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Research Paper

Lindernia dubia (L.) Pennell–Addition for flora of Rajasthan and note on family Scrophulariaceae of Todgarh-Raoli wildlife sanctuary, Rajasthan, India

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Abstract: Present paper deals with 13 species belonging to 7 genera of family Scrophulariaceae collected from this sanctuary. Besides this, *Lindernia dubia* (L.) Pennell reported here for the first time from Rajasthan and addition for flora of Rajasthan. In addition to above, three species first time report for flora of Aravalli range. Six genera and twelve species reported here as addition to the Flora of Todgarh-Raoli wildlife sanctuary, Rajasthan.

Keywords: Addition, Scrophulariaceae, Rajasthan, Aravalli range, Todgarh-Raoli wildlife sanctuary.

Introduction:

India is known for rich repository of biological wealth having more than 17,500 wild plant species and of these 4,000 species have medicinal values and it play an important role in human life. Plants were introduced in this region both adventitiously and intentionally for purpose of food, fodder, soil conservation, medicine, packing material, forage and manure. Several plant species are gradually becoming rare in their original habitats. This is due to uncontrolled clearing of forests for cultivation and for developmental projects taking place in the entire range of distribution in the country or any state and selection of areas rich in plant diversity and declaring these as Biosphere Reserves, National Parks and Wild Life Sanctuaries in different parts of the country, as the "Todgarh-Raoli Wildlife Sanctuary" can save the depleting plant diversity in the Rajasthan State.

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. Todgarh Raoli Sanctuary was declared as Wildlife Sanctuary wide Government of Rajasthan Notification No. F.11 (56) Rev: Group-8/82 dated 28.09.1983 under the provision of Section 18(1) of the Wildlife (Protection) Act 1972 (Central Act no. 53 of 1972). Total Geographical area of the Sanctaury is 495.27 square kilometres. This Sanctuary is extended in three revenue districts viz. Rajsamand, Pali and Ajmer in the southwestern part of Rajasthan State. The administrative headquarter of the Sanctuary is at "Bhim"

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situated at a distance of 100 km from district headquarter Rajasamand. The details of zone wise, range wise and block wise, compartment wise, District wise and legal status wise area are appended at Annexure-1 to 5 respectively.

It is situated 110 km in south-west of Ajmer, 150 km in north-west of Udaipur and 75 km in north-east of Pali district, 55 km from Beawar. Goramghat railway station is situated in the sanctuary. 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 interspersion 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. These habitats provide shelter to wide range of fauna. The sanctuary within its limits has number of historical and religious places like Todgarh, Mangadji ka Mahal, Dudhaleshwar Mahadev, Dhareshwar Mahadeo, Goramji ka Mandir, Vayad Bheruji Ka Mandir, Kajalwas Dhuni etc. With all historical and religious places deep emotions of the people living within and on the periphery of Sanctuary area are attached.

This sanctuary makes an ecotone between hilly forests of Aravallis and Thar dessert situated in the north-west. The hills of this sanctuary acts like a barrier, checking eastward extension of desert. Further, these hill ranges from catchment of many rivers and nallahs. Run off of Todgarh catchment is drained out by 46 nallahs and ultimately these nallahs join eight rivers mainly Dholapani, Sukdi, Jogmandi, Digore, Siryari, Rania etc. As many as nine dams including Phulad, Gajnal, Rodawas, Jogmandi, Hansiyawas, Hichliawas, Digore, Siryari, Rania etc. have been constructed on these rivers, originating from Todgarh hills. These not only provide drinking water to human and bovine population of Pali, Rajsamand and Ajmer districts but also irrigate 28,000 hactares agricultural land of these districts. As many as 27 villages are situated inside the sanctuary whereas 114 villages are on the periphery.

Geographical:

East: Includes the forest area of block Kalab & Kuneja forest boundary along village Dheekan upto the district boundaries of Ajmer and Pali including forest block Bagdi & kalalia- From district boundaries of Ajmer and Pali area of block Satukheda including forest area of Tadgarh Banjari upto the boundaries of Ajmer and Udaipur district.

From boundaries of Udaipur and Pali districts including village Mandavar-Peepli reserve and protected forest boundary near railway line to village Heera ki Bassi up to N.H.-8. From here including the reserve forest block of Baghana and Varjal near village Tegi to protected and reserve forest area of village Ratnaguda to village Tegi Saubhagpura.

West: From Nala and forest road along the boundary of district Pali and Udaipur, including the reserved forest areas of district Pali near village Phulad- Crossing the Railway line including forest boundaries of block Kantaliya – up to village Rodawas of district Pali, block Khoria, Kalab and Kuneja to forest boundary of village Balupura.

North: Near village Balupura, along the Reserve Forest boundaries of Kalab & Kuneja.

South: Revenue area of village Saubhagpura to village Jogimagra, Halela, Nardas ka Guda to village Bassi on N.H.-8 – along with boundaries of Tadgarh-Raoli WLS – from village Daber to Nala and forest road of Tadgarh-Raoli WLS upto the revenue boundaries of Ajmer and Udaipur district.

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Geology, Rock and Soil: Todgarh-Raoli Sanctuary lies in the Aravalli hill ranges, which is one of the oldest formations in the world. The Aravalli hills are a remnant of a great mountain range, which it is, said millions of years ago rivalled The Himalayas. It is probable that they were the centre of a great ice cap during the carboniferous period and the core of this old mountain range, whose remnants is made up of rocks of extreme antiquity. The salient features regarding geology, rock and soil are:

1. The entire system belongs to the metamorphic and sub-metamorphic series of azoic rocks.
2. Metamorphic rock system consists of Gneiss, schist and other forms of crystalline metamorphic rocks with intrusive granite veins.
3. The sub metamorphic rock system consists of slates more or less schist or quartzite's and locally associated limestone and traps.
4. The line of strike of the rock is north-east and south-west while the strata dip generally to the north-west for some times almost vertical.
5. The rocks are greatly fissured in all directions hence it is very difficult to tell in which direction water will percolate.
6. The Aravalli hills are rich in lead and copper.

Soil: The soil varies from clayey to clayey loam to gravel depending upon topography. Black or grey coloured soil is found in patches lying upon the older formations on slopes and on the plateau's, soil is muram and unfertile. The depth of soil varies from 20cm to few meters. Soil is mixed with pebbles and boulders. Resulting from a deposit of blown sand in certain blocks in the western slopes, sand dunes are formed.

Terrain: The forest tract of the sanctuary is highly undulating with broken ranges of hills of height ranging from 300 to 4000 ft. above mean sea level. The slopes are gentle at the outer boundary & gentle to sloppy at Mewar boundary sometimes, become precipitous near to top. Most of the hilly tract is highly sloppy with almost 70 to 100% slopes at places. The hills and hillocks forming a network leading to the nallahas, entering the plains and draining into the bigger nallahas, which leads in many rivers and ultimately join the Luni River.

The topography of the area can be divided into hills, piedmont zones and plains. The hills have got a rugged topography. The plains down the hill are mostly agricultural fields. Area of Rajsamand and Ajmer districts are more hilly, having steep slopes while area of Pali district is less hilly.

Climate: The climate is sub-tropical with extremely hot summer and relatively moderate winter.

Rainfall pattern and Distribution: Rainfall in the area is very erratic and unevenly distributed. Rains generally start in the last week of June and intermittently continue up to September end. Highest intensity of rain is generally observed in the month of July. The average annual rainfall is about 725 mm. The numbers of rainy days are 20 to 25 on an average.

Temperature: a summary of year round pattern:- A wide variation in temperature is observed round the year. Summers are generally very hot. The temperature increases rapidly after mid March. May and June are the hottest months when temperature reaches up to 44°C. Temperature starts declining in the month of October after withdrawal of monsoon. January is the coldest month with mean daily minimum temperature of around 5°C.

Humidity: a summary of year round pattern:- Humidity in the air is generally low and rarely exceeds 30-35 percent except in the rainy season when it ranges between 60-80 percent.

Wind speeds: a summary of year round pattern:- Winds blow from south-west to

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north-east during summer and its direction is reversed during winter season. Winds generally blow with moderate speed and rarely blow at a speed of 40-60 km per hour. During summer, dust storms are sometimes observed.

Drought and its periodicity: Periodic and frequent droughts are observed in the area. Generally good rains are received once in three years. Rains are quite irregular and temporary drought conditions prevail even during the rainy season.

Water Sources: The sanctuary area mainly falls in the Aravalli hill ranges. Because of the shallow soil and its geo-morphological conditions, percolation of the rainwater is considerably low. Most of the nallahs dry up during the pinch period and water is available only at few points in the nallahs due to ground water seepage depending upon recharge during the rains. Moreover, frequent droughts in the region still worsen the conditions for wild life and population. Dams and anicuts constructed on rivers and nallahs prove good water source to wild animals. As many as thrity-eight wells/baories and anicuts are there inside the Sanctuary, small and medium dams are present in and around the sanctuary, which helps in water supply almost throughout the year, spots are there where natural water remains available either throughout the year or till late summers. The main natural source of water supply is rainwater. Number of rivers and big nallahs are traversing through the sanctuary.

Vegetation and Habitats:

The vegetation of the area governs the health of the ecosystem. The Tadgarh-Raoli Wildlife Sanctuary is quite rich in the bio diversity, organised into a geometric composition of ground flora to the top canopy designed naturally to harvest maximum sun light and maximised the bio diversity. The soil formation, ground water recharge, prevention of excessive surface water evaporation, humification and soil structure and prevention of soil erosion are the attributes that depend upon the vegetal cover of the area.

1. **Biogeographic Classification:** The floral constitutents of the Todgarh-Raoli Wildlife Sanctuary are mostly edapho-climate climax type forests. As per the Champion & Seth's classification the forests of this sanctuary fall under the II category of Tropical Dry Deciduous forests, which can be sub classified as:

   Group 5 Tropical Dry deciduous forests
   Sub group 5B - Northern tropical dry deciduous forest
   C_2 - Northern tropical dry mixed deciduous forest

   Following degraded stages of tropical dry deciduous forests exist in the sanctuary.

   DS1 – Dry deciduous scrubs
   DS1 – *Anogeissus pendula* scrub
   E2 – *Boswellia* forests
   E5 – *Butea* forest
   E8 – Saline Alkaline Scrub savannah
   E9 – Dry Bamboo Brakes

2. **The forest types, cover and food for Wild animals:** The vegetation cover varies from place to place due to edaphic and biotic changes. The vegetative cover existing at Todgarh-Raoli Wildlife Sanctuary can be divided into following levels- (1) Wood land, (2) Scrubs and (3) Ground level

Species and communities of conservation importance; Key Area

Heavy biotic pressure and excessive grazing during the past has resulted in reduced regeneration of some vital species leading to low bio diversity. The slow growing and non-coppicing species including medicinal herbs have been worst effected. Although after

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declaration of sanctuary they have started regeneration again but still these vital species need effective protection & propagation measures. The floral species that have become rare are listed below: (1) *Sterculia urens* - Scattered trees are observed. Lack of regeneration is the cause of its loss. (2) *Commiphora wightii* - Dotted plants can be seen in the sanctuary area. (3) *Helecteris isora* - Few trees present in the moist places; (4) *Phoenix sylvestris* - Very rare in Sanctuary; (5) *Wrightia tinctoria* - Very rare in Sanctuary; (6) *Capparis grandis* – very rare; (7) *Dendrophthoe falcata* – Rare; (8) *Tecomella undulata* – Rare; (9) *Tribulus rajasthanensis* – Critical Endangered; (10) *Barleria prionitis var. dicantha* – Endangered; (11) *Ceropegia bulbosa* var. *bulbosa* – Rare; (12) *Ceropegia bulbosa* var. *lushii* – Rare; (13) *Melhania magnifolia* – Endangered; (14) *Euphorbia jodhpurensis* – Endemic; (15) *Moringa concanensis* – Rare; (16) *Butea monosperma* var. *lutea* – Rare; (17) *Capparis separia* – Rare. Apart from above species, some plant communities need conservation efforts. *Bridelia retusa*, *Madhuca indica*, are species of special conservation significance.

Review of literature:

Scrophulariaceae family has 66 genera and 1800 species worldwide, cosmopolitan in distribution, especially in tropical and warm climatic conditions, especially in South Africa (Mabberley, 2017); 62 genera and 368 species in India (Mao & Dash, 2020); 26 genera and 54 species in Rajasthan (Shetty & Singh, 1991). In the Aravalli range, Scrophulariaceae represents 35 species belonging to 19 genera (Otaghavari et al., 2015). Kanther (2019) has done extensive work on the vegetation of the Todgarh-Raoli wildlife sanctuary and reported 01 species of the family Scrophulariaceae. Many researchers (Katewa *et al.*, 2003; Sharma *et al.*, 2005; Sharma & Katewa, 2007; Singh & Shrivastava, 2007; Tiagi & Aery, 2007; Sharma & Khanna, 2010; Kanther & Gena, 2012; Kanther, 2013; Sharma & Purohit, 2013; Kumar & Purohit, 2015; Kumar *et al.*, 2017, 2020; Kanther, 2018; Kumar *et al.*, 2019; Sharma, 2019; Sharma & Khandal, 2019; Purohit, 2019; Purohit *et al.*, 2019; Purohit, 2020a, 2020b, 2020c, 2020d, 2020e, 2020f, 2020g; Kulloli *et al.*, 2019, 2020a, 2020b; Purohit *et al.* 2018, 2020a, 2020b, 2020c, 2020d, 2020e, 2020f, 2020g, 2020h, 2022, 2023; Kulloli & Purohit, 2020, 2022; Purohit & Kumar, 2020; Purohit, 2021a, 2021b; Purohit & Kulloli, 2021, 2022; Purohit & Maina, 2021; Maina *et al.*, 2022; Singh *et al.*, 2022; Purohit, 2024; Purohit *et al.*, 2024) have been reported various plants belonging to different families from Todgarh-Raoli wildlife sanctuary and surrounding area.

Material and Methods:

Kanther (2019) have done extensive work on vegetation of Todgarh-Raoli wildlife sanctuary and reported 301 species belonging to 84 families including with 13 species belonging to 7 genera of family Scrophulariaceae. While working on the floristic diversity of the Todgarh-Raoli Wildlife Sanctuary (Rajasthan) during 2015 to 2019, author collected total 636 plant species, out of which 13 plant samples of family Scrophulariaceae from different locations of this sanctuary and processed for preparation of voucher specimens as per standard procedure (Jain & Rao, 1977). These collected herbarium samples deposited at Botanical Survey of India, Jodhpur (BSJO). After critical study, scrutiny of relavant literatures (Blatter & Hallberg, 1920; Sharma & Tiagi, 1979; Bhandari, 1990; Shetty & Singh, 1991; Tiagi & Aery, 2007; Kumar & Purohit, 2015; Purohit, 2020; Purohit *et al.*, 2020) and herbaria (BSJO, BSA, RUBL, JAC, BLAT, DCH, CAL), these

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plant samples identified and enumerated here alphabetically.

Enumeration of plants of family Scrophulariaceae of Todgarh-Raoli wildlife sanctuary:

1. Kickxia incana (Wall.) Pennell in Acad. Nat. Sci. Phil. Monogr. 5. 59. 1943. Shetty & Singh, Fl. Rajasthan 2. 589. 1991. *Linaria incana* Wall. Pl. As. Rar. 2. 43. 1831. Hook.f., Fl. Brit. India 4. 252. 1883. (Fig. 1 A to 1E)

A prostrate or twining, perennial herbs, up to 15 cm high. Stem weak, prostrate, branched. Leaves alternate, petiolate, variable in size, 3 cm long, ovate, lobed. Flowers in axillary cyme. Pedicels 6 cm long, rigid. Calyx 4 mm long, lanceolate. Corolla 6 cm long, with upper lip purplish with purple spots, spur deflexed, much shorter than corolla. Fruit capsule, seeds pitted.

Flowering & Fruiting: July – Sept.

Status: Rare.

Distribution: Jaipur (Amer); Sirohi (Ambleshwar ghat); Udaipur; Todgarh-Raoli wildlife sanctuary (Dewair).

Specimen examined: Todgarh-Raoli wildlife sanctuary, Bhim Range, Dewair, Rajsamand, 15-Aug-16, 25°25.884′N & 73°48.017′E, 636m, C.S. Purohit 33233 (BSJO 41214, 41215);

2. Kicxia ramosissima (Wall.) Janchen, in Oest. Zeit. 82. 152. 1933. Bhandari, Fl. Indian Desert 252. 1990. Shetty & Singh, Fl. Rajasthan 2. 590. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 379. 2007. *Linaria ramosissima* Wall. Pl. Asiat. Rar. 2. 43. t. 153. 1831. Hook.f., Fl. Brit. India 4. 251. 1883. Duthie, Fl. Upper Gangetic Plain 2. 140. 1911.

A prostrate, glabrous, twining or trailing herbs, up to 20 cm high. Stem much branched, slender, terete, pubescent with spreading hairs. Leaves variable in size, 4 cm long, alternate, petiolate, margin ciliate with few hairs, triangular or hastate, –7 lobed. Flowers in axillary, solitary cyme, yellow. Pedicel up to 4 cm long. Calyx 5 mm long, divided at base, lobed, lobes linear. Corolla 1 cm long, yellow with 3 mm long spur; upper lip bilobed, lower 3-lobed. Stamens didynamous, filaments with few hairs. Ovary subglobose, style glandular pubescent. Fruit a capsule, 4 mm in diam., sparsely pubescent on apex. Seeds spinulose, brown.

Flowering & Fruiting: Throughout the year

Distribution: Alwar (Sariska Tiger Reserve); Barmer; Jaipur (Doasa); Kota (Chhabra); Sirohi (Ambleshwar ghat); Tonk (Kacha Bunda); Todgarh-Raoli wildlife sanctuary (Vagda jha).

Specimen examined: Todgarh-Raoli wildlife sanctuary, Raoli Range, Vagda Jha, 17-Nov-17, 25°49.347′N & 73°58.197′E, 548m, C.S. Purohit 33416;

3. Lindenbergia indica (L.) Vatke Oesterr. Bot. Zeitschr. 25. 10. 1875. Shetty & Singh, Fl. Rajasthan 2. 592. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 380. 2007. *Dodartia indica* L. Sp. Pl. 2. 633. 1753. *Lindenbergia urticaefolia* Lehm. in Link & Otto, Ind, Sem. Hort. Berol. 5. 1829. Hook.f., Fl. Brit. India 4. 262. 1884. Duthie, Fl. Upper Gangetic Plain 2. 160. 1911. (Fig. 2A to 2C).

Annual decumbent herbs, up to 30 cm high. Stem glandular hairy, with purple tinge. Leaves 2–8 × 1–6 cm, all in whorled, ovate-elliptic, subobtuse at apex, glandular-hairy, margin crenate-serrate. Flowers in axillary leafy racemes, 1 to many-together. Calyx 5 mm long, campanulate, divided almost to the middle; lobes 5, oblong, obtuse, ciliate. Corolla 1 cm long, bi-lipped. Stamens exserted through the mouth of corolla-tube. Ovary glabrescent. Fruit capsule, ovoid, beaked, pubescent. Seeds ellipsoid, black.

Flowering & Fruiting: July. – Dec.

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Distribution: Ajmer; Alwar (Sariska Tiger Reserve); Banswara (Shergarh); Barmer (Haldeshwar Mahadeo); Jaipur (Dosa); Nagaur (Sakmbhari hill, Kuchaman); Sirohi (Mount Abu); Todgarh-Raoli wildlife sanctuary (Dhareswar Mahadev, Uprali Bhabhan, Satpalia forest).

Specimen examined: Todgarh-Raoli wildlife sanctuary, Jojawar Range, Dhareshwar Mahadev, Jojawar, Pali, 13-Aug-16, 25°47.823′N & 73°54.790′E, 365m, C.S. Purohit 33212 (BSJO 41173, 41174); Jojawar Range, Uprali Bhabhan, 12 Nov. 2017, 25°46.217′N & 73°54.878′E, 460m, C.S. Purohit 33309 (BSJO 39887, 39888); Todgarh-Raoli wildlife sanctuary, Bhim Range, Satpalia forest, 21-Nov-17, 25°25.381′N & 73°45.588′E, 443m, C.S. Purohit 33449;

4. Lindenbergia muraria (Roxb. ex D.Don) Bruhl. in J. Dept. Bot. Cal. Uni. 2 (Bot.) 27. 1920. Bhandari, Fl. Indian Desert 252. 1990. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 380. 2007. *Stemodia muraria* Roxb. ex D. Don, Prodr. Fl. Nep. 89. 1825. (Fig. 2D to 2E).

A perennial, decumbent herbs, up to 30 cm high. Stem branched, hairy. Leaves 2–5 × 1–2 cm, ovate, margin crenate-serrate, softly pubescent, glandular villous on both sides, acute at apex. Flowers in axillary leafy raceme, 1 to many-together. Pedicel short. Calyx 6 mm long, divided almost to the middle; lobes 5, oblong, obtuse, hairy on both surface. Corolla 1.2 cm long, 2-lipped, divided less than half way down, glandular-hairy; upper lip 2-lobed, pubescent inside; lower lip 3-lobed. Stamens exserted through the mouth of corolla-tube. Ovary glabrescent. Fruit capsule, 6 mm long, ovoid. Seeds ellipsoid, glabrous, black.

Flowering & Fruiting: July. – Dec.

Distribution: Todgarh-Raoli wildlife sanctuary (Kalalia, Halela, Kabradata).

Specimen examined: Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Kalalia, Pali, 06-Aug-16, 25°55.881′N & 74°08.473′E, 499m, C.S. Purohit 33087 (BSJO 40784, 40785); Bhim Range, Halela-Badinda gui, Rajsamand, 11-Aug-16, 25°22.685′N & 73°48.007′E, 739m, C.S. Purohit 33199 (BSJO 41148, 41149); Raoli Range, Kabradata, 10 Nov. 2017, 25°42.736′N & 73°55.517′E, 445m, C.S. Purohit 33267 (BSJO 39821, 39822).

5. Lindernia ciliata (Colsm.) Pennell in Brittonia 2. 182. 1514. Shetty & Singh, Fl. Rajasthan 2. 595. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 380. 2007. *Gratiola ciliata* Colsm. Prodr. Desc. Grat. 14. 1793. *Bonnaya brachiata* Link & Otto, Ic. Pl. Select. 25. t. 11. 1820. Hook.f., Fl. Brit. India 4. 284. 1884. Duthie, Fl. Gangetic Plain 2. 151. 1911. (Fig. 3A to 3C).

An erect or decumbent annual herbs, up to 12 cm high. Stem branched, 4-angled. Leaves 1–4 × 0.5–1.5 cm, sessile, oblong or obovate-lanceolate, opposite, margin serrate with aristate teeth. Flowers in terminal raceme, white or pink. Bracts linear. Calyx 4 mm long, deeply divided; segments linear, ciliate. Corolla 1 cm long, white or pink. Stamens 2. Fruit capsule, up to 1 cm long, cylidric, linear. Seeds many, truncate on both ends.

Flowering & Fruiting: Sept. – Dec.

Distribution: Alwar (Sariska Tiger Reserve); Banswara (Wadita hillage); Jaipur (Ramgarh); Kota (Kishanganj); Pali (Kanpahar); Todgarh-Raoli wildlife sanctuary (Aasan).

Specimen examined: Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Aasan, Pali, 03 Sept. 2018, 25°57.111′ N & 74°07.936′ E;, 435m, C.S. Purohit 33577;

6. Lindernia dubia (L.) Pennell. Acad. Nat. Sci. Ph. Monogr. 1. 141. 1935. (Fig. 4A to 4E)

Annuals to 25 cm tall erect, diffuse, glabrous throughout except calyx & peduncle. Rooting at the lower node.

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Stems purple, quadrangular, rooting at lower nodes, much branched. Leaves sessile, elliptic or ovate or ovate-elliptic,, 10–15 × 3–6 mm, decreasing in size upward, base rounded to cuneate, apex acute; veins 3-5, only primary vein conspicuous. Flowers solitary, axillary, in panicles. Pedicel slender, cylindrical, glandular hairy, equalling or longer than the leaves, 1–2 cm. Calyx deeply 5-lobed, ca. 3 mm; lobes free to base, ca. 0.5 mm wide, hispidulous above, apex acuminate, obscurely 3-veined. Corolla white or pale blue, ca. 6.5 mm, tube 4.5–5 mm long,; lower lip 3-lobed; upper lip galeate, shallowly 2-lobed, lobes sharply pointed. Fertile stamens 2, posterior; staminodes 2, clavate, unappendaged, apex obtuse. Ovary 1.1–1.4 mm long, ellipsoid, style 2.5–3 mm long, stigma 2-lamellate. Capsule ellipsoid or obliquely ellipsoid, 2–5 × 2–3 mm, rounded at both ends, obtuse to acute at apex, glabrous, matured capsules yellow, persistent calyx present, seed numerous. Seeds ellipsoid.

Flowering & Fruiting: Aug. – Nov.

Status: Rare.

Distribution: Andhra Pradesh, Gujarat, Kerala, Madhya Pradesh, Rajasthan (Fig. 5), Tamil Nadu.

Specimen examined: Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Aasan, 03-Sep-18, 25°57.117′N & 74°07.938′E, 442m, C.S. Purohit 33578;

7. Lindernia parviflora (Roxb.) Haines, Bot. Bih. Orissa 635. 1922. Bhandari, Fl. Indian Desert 253. 1990. Shetty & Singh, Fl. Rajasthan 2. 598. 1991. *Gratiola parviflora* Roxb. Pl. Cor. 3. 3. t. 203. 1811. *Ilysanthes parviflora* (Roxb.) Benth. in DC. Prodr. 10. 419. 1846. Hook.f., Fl. Brit. India 4. 283. 1884. Duthie, Fl. Upper Gangetic Plain 2. 151. 1911. (Fig. 3D to 3F).

An erect or decumbent annual herbs, up to 15 cm high. Stem branched from base, with 4-angular stem, rooting in the lower region. Leaves 0.5–2 × 0.3–0.8 cm, ovate-lanceolate, entire, 3–5 nerved, margin entire, rounded at base, subacuta at apex. Flowers in solitary, axillary, leafy raceme, white. Pedicel up to 8 mm long. Calyx 3 mm long, deeply 5-lobed; segments linear. Corolla 5 mm long, fertile stamens 2. Stamens 2, included. Ovary glabrous, style slender. Fruit capsule, 5 mm long, ellipsoid, apiculate.

Flowering & Fruiting: Aug. – March.

Status: Rare.

Distribution: Barmer (Haldeshwar) Chittorgarh (Bassi); Jhalawar; Sirohi (Mount Abu); Todgarh-Raoli wildlife sanctuary (Sarkaniya Beri).

Specimen examined: Todgarh-Raoli wildlife sanctuary,Jojawar Range, Sarkaniya Beri, 25-Nov-17, 25°45.729′N & 73°54.944′E, 451m, C.S. Purohit 33469;

8. Mazus pumilus (Burm.f.) Steenis in Nova Guinea (n.s.) 9. 31. 1958. Shetty & Singh, Fl. Rajasthan 2. 599. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 382. 2007. *Lobelia pumila* Burm.f., Fl. Ind. 186. t. 60. f. 3. 1768. *Majus rugosus* Lour. Fl. Cochinch. 385. 1790. Hook.f., Fl. Brit. India 4. 259. 1884. Duthie, Fl. Gangetic Plain 2. 144. 1911. (Fig. 1F to 1H).

An erect or ascending, annual herbs, up to 15 cm high. Stem erect or ascending, glandular-pubescent. Leaves mostly radical. Petiolate, oblanceolate or obovate-spathulate, margin crenate-dentate, cuneate at base. Flowers in lax, flexuous racemes, glandular hairy. Calyx campanulate, enlarging in fruit; segments ovate-lanceolate, subulate. Corolla pale-blue, lilac or whitish-purple, glandular hairy outside. Fruit capsule, subglobose, included in the calyx. Seeds minute, pale yellow.

Flowering & Fruiting: Most part of the year.

Status: Rare in moist and shady habitats.

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Distribution: Bikaner (Husangsar); Kota (Chhipabaraut); Todgarh-Raoli wildlife sanctuary (Aasan).

Specimen examined: Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Aasan, Pali, 03 Sept. 2018, 25°57.111′ N & 74°07.936′ E;, 435m, C.S. Purohit 33579.

9. Striga angustifolia (D.Don) Saldhana, in Bull. Bot. Surv. India 5. 70. 1963. Bhandari, Fl. Indian Desert 254. 1990. Shetty & Singh, Fl. Rajasthan 2. 604. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 383. 2007. *Buchnera angustifolia* D. Don, Prodr. Fl. Nep. 91. 1825. *Striga euphrasioides* (Benth.) Benth. in Hook. Comp. Bot. Mag. 1. 364. 1836. Hook.f., Fl. Brit. India 4. 299. 1884. (Fig. 6A to 6D).

An erect, scabrid, annual herbs, up to 50 cm high, partially root parasite on grasses. Stem simple, scabrid, filiform, angular, ribbed. Leaves 1–5 × 0.2–0.5 cm, linear, subacute at apex, margin entire or 1–2 teeth on each side. Flowers in axillary, solitary, terminal spike, subsessile. Calyx 12 mm long, campanulate, 15 strong ribs, lobed; lobes 5, as long as tube, each lobe with 3 ribs, one extening in the middle from the base to the apex. Corolla 1.5 cm long, white, tube exserted, incurved beneath. Fruit capsule, 8 mm long, ellipsoid, glabrous, enclosed in the calyx.

Flowering & Fruiting: Aug. – Oct.

Distribution: Banswara (Lasara village); Barmer (Siwana); Ganganagar (Bhaduwala); Jaipur (Moti Dungri); Kota (Barha); Sirohi (Mount Abu); Todgarh-Raoli wildlife sanctuary (Aasan).

Specimen examined: Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Aasan, 03-Sep-18, 25°57.117′N & 74°07.938′E, 442m, C.S. Purohit 33562;

10. Striga gesnerioides (Willd.) Vatke Oesterr. Bot. Zeitschr. 25. 11. 1875. Bhandari, Fl. Indian Desert 256. 1990. Shetty & Singh, Fl. Rajasthan 2. 605. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 384. 2007. *Buchnera gesnerioides* Willd. Sp. Pl. 3. 338. 1800. *Striga orobanchoides* (R. Br. ex Endl.) Benth. Comp. Bot. Mag. 1. 361. t. 19. 1836. Hook.f., Fl. Brit. India 4. 299. 1884. Duthie, Fl. Upper Gangetic Plain 2. 156. 1911.

Erect, annual, much-branched, rigid, galbrous or pubescent, purple, root-parasitic herbs, up to 60 cm high, with prominent haustoria and woody root-stocks. Stem 30 cm long, reddish-purple passing into floral bracts. Leaves 4–8 × 1.5–4 mm, opposite or alternate, scaly, ovate-lanceolate, acute, purple, upper ones passing into bracts. Flowers 1 to 3-nate, in dense terminal spikes. Calyx 6 mm long, tubular, 4 to 5-ribbed, hispid, splitting between the teeth. Corolla bilipped, tube 8 mm long, incurved above the middle, hairy outside and in the throat; upper lib 2-lobed, lower lip 3-lobed. Fruit capsule, ovoid-globose. Seeds minute, oblong.

Flowering & Fruiting: Aug. – Oct.

Local name*: Missi, Gwal-mehndi.*

Distribution*:* Ajmer; Jaipur (Ramgarh); Jodhpur (Kailana, Machiya Biological Park); Nagaur (Bandi Hill, Thanwala); Sirohi (Mount Abu); Udaipur (Kelwara); Todgarh-Raoli Wildlife Sanctuary (Kalalia).

Specimen examined: Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Kalalia, Pali, 06-Aug-16, 25°55.881′N & 74°08.473′E, 499m, C.S. Purohit 33072 (BSJO 40808, 40809);

11. Striga todgarhica C.S. Purohit in J. New Biol. Repor. 10(2): 89–94. 2021.

Annual, erect herb, 10–25 cm tall, entirely hirsute. Stem erect, branched ribbed, hispidly hairy. Leaves green, linear to narrowly lanceolate, with subacute apex, alternate, sessile, 2–4 × 0.2–0.4 cm, densely hairy on dorsal side, flowers in lax, leafy terminal spikes. Bracts similar to leaf in shape and size, densely hairy;

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Bracteole 2, equal, linear, densely hairy on both side, 6–8 mm long. Calyx 6–8 mm long; calyx lobes 5, narrow triangular, hispid, calyx lobe half the length of calyx tube [lobe 2–3 mm long; tube 5–6 mm long]; calyx 13-ribbed, densely hispid along ribs, one calyx rib terminating the tip of each lobe and others in the sinus. Corolla white, salverform, tube 1.5–2 cm, apically strongly curved, lower lip tri–tetra partite, outside in budding; upper lip bilobed, 2.2–2.6 × 2.2–2.4 mm. Stamen 4, attached to distal end of the tube, just below the throat. Ovary 1.5–2 mm long, glabrous; style long upto 4–5 mm long, glabrous, brown colour at the tip. Capsule ovoid, 8–10 mm long, enveloped in persistent calyx. (Fig. 6E to 6F).

Flowering & Fruiting: October – December.

Distribution: Endemic, India, Rajasthan, Todgarh-Raoli wildlife sanctuary.

Specimen examined: **Type**: INDIA. Rajasthan, Todgarh-Raoli Wildlife Sanctuary, Jojawar Range, Uperli Babhan, 460m, (25°46.306' N; 73°56.897' E), 12 November 2017, C.S.Purohit 33306A, (Holo BSJO!); C.S.Purohit 33306B (Iso BSJO!).

Note: This species is strictly parasitic on the grass roots of *Sorghum halepense* (L.) Pers. belonging to family Poaceae. It grows on transition area of gravel and sandy habitat in associated with *Aerva javanica* (Burm.f.) Juss. ex Schult., *Cordia sinensis* Lam., *Bergia ammannioides* Roxb. ex Roth., *Butea monosperma* (Lam.) Taub., *Calotropis procera* (Aiton) Dryand., *Commelina difusa* Burm.f., *Eragrostis amabilis* (L.) Wight & Arn., *Ipomoea nil* (L.) Roth, *Lindenbergia indica* Vatke, *Prosopis juliflora* (Sw.) DC., *Senna siamea* (Lam.) H.S.Irwin & Barneby, *Sorghum halepense* (L.) Pers. and *Trichosanthes tricuspidata* Lour.**Distribution:** Banswara; Jodhpur; Todgarh-Raoli wildlife sanctuary (Uprali Bhabhan).

12. Verbascum chinense (L.) Sant. Fl. Purandhar 90. 1958 & in Rec. Bot. Surv. Imdia 16. 177. 1967. Bhandari, Fl. Indian Desert 256. 1990. Shetty & Singh, Fl. Rajasthan 2. 607. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 385. 2007. *Scrophularia chinensis* L. Mant. Pl. 2. 250. 1771. *Celsia coromandeliana* Vahl, Sysmb. Bot. 3. 79. 1794. Hook.f., Fl. Brit. India 4. 251. 1883. Duthie, Fl. Upper Gangetic Plain 2. 139. 1911.

An erect, annual herbs, up to 1.2 m high. Stem branched, angular, glandular-pubescent. Leaves 5–20 cm long; radical leaves oblong-obovate, petiolate, in rosette; cauline leaves ovate, margin crenate, sessile. Flowers in solitary, axillary, terminal raceme. Bracts ovate-acute. Calyx 6 mm long, divided near to the base; lobes ovate-lanceolate, acute, pubescent. Corolla 1 cm across, lobed; lobe 7 mm long, yellow. Stamens 4, didynamous, filaments densely bearded with elongate. Ovary globose, glabrous; style glabrous, stigma compressed. Fruit capsule, 7 mm in diam., globose. Seeds oblong.

Flowering & Fruiting: Throughout the year.

Distribution*:* Alwar (Siliserh); Banswara (Bagaycha forest); Barmer (Bhujawas); Bikaner (Jamsar); Jaipur (Sambhar Lake); Kota (Shahabad); Nagaur (Vishnu pond, Merta City); Sirohi (Mount Abu); Todgarh-Raoli Wildlife Sanctuary (Bheelon ki Nal, Kana Khejri, Ronda, Mayali mata temple, Jhamuda, Kundal, Jogi Beri).

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 32834 (BSJO 40473, 40474); Raoli Range, Kana Khejri, 02-Aug-16, 25°41.933′N & 73°57.452′E, 717m, C.S. Purohit 33004; Todgarh-Raoli wildlife sanctuary, Raoli Range, Ronda (Dewal-fatehpur), 12-Nov-

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17, 25°49.412′N & 73°59.462′E, 532m, C.S. Purohit 33329; Todgarh-Raoli wildlife sanctuary, Bhim Range, Mayali mata temple, 26-Nov-17, 25°27.635′N & 73°45.348′E, 419m, C.S. Purohit 33477; Todgarh-Raoli wildlife sanctuary, Raoli Range, Jhamuda, 31-Aug-18, 25°43.633′N & 73°54.747′E, 385m, C.S. Purohit 33500; Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Kundal, 24-Feb-19, 26°00.140′N & 74°10.175′E, 441m, C.S. Purohit 31082; Todgarh-Raoli wildlife sanctuary, Raoli Range, Jogi Bera, 28-Feb-19, 25°43.923′N & 73°55.793′E, 433m, C.S. Purohit 38013;

13. **Veronica anagallis-aquatica** L. Sp. Pl. 12. 1753. Hook.f., Fl. Brit. India 4. 293. 1884. Duthie, Fl. Upper Gangetic Plain 2. 154. 1911. Bhandari, Fl. Indian Desert 258. 1990. Shetty & Singh, Fl. Rajasthan 2. 609. 1991. Tiagi & Aery, Fl. Rajasthan (S. & S. E. region) 386. 2007.

An erect, glabrous, annual herbs, up to 30 cm high. Stem erect or decumbent, branched, glandular hairy at apex, rooting from nodes at base. Leaves 3–8 × 0.5–2 cm, sessile, semiamplexicaul, the lower few shortly petiolate, oblong-lanceolate, obtuse or rarely subacute at apex,margin serrate-crenate or entire. Flowers in slender lax, axillary racemes, up to 10 cm long. Peduncle 6 mm long, glandular hairy. Bracts 3 mm long, linear, acute. Calyx 3 mm long, divided to the base, ovate, obtuse. Corolla 5 mm long, pinkish-white. Ovary round. Fruit a capsule, 3 mm long, orbicular, oblong, glabrous. Seeds oblong.

Flowering & Fruiting: Oct. – May.

Distribution*:* Ajmer; Alwar (Sariska Tiger Reserve); Banswara (Ghatol); Bikaner (Lunkaransar); Jaipur; Jodhpur; Kota (Shahabad); Nagaur (Vishnu pond, Merta City); Sirohi (Mount Abu); Todgarh-Raoli wildlife sanctuary (Jamunmata temple, Dodiyo ka Kheda).

Specimen examined: Todgarh-Raoli wildlife sanctuary, Bhim Range, Jamuk mata temple, 10-Sep-18, 25°25.381′N & 73°45.588′E, 443m, C.S. Purohit 31037; Todgarh-Raoli wildlife sanctuary, Bhim Range, Dodiyo ka kheda, Halela, 07-Mar-19, 25°22.685′N & 73°48.007′E, 739m, C.S. Purohit 38057.

Result and Discussion:

This sanctuary represent dominant family is Poaceae where it also dominant in Rajasthan state. Family Scrophulariaceae represent sixth dominant family in this for Aravalli range and Rajasthan state but in Todgarh-Raoli wls, it is not included in top 10 dominant families.

[1]. Statistical Analysis of Family Scrophulariaceae: The present work enumerates 13 species, belonging to 7 genera under family Scrophulariaceae. Dominant genus is *Lindernia* and *Striga* represents 3 species each following by genus *Lindenbergia* (2 species). The 03 genera represented by single species i.e. *Mazus*, *Verbascum* and *Veronica*.

[2]. Addition for Flora of Rajasthan

While working on the floristic diversity of Todgarh-Raoli wildlife sanctuary, Rajasthan during 2015 – 2020 author demarcated a population of 15 – 20 individuals at new localities (Aasan, Pali district) and collected herbarium samples of *Lindernia*. After critical study, scrutiny of literature and study in various herbaria, it is identified as *Lindernia dubia* (L.) Pennell. This species is reported from Andhra Pradesh, Gujarat, Kerala, Madhya Pradesh and Tamil Nadu state. This study reports its new distributional sites from rocky area with twenty individuals in Aasan, Todgarh-Raoli wildlife sanctuary, Rajasthan. It is also first time report and addition for flora of Rajasthan state. In addition, a brief description, phenology, remarks, and photographs provided for easy field identification. The present locality of the *Lindernia dubia* (L.)

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Pennell. in Rajasthan are shown in Fig. 5. The voucher specimens were deposited at Botanical Survey of India, Jodhpur (BSJO).

[3]. Addition for Flora of Aravalli Range:

Otaghvari *et al.* (2015) have done extensive work on flora of Aravalli range and reported 35 species belonging to 19 genera under family Scrophulariaceae (Table-1). In this paper, three plant species i.e. *Lindernia dubia* (L.) Pennell., *Lindernia parviflora* (Roxb.) Haines and *Striga todgarhica* C.S. Purohit are first time report from Aravalli range and addition for flora of Aravalli range.

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

Kanther (2019) have done extensive work on Flora of Todgarh-Raoli wildlife sanctuary and reported 301 species, out of which 2 species belonging to 2 genera under family Scrophulariaceae (table-1). In this paper, six genera i.e. *Kickxia, Lindernia, Mazus, Striga, Verbascum* and *Veronica* are first time report and generic addition for flora of Todgarh-Raoli wildlife sanctuary and 12 plant species i.e. *Kickxia incana* (Wall.) Pennell; *Kicxia ramosissima* (Wall.) Janchen; *Lindenbergia muraria* (Roxb. ex D.Don) Bruhl.; *Lindernia ciliata* (Colsm.) Pennell; *Lindernia dubia* (L.) Pennell.; *Lindernia parviflora* (Roxb.) Haines; *Mazus pumilus* (Burm.f.) Steenis; *Striga angustifolia* (D.Don) Saldhana; *Striga gesnerioides* (Willd.) Vatke; *Striga todgarhica* C.S. Purohit; *Verbascum chinense* (L.) Sant. and *Veronica anagallis-aquatica* L. are first time report and addition for flora of Todgarh-Raoli wildlife sanctuary. Out of these, *Lindenbergia muraria* (Roxb. ex D.Don) Bruhl., *Lindernia dubia* (L.) Pennell., *Striga todgarhica* C.S. Purohit are rare plants of Rajasthan, collected from this sanctuary.

Table 1. Comparison of Scrophulariaceae of this sanctuary with previous publications.

Family	(1)	(2)	(3)	(4)
Scrophulariaceae				
Genus	7	2	19	26
Taxa	13	2	35	54

(1): Todgarh-Raoli wls. (Purohit, 2020a); (2): Todgarh-Raoli wls (Kanther, 2019);

(3): Aravalli range (Otaghvari *et. al.* 2015); (4): Flora of Rajasthan (Shetty & Singh, 1993);

Conclusion:

Present paper deals with 13 species belonging to 9 genera of family Scrophulariaceae collected from this sanctuary. Among these, one species *Lindernia dubia* (L.) Pennell. is reported first time and addition for flora of Rajasthan. Three plant species i.e. *Lindernia dubia* (L.) Pennell., *Lindernia parviflora* (Roxb.) Haines and *Striga todgarhica* C.S. Purohit are first time report from Aravalli range and addition for flora of Aravalli range. Six genera i.e. *Kickxia, Lindernia, Mazus, Striga, Verbascum* and *Veronica* are first time report and generic addition for flora of Todgarh-Raoli wildlife sanctuary and 12 plant species are first time report and addition for flora of Todgarh-Raoli wildlife sanctuary, Rajasthan.

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References:

Bhandari M.M. (1990) Flora of the Indian desert. Scientific Publishers, Jodhpur.

Blatter E. and Hallberg F. (1920). The flora of the Indian desert (Jodhpur and Jaisalmer). *J. Bomb. Nat. Hist. Soc*, 26 (4): 971.

Jain S.K. and Rao R.R. (1976) A Hand Book of Field and Herbarium Methods. Today and Tomorrow's Printers and Publishers, New Delhi.

Kanther R.P. (2013) Traditional wound healing plants of Todgarh-Raoli Wild life Sanctuary Rajasthan, India. *Indian J. Env. Sci.*17(2):105-107.

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.

Kanther R.P. (2019) Dominant flora of Todgarh-Raoli wildlife sanctuary, Rajasthan, India. *J. Indian Bot. Soc.* 98(1-2): 59 – 70.

Kanther R.P. and Gena D. (2012) Ethno-medico-botany of Todgarh-Raoli wildlife sanctuary, Rajasthan, India. *J. Phytol. Res.* 25 (2): 249 – 256.

Katewa S.S., Chaudhary B.L., Jain A. and Galav P. (2003) Traditional uses of plant biodiversity from Aravalli hills of Rajasthan. *Ind. J. Trad. Knowl.* 2(1): 27 – 29.

Kulloli R.N. and Purohit C.S. (2020) *Habenaria gibsonii* var. *foetida* (Orchidaceae) – An addition to the flora of Rajasthan. *Species* 21(67): 202 – 207.

Kulloli R.N. and Purohit C.S. (2022). Assessment of IUCN threat category and present population status of *Ammannia desertorum* Blatt. & Hallb. in Indian desert. *International Journal of Agriculture Sciences*, 13(2): 102 – 108.

Kulloli R.N., Purohit C.S., Kumar R. and Maina V. (2019) Notes on occurrence of *Anticharis glandulosa* Asch. var. *caerulea* Blatt. & Hallb. ex Sant. (Scrophulariaceae) a rare endemic plant of Indian desert. PHYTOTAXONOMY 18: 65–68.

Kulloli R.N., Purohit C.S. and Gosavi K.V.C. (2020a) Extended distribution of critically endangered plant *Dipcadi saxorum* Medik. From Mount Abu Wildlife Sanctuary, India. NeBIO, 11(4): 260 – 254, 2020.

Kulloli R.N., Purohit C.S., Maina V. and Kari B. (2020b) Recollection of Critical Endangered Plant *Ceropegia odorata* Nimmo ex J. Graham (Asclepiadaceae) after 128 years from Mount Abu wildlife sanctuary, Rajasthan, India. *Journal of New Biological Reports* 9(3): 277 – 280.

Kumar S. and Purohit C.S. (2015) Conservation of Threatened Desert Plants. pp-148, Scientific publishers, Jodhpur.

Kumar S., Purohit C.S. and Kulloli R.N. (2017) Conservation of Threatened plants in Desert Botanical Garden, Jodhpur. In Book- Indian Botanic Gardens- Role in Conservation (Eds.: P Singh & SS Dash), BSI Publication, 406-425.

Kumar R., Purohit C.S., Kulloli R.N. and Maina V. (2019) *Begonia picta* Smith (Begoniaceae) – new record for Rajasthan from Mount Abu Wildlife Sanctuary. The Begonian Nov./Dec.: 214-217.

Kumar S., Purohit C.S. and Kulloli R.N. (2020) *Aloe trinervis* sp. nov. A new succulent species from Indian Desert (Asphodelaceae). *Journal of Asia Pacific Biodiversity* 13(2): 325 – 330. https://doi.org/10.1016/j.japb.2020.03.001.

Maina V., Kumar R. and Purohit C.S. (2022) A conspectus of Flowering plants of Aliya-bet, Bharuch, Gujarat. *PHYTOTAXONOMY*, 32 – 48.

Mabberley, D. J. 2017. Mabberley's Plant-Book A Portable Dictionary of Plants, their Classification and Uses, 4th Edition. Cambridge University Press, Cambridge.

Mao, A.A. & Dash, S.S. (2020) Flowering plants of India: An annotated checklist

ISSN: 2348-8344 (Online)
DOI: https://doi.org/10.26540/ijgsr.v12.i2.2025.328

(Dicotyledons), Botanical Survey of India 2: 219.

Otaghvari A.M., Yadav S.R., Raina S.N. and Uniyal P.L. (2015) *Vegetational wealth of Aravalli Rajasthan*. Scientific Publishers, Jodhpur.

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.

Purohit, C.S. (2020a) Biodiversity of Todgarh-Raoli wildlife sanctuary with GIS mapping of EET species. Botanical Survey of India, Kolkata. 581pp. (In Press).

Purohit, C.S. (2020b) *Ipomoea sagittifolia* Burm.f. – New record for Rajasthan and note on family Convolvulaceae of Todgarh-Raoli wildlife sanctuary, Rajasthan. *Int. J. Sci. Res. Sci. Technol.* 7(3): 49 – 65. https://doi.org/10.32628/IJSRST20738.

Purohit, C.S. (2020c) Ethno-medicinal and Economic Plants of Todgarh-Raoli wildlife sanctuary, Rajasthan – A Review. In Souvenior of International Webinar on "Global Environmental Challenges, Biodiversity, Principles of Guru Jambheshwar Ji and Remedies" organized by JNVU, Jodhpur and Jambhani Sahitya Academy, Bikaner on 3 – 5 June, 2020, page no. 54 – 66.

Purohit C.S. (2020d) *Dalechampia* & *Micrococoa* – Two generic addition for flora of Aravalli range, India with Status of Family-Euphorbiaceae of Todgarh-Raoli wildlife sanctuary, Rajasthan, India. J New Biol Rep 9(2): 209 – 219.

Purohit C.S. (2020e) New population records of an Endemic plant- *Melhania magnifolia* Blatt. & Hallb. from Todgarh-Raoli wildlife sanctuary, Rajasthan. *Species*, 21(68): 306-315.

Purohit C.S. (2020f) Seven families addition under class Polypetalae for flora of Todgahr-Raoli wildlife sanctuary, Rajasthan. *Indian Journal of Arid Horticulture* 1(2): 91 – 95.

Purohit C.S. (2020g) Ethno-medicinal and Economic Plants of Todgarh-Raoli wildlife sanctuary, Rajasthan – A Review. In Souvenior of International Webinar on "Global Environmental Challenges, Biodiversity, Principles of Guru Jambheshwar Ji and Remedies" organized by JNVU, Jodhpur and Jambhani Sahitya Academy, Bikaner on 3 – 5 June, 2020, page no. 54 – 66.

Purohit C.S. (2021a) Six species (Cyperaceae) addition for flora of Aravalli range, India with status of family Cyperaceae of Todgarh-Raoli wildlife sanctuary, Rajasthan. *MFP News*, 31(1): 4 – 11.

Purohit C.S. (2021b) *Striga todgarhica* (Orobanchaceae)- A New parasitic species from Todgarh-Raoli wildlife sanctuary, Rajasthan, India. *J. New Bio. Rep.* 10(2): 89 – 94.

Purohit C.S., Kumar R., Kulloli R.N. and Maina V. (2018) Successful *ex-situ* conservation of *Pavonia Arabica* var. *massuriensis* (Malvaceae), an endemic and endangered taxon in the Experimental Botanical Garden of Botanical Survey of India, Jodhpur. *ENVIS Newsletter* 23(2): 30-31.

Purohit C.S., Kulloli R.N. and Bharti A. (2019) *Euphorbia jodhpurensis* Blatt. & Hallb. an endemic plant from the Indian desert and its range extension from Todgarh-Raoli wildlife sanctuary, Rajasthan. EUPHORBIA WORLD 15(3): 18–22.

Purohit C.S. and Kumar R. (2020) A review on genus *Calligonum* L. (Polygonaceae) from India and report *Calligonum crenitum* an addition for Flora of India. *Journal of Asia Pacific Biodiversity* 13(2): 319 – 324. https://doi.org/10.1016/j.japb.2020.03.002.

Purohit C.S., Jain K. and Merushikha. (2020a). A note on family Lamiaceae in Todgarh-Raoli wildlife sanctuary, with addition of two species for flora of Rajasthan. *Int. J. Sci. Res. Sci. Technol.*

7(2): 438 – 444. https://doi.org/10.32628/ IJSRST 207278.

Purohit C.S., Jain K. and Merusikha (2020b) *Cucumis sativus* forma *hardwickii* – New Record for Rajasthan with status of family Cucurbitaceae of Todgarh-Raoli wildlife sanctuary, Rajasthan. *Species*, 21(68): 410 – 423.

Purohit C.S., Singh M. and Bharti A. (2020c) New addition of two IUCN Red Listed bird species of Order: Gruiformes for Todgarh-Raoli Wildlife Sanctuary, Rajasthan, India. *International Journal of Zoology Studies* 5(4): 28 – 29.

Purohit C.S., Singh M., Singh P. and Bharti A. (2020d) Asian Pied Sterling: A new addition to Avian diversity of Todgarh-Raoli wildlife sanctuary, Rajasthan, India. *Journal of New Biological Reports* 9(2): 259 – 261.

Purohit C.S., Jain K., Bharti A., Ram R. and Prasad R. (2020e) *Tephrosia pentaphylla* (Roxb.) G. Don.: Recollection from Todgarh-Raoli wildlife sanctuary, Rajasthan. *Indian Journal of Arid Horticulture* 2(1 & 2): 79 – 80. (Published on April 2022).

Purohit C.S., Kulloli R.N. and Kumar S. (2020f) Present status and ex-situ conservation of *moringa concanensis* in indian desert. *International Journal of Environmental Sciences* 11(2): 44 – 51.

Purohit C.S., Kulloli R.N., Maina V., Kumar R. and Kari B. (2020g) A little known orchid *Habenaria longicorniculata* (Orchidaceae) from Mount Abu wildlife sanctuary, Rajasthan and its IUCN status. *Journal of New Biological Reports*. 9(3): 299 – 305.

Purohit C.S., M. Singh, P. Singh & A. Bharti. (2020h) First Sighting of IUCN red listed three Bird species of family: Accipitridae at Todgarh-raoli wildlife sanctuary, Rajasthan, India. *Journal of Scientific Research in Science and Technology*. 7(2): 366 – 370.

Purohit C.S. and Kulloli R.N. (2021) *Indigofera jaisalmerica* sp. nov. (Fabaceae): A new species from Indian desert. *Journal of Asia Pacific Biodiversity* 14(4): 628 – 635. https://doi.org/10.1016/j.japb.2021.09.006

Purohit C.S. and Maina V. (2021). Know your desert Plant: *Barleria prionitis* – A useful Live Fence species in Arid region. *Desert Environment News Letter, ENVIS, CAZRI,* 23 (3-4): 10 – 11.

Purohit C.S and Kulloli R.N. (2022) *Euphorbia jodhpurensis*. *The IUCN Red List of Threatened Species*: e.T177962845A177969097. https://dx.doi.org/10.2305/IUCN. UK.2022-2.RLTS.T177962845A177969097.en.

Purohit C.S., Kumar R. and Kulloli R.N. (2022) Rediscovery of *Strobilanthes halbergii* Blatt. (Acanthaceae) and endemic species after a centaury from Mount Abu, Rajasthan, India. *PHYTOTAXONOMY,* 22 – 27. (Published online on Feb. 2023).

Purohit C.S., Kumar A. and Meena S.L. (2023) GIS mapping and IUCN Assessment of the Threatened and Endemic species of Indian desert, Rajasthan. Abstracts published in Proceeding of 43INCA International Congress held on 06-08 Nov. 2023, page 72, organized by RRSC, ISRO at Jodhpur.

Purohit C.S., Kumar A., Meena S.L. (2024) Discovery of New Population of an Endemic species *Euphorbia jodhpurensis* Blatt. & Hallb. from Indian Desert, Rajasthan, India. J. New. Biol. Rep. 13(1): 9 – 12.

Purohit C.S. (2024) A note on Family Asteraceae of Todgarh-Raoli Wildlife Sanctuary, Rajasthan, India. Species, 25: 1–26. https://doi.org/10.54905/disssi.v25i76.e36s1703

Sharma A. and Khanna V. (2010) Tadgarh-Raoli Destination with immense potential for Eco-tourism. *South Asian Journal of Tourism and Heritage* 3(1): 152 – 157.

Sharma S. and B. Tiagi (1979) *Flora of North-East Rajasthan*. 265 – 271. New Delhi. She

Sharma S.C. and Purohit C.S. (2013) Grasses of North west Rajasthan, pp- 234 Madhu Publication, Bikaner.

Sharma S.K. (2019). Medicinal plant diversity in Aravallis. *Int. J. Phytocos. Nat. Ingred.* 6: 1 – 3.

Sharma S.K. and Khandal D. (2019) Reporting of New plant species to the flora of Rajasthan. *Indian J. Env. Sci.* 23(2): 51 – 52.

Sharma S.K., Katewa S.S. and Bhatnagar C. (2005) New Records of plants from Rajasthan. *ZOO's PRINT journal* 20(9): 1984 – 1985.

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.

She tty, B.V. & Singh, V. (1991) *Flora of Rajasthan* Vol-2, Botanical Survey of India, Howrah.

Singh M., Bharti A., Purohit C.S. and Tanwar B. (2022) First time sighted two snake species from Todgarh-Raoli wildlife sanctuary, Rajasthan, India. *Indian Journal of Theoretical & Applied Science* 14(1): 16 – 18.

Singh V. and Shrivastava A. (2007) *Biodiversity of Ranthambhore Tiger Reserve, Rajasthan*. Scientific Publishers, Jodhpur.

Tiagi Y.D. and Aery N.C. (2007) *Flora of Rajasthan (south & south-east region)*. Himanshu Publications, Udaipur, India.

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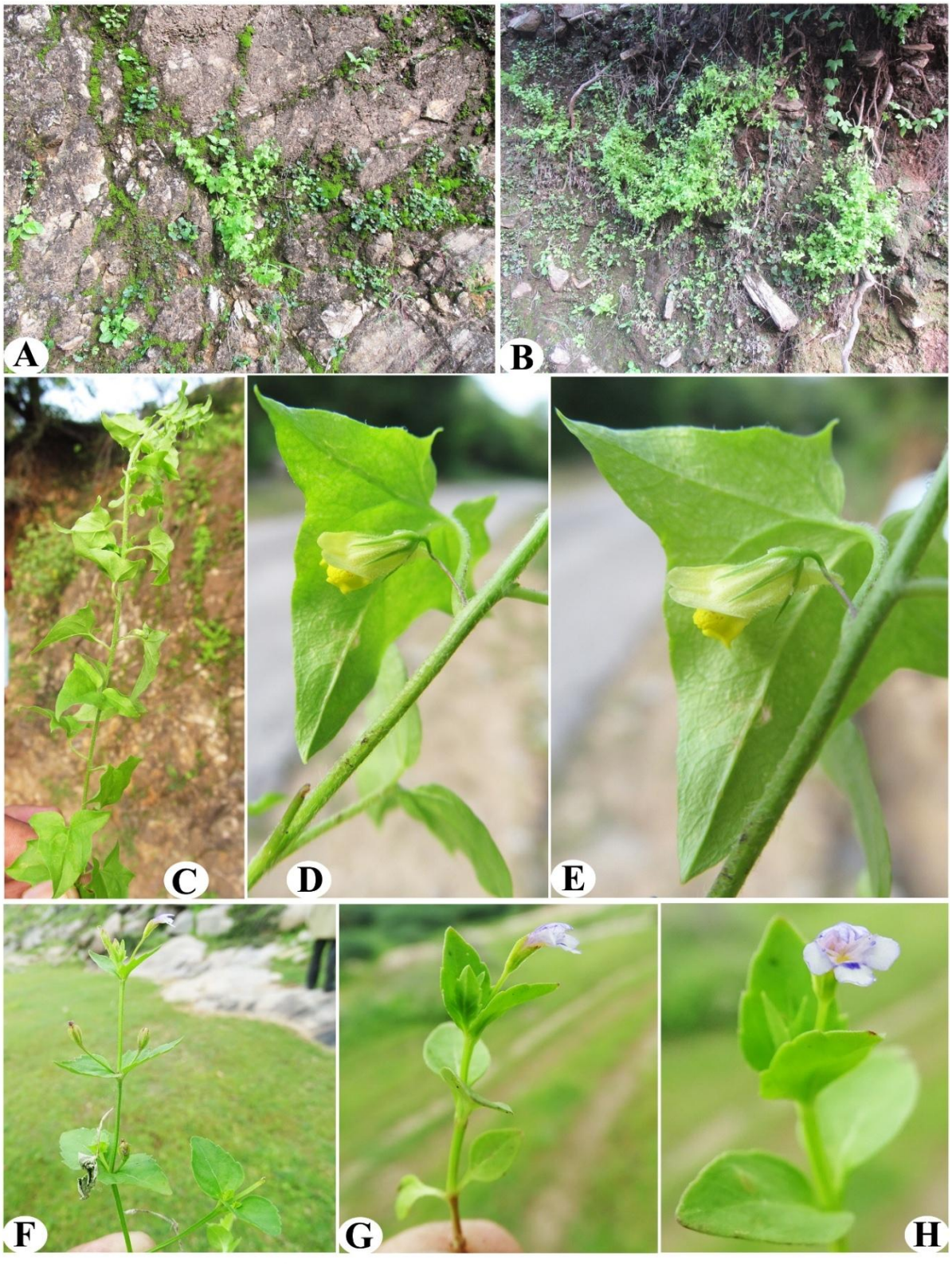

Figure: 1. Scrophulariaceae of Todgarh-Raoli wildlife sanctuary: *Kickxia incana* (Wall.) Pennell (A & B) – Natural habit; (C) – whole plant with flowering; (D & E) – Closeup of flowers; *Mazus pumilus* (Burm.f.) Steenis: (F) – whole plant with fruit; (G & H) – close up of flowers;

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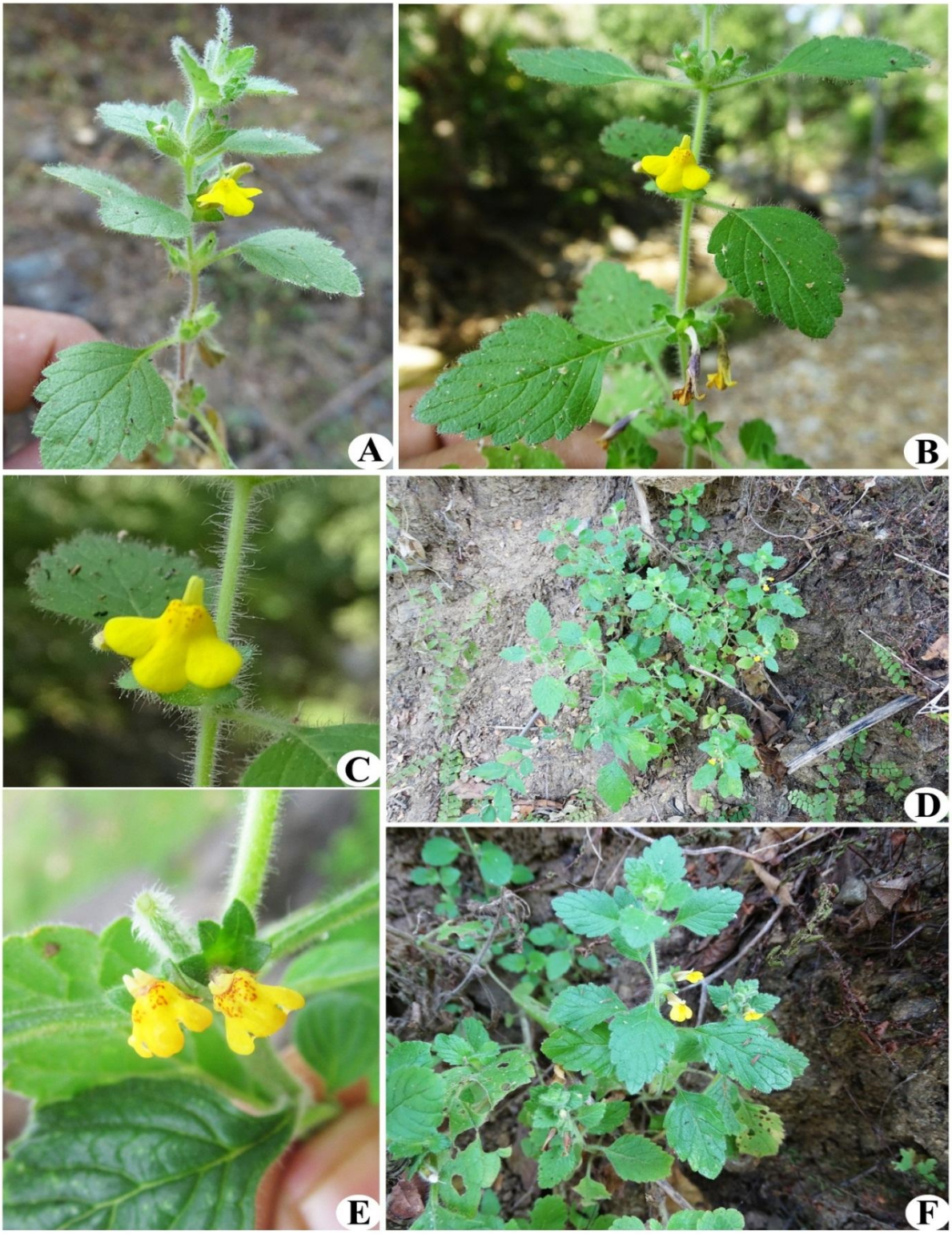

Figure: 2. Scrophulariaceae of Todgarh-Raoli wildlife sanctuary: *Lindenbergia indica* (L.) Vatke (A & B) – whole plant in natural condition; (C) – Close-up of flowers; *Lindenbergia muraria* (Roxb. ex D.Don) Bruhl.: (D) – Natural location at Todgarh-Raoli wls; (E) – Close-up of flowers; (F) – Whole plant;

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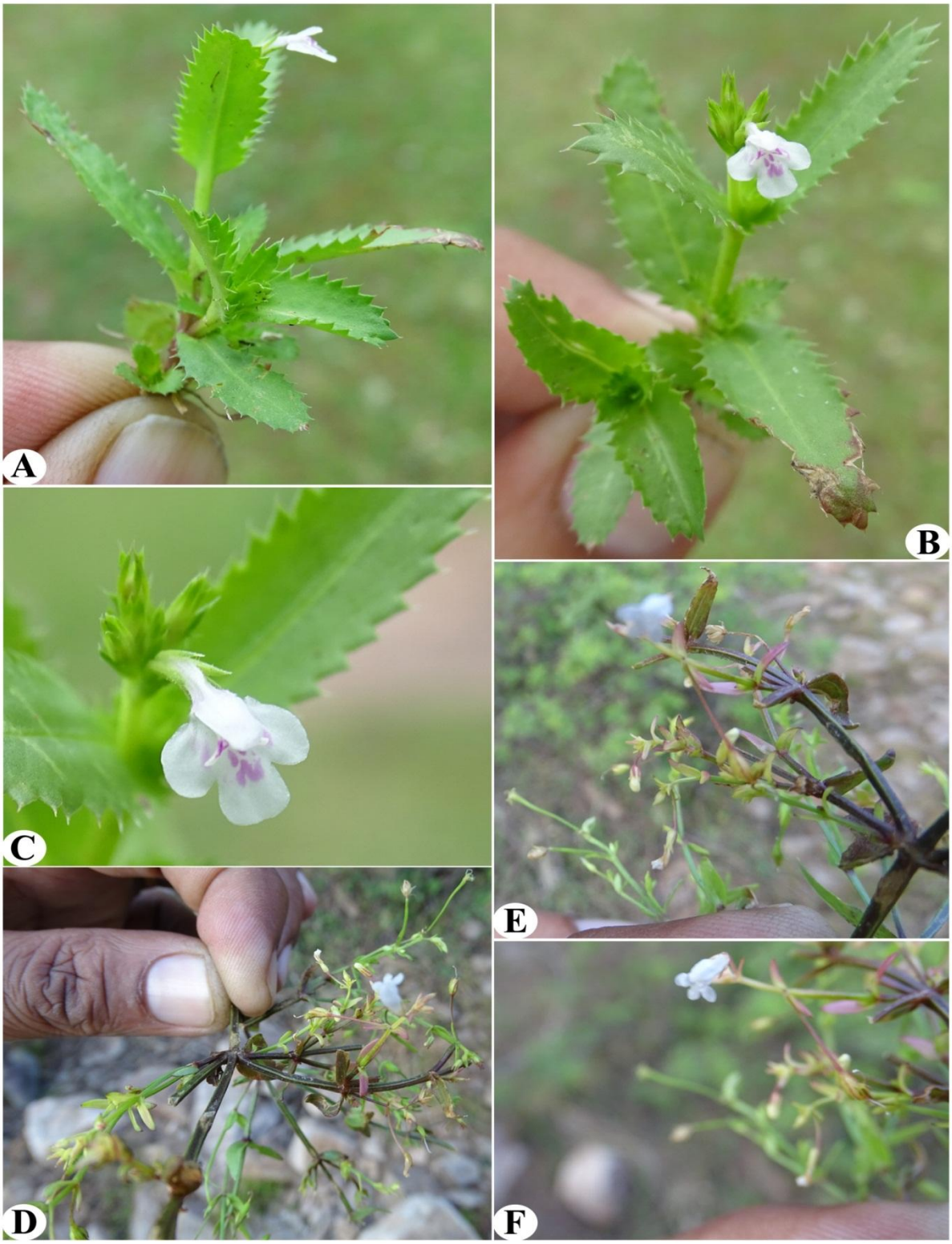

Figure: 3. Scrophulariaceae of Todgarh-Raoli wildlife sanctuary: *Lindernia ciliata* (Colsm.) Pennell: (A & B) – whole plant; (C) – Close-up of flower; *Lindernia parviflora* (Roxb.) Haines: (D) – whole plant; (E) – Stem & Leaves; (F) – Flower;

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Figure:. 4. *Lindernia dubia* (L.) Pennell.: (A to E) – different view of flowers;

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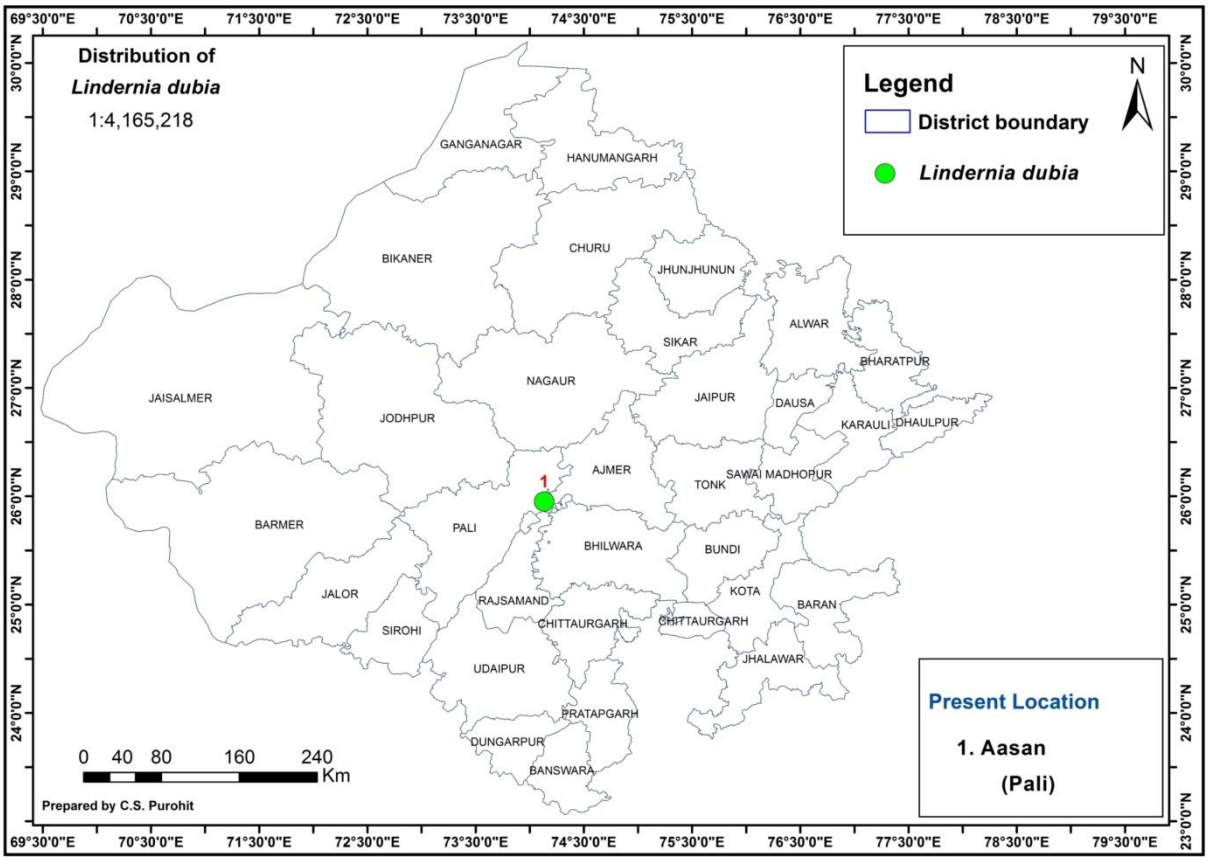

Figure: 5. Map showing distribution of *Lindernia dubia* (L.) Pennell. in Rajasthan.

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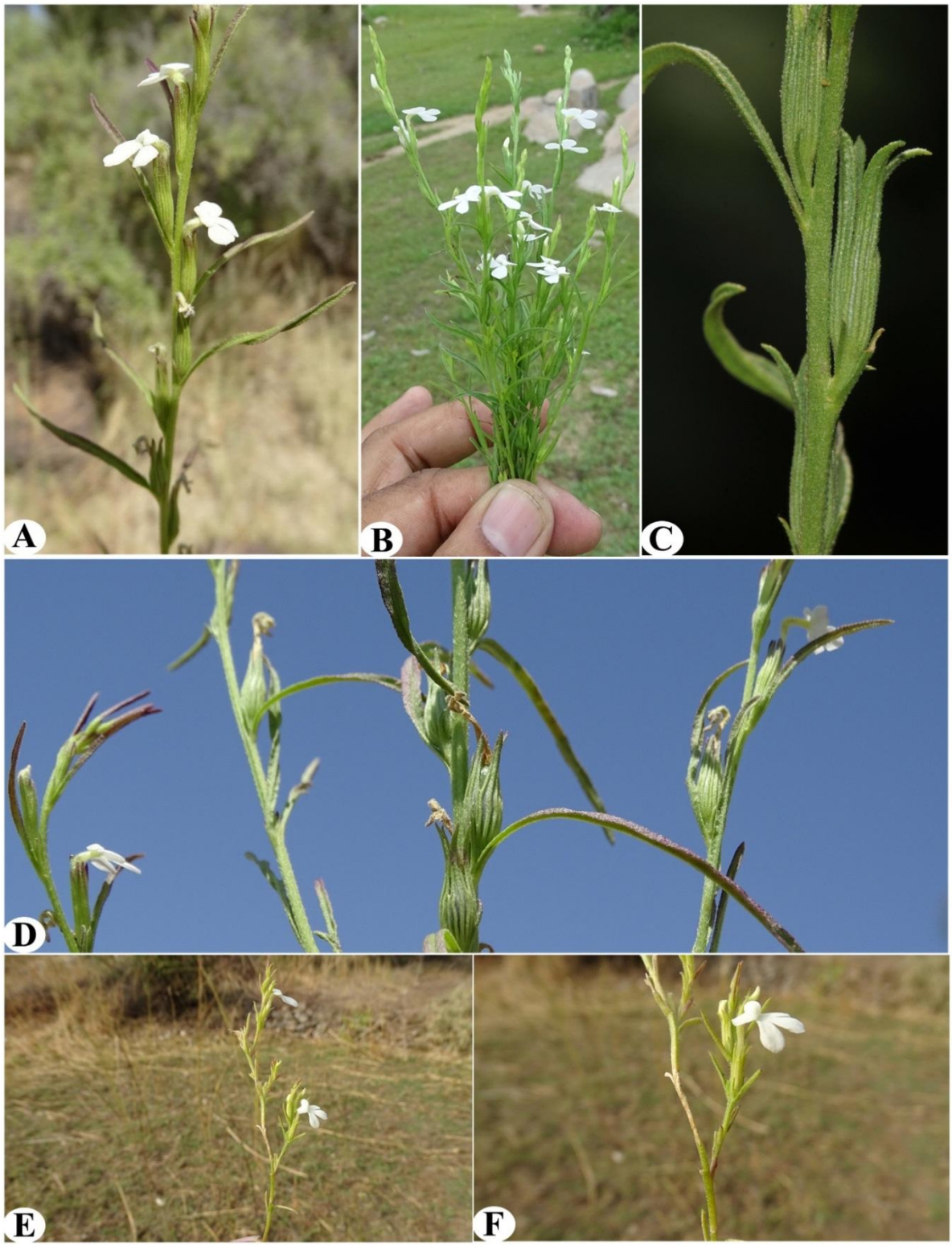

Figure: 6. Scrophulariaceae of Todgarh-Raoli wildlife sanctuary: *Striga angustifolia* (D. Don) Saldhana: (A & B) – Whole plant with flowering; (C) – Bud shows three nerves in each calyx; (D) – Fruiting; *Striga todgarhica* C.S. Purohit: (E) – whole plant; (F) – Close-up of flowers;