

## ECOLOGICAL STUDIES ON THREE MEDICINALLY IMPORTANT PLANTS OF THE FAMILY COMPOSITAE

**D. Sheela\* and G. Asha**

Post Graduate Department of Botany, S.N. College, Cherthala, Alappuzha-688 582, Kerala, India

\*Current address: Department of Botany, St. Teresas College, Kochi-682 011, Kerala, India

### ABSTRACT

All the three plant species selected for the study are short lived medicinal herbs. *Eclipta alba* is mostly found in marshy areas while *Emilia sonchifolia* and *Vernonia cinerea* are mostly seen along road sides and in waste lands. IVI shows that all the three species are not dominant in the habitat.

### INTRODUCTION

India is endowed with rich and varied flora due to wide range of climatic conditions. From time immemorial, many indigenous plants have been used in ayurvedic system of medicine. To meet the increase in demand for the drugs of plant origin, cultivation and proper exploitation of indigenous medicinal plants is essential. Distribution, abundance, authenticity and other ecological aspects of medicinal plants should be investigated thoroughly as they are going to form a prerequisite to facilitate their successful cultivation.

The vast treasure of medicinal plants in our country is reflected in the descriptions of many medicinal plants. The only difficulty in the utility of these descriptions is the lack of knowledge regarding the exact locations, flowering and fruiting times and their abundance so the geographical distribution, abundance, authenticity and other ecological aspects of herbal drugs should be known in order to facilitate their cultivation on a commercial scale. The ecologists should tackle this problem. A great deal of information has been gathered on herbaceous species of grasslands, marshlands and freshwaters through the works of Srivastava & Tandon (1951), Bakshi (1952b), Bakshi & Kapil (1952, 1954), Joshi & Kambhoj (1959), Ramakrishnan (1960), Merlee & Avita (1989) and Sheela & Hema (2003). The present paper deals with the phyto-sociological studies on *Eclipta alba* Hassk., *Emilia sonchifolia* DC. and *Vernonia cinerea* L. belonging to family Compositae.

### MATERIALS AND METHODS

Phyto-sociological studies were carried out at three different sites of Alppuzha district viz., Cherthala, Cheravally and Ambalappuzha by quadrat method. At each site 10 quadrats of 1m<sup>2</sup> were laid randomly and the species were noted. The total number of individuals of each species was counted. The basal diameter of the species was determined by measuring the diameter of the stem just above the soil surface using a meter screw gauge. Phytograph illustrating the phyto-sociological characters and IVI of the species was calculated using the values of relative frequency, relative density and relative dominance (Misra & Puri 1954).

Table 1: List of the most common associates of *Eclipta alba* Hassk. in the three selected study sites.

S. No.	Name of the plant	Site-I Cherthala	Site-II Cheravally	Site-III Ambalappuzha
1.	<i>Ageratum conyzoides</i> L.	-	3.2	7.49
2.	<i>Amarantus viridis</i> L.	6.03	-	3.52
3.	<i>Bacopa monneri</i> L.	15.05	28.26	-
4.	<i>Biophytum sensitivum</i> DC.	-	5.55	-
5.	<i>Centella asiatica</i> Urb.	4	-	25.12
6.	<i>Cephalandra indica</i> Naud	2.42	-	-
7.	<i>Cleome viscosa</i> L.	14.34	3.28	5.76
8.	<i>Clerodendron infortunatum</i> L.	7.35	11.58	-
9.	<i>Commelina benghalensis</i> L.	34.66	14.34	3.52
10.	<i>Cyclea peltata</i> L.	-	-	2
11.	<i>Cyperus difformis</i> L.	3.08	-	19.38
12.	<i>Eclipta alba</i> Hassk.	24.55	42.73	31.69
13.	<i>Eclipta chinensis</i> Hassk.	-	-	15.32
14.	<i>Emilia sonchifolia</i> DC.	-	-	6.91
15.	<i>Euphorbia hirta</i> L.	6.21	-	-
16.	<i>Hygrophylla spinosa</i> L.	-	-	6.99
17.	<i>Hyptis suaveolens</i> Poit.	2.42	-	-
18.	<i>Justitia vahlii</i> Roth.	-	-	4.6
19.	<i>Leucas aspera</i> Spr.	7.29	-	-
20.	<i>Ludwigia prostrata</i> Roxb.	-	15.99	6.99
21.	<i>Marsilea</i> sp.	5.22	-	12.37
22.	<i>Metracarpus verticillaster</i> L.	30.25	17.81	2.8
23.	<i>Mikania scandens</i> DC.	-	-	11.1
24.	<i>Mimosa pudica</i> L.	-	4.32	-
25.	<i>Mirabilis jalapa</i> L.	-	4.3	-
26.	<i>Oldenlandia umbellata</i> L.	5.3	11.4	5.05
27.	<i>Phyllanthus niruri</i> L.	5.34	3.12	9.77
28.	<i>Scoparia dulcis</i> L.	3.85	17.67	-
29.	<i>Sida acuta</i> Burn.	2.28	-	-
30.	<i>Spilanthes ciliata</i> L.	-	12.41	-
31.	<i>Synedrella nodiflora</i> Gaerta.	10.11	24.15	9.88
32.	<i>Trifolium repens</i> L.	6.37	-	29
33.	<i>Urena lobata</i> L.	-	2.93	-
34.	<i>Vernonia cinerea</i> Less.	7.01	7.68	-

## RESULTS AND DISCUSSION

The comparative data of the most common associates at the three sites of all the three plants with their IVI values are given in Tables 1, 2 and 3.

The most common associates of *Eclipta alba* were *Synedrella nodiflora*, *Commelina benghalensis*, *Metracarpus verticillaster* and *Oldenlandia umbellata*, while the least occurring species were *Cyclea peltata*, *Hyptis suaveolens* and *Sida acuta*.

Table 2: List of the most common associates of *Emilia sonchifolia* DC. in the three selected study sites.

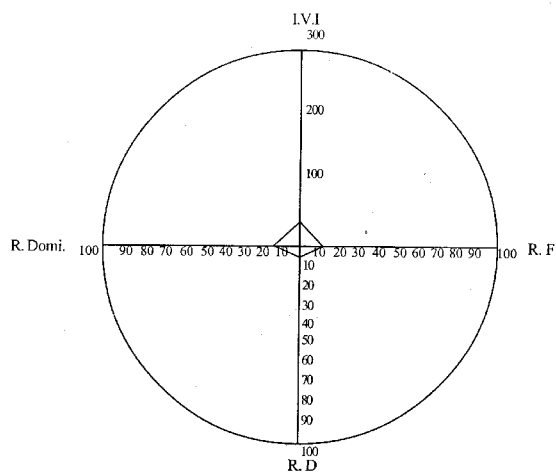
S. No.	Name of the plant	Site-I Cherthala	Site-II Cheravally	Site-III Ambalappuzha
1.	<i>Adenosma capitatum</i> Hk.f.	-	2.32	-
2.	<i>Aerva lanata</i> Juss.	-	4.44	7.52
3.	<i>Ageratum conyzoides</i> L.	2.2	4.37	-
4.	<i>Amarantus viridis</i> L.	-	-	7.31
5.	<i>Asystasia gangetica</i> T. And.	-	-	3.08
6.	<i>Biophytum sensitivum</i> DC.	2.17	13.1	3.92
7.	<i>Borreria hispida</i> K. Sch.	16.07	-	-
8.	<i>Centella asiatica</i> Urb.	-	3.17	-
9.	<i>Cephalandra indica</i> Naud.	-	-	6.01
10.	<i>Cleome viscosa</i> L.	8.36	5.95	10.03
11.	<i>Cleodendron infortunatum</i> L.	8.41	2.05	-
12.	<i>Commelina benghalensis</i> L.	4.93	6.75	3.26
13.	<i>Crotalaria juncea</i> L.	-	-	2.6
14.	<i>Eleutheranthera ruderalis</i> SW	10.71	-	-
15.	<i>Emilia sonchifolia</i> DC.	51.6	38.19	61.87
16.	<i>Eupatorium odoratum</i> L.	8.36	5.23	-
17.	<i>Hemidesmus indicus</i> R.Br.	-	5.34	-
18.	<i>Hyptis suaveolens</i> Poit.	2.23	-	-
19.	<i>Leucas aspera</i> Spr.	28.29	33.66	9.69
20.	<i>Ludwigia perenis</i> L.	-	7.2	-
21.	<i>Metracarpus verticillaster</i> L.	19.55	16.78	19.29
22.	<i>Melastoma malabathricum</i> L.	-	-	2.95
23.	<i>Mimosa pudica</i> L.	-	-	5.45
24.	<i>Mikania scandens</i> DC.	-	-	2.38
25.	<i>Oldenlandia umbellata</i> L.	4.84	13.21	8.59
26.	<i>Passiflora foetida</i> L.	-	-	2.6
27.	<i>Peperomia thomsoni</i> Hk.f.	-	-	4.71
28.	<i>Phyllanthus niruri</i> L.	-	-	2.42
29.	<i>Phyllanthus urinaria</i> L.	5.17	-	-
30.	<i>Physalis minima</i> L.	2.23	-	-
31.	<i>Pouzolzia indica</i> Gaud.	-	4.44	-
32.	<i>Scoparia dulcis</i> L.	3.43	11.89	27.75
33.	<i>Sebastiania chameia</i> L.	9.02	-	-
34.	<i>Sida cordifolia</i> L.	2.29	-	3.52
35.	<i>Synedrella nodiflora</i> Gaertn.	40.96	31.8	7.04
36.	<i>Trifolium repens</i> L.	18.9	5.68	30.84
37.	<i>Urena lobata</i> L.	2.51	3.95	-
38.	<i>Vernonia cinerea</i> Less.	9.61	13.95	14.71

*Emilia sonchifolia* was mostly associated with *Vernonia cinerea*, *Synedrella nodiflora*, *Leucas aspera*, *Metracarpus verticillaster* and *Oldenlandia umbellata*. The least occurring associates were *Adenosma capitatum*, *Asystasia gangetica* and *Crotalaria juncea*.

The common associates of *Vernonia cinerea* were *Leucas aspera*, *Metracarpus verticillaster*,

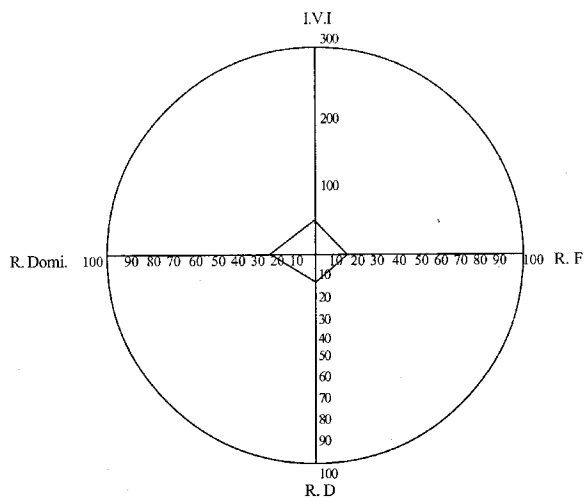
Table 3: List of the most common associates of *Vernonia cinerea* Less. in the three selected study sites.

S. No.	Name of the plant	Site-I Cherthala	Site-II Cheravally	Site-III Ambalappuzha
1.	<i>Achyranthes aspera</i> L.	-	3.98	2.57
2.	<i>Aerva lanata</i> Juss.	-	3.71	-
3.	<i>Ageratum conyzoides</i> L.	6.39	6.04	11.2
4.	<i>Asystasia gangetica</i> T. And.	4.74	-	-
5.	<i>Bacopa monneri</i> L.	-	10.7	-
6.	<i>Biophytum sensitivum</i> DC.	1.96	9.05	11.47
7.	<i>Borreria hispida</i> K. Sch.	3.45	-	-
8.	<i>Centella asiatica</i> Urb.	3.05	-	10.75
9.	<i>Cleome viscosa</i> L.	6.66	6.97	3.5
10.	<i>Cleodendron infortunatum</i> L.	5.4	16.28	-
11.	<i>Commelina benghalensis</i> L.	4.9	7.73	30.86
12.	<i>Crotalaria juncea</i> L.	2.1	-	-
13.	<i>Croton sparsiflorus</i> Mor.	-	-	1.91
14.	<i>Cyperus difformis</i> L.	3.81	-	6.79
15.	<i>Eclipta alba</i> Hassk.	-	3.15	-
16.	<i>Elephantopus scaber</i> L.	-	-	1.94
17.	<i>Emilia sonchifolia</i> DC.	8.91	7.91	-
18.	<i>Eupatorium odoratum</i> L.	7.74	2.39	-
19.	<i>Euphorbia thymifolia</i> L.	12.75	-	-
20.	<i>Hemidesmus indicus</i> R.Br.	-	3.67	-
21.	<i>Hibiscus sabdariffa</i> L.	-	3.46	-
22.	<i>Hyptis suavealens</i> Poit.	4.06	-	-
23.	<i>Leucas aspera</i> Spr.	13.01	9.06	14.11
24.	<i>Marsilea</i> sp.	-	4.83	-
25.	<i>Melochia corchorifolia</i> L.	-	-	2.05
26.	<i>Metracarpus verticillaster</i> L.	23.23	10.45	18.06
27.	<i>Micrococca mercurialis</i> Benth.	2.03	-	-
28.	<i>Mikania scandens</i> DC.	-	-	20.7
29.	<i>Mimosa pudica</i> L.	11.16	-	12.6
30.	<i>Oldenlandia umbellata</i> L.	5.71	25.79	10.57
31.	<i>Peperomia thomsoni</i> Hk.f..	-	-	-
32.	<i>Phyllanthus niruri</i> L.	2.56	4.79	2.39
33.	<i>Phyllanthus urinaria</i> L.	3.55	-	-
34.	<i>Pouzolzia indica</i> Gaud.	8.73	-	-
35.	<i>Scoparia dulcis</i> L.	4.14	10.33	2.02
36.	<i>Sebastiania chamelia</i> L.	10.32	-	5.12
37.	<i>Sida cordifolia</i> L.	5.65	-	-
38.	<i>Synedrella nodiflora</i> Gaertn.	2.1	30.31	24.47
39.	<i>Trifolium repens</i> L.	7.36	6.2	23.24
40.	<i>Urena lobata</i> L.	3.35	2.24	3.07
41.	<i>Vernonia cinerea</i> Less.	33.81	33.96	28.76



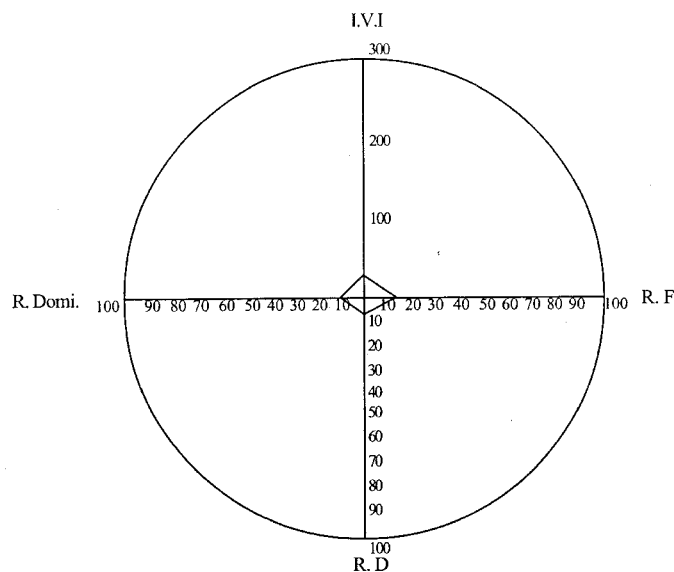
R.F.	R.D.	R. Domi.	I.V.I
12.24	7.06	13.49	32.79

Fig. 1: Phytograph of *Eclipta alba*: R.F.-Relative frequency, R.D.-Relative density, R. Domi-Relative dominance and IVI-Importance value index.



R.F.	R.D.	R. Domi.	I.V.I
15.99	12.93	21.6	50.52

Fig. 2: Phytograph of *Emilia Sonchifolia*: R.F.-Relative frequency, R.D.-Relative density, R. Domi-Relative dominance and IVI-Importance value index.



R.F.	R.D.	R. Domi.	I.V.I
13.98	8.09	10.03	32.1

Fig. 3: Phytograph of *Vernonia cinerea*: R.F.-Relative frequency, R.D.-Relative density, R. Domi-Relative dominance and IVI-Importance value index.

*Synedrella nodiflora* and *Oldenlandia umbellata*. The least occurring plants were *Asystasia gangetica* and *Crotalaria juncea*, *Elephantopus scaber*, and *Melochia corchorifolia*.

Phytograph were drawn (Figs. 1, 2 and 3) in order to represent the position of plants in the population. It shows that all the three species are not dominant in distribution in the community.

## REFERENCES

- Bakshi, T.S. 1952. The autecology of *Anisochilus eriocephalus* Benth. J. Ind. Bot. Soc., 31: 269-280.
- Bakshi, T.S. and Kapil, R.N. 1952. The autecology of *Mullugo nudicaulis* Lam. Bull. Bot. Soc. Beng., 6: 45-48.
- Bakshi, T.S. and Kapil, R.N. 1954. Morphology and ecology of *Mullugo cerviana*. Serv. J. Ind. Bot. Soc., 33: 309-328.
- Joshi, M.C. and Kambhoj, O.P. 1959. Autecological studies on Rajasthan desert plants - *Anticharis linearis* Hochst. J. Ind. Bot. Soc. 47: 63-75.
- Merlee, T.M. and Sr. Avita 1989. Autecological studies on Indian senega (*Polygala chinensis* L.) - A medicinal plant. Feddes Repertorium, 100(3-4): 157-165.
- Misra, R. and Puri, G.S. 1954. Indian Manual of Plant Ecology. Dehradun.
- Ramakrishnan, P.S. 1960. Studies on the autecology of *Euphorbia hirta* L. J. Ind. Bot. Soc., 38: 455-472.
- Sheela, D. and Hema, S. 2003. Phytosociological studies on *Eleutheranthera ruderalis* (SW.) Sch. BIP., an exotic weed in Kerala. Geobios, 30: 271-273.
- Srivastava, G.D. and Tandon, R.K. 1951. A study of autecology of *Trapa bispinosa* Roxb. Proc. Natl. Acad. Sci., India, 21B: 57-66.