

Research Article



An ecological study of medicinal plants in Aloor Grama Panchayath, Thrissur district, Kerala

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Abstract

The present investigation was conducted at ten sites in Aloor grama panchayath, Thrissur district, Kerala. The assessment of the flora was done for four months during the pre-monsoon period from February to May 2015. 80 plant species under 34 families were identified from the study area, during the period of investigation. Of these 45 medicinal plants belonging to 27 families were observed of which 10 were shrubs, 4 are climbers and 31 are herbs. Seven species namely *Ageratum conyzoides* L., *Amaranthus spinosus* L., *Chromolaena odorata* (L.) King & Robins, *Hyptis suaveolens* (L.) Poit., *Lantana camara* L., *Mimosa pudica* L. and *Physalis minima* L. are the invasive species found in the area. Sixteen species of these medicinal plants namely *Alternanthera sessilis* (L.) R. Br. ex DC., *Amaranthus viridis* L., *Bacopa monnieri* (L.) Pennell, *Cleome viscosa* L., *Clerodendrum infortunatum* Wight, *Commelina benghalensis* L., *Cynodon dactylon* (L.) Pers., *Cyperus rotundus* L., *Desmodium triflorum* (L.) DC., *Eclipta alba* (L.) Hassk., *Euphorbia thymifolia* L., *Hygrophila auriculata* (K. Schum.) Heine, *Leucas aspera* L. (Willd) Spreng., *Mollugo pentaphylla* L., *Phyllanthus Amarus* Schumach & Thonn. and *Scoparia dulcis* L. are the weeds recorded during the period of study. *Ageratum conyzoides* L. and *Chromolaena odorata* (L.) King & Robins are the more frequent medicinal plants, *Commelina benghalensis* L., *Cynodon dactylon* (L.) Pers., *Chromolaena odorata* (L.) King & Robins and *Ageratum conyzoides* L. are the more dense medicinal plant species and *Killinga monocephala* Nees. and *Cleome viscosa* L. are the most abundant species in the study area.

Keywords: Medicinal plants, flora, Aloor grama panchayath, Thrissur, Kerala

1. Introduction

The study of medicinal plants has presumed great importance in India and in various states of India no proper inventory of medicinal plants has been prepared. The work done is in the form of scattered or isolated efforts, aiming mostly towards medicinal use of the items. Only very little basic data is available on the biodiversity of the Thrissur district of Kerala, as the area was not surveyed (Nair et al., 2005). Out of 17,500 flowering plant species known from India, more than 4000 species are used as medicinal plants of which 300 species yield gum and dyes and about 100 species yield essential oils and are used as raw materials in drug industry (Chaudhuri 2007).

Over-exploitation and indiscriminate use of wild resources in commercial demand now-a-days play a great role not only behind the quick decline of the species concerned, but also becomes a threat for the survival of other associated species, thus acting as the major factors disturbing the entire ecosystem (Chaudhuri 2007). Both coexistence and competition are affected directed by the number of individuals in the community. It is essential to know the quantitative structure of the community. The quantitative characters of the plants are studied by vegetation analysis and based on these we can estimate the importance of the different species in a particular community (Trivedi et al., 1998).

2. Materials and methods

The present investigation was conducted at Aloor village of Allor grama panchayath in Thrissur district, Kerala. Aloor is 60 km away from Kochi and 12 km from Irinjalakuda and 6 km from Chalakkudy (Fig. 1). The ten sites in Aloor Grama Panchayath were selected and visited periodically for four months from February to May 2015 in order to survey the medicinal plants of the area.

The flowered twigs of the plants are collected periodically and the details about each plant collected were recorded. The identification of plants was done with the help of standard publications and floras available (Gamble and Fischer 1915-1936; Manilal and Sivarajan 1982; Sreekumar and Nair 1991; Sasidharan and Sivarajan 1996; Sasidharan 2004).



Fig. 1. Map of Aloor grama panchayath, Thrissur district, Kerala.

The ten selected sites for the present study are (1) Krishna Nagar (2) Edathadan Temple (3) Punchapadam (4) St. Joseph's Church (5) R.M.H.S. School (6) St. Joseph's E.M.H.S. School (7) Kalletumkara railway station (8) Kanalpalam Road (9) S.N.V.V.H.S. School and (10) St. Annes School in Aloor Grama Panchayath. The quadrat method was followed for the present ecological and quantitative analysis of medicinal plants in Aloor Grama Panchayath. The vegetation was analysed for frequency, density and abundance. The quadrat of 1m x 1m is used for the vegetation analysis of the study area and the frequency, density and abundance were calculated by the following formulae (Trivedi *et al.*, 1998). 10 quadrats are done at each site.

$$\text{Frequency (F)} = \frac{\text{Number of quadrats in which species occurred}}{\text{Total number of quadrats sampled}} \times 100$$

$$\text{Density (D)} = \frac{\text{Total number of individuals of a species in all the sample}}{\text{Total number of quadrats studied}}$$

$$\text{Abundance (A)} = \frac{\text{Total no. of individuals of a species in all quadrats}}{\text{Total no. of quadrats in which species occur}}$$

3. Results and discussion

The present floral analysis showed 80 species of plants, which comes under 34 families from the ten sites during pre-monsoon period. Of these 45 species comes under 27 families have medicinal properties (Table 1) of which 10 were shrubs, 4 are climbers and 31 are herbs. The distribution of the medicinal plants in the study area is given in Table 1. These medicinal plants are used for ayurvedic formulations (Warrier et al., 1996; Sivarajan and Balachandran 1998).

Seven species namely *Ageratum conyzoides* L., *Amaranthus spinosus* L., *Chromolaena odorata* (L.) King & Robins, *Hyptis suaveolens* (L.) Poit., *Lantana camara* L., *Mimosa pudica* L. and *Physalis minima* L. are regarded as invasive species (Sankaran et al., 2013)). Sixteen species namely *Alternanthera sessilis* (L.) R. Br. ex DC., *Amaranthus viridis* L., *Bacopa monnieri* (L.) Pennell, *Cleome viscosa* L., *Clerodendrum infortunatum* Wight, *Commelina benghalensis* L., *Cynodon dactylon* (L.) Pers., *Cyperus rotundus* L., *Desmodium triflorum* (L.) DC., *Eclipta alba* (L.) Hassk., *Euphorbia thymifolia* L., *Hygrophila auriculata* (K. Schum.) Heine, *Leucas aspera* L. (Willd) Spreng., *Mollugo pentaphylla* L., *Phyllanthus Amaras* Schumach & Thonn. and *Scoparia dulcis* L. are the weeds (Thomas and Abraham 1999) found in the study area.

Ageratum conyzoides L. and *Chromolaena odorata* (L.) King & Robins are the more frequent medicinal plants followed by *Sida acuta* Burm., *Commelina benghalensis* L. and *Mimosa pudica* L. (Table 2). *Commelina benghalensis* L., *Cynodon dactylon* (L.) Pers., *Chromolaena odorata* (L.) King & Robins and *Ageratum conyzoides* L. are the more dense medicinal plant species and *Melastoma malabathricum* L., *Calycopteris floribunda* Lam. and *Biophytum reinwardtii* (Zucc.) Klotzsch are the less dense species found in the study area during the period of study. *Killinga monocephala* Nees. and *Cleome viscosa* L. are the most abundant species and *Biophytum reinwardtii* (Zucc.) Klotzsch., *Calycopteris floribunda* Lam. and *Euphorbia prostrata* Alt. are the less abundant medicinal plant species in the study area.

The criteria for the threatened categories are to be applied to a taxon whatever the level of conservation action affecting it. It is important to emphasise here that a taxon may require conservation action even if it is not listed as threatened. Conservation actions which may benefit the taxon are included as part of the documentation requirements as stated in section 5 of IUCN Red data book.

Table 1. List of medicinal plants in Aloor Grama Panchayath, Thrissur.

Sl. No:	Name of plant species	Family	Habit
1	<i>Aerva lanata</i> (L.) Juss. ex Schult.	Amaranthaceae	Herb
2	<i>Ageratum conyzoides</i> L. **	Asteraceae	Herb
3	<i>Alternanthera sessilis</i> (L.) R. Br. ex DC.*	Amaranthaceae	Herb
4	<i>Amaranthus spinosus</i> L. **	Amaranthaceae	Herb
5	<i>Amaranthus viridis</i> L.*	Amaranthaceae	Herb
6	<i>Bacopa monnieri</i> (L.) Pennell *	Scrophulariaceae	Herb
7	<i>Biophytum reinwardtii</i> (Zucc.) Klotzsch.	Oxalidaceae	Herb
8	<i>Boerhaavia diffusa</i> L.	Nyctaginaceae	Herb
9	<i>Calycopteris floribunda</i> Lam.	Combretaceae	Shrub
10	<i>Cardiospermum helicacabum</i> L.	Sapindaceae	Climber
11	<i>Chromolaena odorata</i> (L.) King & Robins **	Asteraceae	Shrub
12	<i>Cleome viscosa</i> L. *	Cappraceae	Herb
13	<i>Clerodendrum infortunatum</i> Wight. *	Verbenaceae	Shrub

14	<i>Commelina benghalensis</i> L. *	Commelinaceae	Herb
15	<i>Crotalaria pallida</i> Dryand.	Fabaceae	Shrub
16	<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae	Climber
17	<i>Cyclea peltata</i> (Lam.) Hook.F. Thomas	Menispermaceae	Climber
18	<i>Cynodon dactylon</i> (L.) Pers. *	Poaceae	Herb
19	<i>Cyperus rotundus</i> L. *	Cyperaceae	Herb
20	<i>Desmodium triflorum</i> (L.) DC. *	Fabaceae	Herb
21	<i>Eclipta alba</i> (L.) Hassk. *	Asteraceae	Herb
22	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Herb
23	<i>Euphorbia prostrata</i> Alt.	Euphorbiaceae	Herb
24	<i>Euphorbia thymifolia</i> L. *	Euphorbiaceae	Herb
25	<i>Ficus hispida</i> L.f.	Moraceae	Shrub
26	<i>Hygrophila auriculata</i> (K. Schum.) Heine *	Acanthaceae	Herb
27	<i>Hyptis suaveolens</i> (L.) Poit. **	Lamiaceae	Shrub
28	<i>Killinga monocephala</i> Nees.	Cyperaceae	Herb
29	<i>Lantana camara</i> L. **	Verbenaceae	Shrub
30	<i>Laportea interrupta</i> (L.) Chew.	Urticaceae	Herb
31	<i>Leucas aspera</i> L. (Willd) Spreng. *	Lamiaceae	Herb
32	<i>Melastoma malabathricum</i> L.	Melastomataceae	Shrub
33	<i>Mimosa pudica</i> L. **	Mimosaceae	Herb
34	<i>Mollugo pentaphylla</i> L. *	Molluginaceae	Herb
35	<i>Ocimum sanctum</i> L.	Lamiaceae	Herb
36	<i>Phyllanthus amarus</i> Schumach & Thonn. *	Euphorbiaceae	Herb
37	<i>Physalis minima</i> L. **	Solanaceae	Herb
38	<i>Portulaca oleracea</i> L.	Portulacaceae	Herb
39	<i>Pothos scandens</i> L.	Araceae	Climber
40	<i>Scoparia dulcis</i> L. *	Scrophulariaceae	Herb
41	<i>Sida acuta</i> Burm.	Malvaceae	Shrub
42	<i>Sida rhombifolia</i> L.	Malvaceae	Shrub
43	<i>Spilanthes ciliata</i> L.	Asteraceae	Herb
44	<i>Torenia bicolor</i> Dalz.	Scrophulariaceae	Herb
45	<i>Tragia involucrata</i> L.	Euphorbiaceae	Herb

* Weeds, ** Invasive species

Table 2. Distribution and quantitative analysis of medicinal plants in Aloor Grama Panchayath, Thrissur.

Sl. No:	Name of plant species	Site Number										Total No: of individuals	Occurrence	F	D	A
		1	2	3	4	5	6	7	8	9	10					
1	<i>Aerva lanata</i> (L.) Juss. ex Schult.	+	-	+	-	-	+	-	-	-	-	53	24	24	0.53	2.21
2	<i>Ageratum conyzoides</i> L.	+	+	+	+	+	-	+	+	+	+	141	58	58	1.41	2.43
3	<i>Alternanthera sessilis</i> (L.) R. Br. ex DC.	+	-	-	-	-	-	-	+	-	-	20	9	9	0.20	2.22
4	<i>Amaranthus spinosus</i> L.	-	+	-	-	-	-	+	-	-	+	118	15	15	1.18	7.87
5	<i>Amaranthus viridis</i> L.	-	-	-	+	-	+	-	-	-	-	35	10	10	0.35	3.50
6	<i>Bacopa monnieri</i> (L.) Pennell	-	-	-	-	+	-	-	-	-	-	8	5	5	0.08	1.60
7	<i>Biophytum reinwardtii</i> (Zucc.) Klotzsch.	-	-	-	-	-	+	-	-	-	-	3	3	3	0.03	1.00
8	<i>Boerhaavia diffusa</i> L.	+	+	-	-	-	+	-	-	-	-	30	14	14	0.3	2.14
9	<i>Calycopteris floribunda</i> Lam.	-	-	-	-	-	+	-	-	-	-	3	3	3	0.03	1.00
10	<i>Cardiospermum helicacabum</i> L.	-	-	-	-	-	+	-	-	-	-	11	6	6	0.11	1.83
11	<i>Chromolaena odorata</i> (L.) King & Robins	+	+	+	+	-	-	+	+	+	+	146	58	58	1.46	2.52
12	<i>Cleome viscosa</i> L.	-	-	-	-	-	+	-	-	-	-	68	6	6	0.68	11.33
13	<i>Clerodendrum infortunatum</i> Wight.	+	-	-	-	-	-	+	-	-	+	29	16	16	0.29	1.81
14	<i>Commelina benghalensis</i> L.	+	+	+	-	-	+	+	+	+	+	430	54	54	4.30	7.96
15	<i>Crotalaria pallida</i> Dryand.	-	-	-	-	-	+	-	-	-	-	11	6	6	0.11	1.83
16	<i>Cuscuta reflexa</i> Roxb.	-	-	-	-	-	+	-	-	-	-	8	4	4	0.08	2.00
17	<i>Cyclea peltata</i> (Lam.) Hook.F. Thomas	-	+	-	-	+	+	-	-	-	-	23	13	13	0.23	1.77
18	<i>Cynodon dactylon</i> (L.) Pers.	+	+	+	+	+	-	-	+	+	-	200	41	41	2.00	4.88
19	<i>Cyperus rotundus</i> L.	-	-	-	-	+	+	-	+	+	-	64	22	22	0.64	2.91
20	<i>Desmodium triflorum</i> (L.) DC.	-	-	+	+	-	-	-	-	-	+	86	17	17	0.86	5.06
21	<i>Eclipta alba</i> (L.) Hassk.	+	-	-	+	+	-	-	+	-	-	34	20	20	0.34	1.70
22	<i>Euphorbia hirta</i> L.	-	-	-	+	+	-	-	-	-	-	28	12	12	0.28	2.33
23	<i>Euphorbia prostrata</i> Alt.	-	-	+	-	-	-	-	-	+	-	11	10	10	0.11	1.10
24	<i>Euphorbia thymifolia</i> L.	-	-	+	-	-	-	-	-	-	-	10	6	6	0.10	1.67
25	<i>Ficus hispida</i> L.f.	-	+	-	-	-	+	+	-	-	-	25	15	15	0.25	1.67

26	<i>Hygrophila auriculata</i> (K. Schum.) Heine	-	-	-	-	-	-	-	-	+	-	10	7	7	0.10	1.43
27	<i>Hyptis suaveolens</i> (L.) Poit.	-	-	-	-	-	-	+	-	-	+	24	10	10	0.24	2.40
28	<i>Killinga monocephala</i> Nees.	-	-	-	-	-	-	-	+	-	-	118	7	7	1.18	16.86
29	<i>Lantana camara</i> L.	-	+	+	+	-	+	+	-	-	+	40	27	27	0.40	1.48
30	<i>Laportea interrupta</i> (L.) Chew.	-	-	-	-	+	-	+	-	-	-	18	11	11	0.18	1.64
31	<i>Leucas aspera</i> L. (Willd) Spreng.	+	-	+	+	-	-	-	-	-	+	23	15	15	0.23	1.53
32	<i>Melastoma malabathricum</i> L.	-	-	+	-	-	-	-	-	-	-	4	3	3	0.04	1.33
33	<i>Mimosa pudica</i> L.	+	+	-	+	+	+	-	+	+	+	96	53	53	0.96	1.81
34	<i>Mollugo pentaphylla</i> L.	-	+	-	-	+	-	-	-	+	-	24	16	16	0.24	1.50
35	<i>Ocimum sanctum</i> L.	-	-	-	-	-	-	-	-	-	+	6	4	4	0.06	1.50
36	<i>Phyllanthus amarus</i> Schumach & Thonn.	+	-	+	-	+	+	-	+	-	-	65	33	33	0.65	1.97
37	<i>Physalis minima</i> L.	+	-	-	+	+	-	-	+	-	-	55	25	25	0.55	2.20
38	<i>Portulaca oleracea</i> L.	-	-	+	-	-	-	-	-	-	-	14	7	7	0.14	2.00
39	<i>Pothos scandens</i> L.	-	-	+	-	+	-	-	-	-	-	7	5	5	0.07	1.40
40	<i>Scoparia dulcis</i> L.	-	+	+	-	-	-	-	-	-	+	32	19	19	0.32	1.68
41	<i>Sida acuta</i> Burm.	+	+	+	+	+	-	+	-	+	+	128	54	54	1.28	2.37
42	<i>Sida rhombifolia</i> L.	-	+	-	-	-	-	+	-	+	-	36	21	21	0.36	1.71
43	<i>Spilanthes ciliata</i> L.	-	+	-	+	-	-	+	+	+	+	89	40	40	0.89	2.23
44	<i>Torenia bicolor</i> Dalz.	-	-	-	-	-	-	-	-	+	-	10	6	6	0.10	1.67
45	<i>Tragia involucrata</i> L.	-	-	-	-	+	-	-	-	-	-	33	16	16	0.33	2.06

F - Frequency; D - Density; A – Abundance

4. Conclusion

The genetic level that is genes, which make up the heredity of each species and are now considered the basic important tool for genetic engineering and creation of transgenic plants and animals and tools for biotechnology research. Despite the benefit from biodiversity, today's threat to species and ecosystem are the greatest recorded in recent history and virtually all of them are caused by human management of biological resources often simulated by misguided economic policies, pollution and unreliable institutions in addition to climatic change. Increasing population and economic development increases the demand for biological resources.

Conflict of interest statement

We declare that we have no conflict of interest.

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