

Enumeration and Systematic Survey of Plant Species of Caesalpiniaceae From Sabarmati River of Gujarat State , India.



Science

KEYWORDS : Caesalpiniaceae , Sabarmati river.

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ABSTRACT

The present study deals with enumeration and systematic survey of plant species of family Caesalpiniaceae observed in the area of Sabarmati river of Gujarat state, India. Plant exploration was conducted to determine plant species of family Caesalpiniaceae. Taxonomic position of these plant species is described in various available Floras. Plant species of family Caesalpiniaceae from Sabarmati riverbed and riverside area, have been listed systematically which counts 19 species of 08 genera, These plant species grown in the study area found wild as well as cultivated.

INTRODUCTION

The Caesalpiniaceae family known as the Peacock Flower family and an economically important of Angiosperms. It includes herbs, shrubs, undershrubs and trees. Most of perennials species and some species are annuals, Plants of this family easily recognized by their fruit (legume). The present work deals with enumeration and systematic survey of plant species of Caesalpiniaceae observed in the study area. Earlier, The Plants of Northern Gujarat published by Saxton & Sedgwick (1918), Shah, C.K. (1963) enumerate the sedges of Sabarmati, Bhatt, et. al (1969) reported vegetation and flora of Khedbrahma region. Sabnis et. al (1975) reported the forest vegetation and phytogeography of Khedbrahma region. Shah, G.L. (1978) published the flora of Gujarat State. Yogi, D.V. (1970) submit thesis of the flora of North Gujarat. Earlier many research workers explore the North Gujarat region but not much explore the riparian-riverain flora of Sabarmati.

STUDY AREA:

The geographical situation of the Sabarmati river is between 22° 30' to 24° 30' North latitude and 72° 30' to 73° 30' East longitude. It originates from Arvalli hills, near Vekaria in Rajasthan State and enters in the Gujarat state at the border of the Sabarkantha district. It passing through seven districts of the Gujarat, Banaskantha, Sabarkantha, Mehsana, Gandhinagar, Ahmedabad, Kheda and Anand. Finally enters into the Gulf of Khambhat (Cambay). Sabarmati river is one of the longest river in the state and its length is about 418 km. It has total 5475 sq.km catchments area.

MATERIAL AND METHODS

The study of family Caesalpiniaceae of angiosperms from the Sabarmati river is based on the extensive and intensive field survey of the vegetation of an area. Field survey was carried out for observation and collection of plants in various seasons. Collected plants Identified by compiling different available floras and authenticated by experts from university department and research institutes. The photographs were taken of all the plant species during field trip. Field study visit made for Six (2000-2005) years during Ph.D. research work and after that visit occasionally upto 2013 to recollect the flowering plants. The enumerated plants were categorized according to their systematic positions on the levels of family, genera and species, followed by Bentham & Hookers classification system. The list of plant species with their Scientific name, Vernacular name and Habit present in description.

RESULT:

The list of collected plants is given in Table-1. Identification keys for Genera and Species described. The keys to the genera and species were made mainly on the basis of morphological characters. With nomenclature and enumeration, brief descriptions of each species, flowering and fruiting period, local names and short information on economic uses wherever available are

mentioned. Simple dichotomous keys to species under each genus are provided for identification. Descriptions of the genera are not given separately.

Table.No.-1. LIST OF SURVEYED PLANT SPECIES

[T-Tree , S-Shrub , Us-Undershrub , H-Herb , Cl-Climber , Tw-Twiner , W- wild , C- cultivated,]

Sl.No	BOTANICAL NAME	LOCAL NAME (In Gujarati)	HABIT	CULTIVATED or WILD	REMARKS
01	Bauhinia racemosa Lam.	Apto	T	Cultivated	Not common
02	Bauhinia purpurea Lam.	Kanchnar	T	Cultivated	Common
03	Caesalpinia pulcherima (L) Sw.	Galtoro	S	Cultivated	Common
04	Caesalpinia crista L.	Kachka	S	Cultivated	Common
05	Cassia absus L.	Chimed, Chon	H	Wild	Not common
06	Cassia auriculata L.	Aval	S	Wild	Not common
07	Cassia fistula L.	Garmalo	T	Wild	Very common
08	Cassia javanica L.	Abbo	T	Cultivated	Common
09	Cassia obtusifolia L.	Punvadio	H	Wild	Common
10	Cassia occidentalis L.	Kasundro	H	Wild	Very common
11	Cassia siamea Lam.	Kasid	T	Cultivated	Very common
12	Cassia sophora L.	Kasundri	Us	Wild	Common
13	Cassia tora L.	Kuvandio	H	Wild	Very common
14	Delonix elata (L.) Gamble.	Sandhesaro	T	Cultivated	Not common
15	Delonix regia (Boj.)	Gulmahor	T	Cultivated	Very common
16	Parkinsonia aculeata L.	Rambaval	S	Cultivated	Not Common
17	Peltophorum pterocarpum (DC.) Backer. ex K. Heyne.	Tamraphali	T	Wild	Common
18	Saraca indica L.	Ashok	T	Cultivated	Not common
19	Tamarindus indica L.	Amla	T	Cultivated	Common

STATISTICAL ANALYSIS OF FAMILY

Table : 2 :

Family: Caesalpiniaceae	No.
Genera	08
Species	19
Herb Species	04
Shrub Species	04
Undershrub Species	01
Tree Species	10
Wild Species	08
Cultivated Species	11

Key to Genera

1. Unarmed,

2. Leaves 1/2 foliolate, deeply cleft from the apex... .. *Bauhinia*

2. Leaves pinnately compound

3. Leaves bipinnate

4. Sepal imbricate *Peltophorum*

4. Sepal valvate... .. *Delonix*

3. Leaves simply pinnate

4. Petal 6, stamens 10, all fertile or 3-5 sterile... .. *Cassia*

4. Petal 3, fertile stamens 3... .. *Tamarindus*

4. Petal absent... .. *Saraca*

1. Armed ,

2. Leaves opposite compound pinnate

compound pinnate ,

3. pod smooth *Parkinsonia*

2. Leaflets opposite compound pinnate,

3. pod spiny *Caesalpinia*

Bauhinia Key to species

1. Flower rosy purple , fertile stamen 3 *B. purpurea*

1. Flower creamy yellow , fertile stamen 10 *B. racemosa*

1. *Bauhinia racemosa* Lam. (Apto)

Encycl. Meth.1:390.1783; FBI 2 : 276 ; FBP 1 : 459 ; FGS 1: 263 ; PNG 262 ; FOS 1 : 197 ; BBM 025

Trees ,with gray or dark-brown bark ; leaves suborbicular, deeply lobed and cordate at base, petiolate ; flowers creamy-yellow or yellow, terminal racemes ; pods, linear, flat, reddish-brown and woody pendent ; seeds globose, smooth, glabrous. Fls. : Jan.-June.

Frs. : Throught the year occasional, found on hillocks in rocky substratum near Dharoi.

2. *Bauhinia purpurea* Lam. (Kanchnar)

Encycl. Meth.1:390.1783; FBI 2 : 284 ; FBP 1 : 459 ; FGS 1: 263 ; PNG 262 ; FOS 1 : 198 ; BBM 415

Trees , with gray or dark-brown bark ; leaves suborbicular, deeply lobed and cordate at base, petiolate ; flowers purple in terminal racemes ; Pods, linear, flat, reddish-brown and woody pendent. Seeds globose, smooth, glabrous. Fls. : Jan.-June. Frs. : Throughtout the year occasional, found in garden near river.

Caesalpinia Key to species

1. Armed climbers

2. Pod spiny... .. *C. crista*

1. Tree or shrubs, Unarmed or weakly armed

2. Shrub , weakly armed , pod flat *C. pulcherima*

3. *Caesalpinia pulcherima* (L) Sw. (Galtoro)

Sp. Pl. 380.1753 FBI 2 : 255 ; FBP 1 : 440 ; FGS 1: 265 ; FOS 1 : 183 ; BBM 026

A tall shrubs ,leaves long pinnate, alternate; leaflets oblong – elliptic; flowers yellow reddish yellow in long terminal racemes; pods linear oblong flattened ; seeds 8-10 smooth , oblong. Fls. & Frs. : throughtout the year, common, found cultivated in garden.

4. *Caesalpinia crista* L. (kachka)

Sp. Pl. 380.1753 FBI 2 : 254 ; FBP 1 : 437 ; FGS 1: 264 ; FOS 1 : 182 ; BBM 414

Shrubs ,leaves long pinnate; leaflets oblong – elliptic; flowers yellow in terminal and racemes; pods oblong flattened ; seeds smooth , oblong. Fls. & Frs. : Aug.-Dec. common, found throughtout in hedgesand in the road side.

Cassia L. Key to Species

1. Tree...

2. Fertile stamen 20 , pod 30 cm or more

long ,cylindric....

3. flower red or pink *C. javanica*

3. Flower yellow... *C. fistula*

2. Fertile stamen 6-7, pod not more than 30

cm, linear *C. siamea*

1. Shrub, under shrub or herbs

2. Fertile, stamens-5, staminods absent.... .. *C. absus*

2. Fertile stamens-7, rest staminods

3. Glands solitary on rachis but not

between pairs of leaflets, lanceolate 4. leaflets

3-5 pair *C. occidentalis* 4. leaflets 6-10 pairs.. *C. sophera*

3. Glands between one or more pairs of leaflets, leaflets obovate,

4. Leaflet pairs-3

5. Gland present between
each of two leaflet pairs

towards base..... *C. tora*

5. Gland present only between

the basal most leaflet pair...

C. obtusifolia 4. Leaflet pairs 8-12...*C. auricu-*

lata

5. *Cassia absus* L. (Chimed, Chon)

Sp. Pl. 376.1753; FBI 2 : 265 ; FBP 1 : 451; FGS 1: 267 ; FOS 1 : 192 ; BBM 097

Suffruticose, erect, 45-60 cm tall herbs, clothed with white pubescence. Leaves 3-5 cm long; leaflets in 2 pairs, ovate-oblong or ovate-elliptic. Flowers pure yellow or tinged red, in terminal and leaf-opposed, racemes. Pods linear-lanceolate dark-brown, glabrescent. Seeds 3-5, shining, black, glabrous, compressed, oblong. Fls. & Frs. : Aug-Dec. common, found in the river side.

6. *Cassia auriculata* L. (Aval)

Sp. Pl. 379.1753; FBI 2 : 263 ; FBP 1 : 448 ; FGS 1: 268 ; PNG 261 ; FOS 1 : 190 ; BBM 027

A tall erect, bushy shrubs, leaves 2.5-8cm long. Leaflets glabrous, obovate and minutely hairy. Flowers yellow, with orange lines in 6-8cm long axillary and terminal, racemes. Pods smooth, linear, flat, pale to dark brown, beaked. Seeds laterally compressed. Fls. & Frs. : Throughout the year, very common, found in the waste lands.

7. *Cassia fistula* L. (Garmalo)

Sp. Pl. 377, 1753 ; FBI 2 : 261 ; FBP 1 : 444 ; FGS 1: 268 ; FOS 1 : 187 ; BBM 273

A tall, deciduous trees, with bark dark-brown and rough bark. Leaves pinnate, petiolate, leaflets in 4-8 pairs, glabrous, entire, base rounded, acute, ovate or elliptic-ovate, petiolate. Flowers bright to golden-yellow, pedicellate, in 20-40cm long, pendent, branched racemes. Pods hard, smooth, dark-blackish-brown, with faint horizontal veins. Seeds ovate, glabrous, smooth. Fls. : Mar-June Frs. : Throughout the year, planted along the river side, also in garden.

8. *Cassia javanica* L.

Sp. Pl. 379, 1753 ; FBI 2 : 267 ; FBP 1 : 444 ; FGS 1: 269 ; BBM 316

A tall trees, with grayish brown and smooth bark; leaves pinnate, petiolate, leaflets in 12-16 pairs ovate or elliptic-ovate, petiolate.; flowers pink, pedicellate, in 20-40cm long, pendent, branched racemes. Pods hard, smooth, dark-brown. Fls. : Mar-June Frs. : Apr - Jul, planted along the river sides, also in garden.

9. *Cassia obtusifolia* L. (Punvadio)

Sp. Pl. 377.1753; FBI 2 : 263 ; FBP 1 : 447 ; FGS 1: 271 ; BBM 272

A tall, suffruticose, glabrous herbs. Leaves alternate, 3-6 cm long; leaflets obovate-oblong, glabrous or nearly so. Flowers bright-yellow, in axillary racemes. Pods linear-cylindric, faintly reticulate, beaked. Seeds oblong or sub-cylindric, dark-brown, smooth, glabrous.

Fls. & Frs. : Sep-Jan. Not common, along roads and in the open area of riverside.

10. *Cassia occidentalis* L. (Kasundro)

Sp. Pl. 377.1753; 261 FBI 2 : 262 ; FBP 1 : 445 ; FGS 1: 271 ;

PNG 261 ; FOS 1 : 188 ; BBM 098

Erect, glabrous herbs, Leaves 10-15cm long; leaflets membranous, glabrous above, thinly hairy beneath, subsessile. Flowers bright-reddish-yellow, in 5-15cm long, terminal and axillary racemes. Pods laterally compressed, linear-oblong compressed, linear-oblong. Seeds subcylindric greenish-brown, smooth, glabrous. Fls. & Frs. : Throughout the year common, found as a weed in waste land.

11. *Cassia siamea* Lam. (Kasid)

Encycl. Meth. Bot.1:648.1785; FBI 2 : 264 ; FBP 1 : 454 ; FGS 1: 272 ; FOS 1 : 194 ; BBM 413

A tall trees, with light-blackish-brown, rough, longitudinally fissured bark. Leaves 6-25 cm long; leaflets 6-14 pairs, coriaceous, ovate-oblong or elliptic oblong minutely petiolulate. Flowers pale-yellow, in terminal, branched racemes. Pods blackish-brown, compressed, reticulate, somewhat constricted between seeds, stoutly beaked. Seeds flat, dark-brown, smooth, glabrous. Fls. & Frs. : Almost around the year, Planted along roads and in gardens.

12. *Cassia sophera* L. (Kasundri)

Sp. Pl. 379.1753; FBI 2 : 262 ; FBP 1: 446 ; FGS 1:273;PNG262;FOS1:188;BBM 315

A much branched, glabrous, hairy. Undershrubs; Leaves leaflets 6-10 pair obovate, sessile. flowers yellow in terminal and axillary racemes. Pods narrowly linear, septate within; Seeds flat, dark-brown. Fls. : Aug-dec. Frs. : Aug-Dec. Rare, planted in garden

13. *Cassia tora* L. (Kuvandio)

Sp. Pl. 376.1753; FBI 2 : 263; FBP 1 : 447 ; FGS1: 274 PNG 261; FOS 1: 189 ; BBM 099

A tall, much branched, glabrous, hairy, herbs. Leaves leaflets obovate, sessile. Flowers yellow. Pods narrowly linear, falcate, reticulate veined, beaked. Fls. : Aug-Nov. Frs. : Aug-Dec. commonly found in waste places and in plains.

Delonix

Key to Species

1. Flowers creamy white to pale golden yellow pods 15-25 cm long..... *D. elata*

1. Flowers reddish orange pods 30-40 cm long... ..

... *D. regia*

14. *Delonix elata* (L.) Gamble, (Sandhesro) Fl.Madras Pres.39 6.1919&1:280.1957(reprinted); FBI2:260;FBP1:441;FGS1:274; FOS1:185; BBM 030

A tall, deciduous trees with brown, smooth bark. Leaves 4-15cm long, petiolate, petioles smooth, pinnate 4-6 pairs, leaflets 8-15 pairs, subsessile, smooth, glabrous, obovate or oblong. Flowers in terminal racemes. Pods, pale to dark-brown, linear, glabrous, beaked. Fls. : Nov-Apr. Frs. : Dec-June Wild and Planted near the riverside in garden.

15. *Delonix regia* (Boj.) (Gulmahor)

Raf.Fl.Tel.2:92.1836; FBI 2:260 ; FBP 1: 442 ; FGS 1: 275 ; FOS 1 : 184 ; BBM 028

Tall, deciduous trees, with gray bark. Leaves 8-30cm long, pinnate 8-20 pairs, leaflets 12-30 pairs, oblong, ovate, acute, glabrous; flowers orange coloured with creamy yellow stripes, in 8-20cm long, terminal, simple or branched racemes; pods across, linear, woody, brown or reddish, flat small beaked; seeds oblong, glabrous, smooth, creamy-white. Fls.: Mar-July Frs. : Apr-Aug. Planted in the garden and near river.

16. *Parkinsonia aculeata* L. (Rambaval)

Sp .Pl. 375.1753 ; FBI 2 : 260 ; FBP 1 : 442 ; FGS 1: 275; FOS 1 : 186 ; BBM 100

A large shrub with smooth bark. Leaves 8-30cm long, bipinnate 1-2 pairs, leaflets ovate ; flowers terminal racemes.; pods linear,reticulate; seeds oblong, smooth, dark brown.**Fls.- Frs.** : Jan.-Jun .Planted as hedge and in the garden and near river.

17. *Peltophorum pterocarpum* (DC.) Backer.ex K. Heyne, (Tamraphali)

utt. Fl. Ned.Ind.(ed.2) 2:755. 1927; FBI 2 :257; FGS 1:276;FOS 1:194; BBM 412

An evergreen tall trees with rough brown bark ; leaves long, alternate, pinnate 6-13 pairs, leaflets 6-17 pairs, oblong, glabrous, acute, smooth ;flowers bright yellow, with purple markings in terminal and axillary reddish-brown panicles ; pods across smooth, lanceolate, dark-brown and woody ; seeds obovate-oblong, compressed, smooth.**Fls. & Frs.** : Almost around the year. Planted along riverside by forest department.

18. *Saraca indica* L. (Ashok)

auct . non L. 1767; FBI 2 : 271 ; FBP 1 : 456 ; FGS 1: 277 ; BBM 362

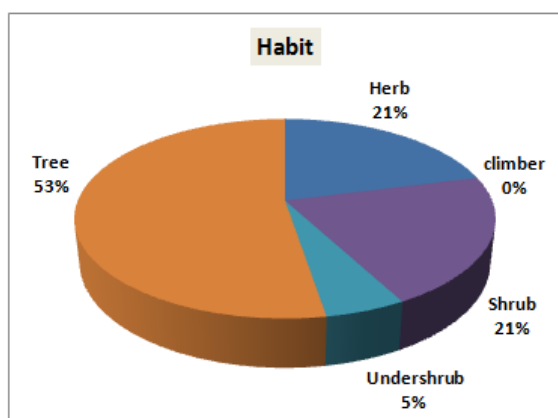
An evergreen tall trees with dark brown rough bark ; leaves long, pinnate leaflets oblong-lanceolate, glabrous, acute, smooth ; flowers creamy yellow in panicle corymb ; pods across smooth, linear -oblong , flat ; seeds ellipsoid-oblong, compressed, smooth.**Fls. & Frs.** : Jan -Jun Planted in the garden near riverside,Indroda nature park

19. *Tamarindus indica* L. (Amli)

Sp. Pl.34. 1753; FBI 2 : 273 ; FBP 1 : 457 ; FGS 1: 276 ; PNG 262 ; BBM 411

A tall evergreen trees with gray, rough bark ; leaves long, leaflets 6-12 pairs, smooth, acute, glabrous, linear-oblong ; flowers yellow, with purple streaks, pedicellate, in lax racemes ; pods across, flat, linear oblong, beaked, with rough fibrous, gray epicarp ; seeds dark brown, smooth, glabrous, rhomboidal **Fls.** : Mar.-July**Frs.** : Apr.-Nov. occasional ,wild or planted near riverside.

DISCUSSION & CONCLUSION:



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