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SHORT COMMUNICATION
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New records of forty-nine herbaceous plant species from lateritic plateaus for Ratnagiri District of Maharashtra, India

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Abstract: Ratnagiri is a coastal district and a part of Konkan region of Maharashtra. During our floristic studies on ephemeral and herbaceous plants of lateritic plateaus of Ratnagiri district from year 2020 to 2022, we have collected 49 herbaceous and ephemeral flowering plant species new addition to the Ratnagiri district. Newly added above said plant species belonging to 19 families and among them 16 species are endemic to India. This paper provides detailed checklist with herbarium specimen numbers for all the collected species and photographs of 16 endemic species.

Keywords: Additions, checklist, diversity, endemic, ephemeral, floristic, flowering plants, herbs, Konkan.

Ratnagiri is a coastal district of Maharashtra and it is divided into nine tehsils for administrative purpose viz., Chiplun, Dapoli, Guhagar, Khed, Lanja, Mandangad, Rajapur, Ratnagiri, and Sangameshwar. The area of Ratnagiri district is 8,208 km^2 and most of the areas are covered by low elevated lateritic plateaus. which is a distinct geographical feature of district. Laterites are iron-rich duricrusts which have formed directly from the breakdown of materials in their immediate vicinity, and so do not contain any readily identifiable allochthonous component, whereas, ferricretes are duricrusts which incorporate materials non-indigenous to the immediate locality (Widdowson 2003). Short-lived species of monsoon vegetation are usually neglected and missed by botanists as they complete their life cycle in short period from June to August. Such short-lived ephemeral and herbaceous species usually restricted to these plateaus. As a part of the research project on the 'Floristic studies on ephemeral and herbaceous plants of lateritic plateaus of Ratnagiri District (Maharashtra)' field explorations have been conducted throughout the Ratnagiri district on lateritic plateaus. During our explorations, total 548 herbaceous flowering plant species are collected of

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Competing interests: The authors declare no competing interests.

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which 49 species are reported first time from Ratnagiri district. After scrutiny of literature (Cooke 1905–1908; Almeida & Mistry 1983–1986; Almeida 1996–2014; Ansari 2009; Cook 1996; Lakshminarasimhan et al. 1996; Singh & Karthikeyan 2000; Mishra & Singh 2001; Singh et al. 2001; Kattukunnel & Antony 2008; Potdar et al. 2012; Wadoodkhan 2015; Darshetkar et al. 2017) revealed that these species were not reported from Ratnagiri district so far, we report these species for the first time.

Material and Methods

The continuous field visits were made on lateritic plateaus of Ratnagiri district for survey, collection and documentation of plant species during different seasons from last three years (2020–2022). Habit and habitat photography was made with the help Canon M-50 DSLR Camera. The specimens were identified by referring to various floras and literature (Cooke 1905–1908; Almeida & Mistry 1983–1986; Almeida 1996–2014; Cook 1996; Lakshminarasimhan et al. 1996; Singh & Karthikeyan 2000; Mishra & Singh 2001; Singh et al. 2001; Yadav et al. 2004; Kattukunnel & Antony 2008; Ansari 2009; Potdar et al. 2012; Wadoodkhan 2015; Darshetkar et al. 2017). Herbarium specimens were prepared as per Jain & Rao (1977) standard methods and deposited at the Shivaji University of Kolhapur (SUK). Recent nomenclature and endemism are updated by using online databases, viz., International Plant Names Index (IPNI), Plants of the World Online (POWO), and Protologues & Shenzhen Code (Turland et al. 2018) has been followed.

Results

Detailed checklist of newly reported herbaceous plants with family and herbarium specimens' number are provided in the Table 1. Photographs of endemic plants species have also been provided in Image 1. and the photographs of lateritic plateaus from early monsoon to summer are provided in Image 2.

Conclusion

The total of 49 species (34 genera) of ephemeral and herbaceous flowering plants belonging to 19 families is reported for the first time from Ratnagiri district of Maharashtra of which 16 species (about 33%) are endemic to India which are marked with an asterisk in Table 1.

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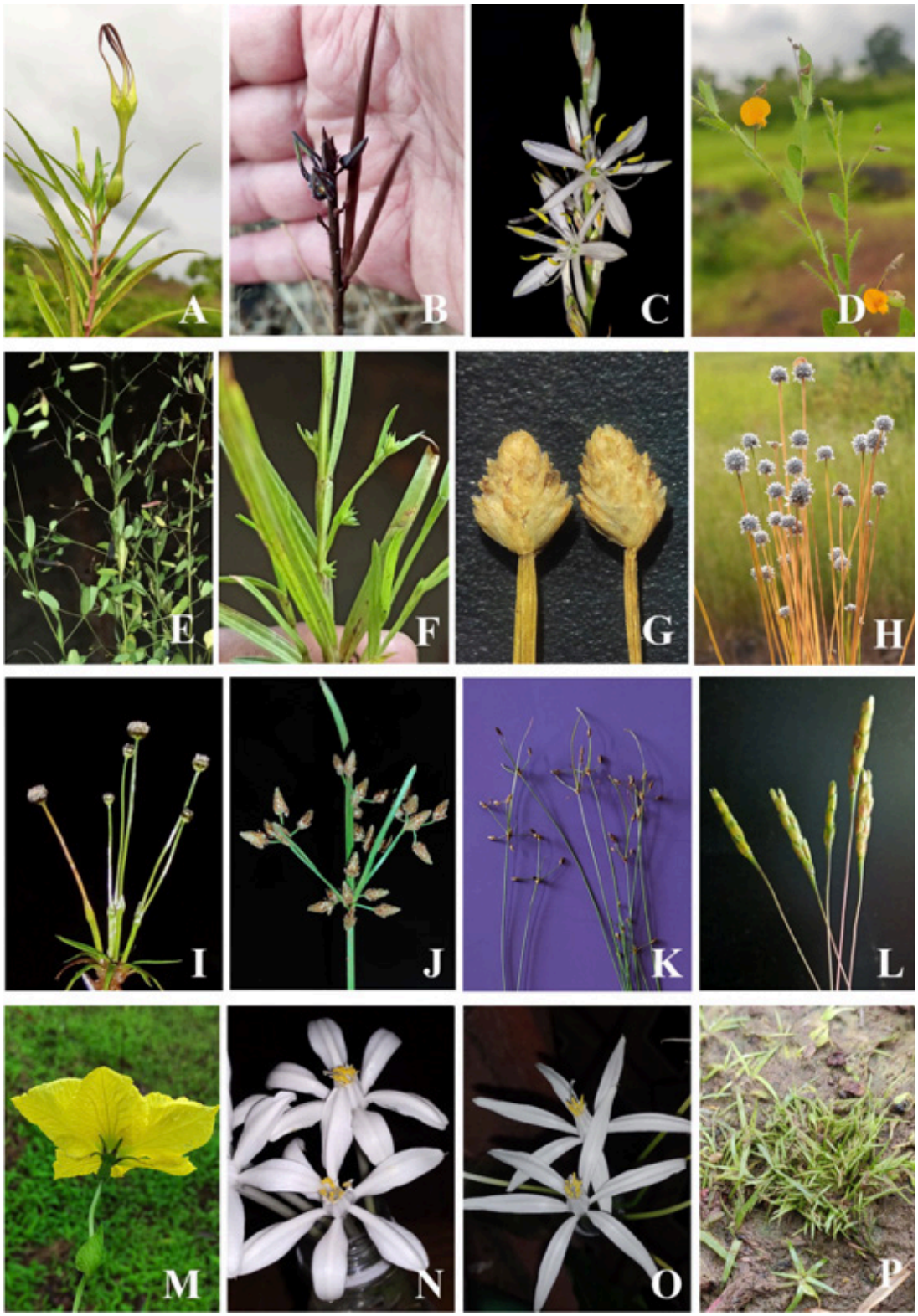

Image 1. Endemic plant species: A—*Ceropegia anantii* S.R.Yadav, Sardesai & S.P.Gaikwad | B—*Ceropegia malwanensis* (S.R.Yadav & N.P.Singh) Bruyns | C—*Chlorophytum borivilianum* Santapau & R.R.Fern| D—*Crotalaria filipes* var. *panthakii* M.R.Almeida & S.M.Almeida | E—*Crotalaria stocksii* Benth. ex Baker | F—*Diplacrum poklei* (Wad.Khan) K.C.Mohan | G—*Eleocharis zatei* W.Khan & Lakshmin | H—*Eriocaulon konkanense* Punekar, Malpure & Lakshmin. | I—*Eriocaulon parvicephalum* Darsh., R.K. Choudhary, Datar & Tamhankar | J—*Fimbristylis bhuskutei* W.Khan & R.D.Taur | K—*Fimbristylis sanjappae* W.Khan & Solanke | L—*Ischaemum bolei* Almeida | M—*Momordica sahyadrica* Kattuk. & V.T.Antony | N—*Pancratium donaldii* Blatt. | O—*Pancratium parvum* Dalzell | P—*Trithuria konkanensis* S.R.Yadav & Janarth. © A.N. Chandore, D.B. Borude and P.P. Bhalekar.

Table 1. Detailed checklist of newly reported herbaceous plants species for Ratnagiri district with family name, localities, habitat/note, phenology, and herbarium specimens' number.

	Scientific name	Family	Locality	Habitat	Phenology	Voucher specimens
1	*Rostellularia quinqueangularis* (J.Koenig ex Roxb.) Nees [*Rostellularia vahlii* Nees]	Acanthaceae	Guhagar; Varveli	Terrestrial erect herbs	October–December	ANC-2274; DBB-767
2	*Strobilanthes crossandra* (Steud.) J.R.I.Wood [*Hemigraphis crenata* (Benth. Ex Hohen.) Bremek.]	Acanthaceae	Rajapur; Hativale, Vikhare-Gothane	Terrestrial herbs	December–March	ANC-2495; DBB-145
3	*Crinum lorifolium* Roxb. [*Crinum pratense* Herb.]	Amaryllidaceae	Rajapur; Dhartale, Rantale, Vikhare-Gothane	Bulbous herbs	June–August	ANC-2014; DBB-512
4	**Pancratium donaldii* Blatt.	Amaryllidaceae	Rajapur; Rantale	Bulbous herbs	May–June	ANC-2013; DBB-507
5	**Pancratium parvum* Dalzell	Amaryllidaceae	Rajapur; Rantale	Bulbous herbs	May–June	ANC-2012; DBB-506
6	**Ceropegia anantii* S.R.Yadav, Sardesai & S.P.Gaikwad	Apocynaceae	Rajapur; Vikhare-Gothane	Tuberous herbs	July–August	ANC-2657; DBB-850
7	*Ceropegia bulbosa* Roxb.	Apocynaceae	Rajapur; Kasheli. Dapoli; Harne	Tuberous herbs, grows on rocky crevices	July–October	ANC-2617; DBB-810, 840
8	**Ceropegia malwanensis* (S.R. Yadav & N.P. Singh) Bruyns *[Brachystelma malwanense* S.R. Yadav & N.P. Singh]	Apocynaceae	Rajapur; Rantale	Tuberous herbs	April–May	ANC-2569; DBB-219
9	*Amorphophallus bulbifer* (Schott) Blume	Araceae	Rajapur; Saundal	Cormatous herbs, grows in shady places	June–July	ANC-2641; DBB-835
10	*Amorphophallus paeoniifolius* (Dennst.) Nicolson	Araceae	Rajapur; Hativale	Cormatous herbs, grows in shady places	June–July	ANC-2642; DBB-835
11	**Chlorophytum borivilianum* Santapau & R.R. Fern.	Asparagaceae	Rajapur; Prindavan	Tuberous roots herbs	July–August	ANC-2019; DBB-513
12	*Blumea hieraciifolia* (Spreng.) DC.	Asteraceae	Rajapur; Kharvate	Terrestrial herbs	December–March	ANC-2542; DBB-192
13	*Ipomoea pileata* Roxb.	Convolvulaceae	Rajapur; Rantale	Climbing herbs	August–November	ANC-2382; DBB-32
14	**Momordica sahyadrica* Kattuk. & V.T.Antony	Cucurbitaceae	Rajapur; Vikhare-Gothane	Climbing herbs	July–November	ANC-2643; DBB-836
15	*Cyperus squarrosus* L.	Cyperaceae	Rajapur; Hativale	Terrestrial herbs	August–November	ANC-2064; DBB-557
16	**Diplacrum poklei* (Wad.Khan) K.C.Mohan [*Scleria poklei* Wad.Khan]	Cyperaceae	Rajapur; Hativale	Terrestrial herbs, grows along stream side	November–January	ANC-2252; DBB-745
17	*Eleocharis equisetina* J. Presl & C. Presl	Cyperaceae	Rajapur; Kasheli	Aquatic herbs, grows in marshy areas on plateaus	August–November	ANC-2612; DBB-805
18	**Eleocharis zatei* W. Khan & Lakshmin.	Cyperaceae	Rajapur; Gavkhadi	Grows in marshy areas on plateaus	August–December	ANC-2609; DBB-802
19	**Fimbristylis bhuskutei* W.Khan & R.D. Taur	Cyperaceae	Rajapur; Saundal	Grow in grassland on plateaus	August–November	ANC-2152; DBB-644
20	*Fimbristylis pubisquama* J.Kern	Cyperaceae	Rajapur; Mudgund	Grows in marshy areas on plateaus	August–December	ANC-2083; DBB-576
21	**Fimbristylis sanjappae* W. Khan & Solanke	Cyperaceae	Rajapur; Vikhare-Gothane	Grows in marshy areas on plateaus	August–December	ANC-2106; DBB-598
22	*Fimbristylis stolonifera* C.B.Clarke	Cyperaceae	Rajapur; Hativale. Ratnagiri; Ganpatipule	After first shower of monsoon grows on plateaus	July–October	ANC-2058; DBB-551
23	*Fimbristylis woodrowii* C.B.Clarke	Cyperaceae	Rajapur; Vikhare-Gothane	Grows in grassland on plateaus: stamen solitary	August–December	ANC-2059; DBB-552
24	*Schoenoplectiella articulata* (L.) Lye [*Schoenoplectus articulates* (L.) Palla]	Cyperaceae	Ratnagiri; Ganpatipule	Aquatic herbs, grows in marshy areas on plateaus	August–December	ANC-2294; DBB-787
25	*Schoenoplectiella corymbosa* (Roth ex Roem. & Schult.) J.R.Starr & Jim.Mejias [*Schoenoplectus corymbosus* (Roth ex Roem. & Schult.) J.Raynal]	Cyperaceae	Rajapur; Padave, Upale	Aquatic herbs, grows in marshy areas on plateaus	August–December	ANC-2031; DBB-527
26	*Scleria lithosperma* (L.) Sw.	Cyperaceae	Rajapur; Barsu	Terrestrial herbs	October–December	ANC-2050; DBB-543
27	**Eriocaulon konkanense* Punekar, Malpure & Lakshmin.	Eriocaulaceae	Rajapur; Vikhare-Gothane	Terrestrial herbs	July–October	ANC-2182; DBB-674

	Scientific name	Family	Locality	Habitat	Phenology	Voucher specimens
28	**Eriocaulon parvicephalum* Darsh., R.K. Choudhary, Datar, and Tamhankar	Eriocaulaceae	Rajapur; Vikhare-Gothane	Terrestrial herbs	July–October	ANC-2187; DBB-679
29	*Eriocaulon setaceum* L.	Eriocaulaceae	Rajapur; Hativale	Aquatic herbs, Grow along streams on plateaus; submerged plant	August–November	ANC-2197; DBB-690
30	*Eriocaulon xeranthemum* Mart.	Eriocaulaceae	Rajapur; Arekarvadi, Jaitapur, Vikhare-Gothane	Terrestrial herbs	August–November	ANC-2180; DBB-672
31	*Aeschynomene americana* L.	Fabaceae	Rajapur; Tervan	Grows on plateaus along road side	August–September	ANC-2201; DBB-27
32	**Crotalaria filipes* var. *panthakii* M.R. Almeida & S.M. Almeida	Fabaceae	Rajapur; Hativale, Vikhare-Gothane	Terrestrial herbs, grows on plateaus	September–December	ANC-2415; DBB-65
33	**Crotalaria stocksii* Benth. Ex Baker	Fabaceae	Rajapur; Vikhare-Gothane	Grows in Grasses on plateaus	August–November	ANC-2482; DBB-132
34	*Desmodium scorpiurus* (Sw.) Desv. ex DC.	Fabaceae	Rajapur	Grows on road side: straggling herbs	August–October	ANC-2506; DBB-156
35	*Teramnus mollis* Benth.	Fabaceae	Rajapur; Taral, Hativale	Climbing herbs, grows on plateaus	August–October	ANC-2392; DBB-42
36	**Trithuria konkanensis* S.R. Yadav & Janarth.	Hydatellaceae	Rajapur; Karshingewadi, Hativale	Tiny herbs, grows in grasses on plateau	July–August	ANC-2136; DBB-628
37	*Blyxa echinosperma* (C.B.Clarke) Hook.f.	Hydrocharitaceae	Ratnagiri; Ganpatipule	Aquatic herbs, grows in streams on plateaus	August–September	ANC-2601; DBB-794
38	*Blyxa octandra* (Roxb.) Planch. Ex Thwaites	Hydrocharitaceae	Rajapur; Sakhar	Aquatic herbs, grows in ponds on plateaus	August–September	ANC-2156; DBB-648
39	*Najas graminea* Delile	Hydrocharitaceae	Rajapur; Nanar	Aquatic herbs, grows in ponds on plateaus	August–November	ANC-2096; DBB-589
40	*Pogostemon quadrifolius* (Benth.) F.Muell.	Lamiaceae	Rajapur; Saundal	Grows in undershrub on plateaus	August–December	ANC-2565; DBB-215
41	*Lindernia procumbens* (Krock.) Borbas	Linderniaceae	Rajapur; Adivare	Grows in paddy fields on plateaus	August–November	ANC-2618; DBB-811
42	*Microcarpaea minima* (J.Koenig ex Retz.) Merr.	Phrymaceae	Rajapur; Kasheli	Grows in marshy areas on plateaus	July–September	ANC-2616; DBB-809
43	**Ischaemum bolei* Almeida	Poaceae	Rajapur; Vikhare-Gothane	Grows on plateaus	July–September	ANC-2476, DBB-126
44	*Leersia hexandra* Sw.	Poaceae	Rajapur; Sakhar	Grows on plateaus in marshy places	July–October	ANC-2460; DBB-110
45	*Setaria parviflora* (Poir.) Kerguelen [*Pennisetum polystachion* (L.) Schult.]	Poaceae	Guhagar	Grows on plateaus along roadsides	October–December	ANC-2276; DBB-769
46	*Dentella repens* var. *serpyllifolia* (Wall. Ex Craib) Verdc.	Rubiaceae	Rajapur; Hativale	Grows on plateaus in marshy places	December–February	ANC-2502; DBB-152
47	*Oldenlandia affinis* (Roem. & Schult.) DC. [*Hedyotis affinis* Roem. & Schult.]	Rubiaceae	Rajapur; Prindavan	Grows in grasses on plateaus	October–September	ANC-2007; DBB-501
48	*Curcuma neilgherrensis* Wight	Zingiberaceae	Rajapur; Hativale	Rhizomatous herbs, grows on plateaus	July–October	ANC-2531; DBB-514
49	*Kaempferia rotunda* L.	Zingiberaceae	Rajapur	Rhizomatous herbs, grows on plateaus	August–September	ANC-2641; DBB-835

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Image 2. A–D—Lateritic plateaus from first shower of monsoon to summer. © A.N. Chandore.

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