FLORISTIC STUDY IN SHOLUR WETLANDS OF NILGIRIS DISTRICT, TAMIL NADU,SOUTH INDIA.

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Abstract:

Wetlands are most important ecosystem in the world these considered to be areas of recreation, flood control, floral and faunal protection. Objective: Documentation the wetland flora in sholur wetlands of Nilgiri District, Tamil Nadu, South India. Methods: An extensive floristic survey was conducted during April 2017 to June 2018 in the wetland ecosystem of Sholur, Nilgiris district, Tamil nadu. Results: In the present investigation, we surveyed and documented about 71 plants belonging to 38 families and 61 genera. Among the documented species the dominant families are Convolvulaceae and Cyperaceae with 5 species each, followed by Commelinaceae, Leguminaceae and Polygonaceae with 4 species each. Amoung the plants 9 collected species are endemic, 45 species are indigenous, 35 plants are medicinally important, 12 are of ornamental, 7 plants used as fodder, 2 plants are edible, 14 are of miscellaneous use and 1 plant is used as vet nary medicine. The wetland plants were categorised and the dominant was Helophytes (25) followed by Hyperhydate (21), Tegnophyte (19), Ephydates (5) and Planktons (1). Continuous monitoring and conservation of swamps is important to safe guard the biological wealth of the study area.

Key words: Floristics, Sholur Wetland, Helophytes, Endemic.

1. Introduction

Indian wetlands are said to be the most pulsating ecological unit in world which ropes unique and diverse ecosystem. Which supply abundant ecological goods and services to the nature. These are said to be Kidneys of Landscape since they sieve the water and waste from both Nature and synthetic (Mitsch, 1986). Wetland flora provides bio-resources for direct economic use and play important role in decontaminating the polluted water (Malaya, 2012). These retain water during dry period thus keeping water table high and relatively stable (Prasad, 2002). They are also nature sponges, when flooded waters overflow the banks of streams and rivers, the porous soil and plants of wetland soak up tremendous amount of excess water. Wetlands provide many functions that are valued by society, often referred to as ecological services (Millennium Ecosystem Assessment, 2005). They are elucidation in providing renowned wildlife habitat.

More than 90% of wildlife species depend on wetland and riparian areas at some point in their lives (Mc Kinstry *et al*., 2004).

Western Ghats of India is said to be one such high bio-cultural diversity region which is one of the global biodiversity hotspot. Now a day's natural wetlands are being vanished due to the development of human population. Nilgiri's wetland are said to be one of the neglected ecosystem. Most of the wetlands have been drained, modified to produce and enhance agricultural crops. Plants growing in wetlands and other moist soil are small and slender herbs, shrubs and climbers. These plants need more amount of water to lead their survival.

1.1. Growth Form

There have been many attempts to classify the aquatic and wetland plants according to their growth forms but very few people have taken steps. Cook (1996) summarised wetland flora and suggested a classification based on the response of the plant to situation for growth and development rather than directly on its morphology. According to this the wetland plants were categorised as follows.

Helophyte- Marshy plants

Hyperhydate- Emergent aquatics

Tegnophyte- Juvenile submerged, adult usually terrestrial

Ephydates- Bottom- rooted with floating leaves

Plankton- Free swimming below the water surface

1.2. Study Area

Nilgiris are some of the most beautiful mountain ranges situated in Southern India. Sholur is a panchayat town in the Nilgiris District of Tamil Nadu located at altitude about 1980 meters above mean sea level. This village consist of six small hamlets named Ooratty, Kotatty, Bickaikkandy, Hosatty, Thattaneri and Backodai. The place is covered with large area of grassland and patches of thick forest vegetation which habitats wild animals as Tiger, Panther, Black Panther, Elephant, Deer, Bear, Bioson, Nilgiri that, small fishes, frogs, crabs, water spiders etc. The present study is focused on conservation of wetland floral diversity in the study area.

2. Materials and Methods

The present investigation was carried out for both intensive and extensive floristic survey during April 2017 to June 2018.The plant species were collected in peak flowering, and the specimen were identified with the help of local floras: *Flora of British India* (Hooker, 1875 - 2006); Flora *of the Presidency of Madras* (Gamble and Fischer, 1915 - 1936); Flora *of Tamil Nadu* (Nair and Henry, 1983); *An Excursion*

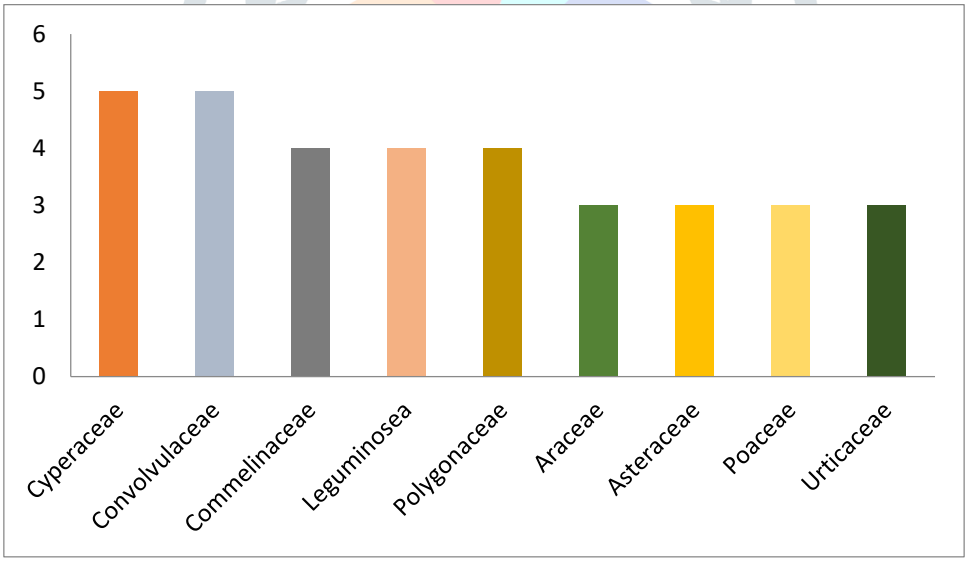
flora of Central Tamil Nadu, India (Matthew, 1991) and *Flowering plants of Sholas and Grasslands of Nilgiris* (Krishnakumar *et al.*, 2013) revisions and monographs. During the field visit the usage of wetland plants were noted from the local people living in the area. The herbarium were prepared and deposited in the Department of Botany, Nirmala College for Women, Coimbatore.

3. Results and Discussion.

3.1. Documentation of Wetland flora

A total of 71 species belonging to 38 families and 61 genera were collected from the six hamlets (Ooratty, Kotatty, Bickaikkandy, Hosatty, Thattaneri and Backodai) of Sholur village. The dominant families Cyperaceae and Convolvulaceae with 5 species each and similar the result was reported by Ramarajan (2014) and Renato (2010). Commelinaceae, Polygonaceae and Leguminosea with 4 species each, Poaceae, Araceae, Asteraceae, Urticaceae were represented by 3 species and other families were represented with two and single species (Table 1). The dominant genera were identified, of which *Ipomea* and *Persicaria* were represented with 3 species Jothmani *et al.*, (2014) have also reported that *Ipomea* is to be the dominant genera in Coimbatore district and the second dominant were *Pouzolzia, Hypericum, Drosera, Schoenoplectiella, Cynotis* and *Adiantum* and each represented with 2 species Fig 1.

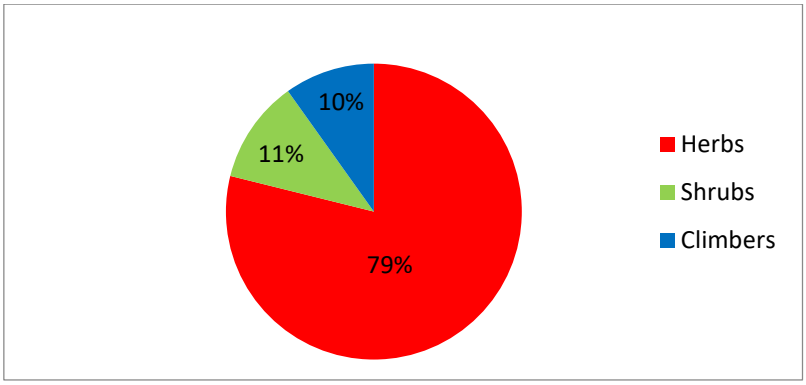
Fig1: Dominant family of the study area



3.2. Life Form analysis

Analysis of habit form indicates that 56 plants were herbs, 8 plants were shrubs and 7 plants were climbers (Table 1). Observations were made earlier studies on wetland flora have been reported that the herbs are the dominant life forms in their study area (Ayyanar and Ignacimuthu, 2009).Fig 2.

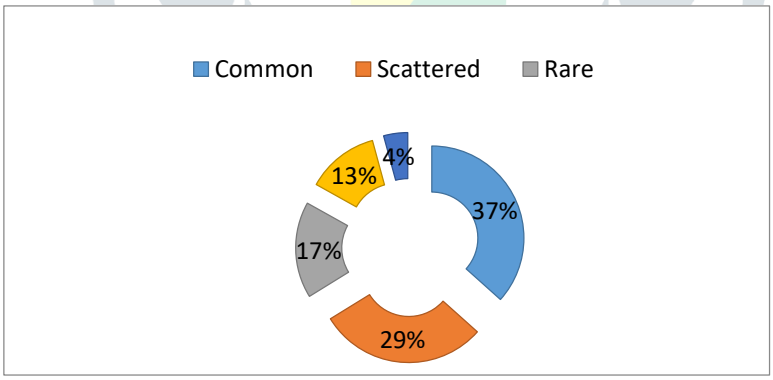
Fig 2: Life form analysis



3.3. Status of Distribution

The collected 71 plant species were categorized on the status of distribution in the study area. Among the collected plants 26 plants were common and are available in all places, 24 plants were scattered in different places, 12 plants were rare in the area. 1or 2 species were rarely spotted and 9 species were identified as endemic based on the IUCN category plants such *Eriocaulon odoratum*, *Impatiens fruticosa*, *Justicia nilgherrensis*, *Murdannia lanuginosa*, *Pouzolzia bennettiana*, *Pouzolzia pentandra*, *Ranunculus diffusus*, *Sonerila wallichii*, *Thunbergia tomentosa*. The present study clearly indicates that wetlands are conservation pockets of endemic plants. Selvamony and Solomon, (2011) have also been reported five rare, endemic and threatened flora from Kanyakumari district, Tamil Nadu.

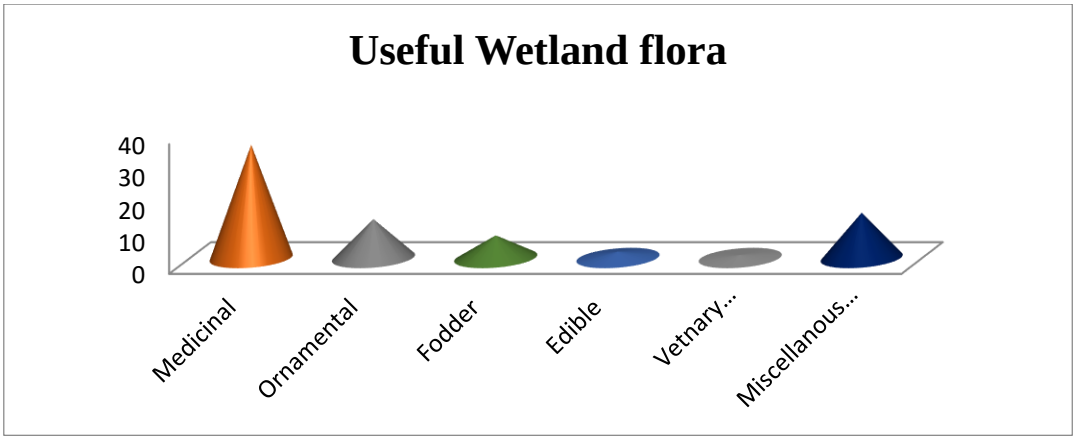
Fig 3: Status of Distribution



3.4. Useful plants from the study area

The data of the collected plants shows that 35 species were medicinally important that are used to treat various diseases, 12 plant species seems to have ornamental importance, 2 species were edible, 7 were used as fodder for the animals, 1 plant species used as vet nary medicine and 14 plant species were used for making manure, bedding material, mat etc. Kensa, (2011) has worked in Vembanur wetland of Kanyakumari district and observed that medicinal plants are to be the dominant in the study area followed by food, fodder, manure etc. Fig 4.

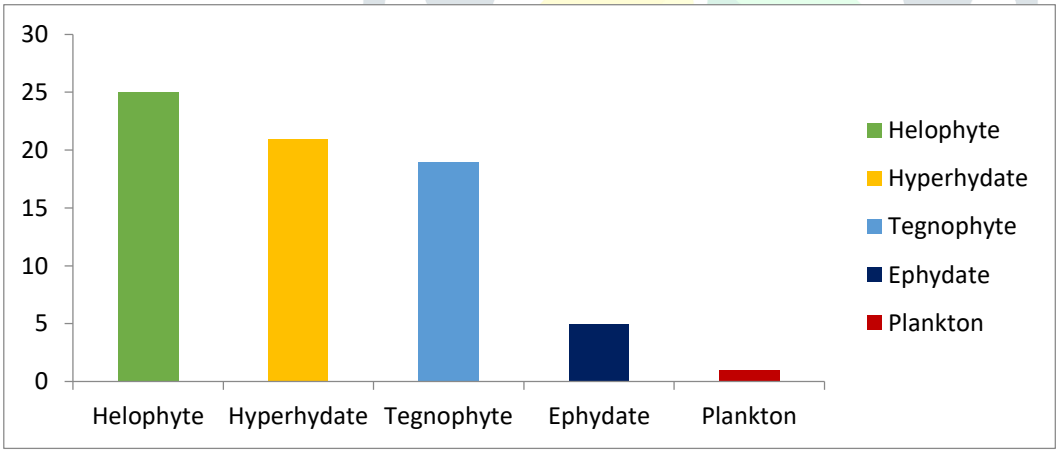
Fig 4: Useful Wetland flora



3.5. Habitat Categorisation according to Cook, 1996

Wetland plants were studied based on the habitat distribution of which Helophytes (Marshy plants) were dominant with 25 species followed by Hyperhydate (Emergent anchored/ Marshy) with 21 species, Tegnophytes (Juvenile submerged, adult usually terrestrial) with 19 species, Ephydate (Suspended hydrophytes) with 5 species and Plankton (Floating leaves) with single species. Ramarajan (2015) and has reported Emergent anchored to be the dominant habituating plants in the study area followed by submerged, free floating and floating leaves anchored. Sukumaran (2011) has been reported Marshy to be the dominant habitat followed by amphibious, fixed floating, submerged and free floating.

Fig 5: **Habitat Categorisation**



4. Conclusion

The identification of the wetland floral diversity is more needed now a day because these are the only source of balancing the water table and to sustain the ecosystem as good filters of nature to retain pure water. Thus the floral diversity is very much important to maintain the ecological balance.

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Table 1: List of Wetland plants from sholur, Nilgiris District, Tamil Nadu

Sl. No	Scientific Name	Family	Habit	Local Name	Uses	Habitat	Population	Nativity
1	*Acmella calva* (DC.) R.K.Jansen	Compositae	Herb	Palvali pundu	Med	Teg	R	Native
2	*Adiantum insicium* Forsk	Adianthaceae	Herb	Nada tahgai	Orn	Teg	C	Exotic
3	*Adiantum randianum* C.Pres	Adianthaceae	Herb	Meena chedi	Med	Teg	C	Exotic
4	*Argyreia hirsuta* Arn	Convolvulaceae	Climber	Pal Kodi	Mis	Hel	S	Native
5	*Arisaema leschenaultia* Bl.	Araceae	Herb	Naga chedi	Med	Hel	R	Native
6	*Bidens pilosa* L.	Compositae	Herb	Thatha thalavetti poo	Med	Teg	C	Native
7	*Breynia retusa* (Dennst.) Alston	Phyllanthaceae	Shrub	Maravagai	Med	Teg	S	Native
8	*Centella asiatica* (L.) Urb	Apiaceae	Herb	Vallarai	Med	Hyp	C	Native
9	*Chloris barbata* Sw	Poaceae	Herb	Cevvara kupul	Med	Teg	C	Exotic
10	*Colocasia esculenta* (L.) Schott	Araceae	Herb	Sema	Edi	Hel	S	Native

11	*Commelina erecta* L.	Commelinaceae	Herb	Nilapasalai	Med	Hel	R	Exotic
12	*Cyanotis arachnoidea* C.B.Clarke	Commelinaceae	Herb	Vallukkai	Fod	Hype	C	Native
13	*Cyanotis villosa* (Spreng.) Schult. & Schult.f.	Commelinaceae	Herb	Valukaipull	Fod	Hel	C	Native
14	*Cynodon dactylon* (L.) Pers.	Poaceae	Herb	Arugampull	Med	Teg	R	Exotic
15	*Cynoglossum zeylanicum* (Vahl) Brand	Boraginaceae	Herb	Picinottarai	Mis	Teg	C	Native
16	*Cyperus rotundus* L.	Cyperaceae	Herb	Muttakkacu	Med	Hyp	C	Exotic
17	*Dorstenia indica* Wight	Urticaceae	Herb	Koppaichedi	Mis	Teg	S	Native
18	*Drosera burmanni* Vahl	Droseraceae	Herb	Azhukanni	Med	Hel	R	Native
19	*Drosera peltata* Thunb.	Droseraceae	Herb	Kocu vetti	Med	Teg	S	Native
20	*Drymaria cordata* (L.) Willd. *ex* Schult.	Caryophyllaceae	Herb	Pottu kodi	Med	Hel	C	Native
21	*Eragrostis unioloides* (Retz.) Nees *ex* Steud.	Poaceae	Herb	Karayampullu	Fod	Hyp	C	Native
22	*Eriocaulon odoratum* D alzell	Eriocaulaceae	Herb	Button poo	Orn	Hyp	E	Native
23	*Euphorbia rothiana* Spreng.	Euphorbiaceae	Herb	Chinnammanpaccharisi	Mis	Teg	C	Native
24	*Hedychium spicatum*	Zingiberaceae	Shrub	Mala engi	Med	Hyp	S	Native

	Sm.							
25	*Hemionitis arifolia* (Burm. f.) T. Moore	Pteridaceae	Herb	Heart fern	Orn	Teg	S	Exotic
26	*Hydrilla verticillata* (L.f.) Royle	Hydrocharitaceae	Herb	Amiranappaci,	Med	Pla	S	Exotic
27	*Hydrocotyle javanica* Thunb.	Araliaceae	Herb	Malai vallarai	Med	Hyp	S	Exotic
28	*Hypericum japonicum* Thunb.	Hypericaceae	Herb	Neer vallarai	Med	Hyp	C	Native
29	*Hypericum wightianum* Wall. *ex* Wight & Arn.	Hypericaceae	Herb	Vettai pakku	Med	Hyp	R	Native
30	*Impatiens fruticosa* Lesch. *ex* DC.	Balsaminaceae	Shrub	Pottu neer chedi	Mis	Hel	E	Native
31	*Indigofera pedicellata* Wight & Arn.	Leguminosae	Herb	Avari	Mis	Teg	S	Native
32	*Ipomoea aquatica* Forssk	Convolvulaceae	Climber	Sarkaraivalli	Med	Ple	S	Exotic
33	*Ipomoea obtusa* Griseb.	Convolvulaceae	Climber	Kakattan	Fod	Hel	S	Exotic
34	*Ipomoea purpurea* (L.) Roth	Convolvulaceae	Climber	Pal kodi	Med	Hel	C	Exotic
35	*Isodon coetsa* (Buch.-Ham. *ex* D.Don) Kudô	Lamiaceae	Herb	Keeran	Mis	Teg	R	Native
36	*Justicia nilgherrensis* (Nees) Wall. *ex* C.B.Clarke	Acanthaceae	Herb	Punnaku poodu	Fod	Hyp	E	Native
37	*Kyllinga brevifolia* Rottb.	Cyperaceae	Herb	Velutta nirbasi	Mis	Hyp	S	Exotic
38	*Kyllinga melanosperma*	Cyperaceae	Herb	Paal	Mis	Hyp	S	Native

	Nees			nirbasi				
39	*Lindernia hyssopoides* (L.) Haines	Linderniaceae	Herb	False pimpernell a	Vet	Hyp	C	Native
40	*Ludwigia peruviana* (L.) H.Hara	Onagraceae	Shrub	Kattukkira mpu	Med	Hyp	R	Exotic
41	*Merremia hederacea* (Burm. f.) Hallier f	Convolvulaceae	Climb er	Elikkatutal ai	Med	Eph	S	Exotic
42	*Moonia heterophylla* Arn.	Compositae	Herb	-	Orn	Hel	S	Native
43	*Murdannia lanuginosa* (Wall. *ex* C.B.Clarke) G.Brückn.	Commelinaceae	Herb	Marshy dew flower	Fod	Eph	E	Native
44	*Nicandra physalodes* (L.) Gaertn.	Solanaceae	Shrub	Sudakku thakkali	Med	Teg	C	Exotic
45	*Oldenlandia auricularia* (L.) K.Schum.	Rubiaceae	Herb	Kattu saya ver	Med	Hel	C	Native
46	*Ophiopogon intermediu s* D.Don	Asparagaceae	Herb	-	Med	Hel	C	Exotic
47	*Ophiorrhiza mungos* L.	Rubiaceae	Herb	Kirippuntu	Med	Eph	C	Exotic
48	*Parnassia mysorensis* F. Heyne *ex* Wight & Arn.	Celastraceae	Herb	Kantanchu li	Med	Hyp	R	Native
49	*Parochetus communis* D.Don	Leguminosae	Herb	Neela pullichan	Orn	Hel	C	Native
50	*Persicaria chinensis* (L.) H. Gross	Polygonaceae	Climb er	Kaka karumbu	Edible	Hel	C	Native
51	*Persicaria glabra* (Willd.) M.Gómez	Polygonaceae	Herb	Attalaree	Med	Hyp	C	Exotic
52	*Persicaria nepalensis* (Meisn.) Miyabe	Polygonaceae	Herb	Niralari	Mis	Hyp	C	Native

53	*Plantago erosa* Wall.	Plantaginaceae	Herb	Ishappukol vitai	Fod	Hel	C	Native
54	*Pouzolzia bennettiana* Wight	Urticaceae	Shrub	-	Med	Teg	E	Native
55	*Pouzolzia pentandra* (Benn. & Br.) Friis & Wilmot-Dear	Urticaceae	Shrub	Serathandam	Mis	Teg	E	Native
56	*Ranunculus diffusus* DC	Ranunculaceae	Herb	-	Med	Hel	E	Native
57	*Rumex nepalensis* Spreng.	Polygonaceae	Herb	Ukkankeerai	Med	Hyp	C	Native
58	*Schoenoplectiella articulata* (L.) Lye	Cyperaceae	Herb	Kuccimullikan	Mis	Hyp	S	Native
59	*Schoenoplectiella mucronata* (L.) J.Jung & H.K.Choi	Cyperaceae	Herb	Manapullu	Mis	Hyp	C	Exotic
60	*Scutellaria violacea* B.Heyne *ex* Benth.	Lamiaceae	Herb	*Novu pacchilai*	Mis	Hel	S	Native
61	*Setaria pumila* (Poir.) Roem. & Schult.	Poaceae	Herb	Koralaepullu	Med	Teg	D	Exotic
62	*Shuteria involucrata* (Wall.) Wight & Arn.	Leguminosae	Herb	Clothed shuteria	Orn	Hel	S	Native
63	*Solanum pseudocapsicum* L.	Solanaceae	Shrub	Karimulli	Orn	Teg	R	Exotic
64	*Sonerila wallichii* Benn.	Melastomataceae	Herb	-	Orn	Hel	E	Native
65	*Thunbergia tomentosa* Wall. *ex* Nees	Acanthaceae	Climber	Indra pushpam	Orn	Hel	E	Native
66	*Trifolium repens* L.	Leguminosae	Herb	Tripatra	Med	Hel	D	Exotic
67	*Utricularia caerulea* L.	Lentibulariaceae	Herb	Blue bladder wort	Orn	Eph	S	Exotic

68	*Veronica polita* Fr.	Plantaginaceae	Herb	Birdeye speedwell	Med	Hel	D	Exotic
69	*Viola pilosa* Blume	Violaceae	Herb	Smooth leaf white violet	Med	Hel	S	Native
70	*Xyris capensis* Thunb.	Xyridaceae	Herb	Neer surai	Orn	Hyp	R	Native
71	*Zantedeschia aethiopica* (L.) Spreng.	Araceae	Herb	Arum lilly	Orn	Hel	R	Exotic

Med- Medicinal, Orn- Ornamental, Mis- Miscellanous, Fod- Fodder.

Hel-Helophyte, Hyp-Hyperhydrate, Teg- Tegnophyte, Eph- Ephydate, Pla- Plankton

C-Common, R-Rare, S-Scattered, E-Endemic, D-Distributed