#### 4.1 Screening Biodiversity

For the selection of plants heavy metal accumulation and their effects it is imperative. To survey and study aquatic plants biodiversity. Hence, major water bodies in and around vadodara were surveyed.

#### **4.1.1** Collection trip Details

Plants were collected from various sites of Baroda district. Total 94 plants were collected from various sites out of which 90 plant species were identified and 04 were unidentified. List of various sites and number of plants collected from this sites is as shown in table .

Sr. No.	Details of field trip (s) conducted	No. of specimen collected
1	MSU Botanical Garden	04
2	MSU Arboratum	02
3	Harni Pond	40
4	Gotri Pond	04
5	Sewasi Pond	02
6	Timbi Village Pond	14
7	Mahisagar River	13
8	Vadhvana Lake	11
Total		90

**Table 9: List of plant collection sites** 

Sr. No.	Scientific name	Common Name	Latitude	Longitude
Acant	haceae			
	Hygrophila polysperma (Roxb.)			
1	T.Anderson	Gokulakanta	N 22° 20' 42.9"	E 73° 13' 12.5"
	Peristrophe paniculata			
2	(Forssk.) Brummitt	Panicled Foldwing	N 22° 19' 03.9"	E 73° 07' 13.8"
3	Barleria prionitis L.	Porcupine Flower	N 22° 26' 13.5"	E 73° 04' 32.4"
4	Rungia pectinata (L.) Nees	Comb Rangia	N 22° 10' 59.4"	E 73° 28' 58.7"
Alism	ataceae			
	Limnophyton obtusifolium (L.)			
5	Miq.	Blunt Arrowhead	N 22° 20' 23.3"	E 73° 13' 12.8"
Amar	anthaceae			
	Alternanthera ficoidea (L.)			
6	R.Br. ex DC.	Sanguinarea	N 22° 20' 41.5"	E 73° 13' 07.1"
7	Alternanthera pungens Kunth.	Khaki weed	N 22° 20' 23.3"	E 73° 13' 12.8"
8	Amaranthus spinosus L.	Spiny amaranth	N 22° 20' 48.4"	E 73° 08' 05.5"
9	Alternanthera ficoides	Joy weed	N 22° 19' 12.1"	E 73° 06' 09.4"
10	Gomphrena celosioides Mart.	Gomphrena Weed	N 22° 19' 11.8"	E 73° 06' 10.2"
11	Alternanthera philoxeroides	Alligator weed	N 22° 26' 12.7"	E 73° 04' 32.5"
12	Achyranthes aspera L.	Prickly chaff flower	N 22° 18' 21.8"	E 73° 16' 37.5"
13	Aerva lanata (L.) Juss.	Gorakh-boonti	N 22° 18' 21.8"	E 73° 16' 37.5"
Apon	ogetanaceae			
•	Aponogeton natans (L.) Engl.			
14	& K.Krause	Cape pond weed	N 22° 26' 00.1"	E 73° 04' 19.9"
Arace	ae	·		
		Shellflower (water		
15	Pistia stratiotes L.	Lettuce)	N 22° 20' 42.9"	E 73° 13' 15.5"
	Spirodela polyrrhiza (L.)			
16	Schleid.	Great duckweed	N 22° 20' 25.9"	E 73° 13' 13.8"
17	Colocasia esculenta (L.) Schott	Elephant's ear	N 22° 20' 25.9"	E 73° 13' 13.8"
18	Lemna trisulca L.	Star duckweed	N 22° 18' 21.7"	E 73° 16' 37.5"
Astera	aceae			
19	Vernonia cinerea (L.) Less.		N 22° 20' 41.1"	E 73° 13' 14.2"
20	Caesulia axillaris	Pink node flower	N 22° 20' 23.8"	E 73° 13' 12.9"
21	Sphaeranthus indicus L.	Gorkhmundi	N 22° 20' 49.4"	E 73° 08' 00.5"
22	Parthenium argentatum A.Gray	Guayule	N 22° 20' 49.6"	E 73° 08' 00.8"

Sr. No.	Scientific name	Common Name	Latitude	Longitude
23	Xanthium spinosum L.	Prickly burweed	N 22° 19' 10.1"	E 73° 06' 09.2"
	<u>^</u>	Indian globe		
24	Echinops echinatus Roxb.	thistle	N 22° 18' 21.8"	E 73° 16' 37.7"
	Blumea laciniata (Wall. ex			
25	Roxb.) DC.	Cutleaf Blumea	N 22° 18' 21.9"	E 73° 16' 37.7"
26	<i>Blumea lacera</i> (Burm.f.) DC.	Kakronda	N 22° 18' 21.9"	E 73° 16' 37.5"
27	Blumea		N 22° 18' 21.8"	E 73° 16' 37.5"
28	Spilanthes acmella (L.) L.	Toothache Plant	N 22° 18' 21.5"	E 73° 16' 37.2"
29	Vernonia cinerea (L.) Less.	Little ironweed	N 22° 18' 21.6"	E 73° 16' 37.4"
30	<i>Tridax procumbens</i> (L.) L.	Jayanthi	N 22° 10' 59.2"	E 73° 28' 58.7"
Azoll	aceae			
	Azolla pinnata var. imbricata			
31	(Roxb. ex Griff.) Bonap	Water velvet	N 22° 20' 25.6"	E 73° 13' 13.4"
Cera	tophyllaceae			
32	Ceratophyllum submersum L.	Hornwort	N 22° 20' 23.5"	E 73° 13' 12.6"
-	aceae	I	I	
33	Chara globularis	Stoneeworts	N 22° 26' 15.7 "	E 73° 04' 33.6"
	melinaceae			
		Asiatic		
34	Commelina communis L.	Dayflower	N 22° 20' 41.9"	E 73° 13' 14.5"
Conv	olvulaceae	-		
35	Ipomoea aquatica Forssk.	Water spinach	N 22° 20' 23.3"	E 73° 13' 12.8"
		European water		
36	cressa cretica L.	clover	N 22° 19' 10.3"	E 73° 06' 09.9"
Cype	raceae			
37	Eliocharis dulsis	Water chestnut	N 22° 19' 11.1"	E 73° 06' 09.1"
38	Scripus articulatus L.	Apurau	N 22° 19' 10.1"	E 73° 06' 09.4"
39	cyperus difformis L.	Flat sedge	N 22° 19' 09.2"	E 73° 06' 10.4"
40	<i>Cyperus</i> sp.		N 22° 19' 10.7"	E 73° 06' 09.4"
41	<i>Cyperus</i> sp.		N 22° 19' 10.4"	E 73° 06' 09.6"
	Eleocharis atropurpurea	Purple		
42	(Retz.) J.Presl & C.Presl	spikerush	N 22° 18' 21.7"	E 73° 16' 37.5"
	Fimbristylis bisumbellata	Grasslike		
43	(Forssk.) Bubani	fimbry	N 22° 18' 21.7"	E 73° 16' 37.3"
44	Cyperus haspan L.	Papyrus sedges	N 22° 10' 59.6"	E 73° 28' 58.8"
Elaeo	ocarpaceae			
	Elaeocarpus variabilis			
45	Zmarzty	Chorphone	N 22° 19' 12.1"	E 73° 06' 09.5"

Sr. No.	Scientific name	Common Name	Latitude	Longitude
Elatin	aceae			l
46	Bergia ammannioides	Jerry Water fire	N 22° 19' 10.1"	E 73° 06' 08.4"
Equise	etaceae			
47	<i>Equisetum ramosissimum</i> subsp. Debile	Snake grass	N 22° 18' 36.6"	E 73° 11' 10.6"
Eupho	orbiaceae			
48	Croton abaitensis Baill.		N 22° 26' 13.7"	E 73° 04' 32.6"
49	Euphorbia prostate	Prostrate sandmat	N 22° 10' 59.1"	E 73° 28' 58.8"
Fabac	eae	-		
50	Aeschynomene indica L.	Curly indigo	N 22° 19' 09.1"	E 73° 06' 10.4"
51	Alhagi pseudalhagi (M. Bieb.) Desv. ex B. Keller & Sh	Camelthorn	N 22° 19' 12.5"	E 73° 06' 09.9"
	Crotalaria herpetoclada			
52	Rossberg	Rattlepods	N 22° 10' 59.0"	E 73° 28' 58.8"
Hydro	ocharitaceae	T	T	I
53	<i>Hydrilla verticillata</i> (L.f.) Royle	Waterweed	N 22° 20' 42.9"	E 73° 13' 15.5"
54	Vallisneria spiralis L.	Tapgrass	N 22° 19' 13.8"	E 73° 10' 48.1"
Lamia	iceae			
55	Hyptis suaveolens (L.) Poit.	Pig nut	N 22° 26' 15.7 "	E 73° 04' 33.4"
Lentit	oulariaceae		1	1
56	Utricularia vulgaris L.	Common Bladderworts	N 22° 19' 12.1"	E 73° 06' 10.4"
Lythra	aceae		1	
57	Ammania baccifera L.	Monarch redstem	N 22° 20' 43.1"	E 73° 13' 11.9"
58	Ammannia multiflora Roxb.	Red stem	N 22° 19' 11.8"	E 73° 13' 11.9"
59	<i>Woodfordia cfruticosa</i> (L.) Kurz	Dhaura	N 22° 26' 12.9"	E 73° 04' 32.7"
	rniaceae	1		
	Lindernia oppositifolia (L.)	Yellowseed		
60	Mukerjee	false pimpernel	N 22° 18' 21.1"	E 73° 16' 37.0"

Sr. No.	Scientific name	Common Name	Latitude	Longitude
Malv	aceae		1	
61	Urena lobata L.	Cesarweed	N 22° 18' 21.3"	E 73° 16' 37.0"
62	Sida alba L.	broomweed	N 22° 10' 59.5"	E 73° 28' 58.9"
63	Triumfetta rhomboidea Jacq.	Burr Bush	N 22° 10' 59.2"	E 73° 28' 58.7"
Mars	iliaceae			
		Four Leaf		
64	Marsilea quadrifolia L.	Clover	N 22° 19' 11.5"	E 73° 06' 10.8"
Meni	spermaceae			
	Cocculus hirsutus (L.)			
65	W.Theob	Broom creeper	N 22° 18' 21.8"	E 73° 16' 37.5"
Meny	anthaceae			
	Nymphoides indica (L.)	Water		
66	Kuntze	Snowflake	N 22° 26' 00.5"	E 73° 04' 19.5"
Onag	graceae	1	1	-
		Water-		
67	Ludvigia perennis L.	primrose	N 22° 20' 24.1"	E 73° 13' 16.0"
60		Willow prime		<b>E 7</b> 00 101 10 11
68	Ludvigia octavalvis	rose	N 22° 20' 22.9"	E 73° 13' 12.1"
	mbonaceae	[		
69	Nelumbo nucifera Gaertn.	Indian lotus	N 22° 20' 41.9"	E 73° 13' 15.9"
	phaeaceae	1	I	
70	Nymphea nouchali Burm.f.	Star lotus	N 22° 18' 36.8"	E 73° 11' 10.7"
Orob	anchaceae	1	1	-
	Lindenbergia			
71	<i>muraria</i> (Roxburgh ex D.			<b>E Z</b> 20 0 41 22 41
71	Don) Brühl		N 22° 26' 12.6"	E 73° 04' 32.4"
Phyll	anthaceae	1		
72	<i>Phyllanthus amarus</i> Schumach. & Thonn.	Commy magazid	N 22º 20' 22 0"	E 73° 13' 11.1"
12	Schumach. & Thom.	Carry-me seed Narrow piss	N 22° 20' 22.0"	E / 5 15 11.1
73	<i>Phyllanthus virgatus</i> G.Forst.	weed	N 22° 10' 59.3"	E 73° 28' 58.9"
Poace	, U	weed	11 22 10 59.5	175 20 50.5
74	Chloris barbata Sw.	Windmill grass	N 22° 20' 22.8"	E 73° 13' 12.3"
/ -	Hygroryza aristata (Retz.)	windinin grass	10 22 20 22.0	
75	Nees ex Wight & Arn.		N 22° 20' 23.6"	E 73° 13' 12.4"
	Dactyloctenium aegyptium			
76	(L.) Willd	Egyptian grass	N 22° 20' 23.9"	E 73° 13' 10.8"
	Paspalidium geminatum	Egyptian		
77	(Forssk.) Stapf	panicgrass	N 22° 19' 12.9"	E 73° 06' 09.4"
	Ischaemum rugosum Salisb.	Wrinkle duck-		
78		beak	N 22° 19' 10.5"	E 73° 06' 09.6"

Sr. No.	Scientific name	Common Name	Latitude	Longitude	
79	Paspalum		N 22° 18' 21.5"	E 73° 16' 37.2"	
80	Paspalum distichum L.	Biscuit grass	N 22° 20' 23.7"	E 73° 13' 12.9"	
81	Typha angustifolia L.	Narrowleaf cattail	N 22° 18' 35.2"	E 73° 11' 11.6"	
Polyg	gonaceae				
82	Polygonum glabrum willd	Dense flower knotweed	N 22° 26' 12.8"	E 73° 04' 32.7"	
Potamogetonaceae					
83	Potamogeton perfoliatus L.	Perfoliate pondweed	N 22° 26' 00.3"	E 73° 04' 19.7"	
84	Potamogeton Sp.		N 22° 26' 00.4"	E 73° 04' 19.6"	
85	Zannichellia palustris L.	Horned pondweed Curly leaf	N 22° 26' 15.9 "	E 73° 04' 33.4"	
86	Pomatogeton crispus	pond weed	N 22° 18' 36.3"	E 73° 11' 10.4"	
Scro	phulariaceae				
87	<i>Limnophila gratioloides</i> R. Br.		N 22° 19' 11.8"	E 73° 06' 11.5"	
88	Verbascum chinense (L.) Santapau	Velvet Plant	N 22° 26' 15.6 "	E 73° 04' 33.2"	
Solar	naceae				
89	Solanum tampicense Dunal	Yellow- fruit nightshade	N 22° 20' 16.0"	E 73° 13' 07.02"	
Verb	enaceae				
90	Phyla nodiflora (L.) Greene	Turkey tangle fogfruit	N 22° 19' 11.1"	E 73° 06' 09.7"	

Table 10: List of collected plants arranged in the family

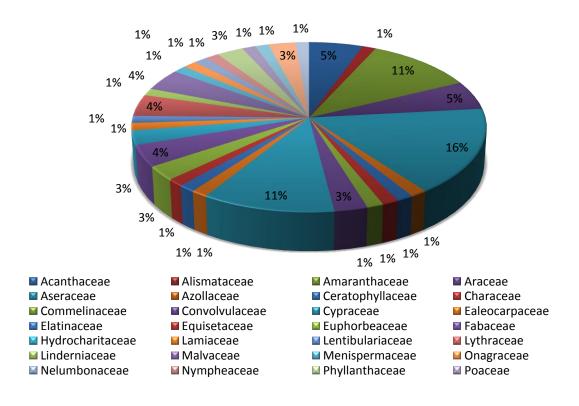


Figure 11: Details of collected plant samples based on family.

Since the study mainly focused ecological parameters, the identified plant species were also categorized in to various ecological groups (Table 11)

Fre	e Floating Hydroph	yte			
Sr. No.	Scientific name	Common Name	Family	Latitude	Longitude
1	<i>Spirodela polyrrhiza</i> (L.) Schleid.	Great duckweed	Araceae	N 22° 20' 25.9"	E 73° 13' 13.8"
2	Azolla pinnata var. imbricata (Roxb. ex Griff.) Bonap	Water velvet	Azollaceae	N 22° 20' 25.6"	E 73° 13' 13.4"
3	Marsilea quadrifolia L.	Four Leaf Clover	Marsiliaceae	N 22° 19' 11.5"	E 73° 06' 10.8"
4	Aponogeton natans (L.) Engl. & K.Krause	Cape pond weed	Aponogetanaceae	N 22° 26' 00.1"	E 73° 04' 19.9"
5	<i>Nymphoides indica</i> (L.) Kuntze	Water Snowflake	Menyanthaceae	N 22° 26' 00.5"	E 73° 04' 19.5"
6	Lemna trisulca L.	Star duckweed	Araceae	N 22° 18' 21.7"	E 73° 16' 37.5"
7	Ceratophyllum submersum L.	Hornwort	Ceratophyllaceae	N 22° 20' 23.5"	E 73° 13' 12.6"
8	Ipomoea aquatica Forssk.	Water spinach	Convolvulaceae	N 22° 20' 23.3"	E 73° 13' 12.8"
9	Nelumbo nucifera Gaertn.	Indian lotus	Nelumbonaceae	N 22° 20' 41.9"	E 73° 13' 15.9"
10	Nymphea nouchali Burm.f.	Star lotus	Nymphaeaceae	N 22° 18' 36.8"	E 73° 11' 10.7"
11	Hygroryza aristata (Retz.) Nees ex Wight & Arn.		Poaceae	N 22° 20' 23.6"	E 73° 13' 12.4"
Suk	omerged Hydrophyte	e		•	
Sr. No	Scientific name	Common Name	Family	Latitude	Longitude
12	Utricularia vulgaris L.	Common Bladderworts	Lentibulariaceae	N 22° 19' 12.1"	E 73° 06' 10.4"
13	zannichellia palustris L.	Horned pondweed	Potamogetonaceae	N 22° 26' 15.9"	E 73° 04' 33.4"
14	<i>Hydrilla verticillata</i> (L.f.) Royle	waterweed	Hydrocharitaceae	N 22° 20' 42.9"	E 73° 13' 15.5"
15	Vallisneria spiralis L.	Tapgrass	Hydrocharitaceae	N 22° 19' 13.8"	E 73° 10' 48.1"

Sr.	omerged Rooted Hy Scientific name	Common	Family	Latitude	Longitude
No.	Limnophyton	Name Blunt	•		-
16	obtusifolium (L.) Miq.	Arrowhead	Alismataceae	N 22° 20' 23.3"	E 73° 13' 12.8"
17	<i>Colocasia esculenta</i> (L.) Schott	Elephant's ear	Araceae	N 22° 20' 25.9"	E 73° 13' 13.8"
18	<i>Gomphrena celosioides</i> Mart.	Gomphrena Weed	Amaranthaceae	N 22° 19' 12.1"	E 73° 06' 09.4"
19	Pomatogeton crispus L.	Curly leaf pond weed	Potamogetonaceae	N 22° 18' 36.3"	E 73° 11' 10.4"
20	Potamogeton perfoliatus L.	Perfoliate pondweed	Potamogetonaceae	N 22° 26' 00.3"	E 73° 04' 19.7"
21	Potamogeton Sp.		Potamogetonaceae	N 22° 26' 00.4"	E 73° 04' 19.6"
We	tland Hydrophyte				
Sr. No.	Scientific name	Common Name	Family	Latitude	Longitude
22	Chloris barbata Sw.	Windmill grass	Poaceae	N 22° 20' 22.8"	E 73° 13' 12.3"
23	Dactyloctenium aegyptium (L.) Willd	Egyptian grass	Poaceae	N 22° 20' 23.9"	E 73° 13' 10.8"
24	Amaranthus spinosus L.	Spiny amaranth	Amaranthaceae	N 22° 20' 48.4"	E 73° 08' 05.5"
25	Sphaeranthus indicus L.	gorkhmundi	Asteraceae	N 22° 20' 49.4"	E 73° 08' 00.5"
26	Peristrophe paniculata (Forssk.) Brummitt	Panicled Foldwing	Acanthaceae	N 22° 19' 03.9"	E 73° 07' 13.8"
27	<i>Limnophila gratioloides</i> R. Br.		Schrophulariaceae	N 22° 19' 11.8"	E 73° 06' 11.5"
28	Bergia ammannioides	Jerry Water fire	Elatinaceae	N 22° 19' 10.1"	E 73° 06' 08.4"
29	Cressa cretica L.	European water clover	Convolvulaceae	N 22° 19' 10.3"	E 73° 06' 09.9"
30	<i>Phyla nodiflora</i> (L.) Greene	Turkey tangle fogfruit	Verbenaceae	N 22° 19' 11.1"	E 73° 06' 09.7"
31	<i>Elaeocarpus variabilis</i> Zmarzty	Chorphone	Elaeocarpaceae	N 22° 19' 12.1"	E 73° 06' 09.5"
32	Aeschynomene indica L.	Curly indigo	Fabaceae	N 22° 19' 09.1"	E 73° 06' 10.4"
33	Malvastrum coromandelianum (L.) Garcke	False mallow	Malvaceae	N 22° 19' 09.1"	E 73° 06' 10.4"

Sr. No.	Scientific name	Common Name	Family	Latitude	Longitude
34	Melgmium indica		Malvaceae	N 22° 19' 10.1"	E 73° 06' 11.4"
35	Paspalidium geminatum (Forssk.) Stapf	Egyptian panicgrass	Poaceae	N 22° 19' 12.9"	E 73° 06' 09.4"
36	<i>Alhagi pseudalhagi</i> (M. Bieb.) Desv. ex B. Keller & Sh	Camelthorn	Fabaceae	N 22° 19' 12.5"	E 73° 06' 09.9"
37	Eliocharis dulsis	Water chestnut	Cyperaceae	N 22° 19' 11.1"	E 73° 06' 09.1"
38	Scripus articulatus L.	Apurau	Cyperaceae	N 22° 19' 10.1"	E 73° 06' 09.4"
39	<i>Ischaemum rugosum</i> Salisb.	Wrinkle duck-beak	Poaceae	N 22° 19' 10.5"	E 73° 06' 09.6"
40	Cyperus difformis L.	Flat sedge	Cyperaceae	N 22° 19' 09.2"	E 73° 06' 10.4"
41	Ammannia multiflora Roxb.	Red stem	Lythraceae	N 22° 19' 12.1"	E 73° 06' 11.4"
42	Alternanthera philoxeroides	Alligator weed	Amaranthaceae	N 22° 19' 11.8"	E 73° 06' 10.2"
43	Xanthium spinosum L.	Prickly burweed	Asteraceae	N 22° 19' 10.1"	E 73° 06' 09.2"
44	<i>Cyperus</i> sp.		Cyperaceae	N 22° 19' 10.7"	E 73° 06' 09.4"
45	<i>Cyperus</i> sp.		Cyperaceae	N 22° 19' 10.4"	E 73° 06' 09.6"
46	Verbascum chinense (L.) Santapau	Velvet Plant	Scrophulariaceae	N 22° 26' 15.6 "	E 73° 04' 33.2"
47	<i>Hyptis suaveolens</i> (L.) Poit.	Pig nut	Lamiaceae	N 22° 26' 15.7 "	E 73° 04' 33.4"
48	Abutilon indicum (L.) Sweet	Indian Mallow	Malvaceae	N 22° 26' 13.6"	E 73° 04' 32.8"
49	Croton abaitensis Baill.		Euphorbiaceae	N 22° 26' 13.7"	E 73° 04' 32.6"
50	Barleria prionitis L.	Porcupine Flower	Acanthaceae	N 22° 26' 13.5"	E 73° 04' 32.4"
51	<i>Woodfordia cfruticosa</i> (L.) Kurz	Dhaura	Lythraceae	N 22° 26' 12.9"	E 73° 04' 32.7"
52	Achyranthes aspera L.	Prickly chaff flower	Amaranthaceae	N 22° 26' 12.7"	E 73° 04' 32.5"
53	<i>Lindenbergia</i> <i>muraria</i> (Roxburgh ex D. Don) Brühl		Orobanchaceae	N 22° 26' 12.6"	E 73° 04' 32.4"
54	<i>Polygonum glabrum</i> willd	Denseflower knotweed	Polygonaceae	N 22° 26' 12.8"	E 73° 04' 32.7"

Sr. No.	Scientific name	Common Name	Family	Latitude	Longitude
55	<i>Eleocharis atropurpurea</i> (Retz.) J.Presl & C.Presl	Purple spikerush	Cyperaceae	N 22° 18' 21.7"	E 73° 16' 37.5"
56	Paspalumdisticum L.	Ginger grass	Poaceae	N 22° 18' 21.5"	E 73° 16' 37.2"
57	Urena lobata L.	Cesarweed	Malvaceae	N 22° 18' 21.3"	E 73° 16' 37.0"
58	<i>Echinops echinatus</i> Roxb.	Indian globe thistle	Asteraceae	N 22° 18' 21.8"	E 73° 16' 37.7"
59	<i>Blumea laciniata</i> (Wall. ex Roxb.) DC.	Cutleaf Blumea	Asteraceae	N 22° 18' 21.9"	E 73° 16' 37.7"
60	<i>Blumea lacera</i> (Burm.f.) DC.	Kakronda	Asteraceae	N 22° 18' 21.9"	E 73° 16' 37.5"
61	Blumea		Asteraceae	N 22° 18' 21.8"	E 73° 16' 37.5"
62	Spilanthes acmella L.	Toothache Plant	Asteraceae	N 22° 18' 21.5"	E 73° 16' 37.2"
63	Cocculus hirsutus L.	Broom creeper	Menispermaceae	N 22° 18' 21.8"	E 73° 16' 37.5"
64	<i>Lindernia oppositifolia</i> (L.) Mukerjee	Yellowseed false pimpernel	Linderniaceae	N 22° 18' 21.1"	E 73° 16' 37.0"
65	<i>Vernonia cinerea</i> (L.) Less.	Little ironweed	Asteraceae	N 22° 18' 21.6"	E 73° 16' 37.4"
66	Aerva lanata (L.) Juss.	Gorakh- boonti	Amaranthaceae	N 22° 18' 21.8"	E 73° 16' 37.5"
67	<i>Fimbristylis</i> <i>bisumbellata</i> (Forssk.) Bubani	Grasslike fimbry	Cyperaceae	N 22° 18' 21.7"	E 73° 16' 37.3"
68	Crotalaria herpetoclada Rossberg	Rattlepods	Fabaceae	N 22° 10' 59.0"	E 73° 28' 58.8"
69	<i>Phyllanthus virgatus</i> G.Forst.	Narrow piss weed	phyllanthaceae	N 22° 10' 59.3"	E 73° 28' 58.9"
70	Euphorbia prostata	Prostrate sandmat	Euphorbiaceae	N 22° 10' 59.1"	E 73° 28' 58.8"
71	<i>Rungia pectinata</i> (L.) Nees	Comb Rangia	Acanthaceae	N 22° 10' 59.4"	E 73° 28' 58.7"
72	Tridax procumbens L.	Jayanthi	Asteraceae	N 22° 10' 59.2"	E 73° 28' 58.7"
73	Sida alba L.	Broomweed	Malvaceae	N 22° 10' 59.5"	E 73° 28' 58.9"
74	<i>Triumfetta rhomboidea</i> Jacq.	Burr Bush	Malvaceae	N 22° 10' 59.2"	E 73° 28' 58.7"
75	Cyperus haspan L.	Papyrus sedges	Cyperaceae	N 22° 10' 59.6"	E 73° 28' 58.8"

Sr. No.	Scientific name	Common Name	Family	Latitude	Longitude
76	Solanum tampicense Dunal	Yellow-fruit nightshade	Solanaceae	N 22° 20' 16.0"	E 73° 13' 7.02"
77	Ludvigia perennis L.	Water- primrose	Onagraceae	N 22° 20' 24.1"	E 73° 13' 16.0"
78	<i>Vernonia cinerea</i> (L.) Less.		Asteraceae	N 22° 20' 41.1"	E 73° 13' 14.2"
79	Phyllanthus amarus Schumach. & Thonn.	Carry-me seed	Phyllanthaceae	N 22° 20' 22.0"	E 73° 13' 11.1"
80	Pistia stratiotes L.	Water Lettuce	Araceae	N 22° 20' 42.9"	E 73° 13' 15.5"
81	Alternanthera ficoidea (L.) R.Br. ex DC.	Sanguinarea	amaranthaceae	N 22° 20' 41.5"	E 73° 13' 07.1"
82	Paspalum distichum L.	Biscuit grass	Poaceae	N 22° 20' 23.7"	E 73° 13' 12.9"
83	Ludvigia octavalvis L.	Willow prime rose	Onagraceae	N 22° 20' 22.9"	E 73° 13' 12.1"
84	Hygrophila polysperma (Roxb.) T.Anderson	Gokulakanta	Acanthaceae	N 22° 20' 42.9"	E 73° 13' 12.5"
85	Ammania baccifera L.	Monarch redstem	Lythraceae	N 22° 20' 43.1"	E 73° 13' 11.9"
86	Alternanthera pungens kunth.	Khaki weed	Amaranthaceae	N 22° 20' 23.3"	E 73° 13' 12.8"
87	Commelina communis L.	Asiatic Dayflower	Commelinaceae	N 22° 20' 41.9"	E 73° 13' 14.5"
88	<i>Equisetum</i> <i>ramosissimum</i> subsp. Debile	Snake grass	Equisetaceae	N 22° 18' 36.6"	E 73° 11' 10.6"
89	Caesulia axillaris L.	Pink node flower	Asteraceae	N 22° 20' 23.8"	E 73° 13' 12.9"
90	Typha angustifolia L.	Narrowleaf cattail	Poaceae	N 22° 18' 35.2"	E 73° 11' 11.6"

## Table 11: List of collected plants arranged in ecological group

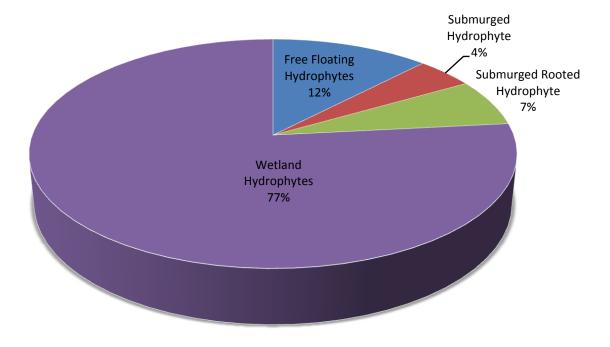
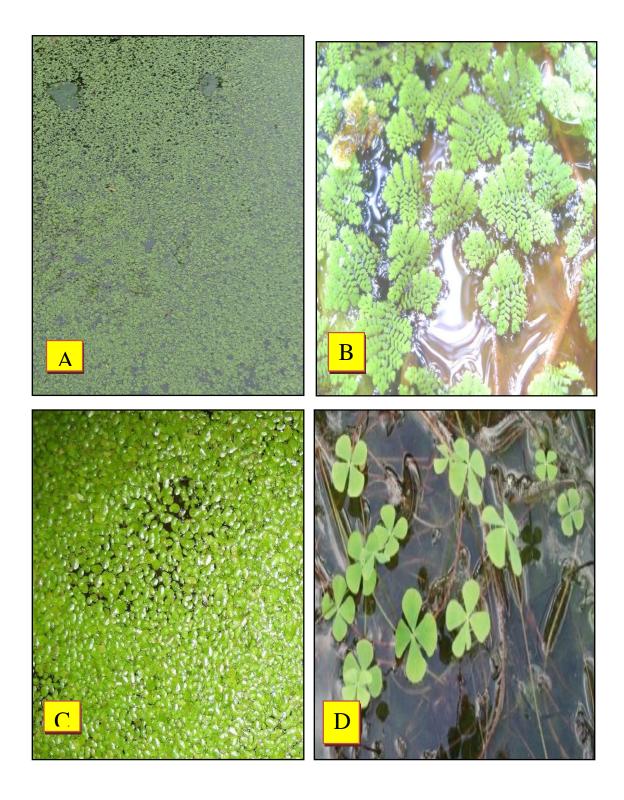
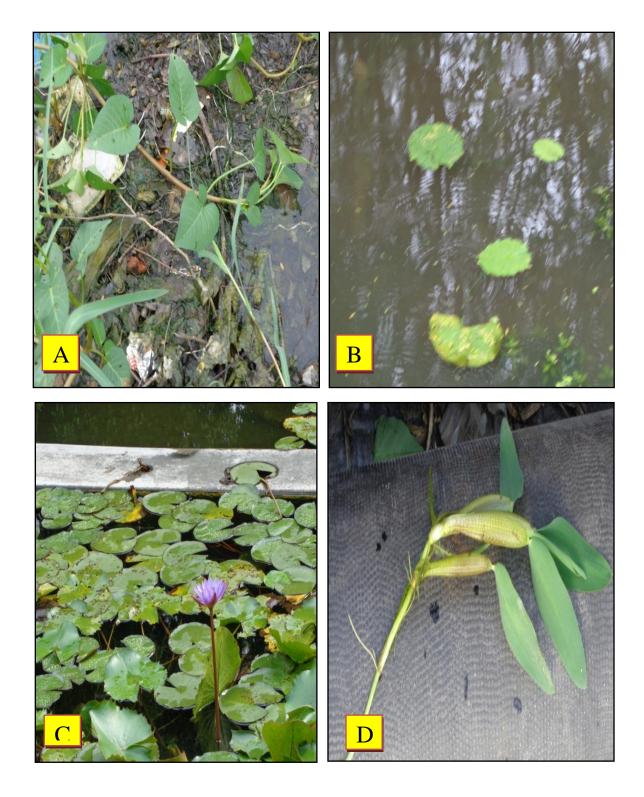


Figure 12: Ecological grouping of collectted plant samples

# Free Floating Hydrophytes







# Submerged Hydrophytes

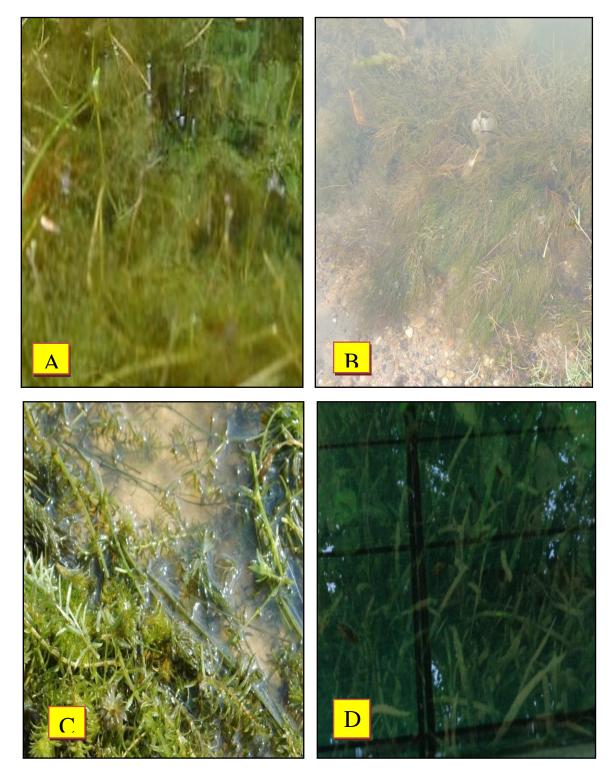
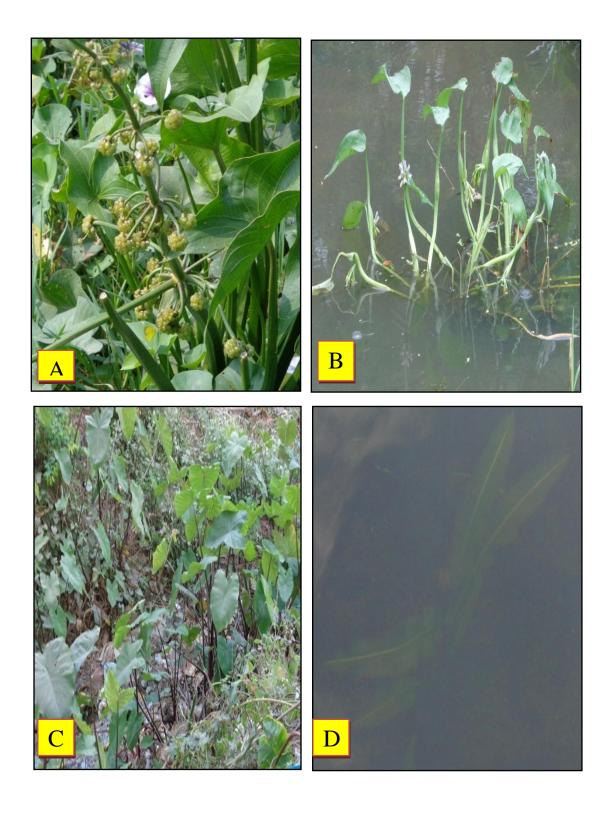


PLATE 4

## Submerged Rooted Hydrophytes





# Wetland Hydrophyte



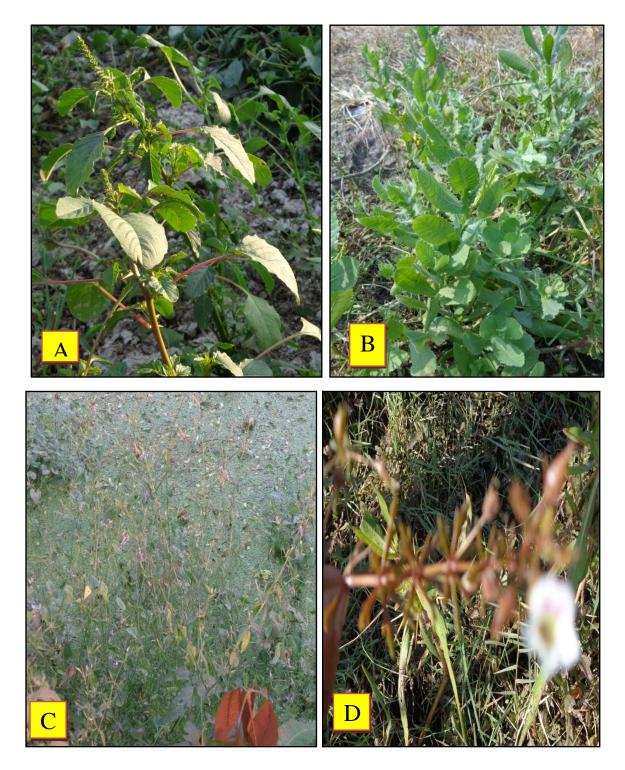




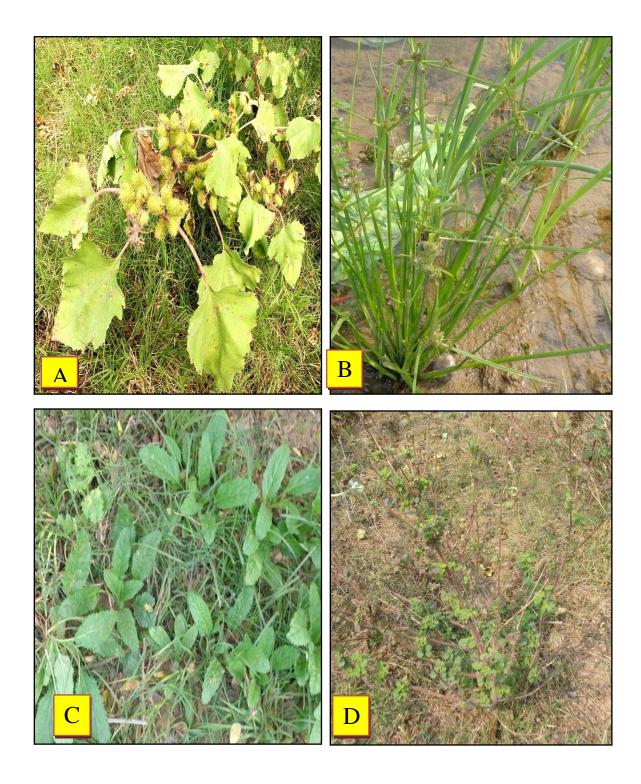
PLATE 9







**PLATE 12** 



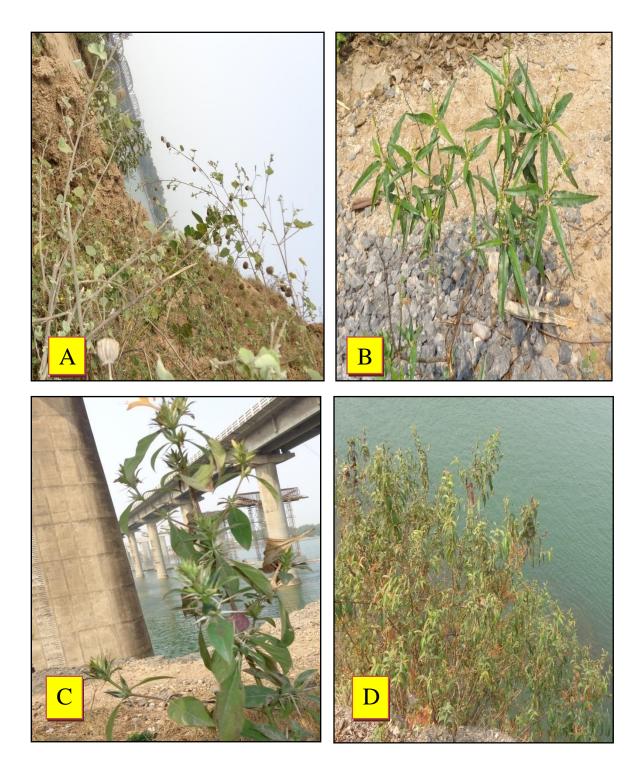
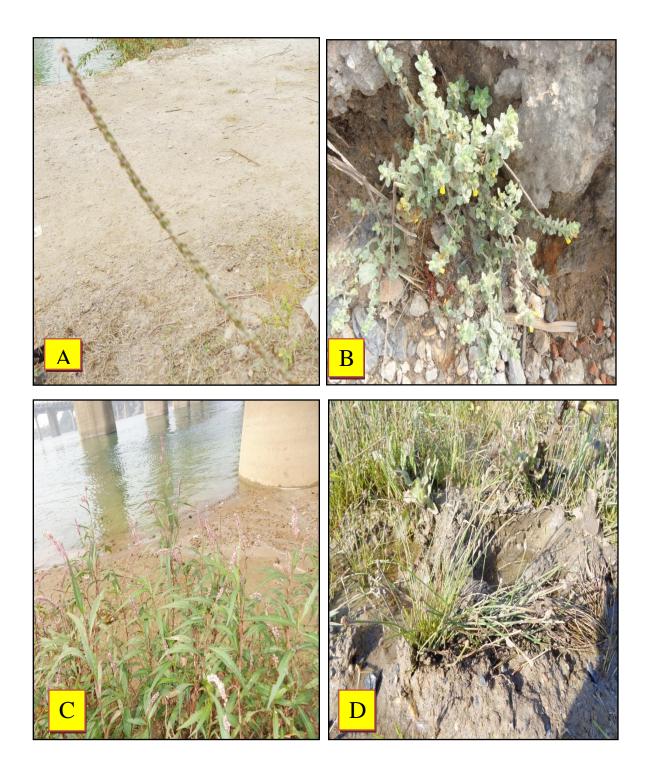


PLATE 14



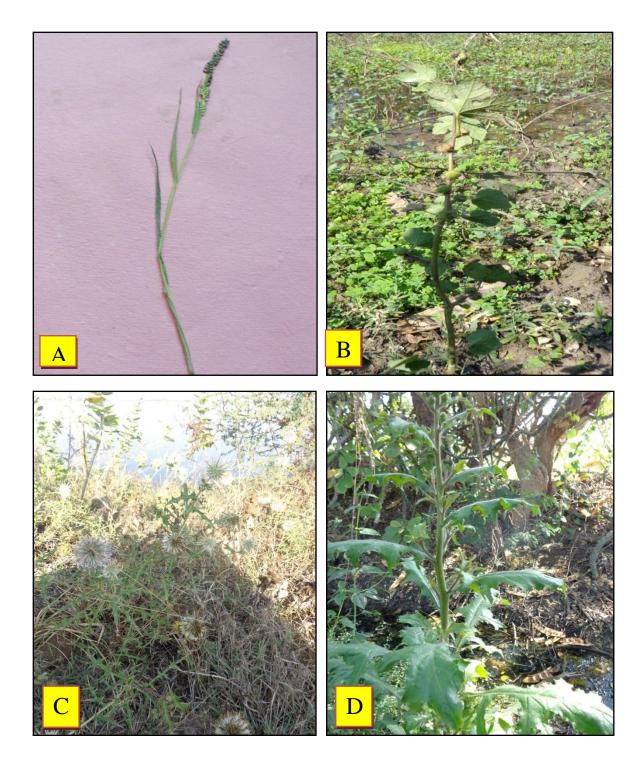
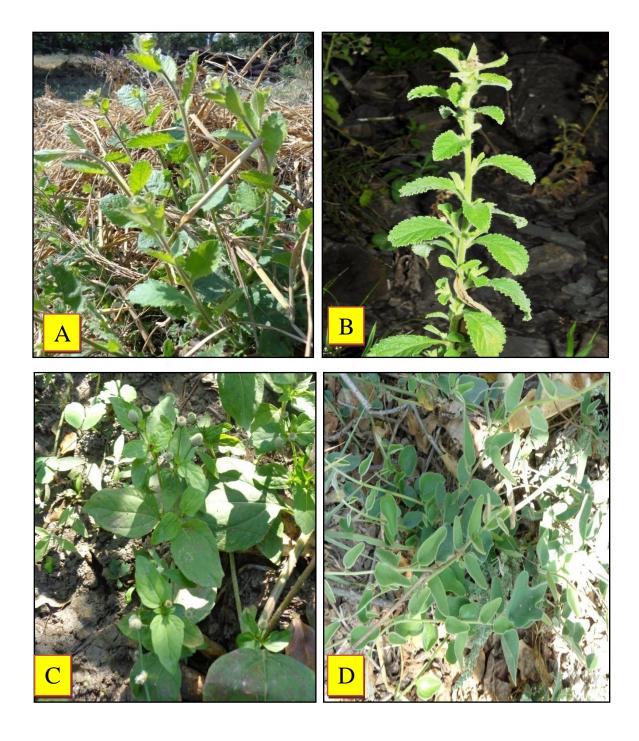


PLATE 16

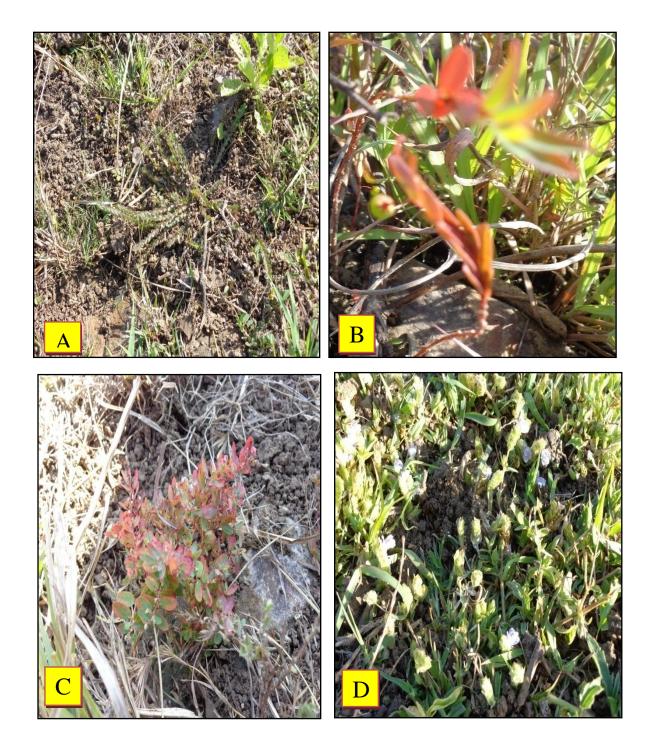




**PLATE 17** 







**PLATE 19** 



**PLATE 20** 

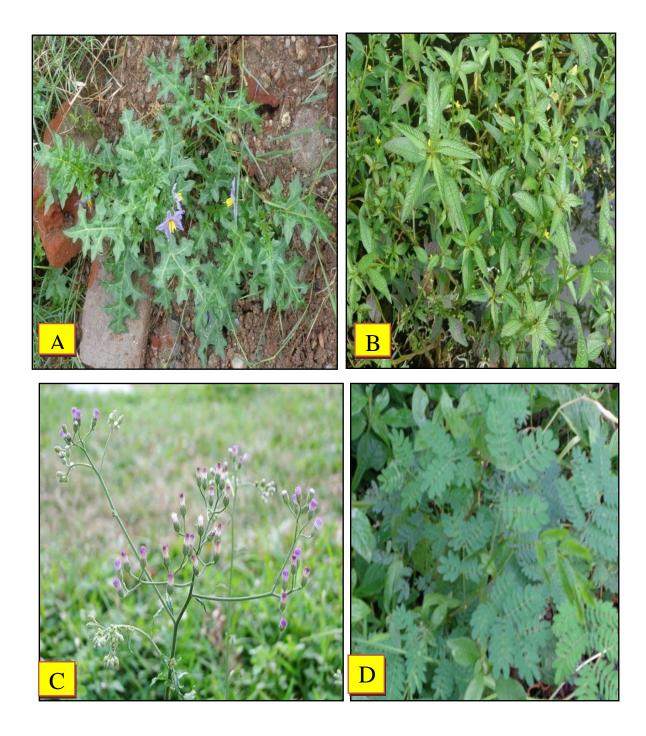


PLATE 21



**PLATE 22** 



PLATE 23

Further for categorization of plant species at generic level DNA isolation and their sequencing had been carried out.

#### 4.2 DNA Barcoding

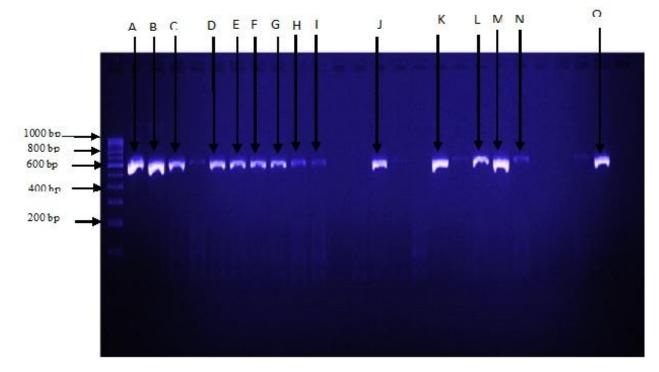
#### 4.2.1 DNA isolation

DNA Isolation of total 90 samples were carried out. DNA positive results found in 86 samples.

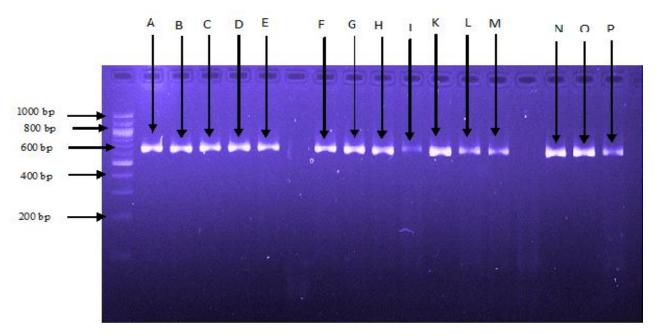
#### 4.2.2 PCR amplification and agarose gel electrophoresis:

Using the designed primers for rbcL, a total of 57/94 (61%) PCR attempts were successful in amplifying the target sequence in collected plants. However, ethidium bromide is commonly used to stain nucleic acid (Sambrook and Russel, 2001) in Metaphor gels for visualization of PCR products. Gels can be stained either before or after electrophoresis. To stain prior to electrophoresis, ethidium bromide was added to the dissolved Metaphor agarose just before pouring the gel. The ethidium bromide stain runs in the opposite direction of the DNA therefore the upper and lower portions of the gels appeared differentially stained especially when gels were electrophoresed at high voltages for a short period of time. Therefore for even staining, ethidium bromide could be included in the electrophoresis buffer.

Gel electrophoresis of the amplified product showed bright bands of the expected product. A higher percentage of amplification results were obtained with designed primers with 57 plants. The size of an amplicon and correspnding primers used are given in the figure legend. This gel (Fig. 13,14,15 and 16) indicates successful PCR amplification where high intensity bands was found.

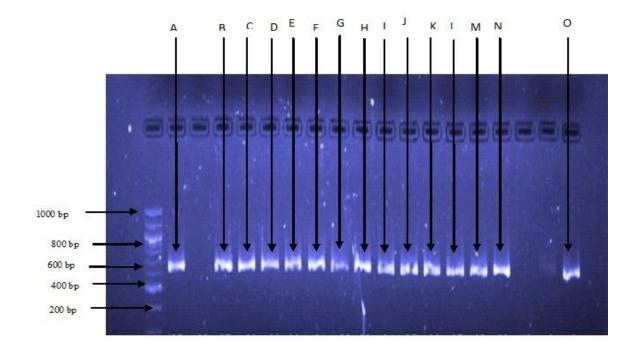


**Figure 13** Figure shows successful PCR amplification of rbcL barcode (A.... O) Sample position, L: 100bp DNA ladder).

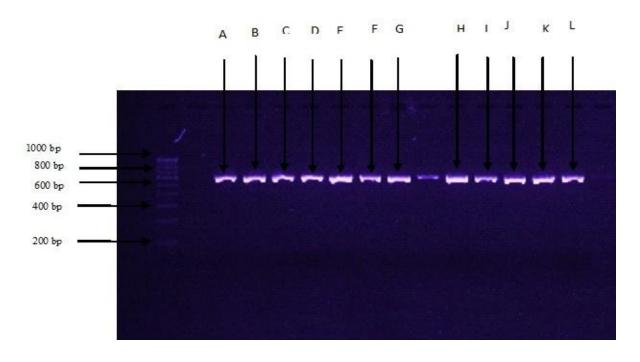


**Figure 14** Figure shows successful PCR amplification of rbcL barcode (A.... O) Sample position, L: 100bp DNA ladder)





**Figure 15** Figure shows successful PCR amplification of rbcL barcode (A.... O) Sample position, L: 100bp DNA ladder)



**Figure 16** Figure shows successful PCR amplification of rbcL barcode (A.... O) Sample position, L: 100bp DNA ladder)



An important component of any DNA extraction method is its use in downstream applications. Therefore, we compared PCR amplification of a plant rbcL gene using the 57 plant tissue DNA extracts. Figure 12, 13, 14 and 15shows a representative agarose gel containing a 600-bp fragment of plant rbcL gene that was PCR-amplified from DNA of 57 plants tissues. Our results indicated that, the well with low intensity bands reflects low PCR amplification compared to others. All the samples showed equal band size (~600bp) referred from the 100 bp DNA ladder (size marker). 100 bp ladder was loaded at 1<sup>st</sup> well position in each raw. It has 10 bands of 100 bp difference. It starts at 100 bp (lowest band) and ends with 1000 bp bands (highest band). Samples bands are close to 600 bp size, suggest the similar PCR product size in the samples.

#### 4.2.3 Sequencing Details :

Total 94 Plants were collected out of which sequencing of 86 plants were successfully completed.

#### 4.2.4 BOLD Submission:

DNA Isolation and gene sequencing of all 90 plants were carried out. In 86 plant samples positive results were obtained. BLAST match of 86 sequence was carried out. Out of which in 57 gene sequence match found in the BLAST tool and remaining 29 plant sequence match were not found in the BLAST tool. Hence, 57 plant samples satisfactory results were obtained which were submitted in BOLD. The illustrative barcode and Accession no. of all 57 plants were generated in BOLD. Detail information about BOLD submission are as shown in table 4,5 and 6.

Sr. No.	Plant name	Accession no.	Sr. No.	Plant name	Accession no.
1	Solanum virginianum	GENG335-14	30	Cressa cretica	GENG385-14
2	Potamogeton crispus	GENG226-14	31	Phyla nodiflora	GENG386-14
3	Ludwigia perrium	GENG227-14	32	Elaeocarpus variabilis	GENG387-14
4	Vernonia einerea	GENG228-14	33	Aeschynomene indica	GENG388-14
5	Phyllanthus amarus	GENG229-14	34	Eleocharis dulcis	GENG389-14
6	Pistia stratiotes	GENG230-14	35	Ischaemum rubosum	GENG390-14
7	Hydrilla verticillata	GENG231-14	36	Cyperus difformis	GENG391-14
8	Paspalum disticum	GENG232-14	37	Alternanthera philoxeroides	GENG392-14
9	Ludwigia octavalvis	GENG233-14	38	Xanthium spp.	GENG393-14
10	Ipomoea aquatica	GENG234-14	39	Cyperus spp.	GENG394-14
11	Hygrophila auriculata	GENG235-14	40	Hygrophila spp.	GENG395-14
12	Nelumbo nucifera	GENG236-14	41	Potemogeton natans	GENG462-14
13	Vallisneria spiralis	GENG237-14	42	Lemna spp.	GENG463-14
14	EquisetumSpp.	GENG238-14	43	Abutilon indicum	GENG464-14
15	Chloris barbata	GENG370-14	44	Croton aequatoris	GENG465-14
16	Spirodela polyrhiza	GENG372-14	45	Barleria prionitis	GENG466-14
17	Ĥygroryza aristata	GENG371-14	46	Persicaria glabra	GENG467-14
18	Azolla pinnata	GENG373-14	47	Eleocharis atropurpurea	GENG468-14
19	Limnophyton obtusifolium	GENG374-14	48	Blumea spp.	GENG469-14
20	Colocasia esculanta	GENG375-14	49	Spilanthes acmella	GENG470-14
21	Dactyloctenium aegyptium	GENG376-14	50	Cocculus hirsutus	GENG471-14
22	Amaranthus spinosus	GENG377-14	51	Lindernia Spp.	GENG472-14
23	Sphaeranthus indicus	GENG378-14	52	Cyanthilium cinereum	GENG473-14
24	Peristrophe paniculata	GENG379-14	53	Aerva Spp.	GENG474-14
25	Limnophila indica	GENG380-14	54	Rungia Spp.	GENG475-14
26	Marsilea quadrifolia	GENG381-14	55	Tridax procumbens	GENG476-14
27	Utricularia vulgaris	GENG382-14	56	Sida rhombifolia	GENG477-14
28	Gomphrena celosiodes	GENG383-14	57	Pentanema indicum	GENG478-14
29	Bergia spp.	GENG384-14			

Table 12: List of the barcoded plants with their accession no.

Details		Image Sequence
Collection date	9th Oct, 2013	>ACAGAGACTAAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAG
Identification	Solanum tampicense	AGTACAAATTGACTTATTATACTCCTGAGTACCAAACCAAGGATA
	Dunal	CTGATATATTGGCAGCATTCCGAGTAACTCCTCAACCTGGAGTTC
Institution	Gujarat Biodiversity	CACCTGAAGAAGCAGGGGCCGCGGTAGCTGCCGAATCTTCTACT
	Gene Bank	GGTACATGGACAGCGGCGCCGGTAGCTGCCGAACTTTACCAGTCTTGA
Accession	GENG335-14	
number		TCGTTACAAAGGGCGATGCTACCGCATCGAGCGTGTTGTTGGAG
Collection code	BG20131009-0001	AAAAAGATCAATATATTGCTTATGTAGCTTACCCTTTAGACCTTT
		TGAAGAAGGTTCCGTTACCAATATGTTTACTTCCATTGTAGGTAA
Collector	Krupa Unadkat	TGTATTTGGGTTCAAAGCCCTGCGCGCTCTACGTCTGGAAGATCT
Phylum	Magniliophyta	GCGAATCCCTCCTGCTTATATTAAAACTTTCCAAGGTCCGCCTCA
Class	Magniliopsida	GGGATCCAAGTTGAAAGAGATAAATTGAACAAGTATGGTCGTCC
Order	Solanales	CCTGTTGGGATGTACTATTAAACCTAAATGGGGTTATCTGCTAAA
Family	Solanaceae	AACTACGGTAGAGCTGTTTATGAATGTCTTC
Genus	Solanum	
Species	tampicense	rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Identifier	Dr. P.S. Nagar	rbcl R: GTAAAATCAAGTCCACCRCG
Identifier Email	drnagar@gmail.com	ABI Chromatogram
Identifier	MSU Baroda	
Institution		
Identification	Morphology and	
Method	Barcoding	
Voucher Status	Herbarium, Photographs	BILL Concernence was a second and the second and the second s
Country	India	
State	Gujarat	
Region	Vadodara	1
Sector	Harni lake, Baroda	
Exact Site	Pond area	
Latitude	N 22° 20' 16.0"	RCH <sub>elemente</sub> n voorde maritestativen ellederben bet sonske wiedterderbeitenderbeiten der ste elemente die die sie en ook over
Longitude	E 73° 13' 07.02"	Bustative Darcede:
Elevation	108	
Photographer	Krupa Unadkat	
Details		Image Sequence
Details Collection date	10th Oct, 2013	Image         Sequence           >TTATGTCACCACAAACAGAGACTAAAGCAAGTGCTGGATTTAA
Collection date Identification	Pomatogeton crispus	>TTATGTCACCACAAACAGAGACTAAAGCAAGTGCTGGATTTAA AGCTGGTGTTAAAGATTACAAATTGACTTATTATACTCCTGAAT
Collection date Identification Institution	Pomatogeton crispus Gujarat Biodiversity Gene B	AGCTGGTGTTAAAGCAAGGAGCTAAAGCAAGTGCTGGATTTAA AGCTGGTGTTAAAGATTACAAATTGACTTATTATACTCCTGAATA TGAAACCAAGGATACTGATATCTTGGCAGCATTCCGAGTAACC
Collection date Identification Institution Accession number	Pomatogeton crispus	Aank Sank Sank Sank Sank Sank Sank Sank S
Collection date Identification Institution Accession number Collection code	Pomatogeton crispus Gujarat Biodiversity Gene E GENG226-14 BG20131009-0002	Aank Stank CAAGAGAACTAAAGGAAGTACTAAAGCAAGTGCTGGATTTAA AGCTGGTGTTAAAGATTACAAATTGACTTATTATTCCTGAATA TGAAACCAAGGATACTGACTATTGGCAGCATTCCGAGTAACTG TCAACCCAGGAGTTCCACCTACTAGGAAGCCGGGGCTGCAGTAACTG TCAACCCGGAGTTCCACCTACTGAGGAAGCCGGGGCTGCAGTAGCTG GCCGAATCCTCTACTGGTACATGGACAACTGTATGGACTGATGGA
Collection date Identification Institution Accession number Collection code Collector	Pomatogeton crispus Gujarat Biodiversity Gene E GENG226-14 BG20131009-0002 Krupa Unadkat	Ascragotaticacacaacagagactaaagagactaaagagactaaagagactaaagagactaaagagactaaagagactaaagagactaaagagagag
Collection date Identification Institution Accession number Collection code Collector Phylum	Pomatogeton crispus Gujarat Biodiversity Gene E GENG226-14 BG20131009-0002 Krupa Unadkat Magniliophyta	Aank Stank CAAGAGAACTAAAGGAAGTACTAAAGCAAGTGCTGGATTTAA AGCTGGTGTTAAAGATTACAAATTGACTTATTATTCCTGAATA TGAAACCAAGGATACTGACTATTGGCAGCATTCCGAGTAACTG TCAACCCAGGAGTTCCACCTACTAGGAAGCCGGGGCTGCAGTAACTG TCAACCCGGAGTTCCACCTACTGAGGAAGCCGGGGCTGCAGTAGCTG GCCGAATCCTCTACTGGTACATGGACAACTGTATGGACTGATGGA
Collection date Identification Institution Accession number Collection code Collector	Pomatogeton crispus Gujarat Biodiversity Gene E GENG226-14 BG20131009-0002 Krupa Unadkat	Aank AGCTGGTGTTAAAGATTACAAATTGGACTTATATATCCTCGGATTAAA AGCTGGGGTGTAAAGATTACAAATTGGACTTATATATCCTCGGATTAAA AGCTGGGGTTAAAGATTACAAATTGGACTTATATATCCTCGGAATTAA AGCTGGGATTCCAACTGGACAGCATTCCGAGTAACTG TCAAACCCAGGAATTCCAACTGGACAACTGATAGGACTGAATGGACTGATGGACTGAATGGACTGATGGACTGATGGACTGATGGACTGATGGACTGATGGACTGATGGACTGATGGACTGATGGACTGATGGACTGATGGACTGATGGACTGATGGACTGATGTAGTGTGGGCGAATGCTTTATGGGTTCAAAGCTCTTTAGGCTCTTACAAATGGACTGTTCCGACTGGGGTACAAGCTCCTTCAGCCT
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family	Pomatogeton crispus Gujarat Biddiversity Gene E GENG226-14 BG20131009-0002 Krupa Unadkat Magniliophyta Liliopsida Alismatales Potamogetonaceae	Bank
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family G enus	Pomatogeton crispus Gujarat Biodiversity Gene E GENG226-14 BG20131009-0002 Krupa Unadkat Magniliophyta Liliopsida Alismatales Potamogetonaceae Pomatogeton	Aank AscTaGTGCCCCACAAACAGAGACTAAAGCAAGTGCTGGATTTAA AsCTGGTGTTAAAGATTACAAGTGACTGCTGATTAA AsCTGGTGTTAAAGATTACAAGTGACTGATTATACTCCTGAAT TGGAAACCAAGGATACTGATATACTTGGCAGCATTCCGAGTAACTG TCAACCCGGAGTTCCACCTGAGGAAGCGGGGGGCGCGCAGTAGCT GCCGAATCCTCTACTGGGACTGAAAAGGGCGGGGGGCGCGCAGTAGCA ACTTACTAGCTIGGACTGTACAAAGGGCGGGGGGCGCGCAGTGACT ACCTTACTAGCTIGGGACTGGAAAATCGAAAGGGCGATGCTAACAATGTTA TCGATTGGGAAATCCACTGGGACTGAAAAAGCACTTAACAATGTAT TCGATTGGGGAAGTCTACGGGAGGGCGGGGGCGCGCGAGTGACTAACAGTGTTAGGCC ACGTTGGGAAGAGTCTACGAGAGGCGGGGGGCGCGCGCGAGTGACAAACTGATTGAGCC ACGTTGGGGAAGTCTACGGGGAGTCCAGCTGAAAAACTGTACAAGTGTCAGGGCAGTGCTACTAACAATGGACAAACTGACCCGTTACTAACAGTGTTACGAGAGAGA
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family G enus Species	Pomatogeton crispus Gujarat Biodiversity Gene E GENG226-14 BG20131009-0002 Krupa Unadkat Magniliophyta Liliopsida Alismatales Potamogetonaceae Pomatogeton crispus	Aank Bank Bank Bank Bank Bank Bank Bank B
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family G enus	Pomatogeton crispus Gujarat Biodiversity Gene E GENG226-14 BG20131009-0002 Krupa Unadkat Magniliophyta Liliopsida Alismatales Potamogetonaceae Pomatogeton	Aank Aank Bank Bank Bank Bank Bank Bank Bank B
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family G enus Species	Pomatogeton crispus Gujarat Biodiversity Gene E GENG226-14 BG20131009-0002 Krupa Unadkat Magniliophyta Liliopsida Alismatales Potamogetonaceae Pomatogeton crispus	Aank
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family G enus Species	Pomatogeton crispus Gujarat Biodiversity Gene E GENG226-14 BG20131009-0002 Krupa Unadkat Magniliophyta Liliopsida Alismatales Potamogetonaceae Pomatogeton crispus	Aank Aank Bank Bank Bank Bank Bank Bank Bank B
Collection date Identification Institution Accession number Collector Phylum Class Order Family G enus Species Identifier	Pomatogeton crispus Gujarat Biodiversity Gene E GENG226-14 BG20131009-0002 Krupa Unadkat Magniliophyta Liliopsida Alismatales Potamogetonaceae Pomatogeton crispus Dr. P.S. Nagar	Aank
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family G enus Species Identifier	Pomatogeton crispus Gujarat Biodiversity Gene E GENG226-14 BG20131009-0002 Krupa Unadkat Magniliophyta Liliopsida Alismatales Potamogetonaceae Pomatogeton crispus	Aank
Collection date Identification Institution Accession number Collector Phylum Class Order Family Genus Species Identifier Identifier Identifier Identifier Institution	Pomatogeton crispus         Gujarat Biodiversity Gene E         GENG226-14         BG20131009-0002         Krupa Unadkat         Magniliophyta         Liliopsida         Alismatales         Potamogetonaceae         Pomatogeton         crispus         Dr. P.S. Nagar         dmagar@gmail.com         MSU Baroda	Aank Bank Bank Bank Bank Bank Bank Bank B
Collection date Identification Institution Accession number Collector Phylum Class Order Family Genus Species Identifier Identifier Institution Identification	Pomatogeton crispus Gujarat Biodiversity Gene E GENG226-14 BG20131009-0002 Krupa Unadkat Magniliophyta Liliopsida Alismatales Potamogetonaceae Pomatogeton crispus Dr. P.S. Nagar dmagar@gmail.com	Aank Bank Bank Bank Bank Bank Bank Bank B
Collection date Identification Institution Accession number Collector Phylum Class Order Family Genus Species Identifier Identifier Institution Identification Method	Pomatogeton crispus         Gujarat Biodiversity Gene E         GENG226-14         BG20131009-0002         Krupa Unadkat         Magniliophyta         Liliopsida         Alismatales         Potamogetonaceae         Pomatogeton         crispus         Dr. P.S. Nagar         dmagar@gmail.com         MSU Baroda         Morphology and Barcoding	Aank Bank Bank Bank Bank Bank Bank Bank B
Collection date Identification Institution Accession number Collector Phylum Class Order Family Genus Species Identifier Identifier Identifier Institution Identification Method Voucher Status	Pomatogeton crispus         Gujarat Biodiversity Gene E         GENG226-14         BG20131009-0002         Krupa Unadkat         Magniliophyta         Liliopsida         Alismatales         Potamogetonaceae         Pomatogeton         crispus         Dr. P.S. Nagar         dmagar@gmail.com         MSU Baroda	Aank Bank Bank Bank Bank Bank Bank Bank B
Collection date Identification Institution Accession number Collector Phylum Class Order Family Genus Species Identifier Identifier Institution Identification Method	Pomatogeton crispus         Gujarat Biodiversity Gene E         GENG226-14         BG20131009-0002         Krupa Unadkat         Magniliophyta         Liliopsida         Alismatales         Potamogetonaceae         Pomatogeton         crispus         Dr. P.S. Nagar         dmagar@gmail.com         MSU Baroda         Morphology and Barcoding         Herbarium, Photographs	Aank Bank Bank Bank Bank Bank Bank Bank B

		rbel R :GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram
Identifier	MSU Baroda	
Institution		
Identification	Morphology and Barcoding	
Method		1200 Accessory or particular to the determinant of the statement of the statement of the statement of the formation of the fo
Voucher Status	Herbarium, Photographs	
Country	India	
State	Gujarat	
Region	Vadodara	
Sector	MSU Botonical garden	Care and the second sec
Exact Site	Pond area	DCSU_cise-second/side/module/demonstration/cite/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonstration/demonst
Latitude	N 22° 18' 36.3"	Bustrative Barcode:
Longitude	E 73° 11' 10.4"	Bustrative Barcode 200
Elevation	117	
Photographer	Krupa Unadkat	
B	.1	

Details		Image	Sequence
Collection date	11th Oct, 2013	THE REAL PROPERTY AND	>GAGACTAAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGA
Identification	Ludvigia perennis L.		ATAGACTGACTTATTATACTCCTGAGTATGAAACCAAAGATAG
Institution	Gujarat Biodiversity Gene Bank		ATATCTTGGCAGCATTCCGAGTAACTCCTCAACCTGGAGTTCCC
Accession number	GENG227-14		CTGAGGAAGCAGGGGCTGCAGTAGCTGCTGAATCTTCTACTG
Collection code	BG20131009-0003		ACCTGGACAACTGTGTGGACCGATGGGCTTACCAGCCTTGAT
		A A A A A A A A A A A A A A A A A A A	TTATAAAGGAAGATGCTACCACATCGAGCCTGTTGCTGGAGA
Collector	Krupa Unadkat		
Phylum	Magniliophyta		AAAATCAATATATCTGTTATGTAGCTTACCCTTTAGACCTTTT
Class	Rosids		AGAAGGTTCTGTTACTAATATGTTTACTTCCATTGTGGGTAAT
Order	Mrtales		ATTTGGGTTCAAAGCCCTGCGCGCTCTACGTCTGGAGGATCTC
amily	Onagraceae		GAATCCCTCCTTCATATACTAAAACTTTCCAAGGACCGCCTCAT
			GTATCCAAGTTGAGAGAGATAAGTTGAACAAGTATGGCCGTC
Genus	Ludwigia	CONTRACTOR OF THE OWNER	CTATTGGGATGTACTATTAAACCTAAATTAGGGTTATCCGCTA
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Congitude Elevation Photographer Collection date dentification nstitution Accession number Collection code Collector Phylum Class Order Species dentifier dentifier Email dentifier Enail dentifier fier stitution	E 73° 13' 16.0" 115 Krupa Unadkat 12th Oct, 2013 Vernonia cinerea (L.) Less. Gujarat Biodiversity Gene Bank GENG228-14 BG20131009-0004 Krupa Unadkat Magniliophyta Eucotyledons Asterales Asterales Asterales Asteraceae Vernonia <i>Cinerea</i> Dr. P.S. Nagar dmagar@gmail.com MSU Baroda		>ACAGAGACTAAAGCAAGTGTTGGATTCAAAGCTGGTGTTAA ATTATAAATTGACTTATTATACTCCTGAATATAAAACCAAGGAT CTGATATCTTGGCAGCATTTATACTCCTGAATAAAACCAAGGAT CGCTGAAGAAGCAGGGGCCGCAGTAACTCCTCAACCTGGAGT CGCTTGAAGAAGCAGGGGCCGACGAGTGGACTTACGAGCCTGT GGTACATGGACAACTGTGGGACCGATGGACTGACGAGCCTGTCCTGG AAGAAAGTCAATTTATTGCTTATGGAATCGAACCTGTTCGTGG AAGAAAGTCAATTTATTGCTTATGTAGCTTACCTCATTGTAGGTT TGAAGAAGGTTCTGTTACTAACATGTTTACTTCCATTGTAGGAT GCGAATCCCTATTTCGTATGTGAACCTTTCCAAGGTCCGCCTC CGGCATCCAAGTTGAGAGAGATAAATTGAACAAGTATGGGCTGCCG CCCTGTTGGGATGTACTAAACTTAAAATTGGACTCAAGGTCG CCCTGTTGGGATGTACTATAAACCTAAATTGGAGCAAGTTATCGCC AAAACTACGGTAGGAGCTGTTATGAACTAAATTGGGTTATCCGC AAAACTACGGTAGGAGCTGTTTATGAACTAAATTGGGTGGCGCCT rbcL F: ATGTCACCACAAACAGGAGCTAAAGC
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ongitude Clevation Photographer Photographer Collection date dentification nstitution Accession number Collection code Collector Phylum Class Order amily Genus Species dentifier Email dentifier nstitution dentifier institution dentification Method	E 73° 13' 16.0" 115 Krupa Unadkat 12th Oct, 2013 Vemonia cinerea (L.) Less. Gujarat Biodiversity Gene Bank GENG228-14 BG20131009-0004 Krupa Unadkat Magniliophyta Eucotyledons Asterales Asterales Asteraceae Vernonia <i>Cinerea</i> Dr. P.S. Nagar dmagar@gmail.com MSU Baroda Morphology and Barcoding	Image	>ACAGAGACTAAAGCAAGTGTTGGATTCAAAGCTGGTGTTAA ATTA TAAATTGACTTATTATACTCCTGAATATAAACCAAGGAT CTGATATCTTGGCAGCAGCAGTAACTCCTCAACCTGGAGT CGCCTGAAGAAGCAGGGGCGCGAGTAACTCCCTA GGTACATGGACAACTGTGTGGACCGATGGACTTACCGAGCCTTT CGTTACAAAGGCGATGCTATGGAATCGAGCCTGTTCCTGGA AAGAAAGTCAATTTATTGCTTATGTAGCTTACCCATTGGACCT TGAAGAAGTCAATTTATTGCTTATGTAGCTTACCCATTGGACCT GGCATCCAAGTCGTGTGTACAAGCCTGTCCTGGA AGGAAAGTCAATTTGTTACTACATGTTACTCCATTGGAGCT GGCATCCCAGTTGGAAGAGACTAAATTGAACCAGTCTGGAAGAT GCGAATCCCTATTTGGTGTGACAGATAAATTGAACAAGTATGGCG CCCTGTTGGGATGTACAAGCCTGTCTAAAATTGGAGTATCCGC AAAACTACGGTAGAGCTGTTTATAAACCTAAATTGGGGTTATCCGC AAAACTACGGTAGAGCTGTTTATGAATGTCTTCGTGGGGAGCT rbcL F: ATGTCACCACAAACAGAGACTAAAGC rbcL R: GTAAAATCCAAGTCCACCRCG
ongitude Elevation Photographer Collection date dentification nstitution Accession number Collector Phylum Class Order amily Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus Genus G	E 73° 13' 16.0" 115 Krupa Unadkat 12th Oct, 2013 Vemonia cinerea (L.) Less. Gujarat Biodiversity Gene Bank GENG228-14 BG20131009-0004 Krupa Unadkat Magniliophyta Eucotyledons Asterales Asterales Asteraceae Vernonia Cinerea Dr. P.S. Nagar dmagar@gmail.com MSU Baroda Morphology and Barcoding Herbarium, Photographs	Image	>ACAGAGACTAAAGCAAGTGTTGGATTCAAAGCTGGTGTTAA ATTA TAAATTGACTTATTATACTCCTGAATATAAACCAAGGAT CTGATATCTTGGCAGCAGCAGTAACTCCTCAACCTGGAGT CGCCTGAAGAAGCAGGGGCGCGAGTAACTCCCTA GGTACATGGACAACTGTGTGGACCGATGGACTTACCGAGCCTTT CGTTACAAAGGCGATGCTATGGAATCGAGCCTGTTCCTGGA AAGAAAGTCAATTTATTGCTTATGTAGCTTACCCATTGGACCT TGAAGAAGTCAATTTATTGCTTATGTAGCTTACCCATTGGACCT GGCATCCAAGTCGTGTGTACAAGCCTGTCCTGGA AGGAAAGTCAATTTGTTACTACATGTTACTCCATTGGAGCT GGCATCCCAGTTGGAAGAGACTAAATTGAACCAGTCTGGAAGAT GCGAATCCCTATTTGGTGTGACAGATAAATTGAACAAGTATGGCG CCCTGTTGGGATGTACAAGCCTGTCTAAAATTGGAGTATCCGC AAAACTACGGTAGAGCTGTTTATAAACCTAAATTGGGGTTATCCGC AAAACTACGGTAGAGCTGTTTATGAATGTCTTCGTGGGGAGCT rbcL F: ATGTCACCACAAACAGAGACTAAAGC rbcL R: GTAAAATCCAAGTCCACCRCG
Longitude Elevation Photographer Collection date Identification Institution Accession number Collector Phylum Collector Phylum Class Order Family Genus Species Identifier Email Identifier Identifier Identifier Identifier State Country State	E 73° 13' 16.0" 115 Krupa Unadkat 12th Oct, 2013 Vemonia cinerea (L.) Less. Gujarat Biodiversity Gene Bank GENG228-14 BG20131009-0004 Krupa Unadkat Magniliophyta Eucotyledons Asterales Asterales Asteraceae Vernonia <i>Cinerea</i> Dr. P.S. Nagar dmagar@gmail.com MSU Baroda Morphology and Barcoding	Image	>ACAGAGACTAAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAA ATTATAAATTGACTTATTATACTCCTGAATATAAAACCAAGGAT CTGATATCTTGGCAGCATTTTATACTCCTGAATAAAACCAAGGAT CGGTACTTGGACAACTGTTGAGTGACCTCTCAACTGGAGTTGCGGACGACGACGACGACGACGACGACGACGACGACGACG

Institution		
Identification Method	Morphology and Barcoding	Maconsection and a sector of the sector of t
Voucher Status	Herbarium, Photographs	
Country	India	
State	Gujarat	
Region	Vadodara	2021 Second and a second s
Sector	Hami lake, Baroda	Rustative Barcode:
Exact Site	Pond area	-
Latitude	N 22° 20' 41.1"	
Longitude	E 73° 13' 14.2"	249 537
Elevation	112	534 579
tographer	Krupa Unadkat	5/79 5/79

## **PLATE 25**

В

Details		Image	Sequence
Collection date	13th Oct, 2013		>GACTAAAGCAAGTGTTGGATTCAAGGCTGGTGTTAAAGAGTAT
Identification	Phyllanthus a marus Schumach.		AAATTGACTTATTATACTCCTGAGTATGAAACCAAAGATACTGAT
Identification	& Thonn.		
Institution	Gujarat Biodiversity Gene Bank		ATCTTAGCAGCATTCCGAGTAACTCCTCAACCTGGAGTTCCGCCT
Accession number	GENG229-14	AN A THE ALL AND A REAL	GAGGAAGCGGGGGCTGCGGTAGCTGCTGAATCTTCTACTGGTAG
Collection code	BG20131009-0005	The market and the second second	ATGGACAACTGTGTGGACCGACGGACTTACCAGTCTTGATCGTT
Conceaon coac	0020131003-0003		ATAAAGGACGATGCTACCACATCGAGCCTGTTGCTGGAGAAGAA
Collector	Krupa Unadkat	and the second sec	ACTCAATTTATTGCTTATGTAGCTTATCCTTTAGACCTTTTTGAAG
Phylum	Magniliophyta		AAGGTTCTGTTACTAATATGTTTACTTCCATTGTGGGTAATGTAT
Class	Rosids		TGGGTTCAAAGCCTTACGCGCTCTGCGTCTGGAAGATTTGCGAA
Order	Malpighiales		TCCCTCCTGCTTATACTAAAACTTTCCAAGGCCCGCCTCATGGCA
Family	Phyllanthaceae		CCAAGTTGAGAGAGAGATAAATTGAACAAGTATGGCCGCCCTCTAT
Genus			TAGGCTGTACTATTAAACCGAAATTGGGGTTATCCGCTAAGAAT
	Phyllanyhus		
Species	amarus	The second s	ACGGTAGAGCTGTTTATGAATGTCTTCGCGG
Identifier	Dr. P.S. Nagar	B SIR PARA AND AND AND	rbcL F: ATGTCACCACAAACAGAGACTAAAGC
			TDCL F: ATGTCACCACAAACAGAGACTAAAGC
			rbcL R: GTAAAATCAAGTCCACCRCG
			TIDE R. GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram	
Identifier	MSU Baroda		N 201 201 201 201 201 201 201 201 201 201
Institution	Wise Baroda	Lass and the rest of the rest	
Identification	Morphology and Barcoding		and the second states of the s
Method	Morphology and Barcouling		and a second a strategy of the state of the strategy of the st
incurva	Herberium Dhetegrenhs		and a second state of the second
Voucher Status	Herbarium, Photographs India		The TAN INF TAN TAN TAN INF INF TAN INF INF INF INF INF INF INF INF INF IN
Country		from a surface about the form of the transformer and the second of the second formation of the formation of	ling a single and the full balance of large to a factor of the balance for the constraint factor of a factor of the structure of the structure of a factor of the structure of the struc
State	Gujarat		seed to be the
Region	Vadodara		the second s
Sector	Hami lake, Baroda	in the second	al a transministra da da a transministra da
Exact Site	Pond area	e	26
Latitude	N 22° 20' 22.0"		
Longitude	E 73° 13' 11.1"	26.9	53
Elevation	127		
Photographer	Krupa Unadkat		50
A			
A	··· //		
Details		Image	Sequence
Collection date	14th Oct, 2013		>CAAACAGAGACTAAAGCAACTGTCGGATTCAAAGCTGGTGTTA
Identification	Pistia stratiotes L.		AAGATTACAAATTGACTTATTATACTCCTGAGTATGAGACAAAGG
Institution	Gujarat Biodiversity Gene Bank		ATACTGATATCTTGGCAGCATTCCGAGTAACTCCTCAACCAGGGG
Accession number	BG20131009-0006		TTCCACCTGAAGAAGCAGGGGCTGCAGTAGCTGCCGAATCTTCT
Collection code	BG20131009-0006	Tradition of the second	ACTGGTACATGGACAACTGTGTGGACTGATGGACTTACCAGTCT
Collector	Krupa Unadkat		TGATCGTTACAAAGGACGATGCTACCACATCGAACCTGTTCCTGG
Phylum	Magniliophyta		AGAAGAAAGTCAATTTATTGCTTATGTAGCTTACCCTTTAGACCT
Class	Liliopsida		TTTTGAAGAAGGTTCCGTTACCAACATGTTTACTTCCATTGTAGG
Order	Alismatales		TAATGTTTTTGGGTTTAAAGCTTTACGAGCTCTGCGTCTAGAGGA
Family	Araceae		TTTGCGAATTCCTCCCGCGTATTCCAAAACTTTCCAAGGCCCGCCT
Genus	Pistia		CACGGTATCCAAGTTGAAAGAGAGATAAATTGAACAAGTATGGTCG
Species	stratiotes		TCCCCTATTGGGATGTACGATTAAACCAAAATTGGGATTATCCGC GAAAAACTACGGTAGAGCAGTTTATGAATGTCTTCGCGGTGGA
Identifier	Dr. P.S. Nagar		GAAAAACTACGGTAGAGCAGTTTATGAATGTCTTCGCGGTGGA
			rbcL: F: ATGTCACCACAAACAGAGACTAAAGC
			rbcL R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmogar@gmail.com	API Chromotogram	
Identifier Email	dmagar@gmail.com MSU Baroda	ABI Chromatogram	10 10 10 10 10 10 10 10 10 10 10 10 10 1
Institution	MSO Baroua	Construction of the construction of the second second structure second second second second second second second	
Identification	Morphology and Barcoding	all and the set has a based to the set	ومراجع والمراجع
Method		Contence of the state of the st	hila altu in induktri Lieder sameli Microbelia sooiren ta Altu in t
Voucher Status	Herbarium, Photographs		
Country	India	(a) an and be an an an an an and an an and an	
State	Gujarat		
Region	Vadodara	and a start of the	the station rates blue a secility of a statistic material state of the
Sector	Hami lake, Baroda		in the second
Exact Site	Pond area	Bustrative Barcode:	
Latitude	N 22° 20' 42.9"		268

## **PLATE 26**

N 22° 20' 42.9"

E 73° 13' 15.5" 118

Krupa Unadkat

Latitude

В

Longitude

Elevation

Details		Image	Sequence
Collection date	16th Oct, 2013		>GACTAAAGCAGGGCTTGGATTCAAAGCAGGTGTGAAAGATTAT
Identification	Hydrilla verticillata (L.f.) Royle		AAATTAACTTATTATACTCCGGAATATGAAACCAAAGATACTGAT
Institution	Gujarat Biodiversity Gene Bank		ATCTTGGCAGCATTCCGAGTAACTCCGCAACCCGGAGTTCCACCT
Accession number	GENG231-14	and the second	GAAGAAGCGGGGGCCGCAGTAGCTGCTGAATCCTCTACTGGTAG
Collection code	BG20131009-0008	A CARLES AND A CARLES AND A CARLES AND	ATGGACAACTGTGTGGACTGATGGGCTTACTAGCCTTGATCGTT
			ACAAA GGAC GAT GCT A CCA CATT GAGCC CGT GC CG GAGAG GA
Collector	Krupa Unadkat		AGATCAATACATTGCTTATGTAGCTTATCCTTTAGACCTTTTTGAA
Phylum	Magniliophyta		GAAGGTTCTGTTACCAACATGTTTACTTCCATTGTAGGTAATGTA
Class	Liliopsida		TTTGGGTTCAAAGCTCTACGAGCTCTACGCTTAGAGGATCTGCG
Order	Alismatales		ATTCCCCCTGCTTATTCCAAAACTTTTCCAAGGTCCACCTCATGGA
Family	Hydrocharitaceae	COND	TCCAAGTTGAAAGAGATAGATTAAACAAATATGGCCGTCCTCTA
Genus	Hydrilla		TGGGATGTACTATTAAACCAAAATTGGGATTATCCGCGAAAAA
Species Identifier	Verticillata		TACGGTAGAGCGGTTTATGAATGTCTACGCGTGTTTTTTTT
dentifier	Dr. P.S. Nagar		TACGGTAGAGCGGTTTATGAATGTCTACGCGTGTTTTTTTT
			rbcL F: ATGTCACCACAAACAGAGACTAAAGC
			rbcl R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram	
Identifier Institution	MSU Baroda	Toronal Scale ( which are an exception of the control scale of the contr	
Identification Method	Morphology and Barcoding		in the second
Voucher Status	Herbarium, Photographs		
Country	India	A 20 YO REPORT OF A 10 YO REPORT OF AN ADDRESS OF A 10 YO REPORT	
State	Gujarat		
Region	Vadodara	]	I some the start better
ector	Hami lake, Baroda	]	and a second data walks which was a second with the second s
Exact Site	Pond area		anne and an analysis and the attended to the state of the
atitude	N 22° 20' 42.9"	Bustrative Barcode:	
ongitude	E 73° 13' 15.5"		
levation	112	26.9	
Photographer	Krupa Unadkat		
			•
Details		Image	Sequence

Details		Image	Sequence
Collection date	18th Oct, 2013		>GAGACTAAAGCAAGTGTTGGATTTAAAGCAGGTGTTAAGGATT
Identification	Paspalum distichum L.	AND LAND AND AND	ATAAATTGACTTACTACACCCCGGAGTACGAAACCAAGGATACT
Institution	Gujarat Biodiversity Gene Bank		GATATCTTGGCAGCATTCCGAGTAACTCCTCAGCCCGGGGTTCCA
Accession number	GENG232-14		CCTGAAGAAGCAGGGGCTGCAGTAGCTGCGGAATCTTCTACTGG
Collection code	BG20131009-0010		TACATGGACAACTGTTTGGACTGATGGACTTACCAGTCTTGATCG
S		ALL SALANS AND ALL ST	TTACAAAGGACGATGCTATCACATCGAACCCGTTCCTGGGGAGG
Collector	Krupa Unadkat	Sola A PAGE A PA	CAGATCAATATATCTGTTATGTAGCTTATCCATTAGACCTATTTGA
Phylum	Magniliophyta		AGAGGGTTCTGTTACTAATATGTTTACTTCCATCGTGGGTAACGT
Class	Liliopsida		ATTTGGTTTCAAAGCCTTACGCGCTCTACGTTTGGAGGATCTACG
Order	Poales	ALL	AATTCCCCCTACTTATTCAAAAACTTTCCAAGGTCCGCCTCACGGT
Family	Poaceae		ATCCAAGTTGAAAGGGATAAGTTGAACAAGTATGGTCGTCCTTT
Genus	Paspalum		
Species	distichum		ATTGGGATGTACTATTAAACCAAAATTGGGATTATCCGCAAAAA
Identifier	Dr. P.S. Nagar		ATTACGGTAGAGCGTGTTATGAGTGTCTA
			rbcL F : ATGTCACCACAAACAGAGACTAAAGC
			rbcL R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram	
Identifier Institution	MSU Baroda		
Identification Method	Morphology and Barcoding	With a second second by and database a stability	Add have a bet which a second be served as defension of an ended a second second second second second second se
Voucher Status	Herbarium, Photographs		
Country	India	IN 20 IN 20 IN 20 IN 10	n 19 19 19 19 19 20 20 30 30 31 31 30 30 30 30 30 30 40 40 40 40 40 40 40 40 40 40 40 40 40
State	Gujarat		
Region	Vadodara		
Sector	Hami lake, Baroda	And the second second state of the state of	Rentedware Alternet Market and Antonio and Alternet and Antonio and Antonio and Antonio and Antonio and Antonio
Exact Site	Pond area		
Latitude	N 22° 20' 23.7"	Bustrative Barcode.	
Longitude	E 73° 13' 12.9"		
Elevation	105	252	517
Photographer	Krupa Unadkat		
В		536 	563

Details		Image	Sequence
Collection date	19th Oct, 2013		>TTGTAAAATCCAATCCACCGCGAAGACATTCATAACATGCTCTA
Identification	Ludvigia octavalvis		CCGTAGTTCTTAGCGGATAACCCTAATTTAGGTTTAATAGTACAT
Institution	Gujarat Biodiversity Gene Bank		CCCAATAGGGGACGGCCATACTTGTTCAACTTATCTCTCTC
Accession number	GENG233-14	THE READER SHE AND AND	TGGATACCATGAGGCGGTCCTTGGAAAGTTTTAGTATATGAAGG
Collection code	BG20131009-0011	CONTRACTOR OF A STATISTICS	AGGGATTCTCAGATCCTCCAGACGTAGAGCGCGCAGGGCTTTGA
			ACCCAAATACATTACCCACAATGGAAGTAAACATATTAGTAACAG
Collector	Krupa Unadkat		AACCTTCTTCAAAAAGGTCTAAAGGGTAAGCTACATAACAGATAT
Phylum	Magniliophyta		ATTGATTTTCTTCTCCAGCAACAGGCTCGATGTGGTAGCATCTTC
Class	Rosids	ALLIV CONTRACT AND C	CTTTATAACGATCAAGGCTGGTAAGCCCATCGGTCCACACAGTTG
Order	Mrtales		TCCAGGTACCAGTAGAAGATTCAGCAGCTACTGCAGCCCCTGCTT
Family	Onagraceae		
Genus	Ludwigia	A AAR AT AREA A CREED	CCTCAGCCGGAACTCCAGGTTGAGGAGTTACTCGGAATGCTGCC
Species	octavalvis	A DAY THE AND A	AAGATATCACTATCTTTGGTTTCATACTCAGGAGTATAATAAGTC
Identifier	Dr. P.S. Nagar		AGTCTATAATCTTTAACACCAGCTTTGAATCCAACACTTGCTTTAG
			TCTCTGTTTGTGGGTG
			rbcL F: ATGTCACCACAAACAGAGACTAAAGC
			rbcL R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram	
Identifier	MSU Baroda	The Real Real and Market Strategies and the real real real real real real real rea	al 19 Sec. No per section to the term and the term the term to the section and an are section when the term per term the
Institution		1	i indu e i
Identification	Morphology and Barcoding	rtical Scale	in the second
Method		The state of the s	a da katu ya kita kita kita kita kita kita kita kit
Voucher Status	Herbarium, Photographs	10 10 10 40 10 15 40 40 10 10 10 10 10 10 10 10 10 10 10 10 10	on Die zie Die zie zie zie zie zie zie zie zie zie z
Country	India	and The concerning of the concernence of the concerning of the concerning both and the concerning of t	
State	Gujarat		ومقربهما والمرابط المراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع
Region	Vadodara	rtical Scale	1. A Interes which mouse that he dole and the first state of the state of the state of the
Sector	Hami lake, Baroda	This is the produced and the second sec	NAKARAN MUMANAN MUMANA
Exact Site	Pond area	Bustrative Barcode:	
Latitude	N 22° 20' 22.9"		268
Longitude	E 73° 13' 12.1"		
Elevation	118		
Photographer	Krupa Unadkat	538	597
A	.L		
		-	
Details		Image	Sequence
Collection date Identification	20th Oct, 2013		>GCGAAGACATTCATAAACCGCTCTACCGTAGTTTTTAGCAGATA
Identification	Ipomoea aquatica Forssk. Gujarat Biodiversity Gene Bank		ACCCCAATTITGGTTTAATAGTACATCCCAACAGAGGACGACCAT
msutuuon	Gujarat brouversity Gene Bank		ACTTGTTCAATTTATCTCTCTCAACTTGGATACCATGAGGCGGGC

Details		Image	Sequence
Collection date	20th Oct, 2013		>GCGAAGACATTCATAAACCGCTCTACCGTAGTTTTTAGCAGATA
Identification	Ipomoea aquatica Forssk.		ACCCCAATTTTGGTTTAATAGTACATCCCAACAGAGGACGACCAT
Institution	Gujarat Biodiversity Gene Bank		ACTTGTTCAATTTATCTCTCTCAACTTGGATACCATGAGGCGGGC
Accession number	GENG234-14		CTTGAAAAGTTTTAATATAAGCCGTAGGGATTCGTAAATCTTCCA
Collection code	BG20131009-0012		GACGTAGAGCGCGCAGTGCTTTGAACCCAAATACATTACCCACA
Collector	Krupa Unadkat		ATGGAAGTAAACATGTTGGTAACAGAACCTTCTTCAAAAAGGTC
Phylum			TAAAGGGTAAGCTACATAAGCAATATATTGATCTTTTCTCCAAT
Class	Magniliophyta Magniliopsida		AACGCGCTCGATGCGGTAGCATCGCCCCTTGTACCGATCAAGGC
Order	Solanales		TGGTAAGTCCATCGGTCCACACAGTTGTCCATGTACCAGTAGAA
Family	Convolvulaceae		GATTCCGCAGCTACCGCGGCCCCTGCTTCTTCAGGCGGAACTCCG
Genus	Ipomoea		GGTTGAGGAGTTACTCGGAATGCTGCCAAGATATCAGTATCTTT
Species	aguatica		GGTTTCGTACTCAGGAGTATAATAAGTCAATTTGTAGTCTTTTAC
Identifier	Dr. P.S. Nagar		ACCAGCTTTGAATCCAACACTTGCTTTAGTCTCTGTTTGGGGGG
Identifier	bitt to ttagat		
			Rbcl F: ATGTCACCACAAACAGAGACTAAAGC
			rbcL R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram	
Identifier	MSU Baroda		240 226 256 270 258 256 350 255 320 356 340 325 360 275 358 290 466 450 456 466 469 468 476 466 476 566 5
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Method			the second second second second second second states and the second second second second second second second s
Voucher Status	Herbarium, Photographs	A second and a second advantage of the second advantage of the second advantage of the second advantage of the	
Country	India		
State	Gujarat	10 20 36 40 70 40 70 80 90 90 10 10 120 124 124 146 176 146 73 196 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 170 146 140 140 140 140 140 140 140 140 140 140	116 266 216 226 238 246 256 256 256 256 256 256 256 256 256 300 310 328 338 349 338 366 356 356 350 350 350 350 350 350 350 350 350 350
Region	Vadodara	411	
Sector	Hami lake, Baroda		
Exact Site	Pond area		and the second
Latitude	N 22° 20' 23.3"		
Longitude	E 73° 13' 12.8"	Bustrative Barcode:	248
Elevation	110		
Photographer	Krupa Unadkat	269	537
		538	577
B			

Details		Image	Sequence
Collection date	21st Oct, 2013	Part All All All All All All All All All Al	>ACAGAGACTAAAGCAAATGTTGGATTCAAAGCGGGTGTTAAA
Identification	Hygrophila polysperma (Roxb.)		AGTACAAATTGACTTATTATACTCCTGAATATGAAACCAAAGAT
	T.Anderson		CTGATATCTTGGCAGCATTCCGAGTAACTCCTCAACCGGGAGTT
Institution	Gujarat Biodiversity Gene Bank		CAGCTGAAGAAGCAGGGGCCGCGGTAGCTGCCGAATCTTCTAC
Accession number	GENG235-14	Carlos and the Part of the	GGTACATGGACAACCGTGTGGACCGATGGACTTACCAGCCTTG
Collection code	BG20131009-0013		TCGTTACAAAGGGCGATGCTACAACATTGAGCCCGTTCCTGGC
			AACCAGATCAATATATCTGTTATGTAGCTTACCCTTTAGACCCTT
Collector	Krupa Unadkat		TGAAGAAGGTTCTGTTACCAACATGTTTACTTCCATTGTAGGAA
Phylum	Magniliophyta	A STANDARD STANDER	
Class	Magniliopsida		TGTATTTGGGTTTAAAGCCCTGCGTGCTCTACGTCTGGAAGATC
Order	Lamiales		GCGAATCCCTGTTGCTTATGTTAAAACTTTCCAGGGTCCGCCTCA
Family	Acanthaceae		TGGGATCCAAAGTGAGAGAGAGATAAATTGAACAAGTATGGTCGT
Genus	Hygrophila		CTCTGCTGGGATGTACTATTAAACCTAAATTGGGGTTATCCGCT
Species	polysperma		AAAACTATGGTAGAGCGTGTTATGAATGTCTTCGC
Identifier	Dr. P.S. Nagar		
	23		rbcL F: ATGTCACCACAAACAGAGACTAAAGC
		1 / A COLORADOR PARTICIPATION COLORADOR	
			rbcL R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram	
Identifier	MSU Baroda	is in a property of a second a table in the second se	- Las 100 des 200 des des uns das tes des tes des des 100 des
Institution	moo baroad		
Identification	Morphology and Barcoding	I have a start of the second start of the second start at the second start of the seco	the bit over the small site is will district in the subment of the others, a subscree, the
Method	°	Department of the share of the second s	lii sonada hidin ishin yaa ayaa hadini kada ka kabina
Voucher Status	Herbarium, Photographs	The solution in the second sec	
Country	India		
State	Gujarat	Proved Scale (A. et A. et A. et A. et al. et a	(a) 20 Jay 25 Jay 36 Jay 30 (0) 58 (0) 38 (0) 38 (0) 38 (1) in 20 an
Region	Vadodara		
Sector	Hami lake, Baroda	1.	
Exact Site	Pond area	Dissignment of the second state of the second	more drive with the distance of a standard stand of the
Latitude	N 22° 20' 42.9"	Bustrative Barcode:	
Longitude	E 73° 13' 12.5"	•	24.0
Elevation	109		
Photographer	Krupa Unadkat		637
i notographer	Ridpa ondakat	534	
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Details		Image	Sequence
Collection date	25th Oct, 2013	A CARLES AND A C	>TGTTGTAAAAAAAAAAAAAAACACGCGTAGACATTCATAAACCG
Identification	Nolumbo pucifora Caorta		TCTACCCTA CTTCTTACCCCCATA ACCCCCA ATTTTCCTTTA ATA

Details		Image	Sequence	
Collection date	25th Oct, 2013	and the second	>TGTTGTAAAAAAAAAAAAAAAACACGCGTAGACATTCATAAACCGC	
Identification	Nelumbo nucifera Gaertn.		TCTACCGTAGTTCTTAGCGGATAACCCCAATTTTGGTTTAATAGT	
Institution	Gujarat Biodiversity Gene Bank		ACATCCCAATAGGGGACGACCATACTTGTTCAATTTATCTCTCTC	
Accession number	GENG236-14		AACTTGGATACCATGAGGTGGGCCTTGGAAAGTTTTAGAATAAG	
Collection code	BG20131009-0017		CAGGAGGGATTCGCAGATCCTCCAGACGTAGAGCACGTAGGGC	
			TTTGAACCCAAATACATTACCCACAATGGAAGTAAACATGTTAGT	
Collector	Krupa Unadkat		AACA GAA CCTTCTTC AAAAAGGTCTAAAGGGTAA GCTACATAAG	
Phylum	Magniliophyta		CAATAAATTGACTTTCTTCTCCAGCAACGGGCTCGATGTGGTAGC	
Class	Eucotyledon		ATCGTCCTTTGTAACGATCAAGGCTGGTAAGTCCATCGGTCCACA	
Order	Proteales	and the second	CAGTTGTCCATGTACCAGTAGAAGATTCGGCAGCTACCGCGGCC	
Family	Nelumbonaceae	and the second	CCTGCTTCCTCAGGTGGAACTCCAGGTTGAGG	
Genus	Nelumbo		CCIGCITCCICAGGIGGAACTCCAGGITGAGG	
Species	nucifera	A THE REAL PROPERTY AND A DECIMAL AND A	rbcL F: ATGTCACCACAAACAGAGACTAAAGC	
Identifier	Dr. P.S. Nagar			
			rbcL R : GTAAAATCAAGTCCACCRCG	
Identifier Email	dmagar@gmail.com	ABI Chromatogram		
Identifier	MSU Baroda	14 30 30 44 56 56 50 100 100 100 100 100 100 100 100 100	ON 240 250 260 270 260 251 260 261 270 270 270 270 270 270 270 270 270 270	
Institution				
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Method			<u>aa dada waxaa dada waxaa dada dada dada </u>	
Voucher Status	Herbarium, Photographs	-		
Country	India	16 28 38 40 30 40 78 38 50 108 118 128 138 130 100 176 158 298 206 216 220 2	210 240 270 260 270 201 270 201 270 201 220 220 220 230 240 270 201 270 201 270 400 400 420 420 420 420 470	
State	Gujarat		CONTRACTOR AND ADDRESS TO THE ACCOUNT OF THE ACCOUNT OF THE ADDRESS ADDR	
Region	Vadodara			
Sector	Hami lake, Baroda	أليف الفاقية متطلبين ويرجأن فرجينا المراجع	lands a prost of Aman All	
Exact Site	Pond area		MINING CONTRACTOR AND CONTRACT AND C	
Latitude	N 22° 20' 41.9" E 73° 13' 15.9"	Illustrative Barcode:		
Longitude		9 260		
Elevation	102			
Photographer	Krupa Unadkat	269	434	
В				
	'	'		

Details	1	Image	Sequence
Collection date	27th Oct, 2013		>ACAGAGACTAAAGCAGGTCTTGGGTTCAAAGCTGGCGTGAAAG
Identification	Vallisneria spiralis L.		TACAAATTGACTTATTATACGCCTGAATATGAAACCAAAGATACT
	and the second		
Institution	Gujarat Biodiversity Gene Bank		TATCTTGGCAGCATTCCGAGTCACTCCGCAACCTGGAGTTCCACC
Accession number	GENG237-14		AAGAAGCGGGGGCCGCAGTAGCTGCCGAATCCTCTACTGGTACA
Collection code	BG20131009-0019		GACAACTGTGTGGGACTGATGGGGCTTACTAGCCTTGATCGTTACAA
concentration court			
Collector	Krupe Upedket		GGACGATGCTACCACATCGAGCCCGTTGCCGGAGAGGAAGATCA
	Krupa Unadkat		ATATTGCTTATGTAGCTTATCCTTTAGACCTTTTTGAAGAAGGTTC
Phylum	Magniliophyta		
Class	Liliopsida	THE REPORT OF A	TTACCAACATGTTTACTTCCATTGTAGGTAATGTATTTGGGTTCAA
Order	Alismatales		CTCTACGAGCTTTACGCTTAGAGGATCTACGAATTCCTGCTGCTTA
			CCAAAACTTTTCAAGGTCCACCTCATGGAATTCAAGTTGAGAGAG
Family	Hydrocharitaceae	and for the second of the seco	
Genus	Vallisneria		AGATTGAACAAATATGGTCGTCCTCTATTGGGATGTACTATTAAA
Species	Spiralis		CAAACTGGGATTATCCGCGAAAAACTACGGTAGAGCAGTTTATG
Identifier			TGTCTA
Identifier	Dr. P.S. Nagar		IGICIA
			rbcL F: ATGTCACCACAAACAGAGACTAAAGC
			rbcL R GTAAAATCAAGTCCACCRCG
dantifi an Tarait	den anna Oannaille a m	A BI Characterization	1
Identifier Email	dmagar@gmail.com	ABI Chromatogram	
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institution	Construction Construction		A REAL OF A REAL PROPERTY OF A
Identification	Morphology and Barcoding		
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Voucher Status	Herbarium, Photographs		
Country	India		
State	Gujarat	orizontal Scale	
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Region	Vadodara		
Sector	MSU Arboratum		
Exact Site	Pond area	22	Anne electron control station, many way, and electrol states by the basic concerdent
Latitude	N 22° 19' 13.8"	Ilustrative Barcode:	
Longitude	E 73° 10' 48.1"		
Elevation	104		
Photographer	Krupa Unadkat		53
A			74
A		538	te
A			54
			te Sequence
Details		Timage	te. Sequence
Details Collection date	28th Oct, 2013		
Details Collection date	28th Oct, 2013 Equisetum ramosissimum		>ACAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA
Details			>ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT
<b>Details</b> Collection date Identification	Equisetum ramosissimum subsp. Debile		>ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTCGTATGACTCCGCAGCCGGGGGTA
Details Collection date Identification Institution	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank		>ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTCGTATGACTCCGCAGCCGGGGGTA
Details Collection date Identification Institution Accession number	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14		>ACAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTCGTATGACTCCGCAGCCGGGGGTA ACCGGAAGAAGCAGGAGCAGCTGTAGCTGCTGAATCCTCCAC
Details Collection date Identification Institution Accession number	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank		>ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTCGTATGACTCCGCAGCCGGGGGTA ACCGGAAGAAGCAGGAGCAGCTGTAGCTGCTGAATCCTCCACC GGCACCTGGACTACCGTATGGACAGACGGACTTACTAGTCTTG
Details Collection date Identification Institution Accession number	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14		>ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAA ATTATCGATTGACTTATTTTACCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTCGTATGATCCCGCAGCCGGGGGTA ACCGGAAGCAGCAGGAGCAGCTGTAGCTGCTGAATCCTCCAC GGCACCTGGACTACCGTATGGACAGGAGCTACTAGTCTT TCGATATAAAGGTCGCTGCTATAATATTGAGCCTGTTGCTGGA
Details Collection date Identification Institution Accession number Collection code	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14		>ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTCGTATGACTCCGCAGCCGGGGGTA ACCGGAAGAAGCAGGAGCAGCTGTAGCTGGCTGAATCCTCCAC GGCACCTGGACTACCGTATGGACAGACGGACTTACTAGTCTTG TCGATATAAAGGTCGCTGCTATATATTGAGCCTGTTGCTGGA AAGATAACCAATTCATAGCTTATGTAGCCTATCCTTTAGATCTT
Details Collection date Identification Institution Accession number Collection code Collector	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat		>ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTCGTATGACTCCGCAGCCGGGGGTA ACCGGAAGAAGCAGGAGCAGCTGTAGCTGGCTGAATCCTCCAC GGCACCTGGACTACCGTATGGACAGACGGACTTACTAGTCTTG TCGATATAAAGGTCGCTGCTATATATTGAGCCTGTTGCTGGA AAGATAACCAATTCATAGCTTATGTAGCCTATCCTTTAGATCTT
Details Collection date Identification Institution Accession number Collection code Collector Phylum	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat Pteridophyta		>ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTCGTATGACTCCGCAGCCGGGGGTA ACCGGAAGAAGCAGGAGCAGCGTGTAGCTGGCTGAATCCTCCAC GGCACCTGGACTACCGTATGGACAGACGACCTTACTAGTCTTG TCGATATAAAGGTCGCTGCTATATATTGAGCCTGTTGCTGGA AAGATAACCAATTCATAGCTTATGTAGCCTATCCTTAGATCTT TGAAGAAGGTTCTGTTACCAATATGTTTACTTCAATTGTTGGTA
Details Collection date Identification Institution Accession number Collector code Collector Phylum Class	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat Pteridophyta Equisetopsida		>ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTCGTATGACTCCGCAGCCGGGGGTA ACCGGAAGAAGCAGGAGCAGCTGTAGCTGCTGAATCCTCCAC GGCACCTGGACTACCGTATGGACAGACGGACTTACTAGTCTTC TCGATATAAAGGTCGCTGCTATAATATTGAGCCTGTTGCTGGA AAGATAACCAATTCGTTACTATATATGAGCCTATCGTTGAGTGT TGAAGAAGGTTCTGTTACCAATATGTTACTTCAATTGTTGGTA TGTTTTCGGCTTCAAAGCTCTACGTTTACGTTTAGAAGATT
Details Collection date Identification Institution Accession number Collector code Collector Phylum Class	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat Pteridophyta		>ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTCGTATGACTCCGCAGCCGGGGGTA ACCGGAAGAAGCAGGAGCAGCTGTAGCTGCTGAATCCTCCAC GGCACCTGGACTACCGTATGGACAGACGGACTTACTAGTCTTC TCGATATAAAGGTCGCTGCTATAATATTGAGCCTGTTGCTGGA AAGATAACCAATTCGTTACTATATATGAGCCTATCGTTGAGTGT TGAAGAAGGTTCTGTTACCAATATGTTACTTCAATTGTTGGTA TGTTTTCGGCTTCAAAGCTCTACGTTTACGTTTAGAAGATT
Details Collection date Identification Institution Accession number Collection code Collector Phylum Class Order	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat Pteridophyta Equisetopsida		>ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTCGTATGACTCCGCAGCCGGGGGTA ACCGGAAGAAGCAGGAGCAGGCCGTAGCTGGCTGAATCCTCCAC GGCACCTGGACTACCGTATGGACAGACGGACTTACTAGTCTTC TCGATATAAAGGTCGCTGCTATATATTGAGCCTGTCGTGA AAGATAACCAATTCATAGCTTATGTAGCCTATCCTTTAGATCTT TGAAGAAGTTCCTGTTACCAATTGTTTACTTCAATTGTTGGTA TGTTTTCGGCTTCAAAGCTCTACGGCTTTACGTTAGAAGATT CGAATTCCTCCTGCTTATCTAAAACTTTTATGGACCGCCCCCA
Details Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat Pteridophyta Equisetopsida Equisetales Equisetaceae		>ACAGAGAGACTAA AGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTGTATGATAGAACCCAGGGGGTA ACCGGAAGCAAGCAGGAGCAGCTGTAGCTGCGGACCCTGCAGC GGCACCTGGACTACCGTATGGACAGCAGGACCTACTAGTCTT TGGATATAAAGGTCGCTGCTATGGACAGCAGCGCCTTACTATCTTGGTA AAGATAACCAATTCATAGCTTATGTAGCCTATCCTTTAGATCTT TGAAGAAGGTTCGTTACCAATATGTTACTTCAATTGTTGGTA TGTTTTCGGCTTCAAAGCTCTACGTGCTTTACGTCATGCTTAGAAGAT CGAATTCCTCCTGCTTATCTAAACTTTTATGAGACCGCCCCC GTATCCAGGTTGAAAGAGATAAGTTAAACAAATATGGTCGTCC
Details Collection date Identification Institution Accession number Collector Collector Phylum Class Order Family Genus	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat Pteridophyta Equisetopsida Equisetales Equisetaceae Equisetaceae Equisetum		>ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTCGTATGACTCGCAGCCGGGGGTA ACCGGAAGCAGCAGGAGCAGCTGTAGCTGCAGCCGGCGCG GGCACCTGGACTACCGTATGGACAGACGGACTTACTAGTCTTC TCGATATAAAGGTCGCTGCTAGAAGACGACCTACTAGTCTTT TGAAGAAGGATCTGTTACCAATATGTAGCCTATCCTTTAGATCTT TGAAGAAGGTCTCGTTACCAATATGTTACCTTCAGATGATT CGAATCCCCGCTGCTATCCAAAGCTCATAGGACCGCCCCAC GTATCCCCGGTTGAAAGAGATAAGTTAAACAAATATGGGCCCCCCCAC TTATTAGGTTGACAATTAAACCAAAATTGGGACTTTCGCTAA
Details Collection date Identification Institution Accession number Collector code Collector Phylum Class Order Family Genus Species	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat Pteridophyta Equisetopsida Equisetales Equisetales Equisetum ramosissimum subsp. Debile		>ACAGAGAGACTAA AGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCATTTGTATGATAGAACCCAGGGGGTA ACCGGAAGCAAGCAGGAGCAGCTGTAGCTGCGGACCCTGCAGC GGCACCTGGACTACCGTATGGACAGCAGGACCTACTAGTCTT TGGATATAAAGGTCGCTGCTATGGACAGCAGCGCCTTACTATCTTGGTA AAGATAACCAATTCATAGCTTATGTAGCCTATCCTTTAGATCTT TGAAGAAGGTTCGTTACCAATATGTTACTTCAATTGTTGGTA TGTTTTCGGCTTCAAAGCTCTACGTGCTTTACGTCATGCTTAGAAGAT CGAATTCCTCCTGCTTATCTAAACTTTTATGAGACCGCCCCC GTATCCAGGTTGAAAGAGATAAGTTAAACAAATATGGTCGTCC
Details Collection date Identification Institution Accession number Collector code Collector Phylum Class Order Family Genus Species	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat Pteridophyta Equisetopsida Equisetales Equisetaceae Equisetaceae Equisetum		ACAGAGAGACTAA AGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTAATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCACTTACGATGCCGCGCGCGGGGTA ACCGGAAGAAGCAGGAGCAGCTGTAGCTGCTGGAATCCTCCAC GGCACCTGGACTACCGTATGGACAGACGGACTTACTAGTCTTC TCGATATAAAGGTCGCTGCTATATATTGAGCCCGTCGTGATGGAC AAGATAACCAATTCGATACTATAGTAGCCTATCCTTTAGATCTT TGAAGAAGGTTCTGTTACCAATAGTTTACTTCAATTGTTGGTA TGTTTTCGGCTTCAAAGCTCTACGGTCTTAAGAGACTTACGTTAGAAGATT CGAATTCCTCCTGCTTATTCTAAAACTTTTAAGGACCGCCCCA GTATCCAGGTTGAAAGAGATAAGTTAAACAAATATGGTCGTCC TTATTAGGTTGTAACAATTAAACCAAAATTGGGACTTTCTGCTAA AACTATGGTAGAAGCGTGTTAACAAATTGGGACTTTCTGCTAA
Details Collection date	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat Pteridophyta Equisetopsida Equisetales Equisetales Equisetum ramosissimum subsp. Debile		>ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGGATTTCGATGACTCGCAGCCGGGGGTA ACCGGAAGCAGCAGGAGCAGCTGTAGGCTGCGCAGCCGGGGGTA CGGCACCTGGACTACCGTATGGACAGACGGACTTACTAGTCTTG TCGATATAAAGGTCGCTGCTATGTAGACGCACTACTAGTCTTT TGAAGAAGGATCTGTTACCAATATGTTGACCTATCGTTAGAAGAT TGTTTCGGCTTCAAAGCTCATAGTCTTCATGGTA TGTTTCGCGCTTCAAAGCTCATGTTAGAAGATT CGAATCCCCGGTTGAAAGAGATAAACTTTAAAGGACCGCCCCA GTATCCAGGTTGAAAGAGATAAGTTAAACAAATATGGGCCTCTCGTAA
Details Collection date Identification Institution Accession number Collector code Collector Phylum Class Order Family Genus Species	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat Pteridophyta Equisetopsida Equisetales Equisetales Equisetum ramosissimum subsp. Debile		ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTAATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCAGTTTCGTATGACTCCCACGCGGGGGTA ACCGGAAGAAGCAGGAGCAGCTGTAGCTGCTGGACGACCTGCGGACTACCTCACGTATGGACGACGACGACGACGACTACTGAGCTGT CGATATAAAGGTCGCTGCTATGAACGGACTACTGAGCCTG TCGATATAAAGGTCGCTGCTGACTGACCGACCTACTGGGAC AAGATAACCAATTCGATAGTGTACCCTATCGTGAG AGAGTAACCAATTCGTACATATGTGACCTATCGTGAGAC GGCACCTGGCTTCAAAGCTCACGGCTTACGTTAGAGCTT CGAATACCCAATCGTTACCATATGTGACCTTTCGGAC GGCATCCCTGCTGCTTACCGTCTAGGCTGCCCCAC GTATCCAGGTTGAAAGGAATAAGTTAAACAAATATGGCGTCCC TTATTAGGTTGTACAATTAAACCAAAATTGGGACTTTCTGCTAA AACTATGGTAGAAGCTGTTATGAAGTCT
Details Collection date Identification Institution Accession number Collector code Collector Phylum Class Order Family Genus Species	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat Pteridophyta Equisetopsida Equisetales Equisetales Equisetum ramosissimum subsp. Debile		ACAGAGAGACTAA AGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTAATTTTACTCCAGATTTAGAAACCAAAGAT CGATATTTTAGCAGCATTTCGTATGACTCCGCAGCCGGGGGTA ACCGGAAGAAGCAGGAGCAGCTGTAGGCTGCTGGAATCCTCCAC GGCACCTGGACTACCGTATGGACAGACGGACTTACTAGTCTTC TCGATATAAAGGTCGCTGCTATGATGCGCGCTGTAGAACCTTACTGCTGGA AAGATAACCAATTCATAGCTTATGTAGCCTATCCTTTAGATCTT TGAAGAAGGTTCTGTTACCAATATGTTGACCCTATCCTTTAGATCTT CGAATTCCTCGTCTTACCAATATGTTACGTCAGATTCCTCCAA GTTTCCGGCTTCCAAAGCTCACGTGCTTTAGAAGATT CGAATTCCCCTGCTTATCTACGTCTTAGAAGATT CGAATTCCCCGGCTTACAAGCTCTTTAGAGCCCCCA GTACTCCGGGTTGAAAGAGATAAGTTAAACAAATATGGTCGTCC TATTAGGTTGTACAATAAGCAAAATTGGGACTTTCTGCTAA AACTATGGTAGAGCTGTTTATGAAGGACTCACT TbcL F: ATGTCACCACAAACAGAGACCTAAAGC
Details Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat Pteridophyta Equisetopsida Equisetales Equisetales Equisetum ramosissimum subsp. Debile		ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTAATTTTACTCCAGATTATGAAACCAAAGAT CGATATTTTAGCAGCACTTATGATACCCCAGCCGGGGGTA ACCGGAAGAAGCAGGAGCAGCTGTAGCTGCTGGAATCCTCCAC GGCACCTGGACTACCGTATGGACAGACGGACTTACTAGTCTTC TCGATATAAAGGTCGCTGCTAATGAACGGACCTACTAGTCTTC TGAAGAAGGTTCTGTTACTAATATTGAGCCTGTTCGGTA AAGATAACCAATTCGATACTATAGTGTACCTTTCGATCTT TGAAGAAGGTTCTGTTACCAATAGTTTACTTCAATTGTTGGTA TGTTTTCGGCTTCAAAGCTCTACGGTCTTAAGAGACTT CGAATTCCTCCTGCTTATTCTAAAACTTTTAAGGACCGCCCCA GTATCCAGGTTGAAAGAGATAAGTTAAACAAAATATGGTCGTCC TTATTAGGTTGTACAATTAAACCAAAATTGGGACTTTCTGCTAA AACTATGGTAGAAGCTGTTATGAAGGTCT
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Details Collection date identification institution Accession number Collector Phylum Class Order Family Genus Species identifier institution identifier institution identification Method Voucher Status	Equisetum ramosissimum subsp. Debile Gujarat Biodiversity Gene Bank GENG238-14 BG20131009-0020 Krupa Unadkat Pteridophyta Equisetopsida Equisetales Equisetales Equisetales Equisetales Dr. P.S. Nagar dmagar@gmail.com MSU Baroda	ABI Chromato gram	ACAGAGAGACTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTAAAGCAGGTGTTGGATTTAAAGCTGGTGTTAAA ATTATCGATTGACTTATGATCCCAGATTAGAAACCAAAGAT CGATATTTTAGCAGGAGTATTGATGACCCCGCGCGCGGGGTA ACCGGAAGCAAGCAGGAGCAGCTGTAGGACGGACTTACTAGTCTTG GGCACCTGGACTACCGTATGGACAGACGGACTTACTAGTCTTG TCGATATAAAGGTCGCTGCTGTAGACGCAGCCTATCTATGTTGCTGGTA AAGATAACCAATTCATAGCTTATGTAGCCTATCTTTAGAAGATT CGATGTTCGCGCTTCAAAGCTCATAGTGTTAGAAGATT CGATGCTCCCTGCTTGTTACCAATATGTTACTTCAATGGTTGGT
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### **PLATE 30**

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N 22° 18' 36.6"

E 73° 11' 10.6"

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Institution       Gup at Bookersity Gene Bank         Accession number       Genesity Construction         Collector       Res30121-2003         Callector       Krupa Unadkat         Phylin       Magnologiyra         Classics       Lingpida         Poales       Poales         Family       Poales         Callector       Change Construction Constru
Accession number Gelicetion code       Bio20131121-0001         Callection code       Bio20131221-0001         Callection code       Bio2013122-0001         Callection code       Callection code         Callection code       Code code code code code code code code c
Collection code       B620131121-0001         Collection code       Krupa Unadia:         Phylum       Magnoliphy ta         Class       Ulippida         Order       Poales         Family       Poaceae         Genus       Chioris         Species       Dorbotic         Dorbotic       Dr. P.S. Nager         Lifemifier       Dr. P.S. Nager         Lifemifier       Dr. P.S. Nager         Lifemifier       Dr. P.S. Nager         Lifemifier       MSU Boroda         Vecdor Status       All Chormato gram         Lifemifier       MSU Boroda graft         Method       Morphology and Barcoding         Method       Morphology and Barcoding         All Chormato gram       Institution         Latitude       F.215 Neger         All Chormato gram       Institution         Levacion       Species         Poales       Species
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Callector       Kurga Lundkat         Phylum       Magnelophyla         Class       Liloptida         Order       Poales         Family       Poales         Gruss       Choris         Species       bardets         Gruss       Choris         Species       bardets         Benifier       Dr. P.S. Nagar         Ministration       Morphology and Barcoling         Mendadia       Morphology and Barcoling         Method       Morphology and Barcoling         Method       Morphology and Barcoling         Voider State       Guidata         State       Guidata         Callection       Guidata         Region       Vaddata         Sector       Morphology and Barcoling         Multipuid       Cross Table State         Country       India         Region       Vaddata         Sector       MSU Borolag gardie         Photographer       Kurpa Unadkat         Region       Vaddata         Sector       MSU Borolag gardie         Photographer       Kurpa Unadkat         Region       Species         State       Guidata
Phylum         Magnolophysa           Class         Ulopsida           Order         Poles           Family         Pozese           Gruns         Chloris           Species         Databas           Data         Chloris           Species         Data Chloris           Bendifier         Dr. P.S. Negar           Identifier         Dr. P.S. Negar           All         AB Chormato gram           All         AB Chormato gram           Identifier Email         dmagar@gmail.com           Identifier Email         Magar@gmail.com           Identifier Email         Morphology and Barcoding           Method         Worburd gram           Void-of Status         Herbarium, Photographic           Collection date         Calatistic Character Calacter Calacter Calatistic Character Calacter Cala
Phytom         Magnolophyto           Class         Uliopsida           Order         Poaceae           Gauss         Chloris           Species         Darbat           Derbiting         Dr. P.S. Nagar           Identifier         Dr. P.S. Nagar           Identifier         MSU Boroca           Identifier         NSU Boroca           Identifier         MSU Boroca           Identifier         Norphology and Barcodrag           State         State           State         Pord area           State         Pord area           Identifier         Nagar           Instable         Pord area           State         State           Collection date         State
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Order     Pueles       Family     Poecese       Grund     Poecese       Grund     Choins       Species     borbots       Jamily     Dr.P.S. Negar       Grund     dimagrigumaticom       Grund     dimagrigumaticom       Idemtifier     Dr.P.S. Negar       Grund     dimagrigumaticom       Idemtifier     MSU Baroda       Institution     MSU Baroda       Institution     Morphology and Barcoding       Weichord     Morphology and Barcoding       Method     Morphology and Barcoding       Method     Norphology and Barcoding       Method in     Norphology and Ba
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Identifier       Dr. P.S. Nagar       AT         Identifier       Imager@gmail.com       AE         Identifier       MSU Baroda       AB (Chermato gram         Identifier       MSU Baroda       AB (Chermato gram         Identifier       MSU Baroda       AB (Chermato gram         Identifier       Morphology and Barcoding       AB (Chermato gram         Vacucher Status       Herbariun, Photographs       AB (Chermato gram         Country       India       India       India         State       Gujarat       Region       Vadofara         Sector       MSU Botonical gradem       India       India         Laminde       722 70 '228''       India       India         Longitude       722 '10'228''       India       India         Laminde       722 '10'228''       India       India         Restorio       221       India       India       India         Photographer       Krupa Unadkat       India       India       India         Advectorio code       Guiaria Botomeritical Materia       India       India       India         Advectorio code       Guiaria Botomeritical Materia       India       India       India         Laminde <td< td=""></td<>
Animalian       Animalian         Animalian       Animalian         Identifier       Image/@gmail.com         Identifier       MSU Baroda         Institution       Morphology and Barcoding         Veched       Morphology and Barcoding         Voncher Status       Herbarium, Photographs         Country       India         State       Pond area         Laminude       N22 202.5°         Evention       Moudoaria         Sector       MSU Bonola (ag ard)         Evention       N22 202.5°         Longitude       F.23' 13' 12.3°         Elevation       N22 202.5°         Evention       Kupa Unadkat         Ad       The second         Descrite       Specode (ag den laminutation)         Specode (ag den laminutation)       Specode (ag den laminutation)         Ad       The seconde         Elevation on the seconde       Specode (ag den laminutation)         Specode (ag den laminutation)       Specode (ag den laminutation)         Ad       Tataconstructure (ag den laminutation)       Tataconstructure (ag den laminutation)         Ad       Tataconstructure (ag den laminutation)       Tataconstructure (ag den laminutation)         Specode (ag den laminu
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Identifier Email     dmagar@gmail.com       Identifier     MSU Baroda       Isstitution     Identification       Identification     Morphology and Barcoding       Wethed     Worker State       Gujarat     Gujarat       Region     Vadodara       Sector     MSU Boroda       Latitude     N 22' 20' 22.8"       Latitude     N 22' 20' 22.8"       Latitude     N 22' 20' 22.8"       Elevation     121       Photographer     Kupa Unadkat       Addition     Gujarat Bodynethy Gene Bank       Addition     Gujarat Bodynethy Gene Bank       Addition     Gujarat Bodynethy Gene Bank       Addition     Scional Contraction
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Identifier Email     dmagar@gmai.com       Identifier     MSU Baroda       Isstitution     Identification       Method     Morphology and Barcoding       Wetched State     Gujarat       Region     Vadodara       Sector     MSU Boroda       Latitude     N 22' 20' 22.8'       Photographer     Krupa Unadkat       Photographer     Krupa Unadkat       Addition     Gejarat Ial       Addition     Science       Addition     N 22' 20' 22.8'       Latitude     N 22' 20' 22.8'       Collection det     21st Nov, 2013       Collection cell     Science       Addition     Science<
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Identification       Morphology and Barcoding         Method       Morphology and Barcoding         Method       Morphology and Barcoding         Voucher Status       Herbarium, Photographs         Country       India         State       Gujarat         Region       Vadodara         Sector       MSU Botonical garden         Exact Site       Pond area         Latitude       N22' 20' 22.8°         Elevation       121         Photographer       Krupa Unackat         A       A         Defails       Spirodela polymhiza         Collection date       21st Nov, 2013         Itentification       Spirodela polymhiza         Guigarta Bodiversity Gene Bark       Genesaria         Collection date       Clickica Accuration (L)         Schled.       Guigarta Bodiversity Gene Bark         Collection date       Clickica Calcettor Accuration (L)         Spirodela polymhiza       Chi         Phylum       Magartales         Family       Aracesas Genesa Calcettor Acuration (L)         Spirodela       Spirodela         Spirodela       Polymhiza         Collectorio       Krupa Unackat         Phylum
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Country       India         State       Gujarat         Region       Vadodara         Sector       MSU Botonical garden         Exact Site       Pond area         Latitude       N 22° 20° 22.8"         Longitude       E 73° 13° 12.3"         Elevation       121         Photographer       Krupa Unadkat         A       Sector         Ocalit       Collection date         Collection date       21st Nov. 2013         Goldection date       21st Nov. 2013         Collection date       21st Nov. 2013         Goldection code       B620131121-0003         Collector       Krupa Unadkat         Phylum       Magnolophyta         Ulapsida       Order         Phylum       Magnolophyta         Class       Ulapsida         Order       Anaceae         Species       polyritiza         Species       polyritiza         Species       polyritiza         Species       polyritiza         Mentifier       MSU Baroda         Mentifier       MSU Baroda         Mentifier       MSU Baroda         Mentifier       MSU Baroda
State       Gujarat         Region       Vadodara         Sector       MSU Botonical garden         Exact Site       Pond area         Latitude       N.22' 20' 22.8"         Longitude       F.3' 13' 12.3"         Elevation       121         Photographer       Krupa Unadkat         A       State         Collection date       21st Nov, 2013         Guigat Biodiversity Gene Bank       Gigat Biodiversity Gene Bank         Accession number       Giografi Biodiversity Gene Bank         Gollection code       Regolight         Gollection code       Regolight         Gollection code       Regolight         Gollection code       Soundkat         Phylim       Magenolophyla         Libeyida       Image         Species       Spinodela         Spinodela       Spinodela         Species       Spinodela         Species       Diversida         Methification       Morphology and Barcoding <td< td=""></td<>
State       Gujarat         Region       Vadotara         Sector       MSU Botonical garden         Exast Site       Pond area         Latitude       N.22° 02.28"         Longitude       E.73° 13' 12.3"         Elevation       121         Photographer       Krupa Unadkat         A       State         Collection date       21st Nov. 2013         Itanitude       Schindi         State       Schindi         Schindi
Region       Vadodara         Sector       MSU Botonical garden         Exact Site       Pond area         Latitude       N 22* 20* 22.8"         Longitude       E 73* 13* 12.3"         Elevation       121         Photographer       Krupa Unadkat         A       Sector         Collection date       21st Nov, 2013         Institution       Spirodela         Spirodela       polyritica         Collector       Krupa Unadkat         Phytum       Gigarat Bodiversity Gene Bank         Collector       Krupa Unadkat         Phytum       Magnolophyta         Class       Directee         Spirodela       Spirodela         Spirodela       Spirodela         Magnolophyta       Luis         Collector       Krupa Unadkat         Phytum       Magnolophyta         Class       Spirodela         Spirodela       Spirodela     <
Sector       MSU Botonical garden         Exact Site       Pond area         Latitude       N 22' 80' 22.8"         Longitude       E 73' 13' 12.3"         Elevation       121         Photographer       Krupa Unadkat         A       Sector         Ordatis       Collection date         Collection date       21st Nov, 2013         Identification       Spirodelo         Spirodelo       polyant Bodoversity Gene Bank         Collection code       BG20131121-0003         Collection code       BG20131121-0003         Collection code       BG20131121-0003         Collection date       Dr. P. S. Nagar         Mathematical       AACTCACGTACAAAACATCATACATACACAAGAGCCTACAAGAGCCTACAAGCCTCCAAAGCACATCCTACAAGCACATACAT
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EXact Stile       Poind area         Latitude       N22*02 22.8"         Longitude       E73*13'12.3"         Elevation       121         Photographer       Krupa Unadkat         Photographer       Krupa Unadkat         Collection date       21st Nov, 2013         Identification       Spirodela         Spirodela       polymhiza         Collection code       BG20131121-0003         Collector       Krupa Unadkat         Phylum       Magarolophyka         Tasis       Liliopsida         Conference       Autocastrates         Panily       Spirodela         Spirodela       Polymiza         Collection code       BG20131121-0003         Collector       Krupa Unadkat         Phylum       Magarolophyka         Tasis       Liliopsida         Order       Alistatales         Spirodela       Spirodela         Spirodela       Spirodela         Bistution       Magarogenal         Racession number       GENOS22-14         Genass       Spirodela         Species       Polyminia         Halimateles       Genass         Spolidela
Longitude       E 73* 13' 12.3"         Elevation       121         Photographer       Krupa Unadkat         A       Sequence         Collection date       2151 Nov, 2013         Identification       Spirodela         Spirodela       polymhica         Collection code       B620131121-0003         Collection adate       215 Nov, 2013         Identifier       Markets         Phylum       Magnoliophyta         Uliopsida       Uliopsida         Spirodela       Spirodela         Spirodela       Polyta         Collection code       B620131121-0003         Collection       Krupa Unadkat         Phylum       Magnoliophyta         Uliopsida       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela
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Elevation       121         Photographer       Krupa Unadkat         Photographer       Krupa Unadkat         A       Image         Collection date       21st Nov, 2013         Identification       Spirodela polymhra (L)         Schied.       Spirodela polymhra (L)         Collection code       GG0121121-0003         Collection code       GENG372-14         Bd20131121-0003       Collection code         Collection code       GC01231121-0003         Collection code       Gendatt         Phylum       Magnoliophyta         Phylum       Magnoliophyta         Chile       Dr. P.S. Nagar         Identification       Morphology and Barcoding         Method       Morphology and Barcoding
Photographer       Krupa Unadkat       536         A       201       536         B       201       536         B       201       536         A       201       536         B       201       536         B       201       536         A       201       536         A       536       536
Advice     253       Advice     254       Collection date     21st Nov, 2013       Identification     Spirodela       Spirodela     polymhiza       Accession number     Genvart Biodiversity Gene Bank       Accession number     Genvart Biodiversity Gene Bank       Collection code     Boxinitication       Gollection code     Boxinitication       Gollector     Krupa Unadkat       Phylum     Magnoliophyla       Class     Ulliopsida       Order     Airacaasar       Species     polymhiza       Identifier     Dr. P.S. Nagar       Abit Chromatogram       Abit Chromatogram       Abit Chromatogram       Abit Chromatogram
Details       Sequence         Collection date       21st Nov, 2013         Identification       Spirodela         Schield.       Spirodela         Institution       Gujarat Bodiversity Gene Bank         Accession number       GENG372-14         Collector       Krupa Unadkat         Phylum       Magnoliophyta         Ullopsida       Order         Order       Alimatales         Family       Araceae         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Species       polyminiza         Identifier       Dr. P.S. Nagar         Identifier       MSU Baroda         Institution       Morphology and Barcoding         ABI Chromatogram       ABI Chromatogram
Details       Sequence         Collection date       21st Nov, 2013         Identification       Spirodela         Schield.       Spirodela         Institution       Gujarat Bodiversity Gene Bank         Accession number       GENG372-14         Collector       Krupa Unadkat         Phylum       Magnoliophyta         Ullopsida       Order         Order       Alimatales         Family       Araceae         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Species       polyminiza         Identifier       Dr. P.S. Nagar         Identifier       MSU Baroda         Institution       Morphology and Barcoding         ABI Chromatogram       ABI Chromatogram
Details       Sequence         Collection date       21st Nov, 2013         Identification       Spirodela         Schield.       Spirodela         Institution       Gujarat Bodiversity Gene Bank         Accession number       GENG372-14         Collector       Krupa Unadkat         Phylum       Magnoliophyta         Ullopsida       Order         Order       Alimatales         Family       Araceae         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Spirodela       Spirodela         Species       polyminiza         Identifier       Dr. P.S. Nagar         Identifier       MSU Baroda         Institution       Morphology and Barcoding         ABI Chromatogram       ABI Chromatogram
Collection date       21st Nov, 2013         Identification       Spirodela       polymbiza         Linstitution       Gujarat Biodiversity Gene Bank         Accession number       GENG372-14         Collector       Krupa Unadkat         Phylum       Magnolophyta         Lillopsida       Order         Order       Alismatales         Family       Aracease         Spirodela       polymhiza         Class       Dirotacacacacacacacacacacacacacacacacacacac
Collection date       21st Nov, 2013         Identification       Spirodela       polymbiza         Linstitution       Gujarat Biodiversity Gene Bank         Accession number       GENG372-14         Collector       Krupa Unadkat         Phylum       Magnolophyta         Lillopsida       Order         Order       Alismatales         Family       Aracease         Spirodela       polymhiza         Class       Dirotacacacacacacacacacacacacacacacacacacac
Collection date       21st Nov, 2013         Identification       Spirodela       polymbiza         Linstitution       Gujarat Biodiversity Gene Bank         Accession number       GENG372-14         Collector       Krupa Unadkat         Phylum       Magnolophyta         Lillopsida       Order         Order       Alismatales         Family       Aracease         Spirodela       polymhiza         Class       Dirotacacacacacacacacacacacacacacacacacacac
Collection date       21st Nov, 2013         Identification       Spirodela       polymbiza         Linstitution       Gujarat Biodiversity Gene Bank         Accession number       GENG372-14         Collector       Krupa Unadkat         Phylum       Magnolophyta         Lillopsida       Order         Order       Alismatales         Family       Aracease         Spirodela       polymhiza         Class       Dirotacacacacacacacacacacacacacacacacacacac
Identification       Spiradela       polynthiza       (L)         Schleid       Gujarat Biodiversity Gene Bank       GGATCTACTTATTATACTCCTGAGTAGAGACAAAAGATA         Accession number       GENG372-14       GGACCTGAAGAGGGGGCTGCAGTAGCACCGCGAGTACCCCCTGAGTACCCCTTACT         Collector       Krupa Unadkat       Phylum       Magnoliophyta         Class       Uliopsida       Garatales       GGATCTATTGGAGTACACACTGTGGAGTCACCCTTAGGAGCTGCCGATACCCCCCTCAGGTGTGAGCAGCGGCCGCCCCCCCC
Schleid.       Gijarat Biodiversity Gene Bank         Accession number       GEN0372-14         BG20131121-0003       BG20131121-0003         Collector       Krupa Unadkat         Phylum       Magnoliophyta         Class       Lilopsida         Order       Alismatales         Family       Araceae         Genus       Spirodela         Species       polyrrhiza         Identifier       Dr. P.S. Nagar         Identifier       MSU Baroda         Identifier       MSU Baroda         Method       Morphology and Barcoding
Institution       Gujarat Biodiversity Gene Bank Accession number       GENG372-14 GENG372-14 BG20131121-0003       CACCTGAAGAAGCAGGGCTGCAGTAGCTGCGAATCGTACCAGCCGTTGTAGAG GGACCATCGACCAATGGACCAATCGTACCAATCGAACCCGTTGTAGAG AGGAAATCAATGGATGCTAACCATGTTGCGACTGAGGACTAACCCGTTGTAGACCAT TCGTTACAAAGGCGATGCTAACCATGTTGCGACTGAGGACTAACCCGTTGTAGAGCT AGGAAATCAATATATTGCTATGTAGCTTACCACCTTTAGACCTTT TGAAGAAGGCTTCGTTACTAACATGTTTACTACCATGTTGAGGACT CGTACCAAAGGACCAACTGGATGCAACCCGTTGGAAGATT GGAATCCTCCTGCTGCTTACTAACATGTTTACCAAGCCCGTTGGAAGAT GGGATCCCTGCTGCTTACTAACAAGGTTTACCAAGCCCACCTCAA GGGATCCCTCCTGCTGCTTACTAACAAGGTTTACCAAGCGACTAACTGGAGATTA GGGATCCCCCGCTCATGGAGGAGGACGAACCAAAATTGGAACTAAGGTTTCCAAGGCCCACCTCAA GGGATCCCACGCTGCAGGAGGACTAAAATTGGAACAAGATTGGACTTACCGGAA AAACTACGGATGAACACCAAAAATTGGAACAAATTGGGATTACCGGCAA AAACTACGGATGAACACCAAAAATGGGATTACCACCACCACAA AAACTACGGATGAACACAAAACCAAAATTGGAACTAAGCC rbcL R:GTAAAATCAAGGCCACCCACC Identifier         Murphology and Barcoding       AB1 Chromatogram
Accession number Collection code       GENG372-14 BG20131121-0003       Difference         Collection code       Krupa Unadkat         Phylum       Magnoliophyta         Class       Lilopsida         Order       Alismatales         Family       Araceae         Genus       Spirodela         Species       polynthiza         Identifier       Dr. P.S. Nagar         Identifier       MSU Baroda         Identifier       MSU Baroda         Morphology and Barcoding       ABI Chromatogr am
Collection code       BG20131121-0003         Collector       Krupa Unadkat         Phylum       Magnoliophyta         Class       Liliopsida         Order       Alismatales         Family       Araceae         Genus       Spirodela         Species       polyrrhiza         Identifier       Dr. P.S. Nagar         Identifier       MSU Baroda         Identifier       MSU Baroda         Identifier       MSU Baroda         Morphology and Barcoding       ABI Chromatogram
Collector       Krupa Unadkat         Phylum       Magnoliophyta         Class       Liliopsida         Order       Alismatales         Family       Araceae         Spirodela       Spirodela         Species       polyrthiza         Identifier       Dr. P.S. Nagar         Identifier       MSU Baroda         Identifier       MSU Baroda         Identifier       MSU Baroda         Indentifier       Morphology and Barcoding         Method       Morphology and Barcoding
Contector       Mulpio Unlackat         Phylum       Magnoliophyta         Class       Liliopsida         Order       Alismatales         Family       Araceae         Genus       Spirodela         Species       polyrthiza         Identifier       Dr. P.S. Nagar         Identifier       MSU Baroda         Identifier       MSU Baroda         Identifier       MSU Baroda         Institution       Morphology and Barcoding         Method       Morphology and Barcoding
Phylum       Magnoliophyta         Class       Liliopsida         Order       Alismatales         Family       Araceae         Genus       Spirodela         Species       polytrhiza         Identifier       Dr. P.S. Nagar         Identifier       MSU Barcoda         Identifier       MSU Barcoda         Identifier       MSU Barcoda         Identifier       Morphology and Barcoding
Class       Liliopsida         Order       Alismatales         Family       Araceae         Spirodela       Spirodela         Species       polyrrhiza         Identifier       Dr. P.S. Nagar         Identifier       MSU Baroda         Method       Morphology and Barcoding
Order       Alismatales         Family       Araceæ         Genus       Spirodela         Species       polyrrhiza         Identifier       Dr. P.S. Nagar         Identifier       MSU Baroda         Identifier       MSU Baroda         Identifier       MSU Baroda         Identifier       Morphology and Barcoding         Method       Morphology and Barcoding
Family       Araceae         Genus       Spirodela         Species       polyrthiza         Identifier       Dr. P.S. Nagar         Identifier       MSU Baroda         Institution       Morphology and Barcoding         Method       Morphology and Barcoding
Genus       Spirodela         Species       polyrthiza         Identifier       Dr. P.S. Nagar         Identifier       Magar@gmail.com         Identifier       MSU Baroda         Institution       Morphology and Barcooling         Method       Morphology and Barcooling
Identifier     Dr. P.S. Nagar     rbcl. F:ATGTCACCACAAACAGAGACTAAAGC       Identifier     dmagar@gmail.com     ABI Chromatogram       Identifier     MSU Baroda     Identification       Institution     Morphology and Barcoding
Identifier     Dr. P.S. Nagar     rbcl. F:ATGTCACCACAAACAGAGACTAAAGC       Identifier     dmagar@gmail.com     ABI Chromatogram       Identifier     MSU Baroda     Identification       Institution     Morphology and Barcoding       Method     Identification
Identifier Email     dmagar@gmail.com     ABI Chromatogram       Identificer     MSU Baroda     Identification       Institution     Morphology and Barcoding       Method     Morphology and Barcoding
Identifier Email     dmagar@gmail.com     ABI Chromatogram       Identifier     MSU Baroda       Institution     Morphology and Barcoding       Method     Morphology and Barcoding
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Voucher Status Herbarium, Photographs Min. II. and a status of a subject of a status of a
Voucher Status         Herbarium, Photographs           Country         India
State Gujarat
Region Vadodara
Sector Hamilake,
Exact Site Pond area
Latitude N 22° 20' 25.9"
Latitude N 22° 20' 25.9" Longitude E 73° 13' 13.8"
Latitude N 22 <sup>2</sup> 20' 25.9" Longitude E 73° 13' 13.8" Elevation 145
Latitude N 22° 20' 25.9" Longitude E 73' 13' 13.8" Elevation 145 Photographer Krupa Unadkat
Latitude N 22° 20' 25.9" Longitude E 73° 13' 13.8" Elevation 145
Latitude N 22° 20' 25.9" Longitude E 73' 13' 13.8" Elevation 145 Photographer Krupa Unadkat

Details		Image	Sequence
Collection date	21st Nov, 2013	A REAL PROPERTY OF THE PARTY OF	<caaacagagactaaagcaagtgttggatttaaagctggtgtta< th=""></caaacagagactaaagcaagtgttggatttaaagctggtgtta<>
Identification	Hygroryza aristata (Retz.) Nees	A A A A A A A A A A A A A A A A A A A	AGGATTATAAATTGACTTACTACACCCCGGAGTACGAAACCAAG
	ex Wight & Arn.		GATACTGATATCTTGGCAGCATTCCGAGTAACTCCTCAGCCGGG
Institution	Gujarat Biodiversity Gene Bank		GGTTCCGGCCGAAGAAGCAGGGGCTGCAGTAGCTGCCGAATCT
Accession number	GENG371-14		TCTACTGGTACATGGACAACTGTTTGGACTGATGGACTTACCAGT
Collection code	BG20131121-0002		CTTGATCGTTACAAAGGACGATGCTATCACATCGAGCCCGTTGCT
Collector	Krupa Unadkat		GGGGAGGAAAATCAATATATCGCTTATGTAGCTTATCCATTAGA
Phylum	Magnoliophyta		CCTATTTGAAGAGGGTTCTGTTACTAACATGTTTACTTCCATTGTG
Class	Liliopsida		GGTAACGTGTTTGGTTTCAAAGCCCTACGCGCTCTACGTCTGGAG
Order	Poales		GATCTGCGAATTCCCCCTACTTATTCAAAAACTTTCCAAGGTCCG
Family	Poaceae		CCTCATGGTATCCAAGTTGAAAGGGATAAGTTGAACAAGTATGG
Genus	Hygroryza		TCGTCCTTTATTGGGATGTACTATTAAACCAAAATTGGGATTATC
Species	aristata		CGCGAAAAATTATGGTAGAGCGTGTTATGAG
Identifier	Dr. P.S. Nagar	and the second second	COCOAAAAATTATOGTAGAGCOTOTTATGAG
Identifier	Dirition Hugan		rbcL F: ATGTCACCACAAACAGAGACTAAAGC
			rbcL R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram	
Identifier	MSU Baroda		
Institution			
Identification	Morphology and Barcoding	- Lat	
Method	10 0.000 M	Manual and a second data distributed at the later of the second	สารการสารการที่สาวที่สาวที่สาวที่สาวที่สาวที่สาวที่สาวที่สาวที่สาวที่สาวที่สาวที่สาวที่สาวที่สาวที่สาวที่สาวที่
Voucher Status	Herbarium, Photographs		
Country	India		
State	Gujarat	NUMBER OF THE OWNER OF THE DESCRIPTION OF THE OWNER OWNER OF THE OWNER	NUMERAL OF A DESCRIPTION OF A DESCRIPTIO
Region	Vadodara	male	and the second second second and second second second
Sector	Hami lake,	K.W. mar markel had she will be dealer and a strain the strain and the	a de de à la company de la construction de la const
Exact Site	Pond area		
Latitude	N 22° 20' 23.6"	Illustrative Barcode:	220
Longitude	E 73° 13' 12.4"		
Elevation	109	269	507
Photographer	Krupa Unadkat	538	563
	0.000		
A			

Details		Image	Sequence
Collection date	21st Nov, 2013		GAGACTAAAGCAGGCGTTGGATTCAAAGCTGGTGTTAGAGATTA
Identification	Azolla pinnata var. imbricata	PLANE AND ALL VILLE	TCGATTGACCTATTACACTCCTGATTATGTGACCAAAGATACAGA
	(Roxb. ex Griff.) Bonap	APPLY TO ALL SEA INC.	TATTTTGGCAGCTTTCCGAATGACCCCGCAACCCGGAGTCCCACC
Institution	Gujarat Biodiversity Gene Bank	An CARLAND STATISTICS	CGAAGAGGCTGGAGCTGCGGTAGCTGCGGAATCTTCTACAGGT
Accession number	GENG373-14		ACATGGACCACTGTATGGACGGATGGACTTACCAGTCTTGATCG
Collection code	BG20131121-0004		TTACAAAGGTAGATGCTATGATATCGAACCTGTTGCTGGAGAAG
Collector	Krupa Unadkat	A MARKEN AND AND AND AND AND AND AND AND AND AN	ACAATCAGTACATCGCATACGTAGCTTATCCCCTAGATTTATTCG
Phylum	Magnoliophyta	E AT A STALLAR COURSE AND A	AAGAGGGTTCCGTTACCAACATGTTTACCTCTATCGTAGGTAATG
Class	Polypodiopsida		TATTCGGGTTTAAAGCTCTACGTGCTCTTCGCCTAGAAGATCTTC
Order	Salviniales		GAATTCCCCCTGCTTATTCCAAAACTTTCATAGGACCGCCCCATG
Family	Azollaceae	A STREAM STREAM STREAM	GTATCCAGGTTGAAAGGGACAGGTTGAACAAATATGGCCGTCCT
Genus	Azolla		CTACTAGGATGCACGATCAAACCAAAACTGGGTTTATCTGCTAAA
Species	pinnata		AATTATGGTAGAGCCGTTTACGAA
Identifier	Dr. P.S. Nagar		rbel F:ATGTCACCACAAACAGAGACTAAAGC rbel R:GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram	
Identifier	MSU Baroda		
Institution		like l	
Identification	Morphology and Barcoding		
Method		had the second	
Voucher Status	Herbarium, Photographs		
Country	India	and a measure of the second	
State	Gujarat	M.	
Region	Vadodara	Colora -	
Sector	Hami lake,	Illustrative Barcode:	
Exact Site	Pond area		260
Latitude	N 22° 20' 25.6"	269	547
Longitude	E 73° 13' 13.4"		
Elevation	114	538	557
Photographer	Krupa Unadkat B		

Details		Image	Sequence
Collection date	21st Nov, 2013		AAAGCAGGTGTAGGATTCAAAGCTGGTGTTAAAGATTATAAAT
Identification	Limnophyton obtusifolium (L.)		AACTTATTATACTCCGGAATATCAAACCAAAGATACTGATATCT
	Miq.		GGCAGCATTCCGAGTAACCCCACAACCTGGAGTTCCACCTGAG
Institution	Gujarat Biodiversity Gene Bank		AAGCAGGGGCCGCAGTAGCTGCCGAATCCTCTACTGGTACATG
Accession number	GENG374-14		ACAACCGTGTGGGACTGATGGACTTACTAGCCTTGACCGTTACAA
Collection code	BG20131121-0006		GGGGCGATGCTACCACATCGAACCTGTCATTGGAGAGGAAAAT
Collector	Maximum Line allows		AATATTTTGTTATGTCGCTTATCCTTTAGACCTTTTTGAAGAAG
	Krupa Unadkat		CTCTGTTACCAACATGTTTACTTCCATCGTAGGTAATGTATTTGG
Phylum	Magnoliophyta		TITAAAGCGCTACGAGCCCTACGCTTGGAAGATTTGCGAATTCC
Class	Liliopsida Alismatales		
Order	Alismatales		GTGGAAAGAGATAAATTGAACAAATATGGCCGTCCCCTATTAG
Family			ATGTACTATTAAACCAAAATTGGGATTATCCGCGAAAAACTACG
Genus	limnophyton		
Species Identifier	obtusifolium		GGAGAGCGGTT
Identifier	Dr. P.S. Nagar		rbcL F:ATGTCACCACAAACAGAGACTAAAGC
			TIDEET.ATOTCACCACAAACA OA OA CTAAA OC
			rbcl R:GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram	
Identifier	MSU Baroda	to prove the second sec	The file file part for the part and the part is the set for the file file of the set of the file of the file of the set o
Institution			والمستعدية والمنافع المتعادية الملاحد والمتعادية والمتعاد و
Identification	Morphology and Barcoding	A the second	in a state of the second state
Method			
Voucher Status	Herbarium, Photographs		
Country	India	$\frac{1}{2} = \frac{1}{2} + \frac{1}$	
Country State	India Gujarat	(4) A. M. M. M. M. W.	
Country State Region	India Gujarat Vadodara		
Country State Region Sector	India Gujarat Vadodara Hami lake,	Jikatcallon, Barcosto	
Country State Region Sector Exact Site	India Gujarat Vadodara Hami lake, Pond area	Juliana a tanàna mandritra dia kaominina dia kaominina dia kaominina dia kaominina dia kaominina dia kaominina Juliante attempti dia kaominina dia kaominina dia kaominina dia kaominina dia kaominina dia kaominina dia kaomini	
Country State Region Sector Exact Site Latitude	India Gujarat Vadodara Hami lake, Pond area N 22° 20' 23.3"		
Country State Region Sector Exact Site Latitude Longitude	India Gujarat Vadodara Hami lake, Pond area N 22° 20' 23.3" E 73° 13' 12.8"		
Country State Region Sector Exact Site Latitude	India Gujarat Vadodara Hami lake, Pond area N 22° 20' 23.3"		

Details		Image	Sequence
Collection date	21st Nov, 2013		
Identification Institution Accession number	Colocasia esculenta (L.) Schott Gujarat Biodiversity Gene Bank		GCAAGTGCTGGATTCAAAGCTGGTGTTAGAGATTACAAATTGAC TTATTATACTCCTGACTATGAGACAAAAGATACTGATATCTTGGC
Collection code	BG20131121-0008	State of the state	AGCATTCCGAGTAACTCCTCAACCCGGAGTTCCGCCTGAAGAAG CAGGGGCTGCAGTAGCTGCCGAATCTTCTACTGGTACATGGACA
Collector	Krupa Unadkat	DESCRIPTION OF THE PROPERTY OF	ACTGTGTGGACTGATGGACTTACCAGTCTTGATCGTTACAAAGG
Phylum	Magnoliophyta	CAN TO BE AND LAR	ACGATGCTACCACATCGAAGCCGTTCCTGGGGAGGAAAATCAAT
Class Order	Liliopsida Alismatales		ATATTGCTTATGTAGCTTACCCTTTAGACCTTTTTGAAGAAGGTTC TGTTACCAACATGTTTACTTCTATTGTAGGTAATGTTTTTGGGTTT
Family	Araceae	E. R. B. B. ST. S. R. A. M.	AAAGCTTTACGAGCTCTACGTCTAGAGGATTTGCGAATTCCTCCC
Genus Species	Colocasia esculenta		GCTTATTCCAAAACTTTCCAAGGCCCGCCTCACGGTATCCAAGTT
Identifier	Dr. P.S. Nagar		GAAAGAGATAAATTGAACAAGTATGGTCGTCCCCTATTGGGATG TACGATTAAACCAAAATTGGGATTATCCGCGAAAAACTACGGTA GAGCGGTTT rbcL F: ATGTCACCACAAACAGAGACTAAAGC
77			rbcL R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram	2
Identifier Institution	MSU Baroda		a ta secol de la della
Identification Method Voucher Status	Morphology and Barcoding Herbarium, Photographs		
Country	India		
State	Gujarat	The second se	
Region	Vadodara		a sa an tarata dan kanaka da ka
Sector	Sewasi lake	and the second	
Exact Site	Pond area	Illustrative Barcode:	
Latitude	N 22° 20' 25.9"		
Longitude Elevation	E 73° 13' 13.8" 123 B		507 500 500
Photographer	Krupa Unadkat	]	

Details		Image Sequence
Collection date	21st Nov, 2013	<caaacagagagctaaagcaggtgttggatttcaagctggtgtt< td=""></caaacagagagctaaagcaggtgttggatttcaagctggtgtt<>
Identification	Dactyloctenium aegyptium (L.)	AAGATTATAAATTGACTTACTACACCCCGGAATACGAAACCAA
	Willd	GATACTGATATCTTGGCAGCATTCCGAGTAACTCCTCAGCCCGG
Institution	Gujarat Biodiversity Gene Bank	
Accession number	GENG376-14	GTTCCGCCTGAAGAAGCAGGGGCTGCAGTAGCTGCGGAATCT
		TACTGGTACATGGACAACTGTTTGGACTGATGGACTACCAGT
Collection code	BG20131121-0009	TGATCGTTACAAAGGACGATGCTATCACATCGAACCCGTTCCTC
		GGAAGACAGTCAATATATCTGTTATATAGCTTATCCATTAGATC
Collector	Krupa Unadkat	
Phylum	Magnoliophyta	
Class	Liliopsida	TAACGTATTTGGTTTCAAAGCCCTACGTGCTCTACGTTTGGAGG
Order	Poales	
Family	Poaceae	CATGGTATCCAAGTTGAAGGGATAAGTTGAACAAGTAGGTGAACAAGTAGGTG
Genus	Dactyloctenium	TCCTTTATTGGGATGTACTATTAAACCAAAATTGGGATTATCCG
Species	aegyptium	AAAAAATTACGGT
Identifier	Dr. P.S. Nagar	
		rbcL F:ATGTCACCACAAACAGAGACTAAAGC
		rbcL R: GTAAAATCAAGTCCACCRCG
dentifier Email	dmagar@gmail.com	ABI Chromatogram
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Institution	ing o baroua	
dentification	Marphalaguand Provider	فالمتعادين أربع وأستال بنجيل وأسط الجنيئية الراري والمرجب والمتعاد والمتعاد والمتعاد والمتعاد والمتعا
	Morphology and Barcoding	i i i i i i i i i i i i i i i i i i i
Method		
Voucher Status	Herbarium, Photographs	
Country	India	
State	Gujarat	
Region	Vadodara	
Sector	Hamilake	
Exact Site	Pond area	
and a second second		Illustrative Barcode:
Latitude	N 22° 20' 23.9"	
Longitude	E 73° 13' 10.8"	263 53
	120	
Elevation		
Elevation Photographer	Krupa Unadkat A	500 540
Photographer	Krupa Unadkat A	
Photographer Details		Image Sequence
Photographer Details Collection date	21st Nov, 2013	Im a ge Sequen ce ACTAAAGCAAGTGTTGGA TITAAAGCTGGTGTTAAAGATTA
Photographer Details Collection date Identification	21st Nov, 2013 Amaranthus spinosus L.	Image         Sequence           Sequence <actaaaagcaagtigttiggatttaaaggttggtgtaaaagattaagattaggttggattgaaacccaagatactga< td=""></actaaaagcaagtigttiggatttaaaggttggtgtaaaagattaagattaggttggattgaaacccaagatactga<>
Photographer Details Collection date Identification Institution	21st Nov, 2013 Amaranthus spinosus L. Gujarat Biodiversity Gene Bank	Image         Sequence           ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTA         GATGACTTATTATACTCCTGAGTATGAAACCCAAGATACTGA           TCTTGGCAGCATTCCGAGTAAGTCCTCAACCTGGAGTTCCACCTGGAGTTCCAACCTGAGTTCCCAACCTGGAGTTCCACCTGAGTACCCAAGTTCCCAACCTGAGTTCCACCTGAGTTCCAACCTGAGTTCCACCTGAGTTCCAACCTGAGTTCCACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGGAGTTCCACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGAGTTCCAACCTGGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCACCTGGAGTTCCAACCTGGAGTTCCACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCCAACCTGGAGTTCAACCCAAGTTCAACCTGACGTTGACGTGAGTTCAACCTGACGTGAGTTCAACCTGACGTTCAACCTGACGTTCAACCTGGAGTTCCACCTGGAGTTCAACCTGACTGA
Photographer Det nils Collection date identification institution Accession number	21st Nov, 2013 Amaranthus spinosus L. Gujarat Biodiversity Gene Bank GENG377-14	Sequence           ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTA GATTGACTACTCGAGTATGAAACCCAAGATACTGA TCTTGGCAGCATTCCGAGTAAGTCCTCAACCTGGAGTTCCCAC AAGAAGCGGGGGCTGCAGTAGCTGCCGAATCTTCTACTGGT/
Photographer Details Collection date identification institution	21st Nov, 2013 Amaranthus spinosus L. Gujarat Biodiversity Gene Bank	Image         Sequence           - <a>ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTAAAGATTA</a> -         CACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTAAAGATTA           -         CACTAAAGCCAAGTGTTGGATTTAAAGCTGGTGTAAAGATTA           -         CACTAAAGCCAAGTGTTGGATTTAAAGCTGGAGTTACGAAGTACTGA           -         CACTAAAGCCAAGTGTTGGATTTAAAGCTGGAGTTCACCAAGTACTGAA           -         CACTAAAGCCAAGTGTTGGATTCGAAGTACTGAA           -         CACTAAAGCCAAGTGTTGGATTCGAAGTACTGAAGTCCCAACCTGGAGTTCCACCAAGTGCTGCAGCTGACGGAGCTGCCAAGTGTCCCAACCTGGAGTTCCACCAAGTGTATGGACCGACGGACCTGCCAATCTTGACTGGTTGGACAGTGTATGGACCGACGGACCTACCAATCTTGATCGTATGGACCGACGGACCTAACCAATCTTGATCGTATGGACCGACGGACCTAACCAATCTTGACTGGACGACCTAACCAATCTTGACTGGACTGACGACCTAACCAATCTTGACTGGACTTACCAATCTTGACTGGACGTAGTATGGACCGACGACCTAACCAATCTTGACTGGACGACCTAACCAATCTTGACTGGACTGACGACCTAACCAATCTTGAATGCAATCTGACGACCTAACCAATCTTGACTGGACTTAACCAATCTTGACTGGACGACCTAACCAATCTTGACTGGACTTAACCAATCTTGACTGGACTTAACCAATCTTGACTGGACTGACGACCTAACCAATCTTGACTGAC
Photographer Details Collection date identification institution Accession number Collection code	21st Nov, 2013 Amaranthus spinosus L. Gujarat Biodiversity Gene Bank GENG377-14 BG20131121-0010	Sequence           ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTA GATTGACTACTCGAGTATGAAACCCAAGATACTGA TCTTGGCAGCATTCCGAGTAAGTCCTCAACCTGGAGTTCCCAC AAGAAGCGGGGGCTGCAGTAGCTGCCGAATCTTCTACTGGT/
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Details		Image	Sequence
Collection date	21st Nov, 2013		GCAGCATTCCGAGTAACTCCTCAGCCGGGGGTTCCGGCCGAAGA
Identification	Sphaeranthus indicus L.		AGCAGGGGCTGCAGTAGCTGCCGAATCTTCTACTGGTACATGGA
Institution	Gujarat Biodiversity Gene Bank		CAACTGTTTGGACTGATGGACTTACCAGTCTTGATCGTTACAAAG
Accession number	GENG378-14		GACGATGCTATCACATCGAGCCCGTTGCTGGGGGGGGGAGAAAATCAA
Collection code	BG20131121-0011		TATATCGCTTATGTAGCTTATCCATTAGACCTATTTGAAGAGGGT
			TCTGTTACTAACATGTTTACTTCCATTGTGGGTAACGTGTTTGGTT
Collector	Krupa Unadkat		TCAAAGCCCTACGCGCTCTACGTCTGGAGGATCTGCGAATTCCCC
Phylum	Magnoliophyta		CTACTTATTCAAAAACTTTCCAAGGTCCGCCTCATGGTATCCAAG
Class	Eucotyledons		TTGAAAGGGATAAGTTGAACAAGTATGGTCGTCCTTTATTGGGA
Order	Asterales	Sten Strand	TGTACTATTAAACCAAAATTGGGATTATCCGCGAAAAATTATGGT
Family	Asteraceae		AGAGCGTGTTATGAGTGCCTA
Genus	Sphaeranthus		AGAGCGTGTTATGAGTGCCTA
Species	indicus		rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Identifier	Dr. P.S. Nagar	A CONTRACT OF	
			rbcL R: GTAAAATCAAGTCCACCRCG
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Country	India		
State	Gujarat	a to be the second structure of the second structure o	the probability of the probabili
Region	Vadodara		
Sector	Gotri lake		
Exact Site	Pond area	1 10 - mar and a surface of the surgery believes	the second state of the second
Latitude	N 22° 20' 49.4"	Illustrative Barcode:	
Longitude	E 73° 08' 00.5"	nicistanie baroste.	268
Elevation	115		
Photographer	Krupa Unadkat		
		269	467

Details		Image	Sequence
Collection date	21st Nov, 2013		GCAAGTGTTGGATTCAAAGCGGGTGTTAAAGAGTACAAATTGAC
Identification	Peristrophe paniculata		TTATTATACTCCTGAATACGAAACCAAAGATACTGATATCTTGGC
and the second	(Forssk.) Brummitt	A Contraction of the second	AGCATTCCGAGTAACTCCTCAACCGGGAGTTCCACCTGAAGAAG
Institution	Gujarat Biodiversity Gene Bank	and the second sec	CAGGAGCCGCGGTAGCTGCGGAATCTTCCACCGGTACATGGACA
Accession number	GENG379-14	and and the second s	ACCGTGTGGACCGATGGACTTACCAGTCTTGATCGTTACAAAGG
Collection code	BG20131121-0014	A State of the second s	GCGATGCTACAACATCGAGCCCGTTCTTGGGGAAACAGATCAAT
Collector	Keyes the adhest	When the March Constant Part of the	ATATCTGTTATGTAGCTTACCCTTTAGACCTTTTTGAAGAAGGTTC
Phylum	Krupa Unadkat		TGTTACCAACATGTTTACTTCCATTGTGGGAAATGTGTTTGGATT
Class	Magnoliophyta		CAAAGCCTTGCGTGCTCTACGTCTGGAAGATCTTCGAATCCCTAC
Order	Eucotyledons Lamiales		TGCTTATATTAAAAACTTTCCAAGGTCCGCCTCATGGGATCCAAGT
Family	Acanthaceae		TGAGAGAGATAAGTTGAACAAGTATGGTCGTCCCCTGCTGGGAT
Genus	Peristrophe		GTACTATTAAACCGAAATTGGGGGTTATCCGCTAAAAACTATGGT
Species	paniculata		
Identifier	Dr. P.S. Nagar	The Mark Mark Mark Mark	rbcL F: ATGTCACCACAAACAGAGACTAAAGC
	<b>-</b>		rbel R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram	
Identifier	MSU Baroda	(a) (a) (b) (b) (b) (b) (b) (b) (b) (b) (b) (b	
Institution Identification Method Voucher Status	Morphology and Barcoding Herbarium, Photographs	and the second development of the second	
Country	India	a to be a solution of the s	
State	Gujarat		1
Region	Vadodara		Annual and a state and a stat
Sector	Sewasi lake	to the second	
Exact Site	Pond area	Illustrative Barcode:	
Latitude	N 22° 19' 03.9"	1	260
Longitude	E 73° 07' 13.8"		
Elevation	113 B	269	533
Photographer	Krupa Unadkat		

		Image	Sequence
Collection date	21st Nov, 2013	A CONTRACTOR AND A CONTRACTOR	>GCAAGTGTTGGATTCAAAGCGGGTGTTAAAGAGTATAAATTG
Identification	Limnophila gratioloides R. Br.		CTTATTATACTCCTGAATACGAAACCAAAGATACTGATATCTTG
Institution	Gujarat Biodiversity Gene Bank	A REAL SOL	
Accession number			GCAGGGGCCGCGGTAGCTGCCGAATCTTCTACTGGTACATGGA
Collection code	BG20131121-0016	HAVE THE REAL PROPERTY OF AN ALL	AACTGTGTGGACCGATGGACTTACCAGCCTTGATCGTTACAAA
Collector	Krupa Unadkat	The second second	GGCGATGCTACAACATCGAGCCCGTTCCTGGAGAACCAGATCA
Phylum	Magnoliophyta		TATATCTGTTATGTAGCTTACCCTTTAGACCTTTTGAAGAAGGT
Class	Eucotyledons		CTGTTACTAACATGTTTACTTCCATTGTAGGAAACGTATTTGGA
Family	Schrophulariaceae		
Genus	Limnophila		AGCTTATGTTAAAACTTTCCAAGGCCCACCTCATGGGATCCAAG
Species	Qratioloides	AND	TGAGAGAGATAAATTGAACAA GTATGGTCGTCCCCTGTTAGGA
Identifier	Dr. P.S. Nagar		GTACT
	Striegan	SALES AND	
		A SALAR AND	rbcL F: ATGTCACCACAAACAGAGACTAAAGC
		West of the second states	rbcL R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatographs	
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Voucher Status	Herbarium, Photographs		
Country	India		
Country			
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State Region	Gujarat		
State Region Sector	Gujarat Vadodara		
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State Region Sector Exact Site Latitude	Gujarat Vadodara Hami lake Pond area N 22° 19' 11.8"	Illustrative Barcode:	
State Region Sector Exact Site Latitude Longitude	Gujarat Vadodara Hami lake Pond area N 22° 19' 11.8" E 73° 06' 11.5"	Mustrative Barcode:	
State Region Sector Exact Site Latitude Longitude Elevation	Gujarat Vadodara Hami lake Pond area N 22° 19' 11.8" E 73° 06' 11.5" 118	Mustrative Barcode:	
State Region Sector Exact Site Latitude Longitude Elevation Photographer	Gujarat Vadodara Hami lake Pond area N 22° 19' 11.8" E 73° 06' 11.5" 118	Illustrative Barcode:	-a
State Region Sector Exact Site Latitude Longitude Elevation	Gujarat Vadodara Hami lake Pond area N 22° 19' 11.8" E 73° 06' 11.5" 118	Illustrative Barcode:         2           2         2           2         2           2         2	
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State Region Sector Exact Site Latitude Longitude Elevation	Gujarat Vadodara Hami lake Pond area N 22° 19' 11.8" E 73° 06' 11.5" 118	Illustrative Barcode:	
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State Region Sector Exact Site Latitude Longitude Elevation Photographer Details Collection date	Gujarat Vadodara Hami lake Pond area N 22° 19' 11.8" E 73° 06' 11.5" 118 Krupa Unadkat A 21st Nov, 2013	Illustrative Barcode:	Sequence     >AAAGCAGGCGTTGGATTCAAAGCTGGTGTTAAAGATTATCGA
State Region Sector Exact Site Latitude Longitude Elevation Photographer Details Collection date Identification	Gujarat Vadodara Hami lake Pond area N 22° 19' 11.8" E 73° 06' 11.5" 118 Krupa Unadkat 21st Nov, 2013 Marsilea quadrifolia L.	Illustrative Barcode:	Sequence     >AAAGCAGGCGTTGGATTCAAAGCTGGTGTTAAAGATTATCGA TGACCTATTACACTCCCGATTATCAGACCTCACCCCATGATATCT
State Region Sector Exact Site Latitude Longitude Elevation Photographer Details Collection date Identification Institution	Gujarat Vadodara Hami lake Pond area N 22° 19' 11.8" E 73° 06' 11.5" 118 Krupa Unadkat 21st Nov, 2013 Marsilea quadrifolia L. Gujarat Biodiversity Gene Bank	Illustrative Barcode:	Sequence     AAAGCAGGCGTTGGATTCAAAGCTGGTGTTAAAGATTATCGA     TGACCTATTACACTCCCGATTATCAGACCTCACCCCATGATATC     GGCAGCCTTTAGAATGACCCCGCAACCCGGAGTACCACCTGAG
State Region Sector Exact Site Latitude Longitude Elevation Photographer Details Collection date Identification Institution Accession number	Gujarat Vadodara Hami lake Pond area N 22° 19' 11.8" E 73° 06' 11.5" 118 Krupa Unadkat 21st Nov, 2013 Marsilea quadrifolia L. Gujarat Biodiversity Gene Bank GENG381-14	Illustrative Barcode:	49 Sequence >AAAGCAGGCGTTGGATTCAAAGCTGGTGTTAAAGATTATCGA TGACCTATTACACTCCCGATTATCAGACCTCACCCCATGATTATC GGCAGCCTTTAGAATGACCCCGCAACCCGGAGTACCACCTGAG AAGCTGGAGCTGCAGTAGCTGCCGAGAATCTTCTACAGGTACCATG
State Region Sector Exact Site Latitude Longitude Elevation	Gujarat Vadodara Hami lake Pond area N 22° 19' 11.8" E 73° 06' 11.5" 118 Krupa Unadkat 21st Nov, 2013 Marsilea quadrifolia L. Gujarat Biodiversity Gene Bank	Illustrative Barcode:	Sequence     >AAAGCAGGCGTTGGATTCAAAGCTGGTGTTAAAGATTATCGA
State Region Sector Exact Site Latitude Longitude Elevation Photographer Ocollection date Identification Institution Accession number Collection code	Gujarat Vadodara Hami lake Pond area N 22° 19' 11.8" E 73° 06' 11.5" 118 Krupa Unadkat Z1st Nov, 2013 Marsilea quadrifolia L. Gujarat Biodiversity Gene Bank GENG381-14 BG20131121-0017	Illustrative Barcode:	** Sequence >AAAGCAGGCGTTGGATTCAAAGCTGGTGTTAAAGATTATCGA* TGACCTATTACACTCCCGATTATCAGACCTCACCCATGATTATC GGCAGCCTTTAGAATGACCCCGCAACCCGGAGTACCACCTGAG AGGCTGGAGCTGCAGTAGCTGCAGAATCTTCTACAGGTACATG ACTACCTATTGACCGACGACTTACCAGTCTTCGACCGTTACAA AGGTCGTTGCTACGATATCGAACCCGTTCCCGGAGAGGAAAAC
State Region Sector Exact Site Latitude Longitude Elevation Photographer Details Collection date Identification Institution Accession number	Gujarat Vadodara Hami lake Pond area N 22° 19' 11.8" E 73° 06' 11.5" 118 Krupa Unadkat 21st Nov, 2013 Marsilea quadrifolia L. Gujarat Biodiversity Gene Bank GENG381-14	Illustrative Barcode:	49 Sequence >AAAGCAGGCGTTGGATTCAAAGCTGGTGTTAAAGATTATCGA TGACCTATTACACTCCCGATTACAAGCCTGACCACTGATATCT GGCAGCCTTTAGAATGACCCCGCAACCCGGAGTACCACGGAG AAGCTGGAGCTGCAGTAGCTGCAGGAATCTTCTACAGGTACATG ACTACCGTATGGACGGACGGACCTACCAGTCTTGACCGTTACAAG

Details		Image	Sequence
Collection date	21st Nov, 2013		>AAAGCAGGCGTTGGATTCAAAGCTGGTGTTAAAGATTATCGAT
Identification	Marsilea quadrifolia L.		TGACCTATTACACTCCCGATTATCAGACCTCACCCCATGATATCTT
Institution	Gujarat Biodiversity Gene Bank		GGCAGCCTTTAGAATGACCCCGCAACCCGGAGTACCACCTGAGG
Accession number	GENG381-14		AAGCTGGAGCTGCAGTAGCTGCAGAATCTTCTACAGGTACATGG
Collection code	BG20131121-0017		ACTACCGTATGGACGGACGGACTTACCAGTCTTGACCGTTACAA
Collector	Krupa Unadkat		AGGTCGTTGCTACGATATCGAACCCGTTCCCGGAGAGAGA
Phylum	Tracheophyta	Station and the second party	AATACATTGCATATGTAGCTTACCCCTTAGATCTATTTGAAGAGG
Class	Polypodiopsida		GTTCTGTTACCAACATGTTCACCTCTATTGTAGGTAACGTATTTGG
Order	Salviniales		ATTCAAGGCTCTACGTGCTCTTCGACTAGAAGATCTTCGAATCCC
Family	Marsiliaceae		TCCTGCTTATTCCAAAACTTTCATTGGACCCCCTCACGGTATCCAG
Genus	Marsilea		GTTGAAAGAGATAAACTGAACAAATACGGACGTCCTTTATTAGG
Species	quadrifolia		ATGTACCATCAAGCCAAAACTAGGCTTA
Identifier	Dr. P.S. Nagar		rbcl F: ATGTCACCACAAACAGAGACTAAAGC
			rbcL R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatograph	
Identifier Institution	MSU Baroda		. A series and a series of the ser
Identification Method	Morphology and Barcoding		
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Country	India	i i i i i i i i i i i i i i i i i i i	the fire for the fire fire fire fire fire fire fire fir
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Region	Vadodara		lard o
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Exact Site	Pond area	100 febrilitare research and a state of the second state of the se	and a state of the
Latitude	N 22° 19' 11.5"	Illustrative Barcode:	
Longitude	E 73° 06' 10.8"	0	268
Elevation	119		
Photographer	Krupa Unadkat	269	518
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Details		Image	Sequence
Collection date	21st Nov, 2013		>GGATTCAAAGCGGGCGTTAAAGAGTACAAATTGACTTATTAT
Identification	Utricularia vulgaris L.	A REAL PROPERTY AND A REAL	CTCCTGAATACGAAACCAAGGATACTGATATCTTGGCAGCATTC
Institution	Gujarat Biodiversity Gene Bank		GAGTAACCCCTCAACCTGGGGTTCCGCCTGAAGAAGCAGGGGG
Accession number	GENG382-14		
Collection code	BG20131121-0018		GCGGTAGCTGCCGAATCTTCTACTGGTACCTGGACAACTGTAT
Collection code	BG20131121-0018		GACCGATGGACTTACCAGCCTTGATCGTTACAAAGGACGATGC
Collector	Krupa Unadkat		ACAATATCGAGCCGGTTCCTGGAGAAACAGATCAATATATCTG
Phylum			ATGTAGCTTACCCTTTAGACCTTTTTGAAGAAGGTTCTGTTACTA
	Magnoliophyta		CATGTTTACTTCCATTGTAGGAAATGTATTTGGATTCAAAGCCC
Class	Eucotyledons		GCGGGCTCTACGTCTAGAGGATCTGCGAATCCCTGCTGCTTAT
Order	Lamiales		TAAACTTTCCAAGGCCCGCCTCATGGAATCCAAGTTGA
Family	Lentibulariaceae		TAAACTTTCCAAGGCCCGCCTCATGGAATCCAAGTTGA
Genus	Utricularia		rbcL F: ATGTCACCACAAACAGAGACTAAAGC
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Identifier	Dr. P.S. Nagar		rbcL R: GTAAAATCAAGTCCACCRCG
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Region	Vadodara		
Sector	Hami lake	-	
Exact Site	Pond area		
Latitude	N 22° 19' 12.1"	Illustrative Barcode:	
Longitude	E 73° 06' 10.4"	0	268
Elevation	150		
Liciadon			
Photographer	Krupa Unadkat		
Photographer	Krupa Unadkat A	269	436
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Photographer	Krupa Unadkat A	269	434
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Photographer	Krupa Unadkat A	269	430
	Krupa Unadkat A	209 Image	433 Sequence
Details	21st Nov, 2013	269 Image	
Details Collection date Identification	21st Nov, 2013 Gomphrena celosioides Mart.	269 Image	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA
Details Collection date Identification Institution	21st Nov, 2013 Gomphrena celosioides Mart. Gujarat Biodiversity Gene Bank	269 Im age	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTAACTCCTCAACCCTGGAGTTCCACCCG
Details Collection date Identification Institution Accession number	21st Nov, 2013 Gomphrena celosioides Mart. Gujarat Biodiversity Gene Bank GENG383-14	299 Image	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTAACTCCTCAACCTGGAGTTCCACCCG AAGAAGCAGGGGCTGCAGTAGCTGCCGAATCTTCTACTGGTACA
Details Collection date Identification Institution Accession number	21st Nov, 2013 Gomphrena celosioides Mart. Gujarat Biodiversity Gene Bank	299 Image	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTAACTCCTCAACCTGGAGTTCCACCCG AAGAAGCAGGGGCTGCAGTAGCTGCCGAATCTTCACTGGTACA TGGACAACTGTATGGACCGACGGGCTTACCAATCTTGATCGTTAC
Details Collection date Identification Institution Accession number Collection code	21st Nov, 2013 Gomphrena celosioides Mart. Gujarat Biodiversity Gene Bank GENG383-14 BG20131121-0019	299 Image	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTACTCCTCAACTGGAAGTTCCACCCG AAGAAGCAGGGGGCTGCAGTAGCTGCCGAATCTTCTACTGGTACA TGGACAACTGTATGGACCGACGGTGCCGATCCTTGGTCGTACA AAAGGACGATGCTATCATATCGAGCCCGTTGCTGGTGAAGAAAA
Details Collection date Identification Institution Accession number Collection code Collector	21st Nov, 2013 Gomphrena celosioides Mart. Gujarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat	299 Image	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTACTCCTACACCTGGAGTTCCACCCG AAGGAAGCAGGGGCTGCAGTAGCTGCCGAATCTTCTACTGGTACA TGGACAACTGTATGGACCGACGGGCTTACCAATCTTGATCGTAC AAAGGACGATGCTATCATATCGAGCCCGTTGCTGGTGAAGAAAA TCAATATATTTGTTATGTAGCGTATCCTTTAGACCTTTTGAAGAA
Details Collection date Identification Institution Accession number Collection code Collector Phylum	21st Nov, 2013 Gomphrena celosioides Mart. Gujarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta	299 Image	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTAACTCCTCAACCTGGAGTTCCACCCG AAGAAGCAGGGGGCTGCAGTAGCTGCCGAATCTTGATCGTTAC TGGACAACTGTATGGACCGACGGGCTTACCAATCTTGATCGTTAC AAAGGACGATGTGTGGACCGACGGGCTTACCAATCTTGATCGTTAC AAAGGACGATGTGTACTATCGAGCCCGTTGCTGGTGAAGAAAA TCAATATTTGTTATGTACGGTATCCTTTGAGGTAACGTATTTG
Details Collection date Identification Institution Accession number Collection code Collector Phylum Class	21st Nov, 2013 Gomphrena celosioides Mart. Gujarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta Liliopsida	299 Image	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTAACTCCTCAACCTGGAGTTCCACCCG AAGAAGCAGGGGGCTGCAGTAGCTGCCGAATCTTCTGATCGTACA TGGACAACTGTTATGGACCGATGGCTGCCGATCCTTGATCGTTACA AAAGGACGATGCTATCATATCGAGCCCGTTGCTGGTGAAGAAAA TCAATATATTTTGTTATGTAGCGTATCCTTTGAAGCCTTTTGAAGAA GGTTCGTAACCATGTCCATCCATTCGATTGGTGAAGCTATTGG
Details Collection date Identification Institution Accession number Collection code Collector Phylum Class Order	21st Nov, 2013 Gomphrena celosioides Mart. Gujarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta	299 Image	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTAACTCCTCAACCTGGAGTTCCACCCG AAGGAAGCAGGGGCTGCAGTAGCTGCCGAATCTTGATCGTACA TGGACAACTGTATGGACCGACGGGCTTACCAATCTTGATCGTAC AAAGGACGATGCTATCGTACGACGGCTGCTGGTGGAGAAAA TCAATATATTTGTTATGTAGCGATCCACTCTTGAGGTAACGAATTTG GGTTCAAAGCCCTTCGTGCTCTACGTTTGCAGGACCTTTCGCAATCC CTGTTGCTTATGTAAAACTTTCCAAGGCCCACCTCACGGTATCC
Details Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family	A 21st Nov, 2013 Gomphrena celosioides Mart. Gujarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta Liliopsida Caryophyllales Amaranthaceae Gomphrena	299 Image	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTAACTCCTCAACCGGAGTTCCACCCG AAGAAGCAGGGGCTGCAGTAGCTGCCGAATCTTCTACTGGTACA TGGACAACTGTATGGACCGACGGGCTTACCAATCTTGATCGTTAC AAAGGACGATGCTATCATATCGAGCCCGTTGCTGGTGAAGAAA TCAATATATTTTGTTATGTAGCGATGCCGTTTGAGGATTGGCGATCC GGTTCCAAAGCCCTTCGTGCTCTACGTTTGGAGGATTTGCGAATCC CTGTTGCTTATGTAAAACTTTCCAAGGCCCACCCCCACGGTATCC AAGTGAAAGGATAAATTGGACAGTATGGCCGTCCTCTATTC
Details Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species	A 21st Nov, 2013 Gomphrena celosioides Mart. GUjarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta Lillopsida Caryophyllales Amaranthaceae Gomphrena celosioides	299 Image	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTAACTCCTCAACCTGGAGTTCCACCCG AAGAAGCAGGGGCTGCAGTAGCTGCCGAATCTTGATCGTTAC AAGGACGATGTATGGACCGACGGCTTACCAATCTTGATCGTTAC AAAGGACGATGCTATCATACGAGCCGGTTGCTGGTGAAGAAAA GGTTCTGTTACTAACATGTTCACTTCACGTTGCAGGTAACGTATTTG GGTTCAAAGCCTTCGTGCTCACGTTTGAAGGAATTGCCATTCC CTGTTGCTTATGTAAAACTTTCCAAGGCCCACTCACGGTTACC AAGTGGAAGAGATAAATTGAACAAGTATGGCCCACCTCCTTATA GGATGCACTATTAAACCGAAATTGGGGTTATCCGCTAAAAACTA
Details Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species	A 21st Nov, 2013 Gomphrena celosioides Mart. Gujarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta Liliopsida Caryophyllales Amaranthaceae Gomphrena	299 Image	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTAACTCCTCAACCGGAGTTCCACCCG AAGAAGCAGGGGCTGCAGTAGCTGCCGAATCTTCTACTGGTACA TGGACAACTGTATGGACCGACGGGCTTACCAATCTTGATCGTTAC AAAGGACGATGCTATCATATCGAGCCCGTTGCTGGTGAAGAAA TCAATATATTTTGTTATGTAGCGATGCCGTTTGAGGATTGGCGATCC GGTTCCAAAGCCCTTCGTGCTCTACGTTTGGAGGATTTGCGAATCC CTGTTGCTTATGTAAAACTTTCCAAGGCCCACCCCCACGGTATCC AAGTGAAAGGATAAATTGGACAGTATGGCCGTCCTCTATTC
Details Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species	A 21st Nov, 2013 Gomphrena celosioides Mart. GUjarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta Lillopsida Caryophyllales Amaranthaceae Gomphrena celosioides	299	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTAACTCCTCAACCTGGAGTTCCACCCG AAGAAGCAGGGGCTGCAGGAGGGGCTTACCAACCG AAGGAACGATGCTATGGACCGACGGGCTTACCAATCTTGATCGTAC AAAGGACGATGCTATGGACGACGGGCTTACCAATCTTGATGATCGTAC AAAGGACGATGCTATGACGCGTGCCGGTGCTGGTGAAGAAA TCAATATATTTTGTTATGTAGCGACGGTATCCATTGTAGGAACGATTTG GGTTCAAAGCCCTTCGTGCTCACGTTTGGAGGATTTGCGAATCC CTGTTGCTTATGTAAACTTTCCAAGGCCCACCCACCGCAGTATCC AAGTTGAAAGAGATAAATTTGAACAGTATGGCCGTCCTCTATTA GGATGCACTATTAAACCGAAATTGGAGGTTATCCGCTAAAAACTA CGGTCGAGCATGTTAT
Details Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species	A 21st Nov, 2013 Gomphrena celosioides Mart. GUjarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta Lillopsida Caryophyllales Amaranthaceae Gomphrena celosioides	299	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTAACTCCTCAACCTGGAGTTCCACCCG AAGAAGCAGGGGCTGCAGTAGCTGCCGAATCTTGATCGTTAC AAGGACGATGTATGGACCGACGGCTTACCAATCTTGATCGTTAC AAAGGACGATGCTATCATACGAGCCGGTTGCTGGTGAAGAAAA GGTTCTGTTACTAACATGTTCACTTCACGTTGCAGGTAACGTATTTG GGTTCAAAGCCTTCGTGCTCACGTTTGAAGGAATTGCCATTCC CTGTTGCTTATGTAAAACTTTCCAAGGCCCACTCACGGTTACC AAGTGGAAGAGATAAATTGAACAAGTATGGCCCACCTCCTTATA GGATGCACTATTAAACCGAAATTGGGGTTATCCGCTAAAAACTA
Details Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species	A 21st Nov, 2013 Gomphrena celosioides Mart. GUjarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta Lillopsida Caryophyllales Amaranthaceae Gomphrena celosioides	29	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAACCCTAGATACTGATA TCTTGGCAGCATTCCGAGTAACTCCTCAACCTGGAGTTCCACCCG AAGAAGCAGGGGCTGCAGGAGGGGCTTACCAACCG AAGGAACGATGCTATGGACCGACGGGCTTACCAATCTTGATCGTAC AAAGGACGATGCTATGGACGACGGGCTTACCAATCTTGATGATCGTAC AAAGGACGATGCTATGACGCGTGCCGGTGCTGGTGAAGAAA TCAATATATTTTGTTATGTAGCGACGGTATCCATTGTAGGAACGATTTG GGTTCAAAGCCCTTCGTGCTCACGTTTGGAGGATTTGCGAATCC CTGTTGCTTATGTAAACTTTCCAAGGCCCACCCACCGCAGTATCC AAGTTGAAAGAGATAAATTTGAACAGTATGGCCGTCCTCTATTA GGATGCACTATTAAACCGAAATTGGAGGTTATCCGCTAAAAACTA CGGTCGAGCATGTTAT
Details Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species	A 21st Nov, 2013 Gomphrena celosioides Mart. GUjarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta Lillopsida Caryophyllales Amaranthaceae Gomphrena celosioides	29	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCGAGTACTCCCAACCTGGAGTTCCACCCG AAGAAGCAGGGGCTGCAGTAGCTGCCGAATGCTTCTACTGGTACA TGGACAACTGTATGACCGCACGGCTTACCATTCTGATGGTACA AAAGGACGATGCTATCATATCGAGCCCGTTGCTGGTGGAGAAAA TCAATATATTTTTATTATGTAGCGTATCCTTTGAAGCCTITTGAAGAAA GGTTCGTTACTAACATGTTCCATTCCATTGTAGGTACCGATTTGC GGTTGAAAGCCCTTCGTGCTCTACGTTTGCAGGCCACCTCACGGTATCC AAGGACGATGCATACATGTACCAACTGCAGGCCACCCTCACGGTATCC AAGTGCAATATATTATTAGTAAACGAAATTGGACCACCTCCACGGTATCC CTGTTGCTTATGTAAAAACTTCCAATGGCCCACCCTCACGGTATCC CAGGTGCAAAGAGATAAATTGAACAAGTATGGCCGTCCTCTATTA GGATGCAACTATTAAACCGAAATTGGGGTTATCCGCTAAAAACTA CGGTCGAAGCATGTTAT rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Details Collection date Identification Institution Accession number Collector Phylum Class Order Family Genus Species Identifier Identifier Email	21st Nov, 2013 Gomphrena celosioides Mart. Gujarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta Liliopsida Caryophyllales Amaranthaceae Gomphrena celosioides Dr. P.S. Nagar dmagar@gmail.com	207 Image View of the second s	Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCGAGTACTCCCAACCTGGAGTTCCACCCG AAGAAGCAGGGGCTGCAGTAGCTGCCGAATGCTTCTACTGGTACA TGGACAACTGTATGACCGCACGGCTTACCATTCTGATGGTACA AAAGGACGATGCTATCATATCGAGCCCGTTGCTGGTGGAGAAAA TCAATATATTTTTATTATGTAGCGTATCCTTTGAAGCCTITTGAAGAAA GGTTCGTTACTAACATGTTCCATTCCATTGTAGGTACCGATTTGC GGTTGAAAGCCCTTCGTGCTCTACGTTTGCAGGCCACCTCACGGTATCC AAGGACGATGCATACATGTACCAACTGCAGGCCACCCTCACGGTATCC AAGTGCAATATATTATTAGTAAACGAAATTGGACCACCTCCACGGTATCC CTGTTGCTTATGTAAAAACTTCCAATGGCCCACCCTCACGGTATCC CAGGTGCAAAGAGATAAATTGAACAAGTATGGCCGTCCTCTATTA GGATGCAACTATTAAACCGAAATTGGGGTTATCCGCTAAAAACTA CGGTCGAAGCATGTTAT rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Details Collection date Identification Institution Accession number Collector number Collector Phylum Class Order Family Genus Species Identifier Identifier Email Identifier	A 21st Nov, 2013 Gomphrena celosioides Mart. GUjarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta Liliopsida Caryophyllales Amaranthaceae Gomphrena celosioides Dr. P.S. Nagar		Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCGAGTACTCCCAACCTGGAGTTCCACCCG AAGAAGCAGGGGCTGCAGTAGCTGCCGAATGCTTCTACTGGTACA TGGACAACTGTATGACCGCACGGCTTACCATTCTGATGGTACA AAAGGACGATGCTATCATATCGAGCCCGTTGCTGGTGGAGAAAA TCAATATATTTTTATTATGTAGCGTATCCTTTGAAGCCTITTGAAGAAA GGTTCGTTACTAACATGTTCCATTCCATTGTAGGTACCGATTTGC GGTTGAAAGCCCTTCGTGCTCTACGTTTGCAGGCCACCTCACGGTATCC AAGGACGATGCATACATGTACCAACTGCAGGCCACCCTCACGGTATCC AAGTGCAATATATTATTAGTAAACGAAATTGGACCACCTCCACGGTATCC CTGTTGCTTATGTAAAAACTTCCAATGGCCCACCCTCACGGTATCC CAGGTGCAAAGAGATAAATTGAACAAGTATGGCCGTCCTCTATTA GGATGCAACTATTAAACCGAAATTGGGGTTATCCGCTAAAAACTA CGGTCGAAGCATGTTAT rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Details Collection date Identification Institution Accession number Collector code Collector Phylum Class Order Family Genus Species Identifier Identifier Email Identifier Institution	A 21st Nov, 2013 Gomphrena celosioides Mart. GUjarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta Liliopsida Caryophyllales Amaranthaceae Gomphrena celosioides Dr. P.S. Nagar dmagar@gmail.com MSU Baroda		Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCGAGTACTCCCAACCTGGAGTTCCACCCG AAGAAGCAGGGGCTGCAGTAGCTGCCGAATGCTTCTACTGGTACA TGGACAACTGTATGACCGCACGGCTTACCATTCTGATGGTACA AAAGGACGATGCTATCATATCGAGCCCGTTGCTGGTGGAGAAAA TCAATATATTTTTATTATGTAGCGTATCCTTTGAAGCCTITTGAAGAAA GGTTCGTTACTAACATGTTCCATTCCATTGTAGGTACCGATTTGC GGTTGAAAGCCCTTCGTGCTCTACGTTTGCAGGCCACCTCACGGTATCC AAGGACGATGCATACATGTACCAACTGCAGGCCACCCTCACGGTATCC AAGTGCAATATATTATTAGTAAACGAAATTGGACCACCTCCACGGTATCC CTGTTGCTTATGTAAAAACTTCCAATGGCCCACCCTCACGGTATCC CAGGTGCAAAGAGATAAATTGAACAAGTATGGCCGTCCTCTATTA GGATGCAACTATTAAACCGAAATTGGGGTTATCCGCTAAAAACTA CGGTCGAAGCATGTTAT rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Details Collection date Identification Institution Accession number Collector Phylum Class Order Family G enus	21st Nov, 2013 Gomphrena celosioides Mart. Gujarat Biodiversity Gene Bank GENG383-14 BG20131121-0019 Krupa Unadkat Magnoliophyta Liliopsida Caryophyllales Amaranthaceae Gomphrena celosioides Dr. P.S. Nagar dmagar@gmail.com		Sequence >ACTAAAGCAAGTGTTGGATTTAAAGCTGGTGTTAAAGATTACA AATTGACTTATTATACTCCGGAGTATGAAACCCTAGATACTGATA TCTTGGCAGCATTCGAGTACTCCCCAACCTGGAGTTCCACCCG AAGAAGCAGGGGCTGCAGTAGCTGCCGAATGCTTCTACTGGTACA TGGACAACTGTATTGACCGCACGGCTTACCATTCTGATGGTACA AAAGGACGATGCTATCATATCGAGCCCGTTGCTGGTGGAAGAAAA TCAATATATTTTTTATATAGCGTATCCTTTGAAGCCTTTTGATGGTACA GGTTCGTTACTAACATGTTCCATTCCATGTGAGGAATTTGGCGATTCC CTGTTGCTTATGTAAAAACTTTCCAATGGAGCATTTGCGAGTCC CTGTTGCTTATGTAAAAACTTTCCAAGGCCCACCTCACGGTATCC AAGTGCAATATATTATTGAAAACCTATCCAAGGCCCACCTCACGGTATCC CGGTTGAAAGAGATAAATTGAACAAGTATGGCCGTCCTCTATTA GGATGCAACTATTAAACCGAAATTGGAGGATTACCGCTAAAAACTA CGGTCGAAGCATGTTAT rbcL F: ATGTCACCACCAAACAGAGACTAAAGC

**PLATE 37** 

Illustrative Barcode

638

В

India Gujarat

Vadodara

Hami lake Pond area N 22° 19' 12.1"

151

E 73° 06' 09.4"

Krupa Unadkat

Voucher Status Country State

Region

Sector Exact Site

Latitude Longitude

Elevation Photographer

661

Details		Image	Sequence
Collection date	21st Nov, 2013		GAAACCAAAGATACTGATATCTTGGCAGCATTCCGAGTAACTCCT
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			CCTTTAGACCTTTTTGAAGAAGGTTCTGTTACTAACATGTTTACTT
Collector	Krupa Unadkat		
Phylum	Magnoliophyta		CCATTGTGGGTAATGTATTTGGGTTCAAAGCCCTACGCGCTCTAC
Class	Eucotyledons		GTCTGGAGGATTTGCGAATCCCTCCTTCTTATACAAAAACTTTCC
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Photographer	Krupa Unadkat A	269	473
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Details Collection date	21st Nov 2012	Image	Sequence
Details Collection date Identification	21st Nov, 2013 cressa cretica L.	Image	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT
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Collection date Identification		Image	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAACCCGGAGTTCCGCCTGAAG
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Collection date Identification Institution Accession number Collection code Collector	cressa cretica L. Gujarat Biodiversity Gene Bank GENG385-14 BG20131121-0021 Krupa Unadkat	Image	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTAACCCGAGGTTCCGCCTGAAG AAGCAGGGGCCGCCGGGTAGCTGCGGAATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTTACCAGCCTTGATCGGTACAA GGGGCGATGCTACCGCATCGAGCGCGTTGTTGGAGAAAAAGAT
Collection date Identification Institution Accession number Collection code Collector Phylum	cressa aretica L. Gujarat Biodiversity Gene Bank GENG385-14 BG20131121-0021 Krupa Unadkat Magnoliophyta	Image	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAACCCGGAGTTCCGCCTGAAG AAGCAGGGGCCGCGGGTAGCTGCGGAACTCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTTACCAGCCTTGATCGGTACAA GGGGCGATGCTACCGCATCGAGCGCGTTGTTGGAGAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGAACCTTTTGAAGAAG
Collection date Identification Institution Accession number Collection code Collector Phylum Class	cressa cretica L. Gujarat Biodiversity Gene Bank GENG385-14 BG20131121-0021 Krupa Unadkat Magnoliophyta Eucotyledons	Image	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAACCCGGAGTTCCGCCTGAAG AAGCAGGGGCCGGGAGCTGCGGAATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTACCAGCCTTGATCGGTACAA GGGGCGATGCTACCGCATCGAGCGCGTTGTTGGAGAAAAAGAT CAATATTGCTTATGTAGCTTACCGCTTGAGCGTATTTGAAGAAG GTTCGGTTACCAACATGTTTACTTCCATTGTGGGTAATGTATTTG
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order	cressa cretica L. Gujarat Biodiversity Gene Bank GENG385-14 BG20131121-0021 Krupa Unadkat Magnoliophyta Eucotyledons Solanales	Image	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAAACCGAAGATACTGATATCTT AGCAGGGCCGCGGTGCTGCCGGAGTCTCTCTACTGGTACATGG AAGCAGGGGCCGCGGTGCTGCGGACTTACCAGCCTTGATCGGTACATG GGGCGATGCTACCGCATCGAGCGCGTTGTTGGAGAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGACCTTTTGGAGAAAAAGAT GGTTACAAAGCATTGCGCCCTCACGTCGGAAGATCTACGAATC
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Collection date Identification Institution Accession number Collector ode Collector Phylum Class Order Family Genus Species	cressa cretica L. Gujarat Biodiversity Gene Bank GENG385-14 BG20131121-0021 Krupa Unadkat Magnoliophyta Eucotyledons Solanales Convolvulaceae Cressa cretica		>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCTGAGTACAAAACCTGAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAACCCGGAGTTCGCCCTGAAG AAGCAGGGGCCGCGGTAGCTGCGGAATCTTCTACTGGTACATGG ACAACTGTGTGGACCGCATGGACTTACCAGCCTTGATCGGTACAA GGGGCGATGCTACCGCATCGAGCGCGTGTTGGAGAAAAAGAT CAATATATTGCTTATGTAGCTTACCTTTACAGCTTTTGAAGGAAG
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier	cressa cretica L. Gujarat Biodiversity Gene Bank GENG385-14 BG20131121-0021 Krupa Unadkat Magnoliophyta Eucotyledons Solanales Convolvulaceae Cressa cretica Dr. P.S. Nagar		>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAAACCGAAGATACTGATATCTT AGCAGGGCCGCGGGTGCTGCCGGAGTTCTCTACTGGTACATGG AACAACTGTGTGGACCGATGGTCGCGGATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTTACCAGCCTTGATGGAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGACCTTTGGAGAAAAAGAT CAATAATTGCTTATGTAGCTTACCCTTAGACCTTTTGAGAAAAAGAT GGTCCAAAGCATTGCGCGCCTCACGTCGGAAGATCTACGAATG GGTCAAAGCATTGCGCGCCTCACGTCGGAAGATCTACGAATC CCTACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCAACGGTTGACGAGAAAAATTGAACAAGTATGGTCGTCCTCTGTT GGGGTGTACGACAATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGGTGTACGATAAACCTAAAATTGGGGTTATCTGCCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC
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Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family G enus Species Identifier Identifier Email Identifier	cressa cretica L. Gujarat Biodiversity Gene Bank GENG385-14 BG20131121-0021 Krupa Unadkat Magnoliophyta Eucotyledons Solanales Convolvulaceae Cressa cretica Dr. P.S. Nagar		>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAAACCGAAGATACTGATATCTT AGCAGGGCCGCGGGTGCTGCCGGAGTTCTCTACTGGTACATGG AACAACTGTGTGGACCGATGGTCGCGGATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTTACCAGCCTTGATGGAGAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGACCTTTGGAGAAAAAGAT GGTCCAAAGCATTGCGCGCCTCACGTCGTGGAAGATCTACGAATG GGTCAAAGCATTGCGCGCCTCACGTCGGAAGATCTACGAATC CCTACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCAGGGTGTACGAAGATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGTATCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGGTTATCTGCCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Identifier Institution	cressa aretica L. Gujarat Biodiversity Gene Bank GENG385-14 BG20131121-0021 Krupa Unadkat Magnoliophyta Eucotyledons Solanales Convolvulaceae Cressa cretica Dr. P.S. Nagar dmagar@gmail.com MSU Baroda	ABI Chromatograph	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAAACCGAAGATACTGATATCTT AGCAGGGCCGCGGGTGCTGCCGGAGTTCTCTACTGGTACATGG AACAACTGTGTGGACCGATGGTCGCGGATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTTACCAGCCTTGATGGAGAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGACCTTTGGAGAAAAAGAT GGTCCAAAGCATTGCGCGCCTCACGTCGTGGAAGATCTACGAATG GGTCAAAGCATTGCGCGCCTCACGTCGGAAGATCTACGAATC CCTACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCAGGGTGTACGAAGATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGTATCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGGTTATCTGCCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Identifier Institution Identification	cressa aretica L. Gujarat Biodiversity Gene Bank GENG385-14 BG20131121-0021 Krupa Unadkat Magnoliophyta Eucotyledons Solanales Convolvulaceae Cressa cretica Dr. P.S. Nagar dmagar@gmail.com	ABI Chromatograph	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAAACCGAAGATACTGATATCTT AGCAGGGCCGCGGGTGCTGCCGGAGTTCTCTACTGGTACATGG AACAACTGTGTGGACCGATGGTCGCGGATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTTACCAGCCTTGATGGAGAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGACCTTTGGAGAAAAAGAT GGTCCAAAGCATTGCGCGCCTCACGTCGTGGAAGATCTACGAATG GGTCAAAGCATTGCGCGCCTCACGTCGGAAGATCTACGAATC CCTACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCAGGGTGTACGAAGATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGTATCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGGTTATCTGCCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Identifier Institution Identification Method	cressa aretica L. Gujarat Biodiversity Gene Bank GENG385-14 BG20131121-0021 Krupa Unadkat Magnoliophyta Eucotyledons Solanales Convolvulaceae Cressa cretica Dr. P.S. Nagar dmagar@gmail.com MSU Baroda Morphology and Barcoding	ABI Chromatograph	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAAACCGAAGATACTGATATCTT AGCAGGGCCGCGGGTGCTGCCGGAGTTCTCTACTGGTACATGG AACAACTGTGTGGACCGATGGTCGCGGATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTTACCAGCCTTGATGGAGAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGACCTTTGGAGAAAAAGAT GGTCCAAAGCATTGCGCGCCTCACGTCGTGGAAGATCTACGAATG GGTCAAAGCATTGCGCGCCTCACGTCGGAAGATCTACGAATC CCTACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCAGGGTGTACGAAGATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGTATCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGGTTATCTGCCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Identifier Institution Identifier Institution Identification Method Voucher Status	cressa aretica L.         Gujarat Biodiversity Gene Bank         GENG385-14         BG20131121-0021         Krupa Unadkat         Magnoliophyta         Eucotyledons         Solanales         Convolvulaceae         Cressa         cretica         Dr. P.S. Nagar         dmagar@gmail.com         MSU Baroda         Morphology and Barcoding         Herbarium, Photographs	ABI Chromatograph	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAAACCGAAGATACTGATATCTT AGCAGGGCCGCGGGTGCTGCCGGAGTTCTCTACTGGTACATGG AACAACTGTGTGGACCGATGGTCGCGGATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTTACCAGCCTTGATGGAGAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGACCTTTGGAGAAAAAGAT GGTCCAAAGCATTGCGCGCCTCACGTCGTGGAAGATCTACGAATG GGTCAAAGCATTGCGCGCCTCACGTCGGAAGATCTACGAATC CCTACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCAGGGTGTACGAAGATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGTATCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGGTTATCTGCCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Identifier Institution Identification Method	cressa aretica L. Gujarat Biodiversity Gene Bank GENG385-14 BG20131121-0021 Krupa Unadkat Magnoliophyta Eucotyledons Solanales Convolvulaceae Cressa cretica Dr. P.S. Nagar dmagar@gmail.com MSU Baroda Morphology and Barcoding	ABI Chromatograph	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAAACCGAAGATACTGATATCTT AGCAGGGCCGCGGGTGCTGCCGGAGTTCTCTACTGGTACATGG AACAACTGTGTGGACCGATGGTCGCGGATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTTACCAGCCTTGATGGAGAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGACCTTTGGAGAAAAAGAT GGTCCAAAGCATTGCGCGCCTCACGTCGTGGAAGATCTACGAATG GGTCAAAGCATTGCGCGCCTCACGTCGGAAGATCTACGAATC CCTACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCAGGGTGTACGAAGATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGTATCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGGTTATCTGCCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Identifier Institution Identification Method Voucher Status Country	cressa aretica L.         Gujarat Biodiversity Gene Bank         GENG385-14         BG20131121-0021         Krupa Unadkat         Magnoliophyta         Eucotyledons         Solanales         Convolvulaceae         Cressa         cretica         Dr. P.S. Nagar         dmagar@gmail.com         MSU Baroda         Morphology and Barcoding         Herbarium, Photographs         India	ABI Chromatograph	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAAACCGAAGATACTGATATCTT AGCAGGGCCGCGGGTGCTGCCGGAGTTCTCTACTGGTACATGG AACAACTGTGTGGACCGATGGTCGCGGATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTTACCAGCCTTGATGGAGAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGACCTTTGGAGAAAAAGAT GGTCCAAAGCATTGCGCGCCTCACGTCGTGGAAGATCTACGAATG GGTCAAAGCATTGCGCGCCTCACGTCGGAAGATCTACGAATC CCTACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCAGGGTGTACGAAGATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGTATCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGGTTATCTGCCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Identifier Institution Identification Method Voucher Status Country State	cressa aretica L.         Gujarat Biodiversity Gene Bank         GENG385-14         BG20131121-0021         Krupa Unadkat         Magnoliophyta         Eucotyledons         Solanales         Convolvulaceae         Cressa         cretica         Dr. P.S. Nagar         dmagar@gmail.com         MSU Baroda         Morphology and Barcoding         Herbarium, Photographs         India         Gujarat	ABI Chromatograph	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAAACCGAAGATACTGATATCTT AGCAGGACTCCGGAGTACTCCCTCAACCCGGAGTTCCTGCGCTGAAG AAGCAGGGGCCGCGGTGCTGCGGAATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTACCAGCCTTGATGGGAAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGAACCTTTTGAAGAAAG GTTCGGTTACCAACATGTTTACTTCCATTGTGGGTAATGTATTTG GGTCAAAGCATTGCGCGCTCTACGTCTGGAAGATCTACGAATC CCTACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCACGGGTGTACGATAAATTGAACAAGTATGGTGGTGCTCTCTT GGGGTGTACGATTAAACCTAAATTGGAGTATCGCCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC Primer R: GTAAAATCAAGTCACCRCG
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Identifier Institution Identifier Institution Identification Method Voucher Status Country State Region	cressa aretica L.         Gujarat Biodiversity Gene Bank         GENG385-14         BG20131121-0021         Krupa Unadkat         Magnoliophyta         Eucotyledons         Solanales         Convolvulaceae         Cressa         cretica         Dr. P.S. Nagar         MsU Baroda         Morphology and Barcoding         Herbarium, Photographs         India         Gujarat         Vadodara	ABI Chromatograph	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAAACCGAAGATACTGATATCTT AGCAGGGCCGCGGGTGCTGCCGGAGTTCTCTACTGGTACATGG AACAACTGTGTGGACCGATGGTCGCGGATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTTACCAGCCTTGATGGAGAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGACCTTTGGAGAAAAAGAT GGTCCAAAGCATTGCGCGCCTCACGTCGTGGAAGATCTACGAATG GGTCAAAGCATTGCGCGCCTCACGTCGGAAGATCTACGAATC CCTACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCAGGGTGTACGAAGATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGTATCGTCCTCTGTT GGGGTGAACGATTAAACCTAAATTGGAGGTTATCTGCCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Identifier Institution Identifier Institution Identification Method Voucher Status Country State Region Sector	cressa aretica L.         Gujarat Biodiversity Gene Bank         GENG385-14         BG20131121-0021         Krupa Unadkat         Magnoliophyta         Eucotyledons         Solanales         Convolvulaceae         Cressa         cretica         Dr. P.S. Nagar         MSU Baroda         Morphology and Barcoding         Herbarium, Photographs         India         Gujarat         Vadodara         Hami lake	ABI Chromatograph	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAAACCGAAGATACTGATATCTT AGCAGGACTCCGGAGTACTCCCTCAACCCGGAGTTCCTGCGCTGAAG AAGCAGGGGCCGCGGTGCTGCGGAATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTACCAGCCTTGATGGGAAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGAACCTTTTGAAGAAAG GTTCGGTTACCAACATGTTTACTTCCATTGTGGGTAATGTATTTG GGTCAAAGCATTGCGCGCTCTACGTCTGGAAGATCTACGAATC CCTACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCACGGGTGTACGATAAATTGAACAAGTATGGTGGTGCTCTCTT GGGGTGTACGATTAAACCTAAATTGGAGTATCGCCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC Primer R: GTAAAATCAAGTCACCRCG
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Identifier Institution Identifier Institution Identification Method Voucher Status Country State Region Sector Exact Site Latitude Longitude	cressa aretica L.         Gujarat Biodiversity Gene Bank         GENG385-14         BG20131121-0021         Krupa Unadkat         Magnoliophyta         Eucotyledons         Solanales         Convolvulaceae         Cressa         cretica         Dr. P.S. Nagar         MSU Baroda         Morphology and Barcoding         Herbarium, Photographs         India         Gujarat         Vadodara         Hami lake         Pond area         N 22° 19' 10.3"         E 73° 06' 09.9"	ABI Chromatograph	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCGAAACCCAAAGATACTGATATCTT AGCAGGCATCCGGATACTCCCTCAACCCGGAAGTTCTCTACTGGTACATGG AACAACTGTGTGGACCGATGGACCTACCAGCCTTGATCGGTACAA GGGGCGATGCTACCGCATCGAAGCGCGTTGTTGGAGAAAAAGAT CAATATATTGCTTATGTAGCTTACCCCTTTAGACCTTTTGAGAAAAAGAT CAATATATTGCTTATGTAGCTTCACGCTTGGAGAAAAAAGAT CCTACGACTTATTAAAACTTTCCAACGCTGGAAAGATCTACGAATC CCTACGACTTATTAAAACTTTCCCAAGGCCGCCTCATGGCATC CAAGTTGAGAGAGATAAATTGACAAGATAGGTCGTCCTCTGTT GGGGTGTACCAACATGATAAACTTACGAGTATCGCCTCTAGGCCTCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC Primer R: GTAAAATCAAGTCCACCRCG
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Institution Identifier Institution Identifier Institution Identification Method Voucher Status Country State Region Sector Exact Site Latitude Elevation	cressa aretica L.         Gujarat Biodiversity Gene Bank         GENG385-14         BG20131121-0021         Krupa Unadkat         Magnoliophyta         Eucotyledons         Solanales         Convolvulaceae         Cressa         cretica         Dr. P.S. Nagar         Morphology and Barcoding         Herbarium, Photographs         India         Gujarat         Vadodara         Hami lake         Pond area         N 22° 19' 10.3"         E 73° 06' 09.9"         111		>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCTCAAAACCGAAGATACTGATATCTT AGCAGGACTCCGGAGTACTCCCTCAACCCGGAGTTCCTGCGCTGAAG AAGCAGGGGCCGCGGTGCTGCGGAATCTTCTACTGGTACATGG ACAACTGTGTGGACCGATGGACTACCAGCCTTGATGGGAAAAAAGAT CAATATTGCTTATGTAGCTTACCCTTTAGAACCTTTTGAAGAAAG GTTCGGTTACCAACATGTTTACTTCCATTGTGGGTAATGTATTTG GGTCAAAGCATTGCGCGCTCTACGTCTGGAAGATCTACGAATC CCTACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CCACGGGTGTACGATAAATTGAACAAGTATGGTGGTGCTCTCTT GGGGTGTACGATTAAACCTAAATTGGAGTATCGCCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC Primer R: GTAAAATCAAGTCACCRCG
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Identifier Institution Identifier Institution Identification Method Voucher Status Country State Region Sector Exact Site Latitude Longitude	cressa aretica L.         Gujarat Biodiversity Gene Bank         GENG385-14         BG20131121-0021         Krupa Unadkat         Magnoliophyta         Eucotyledons         Solanales         Convolvulaceae         Cressa         cretica         Dr. P.S. Nagar         MSU Baroda         Morphology and Barcoding         Herbarium, Photographs         India         Gujarat         Vadodara         Hami lake         Pond area         N 22° 19' 10.3"         E 73° 06' 09.9"		<ul> <li>&gt;AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCGAAATCTGAACCGAAGATACTGATATCTT AGCAGGATCCGAGTAGCTCCCGGAATCTTCTACTGGTACAATG AACAACTGTGTGGACCGATGGACTACCAGCCTTGATCGTACATGG ACAACTGTGTGGACCGATGCTTACCAGCCTTGATCGTACAA GGGGCGATGCTACCGCATCGAAGCGCCTTGTTGGAGAAAAAAGAT CAATATATTGCTTATGTAGCTTACCCTTTAGACCTTTTGAGAAAAAAGAT CAATATATTGCTATGTAGCTTACCCTTTAGACCTTTTGAGAAAAAAGAT CAATATATTGCTATGTAGCTTACCCTTTAGACCTTTTTGAGAGAAG GTTCGATACAACATGTTTACTTCCATTGTGGGTAATGTATTTG GGTTCAAAGCATTGCGCGCTCTACGTCTGGAAGACTCACGAATC CCACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CAAGTTGAAGAGAATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGTGTACCAACAGATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGTGTACCAACAAGCAAACAGAGACTAAAGC Primer R: GTAAAATCAAGTCCACCRCG</li> </ul>
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Institution Identifier Institution Identifier Institution Identification Method Voucher Status Country State Region Sector Exact Site Latitude Elevation	cressa aretica L.         Gujarat Biodiversity Gene Bank         GENG385-14         BG20131121-0021         Krupa Unadkat         Magnoliophyta         Eucotyledons         Solanales         Convolvulaceae         Cressa         cretica         Dr. P.S. Nagar         dmagar@gmail.com         MSU Baroda         Morphology and Barcoding         Herbarium, Photographs         India         Gujarat         Vadodara         Hami lake         Pond area         N 22° 19' 10.3"         E 73° 06' 09.9"         111         Krupa Unadkat	ABI Chromatograph	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCGAAACCCAAAGATACTGATATCTT AGCAGGCATCCGGATACTCCCTCAACCCGGAAGTTCTCTACTGGTACATGG AACAACTGTGTGGACCGATGGACCTACCAGCCTTGATCGGTACAA GGGGCGATGCTACCGCATCGAAGCGCGTTGTTGGAGAAAAAGAT CAATATATTGCTTATGTAGCTTACCCCTTTAGACCTTTTGAGAAAAAGAT CAATATATTGCTTATGTAGCTTCACGCTTGGAGAAAAAAGAT CCTACGACTTATTAAAACTTTCCAACGCTGGAAAGATCTACGAATC CCTACGACTTATTAAAACTTTCCCAAGGCCGCCTCATGGCATC CAAGTTGAGAGAGATAAATTGACAAGATAGGTCGTCCTCTGTT GGGGTGTACCAACATGATAAACTTACGAGTATCGCCTCTAGGCCTCAAAAACT ACGGT Primer F: ATGTCACCACAAACAGAGACTAAAGC Primer R: GTAAAATCAAGTCCACCRCG
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Institution Identifier Institution Identifier Institution Identification Method Voucher Status Country State Region Sector Exact Site Latitude Elevation	cressa aretica L.         Gujarat Biodiversity Gene Bank         GENG385-14         BG20131121-0021         Krupa Unadkat         Magnoliophyta         Eucotyledons         Solanales         Convolvulaceae         Cressa         cretica         Dr. P.S. Nagar         Morphology and Barcoding         Herbarium, Photographs         India         Gujarat         Vadodara         Hami lake         Pond area         N 22° 19' 10.3"         E 73° 06' 09.9"         111	ABI Chromatograph	<ul> <li>&gt;AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCGAAATCTGAACCGAAGATACTGATATCTT AGCAGGATCCGAGTAGCTCCCGGAATCTTCTACTGGTACAATG AACAACTGTGTGGACCGATGGACTACCAGCCTTGATCGTACATGG ACAACTGTGTGGACCGATGCTTACCAGCCTTGATCGTACAA GGGGCGATGCTACCGCATCGAAGCGCCTTGTTGGAGAAAAAAGAT CAATATATTGCTTATGTAGCTTACCCTTTAGACCTTTTGAGAAAAAAGAT CAATATATTGCTATGTAGCTTACCCTTTAGACCTTTTGAGAAAAAAGAT CAATATATTGCTATGTAGCTTACCCTTTAGACCTTTTTGAGAGAAG GTTCGATACAACATGTTTACTTCCATTGTGGGTAATGTATTTG GGTTCAAAGCATTGCGCGCTCTACGTCTGGAAGACTCACGAATC CCACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CAAGTTGAAGAGAATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGTGTACCAACAGATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGTGTACCAACAAGCAAACAGAGACTAAAGC Primer R: GTAAAATCAAGTCCACCRCG</li> </ul>
Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus Species Identifier Institution Identifier Institution Identifier Institution Identification Method Voucher Status Country State Region Sector Exact Site Latitude Elevation	cressa aretica L.         Gujarat Biodiversity Gene Bank         GENG385-14         BG20131121-0021         Krupa Unadkat         Magnoliophyta         Eucotyledons         Solanales         Convolvulaceae         Cressa         cretica         Dr. P.S. Nagar         dmagar@gmail.com         MSU Baroda         Morphology and Barcoding         Herbarium, Photographs         India         Gujarat         Vadodara         Hami lake         Pond area         N 22° 19' 10.3"         E 73° 06' 09.9"         111         Krupa Unadkat	ABI Chromatograph	<ul> <li>&gt;AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGACTACAAAT TAACTTATTATACTCCTGAGTACAAAACCAAAGATACTGATATCTT AGCAGCATTCCGAGTAACTCCGAAATCTGAACCGAAGATACTGATATCTT AGCAGGATCCGAGTAGCTCCCGGAATCTTCTACTGGTACAATG AACAACTGTGTGGACCGATGGACTACCAGCCTTGATCGTACATGG ACAACTGTGTGGACCGATGCTTACCAGCCTTGATCGTACAA GGGGCGATGCTACCGCATCGAAGCGCCTTGTTGGAGAAAAAAGAT CAATATATTGCTTATGTAGCTTACCCTTTAGACCTTTTGAGAAAAAAGAT CAATATATTGCTATGTAGCTTACCCTTTAGACCTTTTGAGAAAAAAGAT CAATATATTGCTATGTAGCTTACCCTTTAGACCTTTTTGAGAGAAG GTTCGATACAACATGTTTACTTCCATTGTGGGTAATGTATTTG GGTTCAAAGCATTGCGCGCTCTACGTCTGGAAGACTCACGAATC CCACGGCTTATATTAAAACTTTCCAAGGCCCGCCTCATGGCATC CAAGTTGAAGAGAATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGTGTACCAACAGATAAATTGAACAAGTATGGTCGTCCTCTGTT GGGTGTACCAACAAGCAAACAGAGACTAAAGC Primer R: GTAAAATCAAGTCCACCRCG</li> </ul>

Details		Image Sequence
Collection date	21st Nov, 2013	>AGTGTTGGATTCAAAGCGGGTGTAAAAGAGTACAAATTGACT
dentification	Phyla nodiflora (L.) Greene	
institution		
	Gujarat Biodiversity Gene Bank	CATTTCGAGTAACTCCTCAACCTGGAGTTCCACCTGAAGAAGAAGAA
Accession number	GENG386-14	
Collection code	BG20131121-0023	
Collector	Krupa Unadkat	
		- TTGTTATGTAGCTTACCCTTTTAGACCTTTTGAAGAAGGTTCGG
Phylum	Magnoliophyta	
Class	Eucotyledons	
Order	Lamiales	GCCCTACGTGCTCTACGTCTGGAAGATCTGCGAATCCCTGTTGC
		TATGTTAAAACTTTCCAAGGCCCGCCTCACGGGATCCAATCTGA
Family	Verbenaceae	
Genus	Phyla	AGAGATAAATTGAACAAGTATGGTCGTCCCCTG
Species	nodiflora	
		Primer F: ATGTCACCACAGAGAGACTAAAGC
dentifier	Dr. P.S. Nagar	
		Primer R: GTAAAATCAAGTCCACCRCG
dentifier Email	dmagar@gmail.com	ABI Chromatograph
dentifier	MSU Baroda	
institution		1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.
dentification	Morphology and Barcoding	A A A A A A A A A A A A A A A A A A A
	morphorogy and barcouling	
Method		
Voucher Status	Herbarium, Photographs	
Country	India	
State	Gujarat	
Region	Vadodara	
Sector	Hami lake	
Exact Site	Pond area	
		Illustrative Barcode:
Latitude	N 22° 19' 11.1"	26
ongitude	E 73° 06' 09.7"	
Elevation	120	
nevation	Key ex Usedhet	269 47
	Krupa Unadkat 🔥 🔥	
Photographer		
Details		Image Sequence
Details Collection date	21st Nov, 2013	Image     Sequence       >AAAGCACGTGTTGGGTTCAAAGCTGGTGTTAAAGATTATAAA
Details		Image     Sequence       >AAAGCACGTGTTGGGTTCAAAGCTGGTGTTAAAGATTATAAAT
Details Collection date	21st Nov, 2013	Image         Sequence           >AAAGCACGTGTTGGGTTCAAAGCTGGTGTTAAAGATTATAAA           TGACTTATTATACTCCTGAGTATGAAACCAAAGATACCGATATCC
Details Collection date dentification institution	21st Nov, 2013 Elaeocarpus variabilis Zmarzty Gujarat Biodiversity Gene Bank	Image         Sequence           >AAAGCAC GTGTTGGGTTCAAAGCTGGTGTTAAAGATTATAAAT           TGGCTATATTATACTCCTGAGTATGAAACCCAAAGATACCGATATC           TGGCAGCATTCCGAGTAACCCCAACGGGGGTCCCACCTGAA
Details Collection date dentification institution Accession number	21st Nov, 2013 Elaeocarpus variabilis Zmarzty Gujarat Biodiversity Gene Bank GENG387-14	Image         Sequence           >AAAGCACGTGTTGGGTTCAAAGCTGGTGTTAAAGATTATAAA         CGCAGCACGTGTTGGAGTATGAAACCAAAGATACCGATATC           TGACTTATTATACTCCTGAGTATGAAACCAAAGATTCCACTGAA         GGCAGCACTGCGGTAACTCCTCAACCGGGAGTTCCACCTGAA           GAAGCAGGTGCTGCGGTAGCTGCGGAATTCTACTGGTACAA         GAAGCAGGTGCTGCGGTAGCTGCGGAATTCTACTGGTACAA
Details Collection date identification	21st Nov, 2013 Elaeocarpus variabilis Zmarzty Gujarat Biodiversity Gene Bank	Image         Sequence           >>AAAGCACGTGTTGAGAGCTGGTGTTAAAGATTATAAA           TGACTTATTATACTCCTGAGTATGAAACCAAAGATACCGATACCGATAC           GGCAGCATTCCGAGTAACCCCCGAGAGTTCCACCGGAA           GAAGCAGGTGCTGCCGGTAGCTGCGGAATCTCCACCTGAA           GAAGCACGTGTGGGCCCGATGGGCTTACCAGCTCTGATCGTTACA
Details Collection date dentification nstitution Accession number Collection code	21st Nov, 2013 Elaeocarpus variabilis Zmarzty Gujarat Biodiversity Gene Bank GENG387-14 BG20131121-0024	Image         Sequence           >>AAAGCACGTGTTGAGAGCTGGTGTTAAAGATTATAAA           TGACTTATTATACTCCTGAGTATGAAACCAAAGATACCGATACCGATAC           GGCAGCATTCCGAGTAACCCCCGAGAGTTCCACCGGAA           GAAGCAGGTGCTGCCGGTAGCTGCGGAATCTCCACCTGAA           GAAGCACGTGTGGGCCCGATGGGCTTACCAGCTCTGATCGTTACA
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Details		Image Sequence	
Collection date	21st Nov, 2013	>ACTAAAGCAAGTGTTGGGTTCAAAGCTGGTGTTAAAGATTATA	
Identification	Aeschynomene indica L.	AATTGACTTATTATACTCCTGACTATGAAACGAAAGATACTGATA	
Institution	Gujarat Biodiversity Gene Bank	TTTTGGCAGCATTCCGAGTAACTCCTCAACCAGGAGTTCCTCCTC	
Accession number	GENG388-14	AAGAAGCGGGTGCTGCGGTAGCTGCCGAATCTTCTACTGGTAC	
Collection code	BG20131121-0025	TGGACAACCGGTTGGACCGATGGGCTTACCAGTCTTGATCGTTA	
e unceatin coac			
Collector	Krupa Unadkat	AAAGGACGATGCTACAACATCGAGCCCGTTGCTGGAGAAGAAA	
Phylum	Magnoliophyta	ATCAATATATTGCTTATGTAGCTTATCCCTTAGACCTTTTTGAGG	
Class	Eucotyledons	AGGTTCTGTTACTAACATGTTTACTTCCATTGTAGGTAAGGTAATGTCTT	
Order	Fabales	GGGTTCAAGGCCCTGCGTGCCCTACGTCTGGAAGATTTGCGAA	
Family	Fabaceae	CCCTACTTCTTATATAAAAACTTTCCAAGGTCCGCCTCACGGTAT	
Genus	Aeschynomene		
	indica	GGGATGTACTATTAAACCGAAATTGGGGTTATCCGCTAAAAATT	
Species			
Identifier	Dr. P.S. Nagar	ALGGTAGAGLAGT	
		Primer F:ATGTCACCACAAACAGAGACTAAAGC	
		PINIELE A IGICACCACAAACAGAGACTAAAGC	
		Primer R: GTAAAATCAAGTCCACCRCG	
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Identifier Email	dmagar@gmail.com	ABI Chromatograph	
Identifier	MSU Baroda		
Institution			
Identification	Morphology and Barcoding	- so a vie solite solite solite solite solitishing a solitishi bitat solitishi a solitishi a solitishi a solitishi a solitishi solitishi a solitishi solitishi a solitishi a solitishi	
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Country	India		
State	Gujarat		
Region		alaster a	
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	Vadodara		
Sector	Hami lake	and the second	
Sector Exact Site	Hami lake Pond area	Instructive Barcode:	
Sector Exact Site Latitude	Hami lake Pond area N 22° 19' 09.1"		
Sector Exact Site Latitude Longitude	Hami lake Pond area N 22° 19' 09.1" E 73° 06' 10.4"	Inustrative Barcode: 10	
Sector Exact Site Latitude Longitude Elevation	Hami lake Pond area N 22° 19' 09.1" E 73° 06' 10.4" 99 A	Haustrative Barcode:         200           1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1	
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Sector Exact Site Latitude Longitude Elevation Photographer	Hami lake Pond area N 22° 19' 09.1" E 73° 06' 10.4" 99 A	According to the second	
Sector Exact Site Latitude Longitude Elevation Photographer Details	Hami lake Pond area N 22° 19' 09.1" E 73° 06' 10.4" 99 A Krupa Unadkat	Image     Sequence	
Sector Exact Site Latitude Longitude Elevation Photographer Details Collection date	Hami lake Pond area N 22° 19' 09.1" E 73° 06' 10.4" 99 Krupa Unadkat 21st Nov, 2013	Inustrative Barcode:         200           201         520           202         520           203         540           204         540           205         540           206         540           207         540           208         540           209         540           200         540           201         540           202         540           203         540           204         540           205         540           205         540           205         540           205         540           205         540           205         540           205         540           205         540           205         540           205         540           205         540           205         540           205         540           205         540           205         540           205         540           205         540           205         540	
Sector Exact Site Latitude Longitude Elevation Photographer Details Collection date Identification	Hami lake Pond area N 22° 19' 09.1" E 73° 06' 10.4" 99 Krupa Unadkat 21st Nov, 2013 Eliocharis dulsis	Image         Sequence           >AAAGCAAGTGTTTGAAGCAGGGGTTAAAGATTACAA, TACTTATTATACTCCTGAGTATGAAACCAAAGATACTGATATC	
Sector Exact Site Latitude Longitude Elevation Photographer <b>Details</b> Collection date Identification Institution	Hami lake Pond area N 22° 19' 09.1" E 73° 06' 10.4" 99 Krupa Unadkat 21st Nov, 2013 Eliocharis dulsis Gujarat Biodiversity Gene Bank	Intertrative Barcode:         X00           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500           200         500	
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Sector Exact Site Latitude Longitude Elevation Photographer <b>Details</b> Collection date Identification Institution Accession number Sample Id	Hami lake Pond area N 22° 19' 09.1" E 73° 06' 10.4" 99 Krupa Unadkat Z1st Nov, 2013 Eliocharis dulsis Gujarat Biodiversity Gene Bank GENG389-14 BG20131121-0030	Image         Sequence           >AAAGCAAGTGTTGGGTTTAAAGCAGGGGGTTAAAGATTACAA           TTACTTATTATACTCCTGAGTAGAAGCAAAGGAGTTACAAGAATTACAA           AGCAGGAGCTGCAGTAAAGAATTACAA           AGCAGGAGCTGCAGTAACGAATCGAATCGAATCGAATCG	
Sector Exact Site Latitude Longitude Elevation Photographer <b>Details</b> Collection date Identification Institution Accession number Sample Id Field Id	Hami lake Pond area N 22° 19' 09.1" E 73° 06' 10.4" 99 Krupa Unadkat  21st Nov, 2013 Eliocharis dulsis Gujarat Biodiversity Gene Bank GENG389-14 BG20131121-0030 Krupa Unadkat	Intertrative Bacode:         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200         200           1         200	
Sector Exact Site Latitude Longitude Elevation Photographer  Details Collection date Identification Institution Accession number Sample Id Field Id Collection code	Hami lake Pond area N 22° 19° 09.1" E 73° 06' 10.4" 99 Krupa Unadkat 21st Nov, 2013 Eliocharis dulsis Gujarat Biodiversity Gene Bank GENG389-14 BG20131121-0030 Krupa Unadkat Magnoliophyta	Image       Sequence         Sequence	
Sector Exact Site Latitude Longitude Elevation Photographer Ocliection date Identification Institution Accession number Sample Id Field Id Collection code Collector	Hami lake Pond area N 22° 19' 09.1" E 73° 06' 10.4" 99 Krupa Unadkat 21st Nov, 2013 Eliocharis dulsis Gujarat Biodiversity Gene Bank GENG389-14 BG20131121-0030 Krupa Unadkat Magnoliophyta Liliopsida	Image       Sequence         >AAAGCAAGTGTTGGGTTTAAAGCAGGGGTTAAAGATTACAA         Timage       >AAAGCAAGTGTTGGGTTTAAAGCAGGGGTTAAAGATTACAA         AGCAGGAGCTGCCGAGTACCCACAAGATACTGATACCAA         GGCAGCGTTCCGAGTAACCAAAGATACTGATACCAA         AGCAGGAGCTGCCAGTAGCGGCCGAATCTCTACTGGTACAA         AGCAGGAGCTGCCAGTAGCGGCCGGAATCTCTACTGGTACAA         AGCAGGAGCTGCCAGTAGCGGCCGGAATCTTCTACTGGTACAA         AGCAGGAGCTGCCAGTAGCGGCCGGAATCTTCTACTGGTACAAA         AGCAGGAGCTGCCAGTAGCGGCCGGAATCTTCTACTGGAAAAAT         AGCAGGAGCTGCATATAGCGTTTATTGGAGAAAAAT         AGTTATTGCCTATATGAGCTTATCTTAAGCCTTTTCGAAGAAAT         ATTATGCCTATATGAGCTTATCTTAAGGTAATGTATTTGGAGTAATGTATTTGGAGTAATGTATTTGGAGTAATGTATTTGGAGTAATGTATTTGGAGTAATGTATTTGGAGTAATGTATTTGGAGTAATGTATTTGGAGTAATGTATTTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGTAATGTAATTGGAGAAGA	
Sector Exact Site Latitude Longitude Elevation Photographer  Details Collection date Identification Institution Accession number Sample Id Field Id Collection code	Hami lake Pond area N 22° 19° 09.1" E 73° 06' 10.4" 99 Krupa Unadkat 21st Nov, 2013 Eliocharis dulsis Gujarat Biodiversity Gene Bank GENG389-14 BG20131121-0030 Krupa Unadkat Magnoliophyta	Inustrative Barcode:         200           269         577           559         540           540         540           Image         Sequence           >AAAGCAAGTGTTGAGGTTTAAAGCAGGGGTTAAAGATTACAA	

Collection date	21st Nov, 2013	>AAAGCAAGTGTTGGGTTTAAAGCAGGGGTTAAAGATTACAAAC	
Identification	Elio charis dulsis	TTACTTA TTATACTCCTGAGTATGAAACCAAAGATACTGATATCTT	
Institution	Gujarat Biodiversity Gene Bank		GGCAGCGTTCCGAGTAACTCCTCAACCCGGAGTCCCTCCTGAAG
Accession number	GENG389-14		AAGCAGGAGCTGCAGTAGCGGCGGAATCTTCTACTGGTACATGG
Sample Id	BG20131121-0030		ACAACTGTTTGGACTGATGGACTTACCAGTCTTGATCGTTACAAA
			GGGCGATGCTATCATATTGAGCCTGTTATTGGAGAAAAAAATCA
Field Id	Krupa Unadkat	ATTTATTGCCTATGTAGCTTATCCTTTAGACCTTTTCGAAGAAGGT	
Collection code	Magnoliophyta		
Collector	Liliopsida		TCAAAGCCTTACGAGCTCTACGCTTGGAAGACTTACGAATTCCCC
Phylum	Poales		CTGCTTATTCAAAAACTTTCCAAGGCCCACCTCACGGTATCCAAT
Class	Cyperaceae		
Order	Eleocharis		CTGAAAGAGATAAGTTGAACAAATATGGTCGTCCTCTATTGGGA
Family	dulcis		TGTACTATTAAACCAAAATTGGGATTATCCGCAAAGAACTACGGT
Genus	Dr. P.S. Nagar		AGAGCATGTTATGAATGTCTAC
Species	dmagar@gmail.com		Primer F: ATGTCACCACAAACAGAGACTAAAGC
Identifier	MSU Baroda		Primer F: ATGTCACCACAAACAGAGACTAAAGC
			Primer R: GTAAAATCAAGTCCACCRCG
Identifier Email	Morphology and Barcoding	ABI Chromatogram	
Identifier	Herbarium, Photographs		
Institution			
Identification	India	the second se	
Method			
Voucher Status	Gujarat		
Country	Vadodara	10000185000 # * * * * * * * * * * * * * * * * *	
State	Hami lake		
Region	Pond area		مرا بمرابعها بالمراجلة الاستان والتراجي المراجع
Sector	N 22° 19' 10.1"		and a second
Exact Site	E 73° 06' 09.4"	and the second	
Latitude	122		
Longitude	Krupa Unadkat	Illustrative_Barcode:	265
Elevation	122		
Photographer	Krupa Unadkat B	269	537
		520	550

Icom ABI Chromato gram	<ul> <li>&gt;AAAGCAAGTGTTGGGTTTAAAGCAGGGGTTAAAGATTACAAAC TTACTTATTATACTCCTGAGTATGAAACCAAAGATACTGATATCTT GGCAGGGTTCCGAGTAACCCAAGCCGGAATCCTGTACTGGTACATGG AAGCAGGGAGCTGCAGTAGCGGCGGAATCTTCTACTGGTACATGG ACAACTGTTTGGACTGATGGACTGACCGGGAATCTTCTACTGGTACATGG ACAACTGTTTGGACTGATGGACTTACCAGTCTTGACGTTACGAA GGGCGATGCTATCATATTGAGCCTGTTATTGGAGAAGAAAAAAC GGGCGATGCTATCATATTGTGACCTTACGAGAAGAAAAAAC ATTTATTGCCTATGTAGCTTATCGTAGAGAAGAAAAAAC ATTTATTGCCTATGTAGCCTGTTATTGAGGAAAGAAAAACC CTGGTTACTAACAGCTTACCAGTGGAGAATGTACGAAAGACTACGGT TCCGTTACTAGAGCTTACGAAGACTTACGAAATCC CTGGTTATTCAAAAACTTTCCAAGGCCCACCTCACGGTACCCAAT CTGAAAGAGATAAGTTGAACAAAATTGGGATTATCCGCAAAGAACTACGGT AGAGCATGTTATGAAACCAAAATTGGGATTATCCGCAAAGAACTACGGT AGAGCATGTTATGAAACCAAAATTGGGATATCCGCAAAGAACTACGGT AGAGCATGTTATGAAATGTCTA Primer F: ATGTCACCACAAACAGAGACTAAAGC Primer R: GTAAAATCAAGTCCACCRCG</li> </ul>
Iteom ABI Chromatogram	GGCAGCGTTCCGAGTAACTCCTCAACCGGAGTCCCTCCTGAAG           AAGCAGGAGCTGCAGTAGCGGCGGAATCTTCTACTGGTACATGG           ACAACTGTTTGGACTGATGGACTGACGAGGAGACCTTGATCGTACAAG           GGCGATGCTATCGATGGACTGATGGACAAGAAATCA           ATTTATTGCCTATGTAGCTGATCGAGCCTTTTGAGGAAAGAAA
d Barcoding	AAGCAGGAGCTGCAGTAGCGGCGGAATCTTCTACTGGTACATGC ACAACTGTTTGGACTGATGGACTTACCAGTCTTGATCGTACAAG GGGCGATGCTATCATATTGAGCCTGTTATTGGAGAAGAAGAAAATCA ATTTATTGCCTATGTAGCCTGTTATTGGAGAAGAAGAAAGA
Leom ABI Chromatogram d Barcoding	ACAACTGTTTGGACTGATGGACTTACCAGTCTTGATCGTTACAAA GGGCGATGCTATCATATTGAGCCTGTATTGGAGAAGAAAAAAAA
Leom ABI Chromatogram d Barcoding	GGGCGA TGCTA TCATA TTGAGCCTGTTA TTGGAGAAGAAAAAAAAAA
Leom ABI Chromatogram	GGGCGA TGCTA TCATA TTGAGCCTGTTA TTGGAGAAGAAAAAAAAAA
Leom ABI Chromatogram	ATTTATTGCCTATGTAGCTTATCCTTTAGACCTTTTCGAAGAAGAGGT TCCGTTACTAATATGTTTACTTCTATTGTAGGTAATGTATTTGGTT TCAAAGCCTTACGAGCTCTACGCTTGGAAGACTTACGAATTCCCC CTGCTTATTCAAAAACTTTCCAAAGCCCCACCTCACGGTATCCAAT CTGAAAGAGATAAGTTGAACAAATATGGGCGTCCTCATGTGGA TGTACTATTAAACCAAAATTGGGATTATCCGCAAAGAACTACGGT AGAGCATGTTATGAATGTCTA Primer F: ATGTCACCACAAACAGAGACTAAAGC
Lcom ABI Chromatogram	TCCGTTACTAATATGTTTACTTCTATTGTAGGTAATGTATTGGTT TCAAAGCCTTACGAGCTCTACGCTTGGAAGACTTACGAATTCCCC CTGCTTATTCAAAAACTTTCCAAGGCCCACCTCACGGTATCCAAT CTGAAAGAGATAAGTTGAACAAATATGGTCGTCCTCTATTGGGA TGTACTATTAAACCAAAATTGGGATTATCCGCAAAGAACTACGGT AGAGCATGTTATGAATGTCTA Primer F: ATGTCACCACAAACAGAGACTAAAGC
d Barcoding	TCAAAGCCTTACGAGCTCTACGCTTGGAAGACTTACGAATTCCCC CTGCTTATTCAAAAACTTTCCAAGGCCCACCTCACGGTATCCAAT CTGAAAGAGATAAGTTGAACAAATATGGGTCGTCCTCTATTGGGA TGTACTATTAAACCAAAATTGGGATTATCCGCAAAGAACTACGGT AGAGCATGTTATGAAAGTCTA Primer F: ATGTCACCACAAACAGAGACTAAAGC
d Barcoding	CTGCTTATTCAAAAACTTTCCAAGGCCCACCTCACGGTATCCAAT CTGAAAGAGATAAGTTGAACAAATATGGTCGTCCTCTATTGGGA TGTACTATTAAACCAAAATTGGGATTATCCGCAAAGAACTACGGT AGAGCATGTTATGAATGTCTA Primer F: ATGTCACCACAAACAGAGACTAAAGC
d Barcoding	CTGAAAGAGATAAGTTGAACAAATATGGTCGTCCTCTATTGGGA TGTACTATTAAACCAAAATTGGGATTATCCGCAAAGAACTACGGT AGAGCATGTTATGAATGTCTA Primer F: ATGTCACCACAAACAGAGACTAAAGC
d Barcoding	TGTACTATTAAACCAAAATTGGGATTATCCGCAAAGAACTACGGT AGAGCATGTTATGAATGTCTA Primer F: ATGTCACCACAAACAGAGACTAAAGC
d Barcoding	AGAGCATGTTATGAATGTCTA Primer F: ATGTCACCACAAACAGAGACTAAAGC
d Barcoding	Primer F: ATGTCACCACAAACAGAGACTAAAGC
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d Barcoding	Primer R: GTAAAATCAAGTCCACCRCG
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and the second se	dedanas, kasa ana sedara ang ang ang ang ang ang ang ang ang an
Illustrative Barcode:	
1	Illustrative Barcoste:

		Image	Sequence
Collection date	21st Nov, 2013	Superior in the set of the second of the	>AAAGCTTATGTTGGGTTTAAAGCAGGGGTTAAAGATTACAAAC
Identification	cyperus difformis L.	The state of the s	TTACTTATTATACTCCTGAGTACGAAACCAAAGATACTGATATCTT
Institution	Gujarat Biodiversity Gene Bank		GGCAGCGTTCCGAGTAACTCCTCAACCCGGAGTCCCTCCTGAAG
Accession number	GENG391-14	ALL ELLAND ALL PLANT ALL PLANT	AAGCAGGAGCTGCAGTAGCGGCGGAATCTTCTACTGGTACATGG
Collection code	BG20131121-0033		ACAACTGTTTGGACTGATGGACTTACCAGTCTTGATCGTTACAAA
Collector	Krupa Unadkat	AND THE ACT OF A DECEMBER	GGGCGATGCTATCATATCGAGCCTGTTGCTGGAGAAGAAAATCA
Phylum	Magnoliophyta		ATATATTGCCTATGTAGCTTATCCTTTAGACCTTTTCGAAGAAGGT
Class	Liliopsida		TCTGTTACTAACATGTTTACCTCAATTGTAGGTAATGTATTTGGTT
Order	Poales		TCAAAGCCTTACGAGCTCTACGCTTGGAAGACTTACGAATTCCCC
Family	Cyperaceae	A CALL AND A CALL AND A CALL	CTGCTTATTCAAAAACTTTCCAAGGTCCACCTCACGGTATCCAATC
Genus	Cyperus		TGAAAGAGATAAGTTGAACAAGTATGGTCGTCCTCTATTGGGAT
Species	difformis		GTACTATTAAACCAAAATTGGGATTATCCGCAAAGAATTACGGTA
Identifier	Dr. P.S. Nagar		GAGCATGTTATGAA
			Primer F: ATGTCACCACAAACAGAGACTAAAGC
			Primer R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com		
Identifier	MSU Baroda	ABIChromatograph	
Institution		with a second	a na na 15 na na na 10 na
Identification	Morphology and Barcoding		
Method			1
Voucher Status	Herbarium, Photographs	and do under the lot of the south of the Asthe State of the south of the Asthe State of the south	
Country	India		
State	Gujarat		the first die land was also be the first first and the first be the first be the set of
Region	Vadodara	and the second	A DEPENDENCE AND AN AN ADDRESS OF ADDRESS AND ADDRESS ADDR
Sector	Hami lake		
Exact Site	Pond area	4	and the state of t
Latitude	N 22° 19' 12.1"		a sectore all send of real and shall be all the ball of the ball
Longitude	E 73° 06' 11.4"		
Elevation	104	Illustrative Barcode:	
Photographer	Krupa Unadkat	•	260
		202	507
	B	536	551
			Seldar

Details	f	Image	Sequence
Collection date	21st Nov, 2013	STATISTICS AND PERMIT	>AGTGTTGGATTTAAAGCAGGTGTTAAAGATTACAAATTGACTT
Identification	Alternanthera philoxeroides	ABAC THE HOLD OF BACK STATE	TTATACTCCGGAGTATGAAACCCTAGATACCGATATCTTGGCAGC
Institution	Gujarat Biodiversity Gene Bank		ATTCCGAGTAACTCCTCAACCTGGAGTTCCACCCGAAGAAGCAG
Accession number	GENG392-14		GGGCTGCAGTAGCTGCCGAATCTTCTACTGGTACATGGACAACT
Collection code	BG20131121-0035	THE REPORT OF THE REAL PROPERTY OF THE REAL PROPERT	GTATGGACTGACGGGCTTACCAGTCTTGATCGTTACAAAGGACG
			ATGCTACCATATCGAGCCTGTTGCTGGTGAAGAAAACCAATATA
Collector	Krupa Unadkat		TIGTTATGTAGCCTATCCTTTAGACCTTTTTGAAGAAGGTTCTGTT
Phylum	Magnoliophyta		ACTAATATGTTTACTTCCATTGTAGGTAACGTATTTGGGTTCAAA
Class	Liliopsida	A DECEMBER AND	GCCTGCGTGCTCTACGTTTGGAGGATTTGCGAATCCCTGTTGCT
Order	Caryophyllales		
Family	Amaranthaceae		TATATAAAAACTTTCCAAGGCCCGCCTCACGGTATCCAAGTTGAA
Genus	Alternanthera		AGAGATAAATTAAACAAGTATGGCCGTCCTCTATTGGGATGCAC
Species	philoxeroides		TATTAAACCTAAATTGGGGTTATCCGCTAAAAACTATGGTCGAGC
Identifier	Dr. P.S. Nagar	CARLAN AND AND AND AND AND AND AND AND AND A	ATGTTATGAAT
			PrimerF: ATGTCACCACAAACAGAGACTAAAGC
		SAPA AND SA AN AN ADA AN	Primere: A IGTCACCACAAACAGAGACTAAAGC
			Primer R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram	
Identifier	MSU Baroda		
Institution			
Identification	Morphology and Barcoding		
Method			
Voucher Status	Herbarium, Photographs		
Country	India	10 20 40 40 40 40 70 10 40 10 10 10 10 10 10 10 10 10 10 10 10 10	10 77 20 77 70 70 70 10 10 10 10 10 10 10 10 10 10 10 10 10
State	Gujarat		
Region	Vadodara		the start of the s
Sector	Hami lake		
Exact Site	Pond area		
Latitude	N 22° 19' 10.1"	Illustrative Barcode: •	260
	E 73° 06' 09.4"		
Longitude		269 537	
Longitude Elevation	116 A		543 

Details		Image	Sequence
Collection date	21st Nov, 2013	And the second	>AAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGATTATAAAT
Identification	Xanthium spinosum L.	m. Ma	TGACTTATTATACTCCTGAATATGAAACCAAGGATACTGATATCT
Institution	Gujarat Biodiversity Gene Bank	A MARCHINE PARTY	TGGCAGCATTTCGAGTAACTCCTCAACCTGGAGTTCCGCCTGAAG
Accession number	GENG393-14		AAGCAGGGGCCGCAGTAGCTGCCGAATCTTCTACTGGTACATGG
Collection code	BG20131121-0036		ACAACTGTATGGACCGATGGACTTACGAGCCTTGATCGTTACAA
5 <u>.</u>			AGGCCGATGCTATGGACTTGAGCCTGTTCCTGGAGAAGACAATC
Collector	Krupa Unadkat		AATATATTGCTTATGTAGCTTACCCACTAGACCTTTTTGAAGAAG
Phylum	Magnoliophyta		GTTCTGTTACTAACATGTTTACTTCCATTGTAGGTAATGTATTTGG
Class	Asterids		GTTCAAAGCCCTGCGTGCTCTACGTCTGGAAGATTTGCGAATCCC
Order	Asterales		GACTGCATATGTTAAAACTTTCGAGGGTCCGCCTCACGGTATCCA
Family	Asteraceae		AGTTGAGAGAGAGATAAATTGAACAAGTATGGTCGTCCCCTGTTGG
Genus	Xanthium		GATGTACTATTAAACCTAAATTGGACAAGTATGGTCGTCCCCCTGTTGG
Species			
Identifier	Dr. P.S. Nagar		GTAGAGCTTGTTATGAATGTCTT
			Primer F: ATGTCACCACAAACAGAGACTAAAGC
			Primer R: GTAAAATCAAGTCCACCRCG
Identifier Email Identifier	dmagar@gmail.com	ABI Chromatogram	
Institution	MSU Baroda	(i) 20 (ii) 40 (ii) 40 (iii) 20 (iii) 40 (iii	The 29 See 25 De 26 De 26 De 28 DE 29 DE 29 DE 29 DE 20 DE 20 DE 20 DE 20 D
Identification	Morphology and Barcoding		the second se
Method	worphology and barcounig		and the second
Voucher Status	Herbarium, Photographs	-	us an an i da dan 1 Ai dan in
Country	India		
State	Gujarat	rizontal Scale and the and the and the test of	
Region	Vadodara	1	the second se
Sector	Hami lake	11	a standard and the standard an
Exact Site	Pond area	-	anada karaanida kala kala kala kala kala kala kala ka
Latitude	N 22° 19' 10.1"	Ilustrative Barcode:	
Longitude	E 73° 06' 09.4"		268
Elevation	113	209	637
Photographer	Krupa Unadkat	529	557
	B		

Details		Image Sequence		
Collection date	21st Nov, 2013		GTTGGGTTTAAAGCAGGGGTTAAAGATTACAAAC	
Identification	Cyperus sp.	ттасттаттат	ACTCCTGAGTACGAAACCAAAGATACTGATATCT	
Institution	Gujarat Biodiversity Gene Bank	GGCAGCGTTO	CGAGTAACTCCTCAACCTGGAGTCCCTCCTGAAG	
Accession number	GENG394-14	AAGCAGGAG	CTGCAGTAGCGGCGGAATCTTCTACTGGTACATG	
Collection code	BG20131121-0037		GACTGATGGACTTACCAGTCTTGATCGTTACAAA	
			ATCATATCGAACCTGTTGCTGGAGAAGAAAATCA	
Collector	Krupa Unadkat		TATATAGCTTATCCTTTAGACCTTTTCGAAGAAGG	
Phylum	Magnoliophyta		CATGTTTACTTCTATTGTAGGTAATGTATTTGGT	
Class	Liliopsida		ACGAGCTCTACGCTTGGAAGACTTACGAATTCCTC	
Order	Poales			
Family	Cyperaceae		AAAACTTTCCAAGGTCCACCTCACGGTATCCAAG	
Genus	Cyperus		TAAGTTGAACAAGTATGGTCGTCCTCTATTGGGA	
Species			ACCAAAATTGGGATTATCCGCAAAGAATTACGGT	
Identifier	Dr. P.S. Nagar	AGAGCATGTT	ATGAATGTCTAC	
		Primer F: ATG	TCACCACAAACAGAGACTAAAGC	
		Primer R: GTA	AAATCAAGTCCACCRCG	
Identifier Email	dmagar@gmail.com	ABI Chromatograph		
Identifier	MSU Baroda	(a) In the IR for the two we can be used in the late of the late of the late of the IR for the IR for the late of the IR for t	The law	
Institution			11	
Identification	Morphology and Barcoding			
Method				
Voucher Status	Herbarium, Photographs			
Country	India		to be up to be up to the second second and the second second second	
State	Gujarat			
Region	Vadodara		1	
Sector	Hami lake	The second se	and and the state of the state	
Exact Site	Pond area	Illustrative Barcode:		
Latitude	N 22° 19' 10.1"		260	
Longitude	E 73° 06' 09.7"	269	537	
Elevation	114			
Photographer	Krupa Unadkat A	538	538 558	

Details		Image	Sequence
Collection date	21st Nov, 2013		>GTTGGATTCAAAGCGGGTGTTAAAGAGTACAAATTGACTTATT
Identification	Hygrophilla (White Flower)		ATACTCCTGAATATGAAACCAAAGATACTGATATCTTGGCAGCAT
Institution	Gujarat Biodiversity Gene Bank		TCCGAGTAACTCCTCAACCGGGAGTTCCAGCTGAAGAAGCAGGG
Accession number	GENG395-14		GCCGCGGTAGCTGCCGAATCTTCTACCGGTACATGGACAACCGT
Collection code	BG20131121-0039		GTGGACCGATGGACTTACCAGCCTTGATCGTTACAAAGGGCGAT
			GCTACAACATTGAGCCCGTTCCTGGCGAACCAGATCAATATATCT
Collector	Krupa Unadkat		GTTATGTAGCTTACCCTTTAGACCTTTTTGAAGAAGGTTCTGTTAC
Phylum	Magnoliophyta		CAACATGTTTACTTCCATTGTAGGAAATGTATTTGGGTTTAAAGC
Class			CCTGCGTGCTCTACGTCTGGAAGATCTGCGAATCCCTGTTGCTTA
Order			TGTTAAAACTTTCCAGGGTCCGCCTCATGGGATCCAAAGTGAGA
Family	Liver and the		GAGATAAATTGAACAAGTATGGTCGTCCTCTGCTGGGATGTACT
Genus	Hygrophilla		ATTAAACCTAAATTGGGGTTATCCGCTAAAAACTATGGTAGAGC
Species Identifier	Dr. P.S. Nagar		GTGTTATGAATGTCTT
Idenumer	DI. P.S. Nagai		GIGHAIGAAIGICH
			Primer F: ATGTCACCACAAACAGAGACTAAAGC
			Primer R: GTAAAATCAAGTCCACCRCG
T1 20 5 1		ADT OL 1	
Identifier Email Identifier	dmagar@gmail.com MSU Baroda	ABI Chromatograph	
Institution	IVISO Baroda	Pontal Scale Control Charles Control C	210 240 250 256 256 250 256 250 256 250 250 250 250 250 250 256 256 256 256 256 256 256 256 256 256
Identification	Morphology and Barcoding	•	
Method	worphology and barcounig		in a second second base of the second s
Voucher Status	Herbarium, Photographs		
Country	India		
State	Gujarat		
Region	Vadodara	16 29 30 46 30 46 30 46 30 46 30 46 40 100 100 100 100 100 100 100 100 100	246 276 266 276 266 276 276 276 276 276 27
Sector	Hami lake	11	i di selis toli
Exact Site	Pond area	11	and the state of the
Latitude	N 22° 19' 10.1"	1	na na an ing minang ang ing ing ing ing ing ing ing ing ing i
Longitude	E 73° 06' 09.4"		
Elevation	116	Illustrative Barcode:	205
Photographer	Krupa Unadkat	269	527
	В	500	5+0
	• • • • •		

Details		Image	Sequence
Collection date	3 <sup>rd</sup> Feb, 2014		>GTTAAAGATTACAAATTGACTTATTATACTCCTGAATATG
Identification	Ponogeton natans (L.)		AAACCAAGGATACTGATATCTTGGCAGCATTCCGAGTAAC
	Engl. & K.Krause		TCCTCAACCCGGAGTTCCACCTGAGGAAGCGGGGGGCTGC
Institution	Gujarat Biodiversity		GTAGCTGCCGAATCCTCTACTGGTACATGGACAACTGTAT
Accession	Gene Bank GENG462-14	A THE AND A THE ADD	GGACTGATGGACTTACTAGCTTGGATCGTTACAAAGGGCC
number	GENG402-14		
Collection code	BG20140203-0001	Martin Carlos and	ATGCTACCACATCGAGCCTGTTGCTGGCACTGAAAATCAA
Conceasin code	0020140203 0001		TTATTGCCTATGTAGCTTATCCTTTAGACCTTTTTGAAGAA
Collector	Krupa Unadkat		GTTCCGTTACTAACATGTTTACTTCGATTGTGGGTAATGTA
Phylum	Magniliophyta	CLEDNO SCROVER	TTTGGGTTCAAAGCTCTTTCAGCTCTACGTTTGGAAGATCT
Class	Magniliopsida	THE REAL PROPERTY.	ACGAATTCCTCCTGCTTATTCAAAAACTTTCCAAGGTCCTC
Order	Astimatales	ENE MARA	TCACGGAATCCAGGTTGAGAGAGATAAATTGAATAAGTA
Family	Potamogetanaceae	With SK Presch	GGTCGTCCTCTATTGGGATGTACTATTAAACCAAAATTGG
Genus	Potemogeton	The second second	ATTATCCGCGAAAAACTACGGTAGAGCAGTTTATGAATGT
Species	natans		CTA
Identifier	Dr. P.S. Nagar		
			rbcL F: ATGTCACCACAAACAGAGACTAAAGC
			rbcL R: GTAAAATCAAGTCCACCRCG
			IDEE N. GTAAAATCAAGTCCACCRCG
Identifier Email	drnagar@gmail.com	ABI Chromatogram	
Identifier	MSU Baroda		
Institution			
Identification	Morphology and	han	
Method	Barcoding	450, 2121 35	na and an and a state of the st
Voucher Status	Herbarium, Photographs		
Country	India	H. M. M. M. M. M. N. M. N. M.	
State	Gujarat	- 80	
Region	Vadodara Mahisagas siyas Basada	where we have been and the second of the second state of the secon	maladainethaladidhaidhdaanaa, in Atladha ah Ain Unihin ahain ahar Aanaa aa
Sector Exact Site	Mahisagar river, Baroda Pond area		
Latitude	N 22° 26' 00.1"	Burtushen Barcoster	
Lautude	E 73° 04' 19.9"		
Elevation	93 A	24.1	
Photographer	Krupa Unadkat		

Details		Image	Sequence
Details Collection date Identification Institution Accession number Collection code Collector Phylum Class Order Family Genus	3 <sup>rd</sup> Feb, 2014 Lemna Gujarat Biodiversity Gene Bank GENG463-14 BG20140203-0005 Krupa Unadkat Magniliophyta Liliopsida Alismatales Lamnaceae Lemna	Image	Sequence >TTA TGTCACCCACAAACAGAGACTAAAGCAAGTGCTGGATTTAA AGCTGGTGTTAAAGATTACAAATTGACTTATTATACTCCTGAATTAA TGAAACCCAAGGATACTGATATCTTGGCASCATTCCCGAGTAACTCC TCAACCCGGAGTTCCACCTGAGAAAGCGGGGGCTGCAGTAGCT GCCGAATCCTCTACTGGTACATGGACAACTGTATGGACGAGTGACTAG ACTTACTGGCTTGGACGTGAAAAGCGCGGATGCTACCACACTG AGCCTGTTGCTGGCACTGAAAATCAATTTATTGCCTATGTAAGCTT ATCCTTTAGACCTTTTGAAGAAGGTCCGTTACTAAACTTGTTAC TTCGATTGTGGGTAAATGAAAGTTCCCGTTACTAAAACTTTC ACGTTTGGAGATCATCAGGAATCCACTGTTACAAAACTTCT CAAGGTCCTCCTCCACGGAATCCAGGTTGAGAGAGAATAAATGGAA
Species Identifier	triscula Dr. P.S. Nagar		TAAGATIGGTCGCCCCCACAAACAGGTGTACTATTAAGAAGATAAAG TAAGATIGGTCGTCCCTCTATTGGGATGTACTATTAAACAGAAG GGGATTATCCGCGGAAAAACTACGGGGAGAGAAGATTATGAATGTC TACGCGGGGGGACTTGATTTTAC rbcL F: ATGTCACCACAAACAGAGACTAAAGC rbcL R: GTAAAATCAAGTCCACCRCG
Identifier Email Identifier Institution Identification Method Voucher Status Country State Region Sector	dmagar@gmail.com MSU Baroda Morphology and Barcoding Herbarium, Photographs India Gujarat Vadodara Timbi village pond		taliteksi tekketen alan ata kara tekseten ata alan ata ata ata ata ata ata ata ata ata a
Exact Site Latitude Longitude Elevation Photographer	Pond area N 22° 18' 21.7" E 73° 16' 37.5" 97 Krupa Unadkat	Instrative Earcode:	244 597 597 948

Details		Image	Sequence
Collection date	3 <sup>rd</sup> Feb, 2014		>GGTGTTAAAGAGTATAAATTGACTTATTATACTCCGGAATA
Identification	Abutilon indicum		TGAAGTCAAAGAGACTGATATCTTGGCAGCCTTCCGAGTAAC
Institution	Gujarat Biodiversity	"A A STATE	TCCCCAACCCGGAGTTCCGCCTGAGGAAGCGGGGGCCGCGG
<u></u>	Gene Bank	A Stand	TAGCTGCTGAATCTTCTACTGGTACATGGACAACCGTGTGGA
Accession number	GENG464-14 BG20140203-0010		CCGATGGGCTTACCAGCCTTGATCGTTACAAAGGGCGATGCT
Collection code	BG20140203-0010	The second s	
Collector	Krupa Unadkat	1	ACCACATTGAGCCCGTTGCTGGAGAAGAAGATCAATATATAT
Phylum	Magniliophyta	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	GTTATGTAGCTTACCCCTTAGACCTTTTTGAAGAAGGTTCTGT
Class	Eucotyledons		TACTAACATGTTTACTTCCATTGTGGGTAATGTATTTGGGTTC
Order	Malvales	1 Long The State of P	AAAGCCCTGCGCGCTCTACGTTTAGAAGATCTGCGAATCCCT
Family	Malvaceae	and the second sec	ATTTCTTATGTTAAAACTTTCCAAGGCCCGCCTCATGGCATCC
Genus	Abutilon	the state the state	AGGTTGAAAGAGATAAATTGAACAAGTATGGTCGCCCCCTA
Species	indicum	States and a state of the state of the	TTAGGATGTACTATTAAACCTAAATTGGGGTTATCCGCTAAG
Identifier	Dr. P.S. Nagar		AACTACGGTAGAGCAGTTTATGAATGTCTA
		1 and a low restant	rbcL F: ATGTCACCACAAACAGAGACTAAAGC
		and a stand of the second	
		1 de la contraction de la cont	rbcL R: GTAAAATCAAGTCCACCRCG
Identifier Email	drnagar@gmail.com	ABI Chromatogram	
Identifier Institutio		(i) (ii) (ii) (iii) (ii) (ii) (ii) (ii) (ii) (ii) (iii) (iii) (iii) (iii) (iii) (iii) (	
Identification	Morphology and	A A A A A A A A A A A A A A A A A A A	
Method Voucher Status	Barcoding Herbarium,	- When a manufacture of the state of the sta	Wiennich lie en die der in in inders het stellte die der der der Berner der Berner der Berner der Berner der Be
Voucher Status	Photographs		
Country	India	orizontal Scale	
State	Gujarat		
Region	Vadodara	When we will a mer dit doord a on a section in history	in a land in a strand and in the day in the state of the
Sector	Mahisagar river	Illustrative Barcode:	NAT DARA MANYA DA MAYAKA MANA MANA MANA MANA MANA MANA MANA M
Exact Site	Near River	0	269
Latitude	N 22° 26' 13.6"		
Longitude	E 73° 04' 32.8"	264	503
Elevation	96 A		
Photographer	Krupa Unadkat		
Details Collection date	3 <sup>rd</sup> Feb, 2014	Image	Sequence
Identification	3 Feb, 2014	A CONTRACTOR OF A CONTRACTOR	>GGATTCAAGGCTGGTGTTAAAGATTATAAATTGACT TATTATACTCCTGAGTATCAAACAAAAGATACTGATAT
	Croton aequatoris		CTTGGCAGCATTCCGAGTALCAAACAAAGATACTGATAT
Institution	Gujarat Biodiversity Gene Bank		CCACCTGAGGAAGCAGGAGCCGCGGTAGCAGCTGAA
Accession	GENG465-14	al as the second second	TCTTCTACTGGTACATGGACAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGC
number			GGCTTACCAGTCTTGATCGTTATAAAGGGCGATGCTA
Collection code	BG20140203-0011		CGACATCGAGCCCGTTGCTGGAGAAGAAAATCAATAT
Collector	Krupa Unadkat		ATTGCTTATGTAGCTTACCCCTTAGACCTTTTTGAAGA
Phylum	Magniliophyta		AGGTTCTGTTACTAACATGTTTACTTCCATTGTGGGTA
Class	Eucotyledons		ATGTATTTGGGTTCAAAGCCCTACGTGCCCTACGTCTG
Order	Malpighiales		GAGGATTTGCGAATCCCTCCTGCTTATACTAAAACTTT
Family	Euphorbiaceae		CCAAGGGCCGCCTCATGGTATCCAAGTTGAGAGAGA

Details			Image	Sequence
Collection date	3 <sup>rd</sup> Feb, 2014			>GGATTCAAGGCTGGTGTTAAAGATTATAAATTGACT
Identification			and the standard and the	TATTATACTCCTGAGTATCAAACAAAAGATACTGATAT
	Croton aequatori			CTTGGCAGCATTCCGAGTAACTCCTCAACCTGGAGTT
Institution	Gujarat Biodiversit Gene Bank	y		CCACCTGAGGAAGCAGGAGCCGCGGTAGCAGCTGAA
Accession	GENG465-14		at the second	
number	GEN 6403-14			TCTTCTACTGGTACATGGACAACTGTGTGGACCGACG
Collection code	BG20140203-0011			GGCTTACCAGTCTTGATCGTTATAAAGGGCGATGCTA
Conceasin code	0020110200 0011			CGACATCGAGCCCGTTGCTGGAGAAGAAAATCAATAT
Collector	Krupa Unadkat		CALLER ANALY	ATTGCTTATGTAGCTTACCCCTTAGACCTTTTTGAAGA
Phylum	Magniliophyta			AGGTTCTGTTACTAACATGTTTACTTCCATTGTGGGTA
Class	Eucotyledons			ATGTATTTGGGTTCAAAGCCCTACGTGCCCTACGTCTG
Order	Malpighiales		HTT WAR ALL AND	GAGGATTTGCGAATCCCTCCTGCTTATACTAAAACTTT
Family	Euphorbiaceae			CCAAGGGCCGCCTCATGGTATCCAAGTTGAGAGAGA
Genus	Croton		A PAULA AND THE AND A	TAAATTGAACAAGTATGGTCGCCCCCTATTAGGTTGT
Species	abaitensis			
Identifier	Dr. P.S. Nagar		AND STORES AND A	ACTATTAAACCTAAATTAGGGCTATCCGCTAAGAATT
				A
			12 AND ALL ALL ALL ALL ALL ALL ALL ALL ALL AL	
				TrbcL F: ATGTCACCACAAACAGAGACTAAAGC
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Identifier Email	drnagar@gmail.co	m	ABI Chromatogram	
Identifier	MSU Baroda			
Institution			lat i i i human	and the first of the second
Identification	Morphology	and	والأستر المتحاذ المتناد ومنارك والمتراج والمتراجع والمترجع والمتحاد والمتحاد والمتحاد	ditti dikili aidi. Makalahita di kanjata kadit di kada di kada di kada kada kada kada
Method	Barcoding		TYNAD OT KARAKETAKA KARAKETAKA KARAKETAKA KUNANA KARAKA KUNANA KARAKA KUNANA KARAKA KARAKA KARAKA KARAKA KARAK	NAN KARI MARKANTAN MANUNKANA MUTAKANA MUTAKANA MUTAKANA MANUNKANA MATAKANA MATAKANA MATAKANA MATAKANA MATAKANA
Voucher Status	Herbarium,			
	Photographs			
Country	India		1. Let us satisfies allowed as here as	had a low of how where what is structly a start of all the structure of the second structure of the
State	Gujarat		heard-an-management and the later of the first of the line of the line and the line and the later of the late	NALAAN NA DALAMA MATANG MAT
Region	Vadodara		Illustrative Barcode:	269
Sector	Timbi village pond Pond area			
Exact Site Latitude	N 22° 26' 13.7"		269	521
Latitude	N 22" 26' 13.7" E 73° 04' 32.6"			
Elevation	95	B		
Photographer	55 Krupa Unadkat	D		
rnotographer			1	

Details		Image	Sequence
Collection	3 <sup>rd</sup> Feb, 2014		GAAACCAAGGATACTGATATCTTGGCAGCATTCCGAGTAACTC
date		3 5 105 1	CTCAACCCGGAGTTCCGCCTGAAGAAGCAGGGGGCAGCGGTAG
Identifi cati	Barleria prionitis	The second	CTGCCGAATCTTCCACTGGTACATGGACAACCGTGTGGACCGA
on Institution	Gujarat Biodiversity		TGGACTTACCAGCCTTGATCGTTACAAAGGGCGATGCTACAAC
insutation	Gene Bank		ATCGAGCCCGTTGCTGGCGAAACAGATCAATATATCTGTTATG
Accession	GENG466-14		TAGCTTACCCTTTAGACCTTTTTGAAGAAGGTTCTGTTACCAAC
number			ATGTTTACTTCCATTGTAGGAAATGTATTTGGATTCAAAGCCCT
Collection code	BG20140203-0012		GCGTGCTCTACGTCTGGAAGATCTGCGAATCCCTACTGCTTATG
Collector	Krupa Unadkat		TTAAAACTTTCCAAGGTCCGCCTCATGGGATCCAAGTTGAGAG
Phylum	Magniliophyta		AGATAAATTGAACAAATATGGTCGTCCTCTGCTGGGATGTACT
Class	Eucotyledons		ATTAAACCTAAATTGGGGTTATCCGCTAAAAACTATGGTAGAG
Order	LAmiales		CATGT
Family	Acanthaceae		
Genus	Barleria		rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Species	prionitis		
Identifier	Dr. P.S. Nagar		rbcL R: GTAAAATCAAGTCCACCRCG
Identifier Email	drnagar@gmail.com	ABI Chromatogram	
Identifier Institution	MSU Baroda	Will with a start with a start of the	the following the first state of the formation of the for
Identificati on Method	Morphology and Barcoding		allian kana har har har har har har har har har ha
Voucher	Herbarium,	N 10 10 40 10 40 10 10 10 10 10 10 10 10 10 10 10 10 10	0 2.0 20 30 30 30 30 20 30 20 30 30 30 30 30 30 30 40 30 30 40 30 30 40 40 40 40 40 40 40 40 40 40 50 30 30 30
Status	Photographs		
Country	India		
State	Gujarat	الماري العامير في المالية المالية المراجع في ويكافئه أرجا	alberta Last della tatana tatan talahari a dari a dari bartari ta ata a dari dari ata dari dari dari dari dari a
Region	Vadodara		
Sector	Mahi river	Illustrative Raroode	
Exact Site	Pond area N 22° 26' 13.5"	Illustrative Barcode:	268
Latitude Longitude	N 22° 26' 13.5" E 73° 04' 32.4"		268
Elevation	94		
Photograp	Krupa Unadkat A	269	479
her			
	·		

Details		Image	Sequence
Collection date	3 <sup>rd</sup> Feb, 2014		>GTTAAAGAGTATAAATTGAATTATTATACTCCTGACTAT
Identification	Persicaria glabra		GAACCCCACGCACATGATATCTTGGCAGCATTTCGAGTA
Institution	Gujarat Biodiversity		ACTCCTCAACCTGGAGTTCCACCAGAAGAAGCAGGGGC
	Gene Bank	- I The second s	CGCGGTAGCTGCCGAATCTTCTACTGGTACATGGACAAC
Accession	GENG467-14		TGTGTGGACCGATGGACTTACCAGCCTTGATCGTTACAA
Collection code	BG20140203-000	- A the A had a second a	AGGACGATGCTACGGCATCGAGCCTGTTGCTGGAGAAG
Conceaon coac	0020140203 000	in the second addition for the	AAAATCAATATATTGCTTATGTAGCTTACCCATTAGACCT
Collector	Krupa Unadkat		
Phylum	Magniliophyta		TTTTGAAGAAGGTTCTGTTACTAACATGTTTACTTCCATT
Class	Eucotyledons	1 IN A REAL AND	GTAGGTAATGTATTTGGGTTCAAAGCCCTGCGTGCTCTA
Order	Caryophyllales	A LANAL AND A DECK	CGTTTGGAGGATTTGCGAATCCCTCCTGCTTATACGAAA
Family	Polygonaceae		ACTITICCAAGGCCCACCTCACGGTATCCAAGTTGAGAGA
Genus	Persicaria		GACAAATTAAACAAATACGGACGTCCCCTATTGGGATGT
Species	glabra		ACTATTAAACCTAAATTGGGATTGTCCGCTAAGAACTAC
Identifier	Dr. P.S. Nagar	SAN THE ME A VISION	GGTCGAGCAGTTTATGAATGTCTT
			rbcL F: ATGTCACCACAAACAGAGACTAAAGC
		en statistics	rbcl R: GTAAAATCAAGTCCACCRCG
Identifier Email	drnagar@gmail.com	ABI Chromatogram	
Identifier Institution	MSU Baroda		
Identification Method	Morphology and Barcoding	bisker og men ster for stande for stande at stande	alithe in the build the statistical and the statement of the second second second second second second second s
Voucher Status	Herbarium, Photographs		
Country	India		
State	Gujarat	Welson and a proper and the property of the pr	a des an a all the shift of the later in the sheet of the
Region	Vadodara	- Illustrative Barcode:	
Sector	Mahisagar river	0	268
Exact Site	River area		
Latitude	N 22° 26' 12.8"	269	530
Longitude	E 73° 04' 32.7"		530
Elevation	98 B		
Photographer	Krupa Unadkat		

Details		Image	Sequence
Collection date	3 <sup>rd</sup> Feb, 2014		>GTTAAAGATTACAAACTTACTTATTACACTCCTGAGTACGAA
Identification	Eleocharis	Part of the second s	ACCAAAGATACTGATATCTTGGCAGCGTTCCGAGTAACTCCTC
	atropurpurea		
Institution	Gujarat Biodiversity Gene Bank		GCGGAATCTTCTACTGGTACATGGACCACTGTTTGGACTGATG
Accession number	GENG468-14	- Instant - Contraction	GACTTACCAGTCTTGATCGTTACAAAGGGCGATGCTATCATAT
Collection code	BG20140203-017	and the second states of the	CGAGCCTGTTGTTGGGAGAAGAAAATCAATATTGCCTATGT
e onection code	5520140205-017	and and marked of the	8
Collector	Krupa Unadkat		AGCTTATCCTTTAGACCTTTTCGAAGAAGGTTCTGTTACTAATA
Phylum	Magniliophyta	A STAND AND AND	TGTTTACTTCTATTGTAGGTAATGTATTTGGTTTCAAAGCCTTA
Class	Liliopsida	COLORAD AND AND AND AND AND AND AND AND AND A	CGAGCTCTACGCTTGGAAGACTTACGAATTCCCCCTGCTTATT
Order	Poales		CAAAAACTTTCCAAGGCCCACCTCACGGTATCCAATCTGAAAG
Family	Cypraceae	A State of the sta	AGATAAGTTGAACAAATATGGTCGTCCTCTATTGGGATGTACT
Genus	Eleocharis	1 Maria	ATTAAACCAAAATTGGGATTATCCGCAAAGAACTACGGTAGA
Species	atropurpurea		GCATGTTATGAATGTCT
Identifier	Dr. P.S. Nagar		
			rbcL F: ATGTCACCACAAACAGAGACTAAAGC
		A starte the and the same and a starte the	rbcL R: GTAAAATCAAGTCCACCRCG
Identifier Email	dmagar@gmail.com	ABI Chromatogram	
Identifier Institution	MSU Baroda		
Identification	Morphology and	11.1	
Method	Barcoding	- KAN A	a an
Voucher Status	Herbarium,	Production of the second	na ortania and a na ana ana ana ana ana ana ana a
	Photographs	1 20 20 40 20 40 70 10 10 20 10 10 10 10 10 10 10 10 10 10 10 10 10	
Country State	India Gujarat		THE RECEIPTION OF THE AND THE RECEIPTION OF THE AND COMPANY ALL AT A COMPANY AND A
Region	Vadodara	H M	
Sector	Timbi village	- William manufation beaution and the state of the state	สระสมสัตวรรณของ ครับหนึ่งที่สามารับของได้สินสีสัตว์การสมสิทธิสัตว์ได้ได้ที่ได้สีรับได้ครับสามารถสามาร์สามาร์การ
Exact Site	Pond area	Illustrative Barcode:	
Latitude	N 22° 18' 21.7"	1 9	268
Longitude	E 73° 16' 37.5"		
Longitude Elevation	97	- 269	529
		269	529
Elevation	97	269	529
Elevation	97	269	529 
Elevation Photographer	97	269	<sup>529</sup>
Elevation Photographer Details	97 Krupa Unadkat A		

	TATAAATTGACTTATTATACTCCTGAATATGAAACCAAG
	TCTTGGCAGCATTTCGAGTAACTCCTCAACCTGGAGTTC
Institution Gujarat Biodiversity CGCCTGAAGA	AGCAGGGGCCGCAGTAGCTGCCGAATCTTCTACTGGTA
Accession GENG469-14 CATGGACAAC	TGTGTGGACCGATGGACTTACGAGCCTTGATCGTTACA
Accession GENG409-14	GCTATGGAATCGAGCCTGTTCCTGGAGAAGAGAGAGTCAAT
	GTAGCTTACCCATTAGACCTTTTTGAAGAAGAGGTTCTGTT
Collector Krupa Unadkat	TTACTTCCATTGTAGGTAATGTATTTGGGTTCAAAGCCCT
Phylum Magniliophyta	CGTCTGGAAGATTTGCGAATCCCTACTGCGTATATTAAA
Class Eucotyledons ACTITCCAAGO	GTCCGCCTCACGGCATCCAAGTTGAGAGAGATAAATTG
Order Asterales AACAAGTATG	GTCGTCCCCTGTTGGGATGTACTATTAAACCTAAATTGG
	TAAAAACTACGGTAGAGCTGTTTATGAATGTCTTC
Genus Blumea	
	CCACAAACAGAGACTAAAGC
Identifier Dr. P.S. Nagar	TCAAGTCCACCRCG
TUCE N. GTAAAA	TCAAGTCCACCRCG
Identifier Email dmagar@gmail.com ABI Chromatogram	
Identifier MSU Baroda	
Institution	
Identification Morphology and	(the attractive definition of the second in the part state of the state of the second stress state and the
Method Barcoding	
Voucher Status Herbarium,	1 20 21 28 20 20 20 20 20 20 20 20 20 20 20 20 20
Photographs Photographs	1%~#%#%#%#%%#%#%#%#%#%#%#%#%#%#%#%#%#%#%
Country India	
State Gujarat Region Vadodara	ทสไม่สารการใหญ่ได้การประกับสารการประกับสร้างได้เสียงได้เสียงการการปลากการการ
region	
Sector Timbi village pond Illustrative Barcode:	
Latitude N 22° 18' 21.8"	268
Longitude E 73° 16' 37.5"	
Elevation 97	537
Photographer Krupa Unadkat	
B 538	545

Details		Image	Sequence
Collection	3 <sup>rd</sup> Feb, 2014		>GATTATAAATTGACTTATTATACTCCTGAATATGAAACCAAGGATACT
date			GATATCTTGGCAGCATTTCGAGTAACTCCTCAACCTGGAGTTCCGCCTG
Identification	Spilanthes acmella		AAGAAGCAGGGGCCGCAGTAGCTGCCGAATCTTCTACTGGTACATGGA
Institution	Gujarat Biodiversity		CAACTGTATGGACCGATGGACTTACGAGCCTTGATCGTTACAAAGGCC
Accession	Gene Bank GENG470-14		GATGCTATGGAATAGAGCCTGTTCCTGGAGAAGACAATCAAT
number	GENG4/0-14		CITATGTAGCTTACCCATTAGACCTTTTTGAAGAAGACAATCAAT
Collection	BG20140203-024		
code	5520140205-024		ATGTTTACTTCCATTGTAGGTAATGTATTTGGGTTCAAAGCCCTGCGTG
Collector	Krupa Unadkat		CTCTACGTCTGGAAGATTTGCGAATACCGGTTGCGTATGTTAAAACTTT
Phylum	Magniliophyta		CGAGGGTCCGCCTCACGGTATCCAAGTTGAGAGAGATAAATTGAACAA
Class	Eucotydeons	A COMPANY AND A COMPANY	GTATGGTCGTCCCCTGTTGGGATGTACTATTAAACCTAAATTGGGGTTA
Order	Asterales		TCCGCTAAAAACTACGGTAGAGCTTGTTATGAATGTCTTCGTGGTGGA
Family	Asteraceae		CTTGATTTTACA
Genus	Spilanthus		
Species	Acmella		rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Identifier	Dr. P.S. Nagar		rbcL R: GTAAAATCAAGTCCACCRCG
Identifier	drnagar@gmail.com	ABI Chromatogram	
Email			
Identifier	MSU Baroda		
Institution		· Male	والمراجع والمعارية والمناجع والمتعادية أنتسا ومرواتها وماواتها المتعاقية والمار أتركب والماري
Identification Method	Morphology and Barcoding	· P. W. Star Server and the Work of the	nan an sua an an bhaolasa dha an taona an a
Voucher	Herbarium,		
Status	Photographs		
Country	India		
State	Gujarat	Let all the second of the	
Region	Vadodara	- Madarda Malaria and a particular de la sala de la seconda de la seconda de la seconda de la seconda de la sec	and an attelling the shart of second with the test of the state of the second second second second second second
Sector	Timbi village pond		
Exact Site	Pond area	Illustrative Barcode:	
Latitude	N 22° 18' 21.5"		200
Longitude	E 73°16'37.2"	269	537
Elevation	98		
Photographer	Krupa Unadka 🛛 A	538	545

Details		Image	Sequence
Collection	3 <sup>rd</sup> Feb, 2014		>GGTGTTAAAGATTACAAATTGACTTATTATACTCCTGAATAT
date			GAAACCAAAGATACTGATACGCTAGCAGCATTCCGAGTAACT
Identi fication	Cocculus hirsutus		CCTCAACCTGGAGTTCCGCCTGAAGAAGCGGGGGGCTGCGGT
Institution	(L.) W.Theob Gujarat		AGCTGCCGAATCTTCTACAGGTACATGGACAACTGTGTGGAC
Institution	Biodiversity Gene		CGATGGACTTACCAGTCTTGATCGTTATAAAGGACGATGCTA
	Bank		CCACATTGAGCCCGTTGCTGGAGAAGAAAATCAATATATTTG
Accession	GENG471-14		
number			TTATGTAGCTTACCCCTTAGACCTTTTTGAAGAAGGTTCTGTT
Collection	BG20140203-025		ACTAATATGTTTACTTCCATTGTGGGTAATGTTTTTGGTTTCA
code			AAGCGCTACGCGCTCTACGTTTGGAGGATCTGCGAATTCCTA
Collector	Krupa Unadkat		CTGCTTATATTAAAACTTTCCAAGGCCCGCCTCACGGCATCCA
Phylum	Magniliophyta		AGTTGAGAGAGATAAATTGAACAAGTATGGTCGTCCCCTATT
Class	Eucotyledons		GGGATGTACTATTAAACCAAAATTGGGATTATCCGCTAAGAA
Order	Rananculales		CTACGGTAGAGCGGTTTATGAATGTCTCCGCGGT
Family	menispermaceae		
Genus	Cocculus		rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Species Identifier	hirsutus		
Identifier	Dr. P.S. Nagar		rbcL R: GTAAAATCAAGTCCACCRCG
Identi fier	drnagar@gmail.c	ABI Chromatogram	
Email	om	ABI Chromatogram	
Identi fier	MSU Baroda		
Institution	NISO Baloda	والمتعادية والمتحاد والمتحاد والمتحاد والمتحاص والمتحاد والمحاد و	بطالة التقديقية القرمينية. التشاشط الطبيقية الشاط يعراز بترياطه تعكانها من الرجم عن تناقيهم ومن تسمير عد رشي ال
Identification	Morphology and		THE METHOD REPORT AND AND A METHOD REPORT AND A METHOD AND
Method	Barcoding	H. H. H. H. H. H. H. N. N. H.	
Voucher	Herbarium.		
Status	Photographs	Same in the second state of a second state of the second state of	mmekanaimelalumistimatika anaisanaisa kutaka imisinika atau ana ama
Country	India	Illustrative Barcode;	
State	Gujarat	0	268
Region	Vadodara		
Sector	Timbi village pond	269	537
Exact Site	Pond area		
Latitude	N 22° 18' 21.8"	538	539
Longitude	E 73° 16' 37.5		
Elevation	97 <b>B</b>		
Photographer	Krupa Unadka		

Details		Image	Sequence
Collection	3 <sup>rd</sup> Feb, 2014		>GTTGGGTTCAAAGCGGGTGTTAAAGAGTACAAATTGACTTATTATAC
date			TCCTGAATACGAAACCAAAGATACTGATATCTTGGCAGCATTCCGAGT
Identification	Lindernia		AACTCCTCAACCTGGAGTTCCGCCTGAAGAAGCAGGGGCCGCGGTAG
	oppositifolia		
Institution	Gujarat Biodiversity		
	Gene Bank		TTACCAGCCTTGATCGTTACAAAGGGCGATGCTACAACATCGAGCCCG
Accession	GENG472-14		TTCCTGGAGAACAAGATCAATATATCTGTTATGTAGCTTACCCTTTAGA
number			CCTTTTTGAAGAAGGTTCTGTTACTAACATGTTTACTTCCATTGTAGGA
Collection	BG20140203-026		AATGTATTTGGATTCAAAGCCCTGCGTGCTCTACGTCTGGAAGATCTG
code Collector	Kerne Unedliet		
Phylum	Krupa Unadkat		
Class	Magniliophyta Eucotydeons		GGATGTACTATTAAACCTAAATTGGGGGTTATCCGCTAAAAACTACGGT
Order	Lamiales		
Family	Linderniaceae		AGAGCATGTTACGAATGTCTTCGCGGTGGACTTGATTTTAC
Genus	Lindernia		rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Species	Oppositifolia		
Identifier	Dr. P.S. Nagar	- Activite Wil	rbcL R: GTAAAATCAAGTCCACCRCG
Identifier	birrioritagai		
Identifier	drnagar@gmail.com	ABI Chromatogram	
Email		18 28 39 49 29 89 79 80 81 20 10 10 10 10 10 10 10 10 10 10 10 10 10	
Identifier	MSU Baroda		and the structure of the second structure of the second
Institution		<ul> <li>Kilologo summer som his statette kalitikation at the statette st Statette statette st Statette statette statette Statette statette st Statette statette statette</li></ul>	india dia di kata kata kata kata kata kata kata kat
Identification	Morphology and		
Method	Barcoding	reportal Scale at an on the second second second second second second	10 10 10 10 10 10 10 10 10 10 10 10 10 1
Voucher Status	Herbarium, Photographs		
	India	-	In the confect devices a fatal-base set of the set of all or all products the set of
Country State	Gujarat		l. in hir ein sin heiten deten viellen hit des blande ste der der heiten stere eine stere eines stere eines ste
Region	Vadodara	-	
Sector	Timbi village pond	Illustrative Barcode:	268
Exact Site	Pond area		
Latitude	N 22° 18' 21.1"	- 269	537
Longitude	F 73° 16' 37.0"		
Elevation	98	A	568
	Krupa Unadkat		
Photographer			

Details		Image	Sequence
Collection	3 <sup>rd</sup> Feb, 2014	Di Di Ka	>GGTGTTAAAGATTATAAATTGACTTATTATACTCCTGAATATAAAACC
date		XY / W	AAGGATACTGATATCTTGGCAGCATTTCGAGTAACTCCTCAACCTGGAG
Identification	Cyanthilium		TTCCGCCTGAAGAAGCAGGGGCCGCAGTAGCTGCCGAATCTTCTACTG
	cinereum		GTACATGGACAACTGTGTGGACCGATGGACTTACGAGCCTTGATCGTT
Institution	Gujarat Biodiversity Gene Bank		ACAAAGGGCGATGCTATGGAATCGAGCCTGTTCCTGGAGAAGAAAGT
Accession	GENG473-14	A REAL FOR A	
number	GEN0475-14		CAATTTATTGCTTATGTAGCTTACCCATTAGACCTTTTTGAAGAAGGTTC
Collection	BG20140203-027		TGTTACTAACATGTTTACTTCCATTGTAGGTAATGTATTTGGGTTCAAA
code	0020210200 027	Carlow Martin Carlow	GCCCTGCGTGCTCTACGTCTGGAAGATTTGCGAATCCCTATTTCGTATG
Collector	Krupa Unadkat		TTAAAACTTTCCAAGGTCCGCCTCACGGCATCCAAGTTGAGAGAGA
Phylum	Magniliophyta		AATTGAACAAGTATGGTCGTCCCCTGTTGGGATGTACTATTAAACCTAA
Class	Eucotydeons		ATTGGGGTTATCCGCTAAAAACTACGGTAGAGCTGTTTATGAATGTCTT
Order	Asterales		CGTGGTGGACTTGATTTTAC
Family	Asteraceae		
Genus	Cyanthilium	a second to a second	rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Species	inereum		
Identifier	Dr. P.S. Nagar		rbcL R: GTAAAATCAAGTCCACCRCG
Identifier	drnagar@gmail.com	ABI Chromatogram	
Email			111 311 116 116 116 116 116 117 116 117 118 117 117 116 117 116 117 117 317 317 317 417 40 40 40 40 40 40 40 40 41 317 33 23 23 23 24 34
Identifier	MSU Baroda		
Institution		. Will many an and a partition of the second s	and the submitted with a single product the set of the s
Identification	Morphology and		
Method	Barcoding		
Voucher	Herbarium,		
Status	Photographs		
Country	India	Pits meren and a billion while bill a barrier water he	id line in the balances with the district in the state of a shift is in the state of a state of a state of a st
State	Gujarat Vadodara		
Region Sector	Timbi village pond	Illustrative Barcode:	260
Exact Site	Pond area		
Latitude	N 22° 18' 21.6"	269	537
Longitude	E 73° 16' 37.4		
Elevation		538	553
Photographer	Krupa Unadka B		
5.			

Details		Image	Sequence
Collection	3 <sup>rd</sup> Feb, 2014		STTAAAGATTACAAATTGAATTATTATACTCCGGAGTATGAAACCCTA
date			GATACTGATATCTTGGCAGCATTCCGAGTAACTCCTCAACCTGGAGTTC
Identification	Aerva lanata (L.)		
	Juss.		CACCCGAAGAAGCAGGGGCTGCAGTAGCTGCCGAATCTTCTACTGGTA
Institution	Gujarat Biodiversity		CATGGACAACTGTATGGACTGATGGGCTTACCAGTCTTGATCGTTACA
	Gene Bank		AAGGACGATGCTACCACATCGAGCCTGTTGCTGGCGAAGAAAATCAAT
Accession			ATATTTGTTATGTAGCGTATCCTTTAGACCTTTTTGAAGAAGGTTCTGTT
number		States and the second se	ACTAACATGTTTACTTCCATTGTAGGTAACGTATTTGGGTTCAAAGCTC
Collection	BG20140203-028	The second s	
code			TGCGTGCTCTACGTTTGGAGGATTTGCGAATCCCTGTTGCTTATATAAA
Collector	Krupa Unadkat	A LAS AND A LAS	AACTTTCCAAGGCCCGCCTCACGGTATCCAAGTTGAAAGAGATAAATT
Phylum	Magniliophyta		GAACAAGTATGGTCGTCCCCTATTGGGATGCACTATTAAACCTAAATTG
Class	Eucotydeons		GGGTTATCCGCTAAAAACTATGGTCGAGCATGTTATGAATGTCTT
Order	Caryophyllales		GGGTTATCCGCTAAAAACTATGGTCGAGCATGTTATGAATGTCTT
Family			rbcL F: ATGTCACCACAAACAGAGACTAAAGC
	Amaranthaceae		IDCL F. ATGTCACCACAAACAGAGACTAAAGC
Genus	Aerva		rbcL R: GTAAAATCAAGTCCACCRCG
Species	lanata		THE IS GTAAAATCAAGTCCACCRCG
Identifier	Dr. P.S. Nagar		
Identifier	drnagar@gmail.com	ABI Chromatogram	
Email		10 20 20 40 50 40 70 40 70 40 40 50 10 12 120 120 40 120 120 120 120 120 120 120 120 120 12	
ldentifier	MSU Baroda		
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Status Country State Region Sector Exact Site Longitude Elevation Photographer Details Collection date Identification	Photographs India Gujarat Vadodara Vadhvana Village Pond area N 22° 10' 59.0" E 73° 28' 58.8" 102 Krupa Unadkat 3' <sup>d</sup> Feb, 2014 Rungia pectinata (L) Nees	Illustrative Barcode:	Sequence Set TAAAGAATACAAATTGACTTATTATACTCCTGAATACGAAACCAAA GATACTGATATCTTGGCAGCATTCCGAGTAACTCCTCAACCCGGAGTTC CACCTGAAGAAGCAGGAGCCGCGGTAGCTGCGGAATCTTCCACCGGT
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Status Country State Region Sector Exact Site Latitude Longitude Elevation Photographer Details Collection date Identification Institution Accession	Photographs India Gujarat Vadodara Vadhvana Village Pond area N 22° 10' 59.0" E 73° 28' 58.8" 102 Krupa Unadkat 3' <sup>a</sup> Feb, 2014 Rungia pectinata (L.) Nees Gujarat Biodiversity	In age	Sequence         STTAAAGAATACAAATTGACTTATTATACTCCTGAATACGAAACCAAA         GAATACTGATATCTTGGCAGCATTCCGAGTAACTCCTCAACCCGGAGTTC         CACTGAAAGAAGCAGGAGCCGCGGTAGCTGCGGAATCTTCCACCCGTAC
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Status Country State Region Sector Exact Site Latitude Longitude Elevation Photographer Collection date Identification Institution Accession number Collector Phylum Class Order Family	Photographs India Gujarat Vadodara Vadhvana Village Pond area N 22° 10' 59.0" E 73° 28' 58.8" 102 Krupa Unadkat A Rungia pectinata (L.) Nees Gujarat Biodiversity Gene Bank GENG475-14 BG20140203-033 Krupa Unadkat Magniliophyta Eucotydeons Lamiales Acanthaceae	Inage	Sequence Sata Aata Caa Aata Caa Aatt Gac Ti Att Aata Cac Caa Aata Caa Aaca Caa Aa Gat Aat Gat Aat Caa Aatt Gac Aata Caa Gat Gac Ti Cac Caa Gaa Aata Caa Aata Caa Caa Gat Caa Caa Caa Caa Caa Caa Caa Caa Caa C

Guius	Kungia	FDCL F: ATGTCACCACAAACAGAGACTAAAGC
Species	pectinata	
Identifier	Dr. P.S. Nagar	rbcl R GTAAAATCAAGTCCACCRCG
Identifier Email	drnagar@gmail.com	ABI Chromatogram
Identifier Institution	MSU Baroda	And the second s
Identification Method	Morphology and Barcoding	
Voucher Status	Herbarium, Photographs	
Country	India	Marson the the contractivity of the first of the second of
State	Gujarat	
Region	Vadodara	Illustrative Barcode:
Sector	Vadhvana Village	- 0 269
Exact Site	Pond area	
Latitude	N 22° 10' 59.4"	- 369 - 537
Longitude	E 73° 28' 58.7"	538 512
Elevation	101 B	538 542
Photographer	Krupa Unadkat	

# CHAPTER IV : RESULTS

		Image	Sequence
Collection	3 <sup>rd</sup> Feb, 2014	A REAL AND A REAL AND A	>GTTAAAGATTATAAATTGACTTATTATACTCCTGAATATGAAACCAAG
date			GATACTGATATCTTGGCAGCATTTCGAGTAACTCCTCAACCTGGAGTTC
Identification	Tridax procumbens		CGCCTGAAGAAGCAGGGGCCGCAGTAGCTGCCGAATCTTCTACTGGTA
Institution	Gujarat Biodiversity		CATGGACAACTGTATGGACCGATGGACTTACCAGCCTTGATCGTTACA
Accession	Gene Bank GENG476-14		AAGGCCGATGCTATGGAATCGAGCCTGTTCCTGGAGAAGAAAATCAA
number	GENG470-14		ATATTGCTTATGTAGCTTACCCATTAGACCTTTTTGAAGAAGGTTCTGT
Collection	BG20140203-034		ACTAACATGTTTACTTCCATTGTAGGTAATGTATTTGGGTTCAAAGCCC
code	0020210200 001		*
Collector	Krupa Unadkat		TGCGTGCTCTACGTCTGGAAGATTTGCGAATCCCTATTGCTTATGTTAA
Phylum	Magniliophyta		AACTTTCGAGGGTCCGCCTCACGGTATCCAAGTTGAGAGAGA
Class	Eucotydeons	A CONTRACTOR	GAACAAGTATGGTCGTCCCCTGTTGGGATGTACTATTAAACCTAAATTG
Order	Asterales		GGGTTATCCGCTAAAAACTACGGTAGAGCTTGTTATGAATGTCTTCGTC
Family	Asteraceae		GTGGACTTGGATTTTAC
Genus	Tridax		
Species	procumbens		rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Identifier	Dr. P.S. Nagar		
			rbcL R: GTAAAATCAAGTCCACCRCG
Identifier	drnagar@gmail.com	ABI Chromatogram	
Identifier Email		ABI Chromatogram	
Email Identifier	drnagar@gmail.com MSU Baroda	ABI Chromatogram	и и и и и и и и и и и и и и и и и и и
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Email Identifier Institution Identification Method Voucher Status	MSU Baroda Morphology and Barcoding Herbarium, Photographs		
Email Identifier Institution Identification Method Voucher Status Country	MSU Baroda Morphology and Barcoding Herbarium, Photographs India		
Email Identifier Institution Identification Method Voucher Status Country State	MSU Baroda Morphology and Barcoding Herbarium, Photographs India Gujarat		
Email Identifier Institution Identification Method Voucher Status Country State Region	MSU Baroda Morphology and Barcoding Herbarium, Photographs India Gujarat Vadodara		
Email Identifier Institution Identification Method Voucher Status Country State Region Sector	MSU Baroda Morphology and Barcoding Herbarium, Photographs India Gujarat Vadodara Timbi village pond		
Email Identifier Institution Identification Method Voucher Status Country State Region Sector Exact Site	MSU Baroda Morphology and Barcoding Herbarium, Photographs India Gujarat Vadodara Timbi village pond Pond area		антиски сталитиски и проститиски солони солони На сталитиски солони
Email Identification Identification Method Voucher Status Country State Region Sector Exact Site Latitude	MSU Baroda Morphology and Barcoding Herbarium, Photographs India Gujarat Vadodara Timbi village pond Pond area N 22° 10' 59.2"		Manuteshidos/motalize-ativitalite-sidos/licens-inter-dendedinidalitetanin-adam/anarama 200 337
Email Identifier Institution Identification Method Voucher Status Country State Region Sector Exact Site	MSU Baroda Morphology and Barcoding Herbarium, Photographs India Gujarat Vadodara Timbi village pond Pond area		

Details		Image	Sequence
Collection	3 <sup>rd</sup> Feb, 2014		>GAGACTAAAGCAAGTGTTGGATTCAAAGCTGGTGTTAAAGAGTATAA
date			ATTGACTTATTATACTCCGGAATATGAAGTCAAAGATACTGATATCTTG
Identification	Sida rhombifolia		GCAGCCTTCCGAGTATCTCCCCCAACCCGGAGTTCCGCCTGAGGAAGCG
Institution	Gujarat Biodiversity	A LEND LA	GGGGCCGCGGTAGCTGCTGCAATCTTCTACTGGTACATGGACAACCGTG
Accession	Gene Bank GENG477-14		TGGACCGATGGGCTTACCAGCCTTGATCGTTACAAAGGGCGATGCTAC
number	GENG477-14		
Collection	BG20140203-035		
code	6020140203-035		GCTTACCCCTTAGACCTTTTTGAAGAAGGTTCTGTTACTAACATGTTTAC
Collector	Krupa Unadkat	A REAL PROPERTY OF	TTCCATTGTGGGTAATGTATTTGGGTTCAAAGCCCTGCGCGCTCTACGT
Phylum	Magniliophyta	SA SAMARA	TTAGAGGATCTGCGAATCCCTATTGCTTATGTTAAAACTTTCCAAGGCC
Class	Eucotydeons		CACCTCATGGTATCCAGAGTGAAAGAGATAAATTGAACAAGTATGGTC
Order	Malvales		GCCCCCTATTAGGATGTACTATTAAACCTAAATTGGGGTTATCCGCTAA
Family	Malvaceae	Contraction of the contraction o	GAACTACGGTAGAGCATGTTATGAATGTCTACGCGGTGGACTT
Genus	Sida		
Species	rhombifolia		rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Identifier	Dr. P.S. Nagar		
			rbcL R: GTAAAATCAAGTCCACCRCG
Identifier	drnagar@gmail.com	ABI Chromatogram	
Email		advantat (cala) 40 N 40 N 10 N 10 N 10 10 10 10 10 10 10 10 10	
Identifier	MSU Baroda		NET DE L'UN DE L'UN DE LE LUN DE
Institution		. Jahr	
Identification	Morphology and	And the second on which set off out of the set of the set	ality the table (new and the part) of a sharped an east at the other states to reations, where the second states at
Method	Barcoding		AN THE ARTICLE AND
Voucher	Herbarium, Photographs	10 20 30 40 70 40 71 80 20 10 10 10 10 10 10 10 10 10	100 100 200 101 201 201 201 200 200 200
Status Country	India	WHERE ADDRESS OF ADDRESS	
State	Gujarat		
Region	Vadodara	🗌 🏧	and a start when the start of a start of the
Sector	Timbi village pond	Fundantish dada takin the shirt of the state	der Belahmet der Belahmen der abtellikten auf der behählte der eine die schaftigte Handen bischemisten Jahrennen.
Exact Site	Pond area	Illustrative Barcode:	
Latitude	N 22° 10' 59.5"	1	260
Longitude	E 73° 28' 58.9"	209	537
Elevation	103 B	500	575
Photographer	Krupa Unadkat		

PLATE 51

Details		Image	Sequence
Collection	3 <sup>rd</sup> Feb, 2014		>
date		at the second se	AAAGAGTACAAATTGACTTATTATACTCCTGAATACGAAACCAAAGATA
Identification	Pentanema indicum	1 and the get	CTGATATCTTGGCAGCATTCCGAGTAACTCCTCAACCGGGAGTTCCACC
Institution	Gujarat Biodiversity	- All Calante	TGAAGAAGCAGGAGCCGCGGTAGCTGCGGAATCTTCCACCGGTACAT
	Gene Bank		GGACAACCGTGTGGACCGATGGACTTACCAGTCTTGATCGTTACAAAG
Accession	GENG478-14	- here	
number		A THE	GGCGATGCTACAACATCGAGCCCGTTCTTGGGGAAACAGATCAATATA
Collection	BG20140203-036	M- H-	TCTGTTATGTAGCTTACCCTTTAGACCTTTTTGAAGAAGGTTCTGTTACC
code Collector	Krupa Unadkat		AACATGTTTACTTCCATTGTGGGAAATGTGTTTGGATTCAAAGCCTTGC
		and and	GTGCTCTACGTCTGGAAGATCTTCGAATCCCTACTGCTTATACTAAAAC
Phylum Class	Magniliophyta Eucotydeons		TTTCCAAGGTCCGCCTCATGGGATCCAAGTTGAGAGAGATAAGTTGAA
Order	Asterales	A Martin	CAAGTATGGTCGTCCCCTGCTGGGATGTACTATTAAACCGAAATTGGG
Family	Asteraceae		GTTATCCGCTAAAAACTATGGTAGAGCGTGTTATGAATGTCTTCGCGGT
Genus	Pantenema		
Species	indicum		GGACTTGATTTT
Identifier	Dr. P.S. Nagar	S.C.	rbcL F: ATGTCACCACAAACAGAGACTAAAGC
Identifier	DITENSTINAGA	and the second s	IDCL F: ATGTUAUUAUAAAUAGAGAUTAAAGU
		,	rbcL R: GTAAAATCAAGTCCACCRCG
		t Prior	
Identifier Email	drnagar@gmail.com	ABI Chromatogram	
Email Identifier	MSU Baroda	(a) (b) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	
Institution	MSU Baroda		
Identification	Morphology and	MAN	
Method	Barcoding	Manager and the second statements of the second statements of the second s	กลังกลางสีสร้างสายชีวิติการให้การให้กร้างการให้แห่งสายในกลายสายสายสายสายสายสายสายสายสายสายการสายสายการสายสาย
Voucher	Herbarium.		
Status	Photographs	18 20 30 40 30 40 70 80 80 20 100 100 100 100 100 100 100	18 18 18 28 23 23 28 26 26 28 27 38 28 38 38 18 18 18 18 18 19 19 19 18 18 48 43 43 43 46 46 46 46 47 48 46 18 18 18
Country	India		
State	Gujarat	· · ·	
Region	Vadodara	And A A	
Sector	Timbi village pond	- mend "Selfernation of a new cold film to consider a model of the second	second balances of the second balance to be set to a second second balance balance balance of the second balance of the second balance balan
Exact Site	Pond area		
Latitude	N 22° 10' 59.8"	Illustrative Barcode:	268
Longitude	E 73° 28' 58.9"		
Elevation	102	269	500
Photographer	Krupa Unadka A		

# **PLATE 52**

# 4.3 Phylogenetic Analysis

The evolutionary history was inferred by using the Maximum Likelihood method based on the Tamura-Nei model. The tree with the highest log likelihood (-16424.5341) is shown. Initial tree(s) for the heuristic search were obtained automatically as follows. The tree is drawn to scale, with branch lengths measured in the number of substitutions per site (next to the branches). The analysis involved 09 nucleotide sequences. All positions containing gaps and missing data were eliminated. There were a total of 435 positions in the final dataset. Evolutionary analyses were conducted in MEGA5.

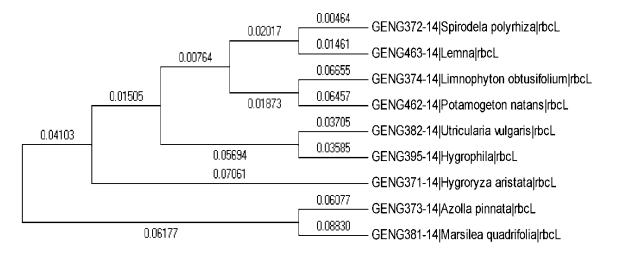


Figure.17: Molecular Phylogenetic anaylsis by Maximum Likelihood method

The clades in the tree constructed with *rbcL* gene sequences were supported by 89% (25/28) of >50% bootstrap values (Figure 1). In a recent study, the *rbcL* marker exhibited intermediate-level (80%) resolution among the evaluated regions (matK > atpF-atpH > rbcL > trnH-psbA > rpoC1) (Burgess et al., 2011). Phylogenetic methods were applied in a recently conducted study of barcoding species using each barcode locus taken alone and in combinations to evaluate species recovery (Roy *et al.*, 2010).



The NJ, MP, and UPGMA methods were used for both single- and multi-locus analyses with 500 bootstrap replicates. When all sequences for a given locus were considered, ITS, *matK*, and *trnH-psbA* were able to form a species-specific clade for only *Berberis pachyacantha*. Not a single species was recovered with *rbcL* using any of the three methods. The clades formed in the trees were mostly mixtures of several species. Therefore, establishing a local barcode database will be valuable for a broad range of potential ecological applications, including the building of community phylogenies (Kress *et al.* 2009).

	1	2	3	4	5	6	7	8	9
1. GENG371-14 Hygroryza aristata rbcL									
2. GENG372-14 Spirodela polyrhiza rbcL	0.115								
3. GENG373-14 Azolla pinnata rbcL	0.216	0.192							
4. GENG374-14 Limnophyton obtusifolium rbcL	0.166	0.098	0.237						
5. GENG381-14 Marsilea quadrifolia rbcL	0.245	0.208	0.149	0.234					
6. GENG382-14 Utricularia vulgaris rbcL	0.136	0.113	0.242	0.161	0.256				
7. GENG395-14 Hygrophila rbcL	0.156	0.116	0.249	0.147	0.263	0.072			
8. GENG462-14 Potamogeton natans rbcL	0.141	0.107	0.229	0.130	0.245	0.151	0.154		
9. GENG463-14 Lemna rbcL	0.115	0.019	0.186	0.115	0.203	0.122	0.128	0.118	

# Table 13: rbcL based Correlation chart

Phylogenetic tree analysis using rbcL sequences assigned the tested plant samples to known species. The plants that were taken into consideration grouped *Spirodela polyrhiza*, Limnophyton obtusifolium *and Lemna sp.* together belongs to Alismatales. *Spirodela polyrhiza* and *Lemna sp.* which were considered under free floating hydrophytes while *Limnophyton obtusifolium* is rooted emergent hydrophytes.

As per chart *Hygroryza aristata* shows lowest value with *Spirodela polyrhiza* and then *Limnophyton obtusifolium*. Similarly *Spirodela polyrhiza* shows lowest value with *Limnophyton obtusifolium* and then *Lemna Sp*. This indicate that this plants are closely related with each other and grouping together.

Moreover, *Hygrophila Sp.* and *Limnophyton obtusifolium* belongs to different families but they are grouped in to Rooted emergent Hydrophyte. In the phylogenic tree *Spirodela polyrhiza* and *Lemna Sp.* shows close relationship so, they are grouped in free floating hydrophyte. Besides this as per correlation chart *Utricularia vulgaris* shows close relationship with *Lemna Sp.*  Contradictory results occur in *Hygrorhyza aristata* is correlating with lowest value at *Spirodela polyrhiza* but *Spirodela polyrhiza* includes in group of free floating hydrophyte while *Hygrorhyza aristata* is rooted emergent hydrophyte. Based on this analysis. Our findings, not withstanding *rbcL* is considered to possess less species-discriminating power than *matK*, are possibly due to its minimal sequence variation (Asahina *et al.*, 2010). The estimated range of the total number of plant species worldwide is believed to be approximately 310,000-422,000 (Graham, 2002).

Morphological identification is inapplicable when studying population biology. In such cases, barcoding is an efficient and valuable technique. Some ecologists have started using the barcoding approach to identify specific unknown plant samples for practical purposes (Li *et al.*, 2009). Ongoing developments of new primers and improvements in sequencing techniques have facilitated the data-emergence process of plant barcoding (Soltis *et al.*, 1996; Burgess *et al.*, 2011). Recently, plant diversity belowground was determined using *rbcL* gene sequences as a core plant DNA barcoding marker (Kesanakurti *et al.*, 2011).

Configuration	Count
Identical sites in all three sequences	46
Divergent sites in all three sequences	200
Unique differences in Sequence A	99
Unique differences in Sequence B	98
Unique differences in Sequence C	115

# Table 14: Tajima's test results

The equality of evolutionary rate between sequences **A** (*GENG371-14 Hygroryza\_aristata*) and **B** (*GENG372-14 Spirodela\_polyrhiza*), with sequence **C** (*GENG373-14 Azolla\_pinnata*) used as an out group in Tajima's relative rate test. The  $\chi^2$  test statistic was 0.01 (P = 0.94320 with 1 degree[s] of freedom). *P*-value less than 0.05 is often used to reject the null hypothesis of equal rates between lineages. The analysis involved 3 nucleotide sequences. Codon positions included were 1st+2nd+3rd+Noncoding. All positions containing gaps and missing data were eliminated. There were a total of 558 positions in the final dataset. Evolutionary analyses were conducted in MEGA5.

·	Α	T/U	С	G
Α	-	4.66	3.74	11.66
T/U	4.33	-	18.48	3.52
С	4.33	23.00	-	3.52
G	14.36	4.66	3.74	-

# Table 15: Likelihood estimate of Substitution Matrix

Each entry is the probability of substitution (r) from one base (row) to another base (column). Substitution pattern and rates were estimated under the Tamura-Nei (1993) model. Rates of different transitional substitutions are shown in **bold** and those of transversionsal substitutions are shown in *italics*. Relative values of instantaneous r should be considered when evaluating them. For simplicity, sum of r values is made equal to 100, The nucleotide frequencies are A = 26.65%, T/U = 28.67%, C = 23.03%, and G = 21.65%. For estimating ML values, a user-specified topology was used. The maximum Log likelihood for this computation was -1804.400. The analysis involved 9 nucleotide sequences. All positions containing gaps and missing data were eliminated. There were a total of 424 positions in the final dataset. Evolutionary analyses were conducted in MEGA5.

M	S	<i>p</i> s	Θ	П	D
57	435	1.000000	0.216851	0.678036	7.627007

#### Table16: Tajima's Neutrality Test results

NOTE.-- The analysis involved 09 nucleotide sequences. All positions containing gaps and missing data were eliminated. There were a total of 435 positions in the final dataset. Evolutionary analyses were conducted in MEGA5.



G=>C	0.04	0.04	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.08	0.04	0.08	0.04	0.08	0.03	0.08
G=>T	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.04	0.04	0.04	0.05	0.05	0.08	0.05	0.08	0.05	0.08	0.05	0.08
∀<=9	0.18	0.18	0.2	0.18	0.2	0.19	0.15	0.19	0.15	0.15	0.16	0.15	0.17	0.19	0.19	0.18	0.14	0.08	0.18	0.08	0.14	0.08	0.14	0.08
S<=3	0.04	0.04	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.08	0.04	0.08	0.04	0.08	0.03	0.08
C=>T	0.18	0.18	0.2	0.18	0.2	0.21	0.25	0.21	0.24	0.25	0.24	0.25	0.17	0.19	0.19	0.19	0.23	0.08	0.19	0.08	0.23	0.08	0.23	0.08
C=>∀	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.08	0.04	0.08	0.04	0.08	0.05	0.08
5<=T	0.04	0.04	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.08	0.04	0.08	0.04	0.08	0.04	0.08
T=>C	0.18	0.18	0.16	0.18	0.16	0.17	0.2	0.17	0.2	0.2	0.19	0.2	0.17	0.15	0.15	0.16	0.19	0.08	0.16	0.08	0.19	0.08	0.19	0.08
A<=T	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.02	0.03	0.02	0.04	0.04	0.04	0.04	0.04	0.08	0.04	0.08	0.04	0.08	0.04	0.08
9<=∀	0.18	0.18	0.16	0.18	0.16	0.16	0.12	0.16	0.12	0.12	0.13	0.12	0.17	0.15	0.15	0.15	0.12	0.08	0.15	0.08	0.12	0.08	0.12	0.08
A=>C	0.04	0.04	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.08	0.04	0.08	0.04	0.08	0.04	0.08
T<=A	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.08	0.05	0.08	0.05	0.08	0.04	0.08
9 per f	0.25	0.25	0.2234	0.25	0.2234	0.2165	0.2165	0.2165	0.2165	0.2165	0.2165	0.2165	0.25	0.2234	0.2234	0.2165	0.2165	0.25	0.2165	0.25	0.2165	0.25	0.2165	0.25
C pera	0.25	0.25	.2234 (	0.25	0.2234	0.2303	0.2303	0.2303	0.2303	0.2303	.2303	0.2303	0.25	0.2234	.2234 (	0.2303	0.2303	0.25	.2303	0.25	.2303	0.25	0.2303	0.25
Т рэтЯ	0.25	0.25	.2766 (	0.25	0.2766 (	0.2867 (	0.2867 (	0.2867 (	0.2867 (	0.2867 (	0.2867 (	0.2867 (	0.25	.2766 (	0.2766 (	0.2867 (	0.2867 (	0.25	.2867 (	0.25	.2867 (	0.25	0.2867 (	0.25
А рэтЯ	0.25	0.25	.2766 0	0.25	0.2766 0	0.2665 0	0.2665 0	0.2665 0	0.2665 0	.2665 0	0.2665 0	.2665 (	0.25	.2766 0	.2766 0	0.2665 (	.2665 0	0.25	.2665 0	0.25	.2665 0	0.25	0.2665 0	0.25
 ਬ	2.4007	2.4912	2.5736 0	2.4492	2.5266 0	2.557 0	5697 0	5115 0	2.5266 0	2.58 0	2.4415 0	2.58 0	2.0563	2.062 0	2.062 0	2.0621 0	2.0721 0	0.5	2.0621 0	0.5	2.0721 0	0.5	0729 0	0.5
emmeð	n/a 2	0.37971 2	0.3646 2	3.36206 2	3.48865 2	0.36566	0.37507 2	3.31966 2	2.8641 2	0.36294	n/a 2	0.36294	n/a 2	n/a	n/a	n/a 2	n/a 2	n/a	n/a 2	5.89873	n/a 2	0.76959	n/a 2	n/a
tnsitevul	0.553064	n/a 0.	n/a 0	0.498922 3.	0.509036 3.	n/a 0.	n/a 0.	0.505657 3.	0.489497 2	n/a 0.	0.555544	0 0	n/a	n/a	0.00001	n/a	n/a	0.539432	0.0001	0.504102 5.	0.00001	n/a 0.	n/a	n/a
	-1760.2 0.9	-1760.4	-1758.5	-1759.7 0.4	-1757.7 0.9	-1757.3	-1755.6	-1756.6 0.9	-1754.9 0.4	-1754.2	-1754.6 0.9	-1754.2	-1810.7	-1811.6	-1811.6 0.	-1810.2	-1807	-1823.5 0.9	-1810.2 0.	-1823.3 0.9	-1807 0.	-1828.7	-1806.8	-1868.8
aDIA	3554.5 -1	3555 -1	3553.3 -1	3555.6 -1	3553.6 -1	3554.9 -1	3553.5 -1	3555.4 -1	3554.1 -1	3556.8 -1	3557.5 -1	3558.8 -1	3653.6 -1	3657.4 -1	3659.5 -1	3658.7 -1	3654.2	3679.1 -1	3660.7 -1	3680.7 -1	3656.2 -	3689.5 -1	3659.8 -1	3767.7 -1
BIC	3660.6 39	3661 3	3665.5 39	3667.8 39	3672.1 38	3679.6 39	3684.4 39	3686.3 39	3691.3 38	3706.4 39	3707.2 38	3714.6 39	3753.4 30	3763.5 30	3771.7 30	3777.2 3(	3778.9 36	3778.9 36	3785.4 3(	3786.8 36	3787.1 3(	3789.3 3(	3803.2 36	3861.3 31
Parameter	17 36	17 3	18 36	18 36	19 36	20 36	21 36	21 36	22 36	24 37	24 37	25 37	16 37	17 37	18 37	19 37	20 37	16 37	20 37	17 37	21 37	16 37	23 38	15 38
leboM	_	Ģ	+0	K2+G+I	T92+G+I	HKY+G	TN93+G	HKY+G+I	TN93+G+I	GTR+G	1+	GTR+G+I			Ŧ	/	3		(+	JC+G+I	3+1	Ģ	~	
	K2+I	K2+G	T92+G	K2+	T92-	¥	TN9	¥	TN9	GTR	GTR+I	GTR	Ŋ	T92	T92+I	HKY	<b>TN93</b>	1C+I	HKY+I	1 C+	TN93+I	JC+G	GTR	9

**Table 17:** Models with the lowest BIC scores (Bayesian Information Criterion)

Models with the lowest BIC scores (Bayesian Information Criterion) are considered to describe the substitution pattern the best. For each model, AICc value (Akaike Information Criterion, corrected), Maximum Likelihood value (*lnL*), and the number of parameters (including branch lengths) are also presented. Non-uniformity of evolutionary rates among sites may be modeled by using a discrete Gamma distribution (+G) with 5 rate categories and by assuming that a certain fraction of sites are evolutionarily invariable (+I). Whenever applicable, estimates of gamma shape parameter and/or the estimated fraction of invariant sites are shown. Assumed or estimated values of transition/transversion bias (R) are shown for each model, as well. They are followed by nucleotide frequencies (f) and rates of base substitutions (r) for each nucleotide pair. Relative values of instantaneous r should be considered when evaluating them. For simplicity, sum of r values is made equal to 1 for each model. For estimating ML values, a tree topology was automatically computed. The analysis involved 57 nucleotide sequences. All positions containing gaps and missing data were eliminated. There were a total of 435 positions in the final dataset. Evolutionary analyses were conducted in MEGA5.

# 4.4 Selection of Plants for bioaccumulation of heavy metal ions (Zn, Ni and Cd) *in vitro*

Lemna species, also known as duckweed, grow in stagnant or slow flowing waters in almost all the world. Duckweed is often identified as Lemna minor, however, there are often other species present often even introduced from tropical or subtropical regions such as *L. polyrhiza L.* and *L.triscula* L. which makes identification very difficult. Some species often found in tanks are like *L, minuta* and *L. valdiviana* or the relatively large *Landoltia punctata*. Quite often, several species occure in the same tank. *Lemna minor*, native to Europe does well with very low pH values as well as with very low water temperature. In winter, this tiny floating plant produces so called turions (Small dense organs containing a lot of starch, which sink to the ground). This strategy ensure its survival during longer cold periods or unfavourable conditions in general. Duckweed is a very undemanding plant, however nutrient rich water and at least medium lighting furthers growth considerably. It reproduces mainly by budding: two daughter plants grow from "bags" on the sides of the plant, which break off early in their development. Duckweed oftern becomes a major weed due to its smallness, adaptability and extremely fast growth. Its growth rate makes its highly annoying and difficult to control as well as its tendency to shade off other plants to high degree.

# Lemna polyrhhiza L. (Spirodela polyrhhiza L. Schleiden)

Spirodela polyrhhiza L. Schleiden (giant duckweed) is a cosmopolite representative of the Lemnoideae subfamily araceae. Although *Lemna gibba* L. and *L. minor* L. are the commonly used species in standardized ecotoxicological test procedures. *S. polyrhhiza* is also widely applied as a model organism in plant physiology, ecotoxicology and bioremediation studies (Olah *et al.*, 2008). This special attention could partly be attributed to its special way of propogation. However, it can produce not only daughter fronds but turions or turion like fronds as well which serve as dormant buds for surviving unfavourable periods (Jacobs, 1947). *S. polyrhhiza* L. is the most extreme example of this strategy since in temperate regions its winter survival relies exclusively on its turions because normal fronds cannot tolerate low temperatures (Appenroth, 2001). Turions are produced by the same meristematic regions as normal vegetative fronds.

Jacobs (1947) observed that the growing primordium loses its ability to reversibly switch between normal and turion developmental paths when it reaches approximately 0.2 mm length. According structural simplicity and small size of frons, rapid growth and easy observation of turion formation qualify *S. polyrhiza* as an ideal model system for investigating regulation of morphogenesis and dormancy in plant (Chaloupkova and Smart, 1994). Besides their popularity in plant physiological and ecotoxicological research, common advanrages of duckweed species make these plant suitable for various fields of practical applications (Wang *et al.*, 2014). Recently duckweeds are considered as potential candidates for bioremediation, waste water treatment, and raw material (eg. Protein and starch production (Cheng and Stomp, 2009).

Despite its extensive application in exotoxicology and phytoremediation research, the effect of heavy metals on turion formation of *S. polyrhiza* are sparingly discussed and the results are rather contradictory. Xylander *et al.* 1993 found that the presence of either cadmium or nickel in the nutrient medium inhibited formation of turions.

# Lemna triscula L.

*Lemna trisulca* L. is an uncommon Lemna species and not easily identified as such at first glance. *L. triscula L.* will occur in most mesotrophic to eutrophic still or slow flowing water bodies, although it will also ocuur in backwaters in fast flowing rivers. It is tolerant of shade and apparently also of hyper eutrophication and will often occur where there are very few other aquatic plant species. *Lemna triscula* L. is a perennial and every frond has a transparent margin that is toothed at the front. It is in flower from may to july. The flowers are monoecious (individual flowers are either male or female, but both sexes can be found on the same plant). Reproduction is by vegetative budding; flowering is very rare. *L. trisulca* L. grows in stagnant waters poor in phosphate with a conductivity of mainly over 100 Mikrosiemens/cm vor, where it is often found floating under the cover of other duckweed species (*Lemna, Spirodela*). During the winter it keeps growing, forming shorter and wider fronds that sink to the ground, where they keep growing at a slower rate.

Duckweed (*Lemna trisulca* L.) is an aquatic plant with an excellent potential for toxicological studies. Like other species of the family Lemnaceae, it is small in size, grows rapidly and, because it is unattached to the substrate, is relatively easy to culture. It differs from the species of duckweed normally used for toxicity assessment such as *L. minor* and *L. gibba*, since it grows entirely submerged. *Lemna trisulca* L. is a truly aquatic plant and working with it *Lemna trisulca* L. is a truly aquatic plant and working with it avoids complications, which may be associated with air/water interfaces (Huebert *et al.*, 1993). Duckweeds (*Lemna, Spirodela, Wolffia* and *Wolfiella*) are worldwide distributed in freshwater to brackish estuaries. These are free-floating, easy to culture in laboratory and area convenient plant material for ecotoxicological investigations (Prasad *et al.*, 2001). In particular, species of *Lemna* are reported to accumulate toxic metals and therefore are being used as experimental model systems to investigate heavy metal induced responses. Bioavaibility and bioaccumulation of various heavy metals in aquatic and wetland ecosystems is gaining tremendous significance globally (Greger, 1999). Aquatic macrophytes take up metals from the water, producing an internal concentration several fold greater than their surroundings.

Many of the aquatic macrophytes found to be the potential scavengers of heavy metals from aquatic environment and are being used in wastewater renovation systems (Kadlec *et al.*, 2000). Cadmium does not have any metabolic use for plants, it has several industrial applications, electroplating, pigments, (nickel cadmium; silver-cadmium; mercury-cadmium) alloys etc. Intrinsic growth rates of aquatic plants are not constant overtime. Hubert and Gorham (1993), and Landolt and Kandeler (1987) found that the doubling time of *L. minor* varied from 1-3 to 2-8 days over 18 month period. Data on the effect of a reference toxicant over time are scarcer reported no cyclic changes in the effect of relationship between intrinsic growth rate and the Cd reference toxicant (Thorsteinsson *et al.*, 1987).

# 4.4.1 In vitro Culturing of L. polyrhiza L. and L. triscula L.

*L.polyrhhiza* L. and *L. triscula* L. were cultured in laboratory using Hoagland culture medium.

The aim of the present work is to investigate the performance of (*Lemna trisulca* L. and *L.polyrrhiza* L.) to absorb Zn, Ni and Cd from aquatic systems and to represent the rate of Zn, Ni and Cd removal.

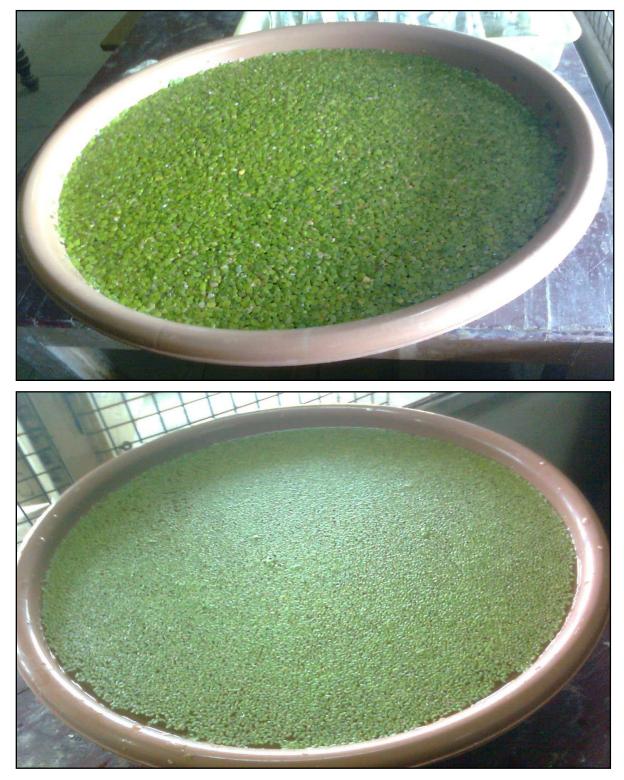
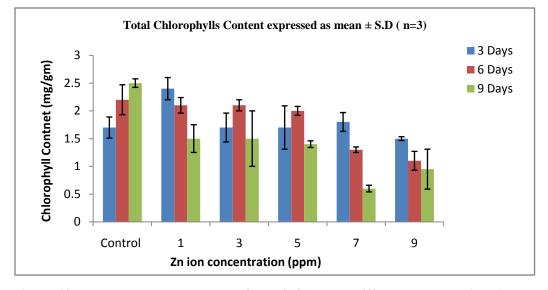


PLATE 53

# 4.5 Effect of metals on Biochemical Parameter of L. polyrhiza L.



4.5.1 Effect of Zn ion on biochemical parameters of L. polyrhiza L

Figure 18: Total chlorophylls content of *L. polyrhiza* L. at different concentration of Zn metal ion

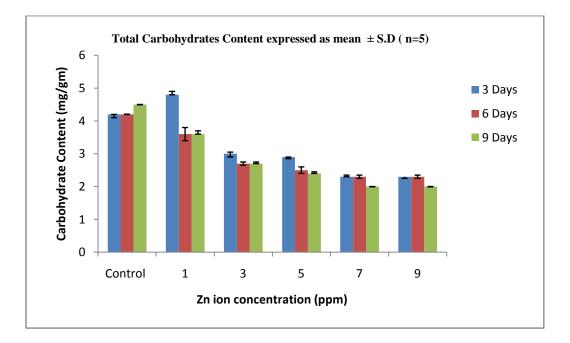


Figure 19 : Total Carbohydrates content of *L. polyrhiza* L. at different concentration of Zn metal ion

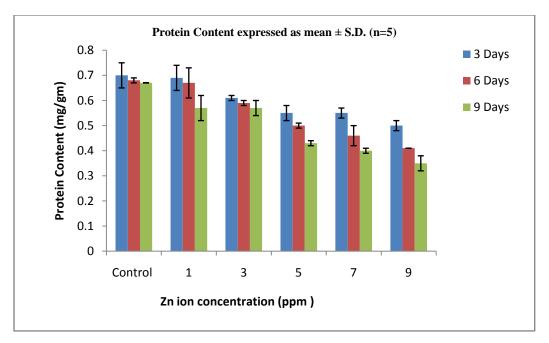


Figure 20: Protein content of L. polyrhiza L. at different concentration of Zn metal ion

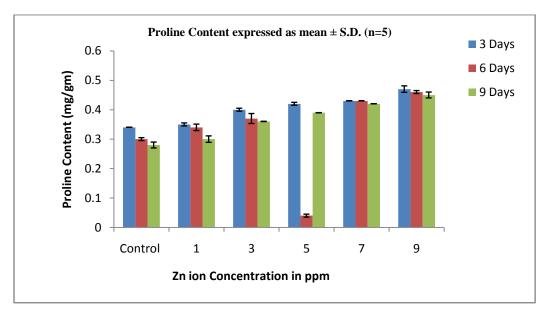


Figure 21: Proline content of L. polyrhiza L.at different concentration of Zn metal ion

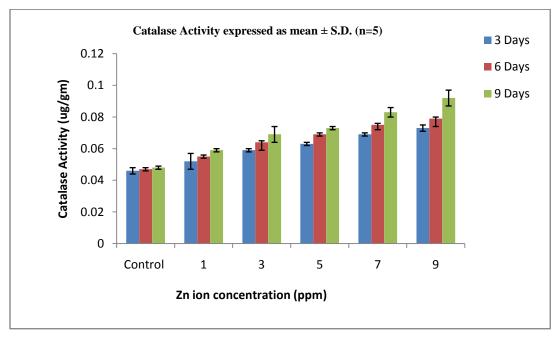


Figure 22: Catalase Activity of L. polyrhiza L. at different concentration of Zn metal ion

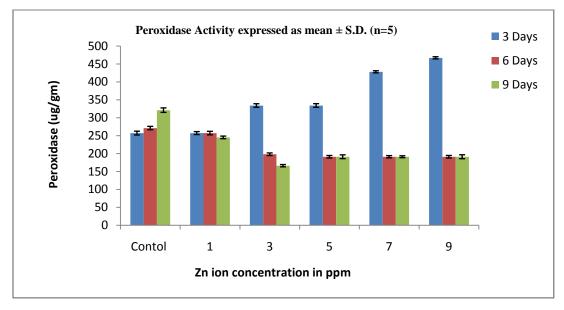


Figure 23 : Peroxidase Activity of L. polyrhiza L. at different concentration of Zn metal ion

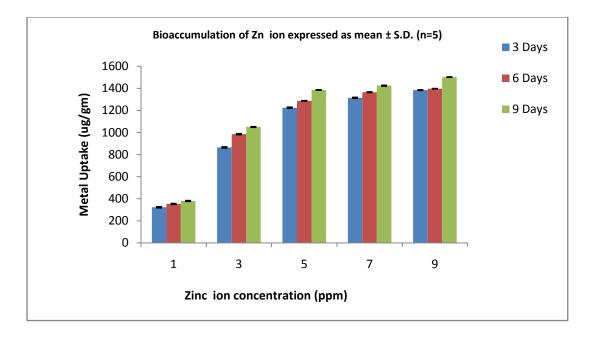


Figure 24: Bioaccumulation of Zn ion of L. polyrhiza L. at different concentration of Zn metal ion

# **Total Chlorophylls Content**

The results of effect of Zn metal ion concentration on total chlorophyll content of *L*. *polyrhiza L.* is represented in Figure 18. It was observed that 1 ppm concentration of the metal ion marginally increased the chlorophyll following 3 days of treatment period. Thereafter, the chlorophyll content showed gradual decline as the treatment period and the metal ion concentration increased. The prolonged exposure of 9 days to high concentration of Zn i.e. 9 ppm significantly reduced (45%) chlorophyll than the control.

Significant difference was observed and results of chlorophyll results were compared with control on  $3^{rd}$  (P = 0.015<0.05),  $6^{th}$  and  $9^{th}$  (P= 0.006< 0.05) treatment period followed by paired t test. No significant results were obtained (P = 0.955> 0.05) when chi square test was performed.

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# **Total Carbohydrates Content**

Data presented in Figure 19 revealed that total carbohydrate content a showed a slight rise at 1 ppm metal ion concentration and thereafter at 3 days treatment period. A negative correlation was recorded with the increased metal ion concentrations and the treatment period. No significant difference was observed when carbohydrate content of the treated plants were compared with control on  $3^{rd}$  day (P = 0.30 >0.05). In addition to that we found significant difference when carbohydrate content of  $6^{th}$  day (P = 0.006< 0.05) and  $9^{th}$  day (P = 0.04 > 0.05) treated plants were compared with control followed by paired t test. Additionally, in chi square test, we did not find significant results (P= 0.57 > 0.05).

#### **Protein Content**

All the experimental concentrations gradually declined protein content as the period of treatment increased from 3 to 9 days (Figure 20). It also decreased with increased metal ion concentrations in all the treatment periods. Protein showed 49% reduction when the plants were treated with 9 ppm Zn ions following exposure of 9 days. Significant difference was observed when Protein content of the treated plants were compared with control on  $3^{rd}$  day (P = 0.05 = 0.05). We obtained significant difference when protein content of  $6^{th}$  day (P= 0.00 < 0.05) and  $9^{th}$  day (P= 0.006 < 0.05) treatment plant when compared with control followed by paired t test. Furthermore, in chi square test, no significant results were obtained (P= 0.95 > 0.05).

#### **Proline Content**

The effect of Zn ion on Proline content of the *L. poyrhiza L.* is represented in Figure 21. A concentration dependent rise in the level of proline was observed during all experimental exposure period. But negative correlation was found between the period of exposure and level of proline content. There is significant difference between proline content of the treated and control plants on  $3^{rd}$  day treatment period (P = 0.01<0.05).

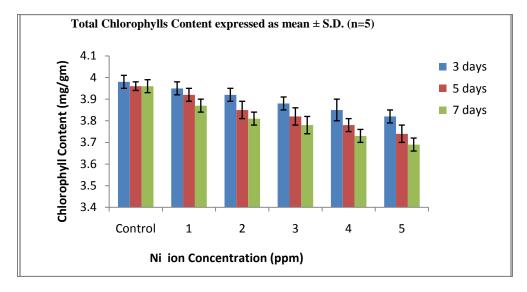
Significant difference were observed when protein content of  $6^{th}$  day (P= 0.02 < 0.05) and  $9^{th}$  day (P= 0.001 < 0.05) were compared with control followed by paired t test. Furthermore, in chi square test, there is no significant results were obtained (P= 0.95 > 0.05).

# **Catalase and peroxidase Activity**

As per results obtained the activity of both catalase and peroxidase were significantly higher in treated plants in comparison with the control plants. (Figure 22 and 23) Greater activities of catalase and guaicol peroxidase indicated that the treated plant were under oxidative stress. In the present investigation it was reported that activities of catalase enhanced linearly with increased metal ion concentration whereas the activity of guaicol peroxidase showed increase with metal ion concentration only at 3 day of exposure period. Thereafter it decreased at 6 and 9 day exposure periods. We found significant difference when catalase activity and peroxidase activity of the treated (exposed in 3,6 and 9 days) were compared with control (P = 0.00 < 0.05) followed by paired t test. Furthermore, in chi square test, there is no significant results were obtained (P = 1.00 > 0.05) for catalase activity and (P = 0.572 > 0.05) for Peroxidase activity.

#### **Bioaccumulation of Zn Metal ion**

Bioaccumulation of Zn ion in the test plants at different concentration is as shown in Figure 24. Exposure to 1 and 3 ppm increased the accumulation of metal ion in all the experimental exposure periods. The concentration beyond 3 ppm i.e. 5,7 and 9 decreased the uptake at 3 day exposure. Also, no further rise n the uptake were reported at 6 and 9 days in test concentrations. There is significant difference between Zn metal uptake of the test plants were compared with control on 3, 6 and 9 days (P = 0.0.4 < 0.05) followed by paired t test. Furthermore, in chi test, there is no significant results were obtained (P = 1.00 > 0.05).



4.5.2 Effect of Ni ion on biochemical parameters of L. polyrhiza L.

Figure 25: Total Chlorophylls Content of *L. polyrhiza* L. at different concentration of Ni metal ion

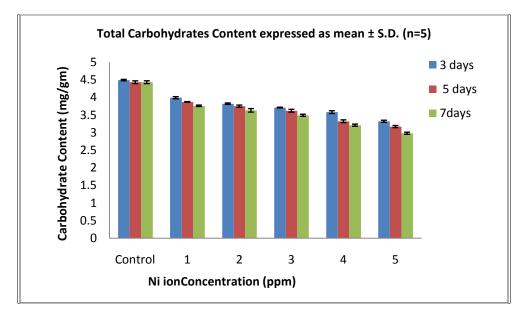


Figure 26: Total Carbohydrates Content of *L. polyrhiza* L. at different concentration of Ni metal ion

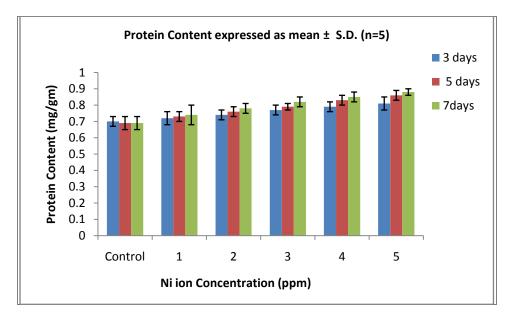


Figure 27: Protein Content of *L. polyrhiza* L. at different concentration of Ni metal ion

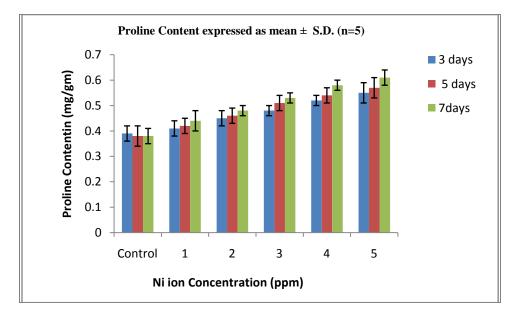


Figure 28: Proline Content of *L. polyrhiza* L. at different concentration of Ni metal ion

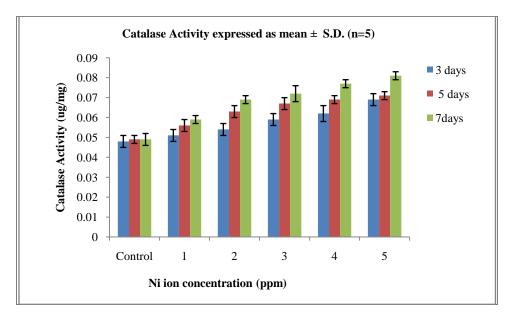


Figure 29: Catalase Activity of *L. polyrhiza* L. at different concentration of Ni metal ion

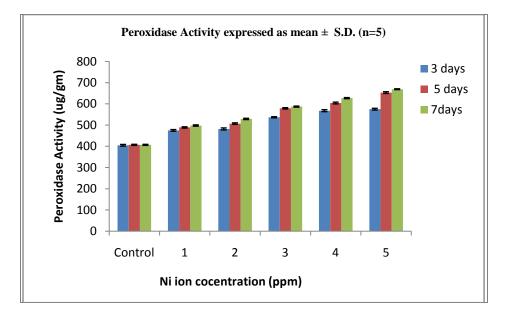


Figure 30: Peroxidase Activity of *L. polyrhiza* L. at different concentration of Ni metal ion

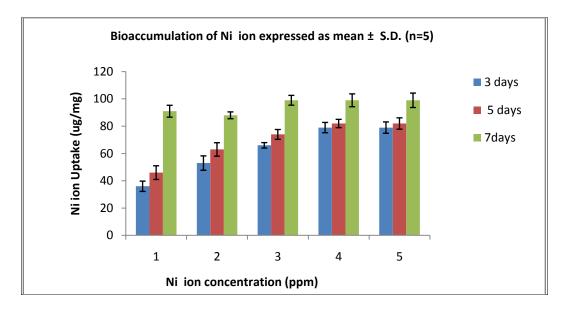


Figure 31: Bioaccumulation of Ni ion of *L. polyrhiza* L. in the different concentration of Ni metal ion

# **Total Chlorophylls Content**

The results of effect of Ni ion concentration on total chlorophyll content of *L. polyrhiza* L. is represented in Figure 25. It was observed that as the concentration of the Ni ion increased from 1 ppm to 5 ppm, total chlorophyll content decreased gradually. The prolonged exposure of 5 days to high concentration of Ni i.e. 5 ppm significantly reduced (45%) chlorophyll than the control. Significant difference was observed and results of chlorophyll results were compared with control on  $3^{rd}$  (P = 0.00<0.05),  $6^{th}$  (P= 0.01< 0.05) and  $9^{th}$  (P= 0.00< 0.05) treatment period followed by paired t test. No significant results were obtained (P = 0.1 > 0.05) when chi square test was performed.



# **Total Carbohydrates Content**

Figure 26 shows the effect of Ni ion on carbohydrate content of *L. polyrhiza L.* It depicted total carbohydrate content decreased as concentration of Ni ion increased. A negative correlation was recorded with the increased metal ion concentrations and the treatment period. Significant difference was observed when carbohydrate content of the treated plants were compared with control on various treatment period i.e. 3,5 and 7 days (P = 0.002 > 0.05) followed by paired t test. Additionally, in chi square test, we did not find significant results (P=1.00 > 0.05).

# **Protein Content**

All the experimental concentrations showed negligible rise in protein content as the period of treatment increased from 3 to 7 days (Figure 27) and with increased Ni ion concentrations in all the treatment periods. Protein showed 12% rise when the plants were treated with 7 ppm Ni ions following exposure of 7 days. We obtained significant difference when protein content of 6<sup>th</sup> 5<sup>th</sup> and 7<sup>th</sup> day ( P=0.00 < 0.05) treated plant as compared to control followed by paired t test. Furthermore, in chi square test, no significant results were obtained ( P=1.0>0.05).

#### **Proline Content**

The effect of Ni ion on Proline content of the *L. poyrhhiza* L. is represented in Figure 28. A concentration dependent rise in the level of proline was observed during all experimental exposure period. But a negative correlation was found between the period of exposure and level of proline content. There is significant difference between proline content of the treated and control plants and treatment periods (3,5 and 7 days) (P = 0.00 < 0.05). While in chi square test, there is no significant results were obtained (P=1.0 > 0.05).



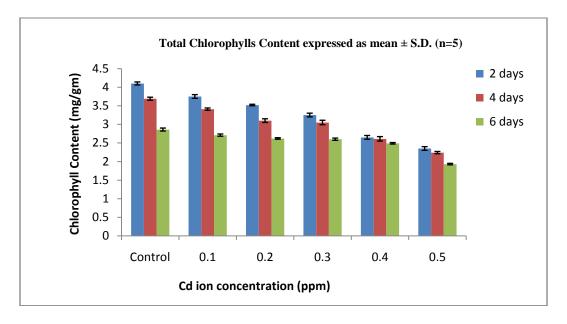
# **Catalase and peroxidase Activity**

As per results obtained the activity of both catalase and peroxidase were significantly higher in treated plants in comparison to the control plants. (Figure 29 and 30) Greater activities of catalase and guaicol peroxidase indicated that the treated plant were under oxidative stress. In the present investigation, it was reported that activities of catalase enhanced linearly with increased metal ion concentration whereas the activity of guaicol peroxidase showed increase with metal ion concentration only at 3 day of exposure period. Thereafter it decreased at 5 and 7 day exposure periods. We found significant difference when catalase activity of the treated (exposed in 3,5 and 7 days) were compared with control (P = 0.00 < 0.05) and peroxidase activity (P = 0.00 < 0.05) followed by paired t test. Furthermore, in chi square test, there is no significant results were obtained (P= 1.00 > 0.05) for catalase activity.

# **Bioaccumulation of Ni ion**

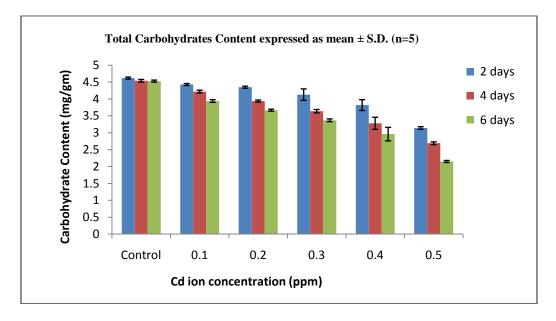
Bioaccumulation of Ni ion in the test plants at different concentration is as shown in Figure 31. Exposure to 1 to 5 ppm metal ion concentration increased the accumulation of metal ion in all the experimental exposure periods. There is significant difference between Ni metal uptake of the test plants were compared with control on 3, 5 and 7 days (P =  $0.0 \ 1 < 0.05$ ) followed by paired t test. Furthermore, in chi test, there is no significant results were obtained (P=1.00 > 0.05).



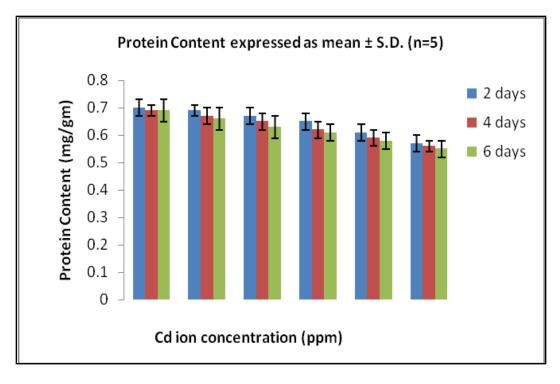


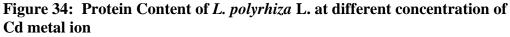
4.5.3 Effect of Cd ion on biochemical parameters of L. polyrhiza L.

Figure 32: Total Chlorophylls Content of *L. polyrhiza* L. at different concentration of Cd metal ion



# Figure 33: Total Carbohydrates Content of *L. polyrhiza* L. in the different concentration of Cd metal ion





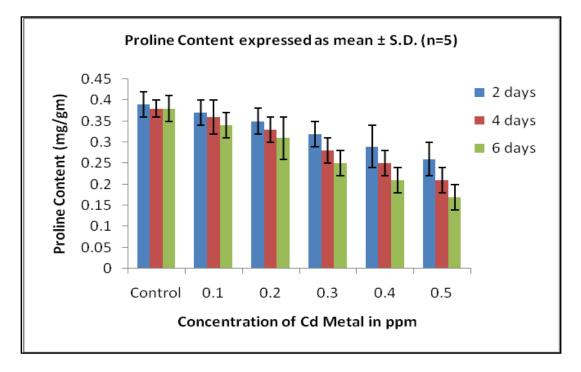


Figure 35: Proline Content of *L. polyrhiza* L. in the different concentration of Cd metal ion



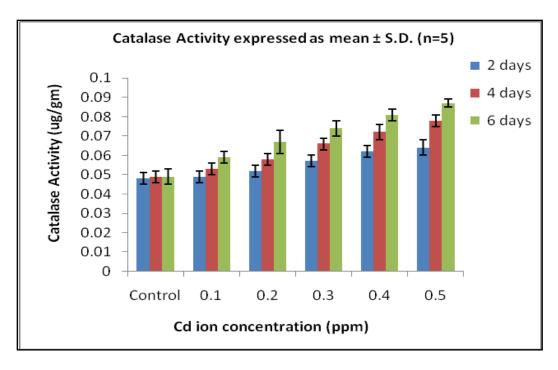


Figure 36: Catalase Activity of *L. polyrhiza* L. at different concentration of Cd metal ion

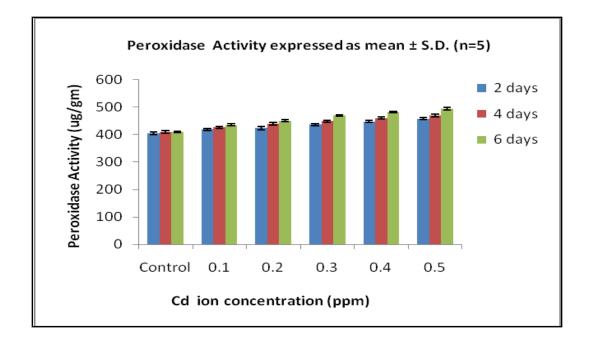


Figure 37: Peroxidase Activity of *L. polyrhiza* L. at different concentration of Cd metal ion

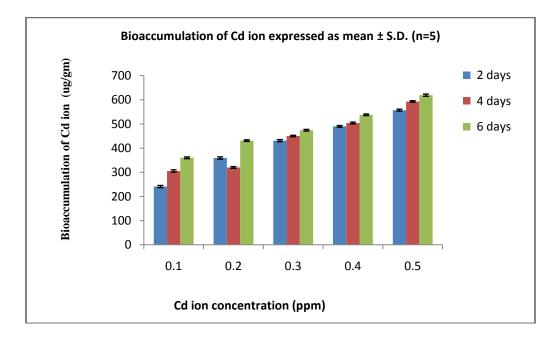


Figure 38: Bioaccumulation of Cd ion of *L. polyrhiza L.* at different concentration of Cd metal ion

# **Total Chlorophylls Contents**

The results of effect of Cd metal ion concentration on total chlorophyll content of *Lemna polyrrhiza* L. is represented in Fig. 32. The chlorophyll content showed gradual decline as the treatment period and the metal ion concentration increased. The prolonged exposure of 6 days to high concentration of Cd i.e. 0.5 ppm significantly reduced (45%) chlorophyll than the control. A significance difference were observed when chlorophyll content of control plant were compared with various treatment period (P = 0.001 < 0.05) followed by paired t test. A significant difference were not obtained when similar results followed by chi square test (P=0.85 > 0.05)

# **Total Carbohydrates Contents**

Figure 33 shows the effect of Cd ion on carbohydrate content of *L. polyrhiza L.* that total carbohydrate content decrease as concentration of Cd ion increased. A negative correlation was recorded with the increased metal ion concentrations and the treatment period.



A significant difference was observed when carbohydrate content of the treated plants were compared with control on  $2^{rd}$  day (P = 0.017<0.05). In addition to that we found significant difference when carbohydrate content of 4 <sup>th</sup> day (P= 0.002< 0.05) and 6<sup>th</sup> day (P= 0.006> 0.05) treated plants were compared with control followed by paired t test. Additionally, in chi square test, we did not find significant results (P= 0.57 > 0.05).

# **Protein Content**

All the experimental concentrations shows decline in protein content as the period of treatment increased from 2 to 6 days and with increased Cd ion concentrations in all the treatment periods (Figure 34). Protein showed 20% decline when the plants were treated with 0.5 ppm Cd ions following exposure of 6 days. We obtained significant difference when protein content of  $6^{th}$   $5^{th}$  and  $7^{th}$  day (P= 0.00 < 0.05) treatment plant when compared with control followed by paired t test. Furthermore, in chi square test, no significant results were obtained (P= 1.0> 0.05).

#### **Proline Content**

The effect of Cd ion on Proline content of the *L. poyrhiza L.* is represented in Figure 35 A concentration dependent rise in the level of proline was observed during all experimental exposure period. But negative correlation was found between the period of exposure and level of proline content. There is significant difference between proline content of the treated and control plants and treatment periods (3,5 and 7 days) (P = 0.00 < 0.05). While in chi square test, there is no significant results were obtained (P=1.0 > 0.05).

# **Catalase and peroxidase Activity**

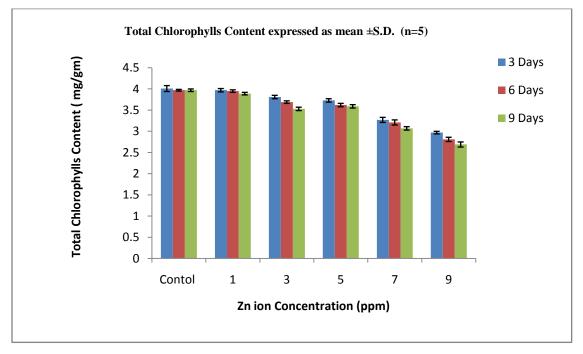
The results depicted that the activity of both catalase and peroxidase were sigificantly higher in treated plants in comparison with the control plants. (Figure 36 and 37) Greater activities of catalase and guaicol peroxidase indicated that the treated plant were under oxidative stress.



In the present investigation it was reported that activities of catalase enhanced linearly with increased metal ion concentration whereas the activity of guaicol peroxidase showed increase with metal ion concentration at 3 day of exposure period. Thereafter it decreased at 5 and 7 day exposure periods. We found significant difference when catalase activity of the treated (exposed in 3,5 and 7 days) were compared with control (P = 0.00 < 0.05) and peroxidase activity (P = 0.00 < 0.05) followed by paired t test. Furthermore, in chi square test, there is no significant results were obtained (P = 1.00 > 0.05) for catalase activity Peroxidase activity.

# **Bioaccumulation of Cd Metal**

Bioaccumulation of cd ion in the test plants at different concentration is as shown in Figure 38. Exposure to 0.1 to 0.5 ppm increased the accumulation of metal ion in all the experimental exposure periods. There is significant difference between Ni metal uptake of the test plants when compared with control on 2, 4 and 6 days (P = 0.03 < 0.05) followed by paired t test. Furthermore, in chi test, there is no significant results were obtained (P = 1.00 > 0.05).



4.5.1 Effect of Zn ion on biochemical parameters of L. triscula L.



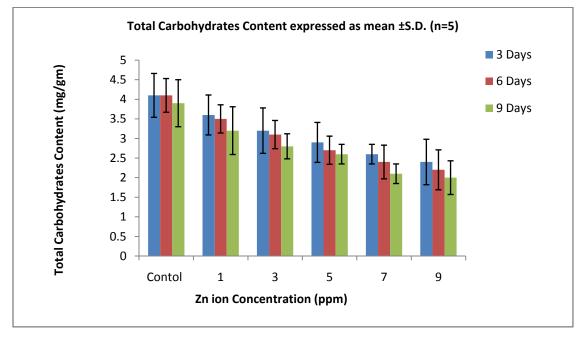


Figure 40: Total Carbohydrate content of L. triscula L. at different concentration of Zn metal ion

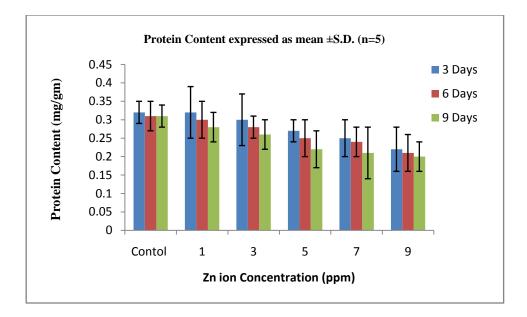


Figure 41 : Protein content of *L. triscula* L. *at* different concentration of Zn metal ion

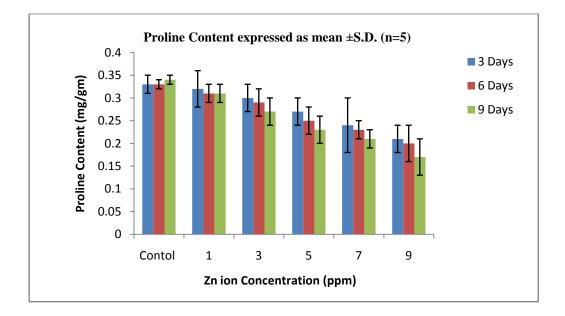


Figure 42: Proline content of L. triscula L. at different concentration of Zn metal ion

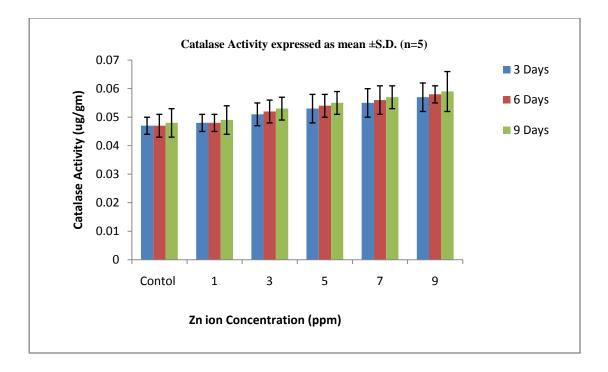


Figure 43 : Catalase activity of L.triscula L. at different concentration of Zn metal ion

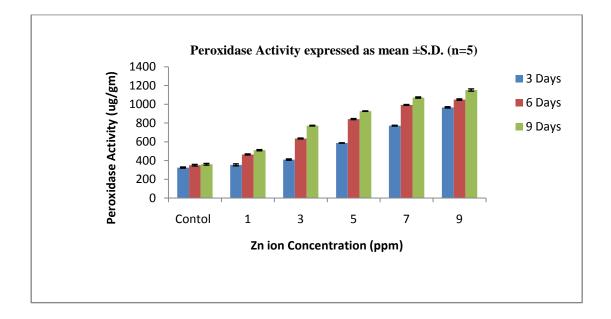


Figure 44 : Peroxidase activity of L. triscula L. at different concentration of Zn metal ion

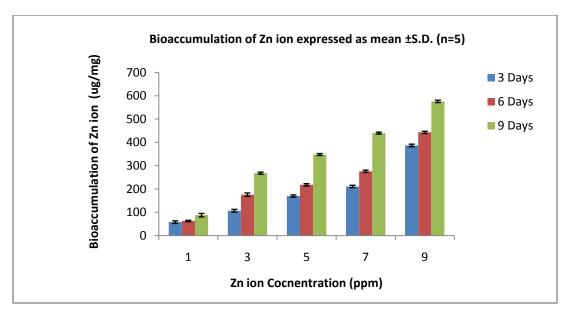


Figure 45: Zn ion uptake of *L. triscula* L. at different concentration of Cd metal ion

# **Chlorophyll Content**

The results of effect of Zn metal ion concentration on total chlorophyll content of *L. triscula L.* is represented in Figure 39. It was observed that the chlorophyll content showed decline as the treatment period and the metal ion concentration increased. The prolonged exposure of 9 days to high concentration of Zn i.e. 9 ppm significantly reduced (50%) chlorophyll than the control. Significant difference was observed and results of chlorophyll results were compared with control on  $3^{rd}$  (P = 0.007<0.05),  $6^{th}$  and  $9^{th}$  (P = 0.009< 0.05) treatment period followed by paired t test. No significant results were obtained (P = 1.0 > 0.05) when chi square test was performed.

# **Total Carbohydrates Content**

Data presented in Figure 40 revealed that total carbohydrate content decreased as the metal concentration and treatment period increased. A negative correlation was recorded with the increased metal ion concentrations and the treatment period. Significant difference was observed when carbohydrate content of the treated plants were compared with control on  $3^{rd}$  day and  $6^{th}$  day (P = 0.001 > 0.05).

In addition to that we found significant difference when carbohydrate content of  $9^{\text{th}}$  day (P= 0.002< 0.05) when treated plants were compared with control followed by paired t test. Additionally, in chi square test, we did not find significant results (P= 1.0 > 0.05).

# **Protein Content**

All the experimental concentrations gradually declined protein content as the period of treatment increased from 3 to 9 days (Figure 41). It also decreased with increased metal ion concentrations in all the treatment periods. Protein showed 62% reduction when the plants were treated with 9 ppm Zn ions following exposure of 9 days. Significant difference was observed when Protein content of the treated plants were compared with control on  $3^{rd}$  day (P = 0.00 < 0.05). We obtained significant difference when protein content of  $6^{th}$  day (P = 0.01 < 0.05) and  $9^{th}$  day (P = 0.007 < 0.05)treatment plant when compared with control followed by paired t test. Furthermore, in chi square test, no significant results were obtained (P=1.0 > 0.05).

# **Proline Content**

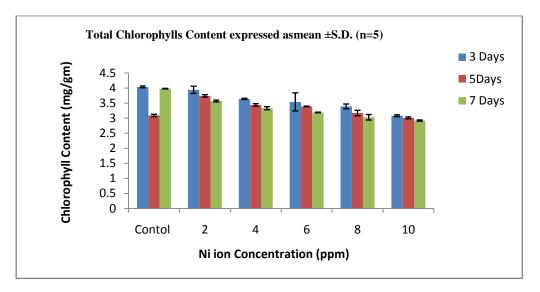
The effect of Zn ion on Proline content of the *L. triscula* L. is represented in Figure 42. A concentration dependent rise in the level of proline was observed during all experimental exposure period. But negative correlation was found between the period of exposure and level of proline content. There is significant difference between proline content of the treated and control plants on  $3^{rd}$  day,  $6^{th}$  day, and  $9^{th}$  day treatment period (P = 0.00< 0.05) were compared with control followed by paired t test. Furthermore, in chi square test, there is no significant results were obtained (P = 0.95 > 0.05).

# **Catalase and peroxidase Activity**

As per results obtained, the activity of both catalase and peroxidase were significantly higher in treated plants in comparison with the control plants. (Fig. 43 and 44) Greater activities of catalase and guaicol peroxidase indicated that the treated plant were under oxidative stress. In the present investigation it was reported that activities of catalase and guaicol peroxidase enhanced linearly with increased metal ion concentration with increase exposure periods. We found significant difference when catalase activity and peroxidase activity of the treated (exposed in 3,6 and 9 days) were compared with control followed by paired t test (P = 0.00 < 0.05). Furthermore, in chi square test, there is no significant results were obtained for catalase activity and for Peroxidase activity (P=1.0 > 0.05).

# **Bioaccumulation of Zn ion**

Bioaccumulation of Zn ion in the test plants at different concentrations is as shown in Figure 45. Exposure to 1 and 3 ppm increased the accumulation of metal ion in all the experimental exposure periods. The concentration beyond 3 ppm i.e. 5,7 and 9 decreased the uptake at 3 day exposure. Also, no further rise in the uptake were reported at 6 and 9 days in test concentrations. There is significant difference between Zn metal uptake of the test plants were compared with control on  $3^{rd}$  day (P = 0.012 < 0.05). We obtained significant difference when protein content of  $6^{th}$  day (P = 0.06 < 0.05) and  $9^{th}$  day (P = 0.001 < 0.05)treatment plant when compared with control followed by paired t test. Furthermore, in chi test, there is no significant results were obtained (P = 1.00 > 0.05).



4.5.5 Effect of Ni ion on biochemical parameters of L. triscula L.

Figure 46 : Total Chlorophylls Content of *L.triscula* L. at different concentration of Ni metal ion

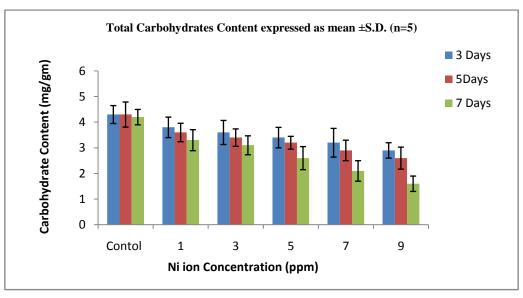


Figure 47 : Carbohydrate Content of *L.triscula* L. at diffenernt concentration of Ni metal ion

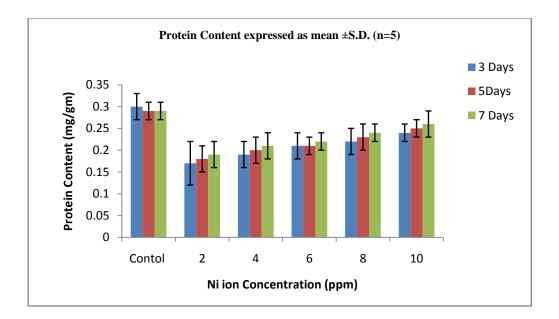


Figure 48: Protein Content of L.triscula L. at different concentration of Ni metal ion

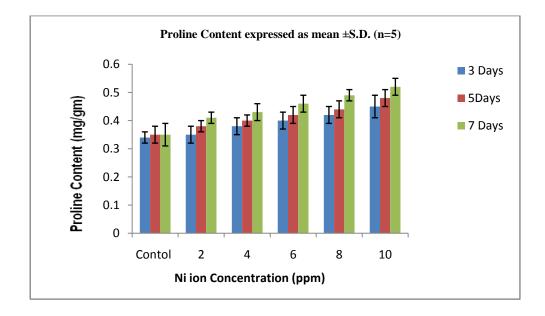


Figure 49: Proline Content of L.triscula L. at different concentration of Ni metal ion

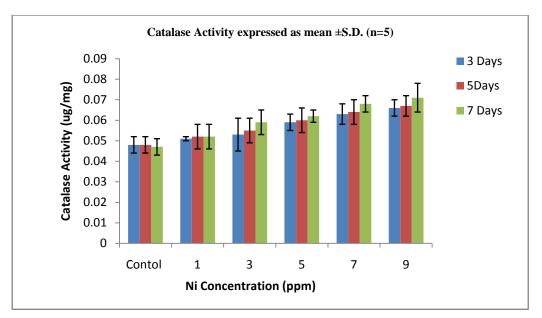


Figure 50 : Catalase Activity of L.triscula L. at different concentration of Ni metal ion

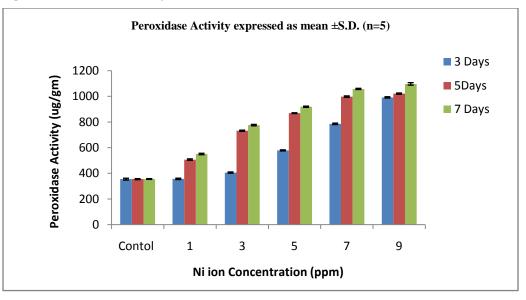


Figure 51 : Peroxidase Activity of L.triscula L. at different concentration of Ni metal ion

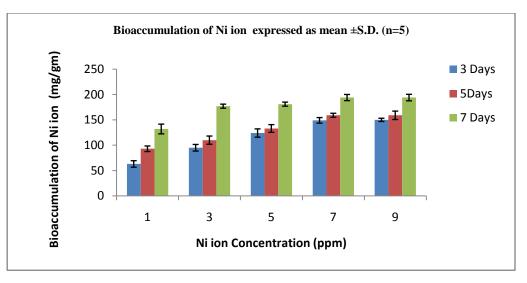


Figure 52 : Bioaccumulation of Ni ion of *L.triscula* L. at different concentration of Ni metal ion

#### **Chlorophyll Content**

The results of effect of Ni ion concentration on total chlorophyll content of *L. triscula* L. is represented in Figure 46. It was observed that as the concentration of the Ni ion increased from 2 ppm to 10 ppm, total chlorophyll content decreased gradually. The prolonged exposure of 7 days to high concentration of Ni i.e. 5 ppm significantly reduced (40%) chlorophyll than the control. Significant difference was observed and results of chlorophyll results were compared with control on  $3^{rd}$  and  $6^{th}$  day (P = 0.03 < 0.05) and 9th (P = 0.10< 0.05) treatment period followed by paired t test. No significant results were obtained (P = 0.1 > 0.05) when chi square test was performed.

#### **Total Carbohydrates Content**

Figure 47 shows the effect of Ni ion on carbohydrate content of *L. triscula* L. It is evident that total carbohydrate content decreased (37.2%) as concentration of Ni ion increased. A negative correlation was recorded with the increased metal ion concentrations and the treatment period. Significant difference was observed when carbohydrate content of the treated plants were compared with control on treatment period i.e. 3 and 5 days (P = 0.000 > 0.05) and 7 days (P= 0.001 < 0.05) followed by paired t test. Additionally, in chi square test, we did not find significant results (P= 1.00 > 0.05).



#### **Protein Content**

All the experimental concentrations showed decreased in protein content as the period of treatment increased from 3 to 7 days and with increased Ni ion concentrations in all the treatment periods (Figure 48). Protein showed increased when the plants were treated with 9 ppm Ni ions following exposure of 7 days. We obtained significant difference when protein content of  $3^{th} 5^{th}$  and  $7^{th}$  day ( P= 0.00 < 0.05) treated plant as compared to control followed by paired t test. Furthermore, in chi square test, no significant results were obtained ( P= 1.0> 0.05).

#### **Proline Content**

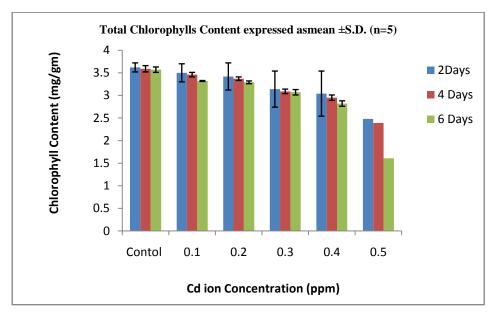
The effect of Ni ion on Proline content of the *L. triscula* L. is represented in Figure 49. A concentration dependent rise in the level of proline was observed during all experimental exposure period. But a negative correlation was found between the period of exposure and level of proline content. There is significant difference between proline content of the treated and control plants and treatment periods (3,5 and 7 days) (P = 0.00 < 0.05). While in chi square test, there is no significant results were obtained (P=1.0 > 0.05).

#### **Catalase and Peroxidase activity**

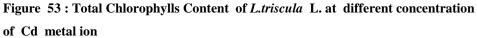
As per results obtained the activity of both catalase and peroxidase were significantly higher in treated plants in comparison to the control plants. (Fig. 50 and 41) enhanced activities of catalase and guaicol peroxidase indicated that the treated plant were under oxidative stress. In the present investigation, it was reported that activities of catalase enhanced linearly with increased metal ion concentration whereas the activity of guaicol peroxidase showed rise with metal ion concentration at 3 day, 5 and 7 day exposure periods. We found significant difference when catalase activity of the treated (exposed in 3,5 and 7 days) were compared with control (P = 0.01 < 0.05) and peroxidase activity (P = 0.005 < 0.05) followed by paired t test. Furthermore, in chi square test, there is no significant results were obtained (P = 1.00 > 0.05) for catalase activity Peroxidase activity.

## **Bioaccumulation of Ni ion**

Bioaccumulation of Ni ion in the test plants at different concentration is as shown in Figure 52. Exposure to 2 to 10 ppm metal ion concentration increased the accumulation of metal ion in all the experimental exposure periods. There is significant difference between Ni metal uptake of the test plants were compared with control on 3, 5 and 7 days (P = 0.007 < 0.05) followed by paired t test. Furthermore, in chi test, there is no significant results were obtained (P = 1.00 > 0.05).



## 4.5.6 Effect of Cd ion on biochemical parameters of L.triscula L.



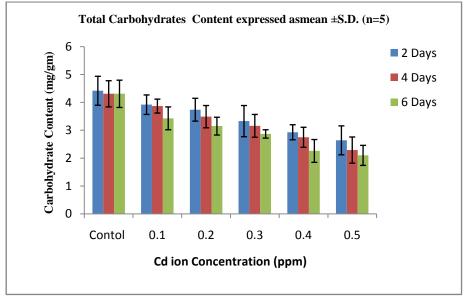


Figure 54 : Total Carbohydrates Content of *L.triscula* L. at different concentration of Cd metal ion

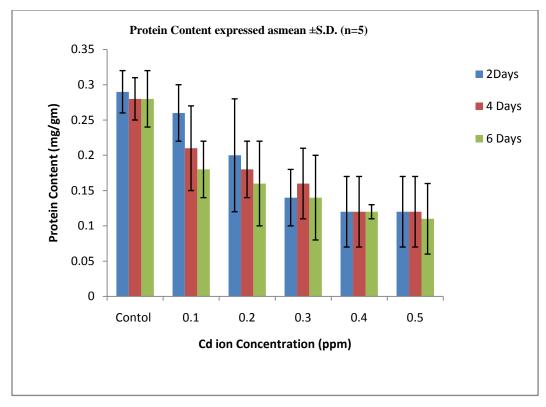


Figure 55: Protein Content of L.triscula L. at different concentration of Cd metal ion

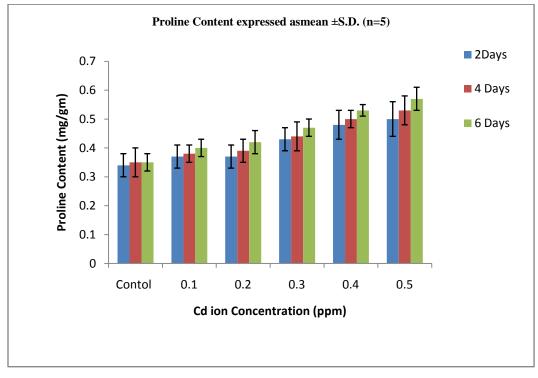
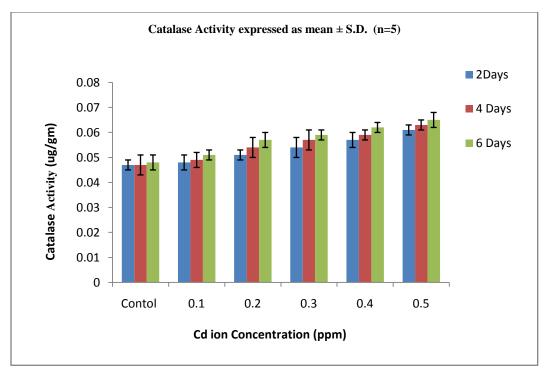
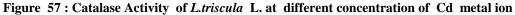


Figure 56: Proline Content of L.triscula L. at diffenernt concentration of Cd metal ion





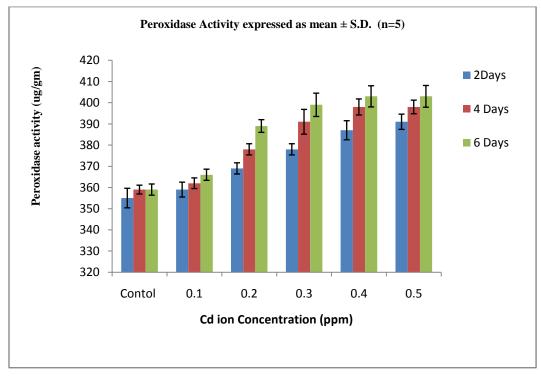


Figure 58 : Peroxidase Activity of L.triscula L. at diffenernt concentration of Cd metal ion

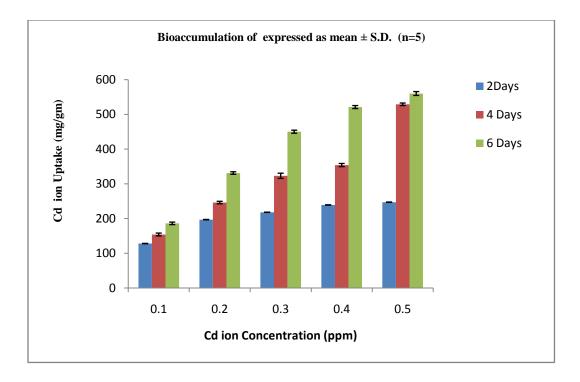


Figure 59 : Cd ion Uptake of L.triscula L. at diffenernt concentration of Cd metal ion

### **Total Chlorophylls Content**

The results of effect of Cd metal ion concentration on total chlorophyll content of *Lemna triscula* L. is represented in Fig. 53. The chlorophyll content showed gradual decline as the treatment period and the metal ion concentration increased. The prolonged exposure of 6 days to high concentration of Cd i.e. 0.5 ppm significantly reduced (55%) chlorophyll than the control. No significance difference were observed when chlorophyll content of control plant were compared with various treatment period (P = 0.5 < 0.05) followed by paired t test. A significant difference were not obtained when similar results followed by chi square test (P= 1.0 > 0.05)

#### **Total Carbohydrates Content**

Figure 54 shows the effect of Cd ion on carbohydrate content of *L. triscula L.* that total carbohydrate content decreased as concentration of Cd ion increased. A negative correlation was found with the increased metal ion concentrations and the treatment period. 4 <sup>th</sup> day and 6<sup>th</sup> day treated plants were compared with control followed by paired t test( P= 0.00> 0.05). Additionally, in chi square test, we did not find significant results (P= 1.00 > 0.05).

#### **Protein Content**

All the experimental concentrations shows decline in protein content as the period of treatment increased from 2 to 6 days and also with increased Cd ion concentrations in all the treatment periods (Figure 55). Protein showed 20% decline when the plants were treated with 0.5 ppm Cd ions following exposure of 6 days. We obtained significant difference when protein content of  $2^{\text{th}}$   $4^{\text{th}}$  and  $6^{\text{th}}$  day ( P= 0.03 < 0.05) treatment plant when compared with control followed by paired t test. Furthermore, in chi square test, no significant results were obtained ( P= 1.0> 0.05).

## **Proline Content**

The effect of Cd ion on Proline content of the *L. triscula* L. is represented in Figure 56. A concentration dependent rise in the level of proline was observed during all experimental exposure period. But negative correlation was found between the period of exposure and level of proline content. There is significant difference between proline content of the treated and control plants and treatment periods (2,4 and 6 days) (P = 0.001 < 0.05). While in chi square test, there is no significant results were obtained (P=1.0 >0.05).

#### **Catalase and peroxidase Activity**

The results depicted that the activity of both catalase and peroxidase were significantly igher in treated plants in comparison with the control plants. (Figure 57 and 58) Greater activities of catalase and guaicol peroxidase indicated that the treated plant were under oxidative stress. In the present investigation it was reported that activities of catalase enhanced linearly with increased metal ion concentration whereas the activity of guaicol peroxidase showed increase with metal ion concentration at 2,4 and 6 days of exposure period. We found significant difference when catalase activity of the treated (exposed in 2,4 and 6 days ) were compared with control (P = 0.00 < 0.05) and peroxidase activity (P = 0.002 < 0.05) followed by paired t test. Furthermore, in chi square test, there is no significant results were obtained (P = 1.00 > 0.05) for catalase activity Peroxidase activity.



#### Cd Metal Uptake Experiment

Bioaccumulation of cd ion in the test plants at different concentration is as shown in Figure 59. Exposure to 0.1 to 0.5 ppm increased the accumulation of metal ion in all the experimental exposure periods. There is significant difference between Cd metal uptake of the test plants when compared with control on 2, 4 and 6 days (P = 0.05 = 0.05) followed by paired t test. Furthermore, in chi test, there is no significant results were obtained (P=1.00 > 0.05).

## 4.6 Effect of metals on plant anatomical structure

## 4.6.1 Light Microscopic study

The control samples showed mesophyll cells full of chloroplasts (Figure A) and uniformly distributed and intact thick outer epidermis (Figure B). The cells have retained their original shape and size as well as intercellular spaces. Whereas 0.5 ppm Cd treated plants showed gradual loss in chlorophyll pigment, disturbance in the arrangement of mesophyll cell (Figure C) and disorganization in epidermal layer. (Figure D).

Anatomical observation revealed that the Cd treated plants showed significant changes in the normal structure with an increase in the metal ion concentration. The highest Cd ion concentration i.e. 0.5 ppm caused more pronounced alterations in normal structure after treatment.

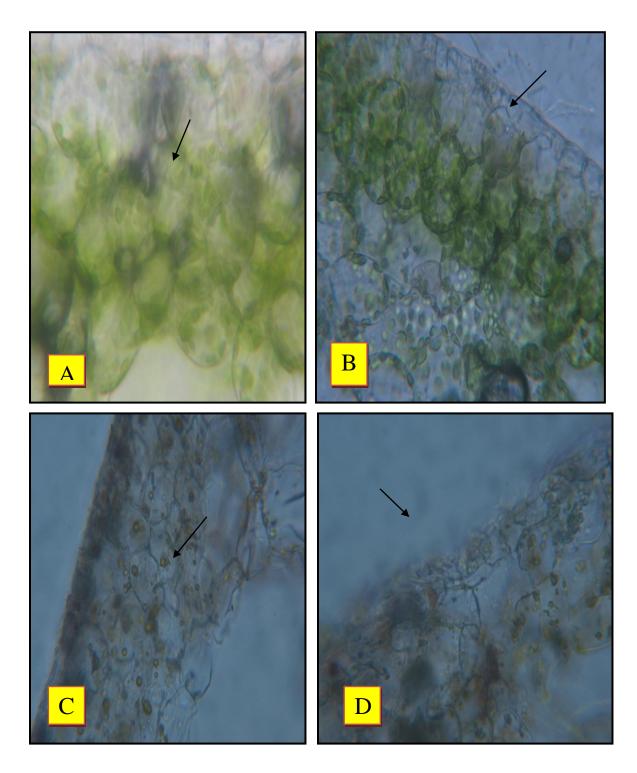


PLATE 54

Bioaccumulation of Cd ion in 3 days treated plants at different concentration is shown in Figure A. The Cadmium treated plants showed gradual changes in the structure with an increase in metal concentration compared to the control group. On examination, of control plants of *Lemna triscula* L revealed that uniformly distributed radially narrow epidermal cells (Figure A), well organized cells of cortical layer with compactly arranged parenchyma cell interrupted by arenchyma cells (Figure C). At the central cylinder was a vasculature (Figure C).

*Lemna triscula* L growing in excess of Zinc ion exhibits anatomically number of differences compared to the control leaf. Zinc treated leaf showed disruption in arrangement of epidermal cells (Figure D) and cortical cells (aerenchyma) being disintegrated forming dark zone (cavity), Figure E. Most significant feature was the change in structure of vascular system which revealed expansion in the xylem and phloem tissues (Figure F).

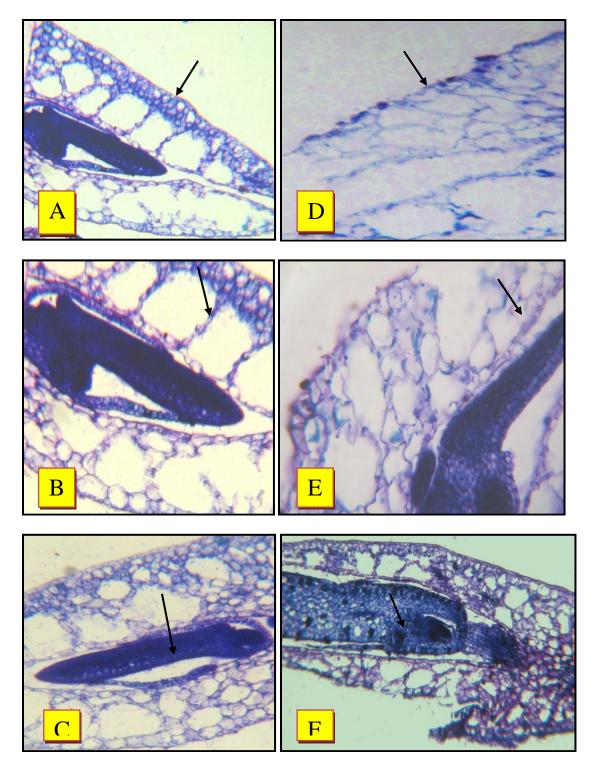
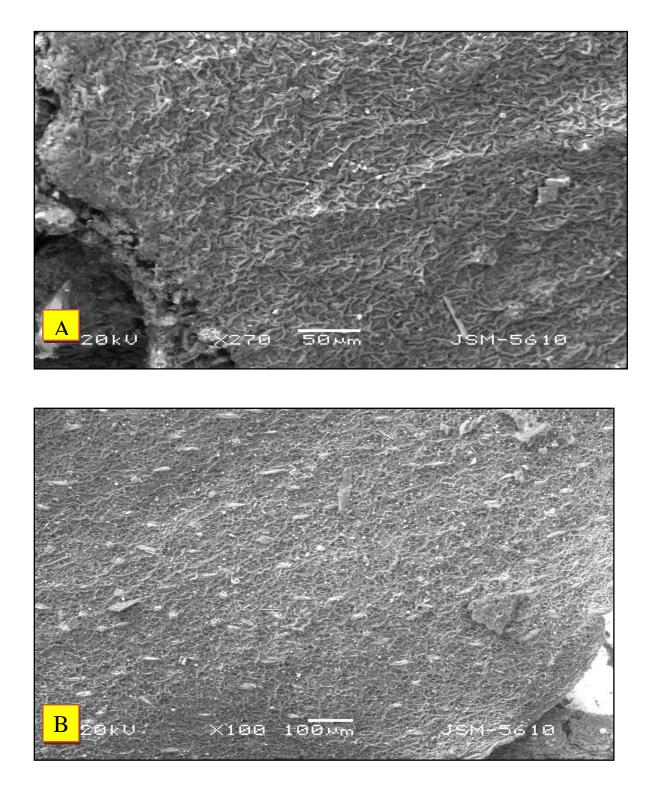
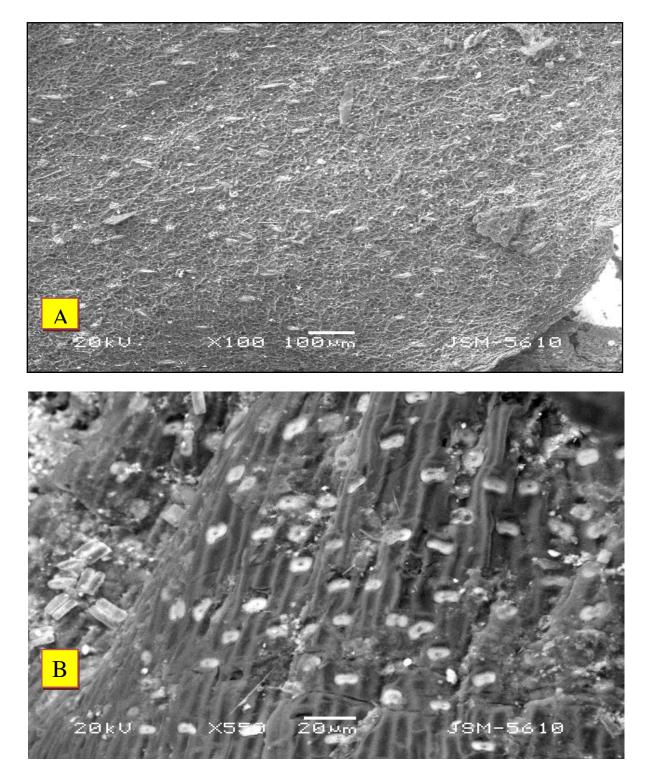


PLATE 55

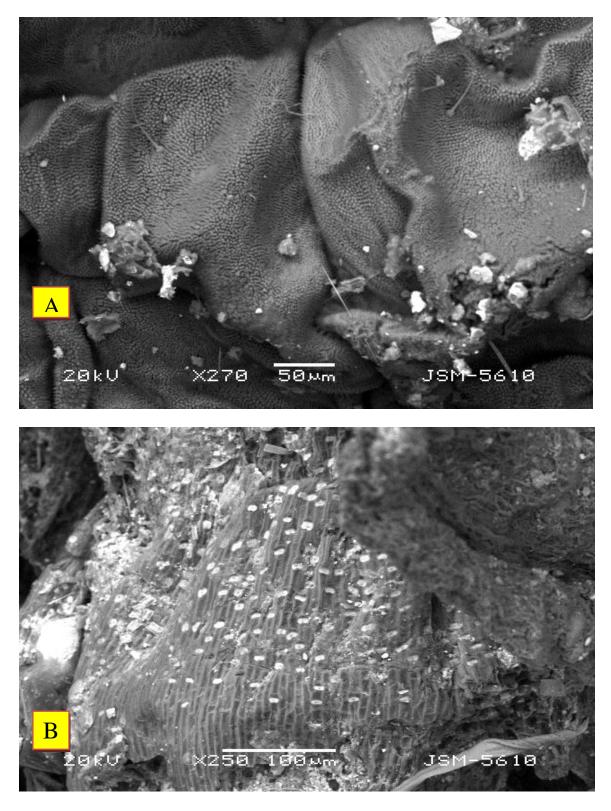
# 4.6.2 Scanning Electron Microscopy



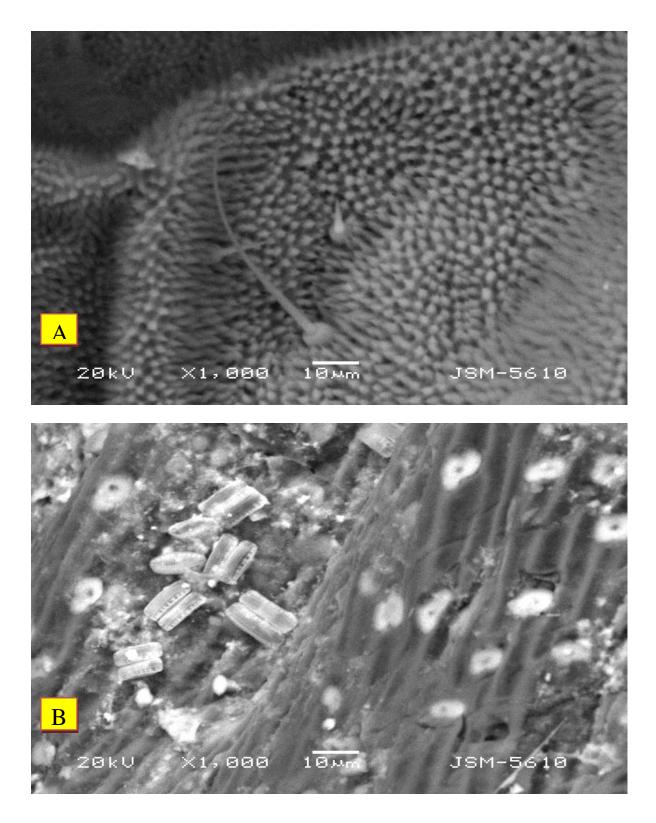
# **PLATE 56**



**PLATE 57** 



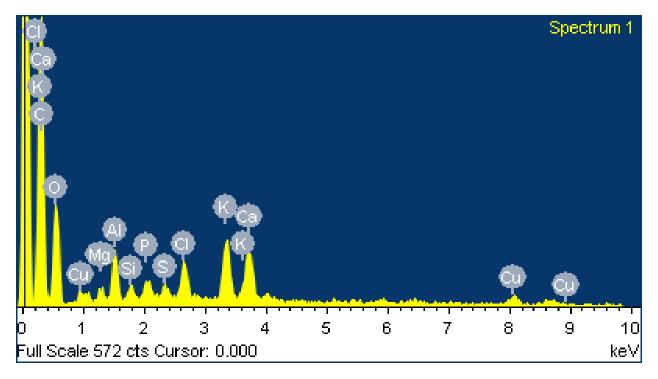
**PLATE 58** 



**PLATE 59** 

# SEM EDX Analysis:

SEM Micrograph of L. polyrhiza L.





Elemen	Weight	Atomic
t	%	%
C K	56.72	67.36
O K	31.49	28.08
Mg K	0.52	0.31
Al K	1.55	0.82
Si K	0.39	0.20
РК	0.65	0.30
S K	0.34	0.15
Cl K	1.43	0.58
ΚK	2.64	0.96
Ca K	2.29	0.81
Cu K	1.99	0.45
Totals	100.00	

1mm

Electron Image 1

# **Treated Plant**

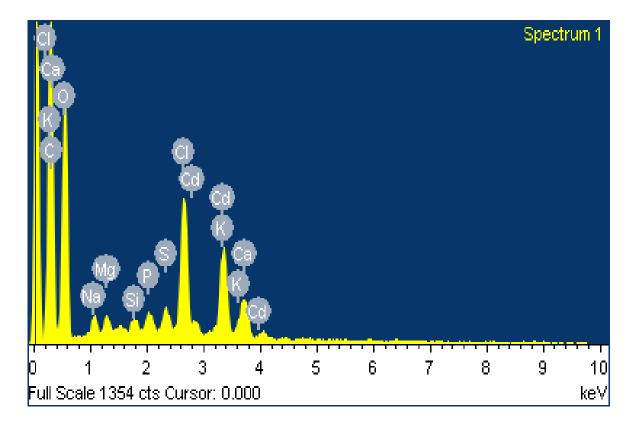


Figure 61: EDX of Control L. polyrhiza L.

Spectrum 1	
400µm	Electron Image 1

Elemen	Weight	Atomic
t	%	%
СК	50.50	60.28
O K	39.87	35.74
Na K	0.70	0.44
Mg K	0.45	0.27
Si K	0.31	0.16
РK	0.45	0.21
S K	0.50	0.22
Cl K	3.24	1.31
ΚK	2.43	0.89
Ca K	1.24	0.44
Cd L	0.30	0.04
Totals	100.00	

#### **CHAPTER IV : RESULTS**

#### **SEM EDX Analysis:**

In the present research, SEM analysis was conducted to observe the surface morphology of *L. polyrrhiza* L. plant powder before and after biosorption of Cadmium ion. SEM analysis reveals the variation in the ultrastructure of control and 'Cd' treated cells of *L. polyrhiza* L. The surface seemed to be complex and heterogenous. It was observed that after biosorption of the metal surface morphology has got changed and agglomeration of particles were observed.

An observation of the SEM micrographs of *L. polyrhiza L.* in the absence of Cd ion reveals that plant displayed dense and porous surface texture (Plates 56,57,58,59 A).

When *L.polyrhhiza* L. treated with 0.5 ppm solution of Cd ion, many anatomical disorganization occurs. Ultrastructural study indicates the presence of many pores, which did not have regular, fixed shape. The porous nature of the adsorbent for the biosorption of metal ions. The surface morphology of pure leaf signnificantly changed on loading with Cd. It is clear from SEM images that leaf have rough surface morphology, which possesses possibility for more adsorption of Cd ion. In treated SEM micrograph shiny and white surface morphology indicates the Cd metal ion adsorbed at the surface of leaves. The SEM images with magnifying 1000 shows that *L. polyrhiza* L. have good possibilities as biosorbent.After the biosorption process, the SEM image of *L. polyrhiza* L. leaves revealed the combination of small and particles size which was suggested that to be an appropriate structure for metal ion concentration. The observed crystalline depositions on the cell surface may be sequestered by specific molecules like metallothioneins (Plates 56,57,58,59 B).

The difference in surface morphology of control and treated plant were clearely observed It is clear that Sublethal concentrations of cd ion caused alterations in surface structure. Such ultrastructural aberrations occurring in *L.polyrhhiza L.* exposed to Cd, at the cell level might be due to alterations caused by Cd metal ion. The observed crystalline depositions are of metals sequestered by specific molecules like metallothioneins.

EDX analysis was performed to determine the elemental composition of the biosorbents before and after the Cd ion adsorption.

The quantitative analysis using EDX of control plant showed that carbon and oxygen are the major constituents that is 56.72 % and 31.49 % respectively. The spectrum also showed the presence of magnesium 0.52 %, aluminium 1.55%, silicon 0.39%, phosphorous 0.65%, sulphur 0.34, chlorine 1.43%, potassium 2.64%, calcium 2.29%, copper 1.99%. Cd ion not found in control plant. All the metal clearly shows peak while Cd ion peak not occur in control plant.

The quantitative analysis using EDX of treated plant showed that carbon and oxygen are the major constituents that is 50.50 % and 39.87 % respectively in the biosorbents. The spectrum also showed the presence of magnesium 0.45 %, Aluminium1.55%, Silicon 0.31%, Phosphorous 0.45%, Sulphur 0.50, chlorine 3.24%, Potassium 2.43%, Calcium 1.24%, Copper 1.99%. Cadmium ion with concentration of 0.30 % found. This indicate that treated plant absorbed cd ion. This again confirmed by peak of Cd ion.

In addition to that percentage shows that constituent of Carbon, Phosphorous, Sulphur, Chlorine concentrations increased while Oxygen, Silicon, Calcium concentration decreased. So, this results reveals that absorption of Cd ion also effects the absorption of other metal ions.