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## REVIEW ARTICLE

### SAREKOPPA KAAN: A FOREST PATCH WAS UNDER COMMUNITY MANAGEMENT IN SORAB TALUK OF SHIVAMOGA DISTRICT, KARNATAKA

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#### ABSTRACT

Kaans are relic forests managed by indigenous communities in Malnad regions of Karnataka since time immemorial are supposed to be highly diverse with respect to plants. In this attempt Kaan forest of Sarekoppa village of Sorab taluk of Shivamoga district, Karnataka was selected to study the plant diversity. We prepared a checklist of plants of Sarekoppa Kaan and assigned the threat status and endemism of the documented plants. Totally, 101 species of 88 genera belongs to 46 diverse families were documented. Of which 64 species were trees, 19 shrubs, 13 climbers/liana and 5 herb species were identified. Species such as *Dysoxylum malabaricum*, *Diospyros crumenata*, *D. sylvatica*, *Myristica malabarica*, *Artocarpus hirsutus* and *Hydnocarpus pentandra* were found to be more abundant in the forest. It was observed that in recent years the encroachments of Kaans land have been taking place for the agricultural purpose and thereby it affecting the protected biodiversity of the area. Hence there should be need of more awareness of importance of inherited Kaans among communities particularly with younger generation and also a proper system of involvement of local communities, or affording more powers to them in protecting and managing the local biodiversity of these relic patches would be a more effective conserving strategy.

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#### INTRODUCTION

Traditional system of nature conservation is deeply rooted in the Indian society. Several traditional conservation practices such as scared groves, sacred trees, and sacred ponds could be seen throughout India. Central Western Ghats in particular where amazing diversity of biological diversity exists and people however, protected these biodiversity in their own traditional management system (Gokhale, 2004; Talbot, 1909). Traditional taboos has been developed by the communities from millennia are used to conserve these biological resources. These traditional conservation systems are differing from place to place and also from region to region depending on their traditional living style. Kaan forests system is one such unique indigenous management system existed in this part from the prehistoric era (Chandran, 1997). The forested districts of Uttara Kannada and Shivamoga in the central Western Ghats of Karnataka are dotted with several grooves with lofty lush green forest cover known as Kaan forests. Kaan forests are the patches of forest recognized as sacred and protected on the grounds of religious and cultural beliefs (Gunaga et al, 2013).

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These forests are situated near to villages and range in size from a few acres to many hectares. Kaan forests literally meaning thick evergreen forest in local language. These forests have existed in the central Western Ghats for millennia and are considered to be a relic of the original forest vegetation of the region. Kaan forests are subjected to traditional systems of conservation practices and management by indigenous and local communities, and their traditional lifestyles are relevant for the conservation and sustainable harvest of resources such as wild nutmeg (*Myristica malabarica*), pepper (*Piper nigrum*), gums, and resin, honey, and tapping toddy to trade in pre historic period (Chandran and Gadgil, 1993a). Due to strict social taboos developed by the traditional communities, still we could able to see such several magnificent relic forest patches in the central Western Ghats (Gunaga et al, 2015). These Kaan forests serve to the local communities in all respects such as usufruct and also serve as watershed areas in the remote villages (Ray et al, 2015). Unfortunately in recent years, the social taboos around these forests are declining and their by the existence of these inherited traditional Kaan forests in future context is the matter of concern. It is reported that these Kaan forests are repository of unique and locally endemic plants. The ideal ecological conditions of the Kaans and the prudent nature of conservation system developed by the indigenous communities which helped to sustain large

number of plants as well as animals including Kaan specialist species in these traditional forests. However, in recent past the new species of *Semecarpus kathalekanensis* discovered from one of the pristine Kaan forests in Uttara Kannada district (Dasappa and Swaminathan, 2000). Further, *Syzygium travencoricum* which is once considered as extinct from its type locality was rediscovered from the same Kaan forest of Uttara Kannada (Chandran *et al*, 2010). Hence with interest of the plants we under took a documentation of plants in one such Kaan forest in Sarekoppa village of Sorab taluk, Karnataka however, this part of forests are less studied with regards to plants. Moreover study on plants of Sarekoppa Kaan which would create more interest among botanists to take further research on the plant diversity in the region.

### Background of study site

Sarekoppa Kaan is situated in Sarekoppa village of Sorab taluk (Latitude 75.065163° N, Longitude 14.437860° E) which is located in between the border of Malnad (high forested area) and Deccan plateau. Village Sarekoppa is about 10 km from Sorab taluk on the way to Banavasi in Karnataka state (Fig 1.). The climate of study area is characterized by a monsoon regime. The southwest monsoon sets in this region around the first week of June and continues up to August or September. After a short gap, the northwest monsoon begins around October for a short period. The average rainfall of the study area ranges from 2,000–2,200 mm per year. To reach the village one must walk through the muddy road for about 5 Km from main road. Just 1 Km before reaching the village, we will enter a huge, dark green laden thick forest patch with sky high tree on either sides of the road.



Figure 1. Map showing study site

The communities of the village are traditionally a hunting gathers and in due course these communities settled as agriculturists. To fulfill their agricultural needs, around 100 or even more than 100 years back people decided to protect their village scrubby forests. After the protection for more than 100 years, due to natural succession these scrub forest had been turned into semi-evergreen vegetation. Sorab taluk is considered to be the hot spots for Kaan forests in Karnataka with about 116 Kaan forests were reported from this taluk (Gokhale, 2004). However, the three taluks including Sirsi,

Sorab and Sagar of Uttara Kannada and Shivamoga districts respectively are said to be the Kaan belts of Karnataka.

### MATERIALS AND METHODS

We visited Sarekoppa Kaan in the month of May-2015 to study the plant diversity. The area of the Kaan spread in 366.88 ha (Survey No. from 2/1 to 2/3 and 167/1 to 167/3). In order to document the plant diversity of the forest patch, walked randomly in the forest and covered entire area of the forest patch including edge, buffer and core zone. We documented each and every plants encountered during sampling. For guiding and to document the local names of the plants, took help from the local women. Taxonomically unidentified plants were brought to the laboratory and get identified by referring standard regional floras such as Gamble and Fischer (1935), Talbot (1909), Cook (1903), and floristic keys (Pascal and Ramesh 1987) of the study area. Lists of threatened plants (RET) in the Kaan forests were prepared with the help of published list of IUCN (2011) (International Union for Conservation of Nature), Ravikumar and Ved (2000), Summy *et al*, (2000), with reference to Nayar (1996) and Chandran (2003) for the identification of endemic species occurring in the Kaan forests.

### RESULTS AND DISCUSSION

While the documentation of the plant species in the Sarakoppa Kaan which is under natural succession over the period of more than hundreds years has metamorphosed into Semi-evergreen forests from Scrub forest. The study revealed 101 species of 88 genera belongs to 46 diverse families (Table 1). Of which 64 species were trees, 19 shrubs, 13 climbers/laina and 5 species were herbs (Fig. 2). A Checklist was prepared and the plants list is provided in the Appendix.

Table 1. Phytosociological details of Sarekoppa Kaan

Sl. No.	Attributes	Numbers
1	Genera	88
2	Species	101
3	Family	46
4	RET plants	17
5	Endemic plants	44

Among the plant species documented, 44% of the species are Western Ghats endemics and about 17% of the species are placed in rare, endangered and threatened category (Fig 1.). Kaan specialist species such as *Dysoxylum malabaricum*, *Diospyros crumenata*, *D. sylvatica*, *Myristica malabarica*, *Mammea suriga*, *Artocarpus hirsutus* and *Hydnocarpus pentandra* were found very abundant in this forest. Kaan forests are considered to be the high diversity of plants. However, the highest number of plant species in the undisturbed Kaan forests of neighboring Sagar taluk was reported as 49-80 species (Gunaga *et al*, 2015). In spite of Sarekoppa Kaan of moderate rainfall area with the occurrence of highest number of plant species (101 species) has proved the community involvement in the protection, conservation and management of biodiversity in the past. It was observed that in recent years the encroachment of Kaans land have been taking place for the cultivation of maize due to its fertile soil and thereby it affecting the protected biodiversity of the area

including Sarkeoppa Kaan in large extent. Hence there should be need of more awareness of importance of inherited Kaans among communities particularly with younger generation and also a proper system of involvement of local communities, or affording more powers to them in protecting and managing the local biodiversity of these relic patches, would be a more effective conserving strategy.

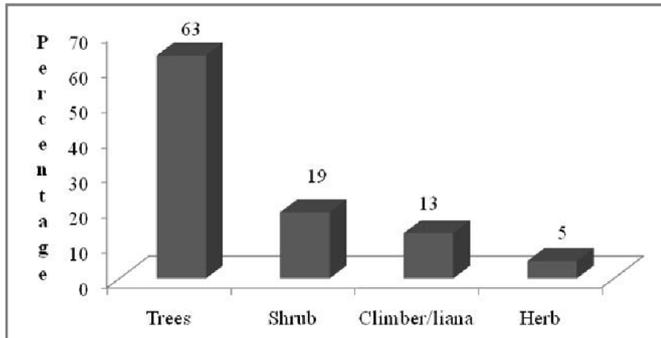


Figure 2. Life form distribution of species in Sarekoppa Kaan

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### APPENDIX

#### Appendix: Checklist of plants of Sarekoppa Kaan

SL. No.	Scientific Name	Local Name	Family	Life form	Status	Endemic Plants
1	<i>Actinodaphne hookeri</i> Meisn.	Tudagenasu	Lauraceae	Tree	--	E
2	<i>Adina cordifolia</i> (Roxb.) Hook. f. ex Brandis	Heddi mara	Rubiaceae	Tree	--	--
3	<i>Aglaia elaeagnoidea</i> (A. Juss.) Benth.	Nyavala	Meliaceae	Tree	--	E
4	<i>Ailanthus triphysa</i> (Dennst.) Alston.	Maddidoopa	Simaroubaceae	Tree	Vu	--
5	<i>Alangium salvifolium</i> (L.f.) Wangerin	Ankole	Alangiaceae	Shrub	--	--
6	<i>Albizia lebbbeck</i> (L.) Benth.	Bilkambi	Mimosaceae	Tree	--	--
7	<i>Allophylus cobbe</i> (L.) Reusch.	Murele soppu	Sapindaceae	Shrub	--	--
8	<i>Alseodaphne semicarpifolia</i> Nees.	Masse	Lauraceae	Tree	--	--
9	<i>Alstonia scholaris</i> (L.) R.Br.	Maddale	Apocynaceae	Tree	--	--
10	<i>Aphanamixis polystachya</i> (Wall.) Parker.	Rohita mara	Meliaceae	Tree	Vu	--
11	<i>Aphananthe cuspidate</i> (Bl.) Palnch.	Nyala mara	Ulmaceae	Tree	--	E
12	<i>Aporosa lindleyana</i> (Wight.) Bail.	Salle	Euphorbiaceae	Tree	--	--
13	<i>Ardisia solanacea</i> Roxb.	Hawalad gida	Myrsinaceae	Shrub	--	--
14	<i>Argyrea nervosa</i>	Aaanepada balli	Convolvulaceae	Climber	--	--
15	<i>Artocarpus hirsutus</i> Lam.	Hebbalasu	Moraceae	Tree	Vu	E
16	<i>Artocarpus heterophyllus</i> Lam.	Halasu	Moraceae	Tree	--	--
17	<i>Artocarpus incisus</i> L.f.	Vaate huli	Moraceae	Tree	--	--
18	<i>Asparagus racemosus</i> Willd.	Shatavari	Liliaceae	Climber	--	--
19	<i>Bauhinia racemosa</i> Lam.	Basavana paada	Fabaceae	Tree	--	--
20	<i>Beilschmiedia wightii</i> Nees	Kaamatti	Lauraceae	Tree	Vu	E
21	<i>Bridelia scandens</i> (Roxb.) Willd.	Bisila hamu	Euphorbiaceae	Shrub	--	--

22	<i>Buchnanania lanzan</i> Spreng.	Nurkalu	Anacardiaceae	Tree	LrnT	--
23	<i>Butea monosperma</i> (Lam.) Taub.	Muttalu	Fabaceae	Tree	--	--
24	<i>Callicarpa tomentosa</i> (L.) J. A. Murray	Tawdathi	Verbenaceae	Shrub	--	--
25	<i>Calycotris floribunda</i> (Roxb.) Poir.	Kumasalu balli	Combretaceae	Liana	--	--
26	<i>Cansjera rheedii</i> J.E. Gmel.	Karadi soppu	Icacinaceae	Shrub	--	--
27	<i>Canthium dicoccum</i> var. <i>umbellatum</i> Santapau & Merch.	Hanigere	Rubiaceae	Tree	--	E
28	<i>Carallia brachiata</i> (Lour.) Merr.	Andi mara	Rhizophoraceae	Tree	--	--
29	<i>Careya arborea</i> Roxb.	Kavalu mara	Lecythidaceae	Tree	--	--
30	<i>Caryota urens</i> L.	Baine	Arecaceae	Palm	--	--
31	<i>Celtis timorensis</i> Spanonghe	Hetari	Ulmaceae	Tree	--	--
32	<i>Chionanthus malabaricus</i> (Wall. ex G. Don) Bedd.	Akkerkalu	Oleaceae	Small tree	--	E
33	<i>Chrysophyllum lanceolatum</i> (Blume) A. DC.	Haale mara	Sapotaceae	Tree	--	E
34	<i>Combretum latifolium</i> Blume.	--	Combretaceae	Liana	--	--
35	<i>Cucumella ritchiei</i> (Chakrav.) C. Jeffery	Shindle balli	Cucurbitaceae	Climber	--	--
36	<i>Dichapetalum gelanoides</i> (Roxb.) Engl.	Kaantengu	Dichapetalaceae	Shrub	--	E
37	<i>Diospyros candolleana</i> Wight	Karikumara	Ebenaceae	Tree	Vu	E
38	<i>Diospyros crumenata</i> Thwaites	Kari mara	Ebenaceae	Tree	En	E
39	<i>Diospyros sylvatica</i> Roxb.	Karivala	Ebenaceae	Tree	--	E
40	<i>Diploclisia glaucaescens</i> (Blume) Diels	Entane balli	Menispermaceae	Liana	--	E
41	<i>Dysoxylum malabaricum</i> Bedd. ex Hiern.	Bili devadaru	Meliaceae	Tree	En	E
42	<i>Ecbolium viride</i> ((Forssk) Alston	Kaanu abbalige	Acanthaceae	Herb	--	E
43	<i>Elaeagnus conferta</i> Roxb.	Halage hannu	Elaeagnaceae	Shrub	Vu	--
44	<i>Entada pursaetha</i> DC.	Ganape balli	Mimoseae	Liana	--	E
45	<i>Eranthemum roseum</i> (Vahl) R. Br.	Kaanhuvu	Acanthaceae	Herb	--	--
46	<i>Erycibe paniculatum</i> Roxb.	--	Convolvulaceae	Climber	--	--
47	<i>Ficus asperrima</i> Roxb.	Garagatti	Moraceae	Small tree	--	--
48	<i>Ficus callosa</i> Willd.	Nayi Vaate	Moraceae	Tree	--	E
49	<i>Ficus heterophylla</i> L. f.	Garagasada mara	Moraceae	Small tree	--	--
50	<i>Ficus hispida</i> L. f.	Dhedo mara	Moraceae	Small tree	--	--
51	<i>Ficus tsjahela</i> Rheede exBurm. f.	Kari basari	Moraceae	Tree	--	--
52	<i>Flacourtia montana</i> Graham.	Sampige hannu	Flacourtiaceae	Tree	--	E
53	<i>Glycosmis pentaphylla</i> (Retz.) DC.	Manikyada gida	Rutaceae	Shrub	--	E
54	<i>Gnetum ula</i> Brongn.	Kugale balli	Gnetaceae	Liana	--	E
55	<i>Grewia tiliifolia</i> Vahl.	Kaan kauri	Tilicaceae	Tree	--	--
56	<i>Holarrhena pubescens</i> (Buch.-Ham.) Wall. ex G. Don	Kodsa	Apocynaceae	Small tree	--	--
57	<i>Holigarna arnottiana</i> Hook. f.	Holageru	Anacardiaceae	Tree	Vu	E
58	<i>Holigarna grahamii</i> (Wight) Kurz.	Dodda halageru	Anacardiaceae	Tree	--	E
59	<i>Hopea ponga</i> (Dennst.) Mabb.	Hagina mara	Dipterocarpaceae	Tree	En	E
60	<i>Hydnocarpus pentandra</i> (Buch.-Ham.) Oken.	Shulti mara	Flacourtiaceae	Tree	Vu	E
61	<i>Ixora nigricans</i> R.Br. ex Wight & Arn.	Black ixora	Rubiaceae	Shrub	--	E
62	<i>Jasminum malabaricum</i> Wight.	Sanna jaaji malli	Oleaceae	Shrub	--	--
63	<i>Knema attenuate</i> (Wall.) ex. Hook. f. & Thomson) Warb.	Rakthada mara	Myristicaceae	Tree	En	E
64	<i>Lagerstroemia microcarpa</i> Wight.	Nandi mara	Lythraceae	Tree	--	--
65	<i>Lamnea coromandelica</i> (Houtt.) Merr.	Gojjalu	Anacardiaceae	Tree	--	--
66	<i>Litsea mysorensis</i> Gamble.	--	Lauraceae	Tree	--	E
67	<i>Macaranga peltata</i> (Roxb.) Muell.-Arg.	Chandakalu	Euphorbiaceae	Tree	--	--
68	<i>Mallotus philippensis</i> (Lam) Muell.-Arg.	Kummkumada gida	Euphorbiaceae	Tree	--	--
69	<i>Mammea suriga</i> (Buch.-Ham.ex Roxb.) Kosterm.	Suragi	Clusiaceae	Tree	Vu	E
70	<i>Mangifera indica</i> L.	Mavu	Anacardiaceae	Tree	--	--
71	<i>Manihot esculanta</i> Crantz.	Tapioca	Euphorbiaceae	Shrub	--	--
72	<i>Melia dubia</i> Cav.	Hucchbevu	Meliaceae	Tree	--	--
73	<i>Memecylon malabaricum</i> (C.B. Clarke.) Congn.	Acherkalu	Melastomaceae	Shrub	--	E
74	<i>Memecylon umbellatum</i> Burm. f.	Acherkalu	Melastomaceae	Tree	--	E
75	<i>Mimusops elengi</i> L.	Renjalu	Sapotaceae	Tree	--	E
76	<i>Mitragyna parvifolia</i> (Roxb.) Korth.	Etagalu	Rubiaceae	Tree	--	--
77	<i>Moullava spicata</i> (Dalzell) Nicolson	Huliyuguruballi	Fabaceae	Liana	--	E
78	<i>Myristica malabarica</i> Lam.	Rampatre	Myristicaceae	Tree	En	E
79	<i>Nothapodytes nimmoniana</i> (J. Graham.) Mabb.	Heltare	Icacinaceae	Shrub	Vu	E
80	<i>Nathopegia racemosa</i> (Dalzell) Ramamoorthy	Gandu holageru	Anacardiaceae	Tree	--	E
81	<i>Olea dioica</i> Roxb.	Bili masse	Oleaceae	Tree	--	E
82	<i>Opleissimus</i> sps.	Hullu	Poaceae	Grass	--	--
83	<i>Pseudarthria viscida</i> W. & A.	--	Fabaceae	Herb	Vu	--
84	<i>Psychotria dalzellii</i> Hook. f.	Kaanu elakki	Rubiaceae	Shrub	--	E
85	<i>Psychotria flavida</i> Talbot	--	Rubiaceae	Shrub	--	E
86	<i>Sideroxylon tomentosum</i> Roxb.	Gombale mara	Sapotaceae	Tree	--	E
87	<i>Streblus asper</i> (Retz.) Lour.	Mitle mara	Moraceae	small tree	--	--
88	<i>Strobilanthes ixiocephalus</i> Benth.	Jenu gurge	Acanthaceae	Shrub	--	E
89	<i>Strobilanthes perfoliatus</i> T. Anderson	Gurge gida	Acanthaceae	Shrub	--	E
90	<i>Syzygium cumini</i> (L.) Skeels	Nerale	Myrtaceae	Tree	--	--
91	<i>Tabernaemontana heyneana</i> Wall.	Halmeti	Apocynaceae	Shrub	--	E
92	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Tari mara	Combretaceae	Tree	--	--
93	<i>Terminalia paniculata</i> Roth.	Hunalu	Combretaceae	Tree	--	--
94	<i>Toddalia asiatica</i> (L.) Lam.	Pargi balli	Rutaceae	Climber	--	E
95	<i>Toona ciliate</i> M. Roem.	Gandhagarike	Meliaceae	Tree	--	E
96	<i>Trema orientalis</i> (L.) Blume.	Swami mara	Cannabaceae	Tree	--	--
97	<i>Trichosanthes palmata</i> Roxb.	Kaage mari balli	Cucurbitaceae	Climber	--	--
98	<i>Triumfetta rhomboidea</i> N. Jacq.	Chinese bur	Malvaceae	Herb	--	--
99	<i>Vitex altissima</i> var. <i>alata</i> Trimen (Cook)	Baranige	Verbenaceae	Tree	--	--
100	<i>Wattakakka volubilis</i> L.f. (Stapf.)	--	Asclepiadaceae	Climber	--	--
101	<i>Zanthoxylum rhetsa</i> (Roxb.) DC.	Zumma	Rutaceae	Tree	--	--

Note: Vu: Vulnerable, En: Endangered, LrnT: Low risk near threatened, E: Endemic