

Observation on Leguminous Plants with Their Taxonomy and Medicinally Uses of Ahmedabad Zoo, Gujarat, India

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ABSTRACT

Kamla Nehru Zoological Garden was established by Rueben David in 1951 CE spread over 21 acres. It was rated the best zoo in Asia in 1974. Kankaria Zoo has also records in breeding of rare species in Zoo like pythons, crocodiles, bearcats and wild asses. Reuben David was awarded Padma Shri in 1974 for it. The present investigations deals with Total 10 plant species are reported from the Ahmedabad zoo campus. I have collected and reported various data with extensive field trips and taken photographs of different plant species and short out in Botanical Name, Family, Fls&Frs, Geographical distribution, Taxonomic description, Medicinal Uses, Chemical Composition of various Angiosperms. All the species identified by using valuable Floras and through proper identification methods held in the Laboratory.

Keywords: Leguminous Plants, Ahmedabad, Medicinal Zoo, Gujarat

I. INTRODUCTION

Ahmedabad is situated in Central Gujarat; it is a largest city of Gujarat state. It lies between 22°55' 35°36' and 23°07' 51°44' North latitude and 72°28' 41°95' and 72°41' 19°59' East longitudes. The Ahmedabad municipal corporation declared the city as megacity and built up Sardar Patel ring road on periphery of the city. Except the peripheral agricultural land, rest part is the city area. It covers 10,000 square kilometer and circumference of the Sardar Patel ring road is 70 kilometer. Kamla Nehru Zoological Garden was established by Rueben David in 1951 CE spread over 21 acres. It was rated the best zoo in Asia in 1974.

I Have Reported Medicinally Uses Of 18 Leguminous Plants Of Ahmedabad Zoo, by the photographs and uses of the medicinal plants. Saxton and Sedgwick (1918 and 1922) studied the plants of North Gujarat. Sutaria (1958), Gandhi (1958), Vaidya and Vora (1964), Vaidya (1967), Pandya (1972), Patel (2010) carried out Floristic study in Ahmedabad. The present paper is there for based on fresh field work carried out

during the year 2015-16 with a few frequent observations in city and vicinity of Ahmedabad city to incorporate data of ornamental plants.

II. METHODOLOGY

Field work The result embodied in this work based on study and collections during 2015-16 to through well planned explorations in these areas. Number of extensive explorations of 10-20 days duration each, were made in different areas of Ahmedabad zoo with emphasis on intensive rather than extensive explorations. Such regions were frequently visited and plants observed and photos are taken of the medicinal plant species. According to Bentham and booker all the selected plants species are arranged and presented with color photographs, Botanical name, Local name, Family and Uses given in the present research paper. Plants were identified by using the Flora of Gujarat state by (Shah 1978) and the text book of systematic botany by and other standard book. Some important information of various medicinal plants collected from.

Observation: List of ornamental plants in Ahmedabad city

PROSOPIS

III. RESULT AND DISCUSSION

RED CALLIANDRA



Figure 1

Botanical name: *Calliandra haematocephala* Hassk.

Family: FABACEAE

Geographical Distribution : Native to tropical and sub-tropical regions of America

Taxonomical Description:

Small, perennial, thornless leguminous tree 10 ft (3 m) or more if not pruned back; grows to 6 ft (1.8 m) with white-reddish brown bark. Leaves are bipinnate and alternate; the rachis is 10-19 cm long, without glands; pinnae are (3-) 6-20 jugate, rachilla are 2-11 cm long; there are 19-60 pairs of leaflets; leaflets are linear, oblong and acute, 5-8 mm x 1 mm. Inflorescences are particulate with flowers in umbelliform clusters, 10-30 cm long. Flower sepals and petals are green, calyx 2 mm long, corolla 5-6 mm long. The numerous red staminal filaments are 4-6 cm long. Fruits are broadly linear, flattened, 8-11 cm x 1.0 cm with thickened and raised margins, finely pubescent or glabrous, brown dehiscent, 8- (12) seeded. Seeds are ellipsoid, flattened, 5-7 mm long and mottled dark brown.



Figure 2

Botanical name: *Prosopis juliflora* (Sw.) DC.

Family : FABACEAE

Geographical Distribution : Sri Lanka, Mexico, South America and the Caribbean

Taxonomical Description:

Prosopis juliflora is a shrub or small tree. It grows to a height of up to 12 metres (39 ft) and has a trunk with a diameter of up to 1.2 metres (3.9 ft).[2] Its leaves are deciduous, bi-pinnate, light green, compounded with 12 to 20 leaflets. Flowers shortly after leaf development. The flowers are in 5–10 cms. long green-yellow cylindrical spikes, which occur in clusters of 2 to 5 at the ends of branches. Pods are 20 to 30 cms. long and contain between 10 and 30 seeds per pod. A mature plant can produce hundreds of thousands of seeds. Seeds remain viable for up to 10 years. The tree reproduces by way of seeds, not vegetatively. Seeds are spread by cattle and other animals that consume the seed pods and spread the seeds in their droppings.

Uses:

Its uses include forage, wood and environmental management.

The plant possesses an unusual amount of the flavanol (-)-mesquitol in its heartwood.

MOTOSISAM



Figure 3

Botanical name : *Dalbergia sissoo* Roxb.

Family : FABACEAE (PAPILIONACEAE)

Fls. & Frs. : Jan.-Oct.

Geographical Distribution : Afghanistan, Pakistan, India.

Taxonomical Description :

Trees upto 10 m tall. Bark thick, light-brown, longitudinally furrowed. Leaves imparipinnate, leaflets 3-5, 1.2-2.5 x 0.5-5.7 cm broadly-ovate, suborbicular, base cuneate, leaf rachis zigzag, terminal largest and lowest smallest, alternate, base narrowed. Flowers in axillary panicles. Calyx campanulate, teeth short, ciliate. Corolla pale-yellow, standard broad, limb obovate-orbicular. Stamens 9, monadelphous in one bundle. Pods 5.0-6.7 x 0.9-1.2 cm, lanceolate, glabrous, reticulate, narrowed at base. Seeds 1-4 brownish, subreniform, glabrous.

Medicinal uses :

Bark: Cholera

Leaves : Eruptions

Stem : Leprosy

KARANJ



Figure 4

Botanical name :

Derris indica (Lam.) Bennet Syn. *Pongamia pinnata* (L.) Pierre.

Family : FABACEAE (PAPILIONACEAE)

Fls. & Frs. : Feb.-July.

Geographical Distribution : Pakistan, India, Sri Lanka, Burma.

Taxonomical Description :

Trees upto 7-15 m tall. Bark grayish-white, rough. Leaves imparipinnate, leaflets 5-9, 6.0-8.4 x 4.1-5.2 cm, coriaceous, broadly ovate or ovate-oblong, acute, stipules oblong. Petioles 2.8-3.3 cm long. Flowers white or purplish, in axillary racems. Calyx campanulate, truncate. Corolla pinkish-white, standard suborbicular, emarginated, claw very short. Stamens 10, monadelphous, anthers versatile. Pods 3.8-4.9 x 1.7-1.9 cm thick elliptic-oblong, compressed, glabrous, smooth, obliquely, woody. Seeds oblong or slightly reniform, brown, rugose.

Medicinal uses :

Roots : Digestive disorders, fever, stammering

Seed oil: Skin diseases

Whole plant : Eye diseases, hair care, itching, piles, ulcers, wounds.

KANCHNAR



Figure 5

Botanical name : *Bauhinia purpurea* L.

Family : CAESALPINIACEAE

Fls. & Frs. : Sep.-Feb.

Geographical Distribution : Arabia, Abyssinia & Soctra, Tropical Africa, Madagascar, India, Sri Lanka, Burma, Malaysia, Java Sumatra & Sunda, Philipines, New

Guinea, W. Indies, Central America & Mexico, Brazil.

Taxonomical Description :

6-10 m tall, trees. Bark, grey, or dark-brown. Leaves suborbicular, coriaceous, deeply lobed cordate base, petiolate. Flowers 3-8 cm across, in 5-12 cm long, terminal racemes. Pods 20-25 × 2-2.5 cm linear flat, apiculate, reddish-brown, woody pendent. Seeds globose, smooth, glabrous.

Medicinal plants:

Bark: Cuts, small pox, ulcers, wounds

Leaves : Lung and chest diseases

KASHID TREE



Figure 6

Botanical name: *Cassia siamea* Lam.

Family: CAESALPINIACEAE

Geographical Distribution :

Taxonomical Description:

Medium size tree grows up to 18 m. It is often used as shade tree. *Cassia siamea* is a medium sized evergreen tree having a great many branches. The leaves are arranged in cascades and the yellow flowers hang in bunches not unlike grapes. The tree grows under humid conditions but does not prefer waterlogging. Flowering occurs from June to January. It can be used for avenue plantation.

Medicinal uses :

The products are only recommended for short-term use, and chronic use and abuse of senna has been associated with organ failure.

Siamese Senna are used as herbal remedies in Nigeria to treat various conditions, including constipation, fungal skin infections and hemorrhoids.

KASOTRI, ASOTRI



Figure 7

Botanical name : *Bauhinia racemosa* Lam.

Family : CAESALPINIACEAE

Fls. : Jan.-June **Frs. :** Throughout the year.

Geographical Distribution : India, Sri Lanka, Java Sumatra & Sunda.

Taxonomical Description :

Deciduous trees upto 3-5 m tall. Bark dark brown, rough, longitudinally fissured. Leaves broader than long 3.5-6.9 × 3.0-8.4 cm green, tomentose, base cordate, petiolate; Petioles 1.0-1.6 cm long. Flowers creamy-yellow, in terminal or leaf-opposed, racemes, bracts, linear, acute. Calyx pubescent, spathaceous. Corolla obovate-spathulate, yellow, narrowly oblanceolate. Stamens 10, all fertile, filaments hairy at base. Pods stalked 6.5-8.8 cm, linear-oblong, woody, slightly curved, dark-brown. Seeds oblong compressed, glabrous, brown.

Medicinal uses :

Leaves : Diarrhoea, dysentery, lung and chest diseases, throat troubles, tumours, urinary problems

Root bark: Intestinal diseases

Stem bark: Diarrhoea, dysentery, emmenagogue, intestinal diseases, skin diseases, throat troubles, tumours, urinary problems

GARMALO



Figure 8

Botanical name : *Cassia fistula* L.

Family : CAESALPINIACEAE

Fls. : Mar.-June

Frs. : Throughout the year.

Geographical Distribution : India, Sri Lanka, China, Malaysia.

Taxonomical Description :

6-10 m tall, deciduous trees. Bark dark-brown and rough in older parts. Leaves paripinnate, 20-45 cm long leaflets 4-8 pairs, 8-20 x 3.0-8.5 cm, ovate or elliptic-ovate, acute, obtuse, petiolates 2.0-5.0 cm long, glabrous. Flowers bright to golden yellow, in 19.0-27.5 cm long lax racemes, drooping. Calyx imbricate, oblong. Petals 5 yellow, obovate, subequal, clawed. Stamens 10, longest 3 are much curled and bear large, oblong, much curved anthers, the 4 median. Stamens straight and 3 remaining very short and erect staminodes. Pods 35-40 cm long, dark blackish-brown with faint horizontal veins. Seeds ovate or ellipsoidal, glabrous, smooth.

Medicinal uses :

Bark: Ear complaints, rabid bite, stomach disorders.

Fruits : Haemorrhoids, purgative

Leaves : Leprosy, skin diseases, syphilis, throat troubles

Roots : Leprosy, skin diseases, syphilis, throat troubles

Seeds: Antidote

GULMAHOR



Figure 9

Botanical name : *Delonix regia* (Boj.) Raf.

Syn. *Poinciana regia* Boj.

Family : CAESALPINIACEAE

Fls. : Jan.-May **Frs. :** June-Dec.

Geographical Distribution : Madagascar, India, Central America & Mexico.

Taxonomical Description :

7-12 m tall deciduous trees, with grey to pale-brown bark. Leaves 8-30 cm long, pinnae 8-20 pair leaflets 12-30 pairs, 0.8-1 x 0.4-0.5 oblong, glabrous or nearly so. Flowers 4.5-5.5 cm across in 8-20 cm long terminal, simple or branched racemes. Pods 30-40 x 3-4 cm, broadly linear, woody dark-brown or reddish-brown flat, beaked. Seeds oblong, glabrous smooth, white or creamy-white, mottled brown.

Medicinal uses :

Bark: Febrifuge

TAMRAFALI



Figure 10

Botanical name : *Peltophorum ptereocarpum* (DC.)
Backer. ex k.

Family : CAESALPINIACEAE

Fls. & Frs.: Throughout the year.

Geographical Distribution : India.

Taxonomical Description :

5-16 m tall, green trees, younger parts rusty-brown or grayish tomentose. Leaves 12-30 cm long alternate pinnae 6-13 pairs leaflets 6-17 pairs. 0.6-2 × 0.3-0.8 cm, oblong glabrous. Flowers bright-yellow in 10-32 cm long terminals and axillary reddish-brown panicles. Pods 5-10 × 1.6-2.2 cm, lanceolate, dark-brown, woody, seeds obovate-oblong, compressed, smooth, glabrous.

Medicinal uses :

Leaves : Swelling

ASHOK



Figure 11

Botanical name : *Saraca asoca* (Roxb.) de Wilde.

Family : CAESALPINIACEAE

Fls. : Dec.-Apr. often throughout the year.

Geographical Distribution : India, Sri Lanka

Taxonomical Description :

6-7 m tall, evergreen tree, with dark-brown, rough bark. Leaves 15-20 cm long, leaflets oblong-lanceolate, glabrous, coriaceous, petiolulate. Flowers yellow or reddish-yellow, in 7-10 cm broad axillary corymbs on old wood, rarely axillary. Pods 10-20 × 3.5-5.5 cm, linear-oblong, flat, glabrous, coriaceous, veined. Seeds

ellipsoid-oblong, slightly compressed, brown, smooth, glabrous.

Medicinal uses :

Bark : Colic, dysentery, Dispepsia, fever, Leucorrhoea, menorrhagia, pimples, polyuria, ulcers

Flowers : bleeding piles, dysentery, haemorrhoids, inflammations, syphilis, scabies

Leaves : Stomach ache

Seeds : Fractures, strangury

AMBLI, AMLI



Figure 12

Botanical name : *Tamarindus indica* L.

Family : CAESALPINIACEAE

Fls. : Mar.-July **Frs. :** Apr.-Nov.

Geographical Distribution : Tropical Africa, India.

Taxonomical Description :

Evergreen tree 12-18 m tall. Bark dark-grey or light-black, rough, longitudinally fissured. Leaves 3.2-6.0 cm long, stipules linear, caduceous. Leaflets 10-20 pairs, linear-oblong, 0.7-1.2 × 0.3-0.5 cm subcoriaceous, glabrous, oblong, obtuse. Flowers yellow with purple streaks, in 4.0-6.5 cm long lax few flowered racemes. Pedicels 0.2-0.6 cm long, bracts concave. Calyx tube turbinate segments 4, membranous. Petals 5, upper 3 developed, lower 2 reduced. Stamens 3 fertile. Pods 3.5-5.0 × 1.8-2.1 cm, subtorulose, linear-oblong, fibrous, slightly curved, scurfy. Seeds 3-12, obovate-oblong, truncate at ends, compressed, smooth, brown, shining.

Medicinal Uses :

Roots : Digestive disorders, inflammations, laxative

Leaves : Analgesic, fever, skin diseases, swellings

Seeds : Antidote, intestinal diseases

BAVAL, KALO BAVAL



Figure 13

Botanical name : *Acacia nilotica* (L.) Del. Sub Sp. *indica* (Bth.) Brenan

Family : MIMOSACEAE

Fls. : July-Oct. **Frs. :** Aug.-Dec.

Geographical Distribution : Arabia, Tropical Africa, Natal ECP, India, Sri Lanka.

Taxonomical Description :

3-9 m tall trees. Bark brown or black longitudinally fissured. Leaves 2.0-4.5 cm long, bipinnate, main rachis hairy with glands, leaflets 10-25 pairs, minute, linear-oblong, glabrous. Petioles 0.5-1.8 cm long, stipular spines variable 0.5-2.3 cm long. White, sharp, straight. Flowers yellow, in globose heads, bracteoles 2 above the middle of the peduncle. Calyx campanulate, teeth very short. Corolla tubular, lobes triangular. Pods 8.0-9.5 x 1.2-1.8 cm, linear-oblong, glaucous-green, jointed, compressed, orbicular, hairy. Seeds 8-12 brownish-black, oblong, compressed, glabrous.

Medicinal uses :

Bark: Astringent, biliousness, bronchitis, cough, diarrhoea, dysentery, leucoderma, piles, skin diseases

Flowers: Astringent

Fruits : Backache, eye complaints.

Gum: Sexual disorders

Leaves : Diarrhoea, eye complaints, gonorrhoea

Seeds: Diarrhoea, dysentery, ulcers.

CORAL TREE, RED SANDALWOOD, SAGA SEED TREE



Figure 14

Botanical name: *Adenantha pavonina* L.

Family: MIMOSACEAE

Geographical Distribution : Native to India and southern China, but now found throughout the tropics.

Taxonomical Description:

Spreading rounded crown, grows up to 30m. Leaves: Compound bipinnate. Green when young, turning yellow when old. Flowers: Tiny, yellowish, fragrant in dense drooping rat-tail like flower heads. Fruits: Curved hanging green pods that turn brown, coil up and split open as they ripen to reveal small bright red seeds. The seeds can only germinate if they are scratched (scarified), boiled for one minute, or dipped in sulphuric acid. This suggests that in nature, they must be eaten and go through the digestive system of an animal before germination. The tiny flowers are said to smell vaguely like orange blossoms.

Medicinal uses :

The ground seeds are used to treat boils and inflammations.

A decoction of the leaves is used to treat gout and rheumatism.

The bark was used to wash hair.

The ground seeds can produce an oil which was used as an industrial lubricant.

KALO SARAS, SIRIS, MOTI HARADI



Figure 15

Botanical name :*Albizia lebeck* (L.) Bth. (Syn. *Mimosa lebbreck* L.

Family : MIMOSACEAE

Fls. : July-Oct. **Frs.** : Oct.-Mar.

Geographical Distribution : Afghanistan, Tropical Africa, India, Sri Lanka, Malaysia, Java Sumatra & Sunda, Philipines, New Guinea.

Taxonomical Description :

Deciduous trees upto 15-20 m tall. Bark pale; leaves abruptly bipinnate with a gland on petiole, above base, pinnae 2-3 pairs, leaflets 5-9 pairs with glands between their bases, the lateral leaflets elliptic-oblong or obovate, coriaceous, pubescent beneath. Flowers white, in globose umbellate heads. Calyx pubescent, teeth short deltoid. Corolla funnelshaped, triangular, acute. Stamens indefinite, exerted much longer than corolla. Pods 20.5-24.6 cm long linear-oblong, pale yellow, bluntly pointed, smooth, shining. Seeds 4-12 slightly reniform, smooth, yellowish-brown.

Medicinal uses :

Bark: Astringent

Flowers: Boils

Leaves : Night blindness

Roots : Ulcers

Seeds: Diarrhoea, dysentery, piles

PARDESI BAVAL, LISOBAVAL



Figure 16

Botanical name :*Leucaena leucocephala* (Lam.) de Wit. Syn. *L. latisiliqua* L.

Family : MIMOSACEAE

Fls. : May-Nov. **Frs.** : May-Feb.

Geographical Distribution : Afghanistan, India, Sri Lanka, Malaysia, Java Sumatra & Sunda, Philipiens, New Guinea, Brazil.

Taxonomical Description :

Trees upto 6-8 m tall. Leaves 2-pinnate, 10-20 pairs, petioles 4.0-5.6 cm long, pinnae 3-8 pairs, leaflets 10-20 pairs 0.5-1.5 x 0.2-0.3 cm membranous, linear-oblong, glabrous, base oblique. Flowers creamy in dense globose heads, heads 1.5-2.5 cm, across. Calyx tubulose, campanulate, membranous tooth, triangular. Corolla free, petals spatulate, oblong, whitish. Stamens 10, exerted. Pods 1.3-22.8 x 0.2- 2.0 cm, flat, glabrous linear oblong, strap-shaped, narrowed at base, dark, brown. Seeds 15-20 ovoid compressed.

Medicinal uses :

Bark: Analgesic

GORAS AMLI, VILAYTI AMLI

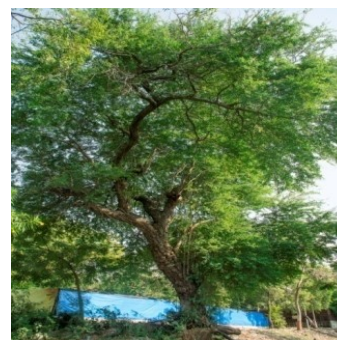


Figure 17

Botanical name : *Pithecellobium dulce* (Roxb.) Bth.

Family : MIMOSACEAE

Fls. : Nov.-Apr. **Frs. :** Dec.-June

Geographical Distribution : India, Philipines, Central America & Mexico, Brazil.

Taxonomical Description :

Armed trees upto 5-10 m tall. Bark rough, longitudinally, fissured grayish-black. Leaves bipinnate, stipules modified into spines, leaflets 2, oblique, obovate, oblong, obtuse, coriaceous, glabrous, 1.0-2.5 x 0.3-1.3 cm flowers white, sessile in small heads forming terminal racemose panicle. Calyx small, 5-toothed. Corolla tubular, valvate. Stamens monadelphous. Pods fleshy, twisted 3.0-14.1 x 0.8-1.0 cm torulose, spiral. Seeds black, compressed, polished, broadly ovate, covered by red or dirty green aril.

Medicinal uses :

Leaves : Swelling

Pods: Cooling

KHIJADO, SAMI



Figure 18

Table 1. Check List of Leguminous Plants of Ahmedbad Zoo

Sr. no.	Botanical Name	Local Name	Family
1	<i>Calliandra haematocephala</i>	Red Calliandra	Fabaceae
2	<i>Prosopis juliflora</i> (Sw.) DC.	Prosopis	Fabaceae
3	<i>Dalbergia sissoo</i> Roxb. Family :	Motosisam	Fabaceae
4	<i>Derris indica</i> (Lam.) Bennet Syn. <i>Pongamia pinnata</i> (L.) Pierre.	karanj	Fabaceae

Botanical name : *Prosopis cineraria* (L.) Druce

Family : MIMOSACEAE

Fls. & Frs. : Oct.-June.

Geographical Distribution : India, Philipines, Central America & Mexico, Brazil

Taxonomical Description :

Trees upto 9-18 m tall. Bark rough, yellowish or blackish-brown. Leaves bipinnate, 3.0-6.0 cm long. Pinnae 2-pairs, with insect galls, on their rachis, leaflets 7-12 pairs, oblong, oblique, rounded, mucronate at apex, hairy. Flowers yellow, in 4.0-9.0 cm long, axillary, branched spikes. Calyx cup-shaped, membranous. Corolla yellow, connate. Stamens 10, free, exserted. Pods 5.0-15.0 cm long, turgid, straight, 10-15 seeded, glabrous. Seeds ovoid-oblong, shining, wrinkled.

Medicinal uses :

Roots : Appetizer, astringent, joint pains, ophthalmia, rheumatism

Stem bark: Diabetes

5	Bauhinia purpurea L. <u>Family :</u>	Kanchnar	Caesalpiniaceae
6	Cassia siamea Lam.	Kashid tree	Caesalpiniaceae
7	Bauhinia racemosa Lam. <u>Family :</u>	Kasotri	Caesalpiniaceae
8	Cassia fistula L.	Garmalo	Caesalpiniaceae
9	Delonix regia (Boj.) Raf. Syn. Poinciana regia Boj.	Gulmahor	Caesalpiniaceae
10	Peltophorum ptereocarpum (DC.) Backer. ex k.	Tamrafali	Caesalpiniaceae
11	Saraca asoca (Roxb.) de Wilde.	Ashok	Caesalpiniaceae
12	Tamarindus indica L.	Ambli	Caesalpiniaceae
13	Acacia nilotica (L.) Del. Sub Sp. indica (Bth.) Brenan	Baval	Mimosaceae
14	Adenantha pavonina L.	Red sandal wood	Mimosaceae
15	Albizia lebeck (L.) Bth. (Syn. Mimosa lebbreck L.	Kalo Saras, Siris, Moti Haradi	Mimosaceae
16	Leucaena leucocephala (Lam.) de Wit. Syn. L. latisiliqua L.	Liso baval	Mimosaceae
17	Pithecellobium dulce (Roxb.) Bth.	Goras Aml, Vilayti Aml	Mimosaceae
18	Prosopis cineraria (L.) Druce	Khijado, Sami	Mimosaceae

IV. CONCLUSION

The work regarding different palm species is constantly changing and will likely continue to do so. The present investigations deals with Total 18 plant species are reported from the Ahmedabad zoo campus. It is also hoped that this work will help to inspire others to learn more about our natural heritage, and to continue where we leave off by discovering additional species of plants and more accurately determining the distribution and abundance of plant species in Ahmedabad zoo.

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