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Floristic account of Aquatic and Wetland Angiosperms of Sabarkantha, District Gujarat

[1] NB Patel, [2] KB Patel

Botany Department, Smt. S. M. Panchal Science College, Talod-383215, India.

Abstract
The present study is an account of investigation on the results of the taxonomic research work carried out during 2010-2014 in aquatic habitats of Sabarkantha district, Gujarat, India. During the survey, floristic account of emergent-aquatic and marshland angiosperms documented and illustrated.

Keywords: Sabarkantha, Aquatic and Wetland Angiosperms, Gujarat.

1. Introduction
The hydrosphere of the earth is composed of all water bodies' viz., oceans, rivers, ponds, lakes, ditches, streams etc. Aquatic bodies are natural water resources. Due to rapid industrialization, urbanization and rapid population growth of the water bodies are polluted. It has disturbed the growth of flora and fauna. Works on floristic study of composition of hydrophytes in different water reservoirs in different parts of India were carried out by several workers like Cook (1996) [3], Agharkar (1923) [1], Dutta *et al.* (2002) [6], Ghosai *et al.* (1993) [7], Subrahmanyam (1962) [10] has described 117 aquatic plants. Lavania *et al.* (1993) [8] has compiled the wetland flora of India. In India the first comprehensive work on the wetland flora was produced by Biswas and Calder (1984) [2]. The present study is meant to preapare the checklist of aquatic and wetland angiosperms of Sabarkantha, district, is the first exploration of the kind in area.

Materials and methods
Study area
The district Sabarkantha is situated in the north-eastern part of Gujarat State between 23.03º-24.30º N latitudes, and 72.43º-73.39º E longitudes.

Floristic survey
An extensive floristic survey was conducted during 2010-2014. The plants specimens were collected at the different reproductive stages to prepare herbarium specimens and authenticate their correct identify. The collected specimens were identified taxonomically with the help of available monographs, taxonomic revisions and floras (Shah, 1978, Cooke, 1901-1908, Cooke, 1967) [9, 5, 4]. Collected specimens were cross checked for correct identification at the Herbarium centre of Gujarat College, Ahmedabad and S.P. University Vallabh Vidyanagar, Gujarat, India.

Results and Discussion
During the study 74 species and 54 genera belonging to 27 families were recorded from the Sabarkantha district (Table 1). In this survey 74 species of angiosperms belonging to 27 families and 54 genera were documented. Dominant families were Cyperaceae with 13 species followed by Poaceae (8), Scrophulariaceae (8), Asteraceae (5), Boraginaceae (4), Commelinaceae (4), four families were represented by 3 species, 3 families were represented by two species each, whereas fourteen families were monospecific. Families with maximum number of species and genera were given in Table 2.

Table 1: List of aquatic and wetland angiosperms from Sabarkantha district, Gujarat.

No.	Scientific name	Family	Local name
1	*Ranunculus sceleratus* L.	Ranunculaceae	*Jal dhana*
2	*Nelumbo nucifera* Gaertn.	Nymphaeaceae	*Kamal*
3	*Nymphaea nouchali* Burm.f.	Nymphaeaceae	*Poyana*
4	*Nymphaea stellata* Willd.	Nymphaeaceae	*Poyana*
5	*Bergia ammannioides* Roxb.	Elatinaceae	*Jalokhrad*
6	*Aeschynomene indica* L.	Papilionaceae	*Todhen*
7	*Sesbania bispinosa* (Jacq.) W.F.Wight	Papilionaceae	*Ikad*
8	*Ammannia baccifera* L.	Lythraceae	*Jal Agio*
9	*Ammania multiflora* Roxb.	Lythraceae	*Zino Agio*
10	*Rotala serpyllifolia* (Roth.) Bremek.	Lythraceae	*Lal agia ni jat nu*
11	*Ludwigia octovalvis* ssp. *sessiliflora* (Mich.) Raven	Onagraceae	*Panlavang*
12	*Oldenlandia corymbosa* L.	Rubiaceae	*Pitpapado*
13	*Caesulia axillaris* Roxb.	Asteraceae	
14	*Cyathocline purpurea* (D. Don.) O. Ktze.	Asteraceae	*Okharad*
15	*Eclipta prostrata* (L.) L. Mant.	Asteraceae	*Bhangro*
16	*Grangea maderaspatana* (L.) Poir.	Asteraceae	*Zinki Mundi*
17	*Sphaeranthus indicus* L.	Asteraceae	*Gorakhmundi*
18	*Nymphoides cristata* (Kuntze.) Kuntze	Gentianaceae	*Poyana*
19	*Coldenia procumbens* L.	Boraginaceae	*Okhrad*

20	*Heliotropium indicum* L.	Boraginaceae	*Hathi sundhi*
21	*Heliotropium ovalifolium* Forsk.	Boraginaceae	*Hathi sundhi*
22	*Heliotropium supinum* L.	Boraginaceae	*Hathi sundhi*
23	*Ipomea aquatica* Forsk.	Convolvulaceae	*Nali ni Bhaji*
24	*Ipomoea fistulosa* Mart. ex Choisy	Convolvulaceae	
25	*Merremia gangetica* (L.) Cufod.	Convolvulaceae	*Undarkani*
26	*Bacopa monnieri* (L.) Pennell	Scrophulariaceae	*Jalnaveri*
27	*Limnophila indica* (L.) Druce	Scrophulariaceae	*Tarati, Purti*
28	*Lindernia ciliata* (Colsm.) Pennell	Scrophulariaceae	
29	*Lindernia crustacea* (L.) F. Muell.	Scrophulariaceae	
30	*Lindernia oppositifolia* (Retz.) Mukerjee	Scrophulariaceae	
31	*Lindernia parviflora* (Roxb.) Haines	Scrophulariaceae	
32	*Peplidium humifusum*Delile.	Scrophulariaceae	
33	*Veronica anagallis-aquatica* L.	Scrophulariaceae	
34	*Utricularia inflexa* Forsk. *stellaris*(L.f) Taylor	Lentibulariaceae	
35	*Hygrophila auriculata* (Schum.) Heine	Acanthaceae	*Kantasheliyo*
36	*Hygrophila serpyllum* (Nees.) T. Anders.	Acanthaceae	*Sarpat*
37	*Phyla nodiflora* (L.) Greene	Verbenaceae	*Ratvelio*
38	*Alternanthera sessillis* (L.) DC.	Amaranthaceae	
39	*Polygonum barbatum* L. var. *gracile* Steward	Polygonaceae	
40	*Polygonum plebeium* R. Br.	Polygonaceae	
41	*Hydrilla verticillata* (L. f.) Royle	Hydrocharitaceae	*Bam*
42	*Ottelia alismoides* (L.) Pers.	Hydrocharitaceae	
43	*Vallisneria spiralis* L.	Hydrocharitaceae	*Jalsarpolia*
44	*Monochoria vaginalis* (Burm.f.) Presl	Pontederiaceae	
45	*Amischophacelus axillaris* (L.) Rolla & Kammathy	Commelinaceae	
46	*Commelina benghalensis* L.	Commelinaceae	*Motushisamuliyu*
47	*Commelina diffusa* Burm. f.	Commelinaceae	*shisamuliyu*
48	*Murdannia nudiflora* (L.) Brenan	Commelinaceae	
49	*Typha angustata* Bory & Chaub.	Typhaceae	*Ghabajariu*
50	*Colocasia esculenta* (L.) Schott	Araceae	*Jangli Pendaru*
51	*Lemna gibba* L.	Lemnaceae	
52	*Sagittaria sagittifolia* L.	Alismataceae	
53	*Potamogeton crispus* L.	Potamogetonaceae	
54	*Cyperus alopecuroides* Rottb.	Cyperaceae	
55	*Cyperus articulatus* L.	Cyperaceae	
56	*Cyperus compressus* L.	Cyperaceae	
57	*Cyperus difformis* L.	Cyperaceae	
58	*Cyperus exaltatus* Retz. *var. exaltatus*	Cyperaceae	
59	*Cyperus iria* L. *var. iria.*	Cyperaceae	
60	*Cyperus rotundus* L. subsp. *Rotundus*	Cyperaceae	
61	*Cyperus triceps* (Rottb.) Endl.	Cyperaceae	
62	*Eleocharis atropurea* Kunth	Cyperaceae	
63	*Fimbristylis dichotoma* (L.) Vahl var. *dichotoma.*	Cyperaceae	
64	*Fuirena ciliaris* (L.) Roxb.	Cyperaceae	
65	*Scirpus articulatus* L.	Cyperaceae	
66	*Scirpus littoralis* Schrd	Cyperaceae	
67	*Echinochloa colonum* (L.) Link	Poaceae	*Samo*
68	*Echinochloa crusgalli* (L.) P. Beauv.	Poaceae	*Adbau samo*
69	*Eragrostis unioloides* (Retz.) Nees ex Steud.	Poaceae	
70	*Oryza minuta* J. S. Presl.	Poaceae	
71	*Paspalidium flavidum* (Retz.) A. Camus	Poaceae	
72	*Paspalum distichum* L.	Poaceae	
73	*Saccharum spontaneum* L.	Poaceae	*Kans*
74	*Vetiveria zizanioides* (L.) Nash.	Poaceae	*Khus*

Table 2: List of families with number of genera and species

No.	Family	Genera	Species
1	Cyperaceae	5	13
2	Scrophulariaceae	5	8
3	Poaceae	7	8
4	Asteraceae	5	5
5	Boraginaceae	2	4
6	Commelinaceae	3	4
7	Nymphaeaceae	2	3

8	Lythraceae	2	3
9	Convolvulaceae	2	3
10	Hydrocharitaceae	3	3
11	Papilionaceae	2	2
12	Acanthaceae	1	2
13	Polygonaceae	1	2
14	Ranunculaceae	1	1
15	Elatinaceae	1	1
16	Onagraceae	1	1
17	Rubiaceae	1	1
18	Gentianaceae	1	1
19	Lentibulariaceae	1	1
20	Verbenaceae	1	1
21	Amaranthaceae	1	1
22	Pontederiaceae	1	1
23	Typhaceae	1	1
24	Araceae	1	1
25	Lemnaceae	1	1
26	Alismataceae	1	1
27	Potamogetonaceae	1	1

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