

Floristic Diversity of Family Malvaceae Found in Kankariya Zoo Campus, Ahmedabad, Gujarat, India

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ABSTRACT

Ahmedabad city is located in the centre of Gujarat. It is located at 23.03° north and 12.58° east spanning on area of 205km². The Kamala Nehru zoological garden is situated near the nocturnal zoological garden at Kankaria in Ahmedabad. In Kamala Nehru zoological garden there are many type of the species like plants, trees and shrubs in zoological garden. They maintain best temperature and oxygen level to animals. Kankariya Kamala Nehru zoological garden was established by Ruben Devi in 1915 which is spreaded over 21 acres. There are many type of species like Malvaceae, Moraceae, Araceae, Asparagaceae, Convolvulaceae, Oleaceae in this zoological garden. Plant species like *Abutilon indicum* (Link) sweet (KHAPAT DABALTGAR), *Abelmoschus esculentus* L. (BHINDO), *Althea rosea* (L.)Cav (GULKHER), *Gossypium herbaceum* L. var. *aceritolum* (KHAPAS), *Hibiscus rosa sinensis* L. (JASOD), *Hibiscus schizopetalus* (Dyer) Hook f.(CHIKNT BHINDI), *Malvaviscus pendulifloras* DC.(SLEEPING HJBISCUS), *Sida alba* L. (KANTALOBALA), *Sida cordata* Burm f.(BHOYABALA), *Sida cordifolia* (MAHABALA), *Sida ovata* Forsk (BHOYBALA), *Thespesia populnea* (L.) Soland (PARAS PIPALO) are described in the present paper.

Keywords : Malvaceae, Zoo, Floristic

I. INTRODUCTION

Malvaceae is a family of flowering plants estimated to contain 244 genera with 4225 known species. Well-known members of this family include okra, cotton, cacao and durian. The largest genera in terms of number of species include *Hibiscus*, *Sterculia*, *Dombeya*, *Pavonia* and *Sida*. A number of species are pests in agriculture, including *Abutilon theophrasti* and *Modiola caroliniana*, and others that are garden escapes. Cotton (four species of *Gossypium*), kenaf (*Hibiscus cannabinus*), cacao (*Theobroma cacao*), kola nut (*Cola* spp.), and okra (*Abelmoschus esculentus*) are important agricultural crops. A number of species, including *Hibiscus syriacus*, *Hibiscus rosa-sinensis* and *Alcea rosea* are garden plants. Most species are herbs or shrubs, but some are trees and lianas.

II. METHODOLOGY

The methodology and approaches for this floristic species at kankaria Kamla Nehru zoological garden was followed as and suggested by Dr. R.S.Patel sir and an intensive field work was undertaken with help of Gardner Bherosinh. In Zoological garden there are many types of species and many types of section and also variety of plants. Plants were collected, photographs are taken in field and identified by the flora of Hooker (1872- 97). Oommachan (1977) Verma pant & Hanfi(1984), Khanna and Kumar (2001), Shukla (1988), Bor and Raizayda (1954), Alverson and Nyffeler (1998), Bayer(1999). Plants so collected are pressed and herbarium was prepared following techniques of Jain and Rao(1977).

III. ENUMERATION OF THE PLANTS

Abutilon indicum (Link) Sweet

- ✓ Local name:- Indian mallow
- ✓ Flowering and fruiting: -Throughout whole year
- ✓ Habit : - shrub
- ✓ Distribution: - The species occurs in a number in tropical and subtropical zones.
- ✓ Description:-The leaves bear solitary yellow flowers which blooms in the evening. The seeds are dark brown or black. Fruit is multi-rigged capsules
- ✓ Uses: - In folk medicine, the plant is used for treating fever, cough, lung disease and urinary diseases. The leaves are used as a demulcent, aphrodisiac, laxative, sedative and diuretic. It is also anti-inflammatory and anthelmintic.

Abelmoschus esculentus L.

- ✓ Local name:- Ladies's finger and okra
- ✓ Flowering and Fruiting:- October to December
- ✓ Habit : - Herb
- ✓ Distributions: - The geographical origin of okra is south Asian, Ethiopian and West Africa origins. Supporters of south Asian origin pointed to the presence of its proposed region. Western Africa has huge diversity of okra.
- ✓ Description: - Leaf margin serrate, base cuneate to cordate, long petiole, flowers are up to 8 cm and are yellow and golden in colour. Fruit capsule up to 14 cm long, ellipsoid to very narrowly ellipsoid. Fruit type is dehiscent dry fruit.
- ✓ Uses: - Useful in treatment of chest complaints, and a decoction is used to improve blood circulation, for the treatment of constipation, haemorrhage, etc. Roots and Flowers are used in the treatment of inflammation of kidney, womb, and vaginal and also to treat loss of appetite.

Althea rosea L.

- ✓ Local name:- Gulkheru
- ✓ Flowering and Fruiting: - October – June.
- ✓ Habit :- Herb
- ✓ Distributions: - This plant is mostly distributed in Europe, south western china and India.
- ✓ Description: - It is biennial or short lived perennial. The flowers are in a range of colour from white to dark red, including pink, yellow and orange. It can easily reach a height of about 8 feet. Fruit is 1.5 to 2.5 cm.
- ✓ Uses: - Leaf is useful in treatment of diarrhoea, gastric and sore throat. Flowers are useful in treatment of bronchitic and fever.

Gossypium herbaceum L.

- ✓ Local name: -Kapas.
- ✓ Flowering and Fruiting: September
- ✓ Habit :- Shrub
- ✓ Distributions: This plant is mostly distributed to the tropical and subtropical regions. It also distributed in tropical and sub-tropical regions and especially worldwide in America.
- ✓ Description: - The flowers are pretty and round. They have bright yellow colour. The fruit of cotton seed is brownish capsule that opens at maturity and expose the seed.
- ✓ Uses: - This cotton is usually use as textile while making clothing and can be made into yarns and sheet of fabric. This plant is used in medical field for making antibiotics.

Hibiscus rosa sinensis L.

- ✓ Local name:- China rose
- ✓ Flowering and Fruiting: - July to December.
- ✓ Habit :- Shrub
- ✓ Distributions: - This type of plant is distributed over India, south western Africa and china.
- ✓ Description: - It is a bushy, evergreen 8-12 ft tall shrub .Flowers are mainly red and yellow. Leaves are glossy and solitary

- ✓ Uses: - The root of this plant is use as the cough treatment. The leaf of this plant is use as a laxative. The flower of this plant is use as a anti- infected of E.coli diarrhoea. They are good anti- diarrhoea. Flowers are used in hair care preparation.

Hibiscus schizopetalus (Dyer) Hook. f.

- ✓ Local name:- Fringed rose mallow, coral hibiscus
- ✓ Flowering and Fruiting: - This plant flowers have in pink and red colour. Flowers are seen whole of the year.
- ✓ Habit :- Shrub
- ✓ Distributions: - This plant is native to tropical eastern Africa in Kenya, Tanzaniya and Mozambique.
- ✓ Description:-It is a shrub growing to 3 meters tall. The red or pink flowers are very distinctive in their frilly, finely divided petals.
- ✓ Uses: - Flowers are used in Urinary diseases, plant is said to be good for psychiatric ailments. A decoction of flower is good for leucorrhoea.

Malvaviscus penduliflorus DC.

- ✓ Local name: - sleeping hibiscus, wax mallow
- ✓ Flowering and Fruiting: Throughout whole year.
- ✓ Habit :- Shrub
- ✓ Distributions: It is distributed in subtropical region of America and it also been recorded in north eastern queen's land.
- ✓ Description: - It is upto 2 m tall, leaves are lanceshaped to narrowly ovate, Flowers occurs singly, hanging from leaf axils and resembles to Hibiscus bud. The plant often becomes vinelike when grown in shady situations, sending out long stems that clamber over and up adjacent trees and bushes.
- ✓ Uses: - Leaf is useful in treatment of diarrhea, gastrict and sore throat. Flowers are useful in treatment of bornchitice and fever.

Sida alba Linn.

- ✓ Local name: -
- ✓ Flowering and Fruiting:
- ✓ Habit :-
- ✓ Distributions: - Throughout tropical Africa, Namibia and Mpumalanga, KwaZulu-Natal, South Africa. Also in America.
- ✓ Description: - An annual or perennial semi-woody herb to 1.75 m high, of open disturbed areas and waste places scattered across the Region, and widely dispersed in the tropics. It occurs as a common weed of rice-fields in Bendel State of Nigeria.
- ✓ Uses: - Leaf and roots are used in diarrhoea, dysentery, malnutrition, debility. Plant is also used as antidotes in venomous stings, bites, etc.

Sida cordifolia L

- ✓ Local name: - Mahabala
- ✓ Flowering and Fruiting:- October-December.
- ✓ Habit :- Shrub
- ✓ Distributions: - This species is distributed over china, India, Srilanka and Thailand.
- ✓ Description:-It is an erect perennial that reaches 50 to200 cm tall. The stems are yellow-green, hairy, long, and slender. The yellow-green leaves are oblong-ovate, covered with hairs. The flowers are dark yellow, sometimes with a darker orange centre, with a hairy 5-lobed calyx and 5-lobed corolla.
- ✓ Uses: - This plant mostly uses in folk medicines for the treatment of inflammation of oral mucosa, asthma, bronchitis and nasal congestion, and stomatitis.

Sida cordata Burm. f.

- ✓ Local name: -Bhoybala, long stalked sida
- ✓ Flowering and Fruiting:- October and November.
- ✓ Habit :- Shrub

- ✓ Distributions: - Mostly distributed over India, China and Africa.
- ✓ Description: - The leaves are 1.55 cm long, are heart shaped one at each node. The flower, 7-8 mm across, is produced at leaf axils, and is yellow in colour.
- ✓ Uses: - The juice of this plant is applied to boils and pimples; the juice of root is used to treat indigestion. A paste of the root is applied as poultices to remove pus from boils and wounds. It is also used in treatment of gonorrhoea and other venereal diseases. The juice of leaves is used to treat cuts and wounds.

Thespesia populnea (L.) Sol. Ex Correa

- ✓ Local name: -Paraspipalo , Indian tulip tree
- ✓ Flowering and Fruiting:- October to December
- ✓ Habit :- Shrub
- ✓ Distributions: - This plant has pan tropical distribution found on coasts around the world. The origin of this plant is India.
- ✓ Description: - Having a height of 6-10 m and it is able to grow in wide range of soil type that may be present in coastal environment.
- ✓ Uses: - Its wood is mainly use for making furniture because it has good ability to undergo carving. This plant is multipurpose plant used in Producing foods, medicines and many other commodities for local use.

Sida acuta Burm.f.

- ✓ Local name:- Horn bean leaved sida
- ✓ Flowering and Fruiting:- September – December
- ✓ Habit :- Shrub
- ✓ Distributions: - Mostly distributed in Dry and deciduous forest of Maharashtra, Karnataka, Belgaum, Chikmagalur and Kerala.

- ✓ Description: - It is erect 70 cm tall, branches distichously, leaf margin serrate, flowers solitary, auxiliary. Petals are creamy-yellow.
- ✓ Uses: - This whole plant is useful in a medicinal plant. Whole plant is useful as a treatment of fever. The root is febrifuge. The juice of this plant is used to treat indigestion. The juice of the root is use in treat fever. The root is chewed to relive a toothache.

Sida ovate Forsk

- ✓ Local name:- Bhoybala
- ✓ Flowering and Fruiting:- October – December
- ✓ Habit :- Shrub
- ✓ Distributions: - Distributed in the northern part of the region from Senegal to Niger and N Nigeria, and in tropical Africa.
- ✓ Description:-It having a height of 60 m.
- ✓ Uses: - This plant is also use as a medicinal plant. It is use in diseases like subcuta – nervous parasitic infection leaves are mostly use.

Hibiscus micranthus L. f.

- ✓ Local name: - Chiknibhindi
- ✓ Flowering and Fruiting:- October to December
- ✓ Habit: - Shrub.
- ✓ Distributions: This plant is distributed in South western Asia, South Africa and India also.
- ✓ Description: - Flowers are white in colour and solitary. Fruit is globule capsule, puberulous ; seeds many and hairy; leaves are alternate-distichously and having ovate, sub orbicular or elliptic shape and serrate margin.
- ✓ Uses: - It is used in folk medicines and has significant anti-inflammatory, antipyretic and neuromuscular blocking properties.

Table 1. Check List Of Malvaceae Family Plant Found From Kankariya Kamla Nehru Zoological Garden.

No	Scientific Name	Local Name	Habit	Flowering and Fruiting Season
1	<i>Abutilon indicum</i> (Link) sweet	Indian mallow	Shrub	Whole Year
2	<i>Abelmoschs esculentus</i> L.	Ladies's finger, okra	Herb	October – December
3	<i>Althea rosea</i> L.	Gulkheru	Herb	October – June
4	<i>Gossypium herbaceum</i> L.	Kapas	Shrub	September
5	<i>Hibiscus rosa sinensis</i> L.	China rose	Shrub	July – December
6	<i>Hibiscus schizopetalus</i> (Dyer) Hook. f.	Coral Hibiscus , fringed rose mallow	Shrub	Whole the Year
7	<i>Malvaviscus pendulifloras</i> DC.	Sleeping hibiscus Wax mallow	Shrub	Whole the Year
8	<i>Sida alba</i> Linn.	Kantalobala , sidas , Fanpetals	Shrub	September- December
9	<i>Sida cordifolia</i> L.	Mahabala	Shrub	October – December
10	<i>Sida cordata</i> Burm. f.	Bhoybala, Long stalked sida	Shrub	October – November
11	<i>Thespesia populnea</i> (L.) Sol. Ex Correa	Paraspipalo	Shrub	October – December
12	<i>Sida actuta</i> Burm. f.	Horn bean leaved sida	Shrub	September– December
13	<i>Sida ovate</i> forsk	Bhoybala	Shrub	October – December
14	<i>Hibiscus micranthus</i> L. f.	Chiknibhindi	Shrub	October – December

IV. RESULTS AND DISCUSSION

In kankaria zoological garden we have collected 14 species of Malvaceae family .These species are also useful in medicinal, and other social uses of flower are worshipping and many more. The valuable specie likes *Abutilon indicum* (Link) Sweet, *Abelmoschs esculentus* L., *Althea rosea* L., *Gossypium herbaceum* L., *Hibiscus rosa sinensis* L. , *Hibiscus schizopetalus* (Dyer) Hook f., *Malvaviscus penduliflorus* DC. , *sida alba* Linn., *Sida cordifolia* L., *Sida cordata* Burm. f., *Sida acuta* Burm. f., *Thespesia populnea* (L.) sol. Ex Correa, *Sida ovate* forsk, and *Hibiscus micranthus* L. f.

were noted from our study. Table 1 shows Check List of Malvaceae Family Plant Found from Kankariya Kamla Nehru Zoological Garden. Table 2 shows Ratio of Wild and Cultivated Species and Table 3 shows Ratio of Habit of Malvaceae Family. Photo Plate is Showing Malvaceae Members growing in the Kankariya Zoo Campus

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Table 2. Ratio Of Wild And Cultivated Species

Plant species	No. of Plant species
Wild	8
Cultivated	6

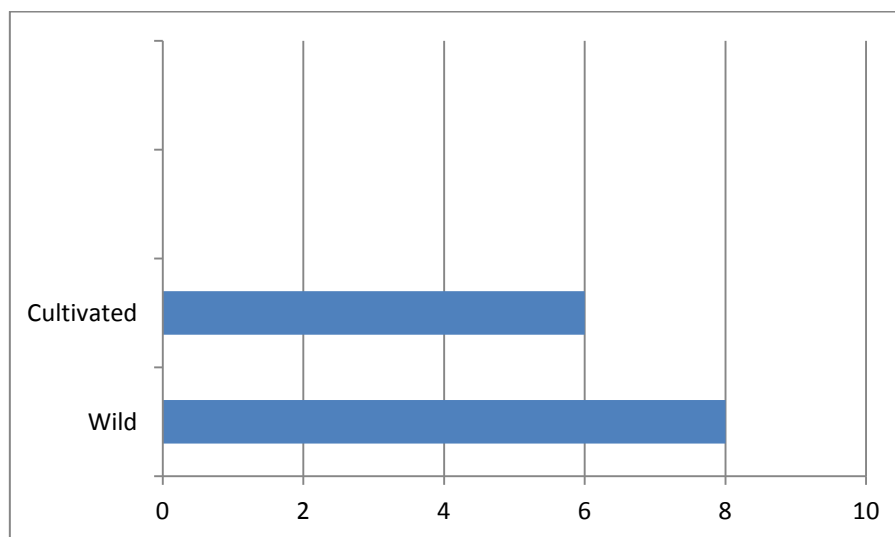


Figure 2. Shows Ratio Of Wild And Cultivated Species

Table:-3 Ratio of Habit of Malvaceae Family

Habit	No. of species
Shrub	12
Herb	2

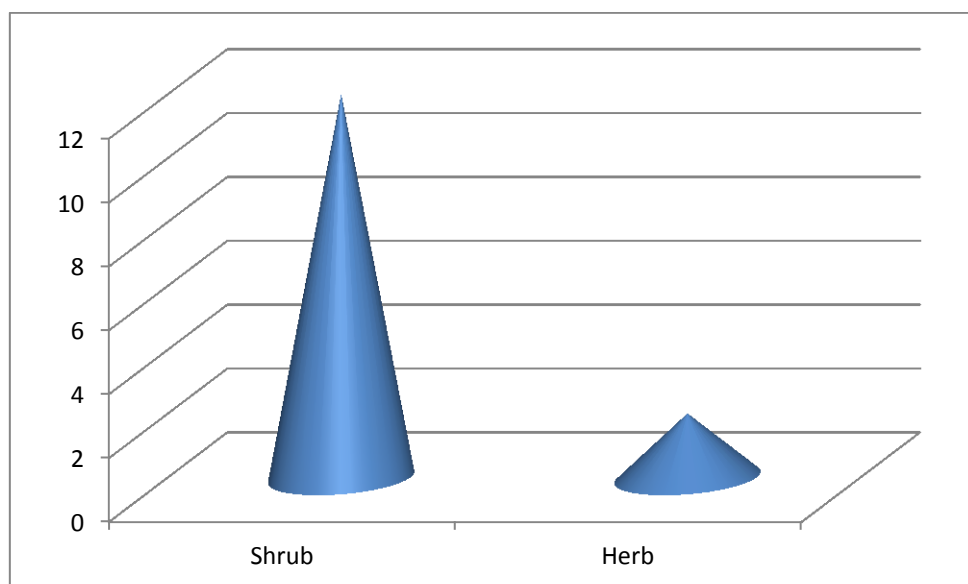


Figure 3 Shows Ratio Of Habit Of Malvaceae Family

VI. REFERENCES

- [1]. Aasati .B.S. and D.S.Yadav Diversity of horticulture crops in North Eastern region.
- [2]. Arora, J.S.Introductory ornamental horticulture.Kalyanipublisher,Ludhiana.
- [3]. Bose, T.K., Chaudhary, B., Sharma, S.P.Tropical garden plants.
- [4]. Patel N.A. Floristic diversity of the Ahmedabad city ,Ph.d. Thesis, Kachchh University,Bhuj
- [5]. S.RajagopalReddy,A. Madhusudhana Reddy,N.S Philomina and N.
- [6]. Sutaria, R.N. A text Book of Systemic Botany ,Publications ,KhadaytaBoook Depot, Ahmedabad.1-414.
- [7]. T.Pulliaiah ,K.Sri Ramamurthy,S.Karuppusamy(2007). Eastern Ghats Hill Ranges of South East India.vol 3.Regency Publications, New Delhi.
- [8]. Vaidya, B.S. (1967). Flora of Ahmedabad Gujarat University,Ahmedabad.
- [9]. Vaidya, B.S. and Vora,A.B. (1964). Some new records for Ahmedabad,J.Guj.Univ.7,193-196.
- [10]. Shah,G.L.(1978). Flora of Gujarat State Part 1 and 2 Sardar Patel University, Vallabh Vidhyanagar.1074
- [11]. Hooker J.D., 1872-97. The Flora of British India, Vol I,pg 317-353 Reeve & Co., London, England.
- [12]. Oommachan M., 1977. The flora of Bhopal Published by J.K. Jatin Brothers India, Page no. 59 to 69.
- [13]. Verma D.M., Pant P.C. and Hanfi M.I., 1985. Flora of Raipur, Durg and Rajnandgaon. Pg. 40-51 Botanical survey of India, Howrah.
- [14]. Khanna K.K., Jha A. K., Kumar A. and Murti S.K., 2001.Endemic and Rare Plants of C.G. Bulletin of Botanical Survey of India, 46(1-4): 77-138.
- [15]. Bor N.L. and Raizayda M.B., 1954. Some beautiful Indian Climbers and Shrubs, The Bombay Natural history Society, Bombay India.
- [16]. Bayer C., 1999. " Support for an expanded family concept of Malvaceae within a recircumscribed order Malvales: a combined analysis of Linnean Society, 129(4): 267-303.
- [17]. Jain S.K. and Rao R.R., 1977. A Handbook of Field and Herbarium Methods. Today and tomorrow publisher, New Delhi.ISBN-10-0880651393.

Photo Plate is Showing Malvaceae Members growing in the Kankariya Zoo Campus

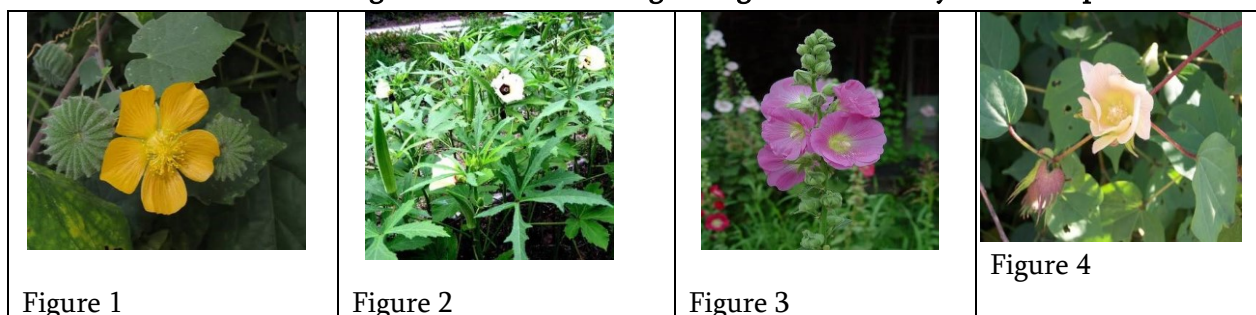




Figure 5



Figure 6



Figure 7



Figure 8



Figure 9



Figure 10

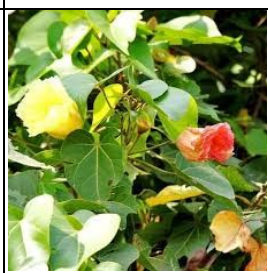


Figure 11



Figure 12



Figure 13



Figure 14