

MORPHOLOGY

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For the economy of space, titles of some journals, floras, monographs and other pertinent literature frequently used have been abbreviated. The abbreviations used are as follows:

Amer.Nat.	.. American naturalists
Ann. Arid Zone	.. Annals of Arid zone
Bhandari	.. Flora of the Indian desert.
BOBSI	.. Bulletin of the Botanical Survey of India.
C.	.. The Flora of the Presidency of Bombay (Reprinted edition): by Cooke Theodore.
Curr.Sci.	.. Current Science
<u>et al.</u>	.. and others.
FBI	.. Flora of British India by Hooker,J.D.
FGS	.. Flora of Gujarat State:By Shah,G.L.
Fl. Mad.	.. Flora of the Presidency of Madras: By Gamble, J.S. and C.E.S. Fisher.
Fl.W.Pak.	.. Flora of West Pakistan, By Nasir,E. and S.I.Ali.
G.	.. Gujarati Language
J.Bio.Sci.	.. Journal of Biological Science
K.	.. Kachchhi Dialect.

Capparis cartilaginea Decne FGS. 1: 68.

Capparis spinosa Linn. Var. (galeata) Hk f. & Th.

FBI.1:173; C.1 : 47; Fl.Wt Pak:

A diffusely prostrate much branched shrub, about 30-60 cm tall. **Stem.** yellowish-green turns dusty white to brown on maturity, cylindrical; branches terete, mostly glabrous; internodes 5-7 cm long. **Leaves** simple, alternate at base and opposite at the apex, petiolate, stipulate, glaucous, fleshy, succulent 2.5-5 x 1.5-3 cm; petiole - glabrous, somewhat ridged, 5-16 mm long; stipules - thorny, hooked, 3-5 mm; lamina - broadly ovate - obovate, sometimes orbicular, glabrous, mostly rounded at the base, entire, mucronate, reticulately veined. **Flowers** solitary, axillary, crowded towards apex, zygomorphic, pedicellate, hermaphrodite, hypogynous; pedicel - jointed 5-7 cm long, Calyx - polysepalous, green, sepals-4, connate at the base, subequal, deeply saccate, enclosing the remaining floral parts, upper much smaller, ovate - oblong, concave, 2-5 cm long; Corolla - polypetalous, white, petals-4, ovate, 2.5-4 cm across, exceeding the calyx; androecium - stamens oo inserted on the torus, purple, longer than petals, anthers basifixed, ditheous, white, 1.5-3 mm across; gynoecium - ovary bicarpellary, syncarpous, stalked, stalk 3.5-5 cm long, 5-10 mm across; style terminal, 2-2.5 mm long; stigma sessile, bifid. **Fruits** elongated berry, reddish

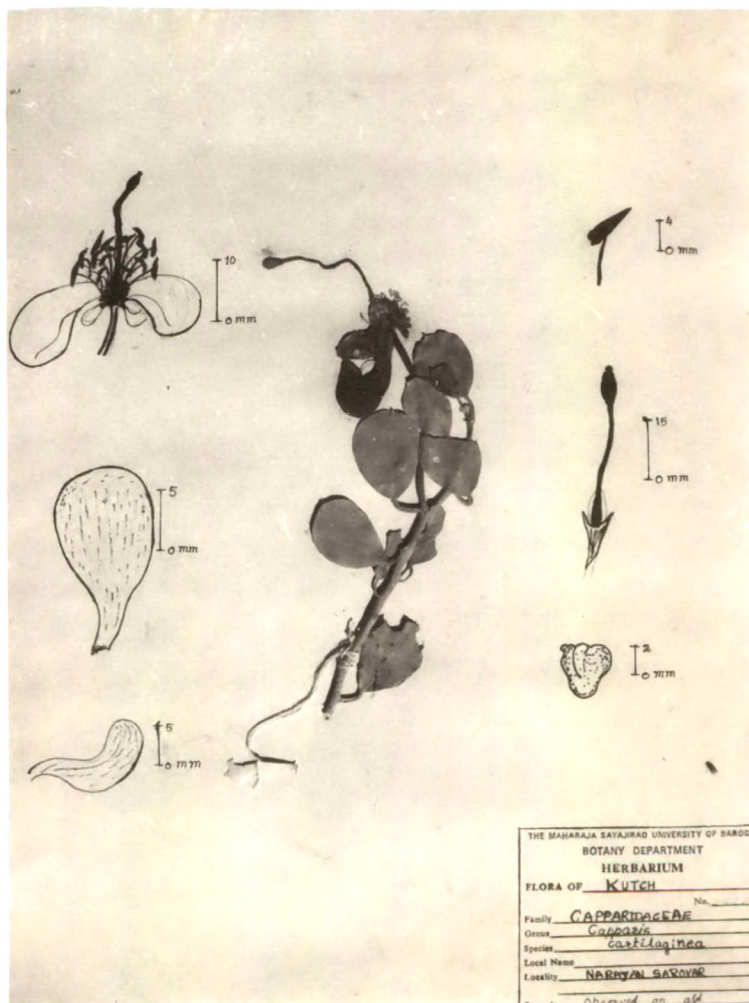


Plate No.16 Capparis cartilaginea Decne.

when ripe, 5-7 cm long **Seeds** globose, smooth, brown
1.5-2.5 mm across. (Fig. Pl no 16)

Local name : Katar

Fls. : Sept. to Nov.,

Frs : Oct. to Jan.

Locality : Narayan Sarovar, Tera

Coll.No. : VMR 11, VMR 18,

Notes: Observed growing in isolated patches in crevices of
old walls and rocks, at 2 spots only.

Abutilon pannosum (Forst.f.) Schlect. FBI. 1:327, Bhandari
58; Fl. W. Pak. 100: 65

Abutilon glaucum (Cav.) Sweet; FGS. 96.

Abutilon muticum Mast. in FBI.1:327.

An erect, profusely branched perennial, thoroughly tomentose undershrub, about 150-180 cm tall. **Stem** yellowish-green, brown at the base, cylindrical; internodes 9-14 cm long. **Leaves** simple, alternate, petiolate, stipulate, densely hairy on both the surfaces, 4-10 x 5-12 cm; petiole - canaliculate, velvety, 3-10 cm; stipules - linear-lanceolate, acute, longitudinally grooved, caducous, 6-10 mm long; lamina - ovate - broadly ovate, cordate at the base, irregularly serrate, acuminate, reticulately veined. **Flowers** solitary, axillary, appearing in raceme on terminal branches

by reduction of leaves, actinomorphic, pedicellate, hermaphrodite, hypogynous; pedicel - 2-3 cm long, jointed above the middle, velvety; calyx - gamosepalous, green, villose, persistent, 1-1.5 cm long, lobes - 5, ovate, half the total length of calyx tube, shortly acuminate; Corolla - polypetalous, yellow, petals - 5, ovate, slightly clawed, hairy on margin, 2-3.5 cm across; androecium - stamens oo, monoadelphous, staminal tube yellow, upper part antheriferous; filament yellowish 2-4 mm; anthers dorsifixed, reniformed, yellow, 1-celled, 2-3 mm across; gynoecium - carpels oo, ovary syncarpous 4-6 mm in diam; many loculed, 3 ovules per locule, style terminal, yellowish orange; stigma capitate. Fruits capsule, globose, villose, mature one shows carpels separating from one another, mericarps conspicuous. Seeds 3 in each mericarp, reniform, brown-black, woolly, 1-2 mm across. (Fig. Pl. no. 17)

Local name : Dalkamli, Dabliar

Fls . : Aug. to Jan.

Frs. : Oct. to Feb.

Locality : Nalia, Tera

Coll No. : VMR 13, VMR 27

Notes: The plant is observed growing alongwith Solanum indicum, Aerva javanica and Alternanthera hybridis as the common associates.

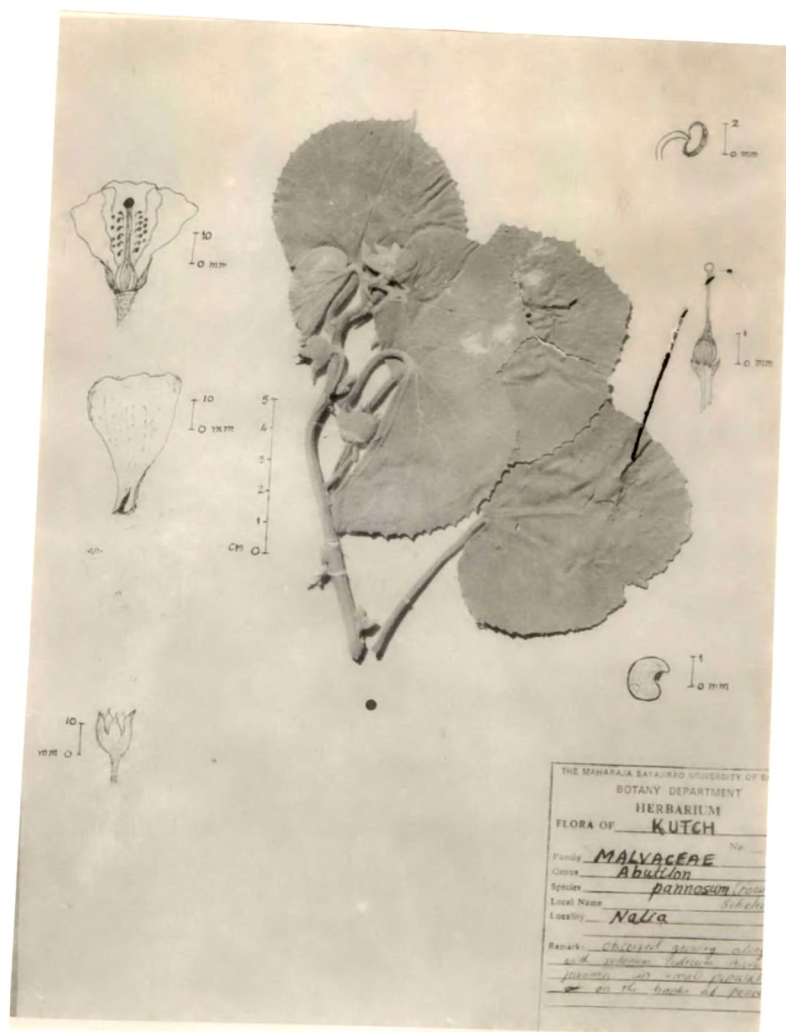


Plate No.17 Abutilon pannosum (Forst. f.) Schelect.

Pavonia arabica Hochst & Steud. FBI.1:331; C.1:107; Bhandari 63; FG.1:111; Fl.W.Pak.100:129.

An erect dichotomously branched, stellately pubescent. large herb or under shrub; about 30-80 cm high. Stem greenish-yellow, turns brown on maturity, basal portion woody and apical herbaceous, cylindrical; internodes 2-4 cm long, branches slender, Leaves simple, opposite-subopposite, petiolate, stipulate, densely pubescent on both surfaces, paler beneath; 1.5-2.5 x 2-5 cm; petiole - sometimes ridged, hairy, .75 -1.5 cm long; Stipules - linear, caducous, 4-7 mm long; lamina - ovate-elliptic, cordate, entire, obtuse, with 1-3 short dentation at the apex, prominent veins on lower side, lower surface paler than upper one. Flowers solitary, axillary, aggregated towards apex, actinomorphic, pedicellate, hermaphrodite, hypogynous; pedicel - 1-1.5 cm, jointed at the tip, pubescent; epicalyx - 10-14, linear, hairy, persistent, longer than corolla, 1.5-2 cm; calyx - gamosepalous, green, hairy, persistent, 7-10 mm long, 5-lobed, lobes $\frac{1}{2}$ the length of calyx, lanceolate acute; Corolla-polypetalous, pink, ovate, hairy at the base, 1-1.5 cm across; androecium - stamens many, monadelphous, staminal tube reddish pink; filaments arising throughout the tube, pink, filiform, 1-2 mm; anthers dorsifixed, reniform, 1-celled, pink, 2-3 mm across; gynoecium - carpels - 5, 3-4 mm across; ovary syncarpous, 5-celled, 1-ovuled, style terminal, villose; stigma pink, capitate. Fruits loculicidal

capsule, oblong-globose, 5-valved, 5-8 mm in diam. Seeds pale brown, glabrous, 1 in each mericarp, oblong slightly winged at the apex, 2-3 mm long. (Fig. Pl. no. 18)

Local name : Rato balbuvaro

Fls. : Aug. to Dec.

Frs. : Sept. to Feb.

Locality : Nakhtrana, Dhinodhar

Coll No. : VMR 9, VMR 22

Notes: Observed as an undergrowth of thorny scrubs at few specific sites only,. The usual associates met with are Sonchus auricomus, Cynodon dactylon, and Convolvulus prostratus.

Pavonia zeylanica (Linn.) Cav. FBI. 1:331; C.1:108; Bhandari 65; FGS.1:112; Fl.W.Pak.100:131.

An erect, profusely branched, pubescent annual/perennial about 30-90 cm high. Stem greenish - yellow turn brown on maturity, woody at base and herbaceous at apex, cylindrical, sometimes ribbed; branches erect-suberect, slender, terrate; internodes 2-3.5 cm long. Leaves simple, alternate, petiolate, stipulate, densely pubescent on both surfaces, 1.5-2 x 2-3.5 cm; petiole-viscous hairy, 1.2-2 cm long; stipules-filiform, hairy, 3-5 mm long; lamina - 3-lobed, lobes generally lanceolate, middle one is longer, punctate or

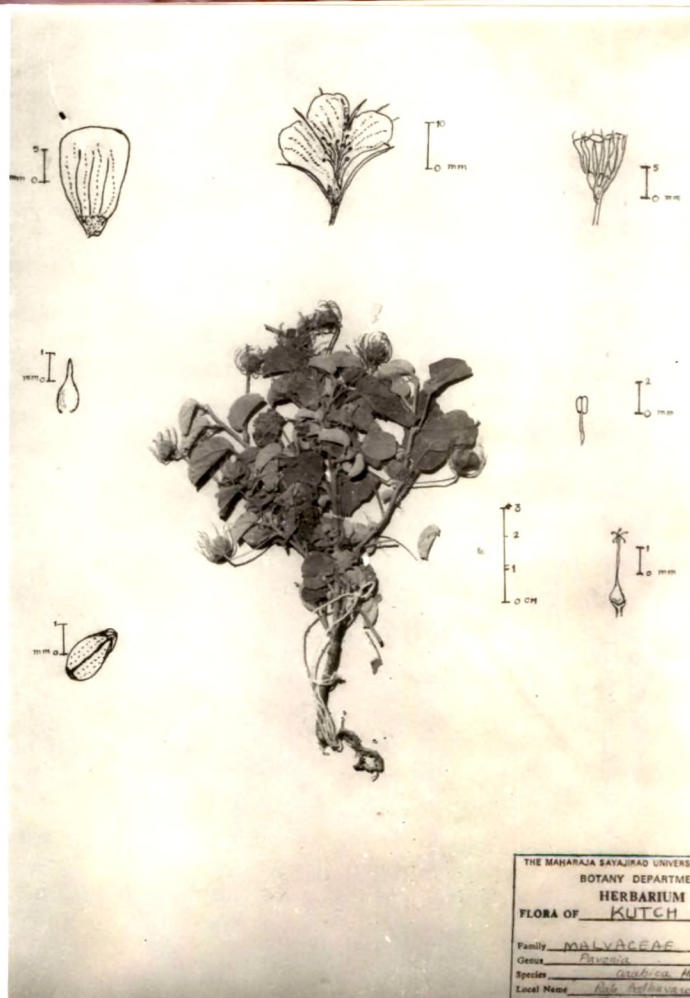


Plate No.18 Pavonia arabica Hochst ex. Steud.

cordate at the base, ovate, irregularly entire somewhat dentate at apex, pubescent on both surfaces, prominent veins 1, reticulately veined. **Flowers** solitary. axillary, aggregated towards apex, actinomorphic, pedicellate, hermaphrodite, hypogynous; pedicel - 2-3 cm long, slender, jointed near or above the middle, pubescent; epicalyx - 10-12, free, filiform. persistent, 7-12 cm, twice as long as calyx or sometimes more; calyx - gamosepalous, green, campanulate, hairy, 5-lobed, lobes lanceolate, acute, persistent, 3-5 mm long; corolla - polypetalous, pink or white, petals-5, ovate, clawed at the base. 0.7-1.75 cm across; androecium -stamens , monoadelphous, staminal tube deep pink, antheriferous throughout; filaments pinkish, 1-2 mm; anthers - reniform. dorsifixed, 1-celled, 2-2.5 mm across; gynoecium + 5-carpeled, syncarpous, 2.5 mm across, ovary - 5 celled, 2 ovuled; style terminal, rounded at the back, pentafid; stigma capitate. **Fruits** loculicidal capsule wedge shaped with marginal wings, 5-valved, minutely pubescent, 0.7-1.2 cm across. **Seeds** 1 - perispermous, oblong brown, slightly pubescent, longitudinal lines are present, 2-4 mm long. (Fig. Pl. no. 19)

Fls. : Aug. to Dec.
 Frs. : Sept. to Feb.
 Locality : Dinodhar, Nakhtrana
 Coll No. : VMR 7, VMR 5.

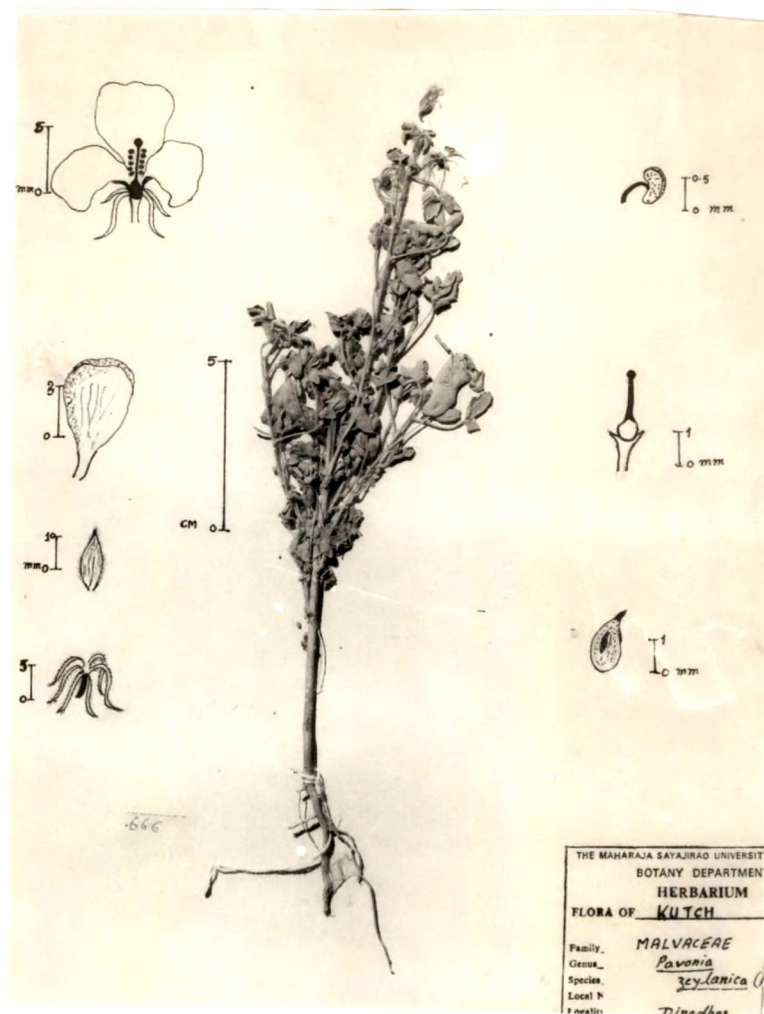


Plate No.19 Pavonia zeylanica (Linn.) Cav.

Notes: Very much restricted in distribution. Observed on gravelly soils of hillocks.

Pavonia grevioides Hochst.ex.Boiss.Fl.W.Pak.100:130

Pavonia ceratocarpa Mast. FBI.1:331;C.1:108;FGS.1:111.

An erect dichotomously branched, slightly hairy, annual perennial undershrub; about 50-70 cm tall. **Stem** greenish-yellow, turns brown on maturity, fissured at the base, herbaceous at the apex; internodes 5-7cm long. **Leaves** simple, alternate, petiolate, stipulate, more or less pubescent, 3-5.5x2.5-3.5 cm; petiole-long somewhat hairy, ribbed, 2-3 cm; stipule - subulate, 1-1.5 mm long; lamina - oblong, rounded or subcordate at the base, serrate, apex, obtuse, stellately hairy when young, pubescent when matured, reticulately veined. **Flowers** solitary, axillary, clustered at the apex or branch tips, actinomorphic, pedicellate, hermaphrodite, hypogynous, pedicel - slender, jointed near the flower, hairy, 1.5-2 cm long, epicalyx - ciliate, 8-10, linear-lanceolate, longer than calyx, connate at the base. 5-7 mm long; calyx - gamosepalous, green, campanulate, 5-lobed, lobes ovate, acute, densely hispid; corolla - polypetalous, yellowish - red, petals-5, connate at the base, jointed to the base of corolla tube, base hairy, 0.7-1.5 cm across, twice as long as calyx, androecium -

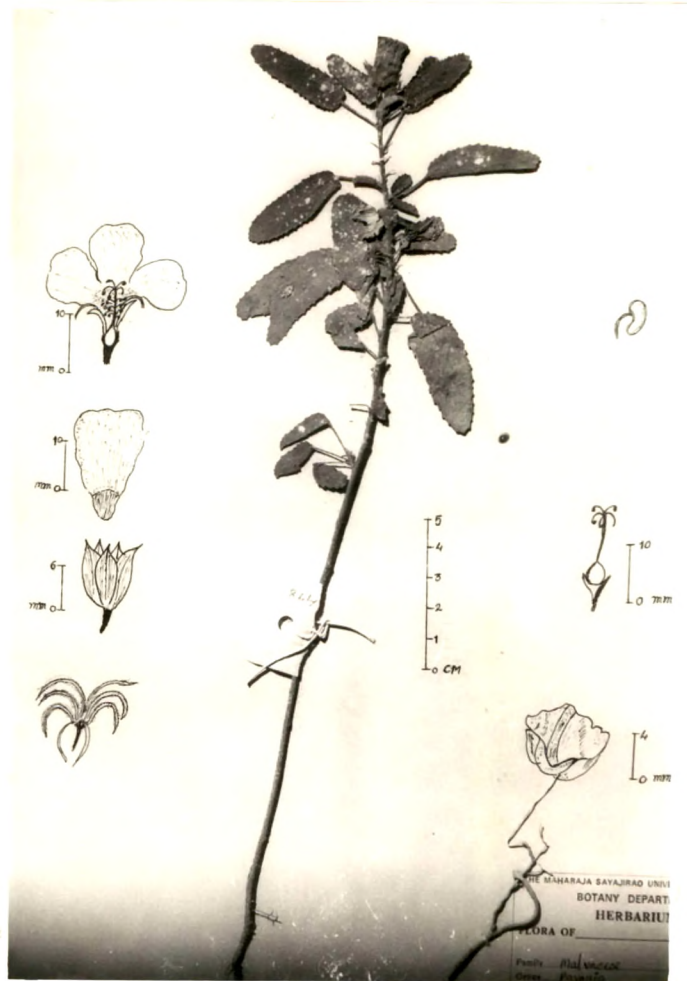


Plate No.20 Pavonia grewoides Hochst. ex. Boiss.

stamens , monoadelphous, staminal tube (dark) yellow, antheriferous above the middle, filaments yellowish, 1-2 mm; anthers reniformed, dorsifixed 1-celled, 1.2-2 mm across; gynoecium - ovary pentacarpellary, syncarpous, triple crested with 3 horn & basal using the appendages, ovary-5 celled, cells-2 ovuled, style terminal, rounded at back, pentafid, stigma capitate. Fruits loculicidal capsule, wedge shaped with marginal wings, 5-valved, minutely pubescent, 0.7-1.2 mm across. Seeds 1-per valve, oblong, brown, glabrous, 2-4 mm long. (Fig. Pl. no. 20)

Local name : Karandia, Khatumbdejo

Fls. : Aug to Sept.

Frs. : Aug to Oct.

Locality : Loriya

Coll No. : VMR 24

Notes: This is a rare plant observed only at Loriya. The usual associates are Hibiscus palmatus, Sida ovata, Justicia heterocarpa and Eragrostis tremula.

Senra incana Cav. FBI.1:331; C.1:110; FGS.1:112; Fl.W.Pak.100; 82'

An erect, spreading much branched, tomentose, perennial undershrub, about 90-120 cm tall. Stem grey, turns brown on maturity, cylindrical; internodes 4-5 cm long. Leaves simple, alternate, petiolate, stipulate, pubescent, upper

surface darker than lower one, 2-4 x 4-6 cm; petiole - hairy, 12-20 mm long; stipules - filiform, 2-4 mm; lamina - 3-lobed, middle one larger, lobes generally deltoid, cordate at the base, distantly serrate, obtuse, reticulately veined, prominent veins-3. Flowers solitary, axillary, crowded towards the apex, actinomorphic, pedicellate, hermaphrodite, hypogynous; pedicel - 5-7 mm, jointed, joint at $\frac{1}{2}$ the total length; involucral bracts-3, large, membranous, free, cordate, reticulately veined, persistent, 1.5-2 x 2-3 cm; calyx - gamosepalous, green, campanulate, persistent, shorter than corolla, 7.5-10 mm long, lobes-5, triangular, acute, 1.5-2 mm in length; corolla - polypetalous, violet to light yellow, petals-5, ovate, 15-25 mm across; androecium - stamens many, mon^oadelphous, staminal tube deep brown-orange, slightly longer than corolla tube, upper part antheriferous; anthers dorsifixed, orange-brown, reniform, 1-celled, 2-4 mm across; gynoecium ovary pentacarpellary, syncarpous, 5-celled, 2-ovuled, 3-5 mm across; style terminal. brown, pentafid at the apex; stigma capitate. Fruits loculicidal capsule, ovoid-globose, puberulous, 5-valved, 10-20 mm in dia. Seeds globular-oblong, brown-black, villose, 3-6 mm across. (Fig. Pl. no. 21)

Local name : Adbau capas

Fls. : Sept. to Jan.

Frs. : Oct. to Mar.

Locality : Narayan Sarovar, Nadibaugh rakhal, Loriya.

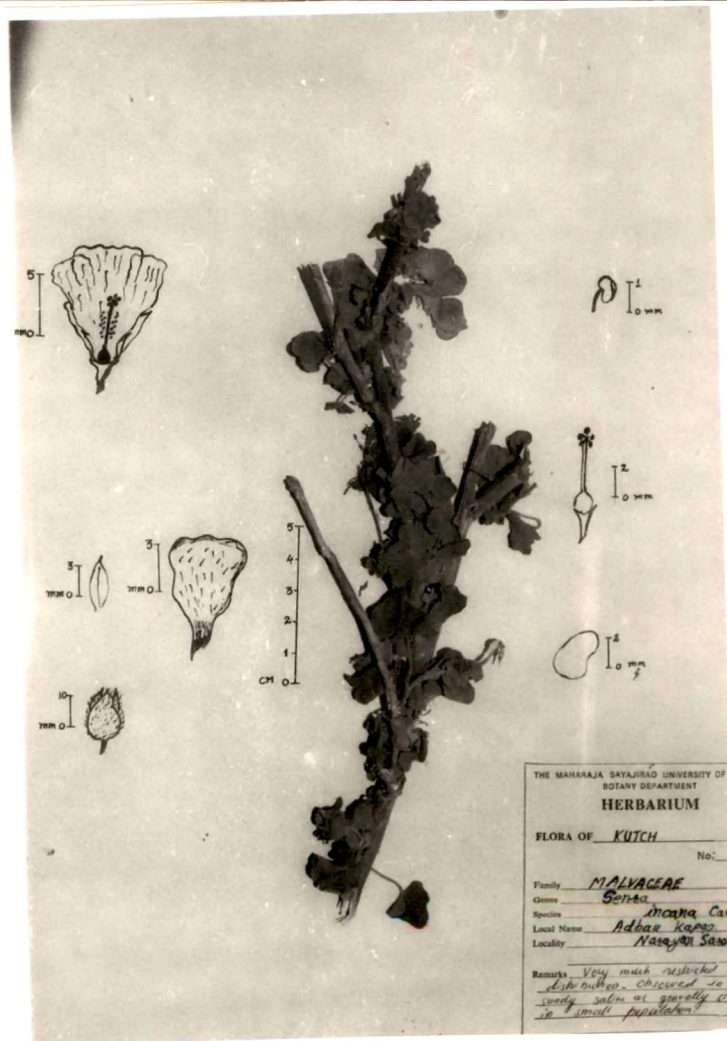


plate No.21 Senra incana Cav.

Coll. No. : VMR 2, 15, 26.

Notes: Loriya population collected from alluvial soils is tallest and less pubescent than other. Two leaves of this population are comparatively larger (3-5 x 4-7 cm). In contrast to this, Narayan Sarovar population collected from sandy saline soils are short sized (1.5-4 x 2.5 cm) and densely pubescent. By and large, plant populations have been observed growing in isolated patches.

Tribulus rajasthanensis Bhandari & Sharma. Bot. Not. 129:367,
1976; Bhandari : 83.

A much branched, diffusely prostrate or somewhat ascending hairy annual herb; about 30-40 cm long. Stem green, turns yellowish-brown on maturity, pubescent, striated; branches somewhat prostrate; internodes 3-4 cm long. Leaves compound, opposite or sometimes alternate, stipulate, equal or unequal at the nodes; stipules - subulate, persistent, 6 mm long; leaflets - petiolulate, oblique, oblong-ovate or lanceolate-ovate, densely pubescent on both surfaces, villose on lower side, 8-13 x 5-7 mm. Flowers solitary, axillary, actinomorphic, pedicellate, hermaphrodite, hypogynous; pedicel - usually shorter than subtending leaf, pubescent, 1-1.5 cm long; calyx - polysepalous, green sepals-5, linear-lanceolate, margin scarious, villose, outside, slightly pubescent inside, acute 6-8 x 1-3 mm;



Plate No. 22 Tribulus rajasthanensis Bhandari et. Sharma.

corolla - polypetalous, yellow; petals-5, obovate, cuneate, with truncate apex, 1-1.2 x 0.5-0.7 cm; androecium - stamens-10, yellow, in 2 whorls, inserted at the base of the disc; filaments unappendaged, 3-5 mm long; anthers basifixed, oblongovate, subequal, 2-2.5 mm long; gynoecium - carpels 5, syncarpous, ovary 2-4 mm across, 5-celled, cells-2 ovuled, ovoid, surrounded by silky hairs; style terminal, stout, stigma pyramidal. **Fruits** schizocarpic, spiny, pubescent, dehiscent into 5 triangular mericarps, 1.4-1.6 cm wide at maturity (two main spines are long). (Fig. Pl.no 22)

Local name : Gokhru

Fls. : Aug. to Dec.

Frs. : Sept. to Jan.

Locality : Anjar, Nakhtrana

Coll.No. : VMR 20, VMR 10

Notes: observed growing on hilly slopes and in fallow fields

Fagonia indica Burm.f.Var. Schweinfurthii Hadidi, Fl.W.Pak.

76:19.

Fagonia cretica auct.non Linn.C.1:173; Bhandari FGS.1:138.

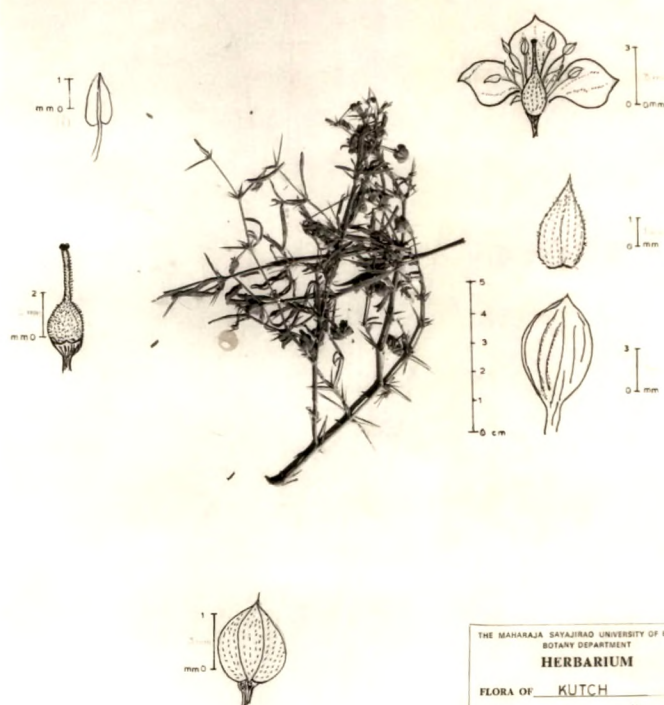
Fagonia arabica Linn. FBI.1:425.

An erect or prostrate, profusely branched glabrous, spiny shrublet about 20-35cm high. Stem green, turns brown at maturity, woody at the base, cylindrical, glabrous; branches

slender; erect or prostrate, terete with 2-4 cm long internodes. **Leaves** compound, trifoliate on lower part and simple, unifoliate at the apex, opposite decussate, petiolate, stipulate, glabrous or glandular, 2-3.5 cm long; petioles - glabrous, terete, 10-15 mm long (in mature); stipules - 2 pairs of sharp thorns, aculeate, shorter than leaves, 6-7 mm long; leaflets - linear-lanceolate or oblong, middle one largest, entire, acute, reticulately veined. **Flowers** solitary, axillary arising among the stipules, actinomorphic, pedicellate, hermaphrodite, hypogynous; stipules - pedicel-glabrous, 6-8 mm long; calyx - polysepalous, green, glabrous, deciduous, ovate-oblong, mucronate, 3-4 mm long; corolla - polypetalous, pink or pink-purple, ovate - spatulate, clawed, obtuse, twice as long as sepals, 7-9 mm long; androecium - stamens-10, free, inserted on disc; filaments filiform, naked, 3-4 mm long; anthers-oblong, basifixed, white, 1-2 mm long; gynoecium - carpels -5, ovary syncarpous, 1-1.5 mm across, hairy, 5-celled, 2-ovules in each cells; style tapering, sometimes angular; stigma simple. **Fruits** septicidal capsule globular, villose, dehiscing into 5 one seeded cocci from the base, 4 mm across. **Seeds** orbicular, compressed and mucilagenous, 1-2 mm in dia. (Fig.Pl.no.23)

Local name : Dhomaso

Fls. : Aug. to Dec.



THE MAHARAJA SAYAJIRAO UNIVERSITY OF RA
BOTANY DEPARTMENT
HERBARIUM

FLORA OF KUTCH No. _____

Family Euphorbiaceae
Genus Fagonia
Species indica var. schweinfurthii
Local Name Burm. f. Hadidi
Locality Nightingale

Remarks Commonly collected in
low hill land on gravel
soil in local population

Plate No. 23 Fagonia indica Burm. f. var. schweinfurthii Hadidi

Frs. : Sept. to Feb.
 Locality : Nakhtrana, Anjar
 Coll No. : VMR 14

Notes: Commonly noticed growing on gravelly soils, in fallow fields and along roadsides in isolated patches.

Zygophyllum simplex Linn.FBI.1:423;C.1:172;Bhandari,84;FGS.
 1:140;Fl.W.Pak.76:31.

An erect to procumbent, much branched herb, about 10-15 cm high. **Stem** palegreen or brown in colour, cylindrical, minutely striate, glabrous, branches prostrate or sometimes suberect, with internodes at 2-4 cm long. **Leaves** simple, opposite, generally unifoliate sometimes bifoliate, succulent, sessile, stipulate; stipules - lanceolate, acute, 2-3 mm long; oblong, cylindrical, fleshy, obtuse, .5-1.75 cm long. **Flowers** solitary axillary, pedicellate, actinomorphic, hermaphrodite, hypogynous; pedicel-glabrous, 4-6 mm long; calyx - polysepalous, green, sepals-5, broadly ovate-ovate, glabrous, persistent, 4-6 x 1-3 mm; corolla - polypetalous, yellow, petals-5, spatulate, truncate at apex, 4-6 mm across; androecium - stamens-10, inserted at the base of the disc; filaments filiform, longer than petals, usually membranous, scaly at the base; anthers oblong-ovate, dorsifixed, 2-celled, 1-2 mm across; gynoecium - carpels-5, ovary syncarpous 1-3 mm across; 5-celled with many ovules;

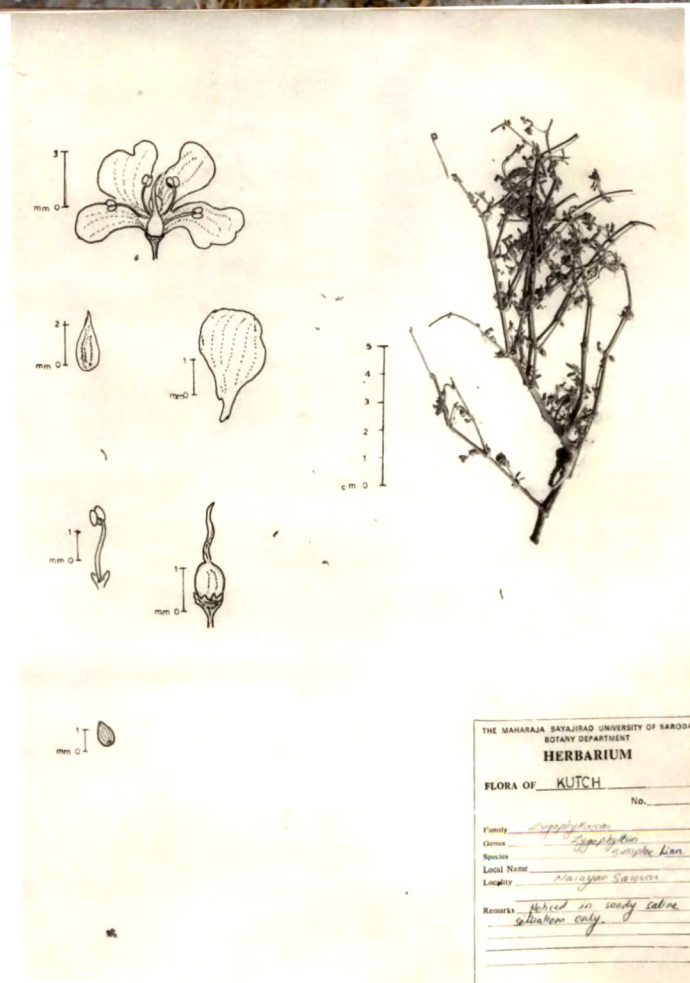


Plate No.24 Zygophyllum simplex Linn.

style angular, persistent; stigma minute; **Fruits** septicidal capsule, globose, dehiscent into 5 cocci, each cocci 3 seeded. **Seeds** pale brown, oblong, glabrous 1-1.5 mm long. (Fig.Pl.no 24)

Local name : Pattani,Atheli

Fls : Aug. to Oct.

Frs : Sept. to Nov.

Locality : Narayan Sarovar

Coll No. : VMR 17

Notes: Noticed in sandy saline situations at Narayan sarovar. The associates metwith are Suaeda fruticosa, S. nudiflora, Salsola baryosma and Evolvulus alsinoides.

Monsonia senegalensis Guill & Per.,FBI.1:427;C.1:175;

Bhandari, 86; FGS.1:140.

An erect, much branched hairy annual herb, about 10-20 cm high. **Stem** yellow-green, woody at the base, cylindrical with diffuse to procumbent branches, arising from nodes, internodes 3-4 cm long. **Leaves** simple, opposite, petiolate, stipulate, glabrous above and softly pubescent beneath; petioles-long, slender, hairy, 2-3.5 cm; stipules - lanceolate - subulate, acute, hairy, 3-6 cm long; lamina - ovate, cordate at the base, repend, denticulate, acute-mucronate at apex, villose on lower side, 2-3.5 x

1.2-2 cm. **Flowers** solitary axillary, bracteate, pedicellate, hermaphrodite, hypogynous; pedicel - long, slender, hairy, about 1-2 cm long; bract - subulate, 4-7mm; calyx - gamosepalous, green, persistent, sepals-5, elliptic-oblong, pubescent, 4-8 mm long; corolla - polypetalous, pink, obovate, veined below, 1-2-1.8 cm long, glands alternate with petals; androecium - stamens-15, penta-adelphous, forming a ring at the base and higher, 5-bundles of 3-stamens each, filaments broad and flattened at base, anthers oblong, dorsifixed, dithecal, 2-4.5 mm across; gynoecium - ovary pentacarpellary, syncarpous, 5-celled, cells 2-ovuled, 1-2 mm across, beaked, beak ending in style, style stigmatose, stipitate, obconical, hairy, about 3-4 mm long, stigma superposed. **Fruits** septicidal capsule, oblong, somewhat pyramidal, separating in 5-lobes, separating septifragally from placentiferous axis, the tails roll up elastically from base to the apex. **Seeds** oblong, wrinkled, hairy, 1.5-3 mm long. (Fig.Pl.no.26)

Local name : Rati fuladi

Fls. : Aug. to Oct.

Frs. : Sept. to Nov.

Locality : Dinodhar, Khavda

Coll No. : VMR 21

Notes: Usually observed growing on hilly slopes and in gravelly situations. Plant appears locally abundant at specific sites only.

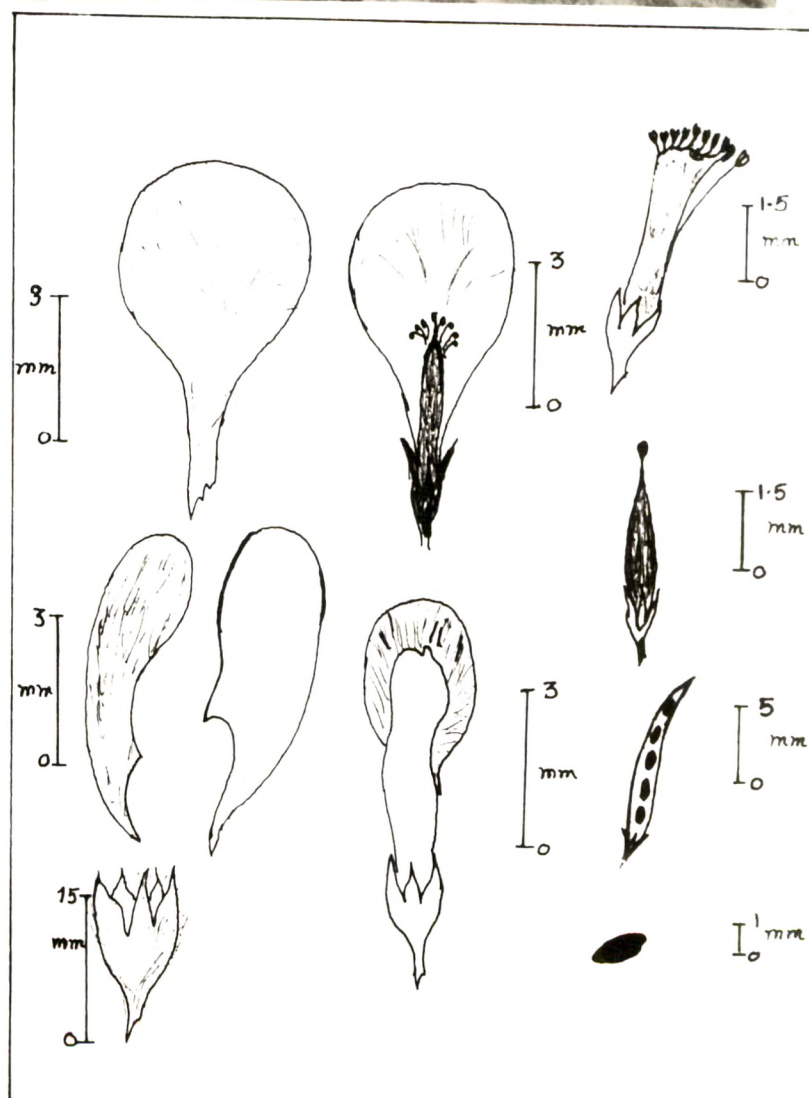


Plate No.25 *Indigofera argentea* Burm. f.



Plate No.26 Monsonia senegalensis Guill & Perr.

Indigofera argentea Burm.f (non.Linn.) C.1:338;Bhandari,
106; Fl. W.Pak.

Indigofera semitrijuga (non Forsk.) Baker, FBI.2:98.

An erect, stout, throughly pubescent perennial herb, about 30-70 cm tall. Stem silvery-brown, argento-canescant, cylindrical, diffusely branched, branches numerous, slender, terete, silvery canescant; internodes 2-4 cm long. Leaves compound, imparipinnate, petiolate, stipulate, 2-3.5 cm long; petioles - canescant, petiolules very short, about 4-5 mm long; stipules - setaceous, usually small, shortly adnate, minute; leaflets - usually 7-9, rarely 11, subsessile, except the terminal one, broadly obovate, base cuneate, entire, rounded at the apex, densely hairy on both the surfaces, reticulately veined, midribs impressed, 5-7 x 2.5-4 mm. Inflorescence axillary raceme, 6-11 flowered, 3-5 cm long, Flowers bracteate, zygomorphic, pedicellate, hermaphrodite, hypogynous; bract- minute, caducous, about 1 mm long; pedicel - short, hairy, 1-2 mm; Calyx - gamosepalous, green, 1.5-2 mm long, 5-toothed, teeth linear-lanceolate, teeth usually longer than the tube, lower one larger than others; Corolla - polypetalous, crimson red, papilionaceous, standard ovate-orbicular, clawed, wings oblong, caducous, keel erect, obtuse-acuminate, caducous, 5-6 mm long; androecium - stamens 10, diadelphous, (1 + 9) filament forms a ring, anthers dorsifixed, reniform, apiculate; gynoecium - ovary monocarpellary, sessile, many .

ovuled, style terminal, glabrous, stigma capitate. Fruits legume, cylindrical, hairy 10-15 mm long, shortly mucronate, **Seeds** globose-discoid, brown, irregularly compressed with minute depressions, 1-1.5 mm in dia. (Fig.Pl.no.25)

Local name : Jungli gali

Fls. : Aug to Nov.

Frs. : Spet. to Dec.

Locality : Mandvi

Coll. No. : VMR 29

Notes: Observed on sea-coast alongwith Leptadenia pyrotechnica and Cyperus laevigatus.

Helichrysum cutchicum (C.B.Clarke) Rao et.Deshpande in BOBSI
10(2): 225,1961

Anaphalis cutchica C.B.Clarke, FBI.3:284; FGS.1:368.

An erect, diffusely branched, hairy annual herb, about 25-40 cm tall. **Stem** dusty white, fistulous at the base, cylindrical and pubescent. **Leaves** simple, usually opposite, sometimes sub-opposite-alternate, sessile, semi-amplexicaul, 4-6 x 1-2 cm; lamina - linear-lanceolate, entire, obtuse-sub-acute, completely hairy on both the surfaces, lower one densely and upper one loosely, white tomentose, reticularly veined. **Inflorescence** cymose head, crowded at

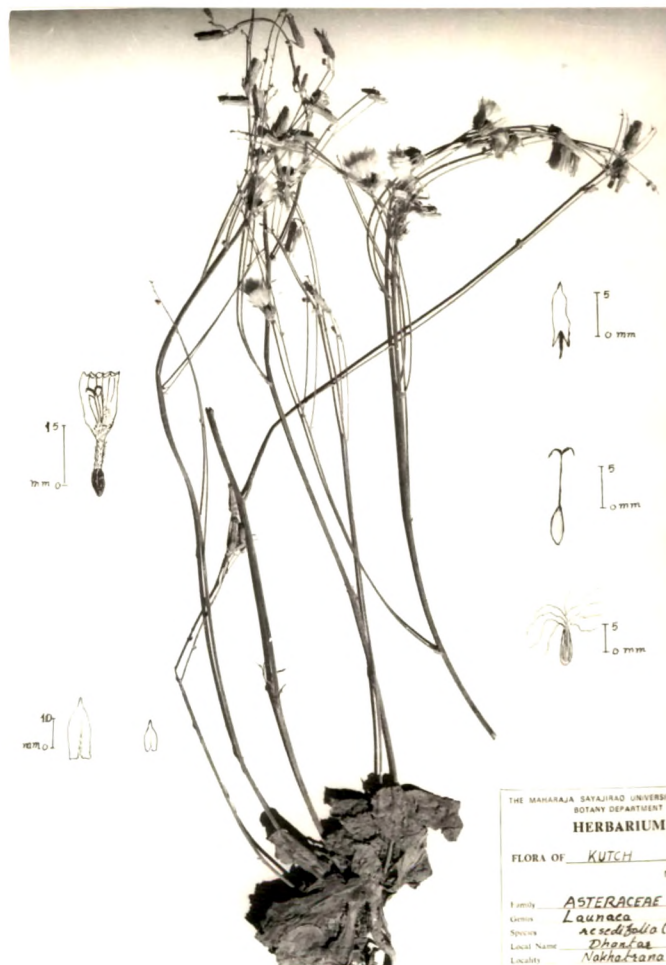


Plate No. 27 Launaea resedifolia (Linn.) O. Kuntze.

the apex, mostly terminal and sometimes axillary, heads white, shiny, heterogamous; involucral bracts many, scarious; outer smaller, ovate, irregularly toothed at the tip, inner larger than the outer, both glabrous inside and hairy outside. **Flowers** Ray florets - bracteate, sessile, zygomorphic, monoecious⁰, epigynous; bracts papillate, usually 6-7 ; calyx -polysepalous, sepals , pappus; corolla - gamopetalous, small, fragile, filiform, minutely toothed, teeth-5, 1-3 mm long; androecium -0; gynoecium - ovary bicarpellary, syncarpous, unilocular¹, 1-ovule; style uniform, slender, stigma minute Disc florets - bracteate sessile, actinomorphic, hermaphrodite, epigynous; calyx-Polysepalous-, pappus, papillate, usually 6-8; Corolla-gamopetalous, dusty white, trumpet shaped, 5-toothed, teeth minute, 2-3 mm; androecium/~~stamens~~-5, syngenesious, epipetalous, filaments filiform, anthers sagitate, basifixed, cordate at the base, about 1 mm across; gynoecium - ovary bicarpellary, syncarpous, unilocular, 1-celled, oblong, 1.5-2 mm long; style terminal, slender; stigma bifid. **Fruits** achene, verrucose, oblong, usually black in colour, ribbed, 1-5.2 mm long. (Fig. Pl. no 28)

Local name :

Fls. : Aug to Nov.

Frs. : Sept. to Dec.

Locality : Nalia, Nadibaugh rakhal

Coll No. : VMR 34

Notes: Locally abundant at Nalia and Nadibaugh rakhal. Observed growing on rocky river-beds and in sandy situations at specific spots only.

Launaea resedifolia (Linn.) O.Kuntze. Bhandari, 183; FGS. 1: 388.

Scarzonera residifolia Linn.

Launaea chondrillioides (DC.) Hook. FBI. 3: 415; C. 2: 121.

A suberect, hairy, annual herb with white latex and long thick tap root; about 20-30 cm tall. Stem brownish in colour, terete, woody and fistulous at basal portion, paniculately branched, branches slender and hairy. Leaves radical leaves - rosulate, narrow, pinnatifid, numerously lobed, lobes unequal, irregularly or acutely toothed; Cauline leaves - simple, alternate, sessile, semi-amplexicaul, pubescent, 8-15 x 3-6 cm; Lamina - lanceolate, pinnatifid, lobes numerous, unequal, irregularly toothed, pubescent on both the surfaces, acute apex, reticulately veined. Inflorescence Head, long, stout, dichotomously branched, branches with small leaves; involucre bracts - numerous, outer ovate, acute, subcordate, shorter than inner ones, innermost linear-lanceolate, acute, membranous, with scarious margin.

Flowers Ray florets - bracteate, subsessile, zygomorphic, monoecious, epigynous; calyx - hairy, long; corolla - gamopetalous, yellow, lobes-5, dentate at apex, 7-10 mm long; androecium - 0; gynoecium - bicarpellary, syncarpous, unilocular, 1-ovule; style slender, stigma minute. Disc florets - bracteate, sessile, actinomorphic, hermaphrodite, epigynous; calyx - polysepalous, , pappus, short; corolla - gamopetalous, yellowish, lobes-5, equal, triangular, acute, 0.7-10 mm long; androecium - stamens-5, syngenesious, epipetalous, filaments very short, filiform; anthers basifixed, sagitate, light yellow, oblong, dithecous, 1-3 mm long; gynoecium - ovary bicarpellary, syncarpous, unilocular, 1-celled, oblong, 2-2.5 mm; style terminal, long, simple; stigma bifid, curved, hairy, **Fruits** achene, oblong, verucose, 1-1.5 mm long, usually black in colour, ribbed. (Fig. Pl.no. 27)

Local name : Bhonpatri
Fls : Aug. to Nov.
Frs. : Sept. to Dec.
Locality : Dinodhar, Nakhtrana
Coll No. : VMR 41,23

Heliotropium bacciferum Forsk. Var. (Suberosum) (Clarke),

Bhandari, 208; Sabnis & Rao in J. Biol. Sci., 20(1):1-6
1977.

Heliotropium undulatum var. (Suberosum) Clarke, FBI. 4:150;
FGS. 1:451.

An erect, much branched, hairy, woody herb, about 30-40 cm in height. **Stem** greyish-white, woody at base, scabrous, cylindrical, internodes 4-6cm long, hairy. **Leaves** simple, alternate, pubescent, sessile; lamina - lanceolate, entire, acute, pubescent, densely clothed with white hairs, reticulately veined. **Inflorescence** scorptoid cyme, arranged in acropetal succession sometimes axillary. **Flowers** actinomorphic, subsessile, hermaphrodite, hypogynous; calyx - gamosepalous, green, tubular, hairy, lobes-5, lobes linear-lanceolate, 3-5 mm long; corolla - gamopetalous, tubular - cylindrical, tube slightly swollen in the middle, distinctly lobed, lobes-5, usually spreading, 5-7 mm long; androecium - stamens-5, epipetalous, inserted above the middle corolla tube, subsessile; anthers linear-lanceolate, 1-1.5 mm long; gynoecium - ovary bicarpellary, 4-celled, 4-ovuled; style terminal, short; usually depressed stigmatic ring at apex, stigma conical, bifid. **Fruits** capsule, depressed globose, slightly hairy, 4-5mm long. **Seeds** nutlet, rounded, black, glabrous, 2-3 mm. (Fig. Pl. no 29)

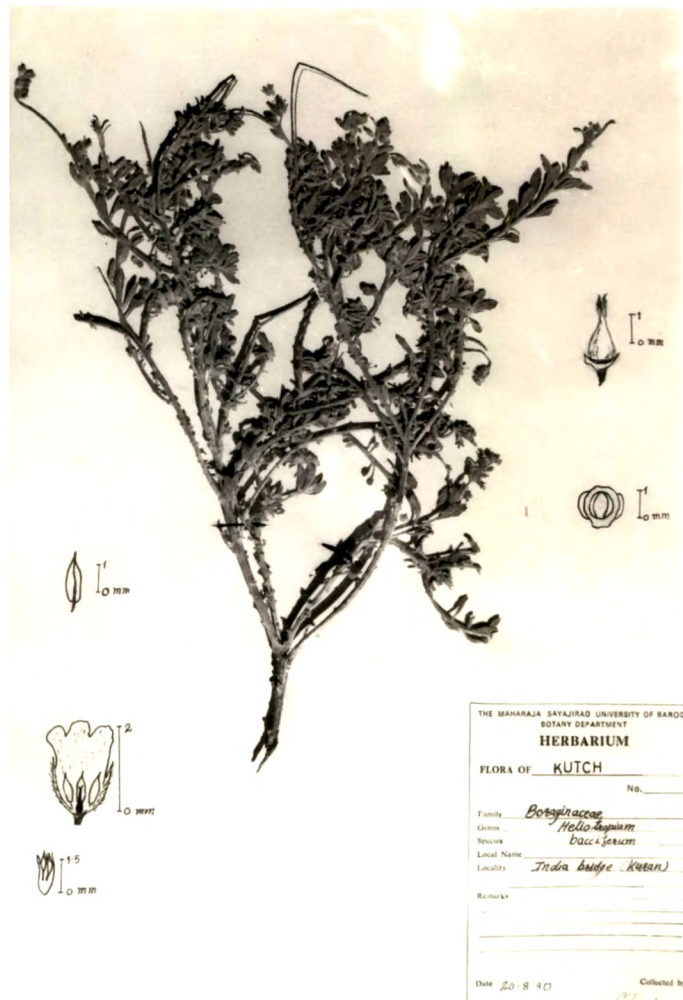


Plate No.29 Heliotropium bacciferum forsk. var suberosum (Clarke)

Bhandari

Local name :

Fls. : Sept. to Nov.

Frs. : Oct to Jan.

Locality : Khavda

Call No. : VMR 27

Notes: Located at one spot only in sandy saline situations.

Ipomoea kotschyana Hochst.ex.Choisy, Andrews. Fl. plants of
Sudan, 3:114.

An prostrate, diffusely branched annual hairy herb, about 25-50 cm long. Stem greenish yellow, turns brown on maturity, herbeaceous, cylindrical, somewhat ridged, hairy, Internodes 2-3 cm long. Leaves simple, alternate, petiolated, stipulate, hairy, 3-5 x 2-4 cm; petiole - long, hairy, 10-15 mm long, stipules - filiform, 1-2 mm, hairy; lamina - pinnatifid, giving trilobed appearance, hairy, margin somewhat wavy, apex obtuse, reticulated veined. Flowers solitary, axillary, actinomorphic, pedicellate, hermaphrodite, hypogynous; pedicel - short, cylindrical, 2-4 mm, hairy, calyx - polysepalous, green, unequal, oblong-ovate, apex-acute, hairy, 2-3.5 mm long prostrate, corolla - gamopetalous, light purple, infundibuliform, 8-10 mm long, lobes-5, equal, mostly hairy inside; androecium - stamens-5, equal, epipetalous, alternate to petals,

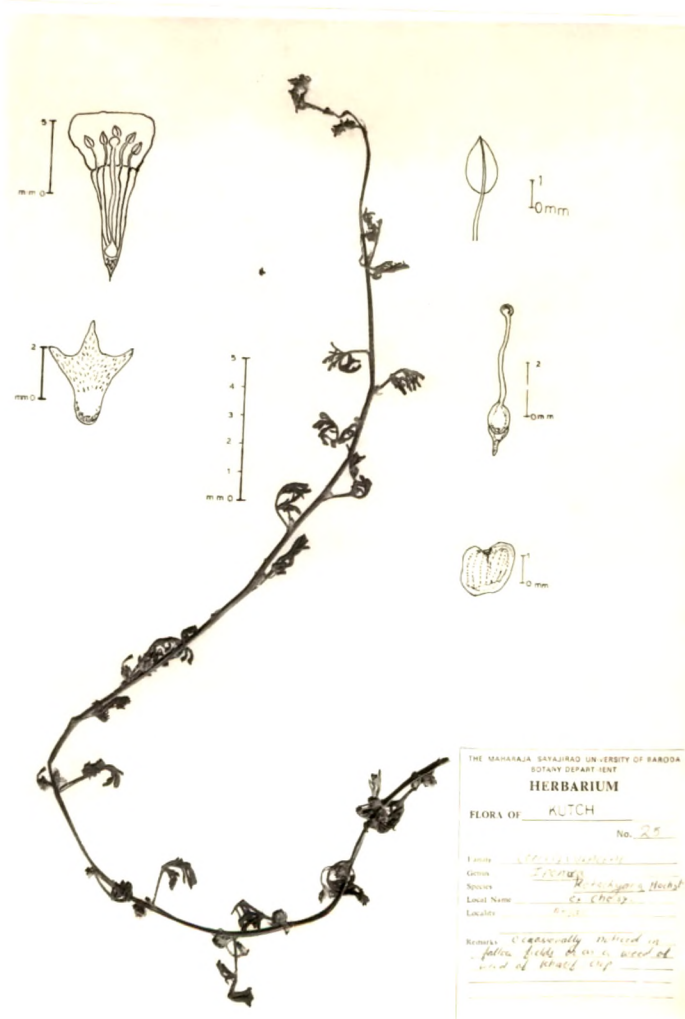


Plate No.30 Ipomoea kotschyana Hochst ex. choisy.

filaments long, inserted deep into corolla tubes, somewhat flattened at base, anthers white-purple, basifixed, ditheous, 1-2 mm across; gynoecium - ovary ^{bi}carpellary, syncarpous, ovoid, 0.7-1.5 mm in dia. glabrous; 4 celled one ovule in each cell 2 -ovules per locule, style terminal, slender; stigma-discoid. Fruits capsule, ovoid, light brown, glabrous, 2-4 mm in dia. Seeds rounded, furred, light yellow-brown, 2 mm in dia. (Fig. Pl. no. 30)

Local name:

Fls : Aug. to Sept.

Frs. : Aug. to Oct.

Locality : Anjar

Coll No. : VMR 32

Notes: Occasionally noticed in fallow fields or as a weed of Kharif crop-fields.

Seddera latifolia Hochst.ex.Steud. Bhandari, 237:FGS.1:481.

Breweria latifolia Clarke, FBI.4:224; C.2:298.

A low much branched, erect, shrub, about 25-30 cm tall, with slender woody branches, fully clothed with silky-grey pubescence. Stem grey in colour, woody at the base, herbeous at apex, cylindrical, internodes 2-4 cm long, hairy when young. Leaves simple, alternate, petiolate, stipulate, pubescent, 1.5-2.5 x 1-1.5 cm; petiole - hairy,



Plate No. 31 Seddera latifolia Hochst. ex. Steud.

rigid, 5-7 mm long; stipules - filiform, 1-2 mm long; lamina - oblong-ovate, base rounded-truncate, entire rounded or sometimes mucronate, silky-grey pubescent, reticulately veined. **Flowers** solitary, axillary, sometimes aggregated at the apex forming short spike, actinomorphic, subsessile, bracteolate, hermaphrodite, hypogynous; pedicel-short, 1-1.5 mm when present, hairy; bracteoles-2, linear-lanceolate; calyx-gamosepalous, greenish-white, hairy, 4-5 mm long; lobes-5, subequal, ovate, acute, 1-1.5 mm; corolla - gamopetalous, infundibuliform, white, equal or slightly exceeding the calyx, 5-lobed, tips reaching upto 1/4th total length of corolla, 2-2.5 mm; androecium - stamens-5, equal, filaments dilated at the base, anthers dusty white, basifixed, ditheous, 1-2 mm across; gynoecium - bicarpellary, syncarpous, ovoid, 0.5-1 mm long, hairy, 2 ovules per locule; style terminal, bifid, stigma peltate. **Fruits** capsule, ovoid, 4.5 mm long, light brown, acute, pubescent. **Seeds** 2 oblong brown or black in colour, glabrous, 2-3 mm long. (Fig. Pl. no. 31)

Local name :

Fls. : Aug. to Dec.

Frs. : Oct. to Jan.

Locality : Nakhtrana

Coll No. : VMR 12

Notes: Occasionally noticed in fallow fields or as a weed of kharif crop-fields.

Chascanum marrubifolium Fenzl ex. Walp; Fl. W. Pak. 77:12.

Bouchea marrbifolia (Fenzl ex. Walp) Schau.; FBI. 4:564;
FGS. 2:500; Bhandari, 277.

A much branched woody perennial herb, about 30-70 cm high. **Stem** greyish-brown, puberulous, woody at the base and herbaceous at the apex, cylindrical with fissured bark, branches erect or suberect, pubescent; internodes 4-5 cm long. **Leaves** simple, opposite to subopposite, petiolate, hirsute, upper surface darker than lower one, lower one more pubescent, petioles - ribbed, hairy, 1.2-2.5 cm long; hairy on both surfaces, apex obtuse-acute, rugously reticulately veined, prominent vein 1 on lower side. **Inflorescence** terminal spike, 15-20 cm long. **Flowers** sessile or subsessile, bracteate, zygomorphic, hermaphrodite, hypogynous; bract-lanceolate, puberulous, acute, persistent 4-6 mm; calyx - gamosepalous, green, persistent, tubular, pubescent, exceeding the bracts, 5-8 mm long, 5-toothed, teeth minute, acute, corolla-gamopetalous, white or cream coloured, ovate, dithecal, 1-2 mm across; gynoecium - ovary bicarpellary, syncarpous, ovary 2-cells, cells 1 - ovuled, 1-1.5 mm long; style terminal filiform, oblique; stigma slightly bilobed. **Fruits** dry dehiscent, enclosed within the calyx tube. 4-5 mm long. Seeds oblong, black, glabrous, somewhat ribbed, pyrenes 3-5 mm long. (Fig. Pl. no 33)

Local name : Bai

Fls. : Aug. to Nov.
 Frs. : Sept. to Dec.
 Locality : Nakhtrana
 Coll No. : VMR 28

Notes: Located only at Nakhtrana on sandy alluvial soils. The common associates noticed were Justicia simplex, Trianthema portulacastrum and Leptadenia pyrotechnica. This plant also appears to be restricted to distribution.

Premna resinosa (Hochst.) Schau.

Premna resinosa Jain & Kanodia in Curr.Sci.29:361-62, 1960; FGS.1:563.

An erect, much branched, glabrous, perennial shrub or small tree, about 2-2.5 m tall. Stem yellowish white, glabrous, woody at the base, much branched above, at about 1 m height, branches slender, somewhat angular, glabrous. Leaves simple opposite, petiolate, glabrous, petiole-slender, glabrous, 5-8 mm long; lamina - ovate or elliptic-oblong, rounded at the base usually entire, sometimes distantly crenate, obtuse, 1-3 x 1-2 cm. Inflorescence small terminal panicles, 3-4 cm long or more than that. Flowers actinomorphic, hermaphrodite, pedicellate, hypogynous, bracteate; bract - pedicel-short, 2-4 mm long; calyx - gamosepalous, campanulate, about 3 mm long, 5-toothed, teeth minute, persistent; corolla - gamotetalous, greenish-white, 4-lobed,

bilipped. 5-8 mm long; androecium - stamens-4, epipetalous, didynamous, alternating with corolla lobes, filaments short, filiform, anthers dorsifixed, ovate, ditheous, 1-1.2 mm across; gynoecium - ovary tetracarpellary, syncarpous, unilocular, 4-ovuled, 2-3 mm long, style terminal, linear, glabrous, stigma shortly bifid. **Fruits** drupe, globular-oblong, with persistent calyx. **Seeds** globular small, black in colour, 1-1.5 mm across. (Fig.Pl. no 34)

Local name :

Fls. : Spet to Dec.

Frs. : Oct. to Jan.

Locality : Kotda, Dinodhar

Coll No. : VMR 25.

Notes: The plant is locally abundant and noticed at specific sites only.

Schweinfurthia pterosperma A.Braun; Andrews in Fl. plants of Sudan.3:141, 1956.

An erect, much branched, glaucous, annual herb, about 20-30 cm high. **Stem** greenish, cylindrical, internodes 2-4 cm long branches slender. **Leaves** simple, usually alternate, rarely subopposite, petiolate, glabrous, succulent 4-5.5 x 2-3 cm; petiole - long, ribbed, glabrous, 1-1.5 cm; lamina linear-oblong sometimes spatulate, usually glabrous, base

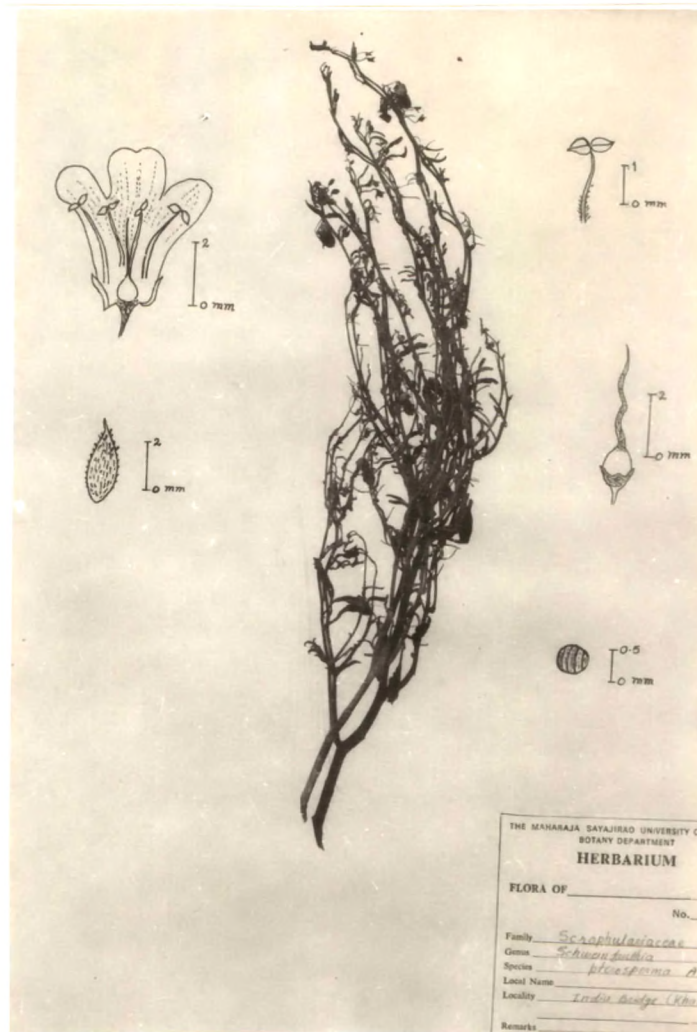


Plate No.32 Schweinfurthia pterosperma A. Braun.

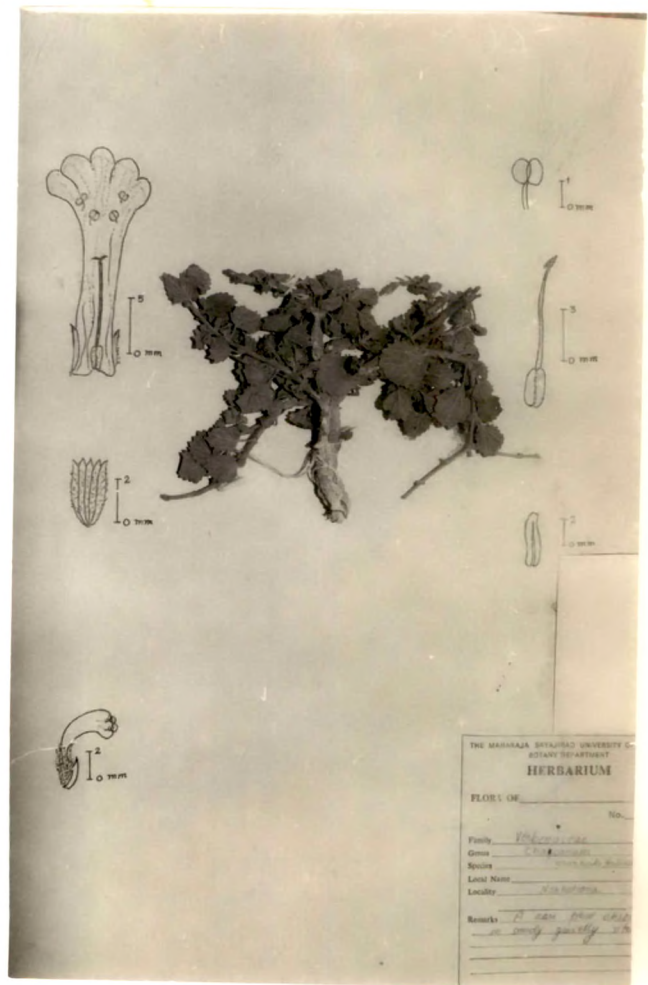


Plate No.33 Chascanum marrubifolium Fenzl ex. Walp.

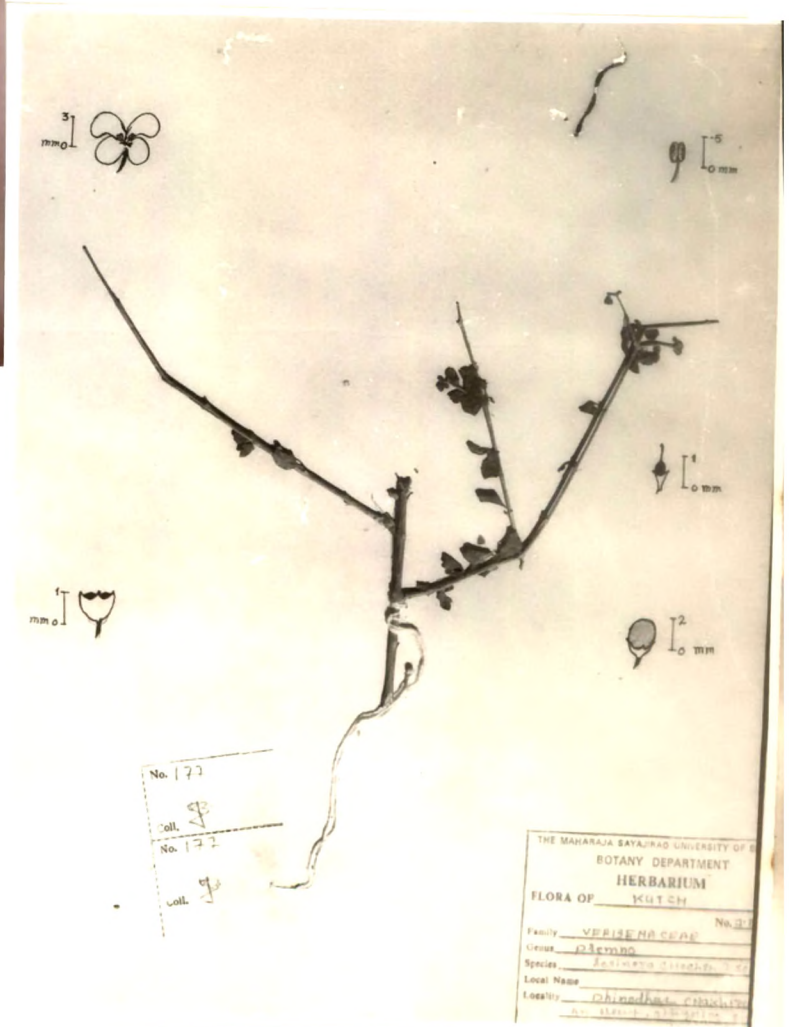


Plate No. 34 Premna resinosa (Hochst.) Schau.

truncate, obtuse apex, entire, reticulately veined. **Flowers** solitary, axillary, zygomorphic, pedicellate, hermaphrodite, hypogynous; pedicel - long, slender 0.5 - 8 cm; calyx - polysepalous, green sepals-5, broadly ovate-oblong, acute, somewhat hairy outside 5-8 mm long; corolla - gamopetalous, whitish-purple, petals-5, upper one bilobed, lower-3 lobed, spreading, usually oblong, obtuse, 8-12 mm long; androecium-stamens-4, (5th rudimentary), epipetalous, filaments filiform, flat and hairy at base, anthers divaricate, dorsifixed, white, didynamous, dithecal, 1-2 mm across, gynoecium - ovary bicarpellary, syncarpous, globular, 1.5-2 mm across; style terminal, filiform, glabrous, stigma minute. **Fruits** capsule, globular, fragile, many seeded, 4-8 mm in dia. **Seeds** obconic, with longitudinal ribs, 1-2 mm across. (Fig. Pl. no. 32)

Local name : Sonnipat.

Fls. : Aug. to Nov.

Frs. : Sept. to Dec.

Locality : Khavda

Coll No. : VMR 30.

Notes: Only in sandy saline situations a few plants were observed at Khavada. The plant appears to be very much restricted in distribution.