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Phytosocialogical and ethnomedicinal studies of sacred groves in konjikuppam village, cuddalore district, Tamil Nadu

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ABSTRACT

The konjikuppam village lies on the state highway linking panruti (5 km south) and Neyveli (10 km north). The sacred grove of konjikuppam is also situated on the main read and is proximate to the village. A large bond of about 3 ha. Size lies behind the temple complex and cannel bringing strong water from the neighboring shallow ferralitic terrain runs into it. An extensive floristic survey of carried out in the sacred groves at monthly intervals between December 2011 and October 2012. Specimen flowering plants were collected and identified taxonomically with the help of different floras. Nine plots were established in three different disturbance areas within the sacred groves and it is divided into three site I. Disturbances, II. Moderately disturbance III. Undisturbance. Present study revealed that a total number of 110 plants belonging to 96 genera and 45 families were recorded from three sites (I. Disturbed, II. Moderately Disturbed, III. Undisturbed) of konjikuppam sacred groves Cuddalore district. The present study revealed that more number of species found in undisturbed site III and least number and density in disturbed site I. a total of 24 plants used in herbal preparations. The local health traditions provide immediate and cheaper remedy or relief to the poor and down trodden inhabiting the villages. The devastation of species diversity in the study area there is an urgent need for regeneration of the species for conservation of species and biodiversity.

Keywords: Phytosocialogical; Sacred groves; Ethnomedicine; Biodiversity

1. INTRODUCTION

Biodiversity studies have been carried out in different plant communities from plains to the hilltops. There are various plant communities that exist as sacred groves distributed throughout India, which are seen as relict of the ancient vegetation, generally rich in plant diversity (Harikrishnan Nair et al., 1997) the protected refugia of the natural ecosystem in a given region have exited as sacred groves in many societies all over the world. The groves are small patches of vegetation types that were traditionally protected and managed by the local communities, through a wide range of management practices (Gadgil and Vartak, 1976).

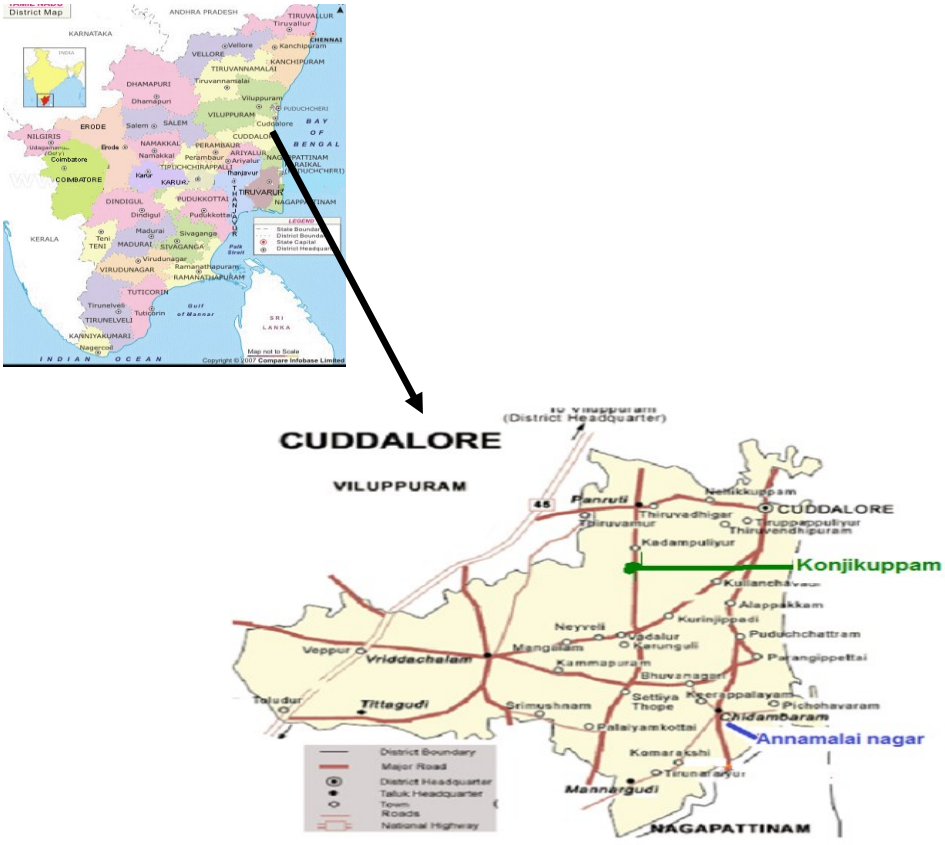
In India 13,720 sacred groves have been identified in various parts of India the sacred groves are the representative of climax vegetation and exhibit the diversity of species such as trees, climbers, epiphytes and other shade loving herbs (Bhandary and Chandrasekar, 2003).many people have described sacred groves in different ways. However, thare is an evident fact that wherever sacred groves exited, because of indigenous traditional socities has spiritual relationship with the exiting physical environment. The role of sacred groves in the conservation of biodiversity has long been recognized (Gadgil and Vartak, 1976; Osambi, 1962; Haridasan and Rao, 1985; Khan et al, 199; Ramanujam and Kadamban, 2001;

Ramanujam and Pravin Kumar Cyril, 2003; Nadanakunjidam and Kamashi, 2003; Nadanakunjidam and Abirami, 2005; Nadanakunjidam, 2006) Vartak and Gadgil have traced this historical link of the sacred groves to the agricultural, hunting and gathering societies (Vartak *et al*., 1973)

Folk medical practitioners are called Nattu Vaidhyans in South India, or Vaidu or Amchi in others. A social dimension also has emerged. Nowadays, people look forward to a long term cure without side effects rather than a short term relief accompanied by lots of ill-effects. Traditional medical systems may be a slow science but the west is gradually turning towards the natural systems of cure and care. The present study enlists the species composition of three sacred groves and importance of traditional medicinal plants in Konjikuppam Village, Cuddalore District.

2. MATERIAL AND METHODS

Konjikuppam village lies on the state highway linking Panruti (5 km south) and Neyveli (10 km North). There are 125 households with a population of ca. 500 people. The sacred grove of Konjikuppam is also situated on the main road and is proximate to the village. It measures 4.5 ha. The terrain is gently undulating and the temple complex is situated on the south-east corner down the slope. A large bond of about 3 ha.



An extensive floristic survey was carried out in the sacred groves at monthly intervals between December 2011 and October 2012. The sacred groves and it is divided into three sites 1. Disturbed, 2. Moderately disturbed, 3. Undisturbed. In each forest type three 50m x 50m plots were randomly setup. Each plot was subdivided into four 25m x25m quadrate for easy sampling.

2. 1. Vegetation analysis

The vegetation data were analyzed for relative frequency, relative density, and relative dominance. The sum of relative frequency, relative density and relative dominance represented the Importance Value Index (IVI) for various species (Curtis, 1959).

Frequency: Frequency is the number of sampling units (as %) which a particular species occurs. Thus frequency of each species calculated as follows:

$$\text{Frequency} = \frac{\text{Number of smapling units in which the species occured}}{\text{Total number of sampling units studied}} \text{ x } 100$$

Density: Density represents the numerical strength of a species in the community. The number of individuals of the species in any unit area is its density. Density gives an idea of degree of competition. It is calculated as follows:

$$\text{Density} = \frac{\text{Number of individuals of the species in all sampling units}}{\text{Number of sampling units studied}}$$

The value thus obtained is then expressed as number of individuals per unit area.

Abundance: This is the number of individuals of any species per sampling unit of occurrence. It is calculated as follows:

$$\text{Abundance} = \frac{\text{Number of individuals of the species in all sampling units}}{\text{Number of sampling units in which the species occured}}$$

Since most of the stems are cylindrical, the basal area was calculated by using the formula:

Basal area = $\pi r2$

Where,

π = 3.14 and 'r' is the radius of the stem at the point of emergence.

Relative frequency: The dispersion of species in relation to that of all the species is termed as relative frequency of a species.

$$\text{Relative frequency} = \frac{\text{Frequency of the species in a quadrat}}{\text{Sum of the frequencies for all species in the same quadrat}} \text{ x } 100$$

Relative density: The proportion of density of a species to that of stand as a whole is referred to as relative density.

$$\text{Relative density} = \frac{\text{Number of individuals of a species}}{\text{Number of individuals of all species}} \text{ x } 100$$

Relative abundance:

$$\text{Relative abundance} = \frac{\text{Abundance of a species}}{\text{Total abundance of all species}} \text{ x } 100$$

Importance value Index (IVI) is the sum of quantities of relative frequency, relative density and relative dominance expressed per 300.

$$\text{Relative Importance value index} = \frac{\text{IVI of the species}}{3}$$

Species diversity: Species diversity is the ratio between the number of species and importance value or number or biomass or productivity and it was calculated using the formula given by Margalef (1968);

H′ = -? (ni/N) 1n (ni/N)

Where, H' = Shannon index of general diversity;
Ni = importance value index of species i;
N = importance value index of the community.

Dominance index: the dominants are the plants by virtue of their abundance, growth performance and dry matter production and become conspicuous in a community concentration of dominance (C) was calculated by Simpson's index (Simpson, 1949).

$C = ? (ni/N)^2$

Where, C = index of dominance *ni* and *N* being same as in the Shannon index of general diversity.

Species richness: Species richness is an indicator of the relative wealth of species in a community (Peet, 1974) and it can be represented by the total number of species in a given community or the number of species per unit area. Species richness was calculated by following formula by (Menhinick, 1964).

$$\text{SR} = \frac{\text{S}}{\text{Log 10 S}}$$

Species evenness: species evenness represents distribution of individuals among the species. It sometimes defined as the ratio of observed diversity to maximum diversity (Margalef, 1958). The evenness of equitability was calculated by the formula suggested by the Pielou (1966) as

$$\text{SR} = \frac{\text{S}}{\sqrt{n}}$$

Where S = number of species, n = number of individuals

Index of similarity: The interspecific association can be evaluated by association index and also by calculating index of similarity. The index of similarity is utilized to compare two coexisting groups was calculated following Odum (1971) as

$$\text{Index of similarity} = \frac{2 \times \text{Numbers of common species}}{\text{Total number of species in both association}} \times 100$$

$$S = 2c/\ a+b$$

Where a = number of species in the sample A;
b = number of species in the sample B and
c = number of species common to both samples.

2. 2. Ethnomedicinal studies

The work was carried out adopting the methodology of Jain (1989 and 1995). The surveys were spread across seasons so as to get maximum information and also to cross check the information provided by the local informants during the earlier visits. Structured questionnaires, interviews, and participatory observations were used to illicit information from the resource persons using standard methods [Martin, 1995].

3. RESULT AND DISCUSSION

Floristic analyses were carried out in disturbed moderately disturbed, and undisturbed of study area. Through there a grove is located in the main road and is proximate to the village, a major portion of the groves remains undisturbed. Theses groves inhabit 110 plant species belonging to 96 genera and 48 families (Table 1).

Tree species richness varied according to the disturbance gradient in the different stands. Consolidated data of phytosociological studies are given in (Table- 5). Tree species richness (number of species) was higher in site III (26 species) followed by Site II (17 species) and Site I (9 species). Site III stand was found to have greater density (83 no/ha), diversity index (0.254), basal area (13.311m^2/ha) and species richness (1.566). However, dominance index (0.267) and evenness index (2.154) were recorded in site I stand. Number of species (species), basal area (4.565 m^2/ha), density (19 no/ha), species richness (0.863) and diversity index (1.103) were found to be least in site I stand. The highest tree species diversity was recorded in the sites III, II stands and lowest in site I stand.

Dominance calculated as the IVI of different species varied greatly indifferent stands. The IVI of trees in the study area is given in (Table - 4) Greater number of tree species (26) was recorded in site I stand followed by site II stand (17), whereas least number of species (9) was seen in site I stand. *Albizia amara* in site I, II and III stands and *Mimusops elengi* and *Madhuca longifolia* in site I stand and *Lepisanthes tetraphylla and Tricalysia apiocarpa* in site III were found as the dominant tree species, whereas *Ficus racemosa* in site I stand were the least dominant in terms of IVI.

3. 1. Seedlings

In seedling population higher in number of species (22), species diversity index (2.209) was observed in site III stand. Evenness index (2.247) in site II stand and dominance index (0.324) in site I stand was found to be greater. However, density (630/ha) basal area (1.301m^2/ha), diversity index (1.048), and evenness index (2.021) in site I stand were least.

(Table-5)Greater number of seedling species (22) was recorded in site III stand was followed by site II and I. Seedlings of *Albizia amara, Chloroxylon swietenia* were seen in three sites whereas the seedlings of Diospyros *montana, Tricalysia apiocarpa, Premna tomentosa* were found in single sites.

3. 2. Saplings

Among the sapling populations number of species (11), basal area (8.050m^2/ha), diversity index (2.150) and species richness (2.157) in site III stand were found to be greater. However, the density (190), and evenness index (2.183) in site II stand and dominance index (0.430) in site I stand were greater. Number of species (2) in site I stand was the least. Density (120/ha), basal area (2.356m^2/ha) and species richness (0.800), diversity index (0.958) and evenness index (2.007) in site I stand, and dominance index (0.104) in site III, were the least (Table -5). Compared with IVI, *Lepisanthes tetraphylla* shows greater (51.42) and least in *Ficus racemosa* (1.75)

3. 3. Shrubs

Among the shrub populations number of species (18), diversity index (2.307), species richness (1.336), eveness index (2.250) in site III stand were greater. However, the dominance index (0.159) in site I stand and basal area (2.213m^2/ha)) were found to be higher. In site I stand basal area (1.057 m2/ha) were found to be least (Table-5). Higher number of shrubs species (18) was recorded in site III and followed by I and II stands. Least number of shrubs species (6) was found in site I stand. *Cassia auriculata Clausena dentata, Glycosmis mauritiana*, *Memecylon umbellatum, Mimosa intsia* were found in all study sites, whereas *Catunaregam spinosa, Grewia hirsuta, Opuntia dilleni* and *Tragia plukeneti* were found in single sites. Compared with IVI, *Glycosmis mauritiana* shows greater (52.32) and least in *Cissus quadrangularis* (0.38) (Table-2).

3. 4. Herbs

Number of species (43), diversity index (2.033), eveness index (2.104) and species richness (1.897) in site III stand were greater. However the density (140/ha), basal area (1.314m^2/ha) in site II and dominance index (0.141) in site I were greater. Least number of species (12), density (4250 ha, basal area (0.063m^2/ha),diversity index (1.637) and evenness index (1.839) in site I and species richness (0.913) and dominance index (0.127) in site III stands were recorded least (Table-5). The density of Acanthaceae, Rutaceae, and Capparidaceae in site III stand were higher, whereas the density of Cactaceae and Lythraceae in site I stand, Nyctaginaceae in site II stand and Solanaceae and Violaceae in site III stand were having least density. Compared with IVI, *Ageratum conyzoides* shows greater (16.65) and least in *Vernonia cinerea* (0.55) (Table-3).

Table 1. List of species encountered at three sites of konjikuppam sacred groves.

S.No	FAMILY	BOTANICAL NAME
1.	Boraginaceae	*Cormona retusa* (Vahl) Masam
2.	Cactaceae	*Opuntia dillenii* (Ker-Gawler) Haw.
3.	Caesalpiniaceae	*Senna auriculata* (L.) Roxb.
4.	Capparidaceae	*Cadaba fruticosa* (L.) Druce
5	Capparidaceae	*Capparis divaricata* Lam.
6	Capparidaceae	*Capparis rotundifolia* Rottl.
7	Capparidaceae	*Capparis sepiaria* Linn.
8	Euphorbiaceae	*Jatropha gossypifolia* L.
9	Euphorbiaceae	*Tragia plukeneti* R.Smith
10	Flacourtiaceae	*Flacourtia indica* (Burm.f) Merr
11	Linaceae	*Hugonia mystax* L.
12	Melostomaceae	*Memecylon umbellatum* Burm.f.
13	Mimosaceae	*Mimosa caesia* L.
14	Ochnaceae	*Ochna obtusata* DC.
15	Rhamnaceae	*Zizyphus oenoplia* (L.) Merr.
16	Rubiaceae	*Canthium coromandelianum* (Burm.f.) Alston
17	Rubiaceae	*Catunaregam spinosa* (Thunb.) Triveng
18	Rubiaceae	*Ixora pavetta* Andrews
19	Rubiaceae	*Tarenna asiatica* (L.) Kuntze ex K. Schum
20	Rutaceae	*Clausena dentata* (Willd.) M. Roem
21	Rutaceae	*Glycosmis mauritiana* (Lam.) Yuich.Tanaka
22	Sapindaceae	*Dodonaea angustifolia* L.f.
23	Tiliaceae	*Grewia hirsuta* Vahl
24	Acanthaceae	*Andrographis paniculata* (Burm.f) Wall.ex Nees
25	Acanthaceae	*Asystasia gangetica* (L.) T.Ander
26	Acanthaceae	*Barleria cuspidata* Heyne ex Nees
27	Acanthaceae	*Barleria prionitis* L.
28	Acanthaceae	*Blepharis molluginifolia* Pers.
29	Acanthaceae	*Ecbolium ligustrinum* (Vahl) Volleson
30	Acanthaceae	*Elytraria acaulis* (L.f.) Lindau
31	Acanthaceae	*Hygrophila auriculata* (Schum.) Heine
32	Acanthaceae	*Lepidagathis cristata* Nees
33	Amaranthaceae	*Achyranthes aspera* L.
34	Amaranthaceae	*Allmania nodiflora* (L.) R.Br. ex Wight.
35	Amaranthaceae	*Alternanthera sessilis* (L.) R.Br. ex DC.
36	Asteraceae	*Acanthospermum hispidum* DC.
36	Asteraceae	*Ageratum conyzoides* L.
37	Asteraceae	*Eclipta prostrata* (L.) L.
38	Asteraceae	*Sonchus oleraceus* L.
39	Asteraceae	*Sphaeranthus indicus* L.
40	Asteraceae	*Vernonia cinerea* L.
41	Boraginaceae	*Coldenia procumbens* L.
42	Boraginaceae	*Heliotropium indicum* L.
43	Cactaceae	*Cereus trigonus* Lem.
44	Caesalpiniaceae	*Senna tora* (L.) Roxb.
45	Capparidaceae	*Cleome aspera* Koenig Ex DC.
46	Capparidaceae	*Cleome monophylla* L.
47	Capparidaceae	*Cleome viscosa* L.
48	Commelinaceae	*Commelina bengalensis* L.
49	Commelinaceae	*Commelina erecta* L.
50	Fabaceae	*Alysicarpus monilifer* (L.) DC.
51	Fabaceae	*Desmodium triflorum* (L.) DC.

52	Fabaceae	*Indigofera aspalathoides* Vahl. ex DC.
53	Fabaceae	*Zornia triphylla* (L.) Pers.
54	Lamiaceae	*Leucas aspera* (Willd.) Link
55	Lamiaceae	*Ocimum canum* Sims
56	Lythraceae	*Ammania baccifera* L.
57	Malvaceae	*Sida cordifolia* L.
58	Molluginaceae	*Mollugo nudicaulis* Lam.
59	Nyctaginaceae	*Boerhaavia diffusa* L.
60	Poaceae	*Cenchrus ciliaris* L.
61	Poaceae	*Chloris barbata* Sw.
62	Poaceae	*Chrysopogon aciculatus* (Retz.) Trin.
63	Poaceae	*Cynodon dactylon* (L.) Pers.
64	Poaceae	*Dactyloctenium aegyptium* (L.) Willd.
65	Poaceae	*Dichanthium annulatum* (Forssk.) Stapf.
66	Poaceae	*Diplachne fusca* (L.) Beauv. ex Roem. et Sch.
67	Poaceae	*Perotis indica* (L.) Kuntze
68	Rubiaceae	*Oldenlandia herbacea* (L.) Roxb.
69	Rubiaceae	*Oldenlandia umbellata* L.
70	Scrophulariaceae	*Scoparia dulcis* L.
71	Solanaceae	*Physalis minima* L.
72	Solanaceae	*Solanum nigrum* L.
73	Tiliaceae	*Corchorus aestuans* L.
74	Tiliaceae	*Triumfetta rhomboidea* Jacq.
75	Verbenaceae	*Phyla nodiflora* (L.) Greene
76	Verbenaceae	*Stachytarpheta jamaicensis* (L.) Vahl
77	Violaceae	*Hybanthus enneaspermus* (L.) F.Muell.
78	Zygophyllaceae	*Tribulus terrestris* L.
79	Alangiaceae	*Alangium salvifolium* (L.f.) Wang
80	Anacardiaceae	*Lannea coromandelica* (Houtt.) Merr.
81	Boraginaceae	*Cordia monoica* Roxb.
82	Boraginaceae	*Cordia obliqua* Willd.
83	Caesalpiniaceae	Cassia fistula L.
84	Celastraceae	*Cassine glauca* (Rottb.) Kuntze
85	Ebenaceae	*Diospyros melonoxylon* Roxb.
86	Ebenaceae	*Diospyros montana* Roxb.
87	Meliaceae	*Azadirachta indica* A.Juss
88	Meliaceae	*Walsura trifoliata* (A.Juss) Harms
89	Mimosaceae	*Acacia nilotica* ssp.*indica* (Benth.) Brenan
90	Mimosaceae	*Acacia auriculiformis* A.Cunn. ex.Benth.
91	Mimosaceae	*Albizia amara* (Roxb.) Boivin
92	Mimosaceae	*Albizia lebbeck* (L.) Benth.
93	Mimosaceae	*Dichrostachys cinerea* (L.) Wt. & Arn.
94	Mimosaceae	*Mimosa intsia* L.
95	Moraceae	*Ficus amplissima* Smith
96	Moraceae	*Ficus racemosa* L.
97	Moraceae	*Ficus religiosa* L.
98	Moraceae	*Streblus asper* Lour.
99	Rubiaceae	*Canthium dicoccum* (Gaertn.) Teijsm & Binn.
100	Rubiaceae	*Morinda pubescens* Sm.
101	Rubiaceae	*Tricalysia apiocarpa* (Dalz.) Gamble
102	Rutaceae	*Atalantia monophylla* (L.) Corr.Ser
103	Rutaceae	*Chloroxylon swietenia* DC.
104	Rutaceae	*Pamburus missionis* (Wt.) Swingle
105	Sapindaceae	*Lepisanthes tetraphylla* (Vahl) Radlk

106	Sapotaceae	*Madhuca longifolia* (Koenig) J.Macbr.
107	Sapotaceae	*Mimusops elengi* L.
108	Sterculiaceae	*Pterospermum canescens* Roxb.
109	Strychnaceae	*Strychnos nux-vomica* L.
110	Verbenaceae	*Premna tomentosa* Willd.

Table 2. Phytosociological analysis of Shrubs in Konjikuppam sacred grove.

Botanical Name	Indls.	RD	RF	BA	RBA	IVI
Cadaba fruticosa	16	13.94	0.20	0.048	0.11	0.45
Canthium coromandelianum	12	3.35	3.46	8.010	1.37	9.13
Capparis divaricata	6	16.62	11.63	0.64	1.44	40.68
Capparis rotundifolia	8	0.40	10.20	0.01	0.44	2.26
Capparis sepiaria	3	0.13	13.87	0.04	2.74	3.11
Catunaregam spinosa	9	0.40	0.20	1.43	1.52	45.04
Clausena dentata	35	8.57	0.37	4.18	0.41	14.02
Cormona retusa	27	0.13	0.61	0.44	0.32	1.25
Dodonaea angustifolia	12	0.40	4.48	2.79	0.44	12.07
Flacourtia indica	6	3.75	3.67	0.37	0.74	14.02
Glycosmis mauritiana	90	42.86	13.79	0.05	0.87	52.32
Grewia carpinifolia	6	2.43	0.20	0.03	0.11	0.36
Grewia hirsuta	4	0.80	1.22	0.11	0.46	1.16
Hugonia mystax	21	3.36	4.69	1.52	0.21	22.28
Ixora pavetta	5	2.58	0.20	0.65	0.27	1.11
Jatropha gossypifolia	2	0.13	0.61	0.06	0.30	0.83
Memecylon umbellatum	10	4.76	3.45	0.10	1.71	9.92
Mimosa intsia	237	36.92	9.43	0.03	0.25	46.53
Ochna obtusata	2	0.26	0.20	0.22	0.12	0.45
Opuntia dillenii	5	0.40	0.40	0.05	0.02	0.38
Senna auriculata	27	0.13	1.02	1.84	0.36	8.05
Tarenna asiatica	11	0.27	0.20	0.97	0.41	3.11
Tragia plukeneti	8	0.13	0.02	0.14	0.02	0.83
Zizyphus oenoplia	3	0.26	3.46	0.75	0.64	1.37

Table 3. Phytosociological analysis of Herbs in Konjikuppam sacred grove.

Botanical Name	Indls.	RD	RF	BA	RBA	IVI
Acanthospermum hispidum	12	2.26	1.66	1.06	3.42	4.78
Achyranthes aspera	25	1.02	0.96	0.48	2.67	2.12
Ageratum conyzoides	17	1.53	1.39	0.72	2.77	16.65
Allmania nodiflora	9	0.34	0.59	0.16	1.45	1.13
Alternanthera sessilis	12	0.51	1.01	0.24	1.26	1.79
Alysicarpus monilifer	13	0.45	0.21	0.21	5.25	0.69
Ammania baccifera	8	0.60	0.85	0.28	1.75	1.51
Andrographis paniculata	9	1.36	1.07	0.64	3.20	13.01
Asystasia gangetica	14	0.26	0.32	0.12	2.00	0.85
Barleria cuspidate	4	1.83	2.03	0.86	2.26	4.56
Barleria prionitis	5	0.32	0.37	0.15	2.14	0.73
Blepharis molluginifolia	8	0.60	0.43	0.28	3.50	1.10
Boerhaavia diffusa	22	0.45	0.32	0.21	3.50	0.81
Cenchrus ciliaris	40	0.51	0.69	0.24	1.85	1.24
Cereus trigonus	3	2.26	2.08	1.06	2.72	7.25
Chloris barbata	42	1.45	1.66	0.68	2.19	5.32
Chrysopogon aciculatus	28	1.30	1.60	0.61	2.03	5.06
Cleome aspera	12	2.58	2.78	1.21	2.33	8.98
Cleome monophylla	9	0.38	0.37	0.18	2.57	0.99
Cleome viscosa	18	2.88	2.19	1.35	3.29	5.26
Coldenia procumbens	4	0.36	0.27	0.17	3.40	0.71
Commelina bengalensis	16	0.45	0.59	0.21	1.91	1.78
Commelina erecta	8	0.28	0.32	0.13	2.17	1.02
Corchorus aestuans	11	0.26	0.27	0.12	2.40	0.88
Cynodon dactylon	28	6.20	5.34	2.91	2.91	12.60
Dactyloctenium aegyptium	19	0.47	0.69	0.22	1.69	1.28
Desmodium triflorum	21	0.17	0.21	0.08	2.00	1.46
Dichanthium annulatum	15	0.28	0.32	0.13	2.17	0.62
Diplachne fusca	11	0.45	0.43	0.21	2.63	1.35
Ecbolium ligustrinum	4	1.45	1.01	0.68	3.58	2.78
Eclipta prostrata	29	1.79	2.19	0.84	2.05	4.06
Elytraria acaulis	5	0.68	0.85	0.32	2.00	2.26
Heliotropium indicum	3	0.60	0.59	0.28	2.55	1.21
Hybanthus enneaspermus	8	0.38	0.32	0.18	3.00	0.73
Hygrophila auriculata	13	2.69	2.99	1.26	2.25	6.39
Indigofera aspalathoides	18	0.40	0.43	0.19	2.38	1.68
Lepidagathis cristata	15	0.30	0.37	0.14	2.00	0.72
Leucas aspera	56	1.04	1.60	0.49	1.63	3.65
Mollugo nudicaulis	88	0.51	0.32	0.24	4.00	4.10
Ocimum canum	22	0.26	0.21	0.12	3.00	0.74
Oldenlandia herbacea	36	2.64	2.24	1.24	2.95	5.90
Oldenlandia umbellata	43	0.34	0.43	0.16	2.00	1.13
Perotis indica	13	1.83	1.12	0.86	4.10	3.19
Phyla nodiflora	25	0.45	0.43	0.21	2.63	0.97
Physalis minima	6	2.30	3.26	1.08	1.77	5.71
Scoparia dulcis	9	1.68	1.55	0.79	2.72	4.68
Senna tora	34	1.36	1.17	0.64	2.91	3.59
Sida cordifolia	88	0.38	0.48	0.18	2.00	1.09
Solanum nigrum	16	0.45	0.64	0.21	1.75	1.43
Sonchus oleraceus	20	2.79	3.36	1.31	2.08	8.05

Sphaeranthus indicus	15	6.84	5.34	3.21	3.21	13.34
Stachytarpheta jamaicensis	56	6.35	5.34	2.98	2.98	13.06
Tribulus terrestris	41	0.60	0.75	0.28	2.00	1.37
Triumfetta rhomboidea	13	0.66	1.12	0.31	1.48	1.84
Vernonia cinerea	27	0.28	0.21	0.13	3.25	.58
Zornia triphylla	6	1.79	1.66	0.84	2.71	3.83

Table 4. Phytosociological analysis of Trees in Konjikuppam sacred grove.

Botanical Name	Indls.	RD	RF	BA	RBA	IVI	BV
Acacia auriculiformis	2	0.67	1.10	0.50	1.27	3.04	0.45
Acacia nilotica ssp.indica	2	0.67	2.20	0.95	2.39	5.26	1.23
Alangium salvifolium	1	0.45	2.08	0.64	4.98	7.52	0.41
Albizia amara	43	20.48	10.34	0.71	12.62	43.44	0.73
Albizia lebbeck	2	0.67	2.20	0.95	2.39	5.26	1.23
Atalantia monophylla	3	1.43	3.45	0.50	8.95	13.82	0.19
Azadirachta indica	1	0.48	3.45	0.20	3.50	7.42	0.08
Canthium dicoccum	4	1.90	10.34	0.03	0.56	12.81	0.01
Cassia fistula	6	2.29	8.33	0.29	2.22	13.24	0.07
Cassine glauca	3	1.35	2.08	0.03	0.25	3.67	0.23
Chloroxylon swietenia	12	5.71	10.34	0.71	12.62	28.68	0.73
Cordia monoica	2	1.83	2.27	3.14	18.01	22.12	2.83
Cordia obliqua	8	2.69	3.30	0.79	1.98	7.97	1.52
Dichrostachys cinerea	1	0.93	2.27	0.03	0.18	3.33	0.01
Diospyros melonoxylon	6	3.37	2.20	0.13	0.38	5.88	0.11
Diospyros montana	4	1.79	4.17	0.36	2.85	8.81	0.23
Ficus amplissima	1	0.92	2.27	0.10	0.55	3.74	0.02
Ficus racemosa	1	0.34	0.10	0.13	0.32	1.75	0.15
Ficus religiosa	1	0.45	2.04	1.52	12.06	14.59	1.39
Lannea coromandelica	1	0.48	3.45	0.71	12.62	16.54	0.73
Lepisanthes tetraphylla	25	22.94	11.36	2.99	17.12	51.42	3.85
Madhuca longifolia	14	6.28	4.17	0.50	3.94	14.38	0.32
Mimusops elengi	4	3.67	6.82	1.13	6.48	16.97	2.19
Morinda pubescens	7	3.14	8.33	0.05	0.38	11.56	0.01
Pamburus missionis	10	3.37	2.20	0.20	0.51	6.08	0.26
Premna tomentosa	4	1.79	4.17	0.03	0.25	6.21	0.01
Pterospermum canescens	2	0.95	3.45	0.05	0.87	5.27	0.01
Streblus asper	5	4.59	2.27	0.50	2.88	9.74	0.45
Strychnos nux-vomica	1	0.45	2.08	0.88	6.91	9.45	1.37
Tricalysia apiocarpa	21	1.83	2.27	0.04	0.22	44.33	0.02
Walsura trifoliata	1.	0.45	2.08	1.52	11.89	14.42	2.35

Table 5. Consoldidate Details of Phytosocialogical Analysis of the Sacred Groves in Konjikuppam Village Cuddalore District.

Sl. No.	Criteria	Disturbed Site I	Moderately Disturbed Site II	Undisturbed Site III
1.	Number of species			
	Trees	9	17	26
	Saplings	2	7	11
	Seedlings	3	6	22
	Shrubs	6	13	18
	Herbs	12	29	43
2.	Density(no/ha)			
	Trees	19	57	83
	Saplings	120	190	160
	Seedlings	630	710	830
	Shrubs	120	420	313
	Herbs	4250	9200	11280
3.	Basal area(m2/ha)			
	Trees	4.565	8.383	13.311
	Saplings	2.356	4.515	8.050
	Seedlings	0.301	0.458	0.519
	Shrubs	1.057	2.213	2.057
	Herbs	0.063	0.087	0.272
4.	Diversity index			
	Trees	1.103	1.572	2.054
	Saplings	0.958	1.856	2.169
	Seedlings	1.048	1.571	2.209
	Shrubs	1.247	2.053	2.307
	Herbs	1.637	2.002	2.056
5.	Dominance index			
	Trees	0.267	0.150	0.125
	Saplings	0.430	0.168	0.104
	Seedlings	0.324	0.164	0.096
	Shrubs	0.159	0.120	0.095
	Herbs	0.194	0.135	0.127
6.	Species richness			
	Trees	0.863	1.042	1.566
	Saplings	0.500	1.299	2.157
	Seedlings	0.378	0.548	1.185
	Shrubs	1.223	0.976	1.336
	Herbs	1.211	0.913	1.175
7.	Evenness index			
	Trees	2.154	2.073	2.097
	Saplings	2.007	2.183	2.128
	Seedlings	2.021	2.247	2.132
	Shrubs	2.081	2.239	2.250
	Herbs	1.839	2.158	2.880

Table 6. Particulars regarding the Ethnomedicinal plants in the sacred grove, Konjikuppam, Cuddalore District, Tamil Nadu.

S.No	Botanical name	Diseases/ Disorders	Parts used	Mode of application
1.	***Albizia lebbeck* (L.) Benth.**	Snake bite	Flower	**The powder prepared from 5gm of flower is taken orally along with hot water three times a day for three days**
2.	***Aristolochia indica* L.**	Snake bite	Root	**Dried roots are powdered and about 10g powder is given with 100 ml of human urine as an antidote for snake bite.**
3.	***Asystasia gangetica* (L.) T.Anderson**	Wounds	Leaves	**Leaf powder is mixed with coconut oil and applied topically to heal wounds (burns).**
4.	***Barleria prionitis* L.**	whooping cough	Whole plant	**About 20 ml of plant juice is used for 3-4 days twice daily, with a pinch of salt to treat whooping cough**
5.	***Blepharis molluginifolia* Pers.**	Bone fracture	Leaves	**Leaf paste is mixed with the powdered black gram, crushed onion and white yolk of one egg and the mixture is applied topically over the fractured bones.**
6.	***Capparis brevispina* L.**	Migraine	Shoot	**Decoction of young branches is taken to cure migraine.**
7.	***Capparis zeylanica* L.**	Syphilis	Roots	**Roots are ground together with 21 black peppers and the powder is taken with watere daily for getting relief in syphilis**
8.	***Cassia auriculata* L.**	Leucorrhea Menorrhoea	Leaf, seed	**Leaves and seeds are ground into paste and made into pills. Three pills are given orally with lime water for 3 days.**
9.	***Cissampelos pariera* L.**	Fever, Headache	Shoot	**5-10 ml juice of aerial part is taken orally twice a day before meals.**
10.	***Clausena dentata* (Willd.) M.Roem**	Wounds	Leaves	**Paste of leaves is applied over the affected area.**
11.	***Cleome viscosa* L.**	Ear ache	Root	**Root is pounded with garlic, mixed with castor oil, boiled and juice is squeezed; about 3 drops applied in the ear to treat ear ache.**
12.	***Chloroxylon swietenia* DC.**	Diabetes	Gum	**About 100 ml gum powder mixed with water is given for about one month for the treatment of diabetes.**
13.	***Coccinia grandis* (L.)Voigt**	Excess bleeding	Whole plant	**2-3 tablespoons of fresh plant juice is recommended for 2-3 days to check bleeding during pregnancy**
14.	***Coldenia procumbens* L.**	White discharge	Leaves	**Juice of leaf is taken orally to prevent white discharge in women.**
15.	***Diospyros montana* Roxb.**	Diabetes	Leaves	**2-3 teaspoonfuls extract of fresh stem bark taken in stomachache.**
16.	***Ficus racemosa* L.**	Diarrhea and Dysentery	Leaves	**About 5 teaspoonful of decoction of stem bark is given twice a day for about 2 days to treat diarrhea and dysentery**
17.	***Hygrophila auriculata* (Schum) Heine**	Jaundice	Leaves, seeds	**Leaves and seeds are ground into paste and made into pills, 2 pills per day taken for 5 days. Diet: Buttermilk and food, salt restricted.**
18.	***Madhuca longifolia* (Koenig) J.Macbr.**	Asthma	Flowers	**Five flowers are boiled in a glass of water until it is reduced to half and is administered orally once a day**
19.	***Mimusops elengi* L.**	Fever	Bark	**Bark powder mixed with red sugar in applied on jaw in toothache**

20.	***Mukia maderapatana* (L.) M.Roem**	Cold and cough	Leaves	**Leaf powder is mixed with boiled rice and taken orally to treat cold and cough**
21.	***Phyla nodiflora* (L.) Greene**	Tooth ache	Leaves	**Leaves ground with Allium sativum and made into pills kept between teeth to check toothache**
22.	***Sphaeranthus indicus* Linn.**	Blood dysentery	Root	**Dried powdered root with 5 black pepper (*Piper nigrum*). Powdered drug given 3g per dose twice a day**
23.	***Stachytarpheta jamaicensis* (L.) Vahl**	Dysentery	Stem, Root	**Paste of stem and root bark is applied topically to treat dysentery**
24.	*Tiliacora acuminata* (Lamk.) Miers ex Hook.f.& Thoms.	**Constipation**	**Stem**	**About 100g pieces of stem are powdered and one teaspoonful is given with warm water twice a day after meals for two weeks to treat constipation**

4. CONCLUSIONS

There are about 24 species used by local communities of Konjikuppam recorded by using structured questionnaire. Although the same species used to treat the same ailment in various parts of Tamilnadu but the mode of preparation and administration is vary. (Table.6) during each field survey, they consented orally to document and publish the results for the study of society. After initial reconnaissance survey of the area in and discussions with the local people, a total of 15 resource persons, comprising of 10 males and 5 females were identified. These are locally referred to as vaidyas and perform the duties of medicinal practitioner. Information on the habitat of the plant, local name of plant, plant part used for curing, method of dosage and administration were recorded.

The Konjikuppam (4.5 ha species) representing 96 genera and 48 families there were 32 trees species, 24 shrubs, 56 hers. The konji plant G*lycomis mauritiana* was the dominant species followed by A*lbizia amara* and *Tricalysia sphaerocarpa*.the Shannon index was 1.72 and eveness of 0.65 heavy undergrowth separately interrupted by trees characterizes the vegetation. The study has confirmed the existence of ecological and medical traditions and documented untapped, useful and valuable information from a tiny tot on the Coromandel ocast of India dominated by a communties. A treasure trove of knowledge awaits the feature researchers as there are 4635 ethnic communities spread over India landscape.

On the otherhand, eventhough the plants somewhat disappeared and also affected due to the Thanae cyclone hitted especially in Cuddalore district on December 30. Due to the devastation of species diversity in the study area there is an urgent need for regeneration of the species for conservation of species and their biodiversity.

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