



## RESEARCH ARTICLE

### FLORISTIC DIVERSITY STUDY OF KALOL TALUKA, PANCHMAHAL, GUJARAT, INDIA

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#### ABSTRACT

Biodiversity conservation is a major concern in our day. Kalolis a town place of Panchmahal district. The total area of Taluka is 3595.18 hectares in which 3558.77 hectares are reserved and 36.41 hectares are protected. Floristic survey of the area is the best way of to understand establishment of natural habitat. Total 312 plant species from 88 families have been documented with their botanical names, local names and family. This record of work is presented as per the flora of Gujarat state.

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#### INTRODUCTION

The most important part of any floristic survey is the correct scientific identification of the plant wealth found in that particular area (Jasrai *et al*, 2014). Biodiversity of plant forms like trees and shrubs constitute the important component (Patel Y B *et al*, 2014a). Floristic studies have acquired increasing importance in recent years in response to the need of developing and under developing countries to assess their plant wealth. The main aim of present study was to analyze the diversified composition of flora in the Kalol Taluka of Panchmahal district, Gujarat, India. Total 312 plant species are documented with their regional importance present status (Table 1). In present the study, at Attarsumba range, in Gandhinagar Forest Division we found most frequent and dense species was followed by *Acacia tortiles* (Forsk) hyne and *Acacia senegal* Willd. Both species become invasive in Attarsumba range (Patel Y B *et al*, 2014b).

#### Study Area

Kalol is Taluka in the Panchmahal district in the east Gujarat in the India. Geographically, this region lies on 22°30'43.19" to 22°41'35.79" North latitude, 073°21'51.04" to 073°33'31.62" East longitude at 328ft. elevation (altitude). In the Taluka light Goradu (Gravelly) is the most common soil while black soil being rare. Kalol consist of 178 villages and 58 panchayats. The climate is characterized by hot summer and general dryness, except in the monsoon. During summer highest day temperature is in between 33°C to 44°C. Winds are generally light in the post monsoon and winter months and sometimes heavy during the summer and monsoon season.

#### MATERIALS AND METHOD

The study area was divided into different regions for convenience and systematic study. It was divided into four zones. Each zone was visited frequently as per the season for floristic study and analysis. These zones were made according to their proximity to various tracks made by local community people for their regular activities in that particular zone. A general survey of the vegetation was made

and different plants such as herbs, shrubs, grasses, climbers and trees along with present their status. The associations of plants were also observed and correlated for all unprotected area. Complete documentation with photographs and herbarium was prepared for future record and reference.

The association of plant diversity was noticeable and regular as other regular records. The study consists of total 312 plant species where 85 Trees, 62 Shrubs, 109 Herbs, 15 Grasses and 41 Climbers (Figure-1) were documented (Table 1). The list comprise of species belong to 88 different families with 247 genus (79%) and 312 species (100%). This region is dominated by Poaceae (17), Asteraceae (14), Caesalpinaceae (14), Fabaceae (14), Mimoseae (13), Apocynaceae (12) and Solanaceae (12) family members (Figure-2). These results suggest the favorable environment and suitable soil and water parameters to the available plant types.

#### DISCUSSION

In Gujarat state herbaceous nearly 4,320 plant species, which accounts for almost 9.33% of the total floral wealth of India (Agrawal, 2001). Enumeration of tree and shrubs by (Patel Y B *et al*, 2014 a. and Dharmesh *et al*, 2014) were recorded 78 floral diversity (Trees and Shrubs) in Attarsumba Range, Gandhinagar Forest Division. Total of 186 plants species belonging to 84 families have recorded from Meghraj Range Forest in District Aravalli (Vediya and Kharadi). In Ahmedabad and Gandhinagar 23 Families with 49 Genus and 66 Species was recorded (Pate *et al*, 2013). In Vadali range forest District Sabarkantha in North Gujarat recorded 353 plant species belonging to 95 angiospermic family and 276 genera of floral diversity (Desai and Ant, 2011). Identification plants by using Gujarat Flora (Shah, 1978) and Field Survey for Forest Resources in Gandhinagar Forest Circle (Jasrai *et al*, 2014).

#### CONCLUSION

Biodiversity has great important for ecological, economic and for the ecosystem stability. In the presence study we conclude 312 plant species which dense by different grasses at the study

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**Table 1** Floristic Diversity of the Study Area

Family	Scientific Name	Local Name	Habitat
	Adhatoda vasica L Nees	Ardusi	Sh
	Andrographis peniculata (Burm f) Nees	Kriyatu	H
	Barleria cristata L	-	Sh
Acanthaceae	Barleria prionitis L	Kantaseriyu	Sh
	Blepharis maderaspatensis (L) Roth	-	H
	Elytraria acaulis (L f) Lindau	-	H
	Peristrophe bicalyculata Retz	Kali Andhedi	H
	Ruellia tuberosa L	Fatakadi	H
Agavaceae	Agave americana L	Ramban	H
	Yucca aloifolia Linn		Sh
Aizoaceae	Trianthema portulacastrum L	Satodo	H
Alangiaceae	Alangium salvifolium (L f) Wang	Ankol	T
Alismataceae	Sagittaria sagittifolia L		H
	Achyranthus aspera L	Andhedi	H
	Aerva lanata (L) Juss	Gorakhadi	H
	Alternanthera sessilis (L) DC	-	H
	Amaranthus spinosus L	Kantalo Tandaljo	H
	Amaranthus viridis L	Dhimado	H
Amaranthaceae	Celosia argentea L	Lapadu	H
	Crinum asiaticum L	Crinum	H
	Digera muricata (L) Mart	Kanjaro	H
	Gomphrena celosioides Mart		H
	Gomphrena globosa L		H
	Pupalia lappacea L	Jepto	H
Amaryllidiaceae	Crinum asiaticum L		H
Anacardiaceae	Mangifera indica L	Ambo	T
	Annona reticulata L	Ramfal	Sh
Annonaceae	Annona squamosa L	Sitafal	T
	Polyalthia longifolia Sonn	Asopalav	T
	Centella asiatica (L) Urb	Brahmi	H
Apiaceae	Coriandrum sativum L	Kothmir	H
	Foeniculum vulgare Mill	Vriyari	H
	Adenium obesum (Forsk) Roem & Schult		Sh
	Allamanda cathartica L	Allamanda	Cl
	Alstonia scholaris L (R) Br	Shaptpari	T
	Carrisa congesta Wt	Karamda	Sh
	Catharanthus roseus (L) G Don	Barmashi	H
Apocynaceae	Cryptostegia grandiflora Roxb		Cl
	Nerium indicum Mill	Lal Karen	Sh
	Plumeria rubra L	Red Champo	T
	Rauvolfia tetraphylla L	Sarpgandha	H
	Tabernaemontana divaricata (L) R Br	Chandni	Sh
	Thevetia neriifolia Juss	Pili Karen	Sh
	Wrightia tomentosa R Br	Motidudhi	T
	Alocasia karthalsii Schott		H
	Aaladium bicolor Vent		H
	Colocasia esculenta (L) Schott		H
Araceae	Dieffenbachia seguine (Jacq) Schott		Sh
	Epipremnum aureum Linden & Andre	Money Plant	Cl
	Epipremnum pinnatum (L) Engl		Cl
	Syngonium macrophyllum Engl		H
	Syngonium podophyllum Schott		H
Araucariaceae	Araucaria columnaris (G Forst) Hook	Christmas Tree	T
	Bismarckia nobilis Hildebr & H Wendl	Bismarck Palm	T
	Borassus flabellifer L	Taad	T
	Caryota urens L	Shiv Jata	T
Arecaceae	Cocos nucifera L	Nariyel	T
	Phoenix acaulis Buch Ham ex Roxb	Phoenix Palm	T
	Phoenix sylvestris (L) Roxb	Khajuri	T
	Roystonea regia H B & K	Bottle Palm	T
	Calotropis gigantea (L) R Br	Akdo	Sh
	Calotropis procera Ait	Nano Aakdo	Sh
Asclepiadaceae	Gymnema sylvestre (Retz) Schult	Madhunsini	Cl
	Leptadenia reticula Retz	Dodi	Cl
	Pergularia daemia (Forsk) Chivo	Chamar Dudheli	Cl
	Tylophora indica (Burm f ) Merr	Dam Vel	Cl
	Blumea eriantha DC	Kalhar	H
	Caesulia axillaris Roxb		H
	Echinops echinatis Roxb	Untkanto	H
Asteraceae	Eclipta alba (L) Hassk	Bhangro	H
	Launaea procumbens (Roxb) Ram & Raj	Galjibi	H
	Parthenium hysterophorus L	Congress Grass	H
	Sonchus asper (L) Hill	-	H
	Sphaeranthus indicus L	Gorakhmundi	H

	Tagetes erecta L	Hajarigal	H
	Tagetes patula L	-	H
	Tridax procumbens L	Pardesi Bhangro	H
	Vernonia cinerea (L) Less	Sahadevi	H
	Vernonia elaeagnifolia DC	-	Cl
	Xanthium strumarium L	Gadariyu	H
Balanitaceae	Balanites aegyptiaca (L) Del	Ingoriyu	T
Bassellaceae	Basella rubra L	Poi Vel	Cl
Bignoniaceae	Spathodea campanulata P Beauv	-	T
	Tecoma stans (L) H B & K	Vasant	Sh
Bombacaceae	Bombax ceiba L	Simlo	T
	Ceiba pentandra (L) Gaertn	Kapok	T
Boraginaceae	Coldenia procumbens L	Okhrad	H
	Heliotropium indicum L	Hathisundhi	H
Brassicaceae	Brassica juncea (L) Czern	Rai	H
Burseraceae	Boswellia serrata Roxb	Salai Gugal	T
	Bauhinia purpurea L	Kanchner	T
	Bauhinia racemosa Lam	Kachnar	T
	Caesalpinia crista L	Kachka	Cl
	Caesalpinia pulcherrima (L) Sw	Galtoro	Sh
	Cassia auriculata L	Awal	Sh
	Cassia fistula L	Garmalo	T
Caesalpiniaceae	Cassia occidentalis L	Kasudro	H
	Cassia siamea Lam	Kasid	T
	Cassia tora L	Puvadiyo	H
	Delonix elata (L) Gamble	Sandesro	T
	Delonix regia (Hook) Raf	Gulmohar	T
	Parkinsonia aculeata L	Ram Baval	Sh
	Saraca asoca Roxb	Ashok	T
	Tamarindus indica L	Khati Amlu	T
Cannaceae	Canna indica L	Kena	H
	Capparis decidua Forsk	Kerdo	Sh
Capparaceae	Capparis sepiaria L	Kali Kanthar	Sh
	Cleome gynandra L	Gandhatu	H
	Cleome viscosa L	Pili Talavani	H
	Capparis grandis L	Gatt Bor	T
Caricaceae	Carica papaya L	Papayu	T
Carophyllaceae	Spergula arvensis L	Sakaliyu	H
Casuarinaceae	Casuarina equisetifolia L	Sharu	T
Chenopodiaceae	Chenopodium album L	Chillni Bhaji	H
	Celastrus paniculata Willd	Malkakni	Cl
Celastraceae	Maytenus emarginata (Willd) D Hou	Viko	T
Chenopodiaceae	Chenopodium album L	Chilni Bhaji	H
	Anogeissus sericea Brandis	Indrok	T
Combretaceae	Quisqualis indica L	Madhu Malti	Cl
	Terminalia arjuna (Roxb ex DC) Wight & Arn	Arjun	T
	Terminalia catappa L	Desi Badam	T
Commelinaceae	Commelina benghalensis L	Shishmuliyu	H
	Commelina diffusa Burm f		H
	Argyreia nervosa (Burm f) Boj	Samudrasok	Cl
	Evolvulus alsinoides L	Kali Sankhavali	H
	Ipomoea aquatica Forsk	-	Cl
	Ipomoea fistulosa Mart ex Choisy	Naffatvel	H
Convolvulaceae	Ipomoea nil (L) Roth	-	Cl
	Ipomoea palmata Forsk	-	Cl
	Ipomoea pes-tigridis L	Wagpadini Vel	H
	Jacquemontia pentantha (Jacq) G Don	Jakshini	Cl
	Merremia gangetic (L) Cufod	Undardi	Cl
	Rivea hypocrteriformis Choisy	Fang	Cl
Crassulaceae	Bryophyllum calycinum Saib		H
	Coccinia indica W& A	Ghiloda	Cl
	Lagenaria leucantha (Duch) Rusby	Dudhi	Cl
Cucurbitaceae	Luffa acutanula (L) Roxb	Turiya	Cl
	Luffa cylindrica (L) M J Roem	Galku	Cl
	Momordica charantia L	Karela	Cl
	Mukia maderaspatana (L) M		Cl
Cupressaceae	Thuja orientalis L	Vidhya	Sh
Cuscutaceae	Cuscuta chinensis L	Antarvel	Cl
	Cyperus bulbosus Vahl		H
Cyperaceae	Cyperus iria L		H
	Cyperus rotundus L	Chiyo	H
Dioscoriaceae	Dioscoriea alata L	Ratalu	Cl
	Cordia dichotoma Forst	Moto Gundo	T
Ehreitaceae	Cordia gharaf (Forsk) E & A	Nani Gundi	T
	Ehretia aspera Roxb	Nani Vadhawrdi	T

	Ehretia laevis Roxb	Tanboliyo	T
Elatinaceae	Bergia capensis L	Jaljambavo	H
	Acalypha indica L	Vaichikato	H
	Croton bonplandianum Baill	Croton	Sh
	Euphorbia hirta L	Dudheli	H
	Euphorbia milli Ch	-	Sh
	Euphorbia nivulia Buch-Ham	Thor	Sh
Euphorbiaceae	Jatropha curcus L	Ratanjyot	Sh
	Jatropha gossypifolia L	Ratanjyot	Sh
	Kirganellia reticulata (Poir) Baill	Kamboi	Sh
	Phyllanthus fraternus Webster	Bhoya Ambli	H
	Ricinus communis L	Divela	Sh
	Securinega virosa Roxb ex Willd	Safedfali	Sh
	Abrus precatorius L	Chanothi	Cl
	Alisicarpus tetragonolobus Edgev	Samervo	H
	Butea monosperma (Lam) Taub	Khakharo	T
	Cajanus cajan L	Tuver	H
	Clitoria ternatea L	Garnibibali	Cl
	Cyamopsis tetragonoloba (L) Taub	Guvar	H
	Dalbergia sissoo Roxb	Moto Sisam	T
	Fabaceae	Derris indica (Lam) Bennet	Karanj
Erythrina suberosa Roxb		Dhed Khakharo	T
Mucana prurita Hk f		Kuvech	Cl
Rhynchosia minima L Dc Var		Dariyavel	Cl
Sesbania sesban (L) Merr		Ikad	H
Tephrosia purpurea (L) Pers		Sarpankho	H
Vigna unguiculata (L) walp		Cholafali	Cl
Anisomeles indica L		Chodharo	H
Leucas aspera (Willd) Link		Kubo	H
Ocimum basilicum L		Damro	H
Lamiaceae	Ocimum sanctum L	Tulsi	H
	Lemna paucicostata Hegelm	-	H
Liliaceae	Allium cepa L	Dungli	H
	Allium sativum L	Lahsun	H
Lilyaceae	Aloe vera (L) Burm f	Kuvarpathu	H
	Ammannia baccifera L	Jal Agio	H
	Lawsonia inermis L	Mehdi	Sh
	Abutilon fruticosum Gum Perr	Zini Khapat	Sh
Lythraceae	Abutilon indicum (L) Sw	Kanski	H
	Gossypium herbaceum L	Kapas	H
	Hibiscus hirtus L	-	Sh
	Hibiscus rosa-sinensis L	Jasud	Sh
	Hibiscus sabdariffa L	Khati Bhindi	Sh
	Hibiscus schizopetalus Hk f	Latkan Jasud	Sh
Malvaceae	Sida acuta Burm f	Bala	H
	Sida cordata (Burm f) Bors	Bhoy Bala	H
	Thespesia populnea (L) Sol ex Correa	Paras Piplo	T
	Martynia annua L	Vichhudo	H
Martyniaceae	Azadirachta indica A Juss	Limdo	T
	Meliaceae	Bakan Limdo	T
Meliaceae	Melia azedarach L	Venivel	Cl
	Cissampelos pareira L	Vevdi	H
	Menispermaceae	Galo	Cl
	Cocculus hirsutus(L) Diels	Austerlian Baval	T
	Tinospora cordifolia (Willd) Miers	Kher	T
	Senegalia ouriculiformis Benth	Bhoy Baval	Sh
	Vachellia catechu L	Aniyar	T
	Vachellia farnesiana (L) Willd	Desi Baval	T
	Vachellia leucophloea Roxb Willd	Shirish	T
	Vachellia nilotica (L) Del	Mor Dhundhiyu	Sh
Mimosaceae	Albizia lebbeck (L) Benth	Subaval	T
	Dichrostachys cinerea L	Lajamani	Sh
	Leucaena leucocephala Lam	Goras Ambli	T
	Mimosa pudica L	Khijado	T
	Pithecellobium dulce (Roxb) Benth	Gando Baval	T
	Prosopis cineraria (L) Druce	Rain Tree	T
	Prosopis juliflora (Sw) Dc	-	H
	Samanea saman F Muell	Fanas	T
Molluginaceae	Glinus lotoides L	Vad	T
	Artocarpus heterophyllus L	-	Sh
	Ficus benghalensis L	Anjir	T
	Ficus benjamina L	Dhed Umbro	Sh
	Ficus carica L	Umaro	T
Moraceae	Ficus hispida L f	Piplo	T
	Ficus racemosa L	Shetur	T
	Ficus religiosa L	Haredo	T
	Morus alba L		
	Streblus asper Lour		

Moringaceae	Moringa oleifera Lam	Saragvo	T
	Moringa concanensis Nimmo	Kadvo Saragvo	T
Musaceae	Musa paradisiaca L	Kela	Sh
	Callistemon citrinus (Curtis) Skeel	Bottle Brush	T
Myrtaceae	Eucalyptus globulus Labill	Nilgiri	T
	Psidium guajava L	Jamfal	Sh
	Syzygium cumini (L) Skeel	Jambu	T
	Boerhavia chinensis (L) Druce	Satedi	H
	Boerhavia diffusa L	Satodi	H
Nyctaginaceae	Bougainvillea glabra Choisy	Bougan Vel	Cl
	Bougainvillea spectabilis Willd	Bouganvel	Cl
Nymphaeaceae	Nymphaea nouchali Burm f	Water Lili	H
	Jasminum flexile Vahl	Jui	Cl
Oleaceae	Jasminum sambac (L) Sol	Mogro	Sh
	Nyctanthes arbortristis L	Parijatak	Sh
Onagraceae	Ludwigia octovalvis Jacq	Pan Laving	H
Oxalidaceae	Oxalis corniculata L	Abuti	H
Pandanaceae	Pandanus odoratissimusLf	Kevdo	Sh
Papaveraceae	Argemone mexicana L	Darudi	H
Plumbaginaceae	Plumbago zeylanica L	Chitrak	Sh
	Apluda mutica L	-	Gr
	Avena sativa Linn	Oat	Gr
	Bumusa arundinacea (Retz) Willd	Kanti Vans	Gr
	Cholris barbata Sw	Mindadiyu	Gr
	Cynodon dactylon (L) Pers	Dharo	Gr
	Dactyloctenium aegyptium L P Beauv	Fataliyu	Gr
	Dactyloctenium indicum Boiss	-	Gr
Poaceae	Dendrocalamus strictus Nees	Vans	Gr
	Eragrostis pilosa (L) P Beauv	-	Gr
	Eragrostis tenella L	-	Gr
	Pennisetum typhoides (Burm f) Stap & Hub	Bajri	Gr
	Setaria tomentosa (Roxb) Kunyh	Gutdi	Gr
	Sorghum halepense (L) Pers	Baru	Gr
	Sorghum vulgare Pers	Juvar	Gr
	Zea mays L	Makai	Gr
Primulaceae	Anagalis arvensis L	-	H
Portulacaceae	Portulaca jrandiflora Hook	Chini Gulab	H
Punicaceae	Punica granatum L	Dadam	Sh
	Zizyphus mauritiana Lam	Bor	T
Rhamnaceae	Zizyphus nummularia (Burm F) W & A	Chani Bor	Sh
	Zizyphus oenoplia (L) Mill	Bordi Velo	Cl
	Hamelia patans Jacq	Hamelia	Sh
Rubiaceae	Ixora coccinea L	Ixora	Sh
	Mitragyna parvifolia Roxb	Kadamb	T
	Morinda tomentosa Heyne ex Roth	Aal	T
	Aegle marmelos L	Bili	T
Rutaceae	Citrus limon L Burm	Limbu	Sh
	Limonia acidissima L	Kothi	T
	Murraya koenigi (L) Spreng Syst	Mitho Limdo	Sh
Salvadoraceae	Salvadora persica L	Piludi	T
Santalaceae	Santalum album L	Chandan	T
Sapindaceae	Cardiospermum halicacabum L	Kagdoliyo	Cl
	Maduca indica J F Gmel	Mahudo	T
Sapotaceae	Manilkara hexandra Roxb	Rayan	T
	Manilkara zapota L	Chikoo	T
	Mimusops elengi L	Borsali	T
Schrophulariaceae	Striga angustifolia D Don	-	H
Simaroubaceae	Ailanthus excelsa Roxb	Arduso	T
	Capsicum annum L	Marcha	H
	Cestrum nocturnum L	Rat Rani	Sh
	Datura innoxia Mill	Kalo Dhanturo	Sh
	Datura metel L	Dhanturo	Sh
	Lycopersicon lycopersicum (L) Karstex	Tamato	H
Solanaceae	Nicotiana tabacum L	Tamaku(Desi)	H
	Physalis minima Nutt	Popti	H
	Solanum indicum L	Jungli Ringni	Sh
	Solanum melongena L	Ringan	Sh
	Solanum nigrum L	Piludi	Sh
	Solanum xanthocarpum Schrad & Wendl	Bhoy Ringani	H
	Withania somnifera(L) Dunal	Aswagandha	H
Sterculiaceae	Sterculia foetida L	Chini Badam	T
	Corchorus aestuans L	Chunch	H
Tiliaceae	Corchorus capsularis L	-	H
	Grewia flavescens Juss	Trambat	Sh
	Triumfetta pentandra A Rich	Zipti	H
Typhaceae	Typha angustata Bory & Chaub	Ghabajariu	H

Ulmaceae	<i>Holoptelea integrifolia</i> (Roxb) Planch	Kanji	T
	<i>Clerodendrum inerme</i> (L) Gaertn	Vad Mahendi	Sh
	<i>Clerodendrum multiflorum</i> Burm F	Arni	Sh
	<i>Duranta repens</i> L	Damyanti	Sh
Verbenaceae	<i>Gmelina arborea</i> Roxb	Sevan	T
	<i>Lantana camara</i> auct NonL	Indradhanush	Sh
	<i>Phyla nudiflora</i> (L) Greene	Ratveliyo	H
	<i>Tectona grandis</i> L	Saag	T
	<i>Vitex negundo</i> L	Nagod	T
Vitaceae	<i>Cayratia carnosia</i> (Lam) Gagnep	Khatkhatumbo	Cl
Zygophyllaceae	<i>Tribulus terrestris</i> L	Gokhru	H

site. We found *Borassus flabellifer* L very frequent during the study relatively other area. Study highlight a rich status of plants compares to other findings but it till required to manage and conserve the biodiversity of this area.

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#### Abbreviations

Cl-Climber, H-Herb, S-Shrub, T-Tree, Gr-Grass.

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