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REDISCOVERY OF *OLAX NANA* (OLACACEAE) FOR GUJARAT STATE

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ABSTRACT

Olax nana Wall. *ex* Benth. has been rediscovered after a century from Kachchh district of Gujarat state. A brief description with photographs for easy identification and information about its phenology and habitat is provided here.

INTRODUCTION

The genus *Olax* L. is widely distributed across Asia (India, China, Burma), Tropical Africa, and Australia with about 40 species. In India it is represented by seven species (Hooker, 1872). *Olax nana* Wall. *ex* Benth. is distributed in Assam, Bihar, Odisha, Punjab, West Bengal and Gujarat (Cooke, 1903; Biswas, 1971; Panda *et al.* 2013).

In Gujarat the family Olacaceae is represented by a single species *O. nana*. First occurrence of this species in Gujarat state was stated by Cooke (1903) on the authority of C. Macnaghten from Rajkot district, Saurashtra region. Later the plant was documented by Thakar (1910) from Dharampur, Ranakandorna, Ranavav, Bhod & Aniyari villages of Porbandar district, Saurashtra region. Since then the plant was never stated from the reported localities (Santapau, 1962; Shah, 1978; Nagar, 2003).

During our recent field excursion *O. nana* has been revived for Gujarat state after 104 years from Kachchh region. It has been collected from Lathedi village, Abdasa taluka, Kachchh district, Gujarat. The plant specimen has been deposited at Botanical Survey of India, Arid Zone Regional Center, Jodhpur.

Olax nana Wall. ex Benth. in *Proceedings of the Linnean Society of London* 1: 88; J.D. Hooker, Flora of British India 1: 576; T. Cooke, Flora of the Presidency of Bombay 1: 222.

A low undershrub, branches twiggy. Leaves alternate, subsessile, oblong–lanceolate, obtuse,

glabrous, 3–5 × 0.6–1.2 cm. Flowers white, solitary, axillary. Petals 3, cohering half way up, tips inflexed; stamens 3, opposite the petals and about half as long as the latter; staminodes 6, ovary ovoid; fruit globose, about 6–8 mm long, deep yellow when ripe (Figure 1b,c).

Flowering: April–May, *fruiting*: June–July.

Vernacular name: Tadholi.

Specimens examined: India, 1932, Wallich, N. s.n. (K000657931!). India, Gujarat, Kachchh, Lathedi (Lat. 23°0'5.81"N Long 69°2'30.82"E), 156 m, 8.10.2014, K.G.Rana 142 (BSI Jodhpur).

Habitat: Dry grassland; it was found growing on ravine slopes with sparse grass cover in sandy loamy soil on a gravelly substrate (Figure 1a).

Status: Stated as a very rare plant in Saurashtra by Santapau (1962). Presently, only 43 individuals were located in a small patch of 100 m^2, the particular site is prone to soil erosion and digging of water for harvesting structure.

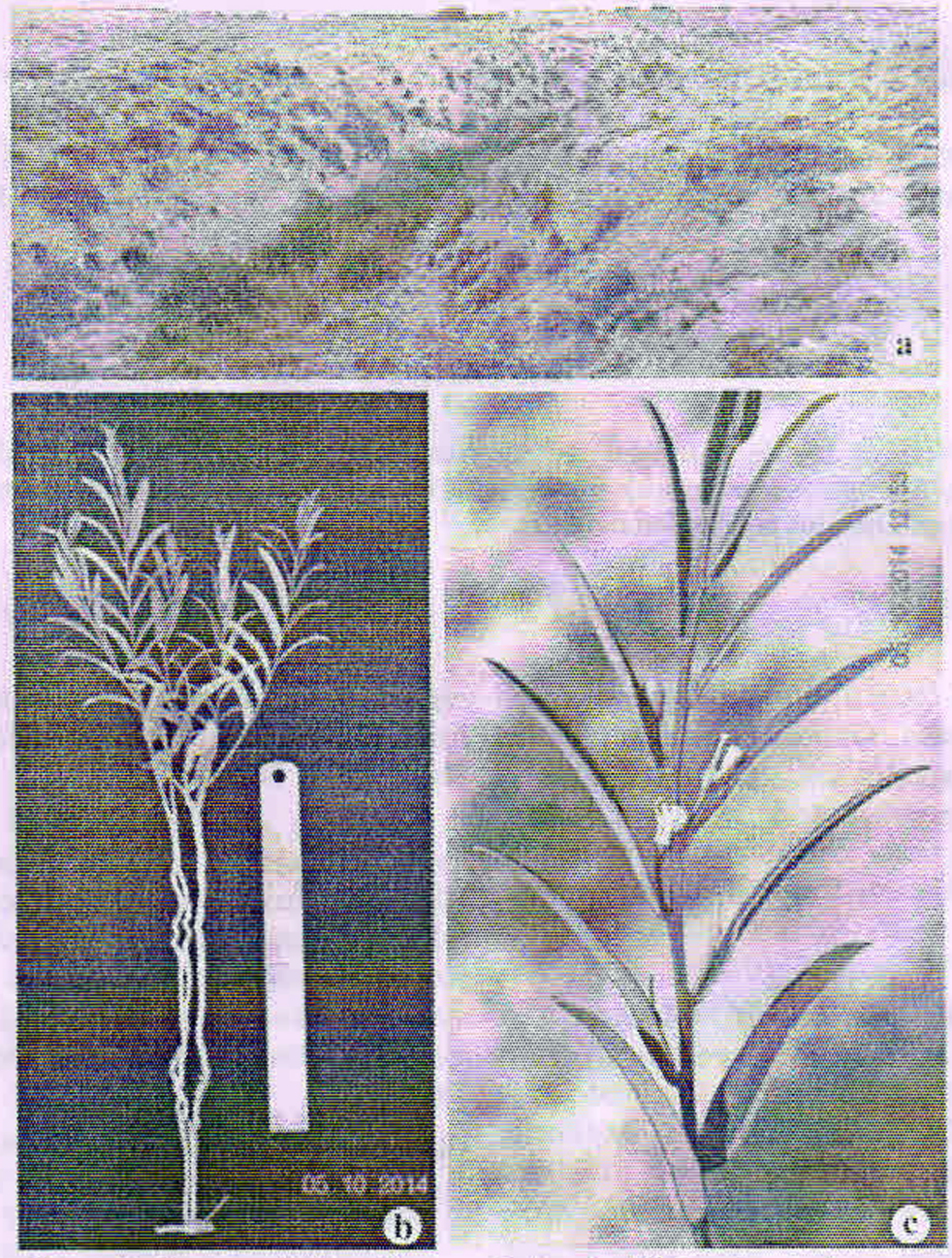

Figure 1. *Olax nana* Wall. *ex* Benth.: **a.** Habitat; **b.** Habit; **c.** A twig showing solitary axillary inflorescence and leaves.

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We are thankful to Gujarat Biodiversity Board, Gandhinagar for financial assistance. We would like to express gratitude towards Botanical Survey of India, Arid Zone Circle - Jodhpur for authentication of plant specimen. Our sincere thanks to Biodiversity Management Committee, Lathedi village for giving permission to survey, and to Vinod Solanki, Sahjeevan for assist in field work.

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ing near the Tequedama Falls (Fig. 8), a very nice waterfall on a river, unfortunately totally polluted and covered with a white industrial foam, the banks too! The road snakes above the river and forest remnants are present on slopes on the left of the road. We find the first species of the Gobenia section, identified by Mark Tebbitt as *Begonia sodiroi* (Fig. 9); this creeping one climbs on shrubs up to 2 meters high.

The next day, we go up on the Tablazo paramo and again find *Begonia sodiroi* in many places at an altitude of 8,000 feet: it climbs on trees and fences stakes. Unfortunately, we see only one young inflorescence (Figs 10 & 11) and no fruit.

We look for *Begonia cornuta* in vain with an bad WP, and another one that is supposed to lead us to *Begonia dugandiana.* It is too far and we give up. These two begonias will remain unknown for us…

We leave the eastern cordillera now, cross the dried up Rio Magdalena and explore the eastern side of the central cordillera towards the Nevado del Ruiz. We heard of this volcano in 1985 because of its eruption which caused many casualties by lahars, or mud torrents. Today, we can see a pillar of smoke, inoffensive from afar! We finish this day with the finding of *Begonia magdalenae,* which looks like *Begonia consobrina*, because of the same leaves (Fig. 12). We arrive at the Termales del Ruiz hostal at an altitude of 13,000 feet and it is cold despite a very hot spring just behind the hostal…

We leave the hostal early the next day and try to approach the volcano. After one km on the trail, we find the second amazing species of this trip: *Begonia umbellata* (Fig. 13) another species of the Casparaya section in full blossom with red flowers. We are at an altitude of 11,500 feet! it is an herbaceous begonia, about one meter high, with very hairy leaves and bisexual inflorescences. Unfortunately, it is early and fruits are not mature. In the same place, we also find *Begonia urticae*.

A trail leads us to the volcano foot in a paramo with Espeltia (Fig. 14) and it seems we are to the back of beyond…in a very amazing landscape (Fig. 15).

We arrive in the evening at the Rio Blanco ornithological reserve where we will stay two days.

To be continued…

Begonia sodiroi C. de Candolle (Fig 11), of the Gobenia section. *Begonia magdalenae* L.B. Smith & B.G. Schubert (Fig 12). *Begonia umbellata* Kunth (Fig 13), a very nice species of Casparaya section. *Espeletia* in the Nevado del Ruiz paramo (Fig 14). The Nevado del Ruiz volcano (Fig 15).

Begonia Picta Smith (Begoniaceae), New Addition To The Flora Of Gujarat, India

Article and photos by Akash Vanzara, Karan Rana & Padamnabhi Nagar

Begonia L. is known worldwide as ornamentals (Neale et al., 2006). The genus is annual or perennial, caulescent or acaulescent herbs or shrubs, usually with subterranean tuber, often succulent; occurring in a variety of habitats, but mainly in moist and shady forests. The genus *Begonia* is represented by 56 species in India (Uddin, 2007), and one species in Gujarat (Shah, 1978).

During the field survey we collected a few plants of the genus *Begonia* when it was flowering during the month of September, 2015 from Narmada District of southern Gujarat. On critical observation and perusal of the relevant literature (Saldhana, 1984; Almeida, 1998) the specimens were identified as *Begonia picta* Smith (Fig. 1). The species is native to Bhutan, China, India, Myanmar, Nepal and Pakistan. In India, it is distributed in Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Odisha (Anand Kumar, 1978; Nair et al., 2014). After a scrutiny of the significant literature (Shah, 1978; Raghavan et al., 1981; Pradeepkumar, 1993), it was found to be a taxon hitherto not recorded from Gujarat State, hence it is reported here as a new distribution record for the state.

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Begonia picta Smith (Fig. 1). Two species, *B. crenata* Dryand and *B. picta* Smith, were collected from two locations: Ninai waterfall in Mohbi village and forest area of Kelda village, Dediapada taluka, Narmada District (Fig. 2).

With the current report, the genus Begonia is now represented by two species, viz., *B. crenata* Dryand and *B. picta* Smith in Gujarat. During field studies the species was collected from two locations: Ninai waterfall in Mohbi village and forest area of Kelda village, Dediapada taluka, Narmada District (Fig. 2). Voucher specimen is deposited in the herbaria of The Maharaja Sayajirao University of Baroda (BARO). A detailed taxonomic description and images are provided here along with its habitat and regional distribution to authenticate the new distribution record.

Begonia picta Smith, Exot. Bot. 2: 81, t. 101, 1805; Clarke in Hook. f., Fl. Brit. Ind. 2: 1879; Gamble, Fl. Pres. Madras 3: 545, 1919.

Rootstock of one or few tubers, plant 6–15 in. Inflorescence scarcely exceeding the leaves; stem obscurely pubescent. Leaves 3–5 by 2–3 in., nearly equally cordate, doubly fine serrate, pilose above, villous on the nerves beneath; petiole of the cauline leaf usually 1 in. at least; stipules lanceolate, hairy, scarcely exceeding the leaves. Peduncle pubescent upwards; bracts oblong-lanceolate, persistent, pubescent. Male flower: outer segments 2, pubescent; petals 2, smaller; stamens shortly monadelphous, ca. 30; anthers obovoid; connective not produced. Female flower: perianth of 4–5 segments, outer larger, pubescent; styles 3, nearly separate, divided half way up into two tortulose branches. Capsule large, 1 in., pubescent; one wing ¼ in. broad, another ½ in., the third 1½ in.; styles persistent; wings slightly ascending, dehiscing by the 3 faces falling off. Seeds light brown, shortly ellipsoid.

Habitat: Found on moist rocks in shaded areas (Fig 1).

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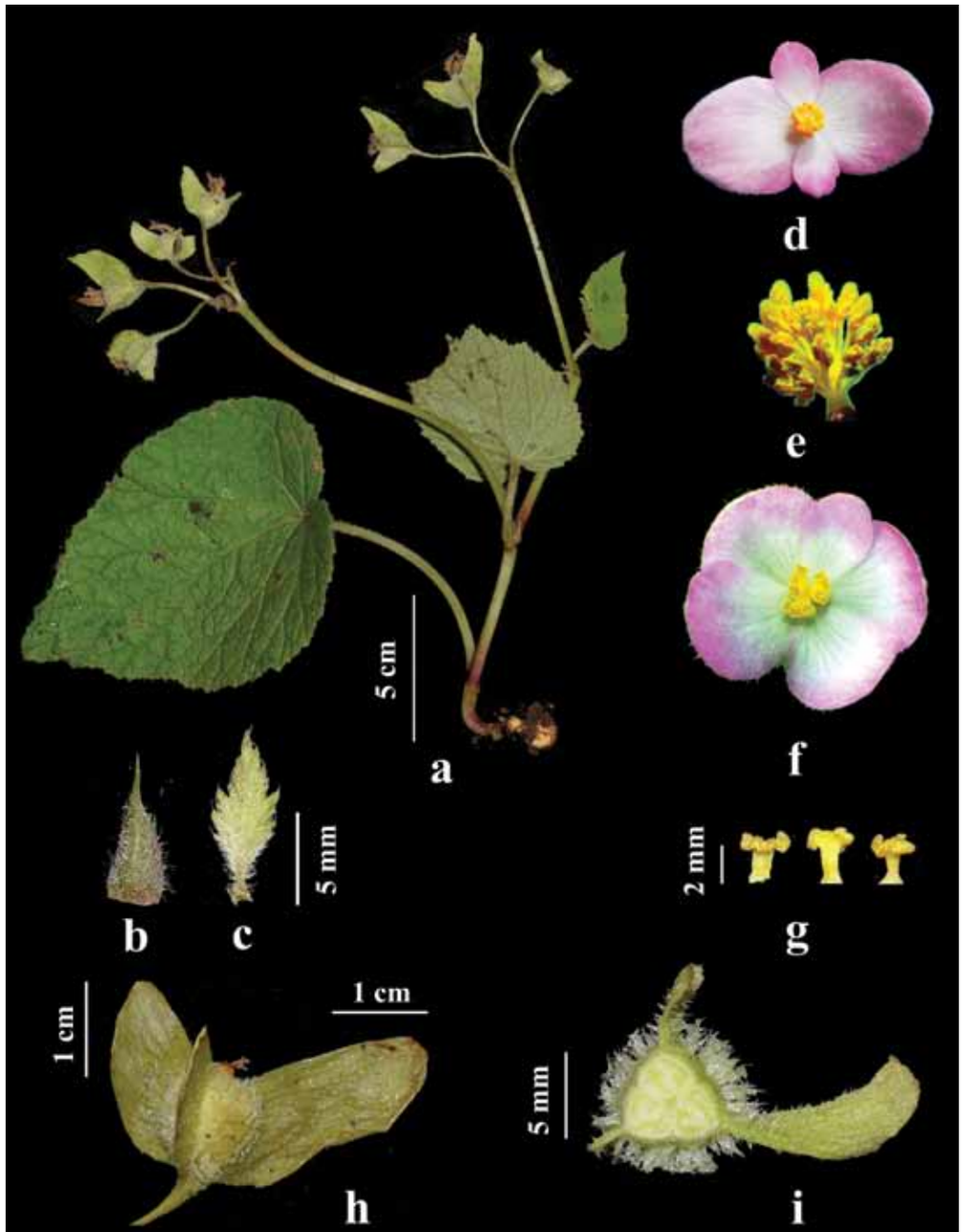

Image 2. *Begonia picta* Sm. a - habit; b - stipule; c - bract; d - male flower; e - stamens; f - female flower; g - styles; h - capsule (style persistent); i - unequal wings of capsule.

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RESEARCH ARTICLE

DIVERSITY AND DISTRIBUTION OF ENDEMIC ANGIOSPERMS IN GUJARAT.

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Gujarat, endemics, angiosperms, diversity

Abstract

Endemic plants represent a small but important part of the flora of Gujarat; still they have not been assessed for their status till date. The present estimate is first of its kind that encompasses all Indian endemics found in Gujarat state that is based on literature review and field surveys. The present findings revealed documentation of 192 Indian endemics, with dicotyledons dominating the endemic flora with 137 taxa (71%) belonging to 97 genera under 33 families, whereas monocotyledons represented by 55 taxa (29%) belonging to 37 genera under 9 families. There are seven species which are exclusively endemic to Gujarat state that are *Helichrysum cutchicum*, *Ischaemum sayajiraoi*, *Rorippa cochlearioides*, *Solanum purpureilineatum*, *Spodiopogon aristatus*, *Tamarix kutchensis* and *Tephrosia jamnagarensis*. Top five families contribute 57% of the total Indian endemics reported from Gujarat; Fabaceae has the largest number (31), which is followed by Poaceae (27), Acanthaceae (20), Asteraceae (12) and Orchidaceae (10). An analysis of the life-form types shows that endemic herbs (66%) dominate the study area, followed by shrubs (12%), trees (11%), climbers (6%), undershrubs (3%) and climbing shrubs (2%). Analysis on the district-wise distribution of Indian endemics shows that the Dangs has maximum number of Indian endemics with 115 taxa, followed by Valsad (104), Narmada (71), Junagadh (63) and Panchmahal (57). In conclusion, the present study demonstrates that endemics are mostly concerted in southern Gujarat region; they are primarily herbaceous; while some of them are known with just a few additional collections.

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Introduction:-

Endemism denotes confinement of a taxon to a restricted area which may range from a small habitat to a biogeographical region, usually isolated by geographical barriers. Studies on plant endemism provide an insight into the centres of diversity and highlight the indigenous nature of its biological diversity. Endemism is a significant factor in diversity assessment and conservation. Reduction and fragmentation of wild population and habitats are occurring at an accelerating scale. These have resulted in small isolated populations (endemic plants) that are at risk

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of extinction for an increasing number of taxa. For such populations, more intensive management becomes necessary for their survival. Hence, in conservation efforts priority should be always given for endemics. So it becomes very essential that threatened taxa should be repeatedly searched for in their type localities for correct assessment of their status and proper management and conservation.

Gujarat state has about 8.7% of its total geographical area under four national parks and 23 wildlife sanctuaries which is more than double the national average and 13.8% area under wetlands which is about one third of the national area under wetland. Because of its unique geographical location, divergent climatic conditions, flat and undulating topography, vast expanse of the unique and fascinating deserts of Rann of Kachchh, the mighty ocean with a long coastline, vast grasslands, extensive thorny and dry deciduous forests in Saurasthra and northern Gujarat; moist to semi-moist forests in southern Gujarat and large area under a variety of wetlands and three hill ranges, namely, Aravalis, Vindhyas and Western Ghats, Gujarat has led to harbor a unique & rich biodiversity in the state. Recent findings by Jani (2014) reveals that the angiosperm flora of Gujarat comprises of 2555 taxa (2320 species, 60 subspecies, 169 varieties and 6 forma), which represents nearly 16.8% of the national flora in its varied phytogeographical regions such as desert, semi-arid scrublands, coastal-reef-rich mangrove belts and dry-moist deciduous forests interspersed with fertile agricultural fields.

Endemic and threatened plants represent a small but important part of the flora of Gujarat. They are very susceptible to the effects of environmental change, because they occur in small populations or at scattered localities and are often confined to unique and localized habitats. The causes of such environmental change are biotic activities such as land clearing, cutting, lopping, overgrazing, the development of man-made forests (monoculture) and industrial pollution. The result of all such activities will be the dwindling of number of certain habitat-specific, wild plants because of change in their habitats. It is therefore urgently required to make an inventory of all such endemic and threatened plant species and to initiate measures to conserve the specific habitats and consequently the species occupying such habitats. The purpose of this list is to provide all relevant information on such plants of Gujarat.

Secondly, over the past years, the forest department has developed many man-made forests (mostly monocultures) in the area for different purposes like providing shelter belts, green belts and for firewood. This also has resulted in the loss of few wild habitats. Although few areas have been partially protected, many others are urgently in need of full-scale protection. Strict laws should be passed and enforced for the preservation of rare species and their habitats and strict penalties should be imposed on defaultors. Until such measures are taken up, it is proposed that the endemic and threatened plants should be brought under cultivation in central nurseries, botanical gardens, etc. and later reintroduced into their wild habitats. Then only there will be grounds for optimism for the protection of endemic and threatened plants and their habitats in Gujarat.

Studies on endemism and their conservation have received petite attention in Gujarat, and except for a few publications, there is little information on this subject. From the available literature it was determined that information on endemics in Gujarat was altogether lacking. An acute need was therefore felt to assess the present situation, locate important lacunae and stimulate studies on as large a scale as possible on threatened plants.

Study Area:-

The study site, Gujarat state, is located on the west coast of India and lies between 20°02' and 24°41' North latitudes, and 68°08' and 74°23' East longitudes covering a land area of 196,024 sq. km.

Gujarat comprises 33 districts, of which Kachchh is the largest holding 23 percent, while Dangs is the smallest holding less than one percent of its total geographical area. The state is broadly classified into Kachchh, Saurashtra, Northern, Central and Southern regions (Fig. 1).

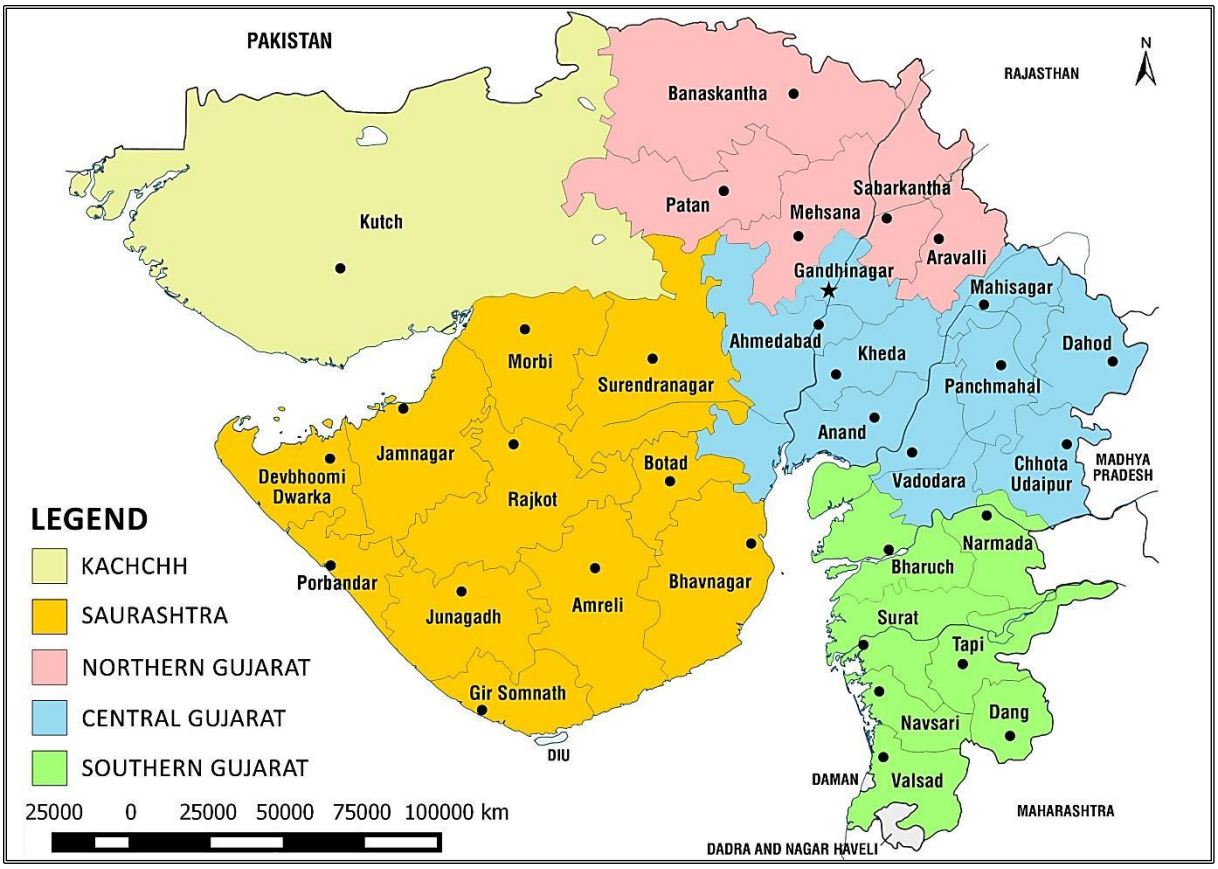

Figure 1:- Study Area.

Kachchh:-

The North-west arid region encompasses the Kachchh district. This region receives very little annual rainfall between 300 and 400 mm, rendering it totally arid. The total geographic area of the region is 40,890 sq. km. Since sandy and saline soils are not supportive of agricultural activities the region has the lowest geographical area under agriculture. The Kachchh region consists of the Ranns, which are salt-encrusted wastelands and rises only a few meters above sea level. Inundated during the monsoons they are divided into the great Rann to the north and the little Rann of Kutch to the east, the Banni Plains between the great Rann and the rocky mainland and the hilly region with the island belt of four rocky projections rising above the Rann, the Kachchh mainland, and the southern coastal plains.

Saurashtra:-

The Saurashtra region includes the districts of Amreli, Bhavnagar, Rajkot, Bhavnagar, Jamnagar, Surendranagar, Junagadh, and Porbandar. The total geographic area of the region consists of 60,950 sq. km. The climate here is dry sub-humid with very low average rainfall at 500 to 800 mm annually. The soil here is predominantly shallow to medium black and calcareous.

Northern Gujarat:-

The North Gujarat region includes the districts of Sabarkantha, Mehsana, Banaskantha, Aravalli and Patan. Its total geographic area comprises 28,910 sq. km. This region has a very small area under forests. It receives 500 to 800 mm of annual average rainfall and the climate varies from arid to semi-arid. Grey Brown loamy, alluvial soils are predominant in this region.

Central Gujarat:-

The Central Gujarat region includes the districts of Kheda, Anand, Vadodara, Ahmedabad, Gandhinagar, Mahisagar, Chhota Udepur, Panchmahals and Dahod. The total geographic area of the region comprises 34,130 sq. km. The

forested area is not extensive in the region and this region leads in agricultural development. Annual rainfall averages from 800 to 1000 mm and the climate is semi-arid while the soil is medium black in nature.

Southern Gujarat:-
The southern region includes the districts of Surat, Bharuch, Valsad, Dangs, Tapi, Narmada and Navsari. Its total geographic area is 23,220 sq. km. The region has the highest forested area in the state. Annual rainfall averages between 1,000 and 1,500 mm and the climate varies from semi-arid to dry sub humid. Deep black and coastal alluvial soil is predominant in this region.

Gujarat state is endowed with great diversity of flora distributed over 19,178 sq. km, of its forest area, nearly 9.78% to the total geographical area. 8.78% of its total geographical area is covered by four national parks and 21 sanctuaries endowed with rich flora.

Method:-
The present estimate is first of its kind that encompasses all vascular plants of the state and is based on extensive survey of literature.

A list of endemic plants from the study area was prepared using PhD thesis:
Oza, G.M. (1961); Sabnis, S.D. (1967); Bedi, S.J. (1968); Deshpande, M.B. (1968); Suryanarayana, B. (1968); Yogi, D.V. (1970); Bhatt, R.P. (1971); Patel R.M. (1971); More, P.G. (1972); Karetala, Y.Y. (1973); Padate, S.N. (1973); Vyas, K.J. (1973); Parabia M.H. (1974); Thaker, D.N. (1974); Bhatt, R.G. (1975); Desai, M.J. (1976); Sanjappa, M. (1977); Menon, A.R.R. (1979); Yadav, S.R. (1979); Bhagwanani P.P. (1980); Joshi, J.V. (1980); Vora, H.M. (1980); Rao, K.S.S. (1981); Gopal, G.V. (1983); Joshi, M.C. (1983); Reddy, A.S. (1987); Thakrar, N.K. (1987); Oza, A.R. (1991); Bhatt, J.B. (1993); Binojkumar, M.S. (1993); Pradeepkumar, G. (1993); Raole, V.M. (1993); Joshi, K.I. (1994); Anjaria, K.B. (2002); Desai, B.S. (2002); Rao, V.R. (2002); Baxi, U.S. (2003); Sisodia, P.S. (2007); Patel, M.K. (2009); Sharma, A.K. (2010); Desai, R.J. (2012); Rao, V.H. (2012); Patel, S.L. (2013); Tadvi, D.S. (2013); Jani, M.D. (2014); Bhambra, G.P. (2015), and from available floristic works:

Thaker, J.I. (1910); Saxton, W.T. and Sedgwick, L.G. (1918); Santapau, H. (1953); Santapau, H. and Raizada, M.B. (1954); Phatak, V.G. and Joshi, B.B. (1955); Chavan, A.R. and Sabnis, S.D. (1958); Cooke, T. (1958); Chavan, A.R. and Mehta, A.R. (1958a); Chavan, A.R. and Mehta, A.R. (1958b); Bharati S.G. (1959); Phatak, V.G. and Oza, G.M. (1959); Chavan, A.R. and Oza, G.M. (1960); Chavan, A.R. and Sabnis, S.D. (1960); Chavan, A.R. and Oza, G.M. (1962); Sabnis, S.D. (1962); Santapau, H. (1962); Sanjappa, M. (1992); Chavan, A.R., Bedi S.J. and Sabnis, S.D. (1963); Patel, R.I. (1965); Chavan, A.R. and Oza, G.M. (1966); Santapau, H. and Kapadia, Z. (1966); Shah, G.L. (1967); Bedi, S.J., Sabnis, S.D. and Bhatt, R.P. (1968); Inamdar, J.A. (1968); Rao, R.S. and Deshpande, U.R. (1968); Shah G.L. and Suryanarayana B. (1968); Padate, S.N. (1969); Inamdar, J.A. and Patel, R.M. (1971); Patel, R.I. (1971); Sabnis, S.D. and Bedi S.J. (1971); Shah G.L. and Patel A.I. (1971); Bhatt R.P. and Sabnis S.D. (1972); Malhotra, S.K. and Wadhwa, B.M. (1973); Shah G.L. and Yogi D.V. (1974); Bahadur K.N. and Bennet S.S.R. (1978); Shah, G.L. (1978); Raghavan, R.S., Wadhwa, B.M., Ansari, M.Y. and Rao, R.S. (1981); Patil, S.N. and Sabnis, S.D. (1982); Shah, G.L. (1983); Bole, P.V. and Pathak, J.M. (1988); Mathew, T. and Nayar, M.P. (1989); Shetty, B.V. and Pandey, R.P. (1992); Nagar P.S., Sata S.J., and Pathak S.J. (2003); Parmar, P.J. and Singh, V. (2003); Nagar, P.S. (2005); Nagar, P.S. (2007); Nagar, P.S. (2008); Pandey R.P., Singh V. and Parmar P.J. (2009); Rajendrakumar, S. and Kalavathy, S. (2010); Raole V.M., Desai R.J. and Veldkamp, J.F. (2011); Patel Y.S., Patel R.M., Joshi P.N. and Dabgar Y.B. (2011); Singhadiya, M.K., Padhye, P.M. and Pandey, R.P. (2011); Joshi, P.N., Joshi, E.B. and Jain B.K. (2012); Meena, S.L. (2012); Parmar, P.J. (2012); Joshi, P.N., H.B. Soni, Sunderraj S.F.W. and Joshua J. (2013); Bhatt, M.R. and Nagar, P.S. (2014); Meena, S.L. (2014a); Meena, S.L. (2014b); Patel R., Patel Y., Kumar A., Mahato R. and Kumar V. (2014); Meena, S.L. and Krishna P.H. (2015); Punjani, B.L., Desai, P. and Patel, S.K. (2015); Satish K.V., Pasha S.V., Hari Krishna P. and Reddy C.S. (2015); Singh P., Karthigeyan K., Lakshminarasimhan P. and Dash S. S. (2015).

Preliminary field observations were carried out in the study area for endemics. A computerized database was generated incorporating details on their distribution, life-form type, habitat, phenology and local names.

Consulting the published literature, unpublished research reports and PhD dissertations pertained to the flora of Gujarat; a comprehensive checklist of angiosperms of Gujarat has been prepared. A few field surveys were organized in various geographic zones of Gujarat in order to enumerate some selected species. Plants were identified

using regional, national and international Floras. This checklist is further processed through the following steps in order to construct taxonomically rich and accurate database.

- Each and every scientific name is looked for the correct orthography from the reliable International Plant Names Index (www.ipni.org) database and corrected wherever required.
- Scientific names are checked for their validity and legitimacy. Also, basionyms and synonyms are provided.
- Distribution data is updated based on the information gathered from the published literature.
- Field surveys were organized in various geographic zones of Gujarat in order to get field data. During these surveys various species were collected, processed and identified using relevant floras.
- The Botanical Survey of India, Arid Zone Circle, Jodhpur; the Botanical Survey of India, Western Regional Center, Pune; Sardar Patel University, Vallabh Vidyanagar; Veer Narmad South Gujarat University, Surat; Government Science College, Gandhinagar; GUIDE, Kachchh; Sahjeevan, Bhuj; Junagadh Agriculture University, Junagadh; Anand Agricultural Univserity, Anand; B.K.M. science college, Valsad, and Waghai Botanical Garden, Dangs were visited for consulting relevant literature so as to update the distribution data of the enumerated species.

Results:-

The survey resulted in the documentation of 192 Indian endemic taxa found in Gujarat state. Recently, Singh *et al*. (2015) enumerated a total of 4303 flowering plant species and infraspecfic taxa recorded as strict endemics to the Indian political boundary. Among them, dicotyledons dominate the endemic flora with 3170 taxa (72%) belonging to 723 genera under 127 families, whereas monocots are represented by 1133 taxa (26%) belonging to 254 genera under 27 families. As per the records, Gujarat ranks 25th having six species exclusively endemic to the state *i.e.*, *Ischaemum sayajiraoi, Spodiopogon aristatus, Tephrosia jamnagarensis, Tamarix kutchensis, Helichrysum cutchicum* and *Pycreus dwarkensis*. But *Pycreus dwarkensis* has been reported in Pakistan (eFloras, 2017), so it is no more an endemic. But, *Rorippa cochlearioides* and *Solanum purpureilineatum* are also exclusively endemic to Gujarat. So as per the present analysis, there are total seven species exclusively endemic to Gujarat state.

In the endemic vascular plants of India database (Singh *et al*., 2015) only 55 endemic taxa have reported Gujarat as a locality, but the present study added 137 more such Indian endemics being reported from Gujarat state which are marked with an asterisk (*).

Araceae Juss:-

***Amorphophallus commutatus** (Schott) Engl.
Herb; *Fl. and Fr.:* June – August
Dahod Dt.: Ratanmahal (Bedi, 1968); Dang Dt.: Galkund (Yadav, 1979), Ahwa, Malegaon, Pipaldahad, Subir (Suryanarayana, 1968); Gir somnath Dt. (Sisodia, 2007); Junagadh Dt.: Chorwad (Bole and Pathak, 1988); Narmada Dt. (Patel, 1971): Mathavali, Sagai, Waghumar (Pradeepkumar, 1993); Panchmahal Dt.: Pavagadh (Oza, 1961); Surat Dt.: Umarpada (Yadav, 1979); Valsad Dt. (Inamdar and Patel, 1971): Pindval (Reddy, 1987), Kaprada (Rao, 2012), Parnera (Yadav, 1979), Dharampur, Nana Pondha (Vora, 1980), Pardi (More, 1972)
***Arisaema murrayi** (J.Graham) Hook.
Herb; *Fl. and Fr.:* June – August
Dahod Dt.: Kanjeta (Bedi, 1968); Dang Dt. (Tadvi, 2013): Ahwa, Don, Malegaon, Saputara; Valsad Dt. (Vora, 1980): Dahikhed (Rao, 2012)

Amaryllidaceae J. St.-Hil:-

***Crinum brachynema** Herb.
Herb; *Fl. and Fr.:* July – August
Valsad Dt. (Inamdar and Patel, 1971): Dharampur (Inamdar, 1968; Vora, 1980), Kaprada (Rao, 2012)
***Pancratium parvum** Dalzell
Herb; *Fl. and Fr.:* June – July
Bhavnagar Dt. (Oza, 1991); Valsad Dt. (Inamdar and Patel, 1971)

Asparagaceae Juss:-

***Chlorophytum borivilianum** Santapau and R.R.Fern.
Herb; *Fl. and Fr.:* June – July

Banaskantha Dt.: Danta (Meena, 2012), Jessore wildlife sanctuary; Dang Dt. (Shah, 1978; Tadvi, 2013): Ahwa (Shah and Suryanarayana, 1967), Malegaon (Suryanarayana, 1968), Bardipada, Kalibel, Mahal, Subir, Waghai (Rao, 2002), Ghoghli, Pimpri, Shivghat; Narmada Dt. (Sharma, 2010): Dediapada, Sagai; Sabarkantha Dt.: Vijaynagar; Surat Dt.

***Chlorophytum malabaricum** Baker
Herb; *Fl. and Fr.:* June
Dang Dt. (Shah, 1978; Tadvi, 2013): Ahwa (Suryanarayana, 1968)

Hyacinthaceae:-

Dipcadi ursulae var. **longiracemosum** Deb and S.Dasgupta
Herb; *Fl. and Fr.:* August
Jamnagar Dt.: Rozi (Bole and Pathak, 1988); Junagadh Dt.: Girnar hill (Shah, 1983)

Orchidaceae Juss:-

***Aerides maculosa** Lindl.
Herb; *Fl. and Fr.:* July – January
Dang Dt. (Tadvi, 2013; Nagar and Bhatt, 2015): Ahwa, Malegaon, Subir (Suryanarayana, 1968); Junagadh Dt.: Sasan-Gir; Navsari Dt.: Bansda; Panchmahal Dt. (Nagar and Bhatt, 2015): Pavagadh (Oza, 1961); Valsad Dt. (Nagar and Bhatt, 2015): Dhamni, Pangarbari (Reddy, 1987), Kaprada (Rao, 2012)

***Dendrobium barbatulum** Lindl.
Herb; *Fl. and Fr.:* March – May
Dang Dt. (Tadvi, 2013): Ahwa, Malegaon (Suryanarayana, 1968), Don (Nagar and Bhatt, 2015); Narmada Dt. (Nagar and Bhatt, 2015): Mohbi (Pradeepkumar, 1993); Panchmahal Dt. (Nagar and Bhatt, 2015); Valsad Dt. (Nagar and Bhatt, 2015): Girnara, Pangarbari (Reddy, 1987), Morai, Varoli Talat (Rao, 2012)

***Dendrobium microbulbon** A.Rich.
Herb; *Fl. and Fr.:* December – May
Dang Dt. (Tadvi, 2013; Nagar and Bhatt, 2015): Ahwa, Malegaon (Suryanarayana, 1968), Bardipada, Dungerda, Galkund, Kalibel, Kasa, Mahal, Subir (Rao, 2002); Narmada Dt.: Kokam, Mathavali, Sagai, Waghumar (Pradeepkumar, 1993), Dediapada, Fulsar, Piplod (Rao, 2002), Ninai; Navsari Dt.: Khambhala, Tadpada (Desai, 1976), Bansda; Surat Dt.: Zankhri; Valsad Dt.: Kaprada

***Dendrobium ovatum** (L.) Kraenzl. [= *Epidendrum ovatum* L.]
Herb; *Fl. and Fr.:* February – March
Dang Dt. (Tadvi, 2013): Subir (Suryanarayana, 1968), Ganja, Kansa; Valsad Dt.: Kaprada

***Eulophia ochreata** Lindl.
Herb; *Fl. and Fr.:* June – October
Dang Dt.: Galkund (Rao, 2002), Ahwa (Nagar and Bhatt, 2015), Mahal; Narmada Dt.: Kelda; Panchmahal Dt.: Khodwa (Santapau and Kapadia, 1966)

***Habenaria foliosa** A.Rich. [= *Habenaria foliosa* A.Rich. var. *gibsonii* (Hook.f.) Bennet; *Habenaria gibsonii* Hook.f. var. *foetida* Blatt. and McCann; *Habenaria gibsonii* Hook.f. var. *gibsonii*; *Habenaria gibsonii* Hook.f. var. *foliosa* (A. Rich.) Santapau and Kapadia]
Herb; *Fl. and Fr.:* July – September
Chhota udepur Dt.; Dang Dt. (Tadvi, 2013; Nagar and Bhatt, 2015): Malegaon (Suryanarayana, 1968); Junagadh Dt.: Datar (Bhatt & Nagar); Narmada Dt.: Namgir (Pradeepkumar, 1993), Ghatoli; Navsari Dt.: Kanai khadi, Mankunia, Vati, Vedchha; Valsad Dt. (Nagar and Bhatt, 2015): Dungri, Ghadoi

***Habenaria grandifloriformis** Blatt. and McCann
Herb; *Fl. and Fr.:* July – August
Dang Dt. (Tadvi, 2013; Nagar and Bhatt, 2015): Malegaon, Saputara (Suryanarayana, 1968); Valsad Dt. (Nagar and Bhatt, 2015): Pindval, Sutharpada (Reddy, 1987), Vavar (Rao, 2012)

***Habenaria longicorniculata** J.Graham
Herb; *Fl. and Fr.:* August – September
Chhota udepur Dt.; Dang Dt. (Tadvi, 2013): Malegaon (Suryanarayana, 1968), Chinchli, Saputara; Valsad Dt.: Sanjan

***Oberonia brunoniana** Wight [= *Malaxis brunoniana* (Wight) Rchb. f.]
Herb; *Fl. and Fr.:* February – March
Dang Dt.: Kansa

***Peristylus stocksii** (Hook.f.) Kraenzl. [= *Habenaria stocksii* Hook.f.]

Herb; *Fl. and Fr.:* July – September
Dang Dt. (Tadvi, 2013): Waghai; Narmada Dt.: Mohbi (Pradeepkumar, 1993); Panchmahal Dt.; Valsad Dt. (Nagar and Bhatt, 2015)

Cyperaceae Juss:-
***Fimbristylis lawiana** (Boeckeler) J.Kern [= *Scirpus lawianus* Boeckeler]
Herb; *Fl. and Fr.:* August – October
Anand Dt.: Umeta; Dang Dt.: Ahwa, Malegaon, Saputara (Suryanarayana, 1968; Parabia, 1974); Vadodara Dt.: Nimeta (Parabia, 1974); Valsad Dt.: Kaprada (Reddy, 1987), Malghar (Rao, 2012)
***Fimbristylis woodrowii** C.B. Clarke
Herb; *Fl. and Fr.:* August – October
Bharuch Dt.: River Dhadhar at Shahpura; Dang Dt.: Ahwa (Suryanarayana, 1968), Waghai (Parabia, 1974); Narmada Dt. (Patel, 1971); Panchmahal Dt.: Tuwa (Deshpande, 1968; Parabia, 1974); Surat Dt.: Dumas (Joshi, 1980); Vadodara Dt. (Parabia, 1974): riverbank of Dhadhar at Shahapura (Sabnis, 1962); Valsad Dt. (Inamdar and Patel, 1971): Pangarbari (Reddy, 1987), Panas (Rao, 2012), Dharampur, Kaprada, Nana Pondha (Vora, 1980)
***Fuirena tuwensis** M.B. Deshp. and G.L. Shah
Herb; *Fl. and Fr.:* October – November
Dadra Nagar Haveli (Sabnis and Bedi, 1971); Panchmahal Dt.: Bakrol, Navagam, Tuwa, Veganpura (Deshpande, 1968; Parabia, 1974)
***Pycreus malabaricus** C.B. Clarke
Herb; *Fl. and Fr.:* August – November
Dang Dt. (Tadvi, 2013): Ahwa (Suryanarayana, 1968; Parabia, 1974); Navsari Dt.: Maroli; Porbandar Dt.: Bileshwar (Menon, 1979); Tapi Dt.: Hindla, Songadh; Valsad Dt.: Pindval (Reddy, 1987), Kaprada (Rao, 2012), Manda
***Scleria stocksiana** Boeckeler
Herb; *Fl. and Fr.:* August – September
Sabarkantha Dt. (Sabnis, 1962): Talod (Saxton and Sedgwick, 1918); Vadodara Dt.: Nimetta (Chavan and Sabnis, 1958)

Eriocaulaceae Martinov:-
***Eriocaulon cuspidatum** Dalzell
Herb; *Fl. and Fr.:* September – November
Chhota udepur Dt.: Kavant (Thaker, 1974)
***Eriocaulon elenorae** Fyson
Herb; *Fl. and Fr.:* September – October
Mehsana Dt. (Shah and Yogi, 1974); Narmada Dt. (Patel, 1971): Kokam (Pradeepkumar, 1993), Vankol (Yadav, 1979); Panchmahal Dt.: Tuwa (Deshpande, 1968); Sabarkantha Dt.: Idar; Valsad Dt. (Inamdar and Patel, 1971): Dharampur (Reddy, 1987), Kaprada (Rao, 2012), Nana Pondha (Vora, 1980)

Poaceae Barnhart:-
***Arthraxon inermis** Hook.f.
Herb; *Fl. and Fr.:* August – November
South Gujarat (Patel, 1965); Dang Dt. (Desai, 2012; Tadvi, 2013); Junagadh Dt.: Petwad (Menon, 1979); Narmada Dt.: Dabka, Namgir, Sagai (Pradeepkumar, 1993); Navsari Dt. (Desai, 2012); Valsad Dt. (Desai, 2012)
***Arthraxon meeboldii** Stapf
Herb; *Fl. and Fr.:* August – October
South Gujarat (Patel, 1965); Dang Dt.; Valsad Dt.
***Arundinella ciliata** (Roxb.) Nees ex Miq.
Herb; *Fl. and Fr.:* August – October
Dang Dt. (Desai, 2012; Tadvi, 2013); Navsari Dt. (Desai, 2012); Valsad Dt. (Desai, 2012): Kaprada, Lavkar, Mandva, Nana Pondha
***Arundinella metzii** Hochst. ex Miq.
Herb; *Fl. and Fr.:* September – November
South Gujarat, on nalla-banks (Patel, 1965); Banaskantha Dt.: Dantiwada, Palanpur (Patel, 2009); Dang Dt.: Saputara (Yadav, 1979); Narmada Dt.: Kanjal, Sagai, Mohbi, Waghumar (Pradeepkumar, 1993); Valsad Dt. (Vora, 1980): Tutarkhed (Reddy, 1987), Kaprada (Rao, 2012)

***Arundinella tuberculata** Munro ex Lisboa
Herb; *Fl. and Fr.:* August
Rajkot Dt.: Valadhari (Bole and Pathak, 1988)
***Capillipedium filiculme** (Hook.f.) Stapf [= *Andropogon filiculmis* Hook.f.]
Herb; *Fl. and Fr.:* August – September
Gujarat (Patel, 1965); Bhavnagar Dt.: Palitana (Menon, 1979); Dang Dt.: Galkund (Yadav, 1979); Jamnagar Dt. (Bole and Pathak, 1988); Panchmahal Dt.: Pavagadh (Chavan and Mehta, 1958b; Oza, 1961); Porbandar Dt.: Barda hill (Bole and Pathak, 1988); Surat Dt. (Desai, 2012); Tapi Dt. (Desai, 2012); Vadodara Dt.: Shardadungri (Padate, 1973), Savli (Padate, 1969); Valsad Dt.: Pendha (Yadav, 1979), Parnera (More, 1972)
***Capillipedium huegelii** (Hack.) A. Camus [= *Andropogon huegelii* Hack.]
Herb; *Fl. and Fr.:* August – September
South Gujarat (Patel, 1965); Amreli Dt. (Menon, 1979); Dahod Dt.: Bendol, Ratanmahal temple (Bedi, 1968); Narmada Dt.: Kalvat, Kelda, Ninaighat (Pradeepkumar, 1993); Rajkot Dt.: Hingolgadh (Menon, 1979); Sabarkantha Dt.: Khedbrahma (Bhatt, 1971; Bhatt and Sabnis, 1972); Valsad Dt.: Pendha (Yadav, 1979)
***Coelorachis clarkei** (Hack.) Blatt. and McCann [= *Rottboellia clarkei* Hack.; *Mnesithea clarkei* (Hack.) de Koning and Sosef; *Manisuris clarkei* (Hack.) Bor ex Santapau]
Herb; *Fl. and Fr.:* September – October
Narmada Dt.: Khamar, Kokam, Sagai (Pradeepkumar, 1993); Valsad Dt.: Kaprada (Desai, 2012)
***Cymbopogon gidarba** (Buch.-Ham. ex Steud.) A. Camus [= *Andropogon gidarba* Steud.]
Herb; *Fl. and Fr.:* December – March
Bharuch Dt.; Junagadh Dt.: Girnar (Menon, 1979); Mehsana Dt.: Kadi (Yogi, 1970); Narmada Dt.: Rajpipla; Porbandar Dt.: Bileshwar (Menon, 1979); Sabarkantha Dt.: Khedbrahma (Yogi, 1970; Bhatt, 1971; Bhatt and Sabnis, 1972), Mahudi, Pahada (Shah and Yogi, 1974; Yogi, 1970)
***Cynodon barberi** Rang. and Tadul.
Herb; *Fl. and Fr.:* September
Sabarkantha Dt.: Himmatnagar; Surat Dt.: Vadpada (Desai, 2012)
***Dimeria stapfiana** C.E. Hubb. and Pilg.
Herb; *Fl. and Fr.:* September – November
Valsad Dt.: Dharampur, Kaprada (Desai, 2012)
***Glyphochloa forficulata** (C.E.C. Fisch.) Clayton [= *Manisuris forficulata* C.E.C.Fisch.]
Herb; *Fl. and Fr.:* September – December
Dang Dt. (Tadvi, 2013): Gadvihir (Desai, 2012)
***Heteropogon ritchiei** (Hook.f.) Blatt. and McCann [= *Andropogon ritchiei* Hook.f.]
Herb; *Fl. and Fr.:* October – December
Gujarat (Patel, 1965); Bhavnagar Dt.: Thadsar; Junagadh Dt.: Rukhmani Dungar, Tulsishyam (Bole and Pathak, 1988); Valsad Dt.: Kaprada (Desai, 2012)
***Isachne elegans** Dalzell ex Hook.f.
Herb; *Fl. and Fr.:* October – December
Surat Dt.: Udhna-Magdalla road (Joshi, 1980)
***Ischaemum bombaiense** Bor
Herb; *Fl. and Fr.:* September – December
Surat Dt.: Umarpada (Desai, 2012)
***Ischaemum diplopogon** Hook.f.
Herb; *Fl. and Fr.:* September – October
Gujarat (Patel, 1965); Panchmahal Dt.: Pavagadh (Chavan and Mehta, 1958b); Dang Dt. (Desai, 2012; Tadvi, 2013)
***Ischaemum santapaui** Bor
Herb; *Fl. and Fr.:* September – November
Dang Dt. (Tadvi, 2013): Girmal fall (Desai, 2012); Tapi Dt. (Desai, 2012); Valsad Dt.: Sanjan
Ischaemum sayajiraoi Raole and R.J. Desai
Herb; *Fl. and Fr.:* September – December
Dang Dt. (Desai, 2012; Tadvi, 2013); Surat Dt.: Umarpada (Desai, 2012); Tapi Dt. (Desai, 2012); Vadodara Dt.: Bacrol, Bhayli (Raole *et al*., 2011)
***Iseilema anthephoroides** Hack.
Herb; *Fl. and Fr.:* July – October

Gujarat (Patel, 1965); Anand Dt.: Khambhat (Bhagwanani, 1980); Chhota udepur Dt.: Kavant (Thaker, 1974); Gandhinagar Dt.: Mansa (Meena, 2014a); Narmada Dt.: Rajpipla (Yadav, 1979); Panchmahal Dt.: Pavagadh (Chavan and Mehta, 1958b; Oza, 1961); Vadodara Dt. (Chavan and Mehta, 1958a): Harni (Sabnis, 1967)
***Lophopogon tridentatus** (Roxb.) C.E.Hubb. [= *Andropogon tridentatus* Roxb.]
Herb; *Fl. and Fr.:* September – December
Gujarat (Patel, 1965); Panchmahal Dt.: Sulatpur (Chavan and Mehta, 1958b), Pavagadh (Oza, 1961)
***Parahyparrhenia bellariensis** (Hack.) Clayton [= *Andropogon bellariensis* Hack.]
Herb; *Fl. and Fr.*: August – October
Rajkot Dt. (Thakrar, 1987)
Spodiopogon aristatus R.J. Desai and Raole
Herb; *Fl. and Fr.:* October – December
Dang Dt. (Desai, 2012; Tadvi, 2013); Navsari Dt. (Desai, 2012); Surat Dt. (Desai, 2012); Tapi Dt.: Bunadha (Desai and Raole, 2012); Valsad Dt.: Dabkhal (Desai and Raole, 2012)
Spodiopogon rhizophorus (Steud.) Pilg. [= *Andropogon rhizophorus* Steud.]
Herb; *Fl. and Fr.:* September – January
Saurashtra (Patel, 1965); Banaskantha Dt.: Jessore wildlife sanctuary, Balaram-Ambaji wildlife sanctuary (Meena, 2012); Chhota udepur Dt.: Kavant (Thaker, 1974); Dang Dt. (Desai, 2012; Tadvi, 2013): Galkund (Yadav, 1979); Devbhumi dwarka Dt.: Abhapara, Venu (Nagar, 2005); Junagadh Dt.: Junvaniya, Sasan (Bole and Pathak, 1988); Narmada Dt.: Rajpipla (Shah, 1967); Pachmahal Dt.: Pavagadh (Chavan and Mehta, 1958b; Oza, 1961); Sabarkantha Dt.: Khedbrahma (Bhatt, 1971; Bhatt and Sabnis, 1972); Tapi Dt. (Desai, 2012); Valsad Dt. (Desai, 2012): Sidhumbar, Tutarkhed (Reddy, 1987), Tiskari (Rao, 2012)
***Trilobachne cookei** (Stapf) Schenck ex Henrard [= *Polytoca cookei* Stapf]
Herb; *Fl. and Fr.:* September – November
Saurashtra (Patel, 1965); Dang Dt. (Tadvi, 2013): Bhenskatri (Desai, 2012); Junagadh Dt.: Girnar foothill (Bole and Pathak, 1988); Valsad Dt.: Kapurnya, Moti Korval, Tamachhadi (Reddy, 1987), Tiskari (Rao, 2012)
***Triplopogon ramosissimus** (Hack.) Bor [= *Ischaemum ramosissimum* Hack.]
Herb; *Fl. and Fr.:* October
Dang Dt. (Desai, 2012; Tadvi, 2013); Tapi Dt.: Tapti riverbank (Patel, 1965); Valsad Dt.: Kodba, Tamachhadi (Reddy, 1987), Kaprada (Rao, 2012)
***Tripogon jacquemontii** Stapf
Herb; *Fl. and Fr.:* August – September
South Gujarat (Patel, 1965); Ahmedabad Dt.; Banaskantha Dt.: Amirgarh hills (Meena, 2012); Chhota udepur Dt.: Kavant (Thaker, 1974); Dang Dt. (Desai, 2012); Gandhinagar Dt.: Kalol (Meena, 2014a); Jamnagar Dt.: Jamvali (Bole and Pathak, 1988); Sabarkantha Dt.: Khedbrahma (Bhatt, 1971; Bhatt and Sabnis, 1972); Surat Dt. (Desai, 2012); Tapi Dt. (Desai, 2012)
***Tripogon lisboae** Stapf
Herb; *Fl. and Fr.:* July – October
Chhota udepur Dt.: Kavant (Thaker, 1974); Dang Dt.; Narmada Dt.: Kevadiya

Zingiberaceae Martinov:-
***Curcuma decipiens** Dalzell
Herb; *Fl. and Fr.:* June – December
Banaskantha Dt.: Hathidhara forest (Meena, 2012); Narmada Dt.: Fulsar, Sagai; Valsad Dt.: Kaprada
***Curcuma inodora** Blatt. [= *Curcuma purpurea* Blatt.]
Herb; *Fl. and Fr.:* August – September
Banaskantha Dt.: Khaiwad, Danta (Meena, 2012); Chhota udepur Dt.: Ambadungar, Kadipani, Mithibor (Desai, 2002), Kavant (Thaker, 1974); Dahod Dt.: Ratanmahal (Bedi, 1968), Devgadh Baria; Dang Dt. (Tadvi, 2013): Ahwa, Malegaon, Subir (Suryanarayana, 1968); Gir somnath Dt. (Santapau and Raizada, 1954; Sisodia, 2007); Junagadh Dt.: Sapnes, Sasan (Menon, 1979), Girnar, Junvaniya (Bole and Pathak, 1988); Mehsana Dt. (Shah and Yogi, 1974); Narmada Dt.: Mathavali, Sagai, Shisha (Pradeepkumar, 1993); Panchmahal Dt.: Machi (Phatak and Oza, 1959), Pavagadh (Oza, 1961); Sabarkantha Dt.: Khedbrahma (Bhatt, 1971; Bhatt and Sabnis, 1972); Surat Dt.: Umarpada (Yadav, 1979); Valsad Dt. (Inamdar and Patel, 1971; Patel RM, 1971): Amba Talat, Moolgam (Reddy, 1987), Kaprada (Rao, 2012), Nana Pondha (Vora, 1980), Chival, Parnera, Udwada (More, 1972)
***Curcuma pseudomontana** J. Graham
Herb; *Fl. and Fr.:* July – October
Dahod Dt.; Narmada Dt.; Panchmahal Dt.: Machi (Chavan and Oza, 1960; Oza, 1961)

***Zingiber nimmonii** (J. Graham) Dalzell [= *Alpinia nimmonii* J. Graham; *Zingiber cernuum* Dalzell]
Herb; *Fl. and Fr.:* January – February
Dang Dt. (Tadvi, 2013): Mahal (Suryanarayana, 1968)

Ranunculaceae Juss:-

Clematis hedysarifolia DC.
Climber; *Fl. and Fr.:* October – December
Dang Dt. (Tadvi, 2013): Shamgahan (Patel, 2013), Ahwa (*MCJ157* Joshi, 1978), Borkhal, Sunda (Yadav, 1979), Saputara, Subir (Suryanarayana, 1968), Malegaon, Sagbara (Gopal, 1983); Narmada Dt.: Sagbara; Panchmahal Dt.: Vajpur (Patel, 2013); Tapi Dt.: Songadh, Vyara; Valsad Dt.: Pangarbari, Tamachhadi (Reddy, 1987; Patel, 2013), Penda (Yadav, 1979), Pindval, Vagval (Reddy, 1987), Varoli (Rao, 2012), Jogvel, Malanpada, Nana Pondha, Vahial (Vora, 1980), Rabada, Parnera (More, 1972)
***Clematis heynei** M.A. Rau [= *Clematis triloba* B. Heyne ex Roth]
Climber; *Fl. and Fr.:* October – March
Dang Dt.: Saputara (Patel, 2013); Narmada Dt.; Navsari Dt.: Unai; Porbandar Dt.: Barda; Valsad Dt.: Dhamni (Patel, 2013), Varoli Talat (Rao, 2012)

Begoniaceae C. Agardh:-
***Begonia crenata** Dryand.
Herb; *Fl. and Fr.:* September – October
Bhavnagar Dt. (Oza, 1991); Chhota udepur Dt. (Karetala, 1973): Mogra, Marchipani (Desai, 2002); Dang Dt. (Tadvi, 2013); Narmada Dt.: Ninaighat (Pradeepkumar, 1993)

Cucurbitaceae Juss:-
***Corallocarpus conocarpus** (Dalzell and A.Gibson) Hook.f. [= *Aechmandra conocarpa* Dalzell and A.Gibson]
Climber; *Fl. and Fr.:* June – August
Ahmedabad Dt.: Dhandhuka (Patel *et al*., 2014); Arvalli Dt.: Dhansura (Patel, 2013); Bharuch Dt.: Malpore (Patel, 2013); Gir somnath Dt. (Sisodia, 2007); Jamnagar Dt.; Junagadh Dt.; Kachchh Dt. (Patel *et al*., 2011): Sural Pith, Bhuj, Wadasar, Tregdi (Joshi *et al*., 2013), Lala bustard sanctuary on Mandavi-Naliya road, Chamra, Bhujpar, Kharai village on Vayor road; Kheda Dt.: Malana Muvada, Ladvel (Patel, 2013); Sabarkantha Dt.: Netrawali (Parmar, 2012), Bayad, Merhan (Patel, 2013)
***Solena amplexicaulis** (Lam.) Gandhi [= *Bryonia amplexicaulis* Lam.]
Climber; *Fl. and Fr.:* July – October
Chhota udepur Dt.; Dang Dt. (Tadvi, 2013): Shamgahan (Patel, 2013); Narmada Dt.: Dediapada (Patel, 2013), Mathavali, Ninaighat, Patvali (Pradeepkumar, 1993); Panchmahal Dt.: Pavagadh (Oza, 1961); Tapi Dt.: Vyara; Valsad Dt.: Dharampur, Pariya-Pardi, Navtad (Patel, 2013), Kaparada (Rao, 2012)

Fabaceae Lindl:-
***Alysicarpus hamosus** Edgew. [= *Alysicarpus procumbens* (Roxb.) Schindl.; *Hedysarum procumbens* Roxb.]
Herb; *Fl. and Fr.:* August – October
Anand Dt.: Khambhat (Bhagwanani, 1980); Banaskantha Dt.: Koteshwar (Meena, 2012); Bharuch Dt.: Gumandev; Bhavnagar Dt.: Palitana (Menon, 1979; Meena, 2014b); Chhota udepur Dt.: Kavant (Thaker, 1974); Dahod Dt.: Ratanmahal (Bedi, 1968), Devgadh baria; Dang Dt. (Tadvi, 2013): Ahwa, Subir (Suryanarayana, 1968); Devbhumi dwarka Dt.: Abhapar, Kileshwar, Ghumli, (Nagar, 2005); Gandhinagar Dt.: Halisa (Meena, 2014a), Mansa; Gir somnath Dt. (Santapau and Raizada, 1954; Sisodia, 2007); Junagadh Dt.: Sasan (Menon, 1979), Kansianes; Kachchh Dt.: Meva Rakhal (Bhatt, 1993), Guhar (Pandey *et al*., 2009), Ningal; Mehsana Dt.: Kadi; Narmada Dt.: Fulsar, Gichad, Namgir, Zadoli (Pradeepkumar, 1993), Gora, Gumandev, Kevadiya, Rajpipla (Patel, 1971); Navsari Dt.; Panchmahal Dt.: Pavagadh (Oza, 1961), Tuwa (Deshpande, 1968); Patan Dt.; Porbandar Dt.: Godhana, Satvirda, Adityana, Ranavav (Nagar, 2005); Sabarkantha Dt.: Khedbrahma (Bhatt, 1971), Samalaji, Bamaraji (Parmar, 2012), Idar, Prantij; Surat Dt. (Joshi, 1980): Pataldevi, Umarpada, Vankal (Yadav, 1979); Tapi Dt.; Vadodara Dt. (Sabnis, 1967): Savli (Padate, 1973); Valsad Dt.: Dhamni (Yadav, 1979), Avdha, Tutarkhed (Reddy, 1987), Umbergaon (Bhagwanani, 1980), Kaprada (Rao, 2012), Nana Pondha (Vora, 1980)
Alysicarpus pubescens J.S.Law
Herb; *Fl. and Fr.:* September – December
Amreli Dt.: Dhari (Gopal, 1983); Bharuch Dt.; Jamnagar Dt.: Ranjit Sagar (Santapau, 1962)
Bauhinia foveolata Dalzell [= *Piliostigma foveolatum* (Dalzell) Thoth.]

Tree; *Fl. and Fr.:* October – March
Ahmedabad Dt. (Meena, 2014a); Dang Dt. (Shah, 1978; Tadvi, 2013): Ahwa (Yadav, 1979), Malegaon, Pipaldahad, Saputara (Suryanarayana, 1968), Bardipada, Don; Narmada Dt. (Sharma, 2010); Navsari Dt.: Mankunia, Raybor; Panchmahal Dt.; Surat Dt.: Divtan; Tapi Dt.: Hindla; Valsad Dt.: Fatepur, Ulaspedhi (Reddy, 1987), Mandva (Rao, 2012), Moti Korval (Rao, 2002), Kaprada, Nana Pondha (Vora, 1980), Chavshala
***Cajanus sericeus** (Baker) Maesen [= *Atylosia sericea* Baker]
Shrub; *Fl. and Fr.:* August – December
Chhota udepur Dt.: Ambadungar (Thaker, 1974); Dang Dt. (Chavan and Oza, 1966); Valsad Dt.: Moti Korval, Pangarbari (Reddy, 1987)
Clitoria annua J.Graham [= *Clitoria biflora* Dalzell]
Herb; *Fl. and Fr.:* July – October
Ahmedabad Dt. (Meena, 2014a); Anand Dt.: Umeta; Banaskantha Dt.: Rinchhidiya (Meena, 2012); Chhota udepur Dt.: Dolariya (Desai, 2002), Kavant (Thaker, 1974; Desai, 2002); Dahod Dt.: Ratanmahal (Bedi, 1968); Dang Dt. (Tadvi, 2013): Ahwa, Malegaon, Subir (Suryanarayana, 1968); Devbhumi dwarka Dt.: Abhapar, Ghumli, (Nagar, 2005); Gir somnath Dt. (Sisodia, 2007); Junagadh Dt.: Sasan (Menon, 1979), Junvaniya (Santapau, 1962); Kachchh Dt. (Patel *et al*., 2011); Mehsana Dt. (Shah and Yogi, 1974); Narmada Dt.: Gumina, Mathavali, Sagai (Pradeepkumar, 1993), Kevadia, Gora, Jhagadiya (Patel, 1971); Panchmahal Dt.: Pavagadh (Oza, 1961); Porbandar Dt.: Godhana (Thaker, 1910); Sabarkantha Dt. (Parmar, 2012): Khedbrahma (Bhatt, 1971); Vadodara Dt.: Laxmi Vilas palace compound; Valsad Dt. (Patel RM, 1971): Ghotan (Rao, 2012), Kaprada, Nana Pondha (Vora, 1980), Hedri
***Crotalaria filipes** Benth. [= *Crotalaria filipes* var. *filipes*]
Herb; *Fl. and Fr.:* October – February
Dang Dt. (Tadvi, 2013): Ahwa (Suryanarayana, 1968), Waghai (Gopal, 1983); Junagadh Dt.: Girnar (Santapau, 1962); Kachchh Dt. (Patel *et al*., 2011); Kheda Dt.: Utkantheshwar (Gopal, 1983); Narmada Dt.; Porbandar Dt. (Thaker, 1910); Valsad Dt. (Patel RM, 1971; Vora, 1980): Avdha, Kaprada (Rao, 2012)
***Crotalaria filipes** var. **trichophora** (Baker) T.Cooke [= *Crotalaria trichophora* Benth. ex Baker f.]
Herb; *Fl. and Fr.:* October – March
Dang Dt. (Tadvi, 2013): Don; Gir somnath Dt. (Santapau and Raizada, 1954); Junagadh Dt.: Junvaniya (Santapau, 1962); Surat Dt.: Nana Varachha (Joshi, 1980); Valsad Dt. (Patel RM, 1971)
Crotalaria leptostachya Benth.
Shrub; *Fl. and Fr.:* October – November
Dahod Dt.: Kanvara dungar, Padaliya (Bedi, 1968); Dang Dt. (Tadvi, 2013): Ahwa, Pipaldahad (Suryanarayana, 1968); Devbhumi dwarka Dt.: Abhapar, Kileshwar, Venu, Ghumli (Nagar, 2005); Gir somnath Dt. (Sisodia, 2007); Junagadh Dt.: Junvaniya, Sasan (Santapau, 1962); Kheda Dt.: Shamariya; Narmada Dt.: Kalvat, Shamariya (Pradeepkumar, 1993); Navsari Dt.: Bansda; Porbandar Dt.: Godhana, Satvirda, Adityana, Ranavav (Nagar, 2005); Tapi Dt.: Vyara; Valsad Dt.: Hedri, Kaprada (Rao, 2012)
Crotalaria notonii Wight and Arn.
Shrub; *Fl. and Fr.:* September – November
Kachchh Dt. (Patel *et al*., 2011); Surat Dt.: Dumas
Crotalaria pusilla DC.
Herb; *Fl. and Fr.:* September – October
Chhota udepur Dt.: Kavant, Luni; Sabarkantha Dt.: Bavsar (Saxton and Sedgwick, 1918)
Crotalaria vestita Baker
Herb; *Fl. and Fr.:* October – December
Arvalli Dt.: Shamlaji; Dang Dt. (Tadvi, 2013): Malegaon, Saputara (Suryanarayana, 1968); Devbhumi dwarka Dt.: Abhapar, Kileshwar, Venu, Ghumli (Nagar, 2005); Jamnagar Dt.: Motwa Matli (Santapau, 1962); Junagadh Dt.: Bordevi (Santapau, 1962); Porbandar Dt.: Godhana, Satvirda, Adityana, Ranavav (Nagar, 2005); Valsad Dt.
***Dalbergia horrida** (Dennst.) Mabb. [= *Amerimnon horridum* Dennst.]
Climbing shrub; *Fl. and Fr.:* January – April
Dahod Dt.: Devgadh baria, Ratanmahal (Bedi, 1968)
Derris heyneana (Wight and Arn.) Benth. [= *Pongamia heyneana* Wight and Arn.]
Climbing shrub; *Fl. and Fr.:* June – July
Gujarat (Singh *et. al*., 2015)
Desmodiastrum belgaumense (Wight) A.Pramanik and Thoth. [= *Alysicarpus belgaumensis* Wight]
Herb; *Fl. and Fr.:* September – October
Panchmahal Dt.: Pavagadh (Oza, 1961)

***Desmodiastrum racemosum** var. **rotundifolium** (Baker) A.Pramanik and Thoth. [= *Desmodium rotundifolium* Baker; *Alysicarpus beddomei* Schindl.; *Desmodium ritchie* Sanjappa]
Herb; *Fl. and Fr.:* August – September
Banaskantha Dt.: Balaram-Ambaji wildlife sanctuary (Meena, 2012); Dang Dt. (Sanjappa, 1977; Tadvi, 2013): Malegaon, Saputara (Suryanarayana, 1968), Subir; Gir somnath Dt. (Santapau, 1962; Sisodia, 2007); Panchmahal Dt.: Pavagadh (Oza, 1961)
Flemingia tuberosa Dalzell [= *Moghania tuberosa* (Dalzell) Kuntze]
Herb; *Fl. and Fr.:* September
Gujarat (Sanjappa, 1992); Valsad Dt.: Arnala (Patel, 2013)
***Geissaspis tenella** Benth.
Herb; *Fl. and Fr.:* August – December
Dang Dt. (Tadvi, 2013)
Hardwickia binata Roxb.
Tree; *Fl. and Fr.:* October – February
Ahmedabad Dt. (Meena, 2014a); Anand Dt. (Anjaria, 2002); Chhota udepur Dt.: Kavant (Thaker, 1974), Lachhras (Desai, 2002), Hampeshwar (*DNT1051*, Thakar, 1970); Dang Dt.: Waghai; Gir somnath Dt. (Sisodia, 2007); Junagadh Dt.: Girnar (Santapau, 1962); Panchmahal Dt.: Shivrajpur; Surat Dt.: Cotton Research Farm nursery (Joshi, 1980); Valsad Dt.: Parnera (More, 1972)
Indigofera angulosa Edgew.
Shrub; *Fl. and Fr.:* August – October
Junagadh Dt.: Gir forest (Sanjappa, 1977); Narmada Dt.: Gora, Junaraj (Patel, 1971), Lal-Darvaja, Thevadia (Shah and Patel, 1971); Sabarkantha Dt.: Khedbrahma (Bhatt, 1971; Sanjappa, 1977), Derol Jagir (Parmar, 2012)
Indigofera coerulea var. **monosperma** (Santapau) Santapau [= *Indigofera articulata* var. *monosperma* Santapau]
Shrub; *Fl. and Fr.:* September – October
Gujarat (Sanjappa, 1992); Devbhumi dwarka Dt.: Dwarka railway line, Okha; Gir Somnath Dt.: Veraval (Gopal, 1983); Jamnagar Dt. (Malhotra and Wadhwa, 1973): Latipur (Rao, 2002), Laloi, Ranjit Sagar (Santapau, 1962), Vijarkhi (Nagar, 2005), Jamjodhpur; Junagadh Dt.: Petwad (Menon, 1979), on Rajkot road; Kachchh Dt. (Shah, 1978; Patel *et al*., 2011): Bhadreshwar (Rao, 1981), Mindhiyari (Pandey *et al*., 2009), Tapkeshwari (Joshi *et al*., 2012); Patan Dt.; Porbandar Dt.: Ranavav, Barda; Rajkot Dt.: Hingolgadh (Menon, 1979), Chibhda, Gondal, Jetalsar, Khirsara, Pradhyuman Park (Santapau, 1962; Nagar, 2008); Sabarkantha Dt.: Bhaderesar (Parmar, 2012); Surendranagar Dt.: Chotila (Santapau, 1962), Jupara
***Indigofera dalzellii** T.Cooke [= *Indigofera triquetra* Dalzell]
Herb; *Fl. and Fr.*: July – September
Narmada Dt.: Shoolpaneshwar
Indigofera prostrata Willd.
Herb; *Fl. and Fr.:* August – December
Dahod Dt.: Ratanmahal (Bedi, 1968); Dang Dt. (Tadvi, 2013): Malegaon, Saputara, Subir (Suryanarayana, 1968); Valsad Dt. (Vora, 1980): Viraxet (Rao, 2012), Ghadoi (Patel RM, 1971)
***Indigofera uniflora** Roxb.
Herb; *Fl. and Fr.*: July – March
Gujarat (Singh *et. al*., 2015)
Mimosa prainiana Gamble
Tree; *Fl. and Fr.:* August – December
Gujarat (Singh *et. al*., 2015)
Pterocarpus marsupium subsp. **acuminatus** (Prain) Thoth. [= *Pterocarpus marsupium* var. *acuminatus* Prain]
Tree; *Fl. and Fr.:* April – July
Banaskantha Dt.: Jessore (Punjani *et al*., 2015); Bhavnagar Dt.: Kadambagiri (Meena, 2014b); Chhota udepur Dt.: Alwa (Thaker, 1974), Mithibor at Dolariya (Desai, 2002); Dahod Dt.: Ratanmahal (Bedi, 1968); Dang Dt. (Tadvi, 2013): Ahwa, Subir (Suryanarayana, 1968); Devbhumi dwarka Dt.: Abhapar, Ghumli, (Nagar, 2005); Jamnagar Dt.: Laloi (Santapau, 1962); Junagadh Dt. (Santapau, 1962); Narmada Dt.: Junaraj, Mathavali, Ninaighat (Pradeepkumar, 1993), Kevadiya; Panchmahal Dt. (Bhatt, 1975); Porbandar Dt.: Barda (Thaker, 1910), Godhana, Satvirda (Nagar, 2005); Sabarkantha Dt.: Khedbrahma (Bhatt, 1971), Damavas (Bhatt and Sabnis, 1972); Valsad Dt. (Inamdar and Patel, 1971; Vora, 1980): Parnera (More, 1972), Marala (Patel RM, 1971), Hedri
Senna montana (Roth) V.Singh [= *Cassia montana* Roth]
Shrub; *Fl. and Fr.:* July – October

Devbhumi dwarka Dt.: Kileshwar; Junagadh Dt. (Santapau, 1962): Bordevi, Ramnath; Porbandar Dt.: Barda (Thaker, 1910), Naliadhar, Satvirda
Sesbania procumbens (Roxb.) Wight and Arn. [= *Aeschynomene procumbens* Roxb.]
Herb; *Fl. and Fr.:* February – March
Vadodara Dt. (Sabnis, 1967)
Smithia setulosa Dalzell
Herb; *Fl. and Fr.:* September – October
Dang Dt. (Tadvi, 2013): Saputara (Suryanarayana, 1968); Valsad Dt.: Dharampur
Tephrosia collina V.S.Sharma
Shrub; *Fl. and Fr.:* August – October
Gujarat (Sanjappa, 1992); Jamnagar Dt.: Jamjodhpur (Nagar, 2007; Bhambra, 2015); Kachchh Dt.: Adesar (Raghavan *et al*., 1981); Mehsana Dt.: Salipur, Vadnagar; Narmada Dt.: Rajpipla (Shah, 1978), Junaraj; Sabarkantha Dt.: Dhandha (Parmar, 2012)
Tephrosia jamnagarensis Santapau [= *Tephrosia axillaris* A.R.Sm.]
Herb; *Fl. and Fr.:* September – October
Gujarat (Sanjappa, 1992); Bharuch Dt.: Bhadbhut (Vyas, 1973; Shah, 1978); Jamnagar Dt.: Victoria bridge, near Rozi island (Santapau, 1962), Khadkhambhaliya vidi (Nagar *et. al*., 2003; Bhambra, 2015), Rasi forest, Roji-Valsura; Junagadh Dt.: Sagdividi; Surat Dt.: Udhna (Joshi, 1980)
Vigna khandalensis (Santapau) Sundararagh. and Wadhw [= *Phaseolus khandalensis* Santapau]
Herb; *Fl. and Fr.:* September – October
Dang Dt. (Tadvi, 2013): Saputara (Suryanarayana, 1968); Valsad Dt.: Kaprada

Euphorbiaceae Juss:-
***Acalypha malabarica** Müll.Arg. [= *Ricinocarpus malabaricus* (Müll.Arg.) Kuntze]
Herb; *Fl. and Fr.:* July – October
Ahmedabad Dt. (Meena, 2014a); Banaskantha Dt.: Palanpur (Meena, 2012); Bhavnagar Dt. (Oza, 1991); Chhota udepur Dt.: Kavant (Thaker, 1974); Gir somnath Dt. (Santapau and Raizada, 1954); Junagadh Dt.: Sasan (Bole and Pathak, 1988; Baxi, 2003); Rajkot Dt.: Gondal irrigation lake, Pradhyuman park (Bole and Pathak, 1988); Sabarkantha Dt. (Parmar, 2012): Damavas (Bhatt, 1971)
Euphorbia coccinea B.Heyne ex Roth [= *Chamaesyce coccinea* (B.Heyne ex Roth) Soják]
Herb; *Fl. and Fr.:* June – October
Daman: Daman airport, Delvada (29.6.1964, M.Y. *Ansari 98538*, BSI)
***Euphorbia deccanensis** V.S.Raju
Herb; *Fl. and Fr.:* October
Devbhumi dwarka Dt.: Beyt; Jamnagar Dt.
Euphorbia elegans Spreng. [= *Chamaesyce elegans* (Spreng.) Soják]
Herb; *Fl. and Fr.:* Mar – May
Porbandar Dt.: Bhad, Garej, Kadachh, Madhavpur (Bole and Pathak, 1988; Baxi, 2003)
***Euphorbia perbracteata** Gage [= *Tithymalus perbracteatus* (Gage) Soják]
Herb; *Fl. and Fr.:* December – April
Anand Dt.: Dhuvaran; Bharuch Dt.: Kavi; Daman: Dabel near tank (4.6.1963, R.S. Rao 89002, CAL); Dang Dt. (Tadvi, 2013): Malegaon, Saputara; Surat Dt. (Joshi, 1980); Vadodara Dt.: Savli (Padate, 1973), Chokari
Euphorbia pycnostegia Boiss. [= *Euphorbia pycnostegia* var. *pycnostegia*]
Herb; *Fl. and Fr.:* October – December
Dang Dt. (Tadvi, 2013): Saputara (Suryanarayana, 1968), Malegaon; Junagadh Dt.: Visavadar (Bole and Pathak, 1988; Baxi, 2003); Rajkot Dt. (Bole and Pathak, 1988)
***Euphorbia pycnostegia** var. **zornioides** (Boiss.) Santapau [= *Euphorbia zornioides* Boiss.]
Herb; *Fl. and Fr.:* August – October
Daman: Savardem, Valpai road (3.10.1970, N.P. Singh, *124958* BSI); Surat Dt.: Bhimpor, Dumas, Magdalla; Vadodara Dt.: Pratapnagar (Patil and Sabnis, 1982)
Euphorbia sebastinei Binojk. and N.P.Balakr. [= *Chamaesyce sebastinei* (Binojk. and N.P.Balakr.) V.S.Raju]
Herb; *Fl. and Fr.:* March – June
Devbhumi dwarka Dt. (Binojkumar, 1993)
***Homonoia retusa** (Graham ex Wight) Müll.Arg. [= *Adelia retusa* Graham ex Wight]
Shrub; *Fl. and Fr.:* November – April
Narmada Dt.: Gora, Kevadia (Patel, 1971), Surpan

***Mallotus polycarpus** (Benth.) Kulju and Welzen [= *Trewia polycarpa* Benth.; *Trewia nudiflora* var. *polycarpa* (Benth.) Susila and N.P.Balakr.]
Tree; *Fl. and Fr.:* December – June
Narmada Dt.; Dang Dt.: Ahwa; Valsad Dt.: Barpuda, Gundiya, Pangarbari, Kaprada (Reddy, 1987), Amba (Rao, 2012), Jogvel, Lavkar, Ozarda, Sildha (Vora, 1980)

Malpighiaceae Juss;-
***Aspidopterys cordata** (B.Heyne ex Wall.) A.Juss. [= *Hiraea cordata* B.Heyne ex Wall.]
Climber; *Fl. and Fr.:* September – January
Dang Dt. (Chavan and Oza, 1966): Saputara (Patel, 2013), Ahwa, Malegaon, Pipaldahad, Shamgahan (Suryanarayana, 1968); Navsari Dt.: Mankunia; Valsad Dt.: Pangarbari, Sutharpada (Reddy, 1987; Patel, 2013)

Phyllanthaceae Martinov:-
***Bridelia montana** (Roxb.) Willd. [= *Clutia montana* Roxb.]
Shrub; *Fl. and Fr.:* August – January
Valsad Dt.: Amba, Avdha, Lavkar, Mandva, Nandgam, Sanjan, Sildha, Umbergaon
***Phyllanthus lawii** J.Graham [= *Diasperus lawii* (J.Graham) Kuntze; *Phyllanthus juniperinoides* Müll.Arg.]
Shrub; *Fl. and Fr.:* November
Bharuch Dt.: Kabirvad; Chhota udepur Dt.: Hampheshwar; Narmada Dt.: Garudeshwar, Kevadiya

Salicaceae Mirb:-
***Flacourtia montana** J.Graham
Tree; *Fl. and Fr.:* December – January
Dang Dt.: Ahwa, Mahal, Malegaon; Gir somnath Dt. (Sisodia, 2007); Junagadh Dt.; Panchmahal Dt.: Pavagadh (Oza, 1961; Chavan and Oza, 1962), Narukot

Rhamnaceae Juss:-
***Ziziphus caracutta** Buch.-Ham. ex Roxb.
Tree; *Fl. and Fr.:* April – June
Dang Dt.: Malegaon; Junagadh Dt.: Sasan (Hiran river); Valsad Dt.
***Ziziphus horrida** Roth
Shrub; *Fl. and Fr.:* July – December
Ahmedabad Dt. (Meena, 2014a): Kadi (Yogi, 1970); Amreli Dt.: Dhari (Menon, 1979); Banaskantha Dt.: Ambaji (Meena, 2012); Dang Dt.: Ahwa (Suryanarayana, 1968); Gir somnath Dt.: Una (Menon, 1979); Junagadh Dt.: Ramnath, Visavadar (Menon, 1979); Mahisagar Dt.: Lunawada; Mehsana Dt. (Shah and Yogi, 1974); Narmada Dt.: Kevadiya (Patel, 1971); Panchmahal Dt. (Bhatt, 1975): Pavagadh (Oza, 1961); Surat Dt.: Chandrapada, Umarpada
Ziziphus williamii Bhandari and Bhansali
Tree; *Fl. and Fr.:* August – October
Ahmedabad Dt.; Bharuch Dt.; Devbhumi dwarka Dt.: Beyt, Shankhodhar island; Kachchh Dt.: Rudramata

Brassicaceae Burnett:-
***Rorippa cochlearioides** (Roth) Al-Shehbaz and Jonsell [= *Alyssum cochlearioides* Roth; *Cochlearia cochlearioides* (Roth) Santapau and Mahesw.]
Herb; *Fl. and Fr.:* December – January
Chhota udepur Dt.: Hampheshwar (Thaker, 1974), Moti Chikli, Ambadungar; Narmada Dt.: Chopadi, Kalvat, Ninaighat (Pradeepkumar, 1993), Gora, Kevadiya (Patel, 1971), Suryakhadi (Shah and Patel, 1971), Rajpipla; Panchmahal Dt.: Pavagadh

Cleomaceae Bercht. and J. Presl:-
Cleome simplicifolia Hook.f. and Thomson
Herb; *Fl. and Fr.:* August – September
Bhavnagar Dt. (Oza, 1991): Palitana (Menon, 1979), Hathab, Shatrunjaya dam (Meena, 2014b); Chhota udepur Dt. (Desai, 2002): Kavant (Thaker, 1974); Dahod Dt.: Ratanmahal (Bedi, 1968), Pipargota (*BEDI2162* Bedi, 1962), Tokarva (*BEDI3396* Bedi, 1962), Devgadh Baria; Devbhumi dwarka Dt.: Bhanvad (Santapau, 1962); Gandhinagar Dt.: Mansa; Gir somnath Dt. (Sisodia, 2007); Jamnagar Dt.: Vijarkhi dam (Santapau, 1962), Abhapar, Kileshwar, Venu, Ghumli (Nagar, 2005); Junagadh Dt.: Sapnes, Sasan (Menon, 1979); Kachchh Dt. (Patel *et al*., 2011):

Nakhatrana (Bhatt, 1993), Mindhiyari (Pandey *et al*., 2009); Kheda Dt.: Matar (*BEDI772* Bedi, 1960); Panchmahal Dt.: Chari (*BEDI1906* Bedi, 1961); Porbandar Dt.: Godhana, Satvirda, Adityana, Ranavav (Thaker, 1910; Nagar, 2005); Rajkot Dt.: Hingolgadh (Menon, 1979), Gondal, Pradhyuman park (Santapau, 1962); Sabarkantha Dt.: Dan Mahudi (*RPB1463*, Bhatt, 1968), Khedbrahma (Yogi, 1970; Bhatt, 1971; Parmar, 2012); Surat Dt.: Rander (Joshi, 1980); Vadodara Dt.: Savli (Padate, 1969; Padate, 1973), Wasanpura (*SNP1605*, Padate, 1961), Lacchanpur (*SNP701*, Padate, 1959), Mokshi (*SNP3867*, Padate, 1972), Manjusar (*SNP1301*, Padate, 1960)

Malvaceae Juss:-

Abelmoschus manihot subsp. **tetraphyllus** var. **megaspermus** Hemadri [= *Abelmoschus manihot* var. *megaspermus* Hemadri]
Undershrub; *Fl. and Fr.:* October – November
Chhota udepur Dt. (Desai, 2002): Hampheshwar; Mehsana Dt.: Kadi
Abelmoschus tuberculatus var. **deltoidefolius** T.K.Paul and M.P.Nayar
Undershrub; *Fl. and Fr.:* August – October
Kachchh Dt.: Narayan sarovar (Parmar and Singh, 2003), Mindhiyari (Pandey *et al*., 2009)
***Erinocarpus nimmonii** J.Graham [= *Erinocarpus nimmoanus* Mast.]
Tree; *Fl. and Fr.*: September – February
Dang Dt: Waghai; Valsad Dt.
Eriolaena stocksii Hook.f. and Thomson ex Mast.
Tree; *Fl. and Fr.:* June – August
Dang Dt. (Tadvi, 2013): Waghai (Gopal, 1983), Gira, Giri, Taola hills (Suryanarayana, 1968), Saputara (Shah and Suryanarayana, 1968), Kalibel; Junagadh Dt.: Sapnes (Menon, 1979); Narmada Dt.: Rajpipla (Gopal, 1983), Gora, Piplod, Sagai (Sharma, 2010), Thavadia; Valsad Dt.

Combretaceae R. Br:-

Anogeissus sericea var. **nummularia** King ex Duthie [= *Anogeissus rotundifolia* Blatt. and Hallb.]
Tree; *Fl. and Fr.:* January – April
Arvalli Dt.: Mahudi, Modasa, Vatrak; Banaskantha Dt.: Balaram temple (Rajendrakumar and Kalavathy, 2010; Meena, 2012), Jessore wildlife sanctuary (Rajendrakumar and Kalavathy, 2010); Gandhinagar Dt.: Mansa; Kheda Dt.; Mehsana Dt.: Juna Sudarsana, Taranga hill (Rajendrakumar and Kalavathy, 2010); Panchmahal Dt.: Tuwa, Pavagadh; Sabarkantha Dt.: Modasa (Parmar, 2012); Vadodara Dt.: Karachiya (Rao, 2002)
Anogeissus sericea Brandis
Tree; *Fl. and Fr.:* January – April
Ahmedabad Dt. (Meena, 2014a); Anand Dt. (Anjaria, 2002); Arvalli Dt.: Mahudi (Yogi, 1970), Modasa, Vatrak (Saxton and Sedgwick, 1918); Banaskantha Dt.: Jessore (Meena, 2012; Punjani *et al*., 2015); Gandhinagar Dt.: Mansa (Yogi, 1970), Moti Pavathi (Gopal, 1983); Junagadh Dt.: Ghodawadi (Menon, 1979); Panchmahal Dt.: Pavagadh (Shah, 1978), Tuwa (Deshpande, 1968); Sabarkantha Dt.: Khedbrahma (Bhatt, 1971), Mama na pipla (Bhatt and Sabnis, 1972)

Lythraceae J. St.-Hil:-

Ammannia nagpurensis T.Mathew and M.P.Nayar
Herb; *Fl. and Fr.:* October – November
Junagadh Dt.: Sasangir to Junvaniya (Mathew and Nayar, 1989); Navsari Dt.: Unai (Mathew and Nayar, 1989)
***Lagerstroemia microcarpa** Wight
Tree; *Fl. and Fr.:* May – December
Ahmedabad Dt. (Meena, 2014a); Chhota udepur Dt.: Kadipani, Adtia, Satun, Raipur Kundai, Ghantoli-songir (Desai, 2002), Kavant (Thaker, 1974); Dang Dt. (Suryanarayana, 1968); Narmada Dt.: Junaraj, Kevadiya (Patel, 1971), Kelda, Kokati, Ninaighat, Sagai, Shisha; Valsad Dt.: Bildha, Jogvel, Nana Pondha, Panas (Vora, 1980), Hedri, Pendha, Umli (Rao, 2012)

Myrtaceae Juss:-

***Syzygium salicifolium** (Wight) J.Graham [= *Eugenia salicifolia* Wight; *Syzygium heyneanum* (Duthie) Gamble; *Eugenia heyneana* Duthie]
Tree; *Fl. and Fr.:* April – May
Arvalli Dt.: Modasa, Vatrak (Saxton and Sedgwick, 1918), Mahudi; Banaskantha Dt.: Gannapipadi, Ambaji (Meena, 2012); Chhota udepur Dt.: Kavant (Thaker, 1974); Dahod Dt.: Ratanmahal (Bedi, 1968), Bhuvera (Gopal, 1983);

Dang Dt. (Tadvi, 2013); Gandhinagar Dt. (Meena, 2014a); Gir somnath Dt. (Sisodia, 2007); Junagadh Dt. (Menon, 1979); Narmada Dt.: Rajpipla (Gopal, 1983), Kelda, Sagai, Waghumar (Pradeepkumar, 1993); Panchmahal Dt.; Sabarkantha Dt.: Khedbrahma (Yogi, 1970; Bhatt, 1971; Bhatt and Sabnis, 1972), Pahada (Yogi, 1970), Vijainagar, Dholwani (Parmar, 2012); Surat Dt.: Zankhvav (Yadav, 1979); Vadodara Dt.: Kamalpura; Valsad Dt. (Vora, 1980): Hedri, Pendha (Yadav, 1979), Kaprada (Rao, 2012)

Burseraceae Kunth:-
***Boswellia serrata** Roxb. ex Colebr.
Tree; *Fl. and Fr.:* December – April
Ahmedabad Dt.: Kundal; Arvalli Dt.: Modasa; Banaskantha Dt.: Jessore (Meena, 2012), Dantiwada, Palanpur (Patel, 2009); Bharuch Dt.; Bhavnagar Dt.: Palitana, Shatrunjaya hill (Meena, 2014b); Chhota udepur Dt.: Kevdi, Kundal, Satun (Desai, 2002), Kavant (Thaker, 1974), Ambadungar (*DNT1518*, Thakkar, 1971); Dahod Dt.: Ratanmahal (Bedi, 1968), Devgadh Baria (Chavan *et al*., 1963), Dhanpur (*BEDI1222*, Bedi, 1961); Dang Dt. (Tadvi, 2013): Subir (Suryanarayana, 1968); Gir somnath Dt. (Santapau and Raizada, 1954; Sisodia, 2007); Jamnagar Dt.: Laloi (Santapau, 1962); Junagadh Dt.: Sapnes, Tulsishyam (Menon, 1979), Kankai (Santapau, 1962), Sasan (Gopal, 1983); Kachchh Dt. (Patel *et al*., 2011); Kheda Dt.: Matar (*BEDI2423* Bedi, 1962); Mahisagar Dt.; Narmada Dt.: Gora, Junaraj (Patel, 1971), Dhirkhadi, Mokhdi, Surpan, Thavadia (Pradeepkumar, 1993); Navsari Dt.; Panchmahal Dt.: Machi, Pavagadh (Oza, 1961); Patan Dt.: Satun; Rajkot Dt.: Hadala (Menon, 1979); Sabarkantha Dt.: Khedbrahma (Bhatt, 1971), Idar (Yogi, 1970), Kotda (Parmar, 2012), Modasa (Saxton and Sedgwick, 1918; Parmar, 2012); Surat Dt.: Kevdi; Surendranagar Dt.: Chotila (Santapau, 1962), Rampara; Valsad Dt.: Chavshala (Yadav, 1979), Dharampur (Gopal, 1983; Reddy, 1987), Kaprada, Nana Pondha (Vora, 1980)

Amaranthaceae Juss:-
***Achyranthes coynei** Santapau
Shrub; *Fl. and Fr.:* September – March
Kachchh Dt.: Kalo Dungar (Satish *et al*., 2015)

Tamaricaceae Link:-
Tamarix kutchensis B.V.Shetty and R.P.Pandey
Shrub; *Fl. and Fr.:* November – January
Kachchh Dt.: Mundra – Mandvi (Shetty and Pandey, 1992), Narayan sarovar tank side (Pandey *et al*., 2009)

Loranthaceae Juss:-
Dendrophthoe falcata var. **coccinea** (Talbot) Santapau [= *Loranthus longiflorus* var. *coccinea* Talbot]
Shrub; *Fl. and Fr.:* February – March
Arvalli Dt.: Modasa; Chhota udepur Dt.: Kavant (Thaker, 1974); Junagadh Dt.: Girnar (Bole and Pathak, 1988); Narmada Dt.: Rajpipla (Shah, 1967); Valsad Dt.: Kaprada (Rao, 2012)

Balsaminaceae A. Rich:-
***Impatiens minor** (DC.) Bennet [= *Balsamina minor* DC.; *Impatiens kleinii* Wight and Arn.]
Herb; *Fl. and Fr.:* August – November
Dahod Dt.: Banvaro (*BEDI457*, Bedi, 1961; *BEDI3012* Bedi, 1962), Pipargota (*BEDI1439*, Bedi, 1961); Dang Dt. (Tadvi, 2013): Ahwa, Malegaon (Suryanarayana, 1968); Mehsana Dt.: Medha; Narmada Dt.: Shisha (Pradeepkumar, 1993); Navsari Dt.: Bansda, Vati; Tapi Dt.: Gaumukh, Vyara; Valsad Dt.: Pangarbari (Reddy, 1987), Ozarda (Rao, 2012), Bilpudi, Boralai

Boraginaceae Juss:-
***Adelocaryum coelestinum** (Lindl.) Brand [= *Cynoglossum coelestinum* Lindl.; *Paracaryum coelestinum* (Lindl.) C.B.Clarke]
Herb; *Fl. and Fr.:* September – November
Dang Dt. (Tadvi, 2013): Don, Saputara; Narmada Dt.: Shisha (Pradeepkumar, 1993), Ninaighat
***Cordia domestica** Roth
Tree; *Fl. and Fr.:* May – August
Ahmedabad Dt. (Meena, 2014a); Chhota udepur Dt. (Shah, 1978): Koraj (Desai, 2002); Dahod Dt.: Popatkuwa (Rao, 2002); Dang Dt. (Tadvi, 2013): Mahal (Yadav, 1979); Junagadh Dt.: Mangrol (Santapau, 1953; Bole and

Pathak, 1988); Panchmahal Dt. (Shah, 1978); Sabarkantha Dt.: Bayad (Parmar, 2012); Valsad Dt.: Kaprada (Reddy, 1987)

Apocynaceae Juss:-
Brachystelma laevigatum Hook.f. [= *Eriopetalum laevigatum* Wight]
Herb; *Fl. and Fr.:* August
Kachchh Dt.
Ceropegia odorata Nimmo [= *Ceropegia blatteri* McCann]
Climber; *Fl. and Fr.:* July – August
Panchmahal Dt.: Pavagadh (Sabnis and Bedi, 1971); Sabarkantha Dt.: Vijaynagar
Sarcostemma intermedium Decne.
Shrub; *Fl. and Fr.:* July – September
Bhavnagar Dt.: Piram island at the mouth of the Narmada river
***Hemidesmus indicus** var. **pubescens** (Wight and Arn.) Hook.f. [= *Hemidesmus pubescens* Wight and Arn.]
Climber; *Fl. and Fr.:* September – October
Junagadh Dt.: Girnar, Chobari (Patel, 2013); Kachchh Dt.: Muru village along Hajipir road (Singhadiya *et al*., 2011); Narmada Dt.: Ninai waterfall; Panchmahal Dt.
***Heterostemma dalzellii** Hook.f.
Shrub; *Fl. and Fr.:* August – October
Narmada Dt.: Gichad (Meena and HariKrishna, 2015)
Tylophora dalzellii Hook.f.
Climber; *Fl. and Fr.:* April – December
Saurashtra (Bole and Pathak, 1988); Dahod Dt.: Dhanpur; Dang Dt. (Tadvi, 2013): Malegaon (Suryanarayana, 1968), Ahwa (*MCJ500*, Joshi, 1970); Devbhumi dwarka Dt.: Abhapar, Kileshwar, Venu, Ghumli (Nagar, 2005); Junagadh Dt.: Sasan; Kachchh Dt. (Thaker, 1910); Patan Dt.: Satun; Porbandar Dt.: Barda (Thaker, 1910; Nagar, 2005); Valsad Dt.: Pangarbari, Sutharpada (Patel, 2013), Dharampur
Wrightia dolichocarpa Bahadur and Bennet
Tree; *Fl. and Fr.:* December – April
Banaskantha Dt: Jessore (Rao, 2002); Dang Dt. (Tadvi, 2013); Dadra and Nagar Haveli (Reddy, 1987): Bonta, Saili (Bahadur and Bennet, 1978); Devbhumi dwarka Dt.: Ghumli; Junagadh Dt.: Girnar; Narmada Dt.: Sagai; Sabarkantha Dt.: Vijaynagar; Valsad Dt.: Moti Korval, Kapurnya (Reddy, 1987), Wilson hill

Gentianaceae Juss:-
***Canscora concanensis** C.B.Clarke
Herb; *Fl. and Fr.:* October – November
Dang Dt. (Tadvi, 2013): Ahwa (Suryanarayana, 1968); Devbhumi dwarka Dt.: Abhapar, Venu (Nagar, 2005); Mahisagar Dt.: Lunawada; Navsari Dt.: Ambabari (Desai, 1976); Panchmahal Dt. (Bhatt, 1975): Machi, Bhadrakali (Bedi *et al.*, 1968); Porbandar Dt.: Godhana, Satvirda (Nagar, 2005); Surat Dt.: Siddh Kutir (Joshi, 1980)
***Exacum pumilum** Griseb.
Herb; *Fl. and Fr.:* August – November
Dang Dt. (Tadvi, 2013): Ahwa (Suryanarayana, 1968); Jamnagar Dt.: Khatiya, Ranjit Sagar; Junagadh Dt.: Gir (Sisodia, 2007); Navsari Dt.: Bansda (Desai, 1976); Valsad Dt. (Patel RM, 1971): Kaprada, Nana Pondha (Vora, 1980), Pardi (More, 1972)
***Swertia minor** (Griseb.) T.Cooke
Herb; *Fl. and Fr.:* August
Dang Dt. (Tadvi, 2013): Malegaon (Suryanarayana, 1968); Valsad Dt.: Pangarbari, Pindval

Rubiaceae Juss:-
***Ixora brachiata** Roxb.
Tree; *Fl. and Fr.:* February – June
Banaskantha Dt.: Balaram-Ambaji wildlife sanctuary (Meena, 2012); Bhavnagar Dt. (Oza, 1991); Chhota udepur Dt.: Ganiyar Bari, Jetpur Pavi, Koraj, Naswadi, Satun, Vasangadh (Desai, 2002); Dang Dt. (Tadvi, 2013); Gir somnath Dt. (Sisodia, 2007); Junagadh Dt.: Girnar, Mithyala, Sapnes (Menon, 1979), Sasan, Willingdon dam (Santapau, 1962); Mahisagar Dt.: Dezar, Shingnali (Bhatt, 1975); Mehsana Dt. (Shah and Yogi, 1974); Porbandar Dt.: Kileshwar (Santapau, 1962); Rajkot Dt.: Hadala (Menon, 1979), Gondal lake (Santapau, 1962); Valsad Dt.: Kaprada (Gopal, 1983), Dhamni, Pendha (Yadav, 1979), Bilpudi, Mandva, Nana Pondha (Vora, 1980)

Kohautia nagporensis (Brace ex Haines) Santapau and Merchant [= *Oldenlandia nagporensis* Brace ex Haines]
Herb; *Fl. and Fr.:* August – September
Panchmahal Dt.
***Neanotis rheedei** (Wight and Arn.) W.H.Lewis [= *Hedyotis rheedei* Wight and Arn.]
Herb; *Fl. and Fr.:* July – October
Chhota udepur Dt.; Dang Dt. (Chavan and Oza, 1966; Tadvi, 2013); Valsad Dt.: Dharampur, Kaprada, Nana Pondha (Vora, 1980)
***Pavetta crassicaulis** Bremek.
Shrub; *Fl. and Fr.:* July – October
Dang Dt. (Tadvi, 2013): Waghai (Yadav, 1979), Malegaon, Saputara (Suryanarayana, 1968); Valsad Dt.: Kaprada (Yadav, 1979), River Par, River Kolak (Vora, 1980), Dharampur, Dixal, Huda

Acanthaceae Juss:-
***Asystasia dalzelliana** Santapau
Herb; *Fl. and Fr.:* August – December
Dang Dt. (Tadvi, 2013): Ahwa, Malegaon, Saputara, Subir (Suryanarayana, 1968)
***Barleria cuspidata** F.Heyne ex Nees
Shrub; *Fl. and Fr.:* December – March
Dang Dt.; Gandhinagar Dt.: Norda nala; Gir somnath Dt. (Sisodia, 2007); Kachchh Dt.; Mehsana Dt. (Shah and Yogi, 1974)
***Barleria gibsonii** Dalzell
Undershrub; *Fl. and Fr.:* September – November
Dang Dt.: Saputara (Suryanarayana, 1968), Gira; Gir somnath Dt. (Sisodia, 2007); Junagadh Dt.: Girnar (Menon, 1979); Valsad Dt.: Dharampur, Kaprada, Nana Pondha (Vora, 1980), Rabda (More, 1972), Fansa, Pangarbari, Sarigam
***Barleria lawii** T.Anderson [= *Barleria sepalosa* C.B.Clarke]
Shrub; *Fl. and Fr.:* October – December
Bhavnagar Dt. (Menon, 1979); Dang Dt.: Saputara (Suryanarayana, 1968); Junagadh Dt.: Cremation ground (Bole and Pathak, 1988), Girnar; Valsad Dt.: Dharampur, Kaprada, Nana Pondha (Vora, 1980)
***Barleria prattensis** Santapau
Undershrub; *Fl. and Fr.:* September – December
Banaskantha Dt.: Koteshwar near Ambaji (Meena, 2012); Bhavnagar Dt.: Kadambagiri (Meena, 2014b); Chhota udepur Dt.: Vagasthal, Rajmahal, Kadipani, Ambadungar, Satun, Jamlidam, Naswadi, Turkheda (Desai, 2002), Kavant (Thaker, 1974); Dahod Dt.: Alindra, Pipargota (Bedi, 1968); Dang Dt. (Tadvi, 2013): Borkhal, Mahal, Waghai (Yadav, 1979), Ahwa, Malegaon, Subir (Suryanarayana, 1968), Don; Gir somnath Dt. (Santapau and Raizada, 1954); Jamnagar Dt.: Kileshwar (Bole and Pathak, 1988); Junagadh Dt.: Sasan (Menon, 1979), Girnar, Junvaniya (Bole and Pathak, 1988); Mehsana Dt. (Shah and Yogi, 1974); Narmada Dt.: Mohbi, Namgir, Waghumar (Pradeepkumar, 1993); Panchmahal Dt.: Pavagadh (Oza, 1961), Tuwa (Deshpande, 1968); Sabarkantha Dt. (Parmar, 2012): Khedbrahma (Bhatt, 1971); Vadodara Dt.: Savli (Padate, 1969; Padate, 1973); Valsad Dt.: Avdha, Dhamni, Pendha, Sidhumbar, Sanjan, Palgam (Yadav, 1979), Amba, Bilpudi, Mandva (Vora, 1980), Parnera (More, 1972), Dungri hill (Patel RM, 1971), Khadakval (Rao, 2012)
***Cynarospermum asperrimum** (Nees) Vollesen [= *Blepharis asperrima* Nees]
Herb; *Fl. and Fr.:* September – December
Dang Dt.: Malegaon; Sabarkantha Dt. (Parmar, 2012): Khedbrahma (Bhatt, 1971); Valsad Dt.: Pendha (Yadav, 1979), Pangarbari
***Dyschoriste vagans** (Wight) Kuntze [= *Calophanes dalzellii* Benth. ex T.Anderson; *Calophanes vagans* Wight]
Herb; *Fl. and Fr.:* November – February
Dang Dt.: Bheskatri, Mahal, Malegaon, Saputara; Narmada Dt.; Valsad Dt. (Patel RM, 1971): Veri Bhavada (Rao, 2012), Dharampur, Kaprada, Nana Pondha (Vora, 1980), Nanakwada (Patel RM, 1971), Moti Korval, Tutarkhed
***Eranthemum roseum** (Vahl) R.Br. [= *Justicia rosea* Vahl; *Daedalacanthus roseus* (Vahl) T.Anderson]
Undershrub; *Fl. and Fr.:* October – January
Ahmedabad Dt.; Anand Dt. (Anjaria, 2002); Chhota udepur Dt.: Mogra, Kadipani, Hampeshwar road, Koraj, Satun, Raipur-kundal, Naswadi, Lagami (Desai, 2002), Kavant (Thaker, 1974); Dahod Dt.: Ratanmahal (Bedi, 1968); Dang Dt. (Tadvi, 2013): Ahwa, Mahal, Malegaon, Pipaldahad, Saputara, Subir (Suryanarayana, 1968), Bheskatri; Devbhumi dwarka Dt.: Abhapara, Ghumli (Bole and Pathak, 1988); Jamnagar Dt.; Junagadh Dt.: Girnar (Bole and Pathak, 1988), Sasan (Menon, 1979); Mehsana Dt. (Shah and Yogi, 1974); Narmada Dt.: Ninaighat, Sagai, Vav,

Waghumar (Pradeepkumar, 1993), Rajpipla (Shah, 1967), Chanderpada; Navsari Dt.: Abrama; Panchmahal Dt.: Pavagadh (Oza, 1961); Sabarkantha Dt.: Khedbrahma (Bhatt, 1971; Bhatt and Sabnis, 1972); Vadodara Dt.: Savli (Padate, 1969), Kamalpura; Valsad Dt. (Inamdar and Patel, 1971): Vavar (Rao, 2012), Dharampur, Kaprada, Nana Pondha (Vora, 1980), Abrama, Atgam, Palan (Patel RM, 1971), Hedri, Parnera, Pendha

***Gantelbua urens** (B.Heyne ex Roxb.) Bremek.

Herb; *Fl. and Fr.:* January – March

Chhota udepur Dt.: Kavant (Thaker, 1974); Dang Dt.: Ahwa; Narmada Dt.: Gichad, Khaman, Namgir (Pradeepkumar, 1993); Navsari Dt.: Bilimora, Unai; Sabarkantha Dt. (Parmar, 2012): Khedbrahma (Bhatt, 1971); Surat Dt. (Joshi, 1980); Vadodara Dt.: Sundarpura (Sabnis, 1967), Dabhoi; Valsad Dt. (Patel RM, 1971): Kaprada (Rao, 2012), Pardi (More, 1972), Dharampur, Nana Pondha

***Haplanthodes nilgherrensis** (Wight) R.B.Majumdar [= *Haplanthus nilgherrensis* Wight.]

Herb; *Fl. and Fr.:* September – December

Banaskantha Dt.: Balaram-Ambaji wildlife sanctuary (Meena, 2012); Dahod Dt.: Banvaro, Panam (Bedi, 1968); Narmada Dt.: Namgir, Shisha, Waghumar (Pradeepkumar, 1993), Rajpipla (Shah, 1967); Panchmahal Dt.: Pavagadh (Oza, 1961); Surat Dt. (Joshi, 1980); Vadodara Dt.; Valsad Dt. (Inamdar and Patel, 1971): Dharampur, Kaprada, Nanapondha (Vora, 1980)

***Haplanthodes tentaculatus** (L.) R.B.Majumdar [= *Ruellia tentaculata* L.]

Herb; *Fl. and Fr.:* October – January

Ahmedabad Dt.; Chhota udepur Dt.: Kavant (Thaker, 1974); Dang Dt. (Tadvi, 2013): Bheskatri, Pipaldahad (Yadav, 1979), Ahwa, Mahal, Malegaon, Subir (Suryanarayana, 1968); Gir somnath Dt. (Santapau and Raizada, 1954); Junagadh Dt.: Shirvaniya (Bole and Pathak, 1988); Mahisagar Dt.; Narmada Dt.: Sagai; Navsari Dt.: Bansda (Desai, 1976); Panchmahal Dt.: Vishwamitri riverbank (Chavan and Sabnis, 1960); Surat Dt.: Zankhvav (Yadav, 1979); Valsad Dt. (Patel RM, 1971): Kaprada (Rao, 2012), Dharampur, Nanapondha (Vora, 1980), Parnera (More, 1972), Hedri, Pendha (Yadav, 1979)

***Haplanthodes verticillatus** (Roxb.) R.B.Majumdar

Herb; *Fl. and Fr.:* October – January

Banaskantha Dt.: Balaram-Ambaji road, Jessore wildlife sanctuary (Meena, 2012); Chhota udepur Dt.: Kavant (Thaker, 1974); Dahod Dt.: Ratanmahal (Bedi, 1968); Dang Dt. (Tadvi, 2013): Ahwa, Nilsakiya (Yadav, 1979), Malegaon, Pipaldahad, Saputara, Subir (Suryanarayana, 1968); Gir somnath Dt. (Santapau and Raizada, 1954); Junagadh Dt.: Girnar, Junvaniya, Kankai, Sasan, Shirvaniya (Bole and Pathak, 1988); Kheda Dt.: Kapadvanj; Narmada Dt.: Chopadi, Namgir, Vav (Pradeepkumar, 1993), Rajpipla (Shah, 1967); Navsari Dt.: Anklachh, Vati (Desai, 1976); Panchmahal Dt.: Machi (Oza, 1961), Kavant; Sabarkantha Dt.: Khedbrahma (Bhatt, 1971; Bhatt and Sabnis, 1972), Dholwani, Vanaj (Parmar, 2012); Surat Dt.: Vankal; Vadodara Dt.: Savli (Padate, 1969; Padate, 1973); Valsad Dt.: Kaprada (Rao, 2012), Dharampur, Nana Pondha (Vora, 1980)

***Hygrophila serpyllum** T.Anderson [= *Physichilus serpyllum* Nees]

Herb; *Fl. and Fr.:* September – December

Anand Dt.: Khambhat (Bhagwanani, 1980); Arvalli Dt.: Modasa, Vatrak (Saxton and Sedgwick, 1918); Banaskantha Dt.: Hathidhara forest (Meena, 2012); Dahod Dt.: Devgadh Baria; Dang Dt. (Tadvi, 2013): Bheskatri, Galkund, Sunda (Yadav, 1979), Ahwa, Malegaon, Pipaldahad, Subir (Suryanarayana, 1968); Gir somnath Dt.; Junagadh Dt.; Kachchh Dt. (Patel *et al*., 2011); Narmada Dt.: Kelda, Namgir, Sankali, Waghumar (Pradeepkumar, 1993), Rajpipla (Shah, 1967); Navsari Dt.: Bansda (Desai, 1976); Panchmahal Dt.: Sankali; Porbandar Dt.: Barda (Bole and Pathak, 1988); Sabarkantha Dt.: Khedbrahma (Yogi, 1970; Bhatt, 1971; Bhatt and Sabnis, 1972; Parmar, 2012), Himmatnagar, Moti Posina, Vireshwar; Surat Dt.: Umarpada; Vadodara Dt.: Savli (Padate, 1973); Valsad Dt. (Inamdar and Patel, 1971): Pendha (Yadav, 1979), Parnera (More, 1972), Umbergaon (Bhagwanani, 1980)

***Justicia neesii** Ramamoorthy [= *Rostellularia neesii* (Ramamoorthy) A.K.Mukh.]

Herb; *Fl. and Fr.:* September – December

Anand Dt.: Dhuvaran; Bharuch Dt.: Kavi; Dahod Dt.: Kanjeta; Junagadh Dt.: Girnar (Bole and Pathak, 1988); Navsari Dt.: Chari; Surat Dt.; Tapi Dt.: Gaumukh; Valsad Dt.: Pangarbari

***Justicia orbiculata** T.Anderson

Herb; *Fl. and Fr.:* August – November

Ahmedabad Dt. (Saxton and Sedgwick, 1918; Yogi, 1970); Sabarkantha Dt.: Prantij (Saxton and Sedgwick, 1918; Parmar, 2012)

Neuracanthus sphaerostachys Dalzell

Shrub; *Fl. and Fr.:* August – October

Arvalli Dt.: Modasa (Yogi, 1970); Banaskantha Dt.: Danta on way to Hadad, Kangura-Umbrapani village near Ambaji (Meena, 2012), Vav; Bhavnagar Dt.: Mithivirdi (Meena, 2014b); Chhota udepur Dt.: Ambadungar, Pavi-

jetpur, Satun (Desai, 2002), Kavant (Thaker, 1974); Dahod Dt.: Ratanmahal (Bedi, 1968), Devgadh Baria; Dang Dt. (Tadvi, 2013): Ghoghli, Subir (Yadav, 1979), Ahwa, Pipaldahad (Suryanarayana, 1968), Waghai; Devbhumi dwarka Dt.: Abhapar, Kileswar, Venu, Ghumli (Nagar, 2005); Gir somnath Dt. (Santapau and Raizada, 1954; Sisodia, 2007); Junagadh Dt.: Girnar (Bole and Pathak, 1988), Ramnath, Sapnes, Sasan (Menon, 1979), Jasadhar, Junvaniya, Tulsishyam (Bole and Pathak, 1988); Narmada Dt.: Kalvat, Shisha, Vav (Pradeepkumar, 1993), Rajpipla (Shah, 1967); Navsari Dt.: Bansda (Desai, 1976); Panchmahal Dt.: Pavagadh (Oza, 1961), Tuwa (Deshpande, 1968); Porbandar Dt.: Godhana, Satvirda, Adityana, Ranavav (Nagar, 2005); Sabarkantha Dt.: Khedbrahma (Bhatt, 1971), Mahudi, Pahada (Yogi, 1970), Dharod, Vadali (Parmar, 2012); Surat Dt.: Umarpada, Zankhvav (Yadav, 1979); Tapi Dt.: Vyara (Yadav, 1979); Vadodara Dt.: Savli (Padate, 1969; Padate, 1973); Valsad Dt. (Inamdar and Patel, 1971): Dighi (Rao, 2012), Dhamni, Sidhumbar (Yadav, 1979), Dharampur, Kaprada, Nana Pondha (Vora, 1980), Chival, Dhari, Parnera, Rabda, Udwada (More, 1972)

Neuracanthus tetragonostachyus subsp. **trinervius** (Wight) Bidgood [= *Neuracanthus trinervius* Wight]

Herb; *Fl. and Fr.:* November – March

Dang Dt. (Tadvi, 2013): Nilsakiya, Saputara (Yadav, 1979), Malegaon (Suryanarayana, 1968); Gir somnath Dt. (Sisodia, 2007); Valsad Dt.: Dharampur, Kaprada, Nanapondha (Vora, 1980), Huda, Tutarkhed

***Rungia elegans** Dalzell and A.Gibson

Herb; *Fl. and Fr.:* September – January

Arvalli Dt.: Modasa; Bhavnagar Dt.: Palitana, Shatrunjaya (Meena, 2014b); Dang Dt. (Tadvi, 2013); Devbhumi dwarka Dt.: Beyt (Bole and Pathak, 1988); Jamnagar Dt.: Dhunvav, Ranjit Sagar, Rozi (Bole and Pathak, 1988); Rajkot Dt.: Pradhyuman park (Bole and Pathak, 1988)

Strobilanthes callosa Nees [= *Carvia callosa* (Nees) Bremek.]

Shrub; *Fl. and Fr.:* October – November

Saurashtra (Santapau, 1953; Bole and Pathak, 1988); Chhota udepur Dt.: Mogra, Kadipani, Turkheda, Kevdi, Jamlidam, Rangpur (Desai, 2002), Ambadungar (Thaker, 1974), Handev dungar, Kavant; Dahod Dt.: Kanjeta, Ratanmahal (Bedi, 1968); Dang Dt. (Tadvi, 2013): Malegaon, Saputara, Subir (Suryanarayana, 1968), Don, Galkund, Waghai; Narmada Dt.: Dabka, Fulsar, Namgir, Vaghumar (Pradeepkumar, 1993), Rajpipla (Shah, 1967), Gora; Navsari Dt.: Ambabari, Anklach, Mankunia, Vati (Desai, 1976); Panchmahal Dt.: Pavagadh (Oza, 1961); Sabarkantha Dt.: Himmatnagar; Valsad Dt.: Chavshala (Rao, 2012), Dharampur, Nana Pondha (Vora, 1980), Dhamni, Pendha

***Thelepaepale ixiocephala** (Benth.) Bremek. [= *Strobilanthes ixiocephala* Benth.]

Shrub; *Fl. and Fr.:* November – January

Banaskantha Dt.: Ambaji (Meena, 2012); Dang Dt.; Junagadh Dt.: Girnar (Menon, 1979)

Bignoniaceae Juss:-

***Dolichandrone atrovirens** (Roth) K.Schum. [= *Bignonia atrovirens* Roth; *Dolichandrone crispa* (Buch.-Ham. ex Roxb.) Seem.]

Tree; *Fl. and Fr.:* May – June

Dahod Dt.: Dumka, Garabdi (Bedi, 1968); Dang Dt.: Borkhal, Subir (Yadav, 1979); Valsad Dt.: Dharampur, Kaprada, Nana Pondha (Vora, 1980)

***Dolichandrone falcata** (Wall. ex DC.) Seem. [= *Dolichandrone lawii* Seem.; *Spathodea falcata* Wall. ex DC.]

Tree; *Fl. and Fr.:* April – June

Ahmedabad Dt.; Chhota udepur Dt.: Bhadurpur, Boriyad, Ghantoli-songir, Koraj, Pani-mines, Sadhli, Vagasthal (Desai, 2002), Kavant (Thaker, 1974); Dang Dt. (Tadvi, 2013): Ahwa (Suryanarayana, 1968), Ambapada, Surkai; Jamnagar Dt. (Nagar, 2005); Kheda Dt.: Majham river (Yogi, 1970); Narmada Dt.: Gora, Gumandev, Netrang, (Patel, 1971), Fulsar, Junaraj, Pankhala (Pradeepkumar, 1993), Vankal (Yadav, 1979), Rajpipla (Shah, 1967); Navsari Dt.: Bansda; Panchmahal Dt.: Tuwa (Deshpande, 1968), Shivarajpur; Porbandar Dt. (Nagar, 2005); Sabarkantha Dt.: Khedbrahma (Bhatt, 1971; Bhatt and Sabnis, 1972), Dhansura (Saxton and Sedgwick, 1918), Meghraj (Parmar, 2012); Vadodara Dt.: Savli (Padate, 1969); Boriyad, Khakharia, Samlaya, Vejpur; Valsad Dt. (Inamdar and Patel, 1971): Dharampur, Kaprada, Nana Pondha (Vora, 1980), Parnera (More, 1972), Dungri (Patel RM, 1971), Kaprada (Rao, 2012)

***Heterophragma quadriloculare** (Roxb.) K.Schum. [= *Bignonia quadrilocularis* Roxb.; *Heterophragma roxburghii* (Spreng.) DC.; *Spathodea roxburghii* Spreng.]

Tree; *Fl. and Fr.:* February – June

Ahmedabad Dt.; Dang Dt. (Tadvi, 2013): Bheskatri, Borkhal, Galkund, Mahal, Sagbara, Subir (Yadav, 1979), Ahwa, Malegaon, Pipaldahad (Suryanarayana, 1968), Kalibel; Devbhumi dwarka Dt.: Abhapara (Bole and Pathak, 1988); Narmada Dt.: Kalvat, Ninaighat, Thavadia (Pradeepkumar, 1993), Ghantoli (Yadav, 1979), Laldarwaja,

Rajpardi (Patel, 1971), Fulsar, Kokam, Namgir, Sagai (Sharma, 2010); Navsari Dt.: Bansda; Surat Dt.: Umarpada (Yadav, 1979); Tapi Dt.: Kelvan, Rani Amba; Vadodara Dt.: MSU campus (Sabnis, 1967), Tarsali; Valsad Dt.: Lavkar (Rao, 2012), Chavshala, Avdha, Pendha (Yadav, 1979), Nana Pondha, Kaprada (Vora, 1980), Bhilad, Huda, Pangarbari

***Radermachera xylocarpa** (Roxb.) K.Schum. [= *Bignonia xylocarpa* Roxb.]
Tree; *Fl. and Fr.:* April – September
Bharuch Dt.: Netrang; Chhota udepur Dt.: Kawant, Jamlidam (Desai, 2002), Ambadungar (Thaker, 1974), Hampheshwar, Kadipani, Turkheda; Dang Dt. (Tadvi, 2013): Waghai (Yadav, 1979); Narmada Dt.: Kokati, Shisha (Pradeepkumar, 1993), Mal, Samot (Joshi, 1983), Piplod (Sharma, 2010), Sagbara; Panchmahal Dt.: Jambughoda; Valsad Dt.: Dharampur, Kaprada, Nanapondha (Vora, 1980), Pangarbari

Lamiaceae Martinov:-

***Anisomeles heyneana** Benth.
Herb; *Fl. and Fr.:* October – December
Chhota udepur Dt.: Kadipani-Hampheshwar road (Desai, 2002), Kavant (Thaker, 1974); Dahod Dt.: Alindra, Banvaro, Pipargota (Bedi, 1968); Dang Dt. (Tadvi, 2013): Ahwa, Malegaon, Pipaldahad, Subir (Suryanarayana, 1968), Mahal; Narmada Dt.: Sagbara, Ghatoli, Rajpipla; Panchmahal Dt.: Pavagadh (Oza, 1961); Tapi Dt.: Vyara; Valsad Dt.: Tukwada (Rao, 2012), Hedri (Yadav, 1979), Nana Pondha, Pangarbari (Vora, 1980), Tamachhadi

***Lavandula bipinnata** (Roth) Kuntze [= *Bystropogon bipinnatus* Roth]
Undershrub; *Fl. and Fr.:* October – January
Bhavnagar Dt.: Palitana (Menon, 1979), Hastagiri (Meena, 2014b); Chhota udepur Dt.: Kavant (Thaker, 1974); Dang Dt. (Tadvi, 2013): Saputara (Yadav, 1979), Ahwa, Malegaon, Subir (Suryanarayana, 1968), Don; Devbhumi dwarka Dt.: Abhapara, Ghumli (Bole and Pathak, 1988), Kileswar, Venu (Nagar, 2005); Gir somnath Dt. (Santapau and Raizada, 1954); Jamnagar Dt. (Nagar, 2005); Junagadh Dt.: Girnar (Menon, 1979); Kachchh Dt. (Patel *et al*., 2011): Bhuj (Bhatt, 1993); Narmada Dt.: Chopdi (Pradeepkumar, 1993); Porbandar Dt.: Godhana, Satvirda (Thaker, 1910; Nagar, 2005)

***Nepeta bombaiensis** Dalzell
Herb; *Fl. and Fr.:* July – August
Chhota udepur Dt.: Kavant; Junagadh Dt.: Girnar (Bole and Pathak, 1988); Panchmahal Dt.: Pavagadh (Oza, 1961)

***Pogostemon purpurascens** Dalzell
Herb; *Fl. and Fr.:* October – January
Dang Dt. (Tadvi, 2013): Malegaon (Yadav, 1979), Mahal, Saputara, Subir (Suryanarayana, 1968); Narmada Dt.: Chopadi, Waghumar (Pradeepkumar, 1993), Dediapada; Sabarkantha Dt.: Khedbrahma (Bhatt and Sabnis, 1972); Valsad Dt.: Hedri (Yadav, 1979)

Lentibulariaceae Rich:-

***Utricularia graminifolia** Vahl [= *Utricularia purpurascens* Graham]
Herb; *Fl. and Fr.:* September – October
Valsad Dt.: Dharampur, Mandva (Vora, 1980)

Oleaceae Hoffmanns. and Link:-

***Jasminum malabaricum** Wight
Climbing shrub; *Fl. and Fr.:* March – May
Dahod Dt.: Kanjeta, Pipargota (Bedi, 1968); Dang Dt. (Tadvi, 2013); Navsari Dt.: Bansda (Desai, 1976), Vedchha; Valsad Dt.: Malegam, Rohina, Sanjan (Patel, 2013), Dharampur, Jogvel, Mandva, Nana Pondha (Vora, 1980), Abrama, Ghadoi, Marla (Patel RM, 1971), Sarigam, Tukwada (Rao, 2012), Rabda (More, 1972)

Convolvulaceae Juss:-

***Argyreia boseana** Santapau and V.Patel
Climber; *Fl. and Fr.:* July – December
Narmada Dt.: Dediapada (Patel, 2013)

***Argyreia sericea** Dalzell
Climber; *Fl. and Fr.:* August – October
Bhavnagar Dt.: Memon boarding (Meena, 2014b); Chhota udepur Dt.: Kavant (Thaker, 1974; Patel, 2013), Ambadungar (*DNT1067*, Thakar, 1970); Dahod Dt.: Devgadh Baria (Patel, 2013), Banvaro, Pipargota (Bedi, 1968); Dang Dt. (Tadvi, 2013): Ahwa (Yadav, 1979), Malegaon, Pipaldahad, Saputara, Subir (Suryanarayana, 1968); Gir

somnath Dt. (Sisodia, 2007); Junagadh Dt.: Girnar, Junvaniya, Sasan (Bole and Pathak, 1988); Narmada Dt.: Dabka, Mathavali, Sagai (Pradeepkumar, 1993), Chanderpada (Yadav, 1979), Gora (Patel, 1971); Navsari Dt.: Bansda (Patel, 2013), Ambabari, Mahuvas, Manpur, Sara, Vati (Desai, 1976); Rajkot Dt.: Gondal (Bole and Pathak, 1988); Vadodara Dt.: Ajwa; Valsad Dt.: Malegam, Pindval (Patel, 2013), Avdha (Yadav, 1979), Dharampur, Kaprada, Nana Pondha (Vora, 1980), Paria (More, 1972), Saron (Patel RM, 1971), Tokarpada (Rao, 2012)

***Merremia rajasthanensis** Bhandari

Climber; *Fl. and Fr.:* September – December

Kachchh Dt. (Joshi, 1994; Patel *et al*., 2011): Narayan sarovar (Patel, 2013), Mindhiyari (Parmar and Singh, 2003; Pandey *et al*., 2009)

***Merremia rhynchorrhiza** Hallier f.

Climber; *Fl. and Fr.:* July – August

Bhavnagar Dt. (Menon, 1979; Meena, 2014b); Gir somnath Dt. (Bole and Pathak, 1988; Sisodia, 2007); Narmada Dt.; Panchmahal Dt.; Valsad Dt.: Pendha (Yadav, 1979); Khatradevi, Umarpada (Patel, 2013)

Solanaceae Juss:-

Solanum hovei Dunal

Shrub; *Fl. and Fr.:* December – January

Ahmedabad Dt.: Dholka, near Sabarmati river

***Solanum purpureilineatum** Sabnis and Bhatt

Herb; *Fl. and Fr.:* October – March

Anand Dt.: Khambhat (Bhagwanani, 1980); Banaskantha Dt.: Tharad; Chhota udepur Dt.: Hampheswar (Thaker, 1974), Kadipani, Kavant; Kachchh Dt.: Bhuj (*KSR44*, Rao, 1977; Bhatt, 1993); Sabarkantha Dt.: Khedbrahma (Bhatt and Sabnis, 1972), Dan Mahudi, Padhara (Bhatt, 1971; Parmar, 2012); Vadodara Dt. (Sabnis, 1967): Savli (Padate, 1973)

Apiaceae Lindl:-

***Heracleum grande** (Dalzell and A.Gibson) Mukhop. [= *Pastinaca grandis* Dalzell and A. Gibson]

Herb; *Fl. and Fr.:* July – August

Dang Dt.: Malegaon, Saputara (Suryanarayana, 1968)

***Pimpinella adscendens** Dalzell

Herb; *Fl. and Fr.:* December – April

Dang Dt.: Saputara; Kachchh Dt.: Dhinodhar, Nakhatrana (Bhatt, 1993); Narmada Dt.: Chopadi, Ninaighat (Pradeepkumar, 1993); Valsad Dt. (Inamdar and Patel, 1971): Vavar (Rao, 2012), Dharampur, Kolak, Tan, Man, Vanki (Vora, 1980), River Par (More, 1972), Atak, Ghadoi, Pardi (Patel RM, 1971)

***Pimpinella tomentosa** Dalzell ex C.B.Clarke [= *Heracleum tomentosum* Dalzell and A.Gibson]

Herb; *Fl. and Fr.:* November – December

Dang Dt. (Tadvi, 2013): Gira-Giri Hills, Saputara (Suryanarayana, 1968); Valsad Dt.: Dharampur, Kaprada, Nanapondha (Vora, 1980)

***Pimpinella wallichiana** (Miq.) Gandhi

Herb; *Fl. and Fr.:* September – December

Dang Dt. (Tadvi, 2013); Valsad Dt.: Rabda, River Auranga at Atak Pardi, Suliya (Rao, 2012)

Asteraceae Bercht. and J. Presl:-

***Artemisia nilagirica** (C.B.Clarke) Pamp.

Herb; *Fl. and Fr.:* September – March

Banaskantha Dt.: Ambaji (Meena, 2012); Valsad Dt.: Dharampur, Kaprada, Nanapondha (Vora, 1980), Parnera (More, 1972)

***Phyllocephalum scabridum** (DC.) K.Kirkman [= *Decaneurum scabridum* DC.; *Baccharoides scabrida* (DC.) M.R.Almeida; *Centratherum molle* (Wall. ex DC.) Benth. and Hook.f.; *Decaneurum molle* (Wall.) DC.]

Herb; *Fl. and Fr.:* September – October

Chhota udepur Dt.: Ambadungar, Kavant; Dahod Dt.: Alindra, Banvaro (Bedi, 1968); Dang Dt. (Tadvi, 2013): Ahwa; Panchmahal Dt.: Pavagadh (Oza, 1961); Valsad Dt.: Dhamni, Kaprada

***Blumea belangeriana** DC.

Herb; *Fl. and Fr.:* December – March

Dang Dt.: Ahwa, Nilsakiya (Yadav, 1979), Malegaon, Saputara (Suryanarayana, 1968); Junagadh Dt.: Girnar (Menon, 1979); Narmada Dt.: Sagbara; Navsari: Bansda (Desai, 1976); Surat Dt.: Zankhvav (Yadav, 1979); Valsad Dt. (Patel RM, 1971): Kaprada (Rao, 2012), Dhamni, Hedri, Parnera, Penda (Yadav, 1979), Pangarbari

***Blumea eriantha** DC.

Herb; *Fl. and Fr.:* October – December

Ahmedabad Dt.: Raypur (Saxton and Sedgwick, 1918), Viramgam (Meena, 2014a), Kharicut canal; Arvalli Dt.: Vatrak (Saxton and Sedgwick, 1918); Banaskantha Dt.: Mahudi (Yogi, 1970), Dantiwada, Palanpur (Patel, 2009); Bharuch Dt.; Bhavnagar Dt.: Shatrunjaya dam (Meena, 2014b); Chhota udepur Dt.: Kawant (Thaker, 1974), Gabadia, Kadipani, Hampeshwar, Satun, Ucheda, Udhwania, Zoz (Desai, 2002); Dahod Dt.: Alindra, Banvaro, Ratanmahal (Bedi, 1968); Dang Dt. (Tadvi, 2013): Bheskatri, Mahal (Yadav, 1979), Ahwa, Malegaon, Pipaldahad, Saputara, Subir (Suryanarayana, 1968); Gandhinagar Dt.: Mansa (Yogi, 1970); Junagadh Dt.: Girnar, Sasan (Menon, 1979); Narmada Dt.: Dumkhal, Sagai, Vav (Pradeepkumar, 1993), Umarkui, Umarpada (Yadav, 1979); Navsari Dt.: Bansda (Desai, 1976); Panchmahal Dt.: Pavagadh (Oza, 1961), Tuwa (Deshpande, 1968); Sabarkantha Dt.: Kotda, Khedbrahma, Isari, Fatehpur, Idar (Parmar, 2012); Vadodara Dt. (Sabnis, 1967): Savli (Padate, 1973), Chokari (Bhagwanani, 1980); Valsad Dt. (Inamdar and Patel, 1971; Patel RM, 1971; Vora, 1980): Chavshala, Nana Pondha, Pendha (Yadav, 1979), Pardi, Parnera (More, 1972), Kaprada (Rao, 2012)

Blumea malcolmii (C.B.Clarke) Hook.f. [= *Pluchea malcolmii* C.B.Clarke]

Herb; *Fl. and Fr.:* November – January

Chhota udepur Dt.: Rangpur (Thaker, 1974); Dang Dt.: Ahwa, Malegaon (Yadav, 1979), Saputara (Suryanarayana, 1968); Junagadh Dt. (Bole and Pathak, 1988); Navsari Dt.: Bansda (Desai, 1976); Panchmahal Dt.: Pavagadh (Oza, 1961); Porbandar Dt.: Satvirda, Adityana, Ranavav (Nagar, 2005); Surat Dt.; Surendranagar Dt.: Rangpur; Vadodara Dt.: Savli (Padate, 1973); Valsad Dt.: Rabda, Tutarkhed

***Goniocaulon indicum** (Klein ex Willd.) C.B.Clarke [= *Amberboa indica* (Klein ex Willd.) DC.; *Serratula indica* Klein ex Willd.; *Goniocaulon glabrum* Cass.]

Herb; *Fl. and Fr.:* December – February

Banaskantha Dt.: Balaram-Ambaji wildlife sanctuary (Meena, 2012); Chhota udepur Dt.: Kavant (Thaker, 1974); Dang Dt. (Tadvi, 2013); Gir somnath Dt. (Sisodia, 2007): Veraval (Bole and Pathak, 1988); Junagadh Dt.: Sasan, Visavadar (Bole and Pathak, 1988); Narmada Dt.: Mokhadi, Surpan, Thavadia (Pradeepkumar, 1993); Navsari Dt.: Bansda, Lakawadi, Mahuvas, Sara, Pratapnagar (Desai, 1976); Sabarkantha Dt. (Parmar, 2012): Khedbrahma (Bhatt, 1971); Vadodara Dt.: Kamalpura, Pratapnagar

Helichrysum cutchicum (C.B.Clarke) R.S.Rao and Deshp.

Herb; *Fl. and Fr.:* August – September

Devbhumi dwarka Dt.: Abhapar, Beyt (Bole and Pathak, 1988), Okhamandal (Bole and Pathak, 1988); Jamnagar Dt.: Laloi, Kota (Bole and Pathak, 1988); Junagadh Dt.: Girnar; Kachchh Dt. (Rao and Deshpande 1968; Raole, 1993; Patel *et al*., 2011): Bhuj, Dahisara (Rao, 1981), Dhinodhar (Shah, 1978), Kotda, Lakhpat, Mosuna, Nakhatrana, Nani Khakhar (Rao, 2002), Hamankhudi, Narayan Sarovar (Pandey *et al*., 2009), Nadibaugh Rakhal, Naliya (Raole, 1993), Banni, Bharasar, Kala dungar, Mandvi, Mundra, Sheh (Joshi *et al*., 2013), Tapkeshwari (Joshi *et al*., 2012); Morbi Dt.: Ravapar (Rao, 2002); Porbandar Dt.: Barda (Shah, 1987)

***Pulicaria wightiana** (DC.) C.B.Clarke [= *Poloa wightiana* DC.]

Herb; *Fl. and Fr.:* October – January

Banaskantha Dt.: Mahudi (Yogi, 1970), Dantiwada, Palanpur (Patel, 2009); Bhavnagar Dt.: Mahuva (Meena, 2014b); Dang Dt. (Tadvi, 2013): Subir (Suryanarayana, 1968); Devbhumi dwarka Dt.: Bhanvad, Kota (Bole and Pathak, 1988); Gandhinagar Dt.: Mansa (Yogi, 1970); Gir somnath Dt. (Santapau and Raizada, 1954): Somnath reclamation (Bole and Pathak, 1988); Jamnagar Dt.: Rozibet (Bole and Pathak, 1988); Junagadh Dt. (Gopal, 1983): Girnar, Khamba, Ramnath, Sapnes (Menon, 1979); Kachchh Dt. (Patel *et al*., 2011): Mindhiyari (Pandey *et al*., 2009); Kheda Dt.: Kapadvanj; Panchmahal Dt.: Pavagadh (Oza, 1961); Rajkot Dt. (Thakrar, 1987); Sabarkantha Dt.: Danmahudi (Bhatt, 1971), Himmatnagar, Idar (Yogi, 1970), Raigarh (Parmar, 2012), Prantij

Senecio bombayensis N.P.Balakr.

Herb; *Fl. and Fr.:* September – November

Dang Dt.: Malegaon, Saputara; Junagadh Dt.: Girnar; Panchmahal Dt.: Pavagadh (Oza, 1961)

***Senecio dalzellii** C.B.Clarke [= *Senecio lawii* C.B.Clarke]

Herb; *Fl. and Fr.:* December – January

Panchmahal Dt.: Pavagadh (Oza, 1961)

***Tricholepis amplexicaulis** C.B.Clarke

Herb; *Fl. and Fr.:* October – January

Dang Dt. (Tadvi, 2013): Gira-Giri hills, Saputara (Suryanarayana, 1968); Devbhumi dwarka Dt.: Abhapara (Bole and Pathak, 1988), Kileswar, Venu (Nagar, 2005); Gir somnath Dt. (Sisodia, 2007); Junagadh Dt.: Gir

Tricholepis glaberrima DC.

Herb; *Fl. and Fr.:* December – January

Ahmedabad Dt. (Meena, 2014a); Anand Dt.: Khambhat (Bhagwanani, 1980); Banaskantha Dt.: Balaram-Ambaji wildlife sanctuary (Meena, 2012); Bharuch Dt. (Gopal, 1983); Chhota udepur Dt.: Ambadungar, Bhadurpur, Hampeshwar, Turkheda (Desai, 2002), Kavant (Thaker, 1974); Dahod Dt.: Ratanmahal (Bedi, 1968), Devgadh Baria; Dang Dt. (Tadvi, 2013): Ahwa, Malegaon, Saputara (Suryanarayana, 1968); Devbhumi dwarka Dt.: Bhanvad (Bole and Pathak, 1988), Abhapar, Kileswar, Venu, Ghumli (Nagar, 2005); Gir somnath Dt. (Santapau and Raizada, 1954); Jamnagar Dt.: Rozibet (Bole and Pathak, 1988); Junagadh Dt.: Girnar (Menon, 1979; Bole and Pathak, 1988), Sasan (Bole and Pathak, 1988); Mehsana Dt.: Visnagar (Bharati, 1959); Panchmahal Dt.: Pavagadh (Oza, 1961), Vishwamitri riverbank (Chavan and Sabnis, 1960); Porbandar Dt.: Godhana (Thaker, 1910; Nagar, 2005); Sabarkantha Dt.: Khedbrahma (Bhatt, 1971; Bhatt and Sabnis, 1972), Vireshwar; Vadodara Dt. (Sabnis, 1967): Savli (Padate, 1969; Padate, 1973), MSU campus (Phatak and Joshi, 1955); Valsad Dt.: Chavsari, Dhabhdi, Kaprada, Mandva (Vora, 1980), Umbergaon (Bhagwanani, 1980), Nana Pondha (Gopal, 1983)

Discussion:-

Among the total 192 Indian endemics found in Gujarat, dicotyledons dominate the endemic flora with 137 taxa (71%) belonging to 97 genera under 33 families, whereas monocots are represented by 55 taxa (29%) belonging to 37 genera under 9 families. The top five families of angiosperms, rich in endemic species contribute 57% of the total endemic species reported from Gujarat. Family Fabaceae has the largest number of Indian endemics (31 taxa), which is followed by Poaceae (27 taxa), Acanthaceae (20 taxa), Asteraceae (12 taxa) and Orchidaceae (10 taxa).

An analysis of the life-form types indicates that the endemic herbs (66%) dominate the study area, followed by shrubs (12%), trees (11%), climbers (6%), undershrubs (3%) and climbing shrubs (2%).

It was observed that large number of endemic herbs, climbers and shrubs flower in the months of September-October; while the peak flowering for trees was observed in April (Fig. 2), which is the hottest season in Gujarat.

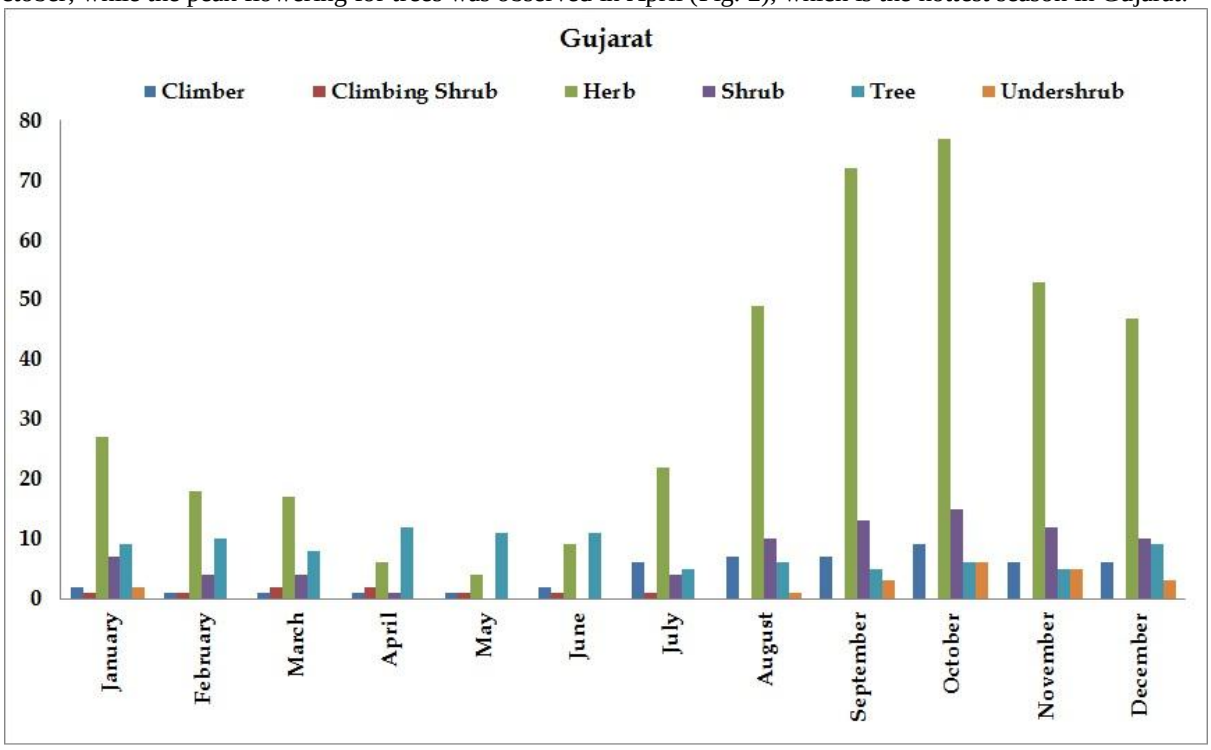

Figure 2-: Flowering phenology of endemic species in different life-forms

Analysis on the district wise distribution of endemic angiosperms shows that Dangs has maximum number of endemic angiosperms with 115 taxa, followed by Valsad (104), Narmada (71), Junagadh (63) and Panchmahal (57).

Kachchh:-
The survey resulted in the documentation of 24 endemic taxa. Of which all of them are dicots belonging to 23 genera under 15 families, and no endemic monocots. Top 4 families contribute 54% of the total endemic species reported from Kachchh. Family Fabaceae has the largest number of endemics (6 taxa), which is followed by Apocynaceae (3 taxa), and Acanthaceae and Asteraceae (2 taxa each), remaining families with single taxa.
An analysis of the life-form types indicates that the endemic herbs (10) dominate the study area, followed by shrubs (6), trees (2), climbers (4) and undershrubs (2).

Saurashtra:-
The survey resulted in the documentation of 87 endemic taxa. Of which Dicots dominate with 70 taxa (80%) belonging to 53 genera under 23 families, whereas monocots are represented by 17 taxa (20%) belonging to 16 genera under 7 families. Top 5 families contribute 60% of the total endemic species reported from Saurashtra. Fabaceae family has the largest number of endemics (15), which is followed by Acanthaceae (13), Poaceae (10), Asteraceae (9) and Euphorbiaceae (5).
An analysis of the life-form types indicates that the endemic herbs (51) dominate the study area, followed by trees (14), shrubs (12), climbers (6) and undershrubs (4).

Northern Gujarat:-
The survey resulted in the documentation of 57 endemic taxa. Of which Dicots dominate with 46 taxa (81%) belonging to 41 genera under 19 families, whereas monocots consists of 11 taxa (19%) belonging to 10 genera under 5 families. Top 5 families contribute 63% of the total endemic species reported from Gujarat. Family Acanthaceae has the largest number of endemics (13), followed by Fabaceae (9), Poaceae (6), Asteraceae (5) and Apocynaceae (3).
An analysis of the life-form types indicates that the endemic herbs (33) dominate the study area, followed by shrubs (9), trees (9), climbers (3) and undershrubs (3).

Central Gujarat:-
The survey resulted in the documentation of 100 endemic taxa. Of which Dicots dominate with 76 taxa (76%) belonging to 62 genera under 30 families, whereas monocots are represented by 24 taxa (24%) belonging to 17 genera under 6 families. Top 5 families contribute 49% of the total endemic species reported from Gujarat. Family Fabaceae has the largest number of endemics (15), Acanthaceae (12), Poaceae (9), Asteraceae (8) and Orchidaceae (5).
An analysis of the life-form types indicates that the endemic herbs (60) dominate the study area, followed by trees (16), shrubs (9), climbers (8), undershrubs (4) and climbing shrubs (3).

Southern Gujarat:-
The survey resulted in the documentation of 157 endemic taxa. Of which Dicots dominate with 108 taxa (69%) belonging to 74 genera under 28 families, whereas monocots represent 49 taxa (31%) belonging to 33 genera under 8 families. Top 5 families contribute 54% of the total endemic species reported from Gujarat. Family Poaceae has the largest number of endemics (24), followed by Fabaceae (22), Acanthaceae (19), Asteraceae and Orchidaceae (10 taxa each).
An analysis of the life-form types indicates that the endemic herbs (95) dominate the study area, followed by trees (19), shrubs (17), climbers (10), undershrubs (4) and climbing shrubs (1).

The present study demonstrates that endemics are mostly concerted in southern Gujarat region, they are primarily herbaceous, and size of the family is directly proportional to the number of endemics. Moreover, many of the endemics are habitat specific, while some of them are known either only by type collections of just a few additional collections.

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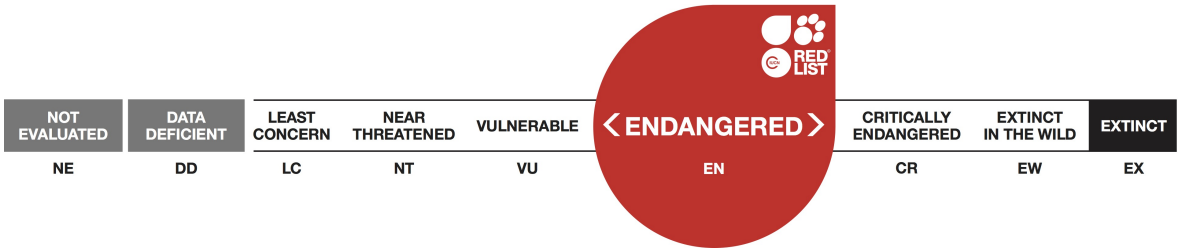
Tephrosia jamnagarensis

Assessment by: Rana, K.



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If you see any errors or have any questions or suggestions on what is shown in this document, please provide us with feedback so that we can correct or extend the information provided.

Taxonomy

Kingdom	Phylum	Class	Order	Family
Plantae	Tracheophyta	Magnoliopsida	Fabales	Fabaceae

Taxon Name: *Tephrosia jamnagarensis* Santapau

Synonym(s):

- *Tephrosia axillaris* A.R.Sm.

Taxonomic Source(s):

The Plant List. 2013. The Plant List Version 1.1. Available at: http://www.theplantlist.org/. (Accessed: July 2016).

Identification Information:

An erect, annual herb; stems simple or sparsely branched, covered with whitish appressed hairs. Leaves simple, 3-5.8 cm. long, 4-7 mm. broad, linear, glabrous above, densely hairy with silvery appressed hairs beneath, subobtuse and clearly apiculate at the apex, the base acute; lateral nerves 25-30 pairs, parallel among themselves; margin entire, with a nerve running from near the base to the apex very near the margin; the nerves are clear on the upper surface, covered with hairs but nearly equally distinct on the lower surface. Petioles 2-3 mm. long, very hairy; stipules subulate, 3-4 mm. long, very hairy. Flowers single or in pairs at practically all the axils of the leaves; peduncles about as long as or slightly shorter than the petioles, densely hairy. Calyx very hairy, 2-3 mm. long, the teeth subulate, filiform, hairy, sub-equal. Corolla bright-purple. Pod compressed, about 20x5 mm. densely hairy with greyish, patent hairs, oblique at both end, apiculate; seeds 5-6, reniform, dull or matt, brownish.

Assessment Information

Red List Category & Criteria: Endangered B1ab(i,ii,iv)+2ab(i,ii,iv) ver 3.1

Year Published: 2017

Date Assessed: November 2, 2016

Justification:

The global distribution of *Tephrosia jamnagarensis* is currently restricted to the Jamnagar and Junagadh districts, Gujarat state, India. The plant was also reported to occur at two localities in southern Gujarat and Saurashtra (in 1980), but at present the plant is restricted to only one location based on the threat of overgrazing . The species is assessed as Critically Endangered since it has a very restricted geographic range, with an extent of occurrence (EOO) of 86 km², while the known area of occupancy (AOO) is just 8 km². The species is threatened by cattle grazing, a major threat in the region, which is resulting in the spread of invasive alien species such as *Senna uniflora.* Monitoring of the population size and trend is required. Additionally, threats to this species should be better studied.

Geographic Range

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Range Description:

Global distribution of *Tephrosia jamnagarensis* is currently restricted to the Jamnagar and Junagadh districts, Gujarat state, India. Earlier, the plant was also reported to occur from two localities in southern Gujarat and Saurashtra, but the presence of this species here is uncertain. From this distribution the plant is estimated to occur in just one location. The area of occupancy is 8 km², and the extent of occurrence (EOO) has declined from 22,096 km² (in 1980), to its current size of 86 km² (in 2015), which is a matter of serious concern. This tenfold decrease in the EOO is likely to be a result of cattle grazing, a major threat in the region, which is resulting in the spread of invasive alien species such as *Senna uniflora*.

Country Occurrence:

Native: India (Gujarat)

Population

During surveys conducted in 2011, 2012, 2013, and 2014, 350, 300, 400 and 300 individuals respectively were observed at the locality of Khadkhambhaliya, Jamnagar.

In 2014, the plant was discovered at a new locality of Sagdividi, Junagadh, the small subpopulation was surveyed and found to comprise 100 individuals growing in agricultural hedges.
Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

Tephrosia jamnagarensis is an annual herb found growing in savanna. It favours a particular environmental gradient determined by topography and salinity, and grows well in the semi-arid climate. The species has been recorded from undulating terrain, flat and hilly areas.

Systems: Terrestrial

Use and Trade

The plant is not commercially traded. However, the presence of phytocomponents like flavonoids, steroids, terpenes and chalcones in aerial parts and seeds of *Tephrosia jamnagarensis* indicate that this plant may possess antioxidant properties and other biological activity which need to be further explored.

Threats (see Appendix for additional information)

The main threat faced by the wild population of *Tephrosia jamnagarensis* is overgrazing by cattle. Such grazing activities are also responsible for the spread and establishment of invasive alien species like *Senna uniflora*, *Lantana camara*, etc.

Conservation Actions (see Appendix for additional information)

The germplasm of *Tephrosia jamnagarensis* had been deposited by Junagadh Agriculture University (JAU) at the National Seed Gene bank, New Delhi India, for long term conservation (http://www.icar.org.in/files/ar0506/cs.pdf). *Ex situ* conservation and multiplication through micro- and macro-propagation techniques would help to secure the long-term survival of this species.

Credits

Assessor(s): Rana, K.

Reviewer(s): Hilton-Taylor, C.

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External Resources

For Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats
(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
2. Savanna -> 2.1. Savanna - Dry	-	Suitable	-

Threats
(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.1. Nomadic grazing	Ongoing	Majority (50-90%)	Very rapid declines	High impact: 8
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Lantana camara)	Ongoing	Majority (50-90%)	Very rapid declines	High impact: 8
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.2. Competition		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Senna uniflora)	Ongoing	Majority (50-90%)	Rapid declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.2. Competition		

Conservation Actions in Place
(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions in Place
In-Place Research, Monitoring and Planning
Action Recovery plan: No
Systematic monitoring scheme: No
In-Place Land/Water Protection and Management
Conservation sites identified: Yes, over entire range
Occur in at least one PA: No

Conservation Actions in Place
Percentage of population protected by PAs (0-100): 0
Area based regional management plan: Yes
Invasive species control or prevention: No
In-Place Species Management
Harvest management plan: No
Successfully reintroduced or introduced beningly: No
Subject to ex-situ conservation: Yes
In-Place Education
Subject to recent education and awareness programmes: Yes
Included in international legislation: No
Subject to any international management/trade controls: No

Conservation Actions Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions Needed
1. Land/water protection -> 1.1. Site/area protection
1. Land/water protection -> 1.2. Resource & habitat protection
2. Land/water management -> 2.2. Invasive/problematic species control
3. Species management -> 3.2. Species recovery
4. Education & awareness -> 4.3. Awareness & communications

Research Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.5. Threats
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
2. Conservation Planning -> 2.2. Area-based Management Plan
3. Monitoring -> 3.1. Population trends

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km²): 8
Continuing decline in area of occupancy (AOO): Yes
Estimated extent of occurrence (EOO) (km²): 86
Continuing decline in extent of occurrence (EOO): Yes
Extreme fluctuations in extent of occurrence (EOO): No
Number of Locations: 2
Continuing decline in number of locations: Yes
Lower elevation limit (m): 9
Upper elevation limit (m): 129
Population
Number of mature individuals: 400
Continuing decline of mature individuals: No
Extreme fluctuations: No
Population severely fragmented: No
No. of subpopulations: 2
Continuing decline in subpopulations: Yes
Extreme fluctuations in subpopulations: No
All individuals in one subpopulation: No
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Unknown
Generation Length (years): 1

The IUCN Red List Partnership

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