

PLANT DIVERSITY STUDIES IN UTTARA KANNADA DISTRICT

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<u>Sl. No.</u>	<u>Shrub Species</u>	<u>Adult</u>	<u>Juvenile</u>
12.	<u>Wagatea spicata</u>		3
13.	<u>Dalbergia sympathetica</u>		1
14.	<u>Artabotrys zeylenicus</u>		5
15.	<u>Peramignya monophylla</u>		3
16.	<u>Anistrocladus heyneanus</u>		11

HERBS

1.	<u>Ecobolium virida</u>		1
2.	<u>Acathaceae I</u>		3
3.	<u>Unknown II</u>		26

CLIMBERS

1.	<u>Uvaria sp.</u>		6
2.	<u>Smilax zeylanica</u>		16
3.	<u>Piper sp.</u>		4 + 204
4.	<u>Unknown IV</u>		1
5.	<u>Papilionaceae I</u>		5
6.	<u>Pothos scandens</u>		1
7.	<u>Adenia lhondala</u>		2
8.	<u>Clematis sp.</u>		2
9.	<u>Connaris sp.</u>		2

LIANES

1.	<u>Calycopteris floribunda</u>		10 + 1
2.	<u>Gnetum sp.</u>		2 + 10

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
33.	<u>Myristica sp.</u>	5	
34.	<u>Nothopeqia sp.</u>	6	28 + 5
35.	<u>Odina wodier</u>	5	
36.	<u>Olea dioica</u>	117	78 + 2
37.	<u>Plectronia didyma</u>	4	
38.	<u>Pterospermum sp.</u>	4	
39.	<u>Randia rugosa</u>	1	
40.	<u>Randia spinosa</u>	4	
41.	<u>Sapium insigna</u>	1	
42.	<u>Schleichera oleosa</u>	5	
43.	<u>Sterculia sp.</u>	1	
44.	<u>Strychnos nux-vomica</u>	1	1
45.	<u>Terminalia chebula</u>	5	
46.	<u>Terminalia paniculata</u>	34	1
47.	<u>Ardisia equalenacea</u>	12	10
48.	<u>Vitex altissima</u>	20	1
49.	<u>Xentolis sp.</u>	2	5
50.	<u>Plectronia perviflora</u>		27
51.	<u>Mallotus sp.</u>		1
52.	<u>Artocarpus lakoocha</u>		1
53.	<u>Neolitsea sp.</u>	27	189
54.	<u>Terminalia bellirica</u>	7	

SHRUBS

1.	<u>Gymnosporia rothiana</u>		10
2.	<u>Glycosmis pentaphylla</u>		40
3.	<u>Chesalia ophioxylodes</u>		10
4.	<u>Croton sp.</u>		12
5.	<u>Psychotria flavida</u>		769 + 26
6.	<u>Psychotria sp.</u>		13
7.	<u>Leea sp.</u>		8
8.	<u>Bridelia sp.</u>		1
9.	<u>Carissa carendra</u>		2
10.	<u>Capparis sp.</u>		10
11.	<u>Dracaena terniflora</u>		39

SANTGAL FOREST

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
1.	<u>Actinodaphne hookeri</u>	4	17 3
2.	<u>Alseodaphne semecarpifolia</u>	1	1
3.	<u>Aporosa lindleyana</u>	3	1
4.	<u>Arenga wightii</u>	1	
5.	<u>Artocarpus lakoocha</u>	1	1
6.	<u>Bischofia javanica</u>	29	
7.	<u>Caryota urens</u>	2	123
8.	<u>Cinnamomum sp.</u>	19	5
9.	<u>Diospyros candoleana</u>	99	20 + 1
10.	<u>Diospyros pruriens</u>	1	5
11.	<u>Strombosia ceylanica</u>	57	3
12.	<u>Dysoxylum malabaricum</u>	10	137 1
13.	<u>Elaeocarpus sp.</u>	2	2
14.	<u>Ervatamia heyneana</u>	8	3
15.	<u>Eugenia sp.</u>	9	
16.	<u>Flacourtia montana</u>	3	
17.	<u>Ficus callosa</u>	1	
18.	<u>Ficus sp.</u>	1	
19.	<u>Ficus sp. III</u>	1	
20.	<u>Ficus asperrima</u>	2	
21.	<u>Garcinia sp.</u>	2	1
22.	<u>Hopea wightiana</u>	13	2
23.	<u>Lagerstroemia microcarpa</u>	4	
24.	<u>Persea macarantha</u>	15	
25.	<u>Linociera malabaricum</u>	12	1
26.	<u>Macaranga peltata</u>	13	
27.	<u>Mallotus philippensis</u>	17	
28.	<u>Magnifera indica</u>	2	
29.	<u>Meliaecae I</u>	73	
30.	<u>Meliaecae II</u>	42	
31.	<u>Murraya exotica</u>	12	41
32.	<u>Nothapodytes foetida</u>	23	3

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
33.	<u>Nothopagia</u> sp.	198	
34.	<u>Olea dioica</u>	32	9 2
35.	<u>Polyalthia</u> sp.	14	
36.	<u>Pterospermum</u> I	71	24 + 2
37.	<u>Pterospermum</u> II	22	10
38.	<u>Symblocos</u> sp.	13	
39.	<u>Terminalia bellirida</u>	3	1
40.	Unknown I	7	
41.	Unknown II	25	
42.	Unknown III	2	
43.	Unknown IV	1	
44.	Unknown V	4	
45.	Unknown VI	9	
46.	Unknown VII	2	
47.	Unknown VIII	3	
48.	Unknown IX	3	
49.	<u>Neolitsea</u> sp.	5	6
50.	<u>Vitex altissima</u>	2	
	<u>SHRUBS</u>		
1.	<u>Bryenia</u> sp.	1	
2.	<u>Leea</u> sp.	9	9
3.	<u>Taranea</u> sp.	7	1
4.	<u>Wagatea spicata</u>	4	1
5.	<u>Colebrookea oppositifolia</u>	4	
6.	Myrtaceae member I	22	
7.	<u>Canthium didyma</u>	9	
8.	<u>Glycosmis pentaphylla</u>		16
9.	<u>Glymosporia rothiana</u>		3
10.	<u>Artabotrys zeylanicus</u>		
11.	<u>Ancestrocladus</u>	3	16 + 2

BENGLE-SUGAVI MINOR FOREST

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
1.	<u>Terminalia paniculata</u>	128	172
2.	<u>Buchanania lanzan</u>	8	19
3.	<u>Xylia xylocarpa</u>	41	439
4.	<u>Ervatamia heyneana</u>	11	82
5.	<u>Terminalia tomentosa</u>	67	161
6.	<u>Terminalia bellirica</u>	25	35
7.	<u>Phyllanthus emblica</u>	19	31
8.	<u>Cassia fistula</u>	2	57
9.	<u>Careya arborea</u>	20	11
10.	<u>Diospyros sp.</u>	6	265
11.	<u>Alseodaphne semicarpifolia</u>	2	85
12.	<u>Dalbergia latifolia</u>	6	10
13.	<u>Bombax malabaricum</u>	1	1
14.	<u>Adina codifolia</u>	5	23
15.	<u>Laqerstroemia microcarpa</u>	12	151
16.	<u>Eugenia jambolana</u>	2	16
17.	<u>Albizzia odoratissima</u>	3	5
18.	<u>Terminalia chebula</u>	3	
19.	<u>Bassia latifolia</u>	7	3
20.	<u>Stereospermum personatum</u>	1	9
21.	<u>Mitragyna parvifolia</u>	1	
22.	<u>Randia uliginosa</u>	4	170
23.	<u>Spondias acuminata</u>	2	
24.	<u>Alstonia scholaris</u>	2	2
25.	<u>Chukrasia tabularis</u>	3	362
26.	<u>Pterocarpus marsupium</u>	2	2
27.	<u>Randia spinosa</u>	1	386
28.	<u>Ficus+Kantolis tomentosum</u>	1	
29.	<u>Gmelina arborea</u>	1	6
30.	<u>Flacourtia sp.</u>		72
31.	<u>Sapindus laurifolia</u>		40
32.	<u>Carallia integerrima</u>		11
33.	<u>Olea dioica</u>		15

<u>Sl.No.</u>	<u>Climber species</u>	<u>Adult</u>	<u>Juvenile</u>
1.	<u>Calamus rotang</u>		108 + 3
2.	<u>Uvaria</u> sp		5
3.	<u>Smilax zeylanica</u>		1
4.	<u>Piper</u> sp.		4
<u>HERBS</u>			
1.	<u>Ecbolium viride</u>		12
2.	<u>Pteris</u>		1
<u>LIANAS</u>			
1.	<u>Calycopteris floribunda</u>		2
2.	<u>Gnetum</u> sp.		1
3.	<u>Vitex</u> sp.		2
4.	<u>Sarcostigma kleinii</u>		2

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
34.	<u>Ziziphus xylopyrus</u>		2
35.	<u>Dillenia pentagyna</u>		4
36.	<u>Dalbergia paniculata</u>		21
37.	<u>Butea frondosa</u>		3
38.	<u>Grewia tilifolia</u>		28

SHRUBS

1.	<u>Ziziphus rugosa</u>	3	91
2.	<u>Carissa carandas</u>	1	19
3.	<u>Clerodendrum sp.</u>		1037
4.	<u>Pavetta sp.</u>		105
5.	<u>Ziziphus cenoplia</u>		119
6.	<u>Toddalia sp.</u>		28
7.	<u>Bamboo sp.</u>		2
8.	<u>Allophylus cobe</u>		384
9.	<u>Bridelia sp.</u>		48
10.	<u>Holarrhena antidysenterica</u>		20
11.	<u>Eupatorium odoratum</u>		113
12.	<u>Breynia sp.</u>		85
13.	<u>Solanum indicum</u>		3
14.	<u>Leea sp.</u>		12
15.	<u>Helicterea isora</u>		10
16.	<u>Glochidion sp.</u>		7
17.	<u>Rauwolfia serpentina</u>		2
18.	<u>Antidesma sp.</u>		8

HERBS

1.	<u>Sida sp.</u>		12
2.	<u>Acanthaceae I</u>		85
3.	<u>Acanthaceae II</u>		06
4.	<u>Acanthaceae III</u>		12
5.	<u>Elephantopus scaber</u>		5
6.	<u>Compositae I</u>		25
7.	<u>Malvaceae I</u>		2

<u>Sl.No.</u>	<u>Herb species</u>	<u>Adult</u>	<u>Juvenile</u>
8.	Compositae II		16
9.	<u>Curuligo orchoides</u>		4
10.	Acanthaceae IV		13
11.	<u>Impatiens sp.</u>		1
12.	<u>Triumfetta-rhomboides</u>		1
13.	Gramineae I - IV		

TREE SPECIES

19.	<u>Acacia torta</u>	5	104
20.	<u>Wagatea spicata</u>	3	60
21.	<u>Paramignya monophylla</u>		8
22.	<u>Jasminium malabaricum</u>		30
23.	<u>Embelia sp.</u>		80

CLIMBERS

1.	<u>Celastrus sp.</u>		15
2.	Papilionaceae I		6
3.	<u>Smilax sp.</u>		1
4.	<u>Clematis sp.</u>		5
5.	<u>Hemidesmus indicus</u>		2

LIANAS

1.	<u>Conyocpeteris floribunda</u>	4	68
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BHAIRUMBE MINOR FOREST

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
1.	<u>Adina cordifolia</u>	1	
2.	<u>Alstonia scholaris</u>	3	
3.	<u>Aporosa lindleyana</u>	1	1
4.	<u>Artocarpus hirsuta</u>	1	
5.	<u>Artocarpus lakoocha</u>	1	2
6.	<u>Bassia latifolia</u>	2	2
7.	<u>Bombax malabaricum</u>	1	
8.	<u>Buchanania lanzan</u>	5	4
9.	<u>Careya arborea</u>	11	54
10.	<u>Dalbergia paniculata</u>	1	
11.	<u>Diospyros montana</u>	15	
12.	<u>Eugenia jambolana</u>	4	3
13.	<u>Ficus sp.</u>	1	
14.	<u>Flacourtia species</u>	6	9
15.	<u>Spondias accuminata</u>	1	
16.	<u>Ziziphus xylopyra</u>	10	4
17.	<u>Holigarna arnottiana</u>	1	
18.	<u>Jala (shorea sp)</u>	3	
19.	<u>Lagerstroemia microcarpa</u>	2	1
20.	<u>Lonicera malabaricum</u>	2	20
21.	<u>Mitragyna parvifolia</u>	2	
22.	<u>Olea dioica</u>	1	
23.	<u>Phyllanthus emblica</u>	6	4
24.	<u>Pterocarpus marsupium</u>	4	1
25.	<u>Randia spinosa</u>	93	148
26.	<u>Randia ulqinosa</u>	22	26
27.	<u>Stereospermum personatum</u>	1	1
28.	<u>Strychnos nux-vomica</u>	55	36
29.	<u>Terminalia bellirica</u>	4	10
30.	<u>Terminalia paniculata</u>	21	48
31.	<u>Terminalia tomentosa</u>	18	87
32.	Unknown II	1	3
33.	<u>Zenthoxylon rhetsa</u>	2	

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
34.	<u>Xylocarpus xylocarpa</u>	9	21
35.	<u>Ervatamia heyneana</u>		20
36.	<u>Pterocarpus marsupium</u>		1
37.	<u>Terminalia chebula</u>		2
38.	<u>Diospyros sp.</u>		52
39.	<u>Mimusops elengi</u>		1
40.	<u>Caryota urens</u>		1
41.	<u>Cinnamomum sp.</u>		2
	<u>SHRUBS</u>		
1.	<u>Leea</u>	1	
2.	<u>Allophylus cobe</u>	2	
3.	<u>Ziziphus rugosa</u>	2	2
4.	<u>Breynia sp.</u>		11
5.	<u>Clerodendrum sp.</u>		196
6.	<u>Eupatorium oderatum</u>		167
7.	<u>Holarrhena antidysenterica</u>		145
8.	<u>Bamboo</u>		1
9.	<u>Cassalpincea I</u>		43
10.	<u>Unknown I</u>		24
11.	<u>Pavetta sp.</u>		3
12.	<u>Carissa cerandae</u>	2	1
13.	<u>Acacia tatorae</u>	10	
14.	<u>Ziziphus benophia</u>		24
15.	<u>Dalbergia sympathetica</u>	4	
16.	<u>Jasmina malabaricum</u>		16
	<u>HERBS</u>		
1.	<u>Acanthaceae I</u>		110
2.	<u>Acanthaceae II</u>		8
3.	<u>Acanthaceae III</u>		3
4.	<u>Elephantopus scaber</u>		48
5.	<u>Mimosa pudica</u>		23
6.	<u>Sida sp.</u>		24
7.	<u>Indigofera sp.</u>		16
8.	<u>Cyperaceae sI</u>		10

<u>Sl.No.</u>	<u>Herb Species</u>	<u>Adult</u>	<u>Juvenile</u>
9.	<u>Compositae</u> I		1
10.	<u>Caesalpineae</u> I		28
11-16.	<u>Gramineae</u> I - VI		

LEVEL

CLIMBERS

1.	<u>Arqyrcia</u>		1
2.	<u>Cissus discolor</u>		1
3.	<u>Smilax zeylanica</u>		1
4.	<u>Hemidesmura indicus</u>		5
5.	<u>Scurrula (Parasite)</u>		3

LIANAS

1.	<u>Calycopteris floribunda</u>	15	70
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CHANDAVAR MINOR FOREST

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
1.	<u>Adina cordifolia</u>	13	
2.	<u>Ailanthus malabarican</u>	1	
3.	<u>Alseodaphne semecarpifolia</u>	4	15
4.	<u>Alstonia scholaris</u>	1	
5.	<u>Aporosa lindleyana</u>	80	242 + 3
6.	<u>Carellia infeqerrima</u>	1	1
7.	<u>Careya arborea</u>	14	2
8.	<u>Cassia fistula</u>	1	
9.	<u>Dillenia pentaqyna</u>	2	1
10.	<u>Elaeocarpus serratus</u>	7	19
11.	<u>Ervatamia beyneana</u>	57	1
12.	<u>Eugenia sp.</u>	13	
13.	<u>Ficus arnottiana</u>	4	
14.	<u>Flacourtia montana</u>	31	31
15.	<u>Garcinia sp.</u>	2	12
16.	<u>Spondias acuminata</u>	1	
17.	<u>Grewia tilifolia</u>	5	
18.	<u>Holigarna arnottiana</u>	40	30
19.	<u>Hopes wightiana</u>	26	81
20.	<u>Ixora brectriata</u>	108	343
21.	<u>Lagerstroemia microcarpa</u>	1	1
22.	<u>Madhuca nerifolia</u>	1	1
23.	<u>Manqifera indica</u>	8	
24.	<u>Memecylln sp.</u>	10	389
25.	<u>Mimusops elenqi</u>	7	
26.	<u>Olea dioica</u>	27	336 + 3
27.	<u>Randia spinosa</u>	4	2
28.	<u>Sepindus laurifolia</u>	1	5
29.	<u>Schleichera eleosa</u>	3	1
30.	<u>Sapium insigne</u>	3	
31.	<u>Stereospermum personatum</u>	1	3
32.	<u>Streyahnos nuxvomica</u>	5	
33.	<u>Syzyqium caryophyllatum</u>	1	8
34.	<u>Terminalia bellirica</u>	2	1

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
35.	<u>Terminalia paniculata</u>	7	22 + 1
36.	<u>Aqlaia sp.</u>	17	
37.	<u>Vitox altissima</u>	23	11 2
38.	<u>Linociera malabaricum</u>	3	
39.	<u>Macaranga paltata</u>		2
40.	<u>Phyllanthus emblica</u>		1
41.	<u>Flacourtia sp.</u>		1
42.	<u>Chukrassia tabularis</u>		1

SHRUBS

1.	<u>Carissa carandus</u>		56
2.	<u>Leea sp.</u>		177
3.	<u>Allophylus cobbe</u>		2 1
4.	<u>Strobilanthus I</u>		987
5.	<u>Strobilanthus II</u>		176
6.	<u>Psychotria flarida</u>		499 24
7.	<u>Chasalia ophioxylodes</u>		23
8.	<u>Bryonia sp.</u>		11
9.	<u>Ixora coccinea</u>		28
10.	<u>Glycosmis pentaphylla</u>		1
11.	<u>Embelia sp.</u>		2
12.	<u>Ziziphus oenoplia</u>		1
13.	<u>Clerodendrum sp.</u>		2
14.	<u>Bridelia sp.</u>		6
15.	<u>Ziziphus rugosa</u>		1
16.	<u>Dalbergia sympathetica</u>		3
17.	<u>Peramignya monophylla</u>		10
18.	<u>Pavetta sp.</u>		1
19.	<u>Waqatea spicata</u>		3 + 3
20.	<u>Uvaria sp.</u>		425
21.	<u>Ventilago sp.</u>		2 + 1
22.	<u>Mussenda frondosa</u>		1

HERBS

1.	<u>Acanthaceae I</u>		1
2.	<u>Cyperaceae I</u>		25

<u>Sl. No.</u>	<u>Herb Species</u>	<u>Adult</u>	<u>Juvenile</u>
3.	<u>Piper</u> sp.		9
4.	<u>Naregamia</u> <u>alata</u>		42
5.	Unknown II		1
6.	Graminae I, II		

CLIMBERS

1.	<u>Strychnes</u> <u>colubrine</u>		1
2.	<u>Smilex</u> <u>zeylanica</u>		2

LIANAS

1.	<u>Celycoptenis</u> <u>floribunda</u>		13
2.	<u>Gnetum</u> sp.		3

MIRZAN MINOR FOREST

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
1.	<u>Aqlaia</u> sp.	4	72
2.	<u>Alseodaphno</u> <u>somecarpifolia</u>	20	3
3.	<u>Wrightia</u> <u>tomentosa</u>	25	8
4.	<u>Aporosa</u> <u>lindleyana</u>	4	4
5.	<u>Bocagia</u> <u>dalzelli</u>	1	
6.	<u>Buchanania</u> <u>lanzan</u>	13	1
7.	<u>Callophyllum</u> <u>elatum</u>	11	1
8.	<u>Careya</u> <u>arboroa</u>	19	2
9.	<u>Diospyros</u> sp.	1	4
10.	<u>Ervatamia</u> <u>heyneana</u>	2	
11.	<u>Ficus</u> <u>arnottiana</u>	3	
12.	<u>Garcinia</u> <u>indica</u>	1	
13.	<u>Spondias</u> <u>accuminata</u>	26	1
14.	<u>Heterophragma</u> sp.	4	
15.	<u>Ixora</u> <u>brachiata</u>	30	89 + 1
16.	<u>Memecylon</u> sp.	12	337 + 9
17.	<u>Mimusopae</u> <u>elenqi</u>	3	1
18.	<u>Olea</u> <u>dioica</u>	2	2
19.	<u>Phyllanthus</u> <u>emblica</u>	2	1
20.	<u>Randia</u> <u>spinosa</u>	17	27
21.	<u>Sapium</u> <u>insigne</u>	8	
22.	<u>Schleichera</u> <u>oleosa</u>	3	
23.	<u>Strychnos</u> <u>nuxvomica</u>	10	13
24.	<u>Terminalia</u> <u>alata</u>	23	120 + 1
25.	<u>Terminalia</u> <u>bellirica</u>	2	
26.	<u>Terminalia</u> <u>paniculata</u>	29	
27.	<u>Vitex</u> <u>altissima</u>	3	2
28.	<u>Flacourtia</u> sp.		1
29.	<u>Flacourtia</u> <u>montana</u>		1
30.	<u>Sapindus</u> <u>laurifolia</u>		1
<u>SHRUBS</u>			
1.	<u>Bryonia</u>	2	
2.	<u>Carissa</u> <u>carandas</u>	19	

<u>Sl.No.</u>	<u>Shrub Species</u>	<u>Adult</u>	<u>Juvenile</u>
3.	<u>Embelia</u> sp.	6 + 7	
4.	<u>Ziziphus xylopyrus</u>	2	
5.	<u>Grewia microcos</u>	259 + 4	
6.	<u>Allophylus lobba</u>	9	
7.	<u>Holarrhena antidysenterica</u>	179 + 2	
8.	<u>Bridelia</u> sp.	4	
9.	<u>Ziziphus rugosa</u>	4	
10.	Unknown II	15	
11.	Unknown III	1	
12.	<u>Croton</u> sp.	72	
13.	Unknown I	4	
14.	Unknown II	1	
15.	<u>Ziziphus oenoplia</u>	7	
16.	<u>Pavetta</u> sp.	1	
17.	<u>Dalbergia sympathetic</u>	3	
18.	<u>Waqatea spicata</u>	2	

CLIMBERS

1.	Unknown II	15	
2.	Unknown III	1	
3.	<u>Jasminum malabaricum</u>	1	

LIANAS

1.	<u>Calycopteris floribunda</u>	4 + 64 + 3	
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HERBS

1.	<u>Acanthaceae</u> I	64	
2.	<u>Naregamia alata</u>	18	
3.	<u>Compositae</u> I	8	
4.	<u>Graminaea</u> I to IV		

TARGODARECA GARDEN

<u>Sl.No.</u>		<u>Adult</u>	<u>Juvenile</u>
1.	<u>Areca catechu</u>	1964	
2.	<u>Theobroma cacao</u>	102	
3.	<u>Cocos nucifera</u>	11	
4.	<u>Artocarpus integrifolia</u>	5	
5.	<u>Erythrina indica</u>	1	
6.	<u>Coffee sp.</u>	1	
7.	<u>Citrus sp.</u>	1	
8.	<u>Magnifera indica</u>	1	
<u>SHRUBS</u>			
1.	<u>Elettaria cardamomum</u>	809	
<u>HERBS</u>			
1.	<u>Musa paradisiaca</u>	226	
<u>CLIMBERS</u>			
1.	<u>Piper nigrum</u>	774	
2.	<u>Piper betel</u>	1	
<u>WEEDS (not counted)</u>			
<u>Cyperaceae I</u>		<u>FERNS</u>	
<u>Compositae I</u>		1.	<u>Adiantum</u>
<u>Scrophulariaceae I</u>		2.	<u>Gleichinia</u>
<u>Phyllanthus niruri</u>		3.	<u>Blechnum</u>
<u>Heliotropium sp.</u>		4.	Fern No. II
<u>Rubiaceae member I</u>		5.	FernNb. IV
<u>Oldenlandia sp.</u>		<u>BRYOPHYTES</u>	
<u>Centella asiatica sp.</u>		1.	<u>Riccia</u>
<u>Solanum nigrum</u>		2.	<u>Dumortiera</u>
<u>Compositae II</u>		3.	<u>Aneura</u>
<u>Dioscorea sp.</u>		4.	Mosses.
<u>Oxalis corniculata</u>			

BIDRALI EUCALYPTUS PLANTATION

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
1.	<u>Eucalyptus</u> sp.	914	6
2.	<u>Terminalia paniculata</u>	83	28
3.	<u>Lagerstroemia microcarpa</u>	106	161
4.	<u>Cassia fistula</u>	26	32
5.	<u>Ervatamia heyneana</u>	15	1
6.	<u>Diospyros montana</u>	10	6
7.	<u>Xeromphis uliginosa</u>	9	18
8.	<u>Diospyros melanoxylon</u>	6	
9.	<u>Grewia tilifolia</u>	4	17
10.	<u>Phyllanthus emblica</u>	4	
11.	<u>Careya arborea</u>	3	4
12.	<u>Eugenia jambolana</u>	2	
13.	<u>Alstonia scholaris</u>	2	
14.	<u>Bassia latifolia</u>	1	1
15.	<u>Adina cardifolia</u>	1	1
16.	<u>Xantolis tomentosa</u>	1	
17.	<u>Terminalia tomentosa</u>	1	
18.	<u>Terminalia bellirica</u>	1	
19.	<u>Ziziphus xylopyra</u>	1	
20.	<u>Xeromphis spinosa</u>		51
21.	<u>Spindias acumina</u>		1
22.	<u>Xylia xylocarpa</u>		168
23.	<u>Macaranga peltata</u>		1
24.	<u>Dalbergia latifolia</u>		1
25.	<u>Buchanania lanzan</u>		1
<u>SHRUBS</u>			
1.	<u>Ziziphus ruqosa</u>	24	8
2.	<u>Callicarpa tomentosa</u>	2	
3.	<u>Holarrhena antidysenterica</u>	2	2
4.	Bamboo		75
5.	<u>Ereynia</u> sp.		33

SONDA TEAK PLANTATION

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
1.	<u>Tectona grandis</u>	1016	32
2.	<u>Adina cordifolia</u>	60	112
3.	<u>Ervatamia heyneana</u>	10	14
4.	<u>Terminalia paniculata</u>	3	
5.	<u>Alstonia scholaris</u>	31	10
6.	<u>Macaranga peltata</u>	3	6
7.	<u>Diospyros mantana</u>	1	1
8.	<u>Eugenia jambolana</u>	1	
9.	<u>Aporosa lindleyana</u>		4
10.	<u>Xantolis tomentosa</u>		3
11.	<u>Mitragyna parvifolia</u>		13
12.	<u>Carallia integerimma</u>		1
13.	<u>Mellotus sp.</u>		2
14.	<u>Sterculia sp.</u>		6
15.	<u>Bauhinia sp.</u>		4
16.	<u>Sapindus laurifolius</u>		2
17.	<u>Spondias acuminata</u>		1
18.	<u>Lagerstroemia microcarpa</u>		3
19.	<u>Cassia fistula</u>		6
20.	<u>Vitex altissima</u>		1
21.	<u>Bassia latifolia</u>		2
22.	<u>Ficus exasperata</u>		4
23.	<u>Dillenia pentagyna</u>		1
24.	<u>Randia spinosa</u>		95 + 1
	<u>SHRUBS</u>		
1.	<u>Eupatorium odoratum</u>		44
2.	<u>Carissa carandas</u>		1
3.	<u>Leea sp.</u>		59 + 2
4.	<u>Glycosmis pentaphyla</u>		6
5.	<u>Glechidion sp.</u>		10 + 2
6.	<u>Callicarpa tomentosa</u>		4 + 1
7.	<u>Allophylus cobbe</u>		2

<u>Sl.No.</u>	<u>Shrub Species</u>	<u>Adult</u>	<u>Juvenile</u>
6.	<u>Clerodendrum</u> sp.		390 + 15
7.	<u>Embelia</u> sp.		11
8.	<u>Eupatorium</u> odoratum		19 + 2
9.	<u>Allophylus</u> cobe		6
10.	<u>Solanum</u> indicum		4 + 1
11.	<u>Acacia</u> tora	1	

HERBS

1.	<u>Indigofera</u>		13
2.	<u>Mimosa</u> pudica		2
3.	<u>Nervilia</u> sp.		1
4.	Compositae I		6
5.	Cyperaceae I		83
6.	Gramineae I	} not counted	
7.	Gramineae II		

LIANAS

1.	<u>Calycopteris</u> floribunda	23	4
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<u>Sl.No.</u>	<u>Shrub species</u>	<u>Adult</u>	<u>Juvenile</u>
8.	<u>Clorodendrum</u>		91
9.	<u>Bryenia</u> sp.		1
10.	<u>Ziziphus rugosa</u>		1
<u>HERBS</u>			
1.	<u>Balsam</u> sp.		24
2.	<u>Boesenbergia pulcherrima</u>		13
3.	<u>Liliaceae</u> member I		9
4.	<u>Amorphallus</u> sp.		2
5.	<u>Dioscorea bulbifera</u>		1
6.	<u>Cyperaceae</u> member I		5
7.	<u>Ophioglossum</u>	} G Ferns	1
8.	<u>Adiantum</u>		4
<u>CLIMBERS</u>			
1.	<u>Clematis</u> sp.		1
<u>LIANAS</u>			
1.	<u>Calyopteris floribunda</u>		3

BHAIRUMBE BETTA LAND

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
1.	<u>Alseodaphne semocarpifolia</u>	1	
2.	<u>Alstonia scholaris</u>		8
3.	<u>Artocarpus hirsutus</u>	2	
4.	<u>Aporosa lindleyana</u>	1	
5.	<u>Bassia latifolia</u>	3	
6.	<u>Buchanania lanzan</u>	2	21
7.	<u>Canallia integerrima</u>	13	15
8.	<u>Careya arborea</u>	1	27
9.	<u>Cassia fistula</u>	62	8
10.	<u>Cinnamomum sp.</u>	1	5
11.	<u>Eugenia jambolana</u>	2	1
12.	<u>Ervatamia heyneana</u>	4	3
13.	<u>Oloa dioica</u>	3	3
14.	<u>Phyllanthus emblica</u>	2	31
15.	<u>Pterocarpus marsupium</u>	52	6 + 1
16.	<u>Randia uliginosa</u>	3	3
17.	<u>Spondias acuminata</u>	1	29
18.	<u>Strychnos nux-vomica</u>	2	
19.	<u>Terminalia bellirica</u>	9	
20.	<u>Terminalia chebula</u>	6	35 + 1
21.	<u>Terminalia paniculata</u>	3	
22.	<u>Terminalia tomentosa</u>	139	
23.	<u>Vitex alrissima</u>	59	72 + 1
24.	<u>Xylia xylocarpa</u>	1	29
25.	<u>Acacia auriculiformis</u>	53	2
26.	<u>Artocarpus lakoocha</u>		15
27.	<u>Caryota urens</u>		4
28.	<u>Chukrassia tabularis</u>		8
29.	<u>Diospyros micr ophylla</u>		2
30.	<u>Diospyros montana</u>		1
31.	<u>Elaeocarpus sp.</u>		1
32.	<u>Ehretia sp.</u>		10
33.	<u>Flacourtia montana</u>		3
			1
			5

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
34.	<u>Flacourtia</u> sp.		4
35.	<u>Phoenix</u> <u>acaulis</u>		1
36.	<u>Carcinia</u> sp.		5
37.	<u>Ziziphus</u> <u>xylopyra</u>		6
38.	<u>Holigarna</u> <u>arnottiana</u>		8 + 1
39.	<u>Ixora</u> <u>brachiata</u>		3
40.	<u>Shorea</u> sp.		2
41.	<u>Linociera</u> <u>malabarica</u>		9
42.	<u>Mallotus</u> <u>philippensis</u>		1
43.	<u>Randia</u> <u>spinosa</u>		133 + 5
44.	<u>Wrightia</u> <u>tomentosa</u>		1
45.	<u>Santalum</u> <u>album</u>		1
46.	<u>Stereospermum</u> <u>personatum</u>		2
47.	<u>Leucaena</u> <u>leucocephala</u>		4
48.	Unknown I		7
49.	<u>Vateria</u> <u>indica</u>		2
50.	<u>Xantolis</u> sp.		1
51.	<u>Xanthoxylum</u> <u>rhetsa</u>		1
52.	Unknown II		6

SHRUBS

1.	<u>Holarrhena</u> <u>antidysenterica</u>		92
2.	<u>Ziziphus</u> <u>rugosa</u>		6
3.	<u>Bryenia</u> sp.		181 + 2
4.	<u>Bridelia</u> sp.		11
5.	<u>Clerodendrum</u> sp.		335 + 4
6.	<u>Croton</u> sp.		1
7.	<u>Embelia</u> sp.		1
8.	<u>Eupatorium</u> <u>odoratum</u>		6
9.	<u>Ixora</u> <u>ococcinea</u>		1
10.	<u>Lantana</u> <u>camara</u>		1
11.	<u>Mussaenda</u> <u>frondosa</u>		1
12.	<u>Allophylus</u> <u>cobba</u>		3
13.	<u>Ziziphus</u> <u>oenoplia</u>		42
14.	<u>Jasminum</u> <u>malabaricum</u>		17
15.	<u>Acacia</u> <u>forte</u>		1 + 1

<u>Sl.No.</u>	<u>Herb Species</u>	<u>Adult</u>	<u>Juvenile</u>
1.	<u>Sida</u> sp.		
2.	<u>Acanthaceae</u> I		43
3.	<u>Rubiaceae</u> I		100
4.	<u>Elephantopus</u> <u>scaber</u>		9
5.	<u>Justicia</u> sp.		117
6.	Unknown I		17
	Graminae I - III		3

CLIMBERS

1.	<u>Adenia</u> <u>hondala</u> :		1
2.	<u>Hemidesmus</u> <u>indicus</u>		1
3.	<u>Ficus</u> sp. (parasite)		1

LIANAS

1.	<u>Calycopteris</u> <u>floribunda</u>		98
2.	<u>Gnetum</u> sp.		1

ABSTRACT

A detailed quantitative study on levels of plant diversity in Sirsi and Kumta taluks of Uttara Kannada showed that:

(1) The overall species numbers in the reserve forests can be ranked Nagur > Sonda > Santgal > Bidralli. However, the percentage of species constituting the trees in Nagure and Santgal reserve forests of Kumta taluk is much higher than that of Bidralli and Sonda..

(2) In contrast, the total number of species in minor forests can be ranked Bengle-Sugavi > Bhairumbe > Chandavar > Mirzan.

(3) In the monoculture vegetation type the total species number can be ranked Eucalyptus plantation > teak plantation > areca palm agroforest.

(4) The total number of species in a leaf manure forest was found to be of the same order as that of reserve and minor forests.

(5) It appears that there is no significant positive correlation between the levels of diversity and the land use pattern.

(6) It was found that the similarity in floristic elements is governed by the geographic proximity of the study locality rather than the type of land use. Thus the

similarity in the floristic elements among the reserve forest localities in Sirsi taluk is much greater to the minor forest localities in this taluk. Similarly the flora of reserve forest of Kumta is much more related to the minor forest in the same taluk.

1.0 INTRODUCTION

There has been growing concern relating to the extent of deforestation and mounting human pressures on the natural vegetative cover in the Western Ghats region in recent years. These ghats harbour a variety of vegetation types and are a home of many an endemic species. Thus we have Moullava spicata, Poeciloneuron indicum, Gnetum scandens and many other endemics. There is an increasing danger that we may be left in uforeseeable future with only a fraction of the multitude of vegetation types that have evolved through millenia. This has serious consequences for the species extinction rates, so that with the increased extinction rates, we stand to lose precious genetic diversity. There are, however, as yet, no detailed quantitative studies in the Indian subcontinent on the impact of human activities on the plant diversity. The present study aims at understanding the patterns of plant diversity and how the human impact affects this diversity. In this report, based on our work carried out from August 1983 to June 1984, we present our results on the levels of plant diversity of angiosperm found in Uttara Kannada district, Karnataka.

2.0 METHODS

2.1 The Habitat : The studies were confined to five taluks of Uttara Kannada district (latitude 13.5° - 15.31° N longitude 74.9° - 75.10° E) of Karnataka. The district can be broadly divided into three zones. The coastal plains in Western

part of the district gradually merge into a series of low elevation hills. These hills enclose a number of valleys. In the eastern part of the district, the Ghats merge with the Deccan plateau. Rainfall is highest in the coastal and in the Ghat region and decreases to the east of the Ghats. The total annual rainfall of the district is on an average 2750 mm. The soils are predominantly lateritic in origin, the underlying rocks being gniesses.

2.2 Selection of study sites : The study sought to estimate the plant diversity levels under all kinds of land uses. This includes the reserve forest, minor forest, leaf manure forest (soppina betta), and in monoculture vegetation such as Eucalyptus, teak and areca palm agroforests. Representative areas of each of these land use types were chosen around four villages in the taluks of Sirsi and Kumta. Table 1 gives the location of these study sites according to the land use and the vegetation types.

2.3 Sampling procedure : In each of these 12 localities, one hectare plots were chosen in October 1983. The actual sampling began in November 1983 and continued till June 1984. The plant diversity estimates are divided into three components. In the first component, all woody plants having a circumference of 10 cm and above at the height of 132 cm from the ground level were enumerated. (These include tree species as well as some of the shrub species). The second component consisted of sampling of individuals of shrub species as well as

saplings of tree species with a circumference of less than 10 cm at height of 132 cm. This was done in ten randomly chosen quadrats of size 10 x 10 mt within the one hectare plot. Thus all the woody individuals that are below 10 cm circumference limit were included in this estimate. The third component of herb layer estimation was carried out in a total of 20 quadrats of size 0.5 x 0.5 m. As it was found to be difficult to count the individuals of the members of Graminae, all the herbaceous individuals were clipped to the ground level and oven dry weight of each of the species was estimated. In the diversity calculations for the herb layer, biomass was used instead of numbers. Fortnightly visits were arranged to collect all species that came into flower.

2.4 Species area curves : In order to arrive at the minimum size of the sampling unit required for sampling the tree layer, species area curves (Mueller-Dombois 1974) were drawn. However, the number of such sampling units required for sampling the entire community was not determined. In order to check the adequacy of sampling of shrub layer, the increase in diversity index with the cumulative number of species in each of the 10 quadrats was plotted (Pileon 1975). For each herb layer, similar procedure was adopted.

2.5 Calculation of diversity indices

2.5.1 Shannon-Weiner's Index, H'

One measure of a community's diversity is simply the number of species it contains, say S . This is however, an

unweighted measure analogous to the range of a qualitative variate. To arrive at a weighted measure, that is, one takes account of the relative quantities of the S species. The appropriate function of P_i ($i = 1, \dots, S$) where P_i is the proportion of the community belonging to the i^{th} species. We are free to choose what this function say $H'(\dots)$ should be. The desirable properties for H' are as follows:

1) for a given S , H' should have its greatest value when $P_i = \frac{1}{S}$ for all i . Such community will be called completely even.

2) Given the two completely even communities, one with S species and other with $S + 1$, the latter should have the greater H' . Property 1 ensures that an "even" community shall have a greater index of diversity than one in which, though the number of species is the same, the community is dominated by one or a few of them in which case its diversity in the intuitive sense would be less. The function of P_i which satisfy this property is

$$H' = - \sum P_i \log P_i$$

This index which is widely used by ecologists is known as Shannon Weiner's index.

2.5.2 Measure of concentration: The function $\sum P_i^2 = \lambda$, has been used as an index of the "dominance" in a many species community. λ is the probability that any two individuals picked independently and at random from the

community will belong to the same species. This measure is a property that is the opposite of diversity. Thus lower the λ , higher is the diversity. This suggests the use of some function that increases with decreasing λ as an index. One possibility is to use $1 - \lambda$. So we have calculated negative of dominance or measure of concentration

$$= 1 - \lambda \text{ or } \frac{1}{\lambda}$$

2.5.3 Brillouin's index: In a fully censused community a collection of the Shannon Weiner's index is not appropriate for measuring the diversity. H' is useful only for 'infinitely large' community in the sense that removing samples from them causes no perceptible change in them. For collection, the appropriate measure of diversity is Brillouin's index defined as

$$H = \frac{1}{N} \log \frac{N_i}{\pi N_i} \quad \text{where}$$

N_i = is the number of individuals in the whole collection and N_i is the number in the i^{th} species for $i = 1, 2, 3, \dots, S$. It should be noted that

$$\lim_{\min(N)} H = H'$$

$$\min(N) \rightarrow \alpha$$

2.5.4 Index of evenness: The diversity of a community depends on two things: the number of species and the evenness with which the individuals are apportioned among them. A community with a few, evenly represented species can have the same diversity index as one with many, unevenly represented species.

It is obviously desirable to keep distinct these two ingredients of diversity, the number of species, S and the evenness. Hence the need for a method of measuring evenness. The one we have used is the ratio of observed diversity index to the maximum value diversity could have in a community with the same number of species

$$J = \frac{H'}{H_{\max}}$$

where

H Brillouin's diversity index

where

$$H_{\max} = \frac{1}{N} \log \frac{N!}{(X!)^{S-r} (Y!)}$$

$$X = \left[\frac{N}{S} \right] + X + 1 = Y$$

since J relates to a collection it is determinable without sampling variance and hence has no standard error.

2.5.5 Potential interspecific individual encounter (PIE):

Much of the interest in diversity has stemmed from its proposed relationship to community stability. Since stability is presumed to be related to the number of links in a web and since links imply interspecific encounters, the probability of interspecific encounter is a variable of interest.

Potentially each individual can encounter interact with every other individual in the community of $N(N-1)/2$ potential encounters in a community of N individuals,

$\frac{\sum(N_i)(N-N_i)}{2}$ encounters involve individuals belonging to

different species. Thus

$$\Delta_i = \sum_{i=1}^s \left(\frac{N_i}{N} \right) \left(\frac{N-N_i}{N-1} \right)$$

$$= \left(\frac{N}{N-1} \right) \left(1 - \sum_{i=1}^s p_i^2 \right)$$

is the probability of interspecific encounter PIE or proportion of potential encounters that is interspecific.

As an equal interpretation, note that if an individual enters a community and encounters two individuals at random, the probability that they belong to different species.

2.5.6 Expected number of species: Species richness can refer to the number of species present, without any particular regard for the exact area or number of individuals examined. However, it is useful to distinguish between numerical species richness, the number of species present, in a collection containing a specified number of individuals. Since the species richness of a collection generally increases with N , comparison of species richness of different collections requires that collections be reduced to a common size (n). This can be affected with the equation

$$E(S_n) = \sum_{i=1}^s \left[1 - \frac{N-N_i}{N} \frac{n}{N} \right]$$

the expected number of species in a sample of n individuals selected at random (without replacement) from a collection containing N individuals and s species. In our study, we have chosen $n = 100$.

2.5.7 Similarity index: A very simple mathematical expression for the similarity of communities is the community coefficient of JACCARD and SORENSEN. It is based on a the presence - absence relationship between the number of species common to two areas (communities) and the total number of species. The coefficient expresses the ratio of the common species to all species found in two vegetation. Thus $\frac{\text{common species}}{\text{all species}} \times 100$.

JACCARD's presence community coefficient is written as

$$IS_J = \frac{C}{A+B-C} \times 100$$

where A,B stands for presence of the total number of species of two communities and C is the common species between two communities, the more widely used similarity index is of SORENSEN.

$$IS_S = \frac{C}{\frac{1}{2}(A+B)} \times 100$$

In other words, the differences between IS_J and IS_S can be described as

$$IS_J = \frac{C}{\text{total number of species}} \times 100$$

$$IS_S = \frac{C}{\text{average number of species}} \times 100$$

3.0 RESULTS

Table 2 summarises the basic taxonomic data on wooden individuals ≥ 10 cm circumference at 132 cm height from the ground level.

3.1 Species numbers in reserve forests (RF): The number of families encountered in the RF can be ranked Nagur > Santgal > Sonda > Bidralli (Table 1).

The forest vegetation was divided into five components. These are trees, shrubs, climbers, lianas and herbs.

Table 3 gives the percentage occurrence of species among these five components. There appears to be no significant differences BETWEEN THE FOUR localities whereas there are differences within each locality. The total number of tree species in the reserve forests can be ranked Nagur > Santgal > Sonda > Bidralli. However, in the overall species number, the rank order is Nagur > Sonda > Santgal > Bidralli. The bulk of species (71-85 percent) is accounted for by tree and shrubs. The remaining 1/3 of species number is accounted for by the climbers, lianas and herbaceous species.

3.2 Species numbers in minor forest: Here, the major part of species composition consists of the tree and shrub species (Table 3). The climbers, lianas and herbaceous species account for approximately a third of the remaining ones. Here again, there does not appear to be significant differences in species numbers among the localities, whereas within

localities, there are significant differences.

3.3 Species numbers in monoculture and leaf manure forests:

In the case of Eucalyptus and teak plantation, much of the species composition is explained by the tree and shrubs, while in the case of areca agroforest, only a fourth occurs in the tree layer, and over 70 percent of the species belong to the herbaceous layer (Table 3). The species numbers in the leaf manure forest indicate that the tree and shrub layer accounts for more than 80 percent of the species.

3.4 Species area curves: Figure 1 gives species area curves for three reserve forest areas of Bidralli, Nagur and Santgal and two localities of minor forests in Mirzan and Chandavar. Figure 2 shows the value of diversity index with the cumulative increase in number of shrub species in three reserve forests of Bidralli, and Santgal. It is evident from these curves that above the size of 4000 m², the curve attains a plateau. Therefore the size of the sampling unit chosen is adequate to sample the individuals of 10 cm and above in circumference. Sonda and also for shrub layer in minor forests of Bengle-Sugavi, Chandavar and Bhairumbe. It is apparent that the sample size of 10 quadrats is adequate for estimating the diversity of shrub species.

3.5 Species diversity indices: The Shannon-Weiner index was calculated to the base e, ten and two. Table 4 gives the values for three reserve forest localities of Bidralli, Nagur and Sonda and four minor forest localities of Bhairumbe, Chandavar, Mirzan and Bengle-Sagar. The indices calculated

were for the woody individuals of 10 cm and above in circumference at 132 cm height from the ground level. By this criteria, it is quite possible that we have included shrub species (as defined in Hassan flora) among the tree species. In this report we restrict ourselves to presenting results on the woody individuals. The individuals sampled in the 10 x 10 m quadrats were again subjected to computations of diversity indices and are not included in this report. It is interesting to note that the Mirzan minor forest has the highest value of index followed by Sonda forest. There does not appear to be differences between the Bhairumba and Chandavar minor forests, the indices of these two minor forests being higher than that of Bidralli reserve forest. The leaf manure forest shows the lowest diversity value. The other measure of index namely the Brillouin index shows the highest value for Sonda.

From these indices it is evident that among the reserve forests of Sonda and Bidralli, the former has, on the whole, a more even spread of individuals in any a given species, than that of the latter. This is evident from the measure of concentration, proportion of potential inter-individual encounters and the dominance coefficient. In other words, species composition is such that it is not dominated by few species alone. In the case of Bidralli, Terminalia paniculata, Xeromphis spinosa, Randia ulginosa and Lagerstroemia microcarpa dominate the community (appendix 1).

The Shannon Weiner index for the minor forest localities is ranked Mirzan > Chandravar > Bhairumbe. However, if one takes the absolute number of tree species the rank order is reversed in the fashion Bhairumbe > Chandavar > Mirzan. This again, points to the conclusion that in the minor forest localities, though the species number is lower than that of leaf manure forest, individuals in each of the species are far more uniformly distributed in the former. This is borne out from the results presented in Table 3. This isto be expected as the owner of leaf manure forest favours retention of those species that are of utility for him in meeting his requirements of leaf manure, fodder and fuel. This also seems to be the case in many of our visits to other bettas in which the dominant tree species are but a few.

This result would indicate that under the current management practices of the bettas, individuals belonging to a few species are able to survive better than most others. One has to do a careful survey to ascertain this aspect. It could be also surmised that these factors together act in a concerted fashion resulting in the low diversity. This appears to be true from a scrutiny of the data on species abundance.

3.6 Species abundance in reserve forests: The most abundant tree species belonging to first storey in the Bidralli reserve forest are Terminalia paniculata, Langerstroemia microcarpa, Ficus asperrima, Grewia tilifolia, Haldina cordifolia and

Xydia xylocarpa. The lower storey consists of Cassia fistula, Buchanania lanzan, Careya arborea, Kydia calycina, Macaranga peltata, Phyllanthus emblica, Xeromphis spinosa, Randia ulqinosa, Schleichera oleosa and others. The undergrowth is dominated by Murraya koenqii, Clerodendrum sp, Bryonia, Chromolaena odoratum and Bambusa arundinacea. The herb species include Triumfetta, Elephantopus and others. Appendix 1 gives the list of species and their numbers in the adult and juvenile classes.

The Sonda reserve forest, the emergent trees species of the canopy are Xydia xylocarpa, I. paniculata, Dillenia pentagyna, Olea dioica. The middle layer consists of Aporosa lindleyana, Flacourtia montana, Xeromphis spinosa, Ervatimia heyneana and others. The herb layer is relatively poorly represented. It has few member of Acanthaceae, Gramineae and others. Appendix 2 gives the list of tree shrub and herb species along with their numbers in adult and juvenile classes.

In Kumta taluk, the reserve forest of Nagur exhibits a different physiognomy. The vegetation consists of more of evergreen elements than that of Bidralli and Sonda. The dominant tree species in the first layer of the canopy include Hopea wightiana, Olea dioica, Holigarna arnottiana, Dysoxylum malabaricum, Persea macrantha and others. The middle layer of the trees consist of Aporosa lindleyana, Ixora brachiata, Knema attenuata, Dillenia pentagyna and others. The evergreen characteristics is evident by the presence of individuals such as Calophyllum apetalum.

Eugenia heyneana, Myristica sp., Diospyros candoleana, Persea macrantha. However, this locality is not free from disturbance which is evident from the presence of Apocosa lindleyana, Sapium insigne, Flacourtia montana, Ervatimia heynea, Randia ulginosa, R. rugosa, Macaranga peltata and others (appendix 3).

The Santgal reserve forest represents an outer edge evergreen forest of the Western slopes of the ghats. The tree species are Diospyros candoliana, D. pruriens, Bischofia javanica, Persea macrantha, Nothopegia sp., Dysoxylum malabaricum, D. binectariferum and others. The shrub species include myrtaceae members, Leea sp., Canthium didyma, Tarenna sp., Piper sp., Smilax zeylanica. The lianas include Gnetum sp., Sarcostigma kleinii and others. The herbaceous flora is very minimally present (appendix 4).

3.7 Species abundance in minor forests: The vegetation in the minor forests does not exhibit a layered structure as is found in the reserve forest. This is mainly due to felling of the commercially important timbers. Nevertheless, it would be possible to restore the layered structure if further felling is stopped and if biotic disturbances are minimised. A notable feature of the composition of the minor forests is that tree species constitute a little over half of the total number of species. The remaining half is distributed among shrub, climber, liana and herb layers (appendix 5).

The most abundant tree species in Bengle-Sugavi minor forest are Terminalia paniculata, T. tomentosa, Xylia xylocarpa and Terminalia bellirica. This composition is of moist deciduous vegetation but, the occurrence of Xeromphis spinosa, Flacourtia montana, Ervatamia heyneana suggests a disturbance to the vegetation. The major shrub species include Clerodendrum sp., Allophylus cobbe, Ziziphus oenopia, Eupatorium odoratum, Pavetta sp. and others. The herb layer consists of members of Acanthaceae, Compositae, Malvaceae and Gramineae. A notable occurrence is that of Moullava spicata, an endemic in this locality (appendix 5).

The Bhairumbe minor forest has predominantly a thorny cover consisting of Xeromphis spinosa, Randia uliginosa, Strychnos nux-vomica. A large number of species is represented by only a few individuals. This in fact contributes to the low value of diversity index compared to Bengle-Sugavi minor forest. The shrub species are Pavetta sp., Clerodendrum sp., Eupatorium odoratum and others. The herbaceous members belong to Acanthaceae, Compositae and Gramineae (appendix 6).

In contrast, the Chandavar minor forest has a well developed canopy. As a result about 55 percent of all species belong to the tree layer. Shrubs form 29 percent and the rest are climbers, lianas and herbs. The low percentage (.9 percent) of herbs suggests that the canopy is intact. However, it must be also pointed out that due to excessive erosion in some localities of the plot, nothing else would

grow on the exposed rocks. This, perhaps contributes to the low percentage of herbaceous flora observed in this plot.

The significant tree species include Lagerstroemia microcarpa, Aporosa lindleyana, Ervatamia heyneana, Holigarna amnottiana, Flacourtia montana, Hopea wightiana and others. The shrub species include Strobilanthes sp. Psychotria flavida, Uvaria sp. Allophylus cobbe and others. The flora consists of Naregamia alata, members of Acantheceae, Cyperaceae and Gramineae (appendix 7).

The Mirzan minor forest is highly disturbed and is located on a lateritic outcrop. The principal tree species are Ixora brachiata, Terminalia paniculata, Spindias acuminata, Wrightia tomentosa, Terminalia alata, Alseodohne semecarpifolia and others. The shrub species is dominated by Grewia microcos Holarrhena antidysenterica, Croton sp. and others (appendix 8).

3.8 Species abundance in monoculture vegetation: Areca palm agro forests : Bulk of the vegetation in the tree layers consists of areca palms only. Theobroma cacao is an under storey tree. Coconut (Cocos nucifera) and jack fruit (Artocarpus integrifolia) are grown as shade trees to the areca palms. The cultivated shrub species is cardamom (Elettaria cardamomum). The giant herb, banana (Musa paradisiaca) forms an important shade crop to the areca palm in early stages of growth. The climbers include black pepper (Piper nigrum) and betel vine (Piper betel). The weed flora consists of Cyperaceae, Compositeae, Scrophulariaceae and

Rubiaceae members (appendix 9).

The Eucalyptus plantation, though purports to be a monoculture, does contain a number of tree, shrub, liana and herb species. These include Lagerstroemia microcarpa, I. paniculata, Cassia fistula and others. In the juvenile phase, one encounters Xylia xylocarpa, Xeromphis spinosa, Macaranga paltata, Buchanania lanzan and others. The shrubs species include Clerodendrum sp., Bambusa arundinacea, Byrenia sp., Ziziphus rugosa and others. The herbaceous flora comprises of members of Cyperaceae, Gramineae and Indigofera sp. (appendix 10). Thus the popular belief that Eucalyptus suppresses the growth of other species does not appear to be correct.

The teak plantation similarly, has a large population of teak. The wild species include Maldina cordifolia, Alstonia scholaris, Ervatimia heynea and others. The dominant shrub species are Clerodendrum, Leea sp., Chromolaena odorata and others. The herb species consists of Balsamina, Bossenbergia and others. (Appendix 11)

3.9 Species abundance in leaf manure (soppina bettas) forests:

Although there are as many as 52 different species, only a few dominate the tree layer. These include Terminalia paniculata, I. tomentosa, Xylia xylocarpa, Careya arborea and Phyllanthus emblica. The remaining species have few individuals. This contributes to the low diversity of the

tree antidysenterica Ziziphus genoplia and others. The herb species are from the members of Acanthaceae Rubiaceae Gramineae and others (appendix 12).

3.10 Similarity in the floristic composition between different localities:

It would be interesting to compare the percentage of species common to each locality which would give us an idea of β -diversity.

In general, irrespective of the land use, the localities in Sirsi taluk are much more related among themselves than those of Kumta taluk. Thus Bidralli reserve forest has a number of species in common with the Bendre-Sugavi. However, the Santgal RF and Nagur RF are more closely related than that of Sonda RF.

Likewise, the minor forest composition in Bhairumbe is more like that of Sonda reserve forest; Bangle minor forest is more like Bidralli RF. However, in the case of Kumta taluk, the Mirzan MF resembles more like Chandavar MF. It is interesting to note that the converse is not true in that the Chandavar MF resembles Sonda RF closely!

The flora of teak plantation near Sonda resembles that of Eucalyptus monoculture in Bidralli. However the converse is not true. The flora of Bhairumbe betta has affinity towards that of Eucalyptus plantations and vice versa.

It appears that as one progresses from the west to east in the Kumta and Sirsi taluks, the common floristic elements could be as low as 8 percent! Table 5 gives the matrix of the similarity indices between these localities and Table 6 summarises these inequalities for each of the eleven localities for which analysis has been carried out.

4.0 CONCLUSIONS

(1) The vegetation of the study localities in Bidralli, Sonda, Bengle-Sugavi and Bhairumbe appears to be true moist deciduous type. The predominant occurrence of the genus Terminalia and Xylia lends to this conclusion.

The vegetation in the study localities of Nagur, Santgal, Chandavar and Mirzan must have been an example of true low land coastal evergreen forests in their climate stage. However, due to recurring human influence, there is an infiltration of deciduous elements into these localities. Thus these localities represent a derived semi evergreen forest.

(2) Due to excessive biotic pressure, the layered structure of the trees is very rarely met within the study locality of Sirsi taluk. The opening up of the canopy permits the percolation of sunlight and hence the higher incidence of shrubs and herbaceous species in the reserve forests of Sirsi taluk.

(3) In Eucalyptus and teak plantations, there does not appear to be any serious constraints to the growth of other native species - provided there is enough spacing left for other species to grow. In fact, we observe the gradual establishment of the once climax species such as Terminalia paniculata, Lagerstroemia microcarpa, Terminalia tomentosa, Diospyros montana and others, besides a number of shrub and herbaceous species among the Eucalyptus plantation.

(4) The overall plant diversity appears to increase with increasing extent of disturbance. However, there is a qualitative change in the plant species composition. With the increasingly xeric conditions in the disturbed and open forests habitat, the drought and browse tolerant species make appearance at the cost of drought intolerant species such as the evergreens. This might lead to shrinking of the habitat of evergreen species.

(5) There is an urgent need to study not only the precise factor governing the distribution of plant species but also identify the threats involved in the survival and growth of these species in the Western Ghats.

TABLE 2

Basic taxonomic data of woody individuals (≥ 10 cm circumference at 132 cm ht) in one hectare plots of Sirsi and Kumta taluks

Sl.No.	Locality	No. of families	No. of species	No. of individuals
1.	Bengle-Sugavi MF	18	44	405
2.	Mirzan MF	21	33	312
3.	Chandavar MF	28	32	580
4.	Sonda RF	24	51	692
5.	Bidralli	19	32	305
6.	Santgal	27	63	964
7.	Bhairumbe betta	16	30	432
8.	Bhairumbe MF	23	40	415
9.	Nagur RF	29	51	1619
10.	Eucalyptus Bidralli	15	25	1245
11.	Teak plantation	8	12	1132

TABLE 1

Type of land use	Village locality in the taluks of			
	Sirsi	Physiognomy of vegetation	Kumta	Physiognomy of vegetation
1. <u>Reserve Forest</u> (Natural forest)	Bidralli	moist deciduous	Nagur	evergreen
	Sonda	"	Santgal	"
2. <u>Minor forest</u>	Bengle-Sugavi	"	Chandavar	Degraded evergreen
	Bhairumbe	"	Mirzan	"
3. <u>Monoculture vegetation</u>				
Eucalyptus	Bidralli		-	
Teak	Sonda			
Areca palm	Targod			
4. <u>Leaf manure forest</u> (soppina betta)	Bhairumbe	"	-	

TABLE - 3

The occurrence of species among different growth forms in the study locality (percentages in parenthesis)

Locality	Plot No.	No. of tree species %	No. of shrub species %	No. of climbers species %	No. of liana species %	No. of herbs species %	Total
1	2	3	4	5	6	7	8
1. Bidralli Reserve Forest	EI	36 (52.17)	13 (18.84)	4 (5.8)	1 (1.45)	15 (21.74)	69
2. Sonda Reserve Forest	EI	43 (54.43)	20 (25.32)	3 (3.8)	2 (2.53)	11 (13.92)	79
3. Nagur Reserve Forest	EIII	54 (64.29)	16 (19.05)	9 (10.71)	2 (2.38)	3 (3.57)	84
4. Santgal Reserve Forest	EII	49 (71.02)	12 (17.39)	4 (5.8)	4 (5.8)	2 (2.9)	69
5. Sugevi-Bengle Minor Forest	EII	37 (42.53)	22 (25.29)	10 (11.49)	1 (1.15)	17 (19.54)	87
6. Bhairumbe Minor Forest	EI	42 (52.5)	15 (18.75)	5 (6.25)	1 (1.25)	16 (20)	79
7. Chandavar Minor Forest	EI	42 (55.26)	22 (28.95)	3 (3.95)	2 (2.63)	7 (9.21)	76
8. Mirjan Minor Forest	EI	30 (50)	18 (30)	3 (5)	1 (1.67)	8 (13.33)	60

Table - 3 (Contd.)

1	2	3	4	5	6	7	8
9. Bhairumbe Betta land	EI	52 (65)	14 (17.5)	3 (3.75)	2 (2.5)	9 (11.25)	80
10. Bidralli Eucalyptus Plantation	EI	25 (71.43)	12 (34.29)	-	1 (2.86)	8 (22.86)	46
11. Targod Area Garden	EI	8 (22.86)	1 (2.86)	2 (5.7)	-	24 (68.57)	35
12. Sonda (Teak plant- ation)	EI	24 (54.6)	10 (22.7)	1 (2.27)	1 (2.27)	8 (18.18)	44

TABLE - 4

Forest/indices	Nagur RF	Bidrahalli RF	Sonda RF	Bhairumbe MF	Chandavaz MF	Mirzan MF	Bhairumbe Botanical	Sugavi RF
1. Shanon-Weiner	a) 2.08 b) .904 c) 3.002	a) 2.31 b) 1.00 c) 3.33	a) 3.13 b) 1.36 c) 4.52	a) 2.95 b) 1.28 c) 4.25	a) 2.98 b) 1.29 c) 4.30	a) 3.16 b) 1.37 c) 4.56	a) 2.15 b) 0.93 c) 3.11	a) 2.50 b) 1.00 c) 3.607
2. Brillouin	2.052	2.18	3.01	2.78	2.85	2.96	2.06	2.367
3. Measure of concentration	.68	0.81	0.93	0.90	0.91	0.94	0.82	.846
4. Proportion of PIE	.68	0.81	0.93	0.90	0.91	0.94	0.82	.846
5. Dominance coefficient	.316	0.18	0.06	0.09	0.08	0.05	0.17	.153
6. Inverse dominance	3.16	5.47	16.59	11.07	12.04	17.98	5.73	6.51
7. Index of evenness	.52	0.66	0.79	0.79	0.77	-	0.63	.706
8. Expected number of species	37	12	24	18	20	11	14	12

TABLE - 6

SIMILARITY IN THE SPECIES COMPOSITION

- 1) Bidrahalli RF > Benglo MF > Sugavi RF > Sonda RF > Bhairumbe MF
 > Mirzan MF > Chandavar MF > Bidrahalli Eucalyptus
 > Bhairumbe betta > Sonda teak plantation > Nagur RF > Santgal RF
- 2) Bhairumbe MF > Sonda > Sugavi > Bidrahalli
 > Bhairumbe betta > Chandavar > Bidrahalli Eucalyptus > Mirzan
 > Nagur > Teak plantation > Santgal
- 3) Chandavar MF > Sonda > Mirzan > Sugavi > Bhairumbe
 > Bidrahalli > Nagur > Eucalyptus > Bhairumbe betta
 > Santgal > Teak plantation.
- 4) Benglo-Sugavi MF > Bidrahalli > Bhairumbe > Bhairumbe betta
 > Sonda > Chandavar > Eucalyptus plantation > Mirzan
 > Nagur > Teak plantation > Santgal.
- 5) Mirzan > Chandavar > Nagur > Bidrahalli RF > Bhairumbe MF
 > Sugavi > Sonda > Bhairumbe betta > Eucalyptus > Santgal
 > Teak
- 6) Santgal RF > Nagur > Sonda > Chandavar > Mirzan >
 Bhairumbe > Bhairumbe betta > Sugavi > Teak plantation >
 > Bidrahalli > Eucalyptus.

- 7) Bhairumbe betta > Eucalyptus plantation > Bhairumbe MF
> Sugavi > Sonda > Bidrahalli > Nagur > Teak plantation
> Chandavar > Mirzan > Santgal.
- 8) Nagur RF > Santgal > Sonda > Mirzan > DChandavar
> Bhairumbe MF > Bhairumbe betta > Sugavi > Bidrahalli
> Eucalyptus > Teak.
- 9) Sonda RF > Bhairumbe MF > Chandavar > Bidrahalli
> Nagur > Sugavi > Bhairumbe betta > Eucalyptus
> Mirzan > Santgal > Teak plantation.
- 10) Teak plantation > Eucalyptus plantation > Bidrahalli RF
> Bhairumbe betta > Bhairumbe MF > Sonda > Chandavar
> Sugavi > Mirzan > Nagur > Santgal.
- 11) Eucalyptus > Bhairumbe betta > Teak plantation
> Sugavi > Bhairumbe MF > Bidrahalli > Sonda
> Chandavar > Mirzan > Nagur > Santgal.

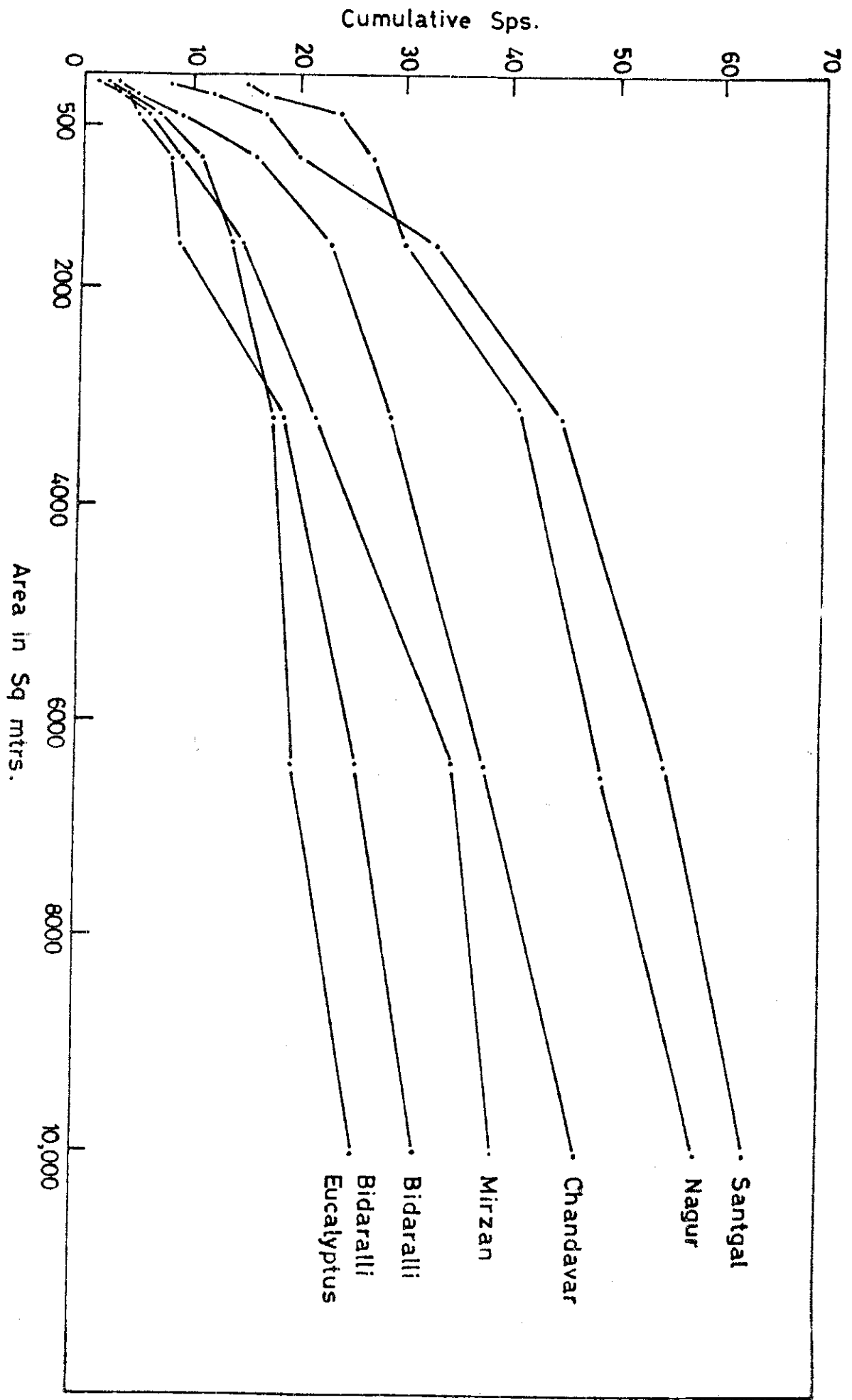
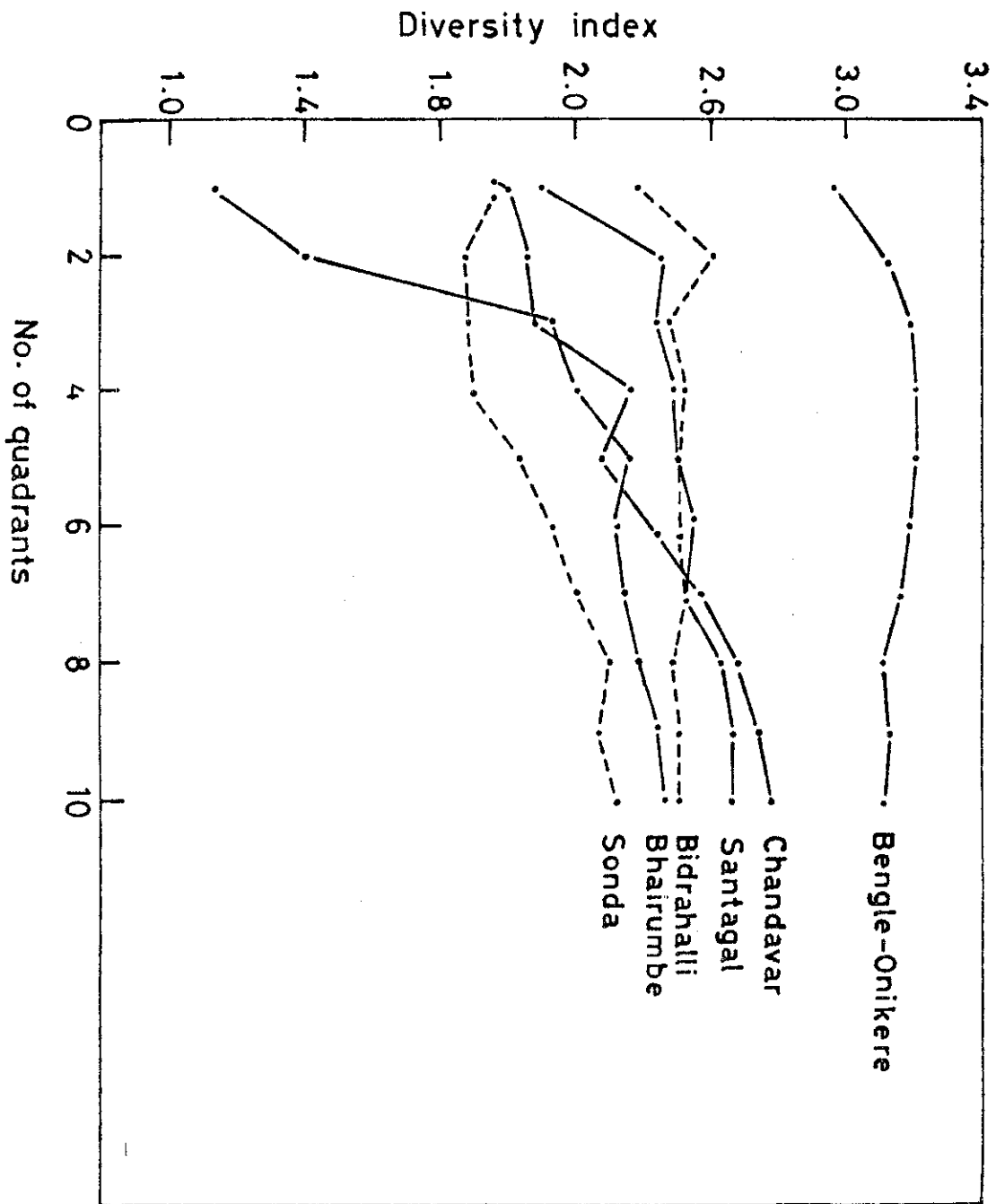


FIG. 1



BIDRALLI

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
1.	<u>Adina cordifolia</u>	12	-
2.	<u>Alchornea scholaris</u>	2	1
3.	<u>Buchanania larzan</u>	1	-
4.	<u>Careya arborea</u>	2	22
5.	<u>Cassia fistula</u>	12	88
6.	<u>Dalbergia latifolia</u>	3	
7.	<u>Dillenia pentagyna</u>	1	33
8.	<u>Diospyros sp.</u>	6	111
9.	<u>Euphrobiaceae I</u>	1	
10.	<u>Ficus asperima</u>	11	90
11.	<u>Grewia tilifolia</u>	11	93
12.	<u>Spondias acuminata</u>	1	-
13.	<u>Kydia calycina</u>	1	6
14.	<u>Lagerstroemia microcarpa</u>	13	241
15.	<u>Macaranga peltata</u>	1	36
16.	<u>Murraya koenigii</u>	3	1061
17.	<u>Phyllanthus emblica</u>	1	16
18.	<u>Schleichera oleosa</u>	1	
19.	<u>Sterculia I</u>	1	7
20.	<u>Sterculia II</u>	3	
21.	<u>Stereospermum personatum</u>	1	23
22.	<u>Strychnos nux-vomica</u>	2	
23.	<u>Terminalia bellirica</u>	1	8
24.	<u>I. paniculata</u>	66	68
25.	<u>I. alata</u>	1	-
26.	<u>Xeromphis spinosa</u>	1	368
27.	<u>X. uliginosa</u>	19	190
28.	<u>Xylia xylocarpa</u>	9	5
29.	<u>Unknown I</u>	9	5
30.	<u>Alseodaphne sp.</u>	-	1
31.	<u>Caryota urens</u>	-	1
32.	<u>Euqenia jambolana</u>	π	7
33.	<u>Artocarpus lakoocha</u>	-	1
34.	<u>Flacourtia sp</u>	-	11
35.	<u>Mallotus philippensis</u>	-	1
36.	<u>Sapindus laurifolia</u>	-	6

<u>Sl.No.</u>	<u>Shrub species</u>	<u>Adult</u>	<u>Jevenile</u>
1.	<u>Allophylus cobbe</u>	6	178
2.	<u>Ziziphus rugosa</u>	3	27
3.	Bamboo		237
4.	<u>Bridelia sp.</u>		1
5.	<u>Cleorodendrum</u>		1979
6.	<u>Embelia</u>		10
7.	<u>Eupatorium odoratum</u>		355
8.	<u>Breyia sp.</u>		487
9.	<u>Holarrhena antidysenterica</u>		6
10.	<u>Leea sp.</u>		38
11.	<u>Rauwolfia serpentina</u>		3
12.	<u>Acacia hirta</u>		11
13.	<u>Solanum indicum</u>		58
<u>HERB SPECIES</u>			
1.	<u>Triumfetta rhomboides</u>		350
2.	<u>Elephantopus scaber</u>		34
3.	<u>Bosenbercia pulcherrima</u>		11
4.	<u>Centrantherum phyllolaenum</u>		8
5.	Papilionaceae I		1
6.	Adiantum		4
7.	<u>Curculigo orchioides</u>		6
8.	Compositae I		1
9.	<u>Mervilia sp.</u>		7
10.	<u>Hibiscus lobatus</u>		2
11.	Cramineae I		
12.	Cramineae II		
13.	Cramineae III		
<u>CLIMBER SPECIES</u>			
1.	<u>Dioscorea sp.</u>		19
2.	<u>Clematis sp.</u>		21
3.	<u>Stephania japonica</u>		2
<u>LIANA SPECIES</u>			
1.	<u>Calycopteris floribunda</u>	2	1

<u>Sl. No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
34.	<u>Cassia fistula</u>		1
35.	<u>Sterculia sp.</u>	9	9
36.	<u>Sapindus laurifolia</u>		4
37.	<u>Mallotus</u>		3
38.	<u>Xeromphis spinosa</u>	50	99
39.	<u>Carallia integerrima</u>		5
40.	<u>Zanthoxylum rhetsa</u>	21	2
41.	<u>Stereospermum personatum</u>	7	9
42.	<u>Vitex altissima</u>		1
43.	<u>Caryota urena</u>		4

SHRUB SPECIES

1.	<u>Bridelia sp.</u>	1	3
2.	<u>Caloscarpa tomentosa</u>	3	4
3.	<u>Carissa carandas</u>	1	1
44.	<u>Leea sp.</u>	7	173
5.	<u>Psychotria sp.</u>	9	1537
6.	<u>Glycosmis sp.</u>		2
7.	<u>Acacia torta</u>		7
8.	<u>Cleorodendrum</u>		465
9.	<u>Allophylus cobbe</u>	25	36
10.	<u>Bryonia sp.</u>		26
11.	<u>Ziziphus rugosa</u>	3	20
12.	Unknown I	7	41
13.	<u>Paramignya sp.</u>		10
14.	<u>Jasminum malabaricum</u>		2 2
15.	<u>Eupatorium odoratum</u>		1
16.	Bamboo		21
17.	<u>Wagatia spicata</u>		4
18.	<u>Embelia sp.</u>		2
19.	<u>Ziziphus oenolia</u>		3
20.	<u>Holerrhena antidysenterica</u>		5

<u>Sl.No.</u>	<u>Herb species</u>	<u>Adult</u>	<u>Juvenile</u>
1.	Acanthaceae I	27	
2.	Acanthaceae II	23	1
3.	Acanthaceae III	8	
4.	Adiantum	1	
5.	<u>Elephantopus scaber</u>	6	
6.	<u>Oldenlandia nitida</u>	6	
7.	Selaginella-Fern	5	
8.	<u>Curculigo sp.</u>	15	
9.	Gramineae I to III		

CLIMBERS

1.	<u>Adena hondala</u>		1
2.	<u>Clematis sp.</u>		3
3.	<u>Cocculus vilosus</u>		3

LIANES

1.	<u>Calycopteris floribunda</u>	14	51
2.	<u>Gnetum sp.</u>	1	1

NAGURE FOREST

<u>Sl.No.</u>	<u>Tree species</u>	<u>Adult</u>	<u>Juvenile</u>
1.	<u>Actinodaphne hookeri</u>	4	1
2.	<u>Aqlaia sp.</u>	4	26
3.	<u>Alseodaphne semecarpifolia</u>	4	11
4.	<u>Aporosa lindleyana</u>	62	11
5.	<u>Buchanania lanzan</u>	3	1
6.	<u>Calophyllum aetalum</u>	1	
7.	<u>Carallia integerrima</u>	2	4
8.	<u>Careya arborea</u>	1	
9.	<u>Caryota urens</u>	8	79 + 2
10.	<u>Cassia fistula</u>	1	
11.	<u>Cinnamomum sp.</u>	9	13
12.	<u>Dillenia pentagyna</u>	25	1
13.	<u>Diospyros candoleana</u>	17	13
14.	<u>Diospyros microphylla</u>	3	11
15.	<u>Diospyros sp.</u>	15	2
16.	<u>Dysoxylum malabaricum</u>	9	
17.	<u>Elagocarpus serratus</u>	1	7
18.	<u>Ervatamia heyneana</u>	1	11
19.	<u>Eugenia jambolana</u>	3	
20.	<u>Eugenia sp.</u>	7	1
21.	<u>Ficus sp.</u>	1	
22.	<u>Flacourtia montana</u>	7	9
23.	<u>Garcinia sp.</u>	4	102 + 4
24.	<u>Holigarna arnottiana</u>	116	37
25.	<u>Hopsea wightiana</u>	898	1739 + 23
26.	<u>Ixora bracheata</u>	50	128
27.	<u>Lagerstroemia microcarpa</u>	5	
28.	<u>Macaranga peltata</u>	2	10
29.	<u>Persea macarantha</u>	4	10
30.	<u>Magnifera indica</u>	4	2
31.	<u>Mimusops elengi</u>	2	
32.	<u>Knema attenuata</u>	52	61 + 2

TABLE - XXVII - DISTRIBUTION OF DRONGOS IN DIFFERENT LOCALITIES

Locality/ species	White bellied drongo	Grey drongo	Bronzed drongo	Racket tailed drongo
Bidrahalli	-	✓	✓	-
Bhengle	✓	-	-	-
Sonda	-	-	✓	✓
Bhairumbe	✓	✓	-	✓
Chandarur	-	✓	-	-
Mirjan	-	✓	-	-
Nagur	-	-	✓*	✓
Santegal	-	-	✓	-

* Seen outside the sampling area.