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# ***Dalechampia* & *Micrococca* – Two Generic addition for flora of Aravalli range, India with Status of Family-Euphorbiaceae of Todgarh-Raoli wildlife sanctuary, Rajasthan, India**

C. S. Purohit

Botanical Survey of India, Andaman &amp; Nicobar Regional Centre, Port Blair-744102, India

**Corresponding author:** [chandansinghpurohit@yahoo.com](mailto:chandansinghpurohit@yahoo.com)

| Received: 4 April 2020 | Accepted: 17 May 2020 |

**How to cite:** Purohit CS. 2020. *Dalechampia* & *Micrococca* – 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.

## **ABSTRACT**

Present paper deals with 24 species belonging to 10 genera of family Euphorbiaceae collected from this sanctuary. Out of these, two genera *Dalechampia* and *Micrococca* are generic addition for flora of Aravalli range. Eight species are first time reported and addition for flora of Aravalli range, India. Five genera *Acalypha*, *Croton*, *Dalechampia*, *Micrococca* and *Securinega* are generic addition for flora of Todgarh-Raoli wildlife sanctuary. Fourteen species are first time reported and addition for flora of Todgarh-Raoli wildlife sanctuary.

**Key words:** Addition, Genera, Flora, Aravalli, Todgarh-Raoli wls.

## **INTRODUCTION**

The Aravalli range runs diagonally across the state extending from Champaner in Gujarat in the south-west to near Delhi in the north-east for a distance of about 692 km. Within Rajasthan, the range runs from Khed Brahma in the south-west to Khetri in the north-east for a length of about 550 km. The elevation of the Aravalli range gradually rises in the south-west direction and so also the vegetation pattern and floral composition changes due to the changes in climatic and edaphic factors. On Khetri hills (792 m) the vegetation is scrubby and in degraded stage. The top of the hills are practically barren while on the slopes, where some sand and moisture accumulate, thick growth of plants such as *Acacia leucophloea*, *A.*

*Senegal*, *Balanites aegyptiaca*, *Capparis decidua*, *Euphorbia nivulia*, *Grewia tenax*, *Justicia adhatoda*, *Securinega leucopyrus* etc. are noticed.

## **REVIEW OF LITERATURE**

Euphorbiaceae is known as spurge family with approx. 5,700 species belonging to 300 genera from all over the world (Govaerts et al. 2000). India is represented 528 species belonging to 84 genera (Arisdasan & Lakshminarsimhan 2017). Out of which 59 species belonging to 17 genera reported from Rajasthan (Shetty & Singh 1991). In the Aravalli range, Euphorbiaceae represents 26 species belonging to 12 genera (Otaghavari et al. 2015). Many researcher (Katewa et al. 2003; Sharma et al. 2005; Sharma & Katewa 2007; Sharma & Khanna 2010;

Jain et al. 2011; Kanther 2013; Aftab et al. 2016; Sharma & Bano 2016; Singh & Yadav 2018; Sharma 2019; Sharma & Khandal 2019; Tomar & Sharma 2019; Purohit 2020; Purohit et al. 2020) have been reported some 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 five species of family Euphorbiaceae i.e. *Euphorbia caducifolia*, *Euphorbia hirta*, *Jatropha curcus*, *Phyllanthus fraternus* and *Phyllanthus virgatus*. Kanther & Gena (2012) reported 70 ethnobotanical important medicinal species from 65 genera belonging to 44 families including two species of family Euphorbiaceae i.e. *Euphorbia caducifolia* and *Euphorbia hirta* used by Rawat tribes in different ways against various ailments in Todgarh-Raoli wildlife sanctuary. Galav et al. (2013) reported 54 species belonging to 34 families used by tribals as ethnoveterinary medicines in the sanctuary. Kanther (2018) reported 21 rare and threatened plants from this sanctuary. Purohit (2019) reported 10 rare plants from this sanctuary. Kanther (2019) have done extensive work extensive vegetation of Todgarh-Raoli wildlife sanctuary and reported 301 species belonging to 84 families including with 11

species belonging to 8 genera of family Euphorbiaceae. Purohit (2020) reported 28 species belonging to 6 genera of family convolvulaceae from this sanctuary.

## MATERIALS AND METHODS

While working on the floristic diversity of the Todgarh-Raoli Wildlife Sanctuary (Rajasthan) during 2015 to 2019, author identified a two plant population: (1) first population of 75 to 80 specimens of twining undershrubs, 3 – 5 lobed dentate-serrate leaves with androgynous yellowish-green flowers, throughout at Khodiya Naka and Pachanpura village from Bijaguda Range (Pali district) and Mewa ka Mathara, Bhim Range (Rajsamand district) and (2) second population of 30 – 40 specimens of erect herbaceous plant, flowers with perianth, male flowers in raceme, 3-perianth, stamens 5–10, throughout Kermal chauraha, Jojawar Rnage (Pali district). These collected herbarium samples deposited at Botanical Survey of India, Jodhpur (BSJO). After critical study, scrutiny of literature (Hooker 1887; Blatter & Hallberg 1920; Bhandari 1990; Shetty & Singh 1991; Binojkumar & Balakrishnan 2010) and herbaria (BSJO, BSA, RUBL, JAC, BLAT, DCH, CAL), it is identified as *Dalechampia scandens* var. *cordofana* and *Micrococcoa mercurialis*.

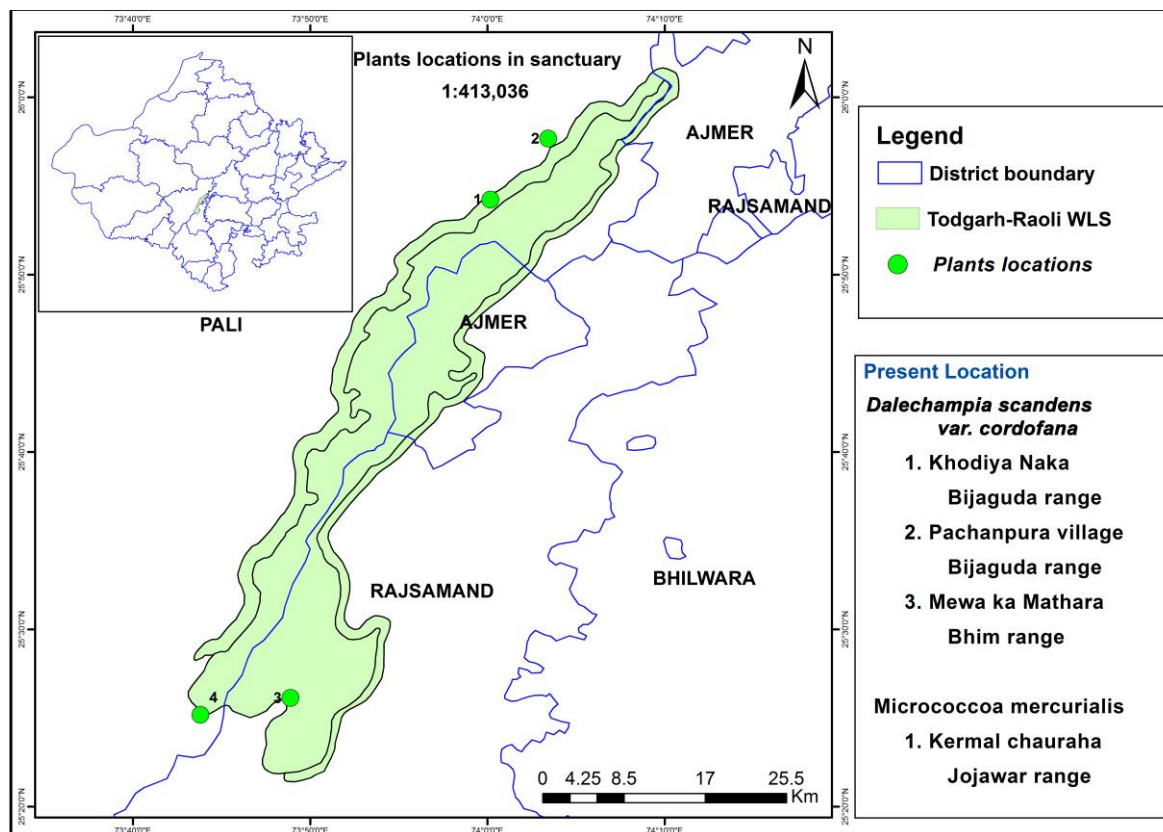


Fig. 1. Distribution map of *Dalechampia scandens* var. *cordofana* and *Micrococcoa mercurialis*

## RESULTS AND DISCUSSION

After study of literature, it is noticed that earlier *Dalechampia scandens* var. *cordofana* was collected by Vyas from Sunda hills, Jalore district and Shetty from Bagol village, Pali district with typical rocky, gravelly habitat and *Micrococca mercurialis* was collected by Sharma from Ramgarh, Amer & Digothia hills, Jaipur district and Singh from Bilara, Jodhpur district. But no one these genera are report from Aravalli range. The genera *Dalechampia* and *Micrococca* are first time reported from Aravalli range, India and both are generic addition for flora of Aravalli range, India. The details of these genera are:

(1) *Dalechampia scandens* L. var. *cordofana* (Hochst. ex Webb.) Muell. – Arg., in DC. Prodr. 15(2). 1245. 1866. *Dalechampia cordofana* Hochst. ex Webb. in Hook. Niger. Fl. 178. 1849.

**Taxonomic description:** A slender, twinning, perennial herbs. Stem puberulous. Leaves alternate, deeply 3–5 lobed; lobes 2–6 × 1–2.5 cm, elliptic-lanceolate, acute at apex, margin dentate-serrate. Petiole up to 2 cm long. Stipule 5 mm long. Flowers in terminal or axillary heads, yellowish-green. Peduncle up to 2 cm long. Bracts in pair; lower bracts trilobed, up to 3.2 cm long, margin serrate-dentate, apex acute, base rounded, 5 – 7 nerved from base, puberulous, yellowish-green; upper bract simple or rarely slightly lobed, up to 3.4 cm long, apex acute, base rounded, 5 = 7 nerved from base, margin serrate-dentate, yellowish-green. Male flowers: calyx up to 1.5 mm long, elliptic-ovate, greenish-yellow; anther minute, yellow. Female flowers: calyx 2 mm long, 4 pairs of linear gland-tipped on lobe, strigose; ovary 1 mm in diam., style 5 mm long, glabrous. Fruit capsule, up to 5 mm long, minutely hispidulous. Seeds one in each cell, 3 mm in diam., grey, brown mottled (Fig. 2& 3).

*Fl. & Fr.:* July – Oct.

**Specimen examined:** INDIA: Rajasthan, Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Khodiya Naka, Pali, 25°54.234'N & 74°00.159'E, 397 m.s.l., 08-Aug-16, C.S. Purohit 33130; Bijajiguda Range, Pachanpura village, 25°57.677'N & 74°03.420'E, 377 m.s.l., 13 Nov. 2017, C.S. Purohit 33345; Bhim Range, Mewa ka Mathara, 25°26.132'N & 73°48.883'E, 754 m.s.l., 21-Nov-17, C.S. Purohit 33453 (Fig. 1).

**Ecology:** This species has its typical habitat in arid to semi-arid rocky and gravelly areas (Fig. 2) in the buffer zone of the Todgarh-Raoli wildlife sanctuary, Rajasthan, associated with *Abutilon bidentatum* Hochst. ex A. Rich var. *bidentatum* (CSP33129); *Abutilon indicum* (L.) Sweet var. *guinense* (Schum.) K.F. Feng. (CSP33137); *Adhatoda zeylanica* Medic. (CSP33452); *Bauhinia variegata* L. (CSP33455); *Bulbostylis barbata* (Rottb.) Clarke (CSP33133); *Clerodendron phlomoids* L.f. (CSP33346); *Cocculus hirsutus* (L.) Diels (CSP33132); *Cocculus pendulous* (J.R. & G. Frost.) Diels (CSP33451, CSP33348); *Cordia gharaf* (Forssk.) Ehrenb. ex Asch.

(CSP33456); *Euphorbia heyneana* Spreng. (CSP33134); *Ipomoea cairica* (L.) Sweet (CSP33454); *Ipomoea nil* (L.) Roth. (CSP33131); *Leptadenia pyrotechnica* (Forssk.) Decne. (CSP33347); *Perotis indica* (L.) O. Ktze (CSP33136); *Polycarpaea corymbosa* (L.) Lam. (CSP33138);. Quadrate data of *Dalechampia scandens* var. *cordofana* resulted in its co-dominant status in nature with RIV- 9.57.

**Distribution:** Rajasthan: Jalore (Sunda hills), Pali (near Bagol village), Todgarh-Raoli wls.

**Population size:** It is observed that the population of this species in nature is about 75-80 individuals on all the collected localities from Aravalli range.

**Note:** Earlier this species was collected from Rajasthan by Vyas from Sunda hills, Jalore district and Shetty from Bagol village, Pali district with typical rocky, gravelly habitat (Shetty & Singh 1991). But no one workers reported this genera from Aravalli range. The genera *Dalechampia* is first time report from Aravalli range, India and generic addition for flora of Aravalli range, India.

(2) *Micrococca mercurialis* (L.) Benth. in Hook. Niger. Fl. 503. 1849. Raizada, Suppl. Duthie, Fl. Upper Gangetic Plain 252. 1976. *Tragia mercurialis* L. Sp. Pl. 980. 1753.

**Taxonomic description:** An erect, annual herb, up to 50 cm high. Leaves 2–6 × 1–2.5 cm, ovate, margin crenate, rounded at base, acute at apex. Flowers in racemes, up to 7 cm long. Male flowers many, minute. Female flowers solitary. Fruit capsule, up to 4 mm in diam., deeply 3-lobed. Seeds plae brown, pitted (Fig. 3).

*Fl. & Fr.:* Aug. – Oct.

**Specimen examined:** Todgarh-Raoli wildlife sanctuary, Jojawar Range, Kermal chauraha, 12-Aug-16, 25°25.184'E & 73°43.80'N, 397m, C.S. Purohit 33208 (Fig. 1).

**Ecology:** This species has its typical habitat in arid to semi-arid rocky and gravelly areas (Fig. 2) in the buffer zone of the Todgarh-Raoli wildlife sanctuary, Rajasthan, associated with *Boerhavia diffusa* L. (CSP33207); *Datura ferox* L. (CSP33204); *Micrococca mercurialis* (L.) Benth. (CSP33208); *Rivea ornata* Choisy (CSP33206); *Setaria intermedia* Roem. & Schult. (CSP33209); *Tectona grandis* L. (CSP33205). Quadrate data of *Micrococca mercurialis* resulted in its co-dominant status in nature with RIV- 6.43.

**Distribution:** Rajasthan: Jaipur, Jodhpur, Sikar.

**Population size:** It is observed that the population of this species in nature is about 15-20 individuals on all the collected localities from Aravalli range.

**Note:** Earlier this species was collected from Rajasthan Sharma from Ramgarh, Amer & Digothia hills, Jaipur district and Singh from Bilara, Jodhpur district with typical rocky, gravelly habitat (Shetty & Singh 1991). But no one workers reported this genera from Aravalli range. The genera *Micrococca* is first time report from Aravalli range, India and generic addition for flora of Aravalli range, India.

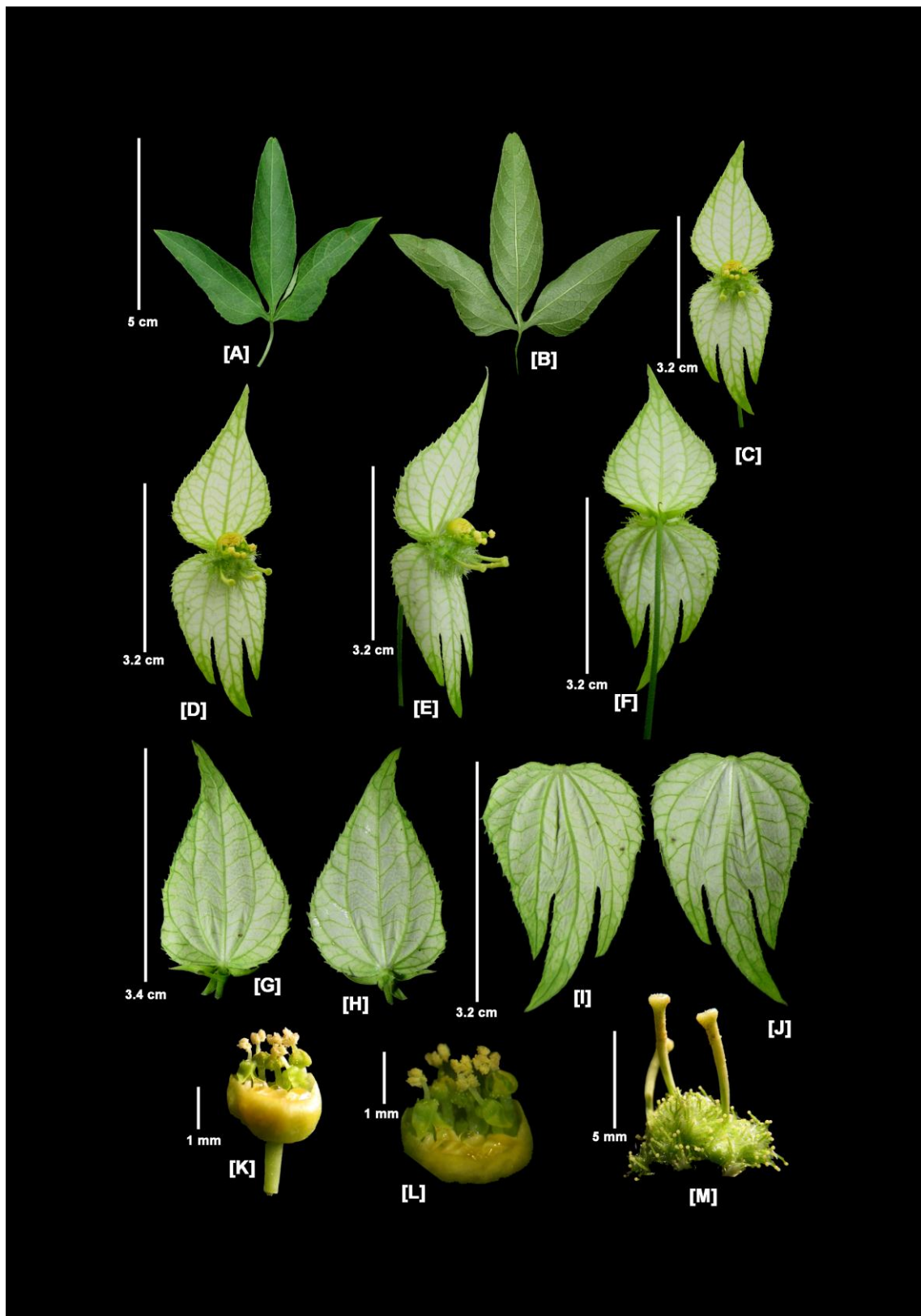


Fig. 2. *Dalechampia scandens* var. *cordofana*:  
 [A & B]-Dorsal & Ventral view of leaf; [C, D, E & F]- Different view of Flowers; [G, H, I & J]- Dorsal & Ventral view of Bracts; [K]- Bisexual flower; [L]- Androecium; [M]- Gynoecium.



Fig. 3. Plant of family Euphorbiaceae collected from Todgarh-Raoli wildlife sanctuary

**STATUS OF FAMILY EUPHORBIACEAE**

Todgarh-Raoli Wildlife 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.

While working on the floristic diversity of the Todgarh-Raoli Wildlife Sanctuary (Rajasthan) during 2015 to 2019, author collected 32 plant samples of family Euphorbiaceae from different locations of this sanctuary. These collected herbarium samples deposited at Botanical Survey of India, Jodhpur (BSJO). After critical study, scrutiny of literature (Hooker, 1887; Blatter & Hallberg 1920; Bhandari 1990; Shetty & Singh 1991) and herbaria (BSJO, BSA, RUBL, JAC, BLAT, DCH, CAL), these plant samples identified and listed here alphabetically.

**[A] Plant list of family Euphorbiaceae of Todgarh-Raoli wildlife sanctuary:****1. *Acalypha ciliata*** Forssk.

*Fl. & Fr.*: July – Nov.

*Distribution*: Alwar, Banswara, Barmer, Jaipur, Sirohi, Udaipur.

*Note*: This genera is reported first time and addition for flora of this sanctuary.

*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 33161.

**2. *Acalypha indica*** L. (*Local name: Kuppi*)

*Fl. & Fr.*: July – Dec.

*Distribution*: Alwar, Dungarpur, Jaipur, Jodhpur, Kota, Nagaur, Tonk.

*Note*: This species is reported first time and addition for flora of this sanctuary.

*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 33151.

**3. *Bridelia retusa*** (L.) Spreng.

*Fl. & Fr.*: July – Dec.

*Distribution*: Ajmer, Alwar, Banswara, Bhilwara, Kota, Pali.

*Specimen examined*: Todgarh-Raoli wildlife sanctuary, Raoli Range, Thoria, 31-Jul-16, 25°48.622'N & 73°58.408'E, 462m, C.S. Purohit 32951.

**4. *Croton bonplandianum*** Baill. (*Local name: Kalabhangra, Jmal-ghota*)

*Fl. & Fr.*: May – Sept.

*Note*: This genera is reported first time and addition for flora of this sanctuary.

*Distribution*: Bikaner, Ganganagar, Jaipur, Jodhpur, Kota, Nagaur, Tonk.

*Specimen examined*: Todgarh-Raoli wildlife sanctuary, Bhim Range, Raja Ka Dhana, Rajsamand, 11-Aug-16, 25°26.275'N & 73°52.450'E, 700m, C.S. Purohit 33185.

**5. *Dalechampia scandens*** L. var. *cordofana* (Hochst. ex Webb.) Muell. – Arg.

*Note*: This genera is reported first time and addition for flora of this sanctuary.

*As above described*

**6. *Euphorbia caducifolia*** Haines (*Local name: Danda-thor*) (Fig. 4)

*Fl. & Fr.*: Dec. – Mar.

*Distribution*: Alwar, Banswara, Bhilwara, Bikaner, Jaisalmer, Jodhpur, Nagaur.

*Specimen examined*: Todgarh-Raoli wildlife sanctuary, Raoli Range, Satumoda, 28-Jul-16, 25°42.552'N & 73°55.386'E, 457m, C.S. Purohit 32868.

**7. *Euphorbia heyneana*** Spreng. (Fig. 4)

*Fl. & Fr.*: July – March.

*Distribution*: Bharatpur, Bikaner, Dungarpur, Ganganagar, Hanumangarh, Jaipur, Jodhpur, Kota, Sirohi.

*Note*: This species is reported first time and addition for flora of Aravalli range.

*Specimen examined*: Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Khodiya Naka, Pali, 08-Aug-16, 25°54.234'N & 74°00.159'E, 397m, C.S. Purohit 33134.

**8. *Euphorbia hirta*** L. (*Local name: Dudhi*) (Fig. 4)

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

*Distribution*: Ajmer, Alwar, Bikaner, Dungarpur, Ganganagar, Jaisalmer, Jodhpur, Nagaur, Sirohi.

*Specimen examined*: Todgarh-Raoli wildlife sanctuary, Raoli Range, Bheelon Ki Nal, 27-Jul-16, 25°43.229'N & 73°55.794'E, 444m, C.S. Purohit 32811.

**9. *Euphorbia hypericifolia*** L. (Fig. 4)

*Fl. & Fr.*: Aug. – Dec.

*Distribution*: Todgarh-Raoli Wildlife Sanctuary (Goramghat, Kalalia, Bhilber).

*Note*: This species is reported first time and addition for flora of Aravalli range.

*Specimen examined*: Todgarh-Raoli wildlife sanctuary, Bhim Range, Goramghat, 05-Aug-16, 25°38.491'N & 73°52.022'E, 488m, C.S. Purohit 33059.

**10. *Euphorbia indica*** Lam. (*Local name: Dudheli*) (Fig. 4)

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

*Distribution*: Ajmer, Alwar, Banswara, Barmer, Bikaner, Jhunjhunu, Nagaur, Sirohi.

*Note*: This species is reported first time and addition for flora of this sanctuary.

*Specimen examined*: Todgarh-Raoli wildlife sanctuary, Bhim Range, Goramghat, 05-Aug-16, C.S. Purohit 33059.

**11. *Euphorbia jodhpurensis*** Blatt. & Hallb.

*Fl. & Fr.*: July – October.

*Distribution*: Jodhpur. Barmer, Ganganagar, Ajmer. Endemic and Endangered.

*Status*: Endemic to Rajasthan, India (Purohit *et al.*, 2019).

*Note*: This species is reported first time and addition for flora of Aravalli range.

- Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Katarghati, 30-Jul-16, 25°43.885'N & 73°59.160'E, 674m, C.S. Purohit 32930;
- 12. *Euphorbia nerifolia* L.** (*Local name: Dandathor*) (Fig. 4)  
*Fl. & Fr.:* March – July.  
*Distribution:* Bhilwara, Jaipur, Jhalawar, Sirohi, Udaipur.  
*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bhim Range, Gauri kund, Baghana, 06-Mar-19, 25°30.818'N & 73°49.553'E, 551m, C.S. Purohit 38049;
- 13. *Euphorbia prostrata* Aiton.** (*Local name: Dudheli*) (Fig. 4)  
*Fl. & Fr.:* July – Oct.  
*Distribution:* Todgarh-Raoli wildlife sanctuary (Goramghat).  
*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bhim Range, Goramghat-Jogmandi, 06-Sep-18, 25°38.401'N & 73°52.291'E, 452m, C.S. Purohit 31015;
- 14. *Euphorbia thymifolia* L.** (*Local name: Dudhi*)  
*Fl. & Fr.:* July – Nov.  
*Distribution:* Alwar, Banswara, Bikaner, Jaipur, Jaisalmer.  
*Note:* This species is reported first time and addition for flora of this sanctuary.  
*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Thoria, Ajmer, 31-Jul-16, 25°48.622'N & 73°58.408'E, 462m, C.S. Purohit 32952;
- 15. *Jatropha curcus* L.** (*Local name: Jamalghota*)  
*Fl. & Fr.:* Throughout the year.  
*Distribution:* Banswara, Bhilwara, Chittorgarh, Jaipur, Kota.  
*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bhim Range, Barar, Rajsamand, 02-Aug-16, 25°38.929'N & 74°00.443'E, 636m, C.S. Purohit 33006;
- 16. *Jatropha gossypifolia* L.** (*Local name: Ratanjot*)  
*Fl. & Fr.:* Throughout the year.  
*Distribution:* Banswara, Bharatpur, Bhilwara, Bikaner, Jhalawar, Nagaur, Udaipur.  
*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bijajiguda Range, Kalab, Pali, 01-Aug-16, 25°56.725'N & 74°03.632'E, 410m, C.S. Purohit 32957.
- 17. *Micrococca mercurialis* (L.) Benth.**  
*Note:* This genera is reported first time and addition for flora of Aravalli range.  
*as described above*
- 18. *Phyllanthus amarus* Schumach. & Thoms.** (*Local name: Gugario*)  
*Fl. & Fr.:* Throughout the year.  
*Distribution:* Alwar, Bikaner, Jaisalmer, Jodhpur, Nagaur.  
*Note:* This species is reported first time and addition for flora of this sanctuary.
- 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 33279.
- 19. *Phyllanthus emblica* L.** (*Local name: Aamla*) (Fig. 3)  
*Fl. & Fr.:* March – Nov.  
*Distribution:* Alwar, Banswara, Bikaner, Dungarpur, Ganganagar, Jaipur, Sirohi.  
*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Mangad ji maharaj temple, 01-Mar-19, 25°48.604'N & 73°59.148'E, 853m, C.S. Purohit 38014;
- 20. *Phyllanthus fraternus* Webster.** (*Local name: Hizar-mani*) (Fig.3)  
*Fl. & Fr.:* Aug. – Dec.  
*Distribution:* Ajmer, Alwar, Banswara, Bikaner, Ganganagar, Jaisalmer, Jodhpur, Nagaur, Sirohi.  
*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Jhamuda, 27-Jul-16, 25°43.633'N & 73°54.747'E, 385m, C.S. Purohit 32840.
- 21. *Phyllanthus reticulatus* Poir.**  
*Fl. & Fr.:* Oct. – Jan.  
*Note:* This species is reported first time and addition for flora of Aravalli range.  
*Distribution:* Ajmer, Bharatpur, Banswara, Jhalawar, Jodhpur, Sirohi.
- 22. *Ricinus communis* L.** (*Local name: Arandi, Arand*)  
*Fl. & Fr.:* Throughout the year.  
*Distribution:* Ajmer, Alwar, Banswara, Bikaner, Ganganagar, Jaisalmer, Nagaur, Sirohi.  
*Specimen examined:* Bijajiguda Range, Dana Baba Temple, Pali, 08-Aug-16, 25°34.807'N & 74°04.006'E, 500m, C.S. Purohit 33123;
- 23. *Securinega leucopyrus* (Willd.) Muell.-Arg.** (*Local name: Ghat-bor*) (Fig. 3)  
*Fl. & Fr.:* May – Sept.  
*Distribution:* Ajmer, Alwar, Jaisalmer, Jhalawar, Jodhpur, Sirohi, Udaipur.  
*Note:* This species is reported first time and addition for flora of this sanctuary.  
*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Bhim Range, Tegi, Rajsamand, 11-Aug-16, 25°26.915'N & 73°53.742'E, 704m, C.S. Purohit 33176.
- 24. *Securinega virosa* (Roxb. ex Willd.) Baillon**  
*Fl. & Fr.:* July – Dec.  
*Distribution:* Alwar, Banswara, Jaisalmer, Jhalawar, Jhunjhunu, Udaipur.  
*Note:* This species is reported first time and addition for flora of Aravalli range.  
*Specimen examined:* Todgarh-Raoli wildlife sanctuary, Raoli Range, Modia, Ajmer, 29-Jul-16, 25°46.396'N & 73°57.060'E, 457m, C.S. Purohit 32888.
- [B] Statistical Analysis:** The present work enumerates 24 species, belonging to 10 genera under family Euphorbiaceae (details in table-1).

Table 1: Status of family Euphorbiaceae in Todgarh-Raoli wls, Rajasthan

Family Name	Genus no.	Genus Name	Species no.
EUPHORBIACEAE	1	<i>Acalypha</i>	2
	2	<i>Bridelia</i>	1
	3	<i>Croton</i>	1
	4	<i>Dalechampia</i>	1
	5	<i>Euphorbia</i>	9
	6	<i>Jatropha</i>	2
	7	<i>Micrococca</i>	1
	8	<i>Phyllanthus</i>	4
	9	<i>Ricinus</i>	1
	10	<i>Securinega</i>	2

**[C] Comparison with the different floras:**

Present status of family Euphorbiaceae in Todgarh-Raoli wls and their comparison with Rajasthan state, desert area, gangetic plain and

India are given in Table-2. Family Euphorbiaceae is 6<sup>th</sup> dominant family in this sanctuary as well as in Rajasthan but in Aravalli range, it is on 9<sup>th</sup> number and in India it's on 7<sup>th</sup> number.

Table 2. Ten dominant families of sanctuary &amp; compare with other areas.

Todgarh-Raoli wls (Purohit 2020)	Aravalli range (Otaghvari et al. 2015)	Rajasthan (Shetty & Singh 1991)	India
Poaceae	Fabaceae	Poaceae	Poaceae
Fabaceae	Poaceae	Fabaceae	Orchidaceae
Asteraceae	Asteraceae	Asteraceae	Fabaceae
Convolvulaceae	Cyperaceae	Cyperaceae	Asteraceae
Cyperaceae	Malvaceae	Acanthaceae	Rubiaceae
<b>Euphorbiaceae</b>	Scrophulariaceae	<b>Euphorbiaceae</b>	Acanthaceae
Acanthaceae	Acanthaceae	Convolvulaceae	<b>Euphorbiaceae</b>
Malvaceae	Convolvulaceae	Scrophulariaceae	Lamiaceae
Amaranthaceae/ Cucurbitaceae	<b>Euphorbiaceae</b>	Malvaceae	Apiaceae
Caesalpiniaceae	Lamiaceae	Lamiaceae	Brassicaceae

Table 3. Comparison of Euphorbiaceae of this sanctuary with other areas.

Family	(1)	(2)	(3)	(4)
<b>Euphorbiaceae</b>				
<b>Genus</b>	10	12	7	17
<b>Species &amp; variety</b>	24	26	24	59

(1): Todgarh-Raoli wls. (Purohit 2020); (2): Aravalli range (Otaghvari et al. 2015); (3): Flora of Indian Desert (Bhandari 1990); (4): Flora of Rajasthan (Shetty & Singh 1991);

Table 3- reveals that 83.33% genera of aravalli range represent in Todgarh-Raoli wildlife sanctuary, whereas 92.31% species, subspecies and variety of aravalli range represent in this sanctuary. In

comparison with Rajasthan flora, 58.82% genera and 82.76% species, subspp, var. of family Euphorbiaceae represents in this Sanctuary.

The family Euphorbiaceae maintains 6<sup>th</sup> number highest diversity among angiosperms containing 24 species under 10 genera. The five genera represented by single species i.e. *Bridelia*, *Croton*, *Dalechampia*, *Micrococca*, *Ricinus* (Table-4).

Table-4. Genera of Euphorbiaceae in this area and compare with other floras

Genus	(1)	(2)	(3)	(4)	(5)	(6)
<i>Acalypha</i>	2	-	2	2	4	4
<i>Bridelia</i>	1	1	1	-	3	3
<i>Croton</i>	1	-	1	-	1	1
<i>Dalechampia</i>	1	-	-	-	1	-
<i>Euphorbia</i>	9	5	9	12	17 (2 var.)	18
<i>Jatropha</i>	2	1	2	-	2	2



<i>Micrococca</i>	1	-	-	-	1	-
<i>Phyllanthus</i>	4	1	5	5	8	6
<i>Ricinus</i>	1	1	1	-	1	1
<i>Securinega</i>	2	-	1	1	2	2

(1): Todgarh-Raoli wls. (Purohit 2020); (2) Todgarh-Raoli wls (Kanther 2019); (3): Aravalli range (Otaghvari et al. 2015); (4): Flora of Indian

Desert (Bhandari 1990); (5): Flora of Rajasthan (Shetty & Singh 1991); (6): Flora of Rajasthan (S&SE regiona) (Tiagi & Aery 2007).



Fig. 4. Plants of family Euphorbiaceae collected from Todgarh-Raoli wildlife sanctuary

## CONCLUSION

Present paper deals with 24 species belonging to 10 genera of family Euphorbiaceae collected from this sanctuary. Out of these, two genera *Dalechampia* and *Micrococca* are generic addition for flora of Aravalli range. Eight species i.e. *Dalechampia scandens* L. var. *cordofana* (Hochst. ex Webb.) Muell. – Arg.; *Euphorbia heyneana* Spreng.; *Euphorbia hypericifolia* L.; *Euphorbia indica* Lam.; *Euphorbia jodhpurensis* Blatt. & Hallb.; *Micrococca mercurialis* (L.) Benth.; *Phyllanthus reticulatus* Poir.; *Securinega virosa* (Roxb. ex Willd.) Baillon are first time reported and addition for flora of Aravalli range, India. Five genera *Acalypha*, *Croton*, *Dalechampia*, *Micrococca*, *Securinega* are generic addition for flora of Todgarh-Raoli wildlife sanctuary. Fourteen species i.e. *Acalypha ciliata* Forssk.; *Acalypha indica* L.; *Croton bonplandianum* Baill.; *Dalechampia scandens* L. var. *cordofana* (Hochst. ex Webb.) Muell. – Arg.; *Euphorbia heyneana* Spreng.; *Euphorbia hypericifolia* L.; *Euphorbia indica* Lam.; *Euphorbia jodhpurensis* Blatt. & Hallb.; *Euphorbia thymifolia* L.; *Micrococca mercurialis* (L.) Benth.; *Phyllanthus amarus* Schumach. & Thoms.; *Phyllanthus reticulatus* Poir.; *Securinega leucopyrus* (Willd.) Muell.-Arg.; *Securinega virosa* (Roxb. ex Willd.) Baillon are first time reported and addition for flora of Todgarh-Raoli wildlife sanctuary.

## ACKNOWLEDGEMENTS

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.

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