Studies on phytosociological approach among hedge plants and climbers from Gujarat

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This paper deals with phytosociological relationships and associations among hedge plants and climbing taxa of Gujarat. The hedge plant species are grown naturally or planted by rurals, tribals and farmers of Gujarat for field fencing. The climbers are grown on hedge plants for getting support. 69 hedge plant species and 96 climbing taxa are enumerated. The data presented here is the result of 5 years consecutive field surveys at different locations in Gujarat.

Key-words—Phytosociology, Hedge plants, Climbers, Gujarat.

INTRODUCTION

THE hedge plants are grown naturally in the forests and waste lands or some of them cultivated by farmers, rural and tribals in fields, along the roadsides and surrounding the homes as live fencing.

The fields are protected by permanent or temporary boundries made with planting plant species in single or double row is known as hedge. The plant species employed as live fence (hedge) have sharp armed structures, large foliage, profuse and short branches and latex or acrid juice may present which prevent entry of human beings and grazing from domestic as well as wild herbivores.

A hedge is a living fence surrounding fields, and houses and also roadsides. For a strong hedge two to three rows of plant species are grown. For securing effective hedge time to time pruning is necessary. In order to make dense hedge annual and perennial climbers should be grown or allowed to grow. There are phytosociological relationships occurring among hedge and climbing plants. The hedge plants provide support to climbers in order to get exposed to sunlight for photosynthesis. While climbers enrich and beautify the hedges by its foliage and flowers. Some parasitic plants cause harm to host hedge plants.

Interactions among plant communities as competitor or struggle for existence is the law of nature. The plants compete with each other to obtain adequate amount of light, water moisture and nutrients. The epiphytes (climbers) are grown on shrubs and trees, but do not obtain nourishment from them. The climbers do not cause appreciable harm to the host plants. They cause shade to host as their foliage hinder light, 2. Their weight may cause young twigs to break and fall off. In some cases their roots may penetrate the barks of host in order to anchor firmly and cause damage which may lead to entry of parasitic bacteria, fungi and insects.

Earlier floristic and economical works were carried out in different regions of Gujarat by Thaker (1910, 1926), Kapadia (1950), Bor & Raizada (1954), Dastur (1956), Santapau (1962), Santapau & Janardhanan (1967), Patel (1971), Shah (1978), Bhandari (1975), Agarwal (1986) and Bole & Pathak (1988). While ecological and phytosociological studies were carried out. Oosting (1950), Odum (1963, 1971), Misra (1968), Daubenmire (1974), Kumar (1997), Bhattacharya (1998) and Bhatt et. al (1999).

MATERIAL AND METHOD

For the floristic studies field trips were arranged at various sites of Gujarat state and data on hedge and climbing plants were recorded in field book. The information regarding hedge and climbing plants was

gathered from farmers and tribal people. The phytosociological studies were carried out by taking random samplings, using belt transect of 1 m x 10 m sizes on selected sites. In the enumeration, botanical name, family, local name and ecological occurrence are mentioned. The plant species are arranged alphabetically (hedge plants in Table 1 and climbing plant in Table 2).

Table 1. Plant species served as hedge

Sr. No.	*Botanical Name*	*Family*	*Local Name*	*Occurrence*
1.	*Abutilon fruticosum* Guill & Perr.	Malvaceae	Khapat	R
2.	*Abutilon indicum* (L.)SW	Malvaceae	Khapat	R
3.	*Acacia farnesians* (L.) Willd.	Mimosaceae	Talbaval	R
4.	*Acacia leucophloea* (Roxb.) Willd	Mimosaceae	Harmobaval	C
5.	*Acacia senegal* (L.) Willd	Mimosaceae	Goradbaval	C
6.	*Acacia sinuata* (Lour.) Merr.	Mimosaceae	Shikakai	VR
7.	**Adhatoda vasica* L.	Acanthaceae	Ardusi	C
8.	*Aegle marmelos* (L.) Corr.	Rutaceae	Bili	VR
9.	*Agave americana* L.	Agavaceae	Ramban	VC
10.	*Alangium salvifolium* (L.) Wang.	Alangiaceae	Ankol	VR
11.	*Anona squamosa L.*	Anonaceae	Sitaphal	R
12.	*Balanites aegyptiaca* (L.) Del.	Balanitaceae	Ingoriyo	VC
13.	**Bougainvillea spectabilis* Willd	Nyctaginaceae	Boganvel	R
14.	*Cedebe fruticosa* (L.) Druce.	Capparaceae	Katkiyo	VR
15.	*Caesalpinia bonducella* Flem.	Caesalpiniaceae	Kachka	C
16.	**Caesalpinia pulcherrima* (L.) SW.	Caesalpiniaceae	Galtoro	R
17.	*Calotropis gigantea* Ait.	Asclepiadaceae	Moto ankado	R
18.	*Calotropis procera* (Willd.) Dry.	Asclepiadaceae	Nano ankdo	C
19.	*Capparis decidua* (Forsk.) Edgew.	Capparaceae	Kerdo	C
20.	*Capparis sepiaria* L.	Capparaceae	Kanther	C
21.	*Carissa congesta* Wt.	Apocynaceae	Karamda	R
22.	*Cassia auriculata* L.	Caesalpiniaceae	Aval	C
23.	*Casuarina equisetifolia* Forst.	Casuarinaceae	Saru	VR
24.	**Clerodendrum inerme* (L.) Gaertn.	Verbenaceae	Kadvi mendi	C
25.	*Clerodendrum multiflorum* (Burnm. f.) O. Ktze.	Verbenanceae	Arani	VR
26.	*Commiphora wightii* (Arn.) Bhandari	Burseraceae	Gugal	VR
27.	*Cordia gharaf* (Forsk) Ehrenb & Asch.	Ehretiaceae	Gundi	R
28.	*Delonix elata* (L.) Gamble.	Caesalpiniaceae	Sandhesaro	C
29.	*Dendrocalamus strictus* (Roxb) Nees.	Poaceae	Vans	R
30.	*Dichrostachis cinerea* (L.) Wt. & Arn.	Mimosaceae	Mordhundhiu	R
31.	*Diospyros cordifolia* Roxb.	Ebenaceae	Dheki	VR
32.	*Dodonaea viscosa* (L.) Jacq.	Sapindaceae	Jakhmi	R
33.	*Duranta repens* L.	Verbenaceae	Damyanti	VRE
34.	*Euphorbia antiquroum* L.	Euphorbiaceae	Tridharo thor	C
35.	*Euphorbia neriifolia* L.	Euphorbiaceae	Vad thor	A
36.	*Euphorbia nivulia* Buch.-Ham.	Euphorbiaceae	Vad thor	VC
37.	*Euphorbia tirucalli* L.	Euphorbiaceae	Kharsani	C
38.	*Flacourtia indica* (Burm.f.) Merr.	Flacourtiaceae	Lodri	VR
39.	*Grewia salvifolia* Heyne ex. Roth.	Tiliaceae	Sisoti	R
40.	*Grewia tenax* (Forsk.) Ash & Schwt.	Tiliaceae	Gangeti	C
41.	*Grewia villosa*	Tiliaceae		R
42.	*Ipomoea fistulosa* Mart. ex. Choisy	Convolvulaceae	Gandivel	C
43.	*Jatropha curcas* L.	Euphorbiaceae	Ratanjot	R
44.	*Jatropha gossypifolia* L.	Euphorbiaceae	Nepalo	VR
45.	*Kirganelia reticulata* (Poir.) Baill.	Euphorbiaceae	Kamboi	C
46.	*Lantana camara* L.	Verbenaceae	Gandhari	C
47.	**Lawsonia alba* Lamk.	Lythraceae	Mendi	C

Sr. No.	Botanical Name	Family	Local Name	Occurrence
48.	*Leucaena latisiliqua* (L.) Gills.	Mimosaceae	Laso baval	C
49.	*Lycium barbarum* L.	Solanaceae	Kakmendi	VR
50.	*Maytenus emarginata* (willd.) D. How.	Celastraceae	Vicklo	VR
51.	*Mimosa harnata* Willd.	Mimosaceae	Kaibaval	VC
52.	*Opuntia elatior* Mill.	Cactaceae	Phaphdotor	C
53.	*Parkinsonia aculeata* L.	Caecalpiniaceae	Rambaval	R
54.	**Pedilanthes tithymaloides(L.)* Poit.	Euphorbiaceae	Vilayati Kharsani	VC
55.	*Pithecellobium dulce (Roxb.)* Benth	Mimosaceae	Gorasamli	R
56.	*Prosopis chilensis* (Molina)stuntz.	Mimosaceae	Gandobaval	A
57.	*Prosopis cineraria* (L.) Druce	Mimosaceae	Khijdo	R
58.	*Salvadora oleoides* Decne	Salvadoraceae	Piludi	VC
59.	*Salvadora persica* L.	Salvadoraceae	Piludi	C
60.	*Securinega leucopyrus* (Willd)Muell.Arg.	Euphorbiaceae	Shinvi	C
61.	*Sesbenia aegyptiaca* Pers.	Fabaceae	Jayanti	C
62.	*Sesbania grandiflora* (L.) Poir	Fabaceae	Agathiyo	VR
63.	**Thevetia peruviana* (Pers.) K. Schum.	Apocynaceae	Pili karen	R
64.	*Triumfetta rotundifolia* Lam	Tiliaceae	Zipto	C
65.	*Vallaris solanacea* (Roth.) O. kuntize	Solanaceae		R
66.	*Vitex negundo* L.	Verbenaceae	Nagod	R
67.	*Zizyphus mauritiana* Lamk.	Rhamnaceae	Bordi	VC
68.	*Zizyphus nummularia* (Burm.f.) W. & A.	Rhamnaceae	Chani bor	A
69.	*Zizyphus oenoplia* (L.) Mill.	Rhamnaceae	Gut bordi	R

A = Abundant, VC = Very common, C = Common, R= = Rare, VR = Very Rare

*Cultivated in gardens

DISCUSSION

In the present work 69 plant species (Table 1) that are employed as hedge, and 96 taxa of climbers, twiners and trailers (Table 2) are enumerated.

Hedges serve as good protection against grazing animals and determine boundries between lands of two adjacent owners. Plant employed as hedge have some characteristics viz. presence of thorns, spines or pricks, dense foliage, presence of acrid juice, latex and stinging hairs which are unpalatable to the herbivores. The hedge plants provide support to climbers, while climbers enrich the hedges by its beautiful foliage and flowers and make thick cover. Sometimes hedges are looking showy due to presence of beautiful climbers. In order to increase firmness of the fences, trees and shrubs are also grown among hedge plants which act as wind breakers.

Apart from plant species as listed in Table 1 & 2, some annual and perennial herbs are also found among hedges and make it dense viz. *Peristrophe bicalyculata* Retz, *Aloe barbadensis* Mill, *Barleria prionitis* L., *Achyranthes aspera* L., *Boerhavia chinensis* (L.) Druce, *Dipteracanthus prostratus* (Poir.) Nees, *Pupalia lappacea* (L.) Juss, *Setaria glauca L., Sida cordata* (Burm. f.) Bors, etc. In the hedges scattered trees and shrubs also occurr such as *Acacia nilotica* (L.) Del., *Azadirachta indica* A. Juss., *Ailanthus excelsa* Roxb. These trees are useful as shades for cattle to both sides of the land.

Some parasitic plant species are also grown on or in hedges viz. *Striga gesneroides* (Willd.), Vatke, *Striga lutea* Lour, *Cassytha filiformis* L., *Cuscuta chinensis* Roxb., *C. reflexa* Roxb., etc. Parasitic climbers are harmful to hedges, however, it is a part of plant diversity. A number of twiners and climbers belonging to the families Asclepiadaceae, Convolvulaceae, Cucurbitaceae, Fabaceae, Menispermaceae, Vitaceae, etc., commonly occur on the hedges. The hedges provide us food, fodder and medicines, besides protection.

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Table 2. Climbers grown on among hedge plants.

Sr. No.	*Botanical Name*	*Family*	*Local Name*	*Occurrence*
1.	*Abrus precatorius* L.	Fabaceae	Chanothi	R
2.	**Adenocalymma alleaceum* Miers.	Bignoniaceae	Lasanvel	C
3.	*Ampelocissus latifolia* (Roxb)	Vitaceae	Jungli draksh	VR
4.	*Antigonon leptopus* Hk. & Arn.	Polygonaceae	Ice cream vel	C
5.	*Argyreia nervosa* (Burm. f.) Boj.	Convolvulaceae	Samudrasok	C
6.	**Aristolochia elegans* Mast.	Aristolochiaceae	Batakvel	R
7.	*Aristolochia indica* L.	Aristolochiaceae	Sapsan	VR
8.	*Asparagus recemosus* Willd.	Liliaceae	Satavari	C
9.	*Basella rubra* L.	Basellaceae	Poi	R
10.	**Bignonia unguiscatae* L.	Bignoniaceae	Nakhvel	VR
11.	*Boerhavia verticillata* Poir.	Nyctaginaceae	Ubhi satodi	VC
12.	*Canavalia gladiata* (Jacq.) Dc.	Fabaceae	Talvardi	VC
13.	*Cardiospermum halicacaburn* L.	Sapindaceae	Kagdolio	C
14.	*Cassytha filiformis* L.	Lauraceae	Akashvel	VR
15.	*Cayratia carnosa* (Lamk.) Gagnep.	Vitaceae	Khatkhatumbo	C
16.	**Celastrus paniculata* Willd.	Celastraceae	Malkankani	R
17.	*Ceropegia bulbosa* Roxb.	Asclepiadaceae	Pataltumbdi	VR
18.	*Cissampelos pareira* L.	Menispermaceae	Venivel	R
19.	*Cissus quadrangularis* L.	Vitaceae	Hadsankal	VC
20.	*Citrullus colocynthis* (L.) Ktze.	Cucurbitaceae	Indravarna	VR
21.	*Clematis gouriana* Roxb.	Ranunculaceae	Morvel	VR
22.	*Clitoria ternatea* L.	Fabaceae	Garni	VC
23.	***Coccinia grandis* (L.) Voigt.	Cucurbitaceae	Tindora	VC
24.	*Cocculus hirsutus* (L.) Diels.	Menispermaceae	Vevdi	VC
25.	*Cocculus pendulus* (Forsk.) Diels.	Menispermaceae		R
26.	*Combretum coccineum* Lam.	Combretaceae	Madhvel	VR
27.	*Convolvulus arvensis* L.	Convolvulaceae	Fudardi	C
28.	*Corallocarpus epigaeus* (Rottl. & Willd) Cl.	Cucurbitaceae	Kadvi nai	R
29.	*Cryptostegia grandiflora* (Roxb) R.Br.	Periplocaceae	Rubbervel	A
30.	*Ctenolepis cerasiformis* (Stocks) Hk. f.	Cucurbitaceae	Ankhfutamani	C
31.	***Cucumis melo* L.	Cucurbitaceae	Chibhdu	C
32.	***Cucurbita maxima* Duch.	Cucurbitaceae	Kolu	C
33.	*Cuscuta chinensis* Lamk.	Cuscutaceae	Amarvel	C
34.	*Cuscuta reflexa* Roxb.	Cuscutaceae	Amarvel	VR
35.	*Dalechampia scandens* L.	Euphorbiaceae	Khajavni	A
36.	*Dioscorea bulbifera* L.	Dioscoreaceae	Varahikand	VR
37.	*Diplocyclos palmatus* (L.) Jeffery	Cucurbitaceae	Shivlingi	R
38.	*Gloriosa superba* L.	Liliaceae	Vachhang	VR
39.	*Gymnema sylvestre* (Retz.) R. Br.	Asclepiadaceae	Madhunasini	VR
40.	*Hemidesmus indicus* (L.) Schult.	Periplocaceae	Anantmul	R
41.	*Hibiscus caesius* Garke.	Malvaceae	—	C
42.	**Hiptage benghalensis* (L.) Kurz.	Malpighiaceae	Madhvilata	R
43.	*Ipomoea cairica* (L.) Sw.	Convolvulaceae	Narvel	R
44.	*Ipomoea dichora* (Roem & Schult.) Choisy	Convolvulaceae	Ratifudardi	C
45.	*Ipomoea digitata* L.	Convolvulaceae	Vidarikand	VR
46.	*Ipomoea hederifolia* L.	Convolvulaceae	—	VR
47.	*Ipomoea muricata* (L.) Jacq.	Convolvulaceae	Bhmardi	C
48.	*Ipomoea nil* (L.) Roth.	Convolvulaceae	Kaladana	C
49.	*Ipomoea obscura* (L.) Ker. Gawl.	Convolvulaceae	Vajvel	C

Sr. No.	Botanical Name	Family	Local Name	Occurrence
50.	*Ipomoea pes-caprae* (L.) Sw.	Convolvulaceae	Maryadvel	R
51.	*Ipomoea pes-tigridis* L.	Convolvulaceae	Waghpadi	A
52.	**Ipomoea purpurea* (L.) Roth.	Convolvulaceae		R
53.	*Ipomoea quamoclit* L.	Convolvulaceae	Kamvel	C
54.	*Ipomoea sepiaria* Koen ex. Roxb.	Convolvulaceae	Hanumanvel	R
55.	*Ipomoea sindica* Stapf.	Convolvulaceae		R
56.	**Jacquemontia violacea* Choisy	Convolvulaceae	Jakshini	C
57.	**Jasminum flexile* Vahl.	Oleaceae	Jul	VC
58.	**Jasminum grandiflorum* L.	Oleaceae	Chameli	C
59.	**Jasminum multiflorum* (Burm. f.) Andr.	Oleaceae		C
60.	**Jasminum officinale* L.	Oleaceae	Chameli	VC
61.	***Lablab purpureus* (L.) Sw.	Fabaceae	Val	C
62.	***Lagenaria siceraria* (Molina) Standley	Cucurbitaceae	Dudhi	C
63.	*Leptadenia reticulata* Wt. & Arn.	Asclepiadaceae	Kharkhodi	C
64.	***Luffa acutangula* (L.) Roxb.	Cucurbitaceae	Turia	C
65.	***Luffa aegyptiaca* Mill.	Cucurbitaceae	Galka	C
66.	*Luffa echinata* Roxb.	Cucurbitaceae	Kukadvel	R
67.	*Maerua oblongifolia* (Forsk.) A. Rich.	Capparaceae	Hemkand	R
68.	*Marsdenia volubilis* (L.f.) Cooke	Asclepiadaceae	Kadvi dodi	R
69.	*Melothria maderaspatana* (L.) Cogn.	Cucurbitaceae	Chanakchibhd	R
70.	*Momordica balsamina* L.	Cucurbitaceae	-------	R
71.	***Momordica charantia* L.	Cucurbitaceae	Karela	VC
72.	*Momordica dioica* Roxb ex. Wild	Cucurbitaceae	Kankoda	C
73.	*Mucuna prurita* HK.f.	Fabaceae	Kaucha	R
74.	***Operculina turpethum* (L.) Silva-Manso	Convolvulaceae	Nasotar	R
75.	*Oxystelma secamone* (L.) Karst	Asclepiadaceae	Jaldudhi	VR
76.	**Passiflora edulis* Sims.	Passifloraceae	Krishankamal	C
77.	*Passiflora foetida* L.	Passifloraceae		C
78.	*Pentatropis capensis* (L.f.) Bull.	Asclepiadaceae	Shigroti	C
79.	*Pentatropis spiralis* (Forsk.) Decna	Asclepiadaceae	Shigroti	C
80.	*Pergularia daemia* (Forsk.) Chiov	Asclepiadaceae	Chamardudhali	A
81.	*Periploca aphylla* Decne	Periplocaceae	--------	VR
82.	**Petrea volubilis* Jacq.	Verbenaceae	Nilambha	R
83.	*Pueraria tuberosa* (Roxb.) DC	Fabaceae	Vidarikand	R
84.	**Quisqualis indica* L.	Combretaceae	Madumalti	C
85.	*Rhynchosia minima* L.	Fabaceae	----------	A
86.	*Rivea hypocrateriformis* (Lamk.) Choisy	Convolvulaceae	Fang	C
87.	**Tecoma grandiflora* Lois	Bignoniaceae	----------	C
88.	*Telosma pallida.* (Roxb.) Craib	Asclepiadaceae	Varshadodi	R
89.	*Teramnus lablalis* Spreng.	Fabaceae	----------	VC
90.	**Thunbergia grandiflora* Roxb.	Acanthaceae	----------	C
91.	*Tinospora cordifolia* (Willd) Miers.	Menispermaceae	Galo	A
92.	*Trichosanthes bracteata* (Lam.) Voigt	Cucurbitaceae	Indrana	R
93.	*Trichosanthes cucumerina* L.	Cucurbitaceae	----------	R
94.	***Trichosanthes dioica* Roxb.	Cucurbitaceae	Parval	C
95.	*Tylophora indica* (Burm.f.) Merr.	Asclepiadaceae	Damvel	R
96.	**Vernonia divergens* (Roxb.) Edgew.	Asteraceae	Pardavel	C

A = Abundant, VC = Very common, C = Common , R = Rare, VR = Very rare

* Cultivated in gardens** Cultivated in farms as crop on hedges.

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