sanctuary, Aravalli Range, and Rajasthan state, are given in Table-1.

Table 1. Ten dominant families of sanctuary & compare with other areas.

Todgahr-Raoli wls (Purohit, 2020)	Todgahr-Raoli wls (Kanther, 2019)	Aravalli range (Otaghvari et. al. 2015)	Rajasthan (Shetty & Singh, 1993)
Poaceae	Poaceae	Fabaceae	Poaceae
Fabaceae	Fabaceae	Poaceae	Fabaceae
Asteraceae	Asteraceae	Asteraceae	Asteraceae
<b>volvulaceae</b>	Euphorbiaceae	Cyperaceae	Cyperaceae
Cyperaceae	Caesalpiniaceae	Malvaceae	Acanthaceae

Euphorbiaceae	Cucurbitaceae	Scrophulariaceae	Euphorbiaceae
Acanthaceae	Asclepiadaceae	Acanthaceae	<b>Convolvulaceae</b>
Malvaceae	Malvaceae	<b>Convolvulaceae</b>	Scrophulariaceae
Amaranthaceae/ Cucurbitaceae	Apocynaceae	Euphorbiaceae	Malvaceae
Caesalpiniaceae	Mimosaceae	Lamiaceae	Lamiaceae

Family Convolvulaceae is 4th dominant family in this sanctuary but in Aravalli range it is on 8th number and in Rajasthan, it is on 7th number. According to Kanther’s 2019, it was not placed in top 10 dominant families of this sanctuary.

[1]. **Statistical Analysis of Family Convolvulaceae:** The present work enumerates 28 species, belonging to 6 genera under family Convolvulaceae (Table-2).

Table. 2: Status of family Convolvulaceae in Todgarh-Raoli wls, Rajasthan

Family Name	Genus no.	Genus Name	Species no.
Convolvulaceae	1	<i>Argyreia</i>	2
	2	<i>Convolvulus</i>	3
	3	<i>Evolvulus</i>	1
	4	<i>Ipomoea</i>	16
	5	<i>Merremia</i>	4
	6	<i>Rivea</i>	2

The family Convolvulaceae maintains 4th number highest diversity among angiosperms containing 28 species under 6 genera. The one genera represented by single species i.e. *Evolvulus* (Table-3).

Table-3. Genera of Convolvulaceae in this area and compare with other floras

Genus	No. of species and varieties			
	(1)	(2)	(3)	(4)
<i>Argyreia</i>	2	-	1	2
<i>Convolvulus</i>	3	1	3	11
<i>Evolvulus</i>	1	1	1	2
<i>Ipomoea</i>	16	3	17	28
<i>Merremia</i>	4	-	4	8
<i>Rivea</i>	2	=	1	2

(1): Todgarh-Raoli wls. (Purohit, 2020); (2): Todgarh-Raoli wls (Kanther, 2019); (3): Aravalli range (Otaghvari *et. al.* 2015); (4): Flora of Rajasthan (Shetty & Singh, 1991);

[2]. **Addition for Flora of Rajasthan**

During the course of field exploration of protected area of Todgarh-Raoli wildlife sanctuary in Nov. 2017, author demarcated and collected small population of individuals belonging to genus *Ipomoea* from Chappali (Bhim Range) with ovate or heart shape leaf with heart shape base and flower white with funnel shape. After critical study, scrutiny of literature (Hook.f., 1883; Johri, 1984; Bhandari M.M. 1990; Shetty and Singh 1991; Tiagi & Aery, 2007; Kanther, 2019) and herbaria (BSJO, BSA, RUBL, JAC, BLAT, DCH, CAL, K), it is identified as *Ipomoea sagittifolia* Burm.f. It is first time report and addition for flora of Rajasthan. Previously, it was reported from Karnataka, Maharashtra, Tamilnadu and West Bengal. It is also an extended distribution of this plant from Rajasthan.

[3]. **Addition for Flora of Aravalli Range:**

In comparison with Convolvulaceae of Aravalli range, 75% genera of aravalli range represent in Todgarh-Raoli wildlife sanctuary (table-4), whereas 93% species and variety of aravalli range represent in this sanctuary. In comparison with Rajasthan flora, 50% genera and 48% species, var. of family Convolvulaceae represents in this Sanctuary.

Otaghvari *et al.* (2015) have done extensive work on flora of Aravalli range and reported 30 species belonging to 8 genera under family Convolvulaceae (Table-4). In this paper, eleven plant species i.e. *Argyreia nervosa* (Burm.f.) Boj.; *Convolvulus deserti* Hochst. & Steud. ex Baker. & Rendle; *Ipomoea alba* L.; *Ipomoea biflora* (L.) Pers.; *Ipomoea nil* (L.) Roth. var. *himalaica* (Clarke) Johri; *Ipomoea quamoclit* L.; *Ipomoea sagittifolia* Burm.f.; *Ipomoea triloba* L.; *Merremia aegyptiaca* (L.) Urban; *Merremia*

*quinquefolia* (L.) Hall.f.; *Rivea ornata* Choisy are first time report from Aravalli range and addition for flora of Aravalli range.

Table 4. Comparison of Convolvulaceae of this sanctuary with previous publications.

Family	(1)	(2)	(3)	(4)
Convolvulaceae				
Genus	6	4	8	12
Species & variety	28	6	30	58

(1): Todgarh-Raoli wls. (Purohit, 2020); (2): Todgarh-Raoli wls (Kanter, 2019); (3): Aravalli range (Otaghvari *et. al.* 2015); (4): Flora of Rajasthan (Shetty & Singh, 1991);

#### [4]. Addition for Flora of Todgarh-Raoli wildlife sanctuary

Kanter (2019) have done extensive work on Flora of Todgarh-Raoli wildlife sanctuary and reported 6 species belonging to 4 genera under family Convolvulaceae (table-4). In this paper, three genera *Argyreia*, *Merremia* and *Rivea* are first time report and generic addition for flora of Todgarh-Raoli wildlife sanctuary and also 25 plant species i.e. *Argyreia sericea* Dalz. in Dalz. & Gibs.; *Argyreia nervosa* (Burm.f.) Boj.; *Convolvulus arvensis* L.; *Convolvulus deserti* Hochst. & Steud. ex Baker. & Rendle; *Convolvulus prostratus* Forsk.; *Ipomoea alba* L.; *Ipomoea biflora* (L.) Pers.; *Ipomoea cairica* (L.) Sweet.; *Ipomoea carnea* Jacq. subsp. *fistulosa* (Mart. ex Choisy) Austin; *Ipomoea dichroa* (Roem. & Schult.) Choisy; *Ipomoea eriocarpa* R.Br.; *Ipomoea indica* (Burm.f.) Merr.; *Ipomoea nil* (L.) Roth. var. *himalaica* (Clarke) Johri; *Ipomoea quamoclit* L.; *Ipomoea sagittifolia* Burm.f.; *Ipomoea sindica* Stapf; *Ipomoea triloba* L.; *Ipomoea turbinata* Lag.; *Ipomoea verticillata* Forsk.; *Merremia aegyptiaca* (L.) Urban; *Merremia dissecta* (Jacq.) Hall.f.; *Merremia emarginata* (Burm.f.) Hall.f.; *Merremia quinquefolia* (L.) Hall.f.; *Rivea hypocreteriformis* (Desr.) Choisy.;

*Rivea ornata* Choisy are first time report and addition for flora of Todgarh-Raoli wildlife sanctuary. Out of these, *Argyreia sericea* Dalz., *Ipomoea nil* (L.) Roth. var. *himalaica* (Clarke) Johri are endemic to India and *Ipomoea alba* (L.) Pers., *Rivea ornata* Choisy are rare plant of Rajasthan, collected from this sanctuary.

#### [5]. Extended distribution of Endemic plant

An endemic plant *Ipomoea nil* (L.) Roth. var. *himalaica* (Clarke) Johri is distributed in Jammu-Kashmir and Himalaya region (Clarke, 1883). S.C. Johri (1984) described this variety on the basis of larger leaves & flowers, seeds velvety pubescent and reported from Swaimadhapur and Sirohit districts in Rajasthan and later included in other publications (Shetty & Singh, 1991; Singh & Shrivastava, 2007; Shrivastava & Singh, 2009) based on S. Sharma collections from Swaimadhapur (S. Sharma 3134) and Sirohi (S. Sharma 5552), housed in RuBL (Herbarium, Rajasthan University, Jaipur). Thereafter, no one collected this specimens from Rajasthan. During plant exploration, author collected this plant from Todgarh-Raoli wildlife sanctuary, Rajasthan. So, this sanctuary is a new locality and extended distribution of endemic plant from Rajasthan.

## V. CONCLUSION

Present paper deals with 28 species belonging to 6 genera of family Convolvulaceae collected from this sanctuary. Out of these, one species *Ipomoea sagittifolia* is reported first time and addition for flora of Rajasthan. Eleven species are reported first time and addition for flora of Aravalli range. Three genera i.e. *Argyreia*, *Merremia* and *Rivea* are first time report and generic addition for flora of Todgarh-Raoli wildlife sanctuary and 25 plant species are addition for flora of Todgarh-Raoli wildlife sanctuary.



## VI. ACKNOWLEDGEMENT

Authors are grateful to the Director, Botanical Survey of India, Kolkata and HOO, BSI-AZRC Jodhpur for facilities and encouragements. Thanks are due to Sh. Bhoma Ram (Field Assistant) and Sh. Ranjeet (M.T.S.), Botanical Survey of India, Arid Zone Regional Centre, Jodhpur, for assistance during field survey. Thanks is also extend to the State Forest Department, Rajasthan and Forest staff, Todgarh-Raoli wildlife sanctuary for extending their co-operation during survey & exploration.

## VII. REFERENCES

- [1]. Bhandari, M. M. (1990): Flora of the Indian Desert. Scientific Publishers, Jodhpur (Revised Edition).
- [2]. Blatter, E. & Hallberg. F. (1920): The flora of the Indian desert (Jodhpur and Jaisalmer). Journal of the Bombay Natural History Society, 26 (4): 971.
- [3]. Clarke, C.B. 1883. Convolvulaceae in Hooker J.D. The Flora of British India 4: 196 – 214.
- [4]. Galav P., Jain A. and Katewa S.S. 2013. Ethnoveterinary medicines used by tribals of Tadgarh-Raoli wildlife sanctuary, Rajasthan, India. *Ind. J. Trad. Knowl.* 12(1): 56 – 61.
- [5]. Jain V., Verma S.K., Sharma S.K. and Katewa S.S. 2011. Bombax ceiba Linn. As an Umbrella tree species in forest of Southern Rajasthan. *Research Journal of Environment Sciences* 5(8): 722 – 729.
- [6]. Johri S.C. 1984. New combination in the Flora of India. *J. Econ. Taxon. Bot.* 5(2): 432.
- [7]. Johri S.C. 1984. The genus Ipomoea L. in Rajasthan. *J. Econ. Taxon. Bot.* 5(5): 1113 – 1142.
- [8]. Kanther R P 2013. Traditional wound healing plants of Todgarh-Raoli Wild life Sanctuary Rajasthan, India. *Indian J of Env Sci* 17(2): 105-107. (Green Earth Publication).
- [9]. Kanther R.P. 2018. Rare and Threatened medicinal plants of Todgarh-Raoli wildlife sanctuary, Rajasthan, India. *J. India. Bot. Soc.* 97(3-4): 59 – 64.
- [10]. Kanther R.P. 2019. Dominant flora of Todgarh-Raoli wildlife sanctuary, Rajasthan, India. *J. Indian Bot. Soc.* 98(1-2): 59 – 70.
- [11]. Kanther R.P. and Gena D. 2012. Ethno-medico-botany of Todgarh-Raoli wildlife sanctuary, Rajasthan, India. *J. Phytol. Res.* 25 (2): 249 – 256.
- [12]. Otaghviri, A.M., Yadav S.R., Raina S.N. and Uniyal P.L. 2015. Vegetational wealth of Aravalli Rajasthan. Scientific Publishers, Jodhpur.
- [13]. Oudhia P. 2001. “Major Ipomoea species of Chhattisgarh”; Source: Botanical.com. (2001; 2002; 2003). Print.
- [14]. Purohit C.S. 2019. A note on some rare plants of Rajasthan reported from Todgarh-Raoli wildlife sanctuary. *Int. J. Usuf. Mngt.* 20: 36 – 45.
- [15]. Purohit C.S., Jain K. and Merushikha 2020. A note on family Lamiaceae in Todgarh-Raoli wildlife sanctuary, with addition of two species for flora of Rajastha. *International Journal of Scientific Research in Science and Technology (IJSRST)*. 7(2): 438 – 444.
- [16]. Purohit, C.S. 2020. Flora of Todgarh-Raoli wildlife sanctuary with GIS mapping of EET species. Project Report submitted to Director, BSI, Kolkata.
- [17]. Sharma S. and Tiagi B. 1979. Flora of North-East Rajasthan. 265 – 271. New Delhi.
- [18]. Sharma S.K. 2019. Medicinal plant diversity in Aravallis. *Int. J. Phytocos. Nat. Ingrid.* 6: 1 – 3.
- [19]. Sharma S.K. and Katewa S.S. 2007. Addition to the Flora of Rajasthan from Southern Aravallis. *ZOO'S PRINT Journal* 22(10): 2867 – 2868.

- [20]. Sharma S.K. and Khandal D. 2019. Reporting of New plant species to the flora of Rajasthan. *Indian J. Environ. Sci.* 23(2): 51 – 52.
- [21]. Sharma S.K., Katewa S.S. and Bhatnagar C. 2005. New Records of plants from Rajasthan. *ZOO's PRINT journal* 20(9): 1984 – 1985.
- [22]. Shrivastava A. and Singh V. 2009. Additional floral elements to the Ranthambhore Tiger Reserve, Rajasthan, India. *JOTT* 1(9): 475 – 480.
- [23]. Singh S. and Yadav. M.K. 2018. Ethnomedicinal cucurbits of Ajmer district with special reference to Raoli-Todgarh wildlife sanctuary of Rajasthan. *Ramarking An Analisation* 3(9): 50 – 54.
- [24]. Singh V. and Shrivastava A. 2007. Biodiversity of Ranthambhore Tiger Reserve, Rajasthan. Scientific Publishers, Jodhpur.
- [25]. Staple, and Yang S.Z. 1998. "Convolvulaceae In: Editorial Committee of Flora of Taiwan", 2nd. Ed., *Flora of Taiwan* 4(1998):341-384. Editorial Committee of the Flora of Taiwan, 2nd, ed., Taipei. Print.
- [26]. Tiagi, Y. D. & Aery, N. C. 2007. *Flora of Rajasthan (south & south-east region)*. Himanshu Publications, Udaipur, India.
- [27]. Tomar S. and Sharma A. 2019. Systematic study of family cucurbitaceae in Todgarh-Raoli wildlife sanctuary. *Periodic Research* 7(4): 65 – 69.

**Cite this article as :**

C. S. Purohit, "Ipomoea Sagittifolia Burm.f. - New Record for Rajasthan and Note on Family Convolvulaceae of Todgarh-Raoli Wildlife Sanctuary, Rajasthan", *International Journal of Scientific Research in Science and Technology (IJSRST)*, Online ISSN : 2395-602X, Print ISSN : 2395-6011, Volume 7 Issue 3, pp. 49-65, May-June 2020. Available at doi : <https://doi.org/10.32628/IJSRST20738>  
Journal URL : <http://ijsrst.com/IJSRST20738>