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Current ecological status of the two medicinal shrubs, *Erythroxylum monogynum* Roxb. and *Ehretia microphylla* Lam. in Maruthamalai hills of Western Ghats and Bannari hills of Eastern Ghats.

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ABSTRACT:

The perpetuation level of two medicinal shrubs such as *Erythroxylum monogynum* and *Ehretia microphylla* in terms of certain quantitative ecological characters was assessed in dry deciduous forests at Maruthamalai hills of Nilgiri Biosphere Reserve, the Western Ghats and Bannari hills of Eastern Ghats for the year, 2011-2012. The results of the study revealed that the species, *Erythroxylum monogynum* established well in Bannari hills by obtaining higher frequency (100%), density (198/100m^2) and basal cover (9467mm^2/100m^2). The importance value index secured by this species in Bannari hills (1.34) also shows that it perpetuated well in that area. On the other hand, this trend was reverse for the other species, *Ehretia microphylla* which shows well establishment in Maruthamalai hills (Frequency 80%, density 105/100m^2 and basal cover 249mm^2/100m^2) than performed in Bannari hills. However, the level of establishment of these two species with respect to all ecological characters studied was too lower in comparison to that of the respective dominant species in the two study areas. Further, it was determined that the establishment of former species was better in foot hills of both the study areas. The other species, *Ehretia microphylla* exhibited slight increase in density with the increase in altitude from the foot hills to interior forests in both study areas. When community is considered as a whole, the degree of perpetuation is not at appreciable level and may be decreased drastically if the anthropogenic disturbance continuous for their medicinal properties. Hence planting of more individuals of *Erythroxylum monogynum* in the foot hills of Bannari hills (365m above msl) and *Ehretia microphylla* in the interior forests of Maruthamalai hills at the altitude around 800m above msl may increase the population size of these two species and hence to meet the demand.

Keywords:

Erythroxylum monogynum, Ehretia microphylla, Maruthamalai hills, Bannari hills, ecological status.

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INTRODUCTION

The Nilgiri Biosphere Reserve of Western Ghats, Tamil Nadu, harbours many types of vegetations like thorny scrub jungles, dry and moist deciduous forests, sholas, grasslands etc., due to varied climatic and soil conditions at different altitudes which results high floristic and faunal diversity (Daniels, 1992). Maruthamalai hills and Bannari hills are the part of Nilgiri Biosphere Reserve of the Western Ghats and the Eastern Ghats respectively which are mainly constituted by dry deciduous forests (Champion, 1939). These forests are considered to be the potential vegetations contain rich number of medicinal plants owing to water stress (Daubenmire, 1970). Proper ecological studies on current standing crop availability status of these species in terms of population size are most essential for the sustainable utilization and conservation of them in an affective manner. However, no such studies are carried out so far in this line for any species in the deciduous forests of the two study areas at Maruthamalai hills and Bannari hills.

Erythroxylum monogynum (Erythroxylaceae) and *Ehretia microphylla* (Boraginaceae) are the two shrubby species endowed with many medicinal uses and generally available in the two study areas with varied population densities at different altitudes from the foot hills to the interior forests. The leaves and bark of the *Erythroxylon monogynum* are medicinally used by traditional healer. It pacifies vitiated pitta and anti-inflammatory, to treat skin diseases and antimalarial also (Anand *et al.,* 2006). The leaf paste is taken internally for antiapetite (Kurusuresh *et al*., 2011). The leaves of *Ehretia microphylla* is used to make tea. Leaf decoction is used for abdominal colic and for the treatment of diarrhoea and dysentery. Further, the leaves are anti-inflammatory (Anonymous, 1940-1976). To know the current status on population density in different altitudes of their territory in Maruthamalai hills and Bannari hills, the present study has been undertaken.

MATERIALS AND METHODS

Study area

The study area, Maruthamalai hills is a part of Nilgiri Biosphere Reserve, the Western Ghats, situated 15km away from Coimbatore city in western side at an altitude of 600m above msl. The Bannari hills situated adjoing the Nilgiri Biosphere Reserve near Sathymangalam at an altitude of 365m above msl is the western most part of Eastern Ghats. Both area contain semi-arid habitat with dry deciduous forests. The climatic factors and vegetations of both the study areas are described by Pascal (1988) and Paulsamy (2011). The annual rainfall recorded for Maruthamalai hills is ca.570mm and for Bannari hills, it is ca.550mm. The temperature in an year is varying between 18 and 37°C in Maruthamalai hills and 21 and 41°C in Bannari hills. It shows that macroclimatic conditions in both areas are varying slightly.

Methods

The study was conducted for a period of one year from April, 2011 to March 2012 by sampling the vegetations at alternative months. An one hectare plot (20×500m) was established in each study area starting at the foot hills and spreading up towards the interior forests. Each plot was subdivided into ten subplots of 20×50m size and each subplot was further divided into ten smaller plots of 2×50m size. The altitudes of the sampling plot at the starting point in the foot hills and at the end point in the interior forests of the Maruthamalai hills and Bannari hills are 500 and 800m above msl, and 365 and 610m above msl respectively. The individuals of the study species, *Erythroxylum monogynum* and *Ehretia microphylla* were recorded to determine the species level of distribution (frequency), density and basal cover (dominance) in the community following the methods of Cottom and Curtis (1956).

To calculate average basal area of individuals, the stem circumference at 30cm high from soil for each species was measured. Then the formula πr^2 was used to

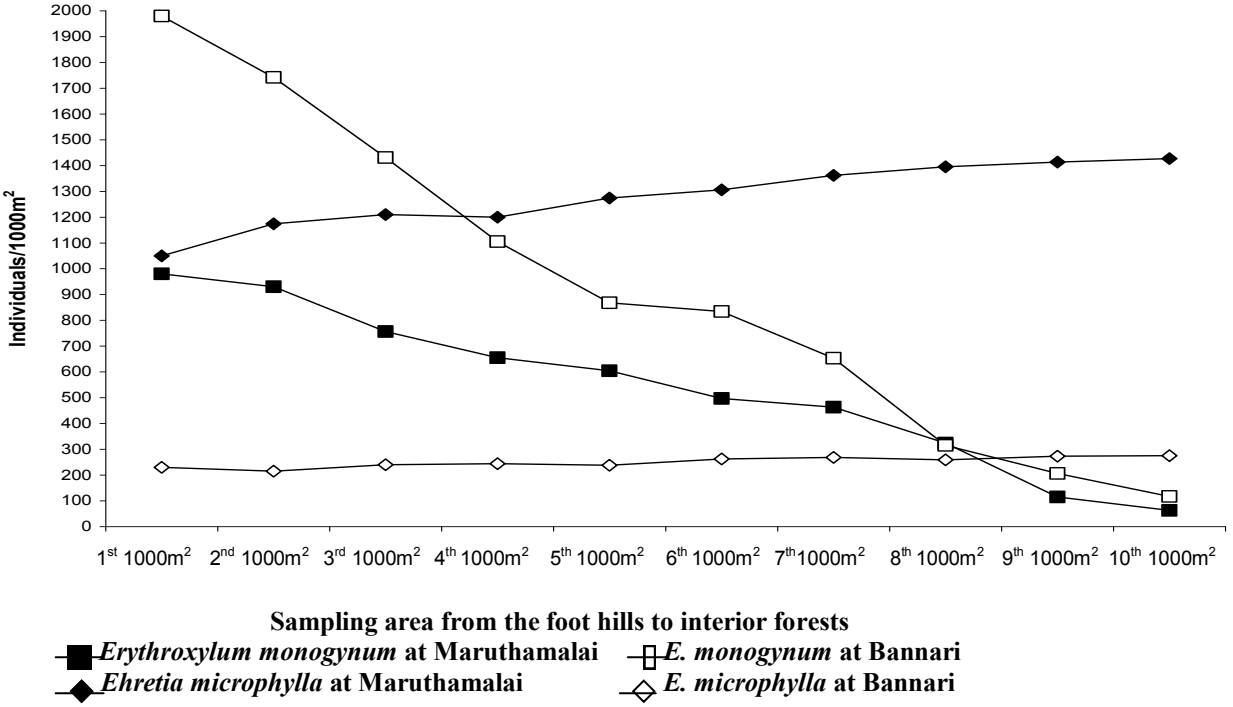

Fig 1. Number of individuals of *Erythroxylum monogynum* and *Ehretia microphylla* found in every 1,000m^2 sampling area from the foot hills to interior forests.

derive the average basal area. The average basal area was multiplied with the density to obtain the basal cover. The importance value index (IVI) and the relative value of importance (RVI) of the two study species were calculated separately following the methods of Curtis and Mc Intosh (1950).

RESULTS AND DISCUSSION

The data on frequency, density, basal cover, IVI and RVI for the two study species, *Erythroxylum monogynum* and *Ehretia microphylla* are shown in Table 1. Higher frequency of 100% in Bannari hills for the species, *Erythroxylum monogynum* and 80% in the Maruthamalai hills for the species, *Ehretia microphylla* showed that these two species are location specific in distribution despite the habitats of them in both study areas are dry deciduous forests. It may be explained due to the most favourable microclimatic conditions available in the respective study area for the respective species. Murugasen (2005) reported that the nutrient status and pH of the soils of Maruthamalai hills and Bannari hills are varied most considerably. This fact may influence the germination rate of seedlings of the study species and hence the distribution. Like the trend of frequency, the density of the two study species is also site specific (Table 1). For the species, *Erythroxylum monogynum,* the study area Bannari hills registered higher density of 198 individuals/100m^2 against the density, 9.8 individuals/100m^2 at Maruthamalai hills. However, this trend was reverse for the case of *Ehretia microphylla,* which registered higher density (105 individuals/100m^2) in Maruthamalai hills and lower density (23 individuals/100m^2) in Bannari hills. It may be attributed to the influence of light and temperature respectively in the germination and seedling establishment (Khurana and Singh, 2001). Guariguata (2000) stated that light intensity and its spectral quality influence the germination, survival and growth of seedlings of tropical tree and shrub species with marked interspecific variation. Similarly, temperature is the most important environmental factor responsible for the

Table 1. Species richness of Maruthamalai hills and Bannari hills in the communities upto 800 and 610m above msl respectively from the foot hills (600m elevation for Maruthamali hills and 365m above msl for Bannari hills) with mean annual values of frequency, density, basal cover, importance value index (IVI) and relative value index (RVI) for *Erythroxylum monogynum* and *Ehretia microphylla* during 2011-2012.

Quantitative ecological character	Species	Study area	
		Maruthamalai hills	Bannari hills
Frequency (%)	*Erythroxylum monogynum*	55±3.5	100±0.0
	Ehretia microphylla	80±2.1	30±0.5
Density (individuals/100m^2)	*Erythroxylum monogynum*	98±2.1	198±3.1
	Ehretia microphylla	105±1.6	23±0.6
Basal cover (mm^2/100m^2)	*Erythroxylum monogynum*	5377±29.8	9467±46.3
	Ehretia microphylla	249±6.7	97±2.1
IVI	*Erythroxylum monogynum*	0.92 (17.42)	1.34 (15.60)
	Ehretia microphylla	1.08 (19.21)	0.41 (16.40)
RVI	*Erythroxylum monogynum*	0.31 (5.80)	0.45 (3.20)
	Ehretia microphylla	0.36 (6.40)	0.14 (5.46)

Species richness: Maruthamalai hills-165; Bannari hills-174.
The values followed by '±' are SD of the samples taken at the alternative months during the study period of one year.
Values in parentheses are the data for the respective dominant species in the study areas.

synchronization of germination with conditions suitable for seedling establishment (Probert, 2000). It regulates germination by determining the capacity and rate of germination, by removing primary and/ or secondary dormancy, and by inducing secondary dormancy in many tropical species (Bewley and Black, 1994). Paulsamy *et al.,* (2009) described the variation in light, temperature and soil factors in the two study areas, Maruthamalai hills and Bannari hills which may influence the seed germination and seedling development and consequently the density of the two study species. This type of influence of microclimate on the population size of individual species in the two communities is also evidenced in floristic composition (i.e), of the 306 species altogether encounted, only 11% of species are known to occur commonly in both communities and the 89% of flora are site specific due to microclimatic variation despite the dry desiduous forest habitat in both areas in which the two study species occur. Similar trend of results have been observed by Castro-Marin *et al.,* (2011) for certain tropical species in Nicaragua at varied microclimatic conditions. As for the characters, frequency and density, the two species showed similar trend of basal cover occupation in the respective forests (Table 1). The species, *Erythroxylum monogynum* occupied higher basal cover of 9467mm^2/100m^2 in Bannari hills where it registered greater frequency and density, whereas the species, *Ehretia microphylla* recorded its higher basal cover (249 mm^2/100m^2) in Maruthamalai hills. This may be attributed to the preference of microhabitats with respect to light, temperature and soil conditions. The greater variation in basal cover between the two species is mainly due to the wide variation in density between them, a most responsible quantitative ecological factor, which determines the attribute, basal cover for the individuals of any species with matured condition (Weaver and Clements, 1929).

Based on the IVI and RVI values, the plant species, *Albizzia amara* in Maruthamalai forest and *Anogeissus latifolia* in Bannari hills were determined to be dominants (Table 1). In any natural community, the dominant plant species play a major role in community metabolism and in other functions also. Of the many species found in the study areas (165 species in Maruthamalai hills and 174 in Bannari hills) (Appendix I) the study species, *Erythroxylum monogynum* accounted for 95 and 91% lower IVI against the dominant species in Maruthamalai hills and Bannari hills respectively. Similarly, the

Appendix I
List of plant species available in the study areas
Maruthamalai hills and Bannari hills over the study period of one year 2011-2012.

S. No	Species	Maruthamalai hills	Bannari hills
1	*Abrus precatorius* L.	+	+
2	*Abutilon indicum* (G.Don)	-	+
3	*Acacia caesia* W. & A.	-	+
4	*A. intsia* (L.) Willd. W. & A.	-	+
5	*A. leucophloea* (Roxb.) Willd.	+	-
6	*A. nilotica* (L.) Willd Del.	+	-
7	*A. pennata* (L.) Willd	-	+
8	*A. sinuata* (Lour.) Merr.	-	+
9	*A. torta* (Roxb.) Craib	+	+
10	*Acalypha fruticosa* Forsk.	+	-
11	*A. indica* L	+	-
12	*Acanthospermum hispidium* DC.	+	-
13	*Achyranthes aspera* Linn.	+	-
14	*Acorus calamus* L.	-	+
15	*Acrocarpus fraxinifolius* W.	-	+
16	*Adhatoda vasica* Nees.	-	+
17	*Adina cordifolia* Bth HK.f.	-	+
18	*Aegle marmelos* Corr.	-	+
19	*Aerva lanata* Juss.	+	-
20	*Aganosma cymosa* G. Don.	-	+
21	*Agave americana* L.	+	-
22	*Ailanthus excelsa* Roxb.	-	+
23	*Alangium salvifolium* Wang.	-	+
24	*Albizzia amara* Boiv.	+	-
25	*A. lebbeck* Benth.	+	-
26	*A. odoratissima* Benth.	-	+
27	*A. richardiana* King & Prain.	-	+
28	*Aloe vera* (L.)	-	+
29	*Alternanthera pungens* kunth.	+	-
30	*Alysicarpus monilifer* DC.	+	-
31	*A. rugosus* DC.	+	-
32	*Amaranthus viridis* L.	+	-
33	*Andrographis paniculata* Nees	-	+
34	*Anisomeles malabarica* R. Br.	-	+
35	*Annona squamosa* L.	+	+
36	*Argyreia pomacea* (Roxb.) Choisy.	+	-
37	*A. aggregate* (Roxb.) Choisy.	+	-
38	*A. cuneata* (Willd.) Ker Gawl.	-	+
39	*A. involucrata* C.B.Clarke Cl.	-	+
40	*A. kleiniana* (Roem. & Schult.)	-	+
41	*A. pilosa* Wight & Arn.	-	+
42	*Aristolochia indica* L.	+	+
43	*A. tagala* Cham.	-	+
44	*Asparagus racemosus* Willd	+	--
45	*Atalantia monophylla* Corr.	+	+
46	*Azadirachta indica* A. Juss.	+	-
47	*Azima tetracantha* Lam.	-	+
48	*Bambusa arundinacea* Willd.	+	-
49	*B. balcoona* Roxb.	-	+
50	*B. bambos* (L.) Voss	-	+

51	*B. tulda* Roxb.	-	+
52	*B. vulgaris* L.	-	+
53	*Barleria acuminata* W.	+	
54	*B. buxifolia* Linn.	+	-
55	*B. mysorensis* Roth.	-	+
56	*B. prionitis* Linn.	+	-
57	*Bauhinia variegata* L.	+	-
58	*Blepharis maderaspatensis* (L.) B. Hexyne ex Roth	+	-
59	*Boerhaavia diffusa* L	+	-
60	*B. hispida* k.sch.	+	-
61	*B. ocymoides* DC	+	-
62	*B. repens* L.	-	+
63	*Bombax malabaricum* DC.	-	+
64	*Borassus flabellifer* L.	-	+
65	*Boswellia serrata* Roxb.	-	+
66	*Breynia rhamnoides* M. Arg.	+	-
67	*Bridelia crenulata* Roxb.	-	+
68	*Butea monosperma* Lam.	-	+
69	*Cadaba indica* Lam.	+	-
70	*Caesalpinia crista* L.	-	+
71	*C. sepiaria* Roxb.	-	+
72	*Calotropis gigantea* R.Br.	+	-
73	*Canarium strictum* Roxb	-	+
74	*Canavalia gladiata* DC.	+	-
75	*C. mollis* W. & A.	+	-
76	*C. virosa* Wight & Arn.	-	+
77	*Cansjera rheed*i J. Gmel.	-	+
78	*Capparis sepiara* (L.) R.Br.	-	+
79	*C. brevispina* DC.	+	-
80	*C. divaricata* Hk.f & T.	-	+
81	*C. grandis* L. f.	+	-
82	*C. shevaroyensis* Sund.-Ragh.	-	+
83	*C. zeylanica* Wall.	+	+
84	*Cardiospermum canescens* Wall.	+	-
85	*C. halicacabum* L.	+	-
86	*Carica papaya* L	-	+
87	*Carissa carandas* L.	+	+
88	*C. occidentalis* L.	+	-
89	*Carrissa spinarum* L	+	+
90	*Carmona retusa* (Vahl.) Mas.	+	-
91	*Cassia auriculata* L.	+	-
92	*C. fistula* L.	+	-
93	*C. occidentalis* L.	+	-
94	*C. siamea* Lam.	+	-
95	*C. sophera* L.	-	+
96	*Cassine glauca* Lam.	+	-
97	*Casuarina junghuhniana* Miq	+	+
98	*Celastrus paniculatas* Willd.	+	-
99	*Chloroxylon swietenia* DC.	+	-
100	*Chromolaena odorata* (L).R.M.King & H.Roxb.	+	-

101	*Cinnamomum malabathrum* (Burm. f.) Blume	-	+
102	*Cissampelos pareira* L.	+	-
103	*Cissus heyneana* Planch	-	+
104	*C. quadrangularis* Linn.	+	+
105	*C. vitiginea* L.	-	+
106	*Citrus medica* L	-	+
107	*Clematis gouriana* Roxb.	-	+
108	*Cleome gynandra* L.	-	+
109	*C. viscosa* L.	+	-
110	*Clitoria ternatea* L.	+	-
111	*Coccinia grandis* (Linn.) Voigt	-	+
112	*C. indica* Wight & Arn.	+	-
113	*C.s hirsutus* (Diels,)	+	+
114	*C.. Pendulous* (Forsk.) Diels.	+	-
115	*Combretum albidium (Piluki)*.	-	+
116	*Commiphora berryi* (Arn) Engl.	+	-
117	*C. caudata* Engl.	+	-
118	*C. caudata (*Wight & Arn.) Engl.	+	-
119	*Cosmostigma racemosum* Wight.	-	+
120	*Crataeva adansonii* DC.Ssp.Odira (Buch-Ham.) M. jacobs.	+	-
121	*Crotalaria verrucosa* L.	+	-
122	*Croton bonplandianum* Baill	+	-
123	*Cucumis sativus* L.	-	+
124	*Curculigo orchioides* Gaertn	-	+
125	*Cynodon dactylon* Pers.	+	-
126	*Daemia extensa* R. Br.	+	-
127	*Dalbergia latifolia* Roxb.	-	+
128	*Datura metel* Linn.	-	+
129	*Decalepis hamiltonii* Wight & Arn..	-	+
130	*Delonix regia* Raf.	+	-
131	*Derris scandens* Benth.	-	+
132	*Desmodium triflorum* DC.	+	-
133	*Dictrostachys cinerea W. & A*.	+	-
134	*Dimocarpus longan* Lour.	-	+
135	*Diospyros montana* Roxb.	+	+
136	*Diploclisia glaucescens* Diels.	-	+
137	*Dodonaea viscosa* (L.)	+	-
138	*Drypetes roxburghii (*Wall.) Hur	-	+
139	*Eclipta prostrate* Linn.	-	+
140	*Embelia basaal* (R & S) A. Dc	-	+
141	*Emblica officinalis* Gaertn.	-	+
142	*Enicostemma hyssopifolium* (Willd.) Verd.	-	+
143	*Entada pursaetha* DC.	-	+
144	*Erythina stricta* Roxb.	-	+
145	*Erythroxylon monogynum* Roxb.	+	+
146	*Eucalyptus globulus* Labill.	+	-
147	*E. territicornis* Sm.	-	+
148	*Euphorbia antiquorum* L.	+	+
149	*E. hirta* L	+	-
150	*Evolvulus alsinoides* L.	+	-

151	*E. glomeralus* Nees & Mart.	-	+
152	*Ficus benghalensis* L.	+	+
153	*F. drupacea* Thunberg.	-	+
154	*F. microcarpa* L.f.	-	+
155	*F. racemosa* L.	-	+
156	*Fluggea luecopyrus Willd*	+	-
157	*Gardenia gummifera* L. f.	+	-
158	*Gloriosa superba* L	+	+
159	*Grewia flavescens* Juss.	+	+
160	*G. hirsuta* (Vahl.)	+	-
161	*G. rhamnifolia* Heyne .	-	+
162	*G. tiliaefolia* Vahl.	-	+
163	*G. villosa* (Willd).	+	-
164	*Gymnema sylvestre* R. Br.	+	+
165	*G. tingens* W. & A.	-	+
166	*Hemidesmus indicus* R. Br.	+	+
167	*Heteropogon contortus* Beauv.	+	-
168	*Hibiscus micranthus* L.f.	+	-
169	*H. tiliaceus* L.	+	-
170	*Hiptage benghalensis* (L.) Kurz.	-	+
171	*Holoptelea integrifolia* Pl.	+	-
172	*Hugonia mystax* L.	-	+
173	*Ichnocarpus frutescens* R. Br.	+	-
174	*Indigofera enneaphylla* L.	+	
175	*Ipomaea nill* (L.) Roth.	+	-
176	*I. obscura* (L.) K- Gawl	-	+
177	*I. staphylina* R. & S.	+	+
178	*I. staphylina* R. & S.	-	+
179	*Jasminum angustifolium* Vahl.	-	+
180	*J. auriculatum* (vahl.)	+	-
181	*J. sessiliflorum* Vahl.	-	+
182	*Jatropha curcas* L.	-	+
183	*J. grandulifera* Roxb.	+	-
184	*Justicia tranquebariensis* L. f.	+	-
185	*Kedrostis foetidissima* (Jacq.) Cogn.	+	-
186	*Kydia calycina* Roxb.	-	+
187	*Lantana camara* L.	+	+
188	*Leptadenia reticulata* W&A.	+	-
189	*Leucas aspera* (Spr.)	+	-
190	*Loeseneriella obtusifolia* (Roxb.)	-	+
191	*Malvastrum coromandelianum* Garcke.	+	-
192	*Marsdenia brunoniana* Wight & Arn.	-	+
193	*M. tenacissima* (Roxb.) Wight et Arn.	-	+
194	*Maytenus heyneana* (Roth) D.C.S.Raju & Babu	-	+
195	*Meliosma pinnata* (Roxb.)	-	+
196	*Memecylon madgolense* Gamb.	-	+
197	*M. parvifolium* Thwaites	-	+
198	*Mentha spicata* L	-	+
199	*Mimosa invisa* Linn.	-	+
200	*Mimusops elengi* L.	-	+
201	*Morinda tinctoria* Roxb.	+	-
202	*Mundulea sericea* (Willd.) A.cheva.	+	-
203	*Murraya paniculata* (L.) Jack.	-	+
204	*Myristica dactyloides* Gaertn.	-	+
205	*Naravelia zeylanica* DC.	-	+

206	*Naringi crenulata* (Roxb.) Nicolson.	+	+
207	*Ocimum basilicum* Linn.	-	+
208	*O. sanctum* L.	-	+
209	*Oldenlandia umbellata* L.	+	-
210	*Opuntia stricta* (Haw.) Haw.	+	-
211	*Orthosiphon thymiflorus* (Roth.) Sleesen.	+	-
212	*Oxytenanthera nigrociliata* (Buse.) Munro.	-	+
213	*Pachygone ovata* (Poir).	-	+
214	*Parkinsonia aculeata* L.	-	+
215	*Parthenium hysterophorus* L.	+	-
216	*Passiflora foetida* L.	+	-
217	*Pavetta indica* L.	+	-
218	*Pavonia zeylanica* Cav.	+	-
219	*Peltophorum pterocarpum* Baker ex k.Heyne.	+	-
220	*Pergularia daemia* (Forsk.) Chiov.	-	+
221	*Peristrophe bicalyculata* Nees.	+	+
222	*Phyllanthus amarus* Schum. & Thonn.	-	+
223	*P. emblica* L.	+	-
224	*P. maderaspatensis* L.	+	-
225	*P. reticulatus* Poir	+	-
226	*Piper nigrum* L.	-	+
227	*Pithecelobium dulce* Benth.	+	-
228	*Plecospermum spinosum* Trecul.	-	+
229	*Polycarpaea corymbosa* (L) Lam.	+	-
230	*Polygala bolbothrix* Dunn.	+	-
231	*P. jacobi* chandrab	+	-
232	*Pongamia pinnata* (L.) Pierre.	+	+
233	*Premna tomentosa* Willd.	+	+
234	*P. villosa* C.B. Clarke.	-	+
235	*Prosopis juliflora* (Sw.) DC.Kern.	+	-
236	*P. spicigera* L.	+	-
237	*Pseudarthria viscida* W. & A..	+	-
238	*Psidium guajava* L	-	+
239	*Pterocarpus marsupium* Roxburgh.	-	+
240	*Pterolobium hexapetalum* (Roth.) S&W.	-	+
241	*P. indicum* A. Rich.	+	-
242	*Quisqualis indica* L.	-	+
243	*Radermachera xylocarpa* K.Schum.	-	+
244	*Randia dumetorum* Lam.	+	-
245	*R. malabarica* Lam.	+	-
246	*Rauwolfia serpentina* Benth. ex Kurz.	-	+
247	*Rhaphidophora laciniata* (Burm.f.) Merr.	-	+
248	*Rhynchosia densiflora* DC.	+	-
249	*Ricinus communis* L.	-	+
250	*Rivea hypocrateriformis* Choisy.	+	-
251	*Rothia indica* (L.) Druce.	+	-
252	*Rubus ellipticus* Sm.	-	+
253	*R. niveus* Thunb.	-	+
254	*Ruellia patula* jacq	+	-
255	*Sanseviera roxburghiana* (schult.f)	+	-
256	*Santalum album* L.	+	+
257	*Sapindus emarginatus* L.	-	+
258	*Sarcostemma acidium* W & A.	-	+

259	*S. intermedium* Dcne.	+	-
260	*Schleichera oleosa* Lour.	-	+
261	*S. trijuga* Willd .	+	-
262	*Scorparia dulcis* L.	-	+
263	*Scutia myrtina* Kurz.	-	+
264	*Secamone emetica* R.Br	+	+
265	*Sesamum laciniatum* Klein	-	+
266	*Sesbania grandiflora* Pers.	-	+
267	*Sida acuta* Burm .	+	-
268	*Sida cordata (Burm . f.) Borss* .	+	-
269	*S. cordifolia* L	+	-
270	*S. rhomboidea* Roxb	+	
271	*Smilax zeylanica* L.	-	+
272	*Solanum seaforthianum* L.	-	+
273	*S. surattense* Burm.f.	-	+
274	*S. torvum* Sw.	+	-
275	*Solena amplexicaulis* (Lam)Gandhi	+	-
276	*Spilanthes acmella* Murr.	-	+
277	*Stemodia viscosa* Roxb.	-	+
278	*Streblus asper* Lour.	+	-
279	*Syzigium cumini* (L.) Skeels.	+	+
280	*Tamarindus indica* L.	+	+
281	*Tarenna asiatica* (L.) Alston.	+	-
282	*Tectona grandis* L.f.	+	-
283	*Tephrosia purpurea* Pers	+	-
284	*T. villosa* W. & A.	+	-
285	*Terminalia arjuna* (Roxb.) W.& A.	+	+
286	*T. bellerica* Roxb.	-	+
287	*T. crenulata* Roth.	-	+
288	*T. tomentosa* W. & A.	-	+
289	*Thespesia populnea* Cav.	+	-
290	*Thevetia peruviana* (Pers.) Merr.	+	-
291	*Tiliacora acuminata* Miers.	+	-
292	*Toddalia asiatica* Lam.	+	+
293	*Tridax procumbens* L	+	-
294	*Uvaria narum* Wall.	-	+
295	*Ventilago maderaspatana* Gaertn.	+	+
296	*Vernonia cinerea* Less.	+	-
297	*Vitex altissimia Leaf*	-	+
298	*Waltheria indica* L	+	-
299	*Wattakaka volubilis* (L.f)	-	+
300	*Withania somnifera* Dunn.	-	+
301	*Zanthoxylum ovalifolium* Wight.	-	+
302	*Z. tetraspermum* W.& A.	-	+
303	*Zizyphus mauritiana* Lam.	-	+
304	*Z. oenoplia* Mill.	+	+
305	*Z. trinervia* Roxb	+	-
306	*Z. xylopyrus* Willd.	-	+

species, *Ehretia microphylla* registered 94 and 98% lower IVI against the dominants in Maruthamalai hills and Bannari hills respectively. This fact suggests that when the community is considered as a whole, the two study species were playing least role in community metabolism.

The density of the two study species in their habitats from the foot hills to interior forests at every 1000m^2 sampling areas was determined to be varied considerably (Fig 1). The density of the species, *Erythroxylum monogynum* was decreased drastically from 980/1000m^2 at foot hills (600m above msl) to 63/1000m^2 (800m above msl) at interior forest in Maruthamalai hills and 1980 (365m above msl) to 117/1000m^2 (610m above msl) in Bannari hills. On the other hand, the other species, *Ehretia microphylla* showed increasing of density from the foot hills to interior forests. In Maruthamalai hills at low hills the density of this species was 1050 individuals in first 1000m^2 sampling area and 1427 individuals at 10th 1000m^2 sampling area at higher elevations. However, the enhancement of density of this species in Bannari hills from lower altitude at foot hills to higher altitudes at interior forests was not so higher (i.e) it was 230 at 1st 1000m^2 and 275 only at 10th 1000m^2. This fact shows that both the species exhibited inverse relationship over the altitudinal preference for their establishment. Further it indicates that the microclimatic conditions at the foot hills of both the study areas are favourable for the case, *Erythroxylum monogynum* and this fact was reverse for the species *Ehretia microphylla* (i.e) microclimate at foot hills is so conducive for this species and it was establishing relatively well in the habitat which is away from foot hills at higher altitudes. Asfaw (1989) stated that altitude is a most important topographical factor that influences the seed germination, growth, reproduction and phenophases of any plant species distributed in a wide range of geographical area.

The results of the study revealed that the two study species established well in dry deciduous forests of Maruthamalai hills and Bannari hills at specific locations. However, on basis of IVI, in comparison to respective dominant species their functional role in community metabolism is least. Further, the IVI and RVI values showed that they may decline drastically, if exploitation continuous severely for their medicinal values by the local public, traditional healers and herb gatherers. However, still large sampling is required to confirm this fact.

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