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Floristic analysis of riparian elements in the lower stretch of Chaliyar River in Kozhikode district, Kerala, India

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Abstract
Riparian floristic elements in the lower stretch of River Chaliyar flowing through Kozhikode District, Kerala, India was analyzed and documented taxonomically. There are about 171 species belonging to 45 families and 134 genera were documented. In dicotyledons Asteraceae is the dominanat family with 17 species belongs to 15 genera followed by Fabaceae with 14 species belongs to 10 genera and Euphorbiaceae with 12 species belongs to 10 genera. Similarly, in monocotyledons, Poaceae is the dominant family with 20 species belongs to 12 genera. The life form analysis of the documented Riparian plants reveals that, herbs are dominant (99 in nos.), followed by shrubs (30 in nos.), trees (22 in nos.) and climbers (20 in nos.). The present study also highlighted the threatening factors that affect the distribution of plant species in the riparian regions. Many exotic plants are luxuriantly growing in the riparian regions which are also documented, there are about 51 species belongs to 43 genera and 22 families are exotic plants in the study area.

Keywords: floristic elements, riparian, chaliyar river, angiosperms

Introduction
The Plant communities seen along the river margins are commonly referred to as the riparian vegetation. From the beginning to the end of a river, the riparian zone is highly influenced by the quantum and flow of water in the river channel. It is a transitional zone between the aquatic and terrestrial habitats. The riparian zones are the most productive and species rich ecosystems at the same time sensitive to the human disturbances [1, 2, 3, 4]. They have their own unique characteristics like hydric soil, floral and faunal composition, community structure, relationships [5]. The nutrient depositions are more in the riparian zone compared to the other regions. Soils in this area absorb water during the wet seasons and slowly release moisture into the stream. This buffers the effect of peak runoff and keeps streams flowing longer [6, 7]. Plants of the riparian forest have numerous morphological and physiological adaptations which suit them for life in high – energy and wet environments [8].
In the recent years, there has been a growing concern with regard to the health of riparian ecosystems. Essentially the overall health of the riparian zone depends upon the habitat, plant and animal species, the effectiveness of linkages and the maintenance of ecological processes. However, due to unplanned developmental activities riparian zones have suffered greatly and degraded in many parts [9, 10]. The factors such as altered flow patterns affecting the upstream and downstream sediments and biological materials, uncontrolled exploitation of perennial streams by the local population and increased pollution levels mainly contributed by industries around the riparian zones have inadvertently affected the riparian species composition. This has been lead to severe irreversible damage to the riparian ecosystems of many rivers [11].
The objectives of the present study were Documentation and authentication of riparian floristic elements in the study area and to analyze the major threat factors, which are imposed to the present study area.

2. Materials and Methods
2.1 Study Area
Chaliyar is the fourth longest river in Kerala at 169 km in length. The Chaliyar is also known as Beypore River as it nears the sea. Nilambur, Edavanna, Areekode, Kizhuparamba, Cheruvadi, Mavoor, Peruvayal, Feroke and Beypore are some of the towns or villages situated along the banks of Chaliyar. Chaliyar River has a total drainage area of 2,923sq Kms, of which 2,535sq Kms is in Kerala and the rest in Tamil Nadu. Six major streams such as Chaliyarpuzha, Punnapuzha, Kanjirapuzha, Karimpuzha, Iruvahnipuzha and Cherupuzha constitute the Chaliyar River drainage system [12]. The River has two names - Chaliyar and Beypore River, of which the former is more popular. The river meets the Arabian Sea at an 'azhi' (estuary), the southern part of which is known as Chaliyam and northern part as Beypore. Thus, the river gets the names Chaliyar and Beypore River.
The Chaliyar River is originates in the Ilambalari Hills, located near Cherambadi town in Gudalur taluk of Nilgiri district in Tamil Nadu. The River flows through Malappuram District for most of its length and then for around 17 km it forms the boundary between Malappuram District and Kozhikode District before entering the city of Kozhikode for its final 10 km journey and finally empties into the Arabian Sea (Fig 1 and 2).

2.2 Data Collection and Analysis
The present study was based on an extensive survey and field observation, carried out between the months of November 2019 to March 2020. The investigation was made to document the riparian vegetation of Chaliyar river in the Kozhikode region

especially which flows through the Beypore, Feroke, Olavanna, Mavoor, Arikkode etc.

The documentation was mainly based on the field observation as well as the collection of plant species. The plant specimens were collected at different reproductive stages to prepare herbarium specimens. After the collection, the plants were identified by the use of different Floras like Flora of Presidency of Madras [13], Flora of Calicut [14], Flora of Nilambur [15], Flora of British India by Hooker [16] and plants were photographed using Nikon D 5300 camera. The nomenclatures of the plants were made up to date as per the rules given in the International Code of Botanical nomenclature (ICBN), the plant list (Cite the web ID) and Flowering Plants of Kerala [17]. The specimens were processed for the preparation of Herbarium by standard methods [18, 19, 20]. The voucher specimens are deposited in the Herbaria of Department of Botany, St. Joseph's College (Autonomous), Kozhikode (DEV) for future reference.

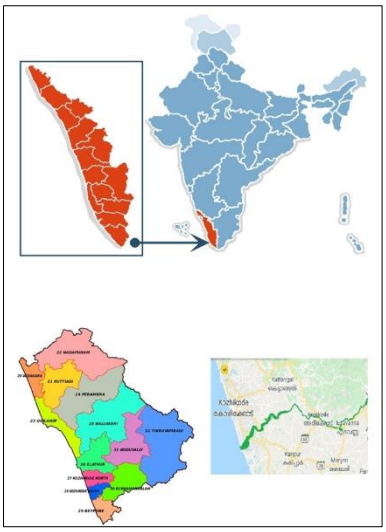

Fig 1: Map of Study Area – Map of India with Kerala State & Kozhikode District (Source: GIS and Google Map)

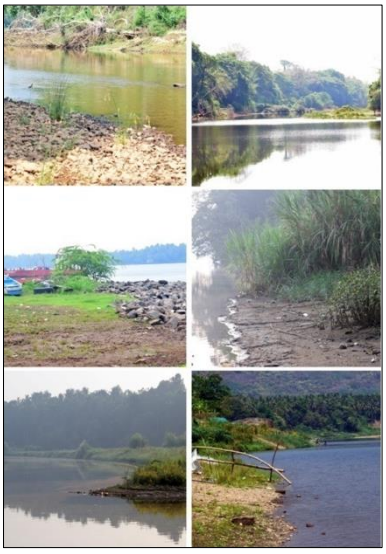

Fig 2: Different views of study are

3. Results and Discussion

3.1 Floristic Diversity

The result of the present investigation reveals that there are about 171 species belonging to 45 families and 134 genera were documented (Table 1). Riparian areas are generally believed to be a treasure house of variety of plants such as trees, climbers, epiphytes and other shade loving herbs.

The present analysis shows that, out of 51 families represented, the 41 families are included under class dicotyledons and 4 families are included under monocotyledons. In Angiosperms the dicotyledons (113 Nos.) are dominant over the monocotyledons (21 Nos.). Among the dicotyledons sub class polypetalae is dominant (20 Nos.) followed by gamopetalae (15 Nos.) and Monochlamydae (6 Nos.). Regarding the total of 171 species represented, Dicotyledons includes 142 species and Monocotyledons consist of 29 species (Fig.3).

Table 1: Analysis of species diversity in the Riparian areas

Analysis of species diversity		Families		Genera		Species	
Dicotyledons	Polypetalae	20	41	41	113	52	142
	Gamopetalae	15		50		59	
	Monochlamydae	6		22		31	
Monocotyledons		4		21		29	
Total	45			134		171	

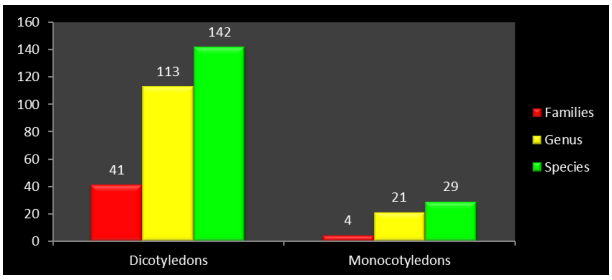

Fig 3: Analysis of total distribution of plants in the study area.

Analysis of dominant families and genera of dicotyledons plants which are distributed in the study area reveals that, out of 41 families distributed, Asteraceae is the dominanat family with 17 species belonging to 15 genera, followed by Fabaceae with 14 species belonging to 10 genera, Euphorbiaceae with 12 species belonging to 10 genera, Amaranthaceae with 9 species belonging to 6 genera, Lamiaceae and Rubiaceae with 5 species belonging to 5 genera each and Malvaceae and Verbanaceae with 6 species belonging to 4 genera each (Fig 4).

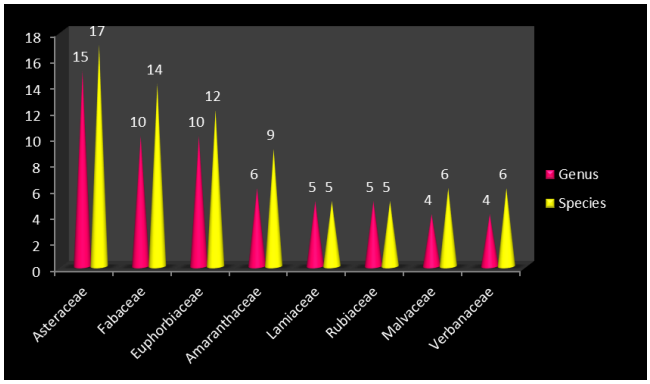

Fig 4: Analysis of dominant families and genera of dicotyledons plants

Among the total 4 families represented in the monocotyledons, Poaceae is the dominant family with 20 species belonging to 12 genera, followed by Araceae with 5 species belongs to 5 genera and Commelinaceae and Amaryllidaceae with 2 species belongs to 2 genera (Fig 5).

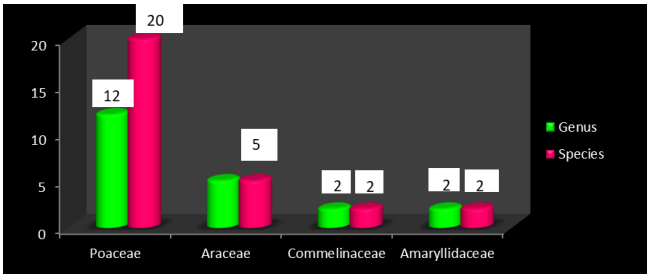

Fig 5: Analysis of dominant families and genera of monocotyledonous plants

Similarly, life form analysis of the documented riparian plants in the study Area reveals that, herbs are dominant (99 Nos.), followed by shrubs (30 Nos.), trees (22 Nos.) and climbers (20 Nos.) (Fig 6).

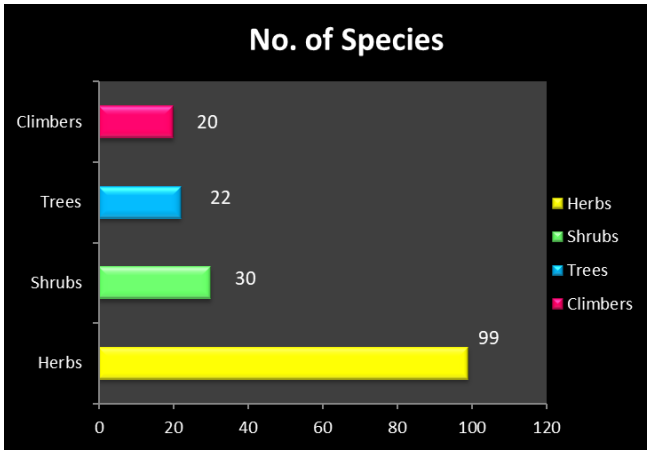

Fig 6: Life form analysis of riparian plants in the study area

3.2 Distribution Pattern of Riparian Plants in the Study Area.
The diversity and distribution of plants in the study area reveals that, there are about 136 species which are commonly distributed. While 32 species are uncommon or sporadically distributed and 3 of them are very rarely occur in the study area. This diversity analysis also highlights the value of riparian plants which are documented from the study area can also contribute more to the biodiversity of an existing area (Table2 and Fig 7).

Table 2: Pattern of distribution of plant species in the study area (√)

Sl No.	Botanical Name	Common	Uncommon	Rare
1.	*Cleome burmannii* Wight & Arn	√		
2.	*Cleome viscosa* L.	√		
3.	*Portulaca oleracea* L.	√		
4.	*Abutilon hirtum*(Lam.) Sweet	√		
5.	*Hibiscus hispidissimus* Griff	√		
6.	*Sida acuta* Burm. F.	√		
7.	*Sida cordifolia* L.	√		
8.	*Sida fryxellii* Sivar. & Pradeep	√		
9.	*Urena lobata* L.	√		
10.	*Melochia corchorifolia* L.		√	
11.	*Sterculia guttata* Roxb. *ex* DC.		√	
12.	*Corchorus aestuans* L.		√	
13.	*Biophytum reinwardtii* (Zucc.) Klotzsch	√		
14.	*Glycosmis pentaphylla* (Retz.) DC.	√		
15.	*Ziziphus mauritiana* Lam.		√	
16	*Leea indica* (Burm. f.) Merr.	√		
17.	*Cardiospermum halicacabum* L.	√		
18.	*Abrus precatorius* L.	√		
19.	*Calopogonium mucunoides* Desv.	√		
20.	*Canavalia mollis* Wight & Arn.	√		
21.	*Centrosema molle* Benth.	√		
22.	*Crotalaria pallida* Dryand.	√		
23.	*Crotalaria verrucosa* L.	√		
24.	*Desmodium heterophyllum* (Willd.) DC.	√		
25.	*Desmodium tortuosum* (Sw.) DC.	√		
26.	*Desmodium triflorum* (L.) DC	√		
27.	*Derris trifoliata* Lour.		√	
28.	*Flemingia macrophylla* (Willd.) Prain			√
29.	*Gliricidia sepium* (Jacq.) Kunth *ex* Walp.	√		
30.	*Tephrosia pumila* (Lam.) Pers.	√		
31.	*Tephrosia purpurea* (L.) Pers	√		
32.	*Senna occidentalis* (L.) Link, Handb	√		
33.	*Senna tora* (L.) Roxb.	√		
34.	*Acacia catechu* (L.f.) Willd	√		

35.	*Albizia saman* (Jacq.) F.Muell.	√		
36.	*Mimosa pudica* L..	√		
37.	*Mimosa diplotricha* C. Wight *ex* Sanvalle	√		
38.	*Prosopis juliflora* (Sw.) DC.	√		
39.	*Calycopteris floribunda* Lam.	√		
40.	*Terminalia catappa* L.	√		
41.	*Ammannia baccifera* L.	√		
42.	*Rotala indica* (Willd.) Koehne in Engl.			√
43.	*Ludwigia octovalvis* (Jacq.) Raven.	√		
44.	*Ludwigia perennis* L.	√		
45.	*Ludwigia peruviana* (L.) H. Hara		√	
46.	*Passiflora foetida* L.		√	
47.	*Citrullus lanatus* (Thunb.) Matsumara		√	
48.	*Coccinia grandis* (L.) Voight, Hort.		√	
49.	*Luffa cylindrica* (L.) Roem		√	
50.	*Mukia maderaspatana* (L.) Roem.		√	
51.	*Trianthema portulacastrum* L.		√	
52.	*Glinus oppositifolius* (L.) A. DC.	√		
53.	*Ixora coccinea* L.		√	
54.	*Morinda citrifolia* L.	√		
55.	*Mussaenda frondosa* L.	√		
56.	*Oldenlandia corymbosa* L.	√		
57.	*Spermacoce hispida* L	√		
58.	*Ageratum conyzoides* L.	√		
59.	*Blumea axillaris* (Lam.) DC.	√		
60.	*Blumea lacera* (Burm. f.) DC.	√		
61.	*Blumea membranacea* Wall. *ex* DC.	√		
62.	*Chromolaena odorata* (L.) King & Robins.	√		
63.	*Crassocephalum crepidioides* S. Moore.	√		
64.	*Eclipta prostrata* (L.) L.	√		
65.	*Grangea maderaspatana* (L.) Poir.		√	
66.	*Mikania micrantha* Kunth.	√		
67.	*Sphaeranthus indicus* L.		√	
68.	*Spilanthes radicans* Jacq.		√	
69.	*Synedrella nodiflora* (L.) Gaertn.	√		
70.	*Tridax procumbens* L.	√		
71.	*Vernonia cinerea* (L.) Less.	√		
72.	*Vicoa indica* (L.) Ling.		√	
73.	*Wedelia chinensis* (Osbeck) Merr.	√		
74.	*Xanthium indicum* Koenig.	√		
75.	*Catharanthus pusillus* (Murr.) G. Don.	√		
76.	*Rauvolfia tetraphylla* L.	√		
77.	*Calotropis gigantea* (L.) R. Br.	√		
78.	*Hemidesmus indicus* (L.) R. Br.	√		
79.	*Canscora diffusa* (Vahl) R. Br.	√		
80.	*Hydrolea zeylanica* (L.) Vahl.	√		
81.	*Heliotropium indicum* L.		√	
82.	*Rotula aquatica* Lour.		√	
83.	*Ipomoea pes-caprae* (L.) R. Br.	√		
84.	*Ipomoea triloba* L.	√		
85.	*Ipomoea hederifolia* L.	√		
86.	*Ipomoea cairica* (L.) Sweet.	√		
87.	*Merremia hederacea* (Burm. f.) Hall. f.		√	
88.	*Xenostegia tridentata* (L.) Austin		√	
89.	*Datura stramonium* L.	√		
90.	*Solanum aculeatissimum* Jacq.	√		
91.	*Solanum virginianum* L.	√		
92.	*Lindernia anagallis* (Burm. f.) Pennell.	√		
93.	*Lindernia crustacea* (L.) F.v. Muell.	√		
94.	*Parasopubia delphiniifolia* (L.) H.-P.		√	
95.	*Scoparia dulcis* L.	√		
96.	*Stemodia verticillata* (Mill.) Sprague.	√		
97.	*Martynia annua* L.	√		
98.	*Pedalium murex* L.		√	

99.	*Andrographis echioides* (L.)Nees.		√	
100.	*Dipteracanthus prostratus* (Poir.) Nees	√		
101.	*Clerodendrum indicum* (L.) O. Ktze	√		
102.	*Clerodendrum inerme* (L.) Gaertn.	√		
103.	*Clerodendrum infortunatum* L.	√		
104.	*Lantana camara* L.	√		
105.	*Phyla nodiflora* (L.) Greene.		√	
106.	*Premna serratifolia* L.	√		
107.	*Anisochilus carnosus* (L. f.) Wall.	√		
108.	*Hyptis suaveolens* (L.) Poit.	√		
109.	*Leucas aspera* (Willd.) Link.	√		
110.	*Ocimum americanum* L.	√		
111.	*Pogostemon purpurascens* Dalz.	√		
112.	*Boerhavia diffusa* L	√		
113.	*Boerhavia erecta* L	√		
114.	*Achyranthes aspera* L.	√		
115.	*Celosia argentea* L.	√		
116.	*Aerva lanata* (L.) Juss.	√		
117.	*Alternanthera bettzickiana* (Regel) Voss.	√		
118.	*Alternanthera paronychioides* A. St. Hill.	√		
119.	*Alternanthera tenella* Colla	√		
120.	*Amaranthus spinosus* L.	√		
121.	*Gomphrena serrata* L.	√		
122.	*Gomphrena celosioides* Mart.	√		
123.	*Persicaria glabra* (Willd.) Gomez.	√		
124.	*Persicaria barbata* (L.) Hara.	√		
125.	*Acalypha indica* L.	√		
126.	*Trewia nudiflora* L.	√		
127.	*Croton bonplandianus* Baill.	√		
128.	*Euphorbia hirta* L.	√		
129.	*Euphorbia thymifolia* L.	√		
130.	*Homonoia riparia* Lour.	√		
131.	*Jatropha gossypifolia* L.		√	
132.	*Macaranga peltata* (Roxb.) Muell.	√		
133.	*Microstachys chamaelea* (L.) Muell.	√		
134.	*Phyllanthus amarus* Schum. & Thonn.	√		
135.	*Phyllanthus reticulatus* Poir.			√
136.	*Ricinus communis* L.	√		
137.	*Pilea microphylla* (L.) Liebm.	√		
138.	*Pouzolzia zeylanica* (L.) Bennett.	√		
139.	*Ficus exasperata* Vahl.	√		
140.	*Ficus racemosa* L	√		
141.	*Ficus religiosa* L	√		
142.	*Morus alba* L.	√		
143.	*Agapanthus africanus* (L.) Hoffmanns.		√	
144.	*Pancratium triflorum* Roxb.		√	
145.	*Commelina benghalensis* L.	√		
146.	*Cyanotis cristata* (L.) D. Don	√		
147.	*Areca catechu* L.	√		
148.	*Calamus hookerianus* Becc.		√	
149.	*Caryota urens* L.		√	
150.	*Cocos nucifera* L.		√	
151.	*Corypha umbraculifera* L		√	
152.	*Chloris barbata* Sw.	√		
153.	*Bambusa bambos* (L.) Voss.	√		
154.	*Cyrtococcum longipes* Wight & Arn.	√		
155.	*Cyrtococcum trigonum* (Retz.) A. Camus.	√		
156.	*Dactyloctenium aegyptium* (L.) P. Beauv.	√		
157.	*Digitaria abludens* (Roem. & Schult.) Veldk	√		
158.	*Digitaria setigera* Roth in Roem. & Schult.	√		
159.	*Eleusine indica* (L.) Gaertn.	√		
160.	*Eragrostis atrovirens* (Desf.) Trin. *ex* Steud.	√		
161.	*Eragrostis gangetica* (Roxb.) Steud.	√		
162.	*Eragrostis pilosa* (L.) P. Beauv.	√		

163.	*Eragrostis unioloides* (Retz.) Nees	√		
164.	*Eragrostis tenella* (L.) P. Beauv. *ex* Roem.	√		
165.	*Eragrostis viscosa* (Retz.) Trin	√		
166.	*Heteropogon contortus* (L.) P. Beauv.	√		
167.	*Ischaemum timorense* Kunth.	√		
168.	*Panicum repens* L.	√		
169.	*Pennisetum polystachyon* (L.) Schult.	√		
170.	*Saccharum arundinaceum* Retz.	√		
171.	*Saccharum spontaneum* L.	√		

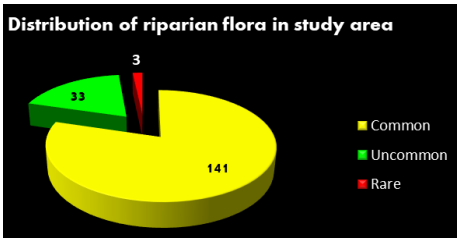

Fig 7: Distribution analysis Riparian plants in the study area

3.3 Exotic plants in the riparian zone

The present study also documented the exotic plants in the Riparian regions. About 51 species belongs to 43 genera and 22 families are recorded as exotic plants in the study area [4] (Table 3).

Table 3: List of exotic plants in the study area.

Sl No.	Botanical Name	Family	Nativity
1	*Acacia catechu* (L.f.) Willd	Mimosaceae	Southern Himalayas of Pakisthan, Nepal
2	*Agapanthus africanus* (L.) Hoffmanns	Amarathaceae	SouthAfrica
3	*Ageratum conyzoides* L.	Asteraceae	Central America and Carribbean
4	*Albizia saman* (Jacq.) F.Muell	Mimosaceae	Northern Tropical South America
5	*Alternanthera bettzickiana* (Regel) Voss	Amaranthaceae	South America
6	*Alternanthera paronychioides* A. St. Hill.	Amaranthaceae	Tropical America
7	*Alternanthera tenella* Colla.	Amaranthaceae	Tropical America
8	*Amaranthus spinosus* L.	Amaranthaceae	South-East Asia
9	*Calopogonium mucunoides* Desv.	Fabaceae	Tropical Americas and West Indies
10	*Centrosema molle* Benth.	Fabaceae	South America
11	*Chloris barbata* Sw.	Poaceae	Central Americ and North America
12	*Chromolaena odorata* (L.) King & Robins.	Asteraceae	Americas
13	*Citrullus lanatus* (Thunb.) Matsumara & Nakai	Cucurbitaceae	West Africa
14	*Crassocephalum crepidioides* (Benth.) S. Moore	Asteraceae	Africa and Madagascar
15	*Croton bonplandianus* Baill	Euphorbiaceae	South Bolivia, Paraguay, South Western Brazil and Northern Argentina
16	*Dactyloctenium aegyptium* (L.) P. Beauv.	Poaceae	Africa
17	*Datura stramonium* L.	Solanaceae	Central America
18	*Desmodium tortuosum* (Sw.) DC	Fabaceae	South –Eastern United States
19	*Eragrostis viscosa* (Retz.) Trin.	Mimosaceae	Eurasia and Africa
20	*Euphorbia hirta* L.	Euphorbiaceae	India
21	*Ficus religiosa* L.	Moraceae	China
22	*Gliricidia sepium* (Jacq.) Kunth *ex* Walp	Fabaceae	Mexico and Central America
23	*Gomphrena celosioides* Mart.	Amaranthaceae	Brazil, Paraguay
24	*Gomphrena serrata* L.	Amaranthaceae	South America
25	*Hyptis suaveolens* (L.) Poit.	Lamiaceae	Tropical America
26	*Ipomoea cairica* (L.) Sweet	Convolvulaceae	Tropical Africa and Asia
27	*Ipomoea hederifolia* L.	Convolvulaceae	Americas
28	*Ipomoea triloba* L.	Convolvulaceae	Tropical Americas
29	*Jatropha gossypifolia* L.	Euphorbiaceae	Mexico and South America
30	*Lantana camara* L.	Verbenaceae	American Tropics
31	*Ludwigia peruviana* (L.) H. Hara	Onagraceae	Tropical America
32	*Martynia annua* L.	Pedaliaceae	Mexico, Central America and Carribbean
33	*Mikania micrantha* Kunth	Asteraceae	Tropical America
34	*Mimosa diplotricha* C. Wight *ex* Sanvalle	Mimosaceae	South America and Central America
35	*Mimosa pudica* L.	Mimosaceae	South America, North America, Central America
36	*Morus alba* L.	Moraceae	China and Eastern North America
37	*Ocimum americanum* L.	Lamiaceae	Africa, China
38	*Passiflora foetida* L.	Passifloraceae	Tropical America
39	*Pennisetum polystachyon* (L.) Schult.	Poaceae	Tropical Africa
40	*Pilea microphylla* (L.) Liebm.	Urticaceae	Mexico and Tropical South America
41	*Prosopis juliflora* (Sw.) DC.	Mimosaceae	Mexico, South America, Carribbean

42	*Rauvolfia tetraphylla* L.	Apocynaceae	Mexico, Cental America, West Indies and Northern south America
43	*Ricinus communis* L.	Euphorbiaceae	Souteastern medeterranean Basin, Eastern Africa
44	*Scoparia dulcis* L.	Scrophulariacea	Neotropics
45	*Senna occidentalis* (L.) Link	Caesalpiniaceae	South America
46	*Senna tora* (L.) Roxb	Caesalpiniaceae	Central America
47	*Spilanthes radicans* Jacq.	Asteraceae	Mexico and Central America
48	*Synedrella nodiflora* (L.) Gaertn.	Asteraceae	South America, Central America, Mexico, West Indies and Florida
49	*Terminalia catappa* L.	Combretaceae	South East Asia
50	*Tridax procumbens* L.	Asteraceae	Tropical America
51	*Ziziphus mauritiana* Lam.	Rhamnaceae	South-East Asia

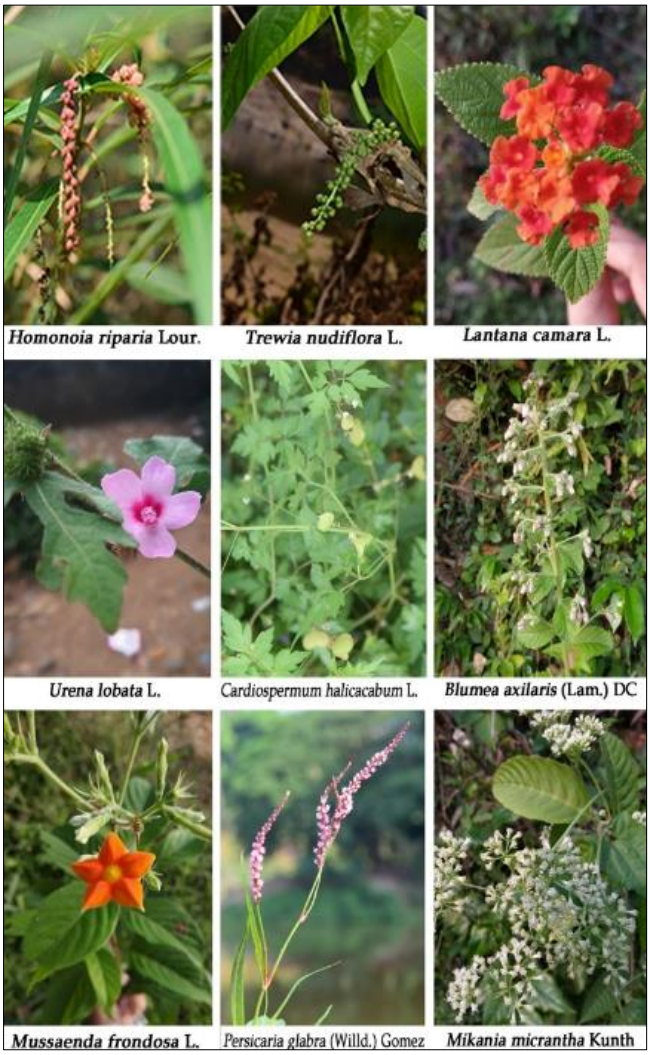

Fig 8: Selected images of plants in the study area

3.4 Major threats to the study area

The present study also noticed some threats in the study area are habitat destruction as well as habitat fragmentation along with some anthropogenic pressures. The major anthropogenic activities include the pollution, conversion of natural habitats to cultivated lands, Construction of various industries in the river side, Deforestation, Stream channelization, Livestock grazing etc [21]. More over the invasion of many exotic plants such as *Mikania micrantha*, *Mimosa pudica*, *Ipomoea cairica*, *Lantana camara*, *Dactyloctenium aegyptium* etc. are also adversely affect the growth and survival of many native plant species. In addition to these natural calamities such as landslides and land slips, flood, drought, Soil erosion, etc. Hence, an urgent attention is required to protect and conserve these valuable plant species for future generation (Fig 8).

Fig 8: Major threats in the study area

4. Conclusion

The present study on Floristic analysis of riparian elements in the lower stretch of Chaliyar river in Kozhikode district, Kerala, India, revealed that there are about 171 species belonging to 45 families and 134 genera were documented. In dicotyledons Asteraceae is the dominanat family with 17 species belongs to 15 genera followed by Fabaceae with 14 species belongs to 10 genera and Euphorbiaceae with 12 species belongs to 10 genera. Similarly, in monocotyledons, Poaceae is the dominant family with 20 species belongs to 12 genera. The life form analysis of the documented Riparian plants reveals that, herbs are domiant (99 in nos.), followed by shrubs (30 in nos.), trees (22 in nos.) and climbers (20 in nos.)

The diversity and distribution of Riparian plants in the study area reveals that, there are about 136 species which are commonly distributed. While 31 species are uncommon or sporadically distributed and 3 of them are very rarely occur in the study area. In addition to that 51 species are non-native in their origin but now they are naturalized in the present study area.

The Riparian zones are most diverse, dynamic and complex biophysical habitats on the terrestrian portion on the planet. These are the interfaces between aquatic and terrestrial ecosystems. Through the present study we hope to convey that, the various plants, which are documented from the study area, are also an important factor for the contribution to the biodiversity of the

existing area. Even though these riparian plants are conserved in their natural habitats. Some of the threatened factors like fast rate of biotic interference, destruction of natural habitat by human interference, invasion of some exotic weeds and unsustainable utilization of natural resources may adversely affect the existing diversity of plants of these Riparian regions. In addition to this the natural calamities also play a crucial role in the replacement of existing vegetation in the Riparian zones. The safe conservation and sustainable utilization of natural plant diversity is very essential for future generation. Due to lack of awareness about conservation and the balance of nature many of our natural habitats are lost forever. So conservation of wild plant resources will help to maintain the balance of nature to a wide extend.

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