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About the Institute

The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

Eastern Upland series. King, Simpkins, Ideal, Dixie, Trice, Cleveland, Half and Half, seem to offer no definite differences in foliage characters. The last, Half and Half, compared in next row with 624 Texas big-boll type seems distinctly different in general habit of growth and cut of foliage. Most definite difference seems to be greater width of leaves and especially the stronger divergence of the lobes in 624. On Half and Half there seem to be few or no three-lobed leaves with sides strongly divergent, but many on 642. Base of leaf apart from lobes seems relatively longer in Half and Half. General tendency to larger leaves, stronger lobing, and more divergent lateral margins in the Texas big-boll type; the plants with shorter stalks, leaves often somewhat drooping that is somewhat more so than in the eastern varieties.

Tuxtla fully as distinct from Holdon than 624 from Half and Half, rather more so. Leaf forms still variable but may be considered a distinct step in the deviation of Sea Island characters, that is the lobes are more strongly developed, the sidelobes often more prominent than the forelobes. More of the leaves with five lobes. General color of foliage darker. Leaf surfact no so flat. Posterior margins more elevated and the lobes more channeled and with higher folds between, full between the lobes. Summing up, Tuxtla more strongly lobed and especially the sidelobes more strongly developed.

Watt seems to keep this distinct from hirsutum mostly because he considers it a wild species, hirsutum as cultivated King's Improved is mentioned as an example of G. punctatum along with Moqui, Texas Woll and Hindi (on p.169), while on Pl. 31 it is illustrated as an example of G. hirsutum, of which it seems likely to represent the typical form.

Gossypium barbadense.

San Antonio, Texas, 9-4-16. p.88

Watt on p.260 seems to unite this species with G. vitifolium, and also states that some of the Egyptian cottons belong to the same species.

Gossypium herbaceus

San Antonio, Texas, 9-3-16. p.86.

Said by Linnaeus not to have the three glands under the ribs of the leaves as in *Barbadense*.

Gossypium barbadense.

San Antonio, Texas, 9-3-16. p.86.

Perhaps the least satisfactory identification of the
Linnaean species. Leaves of "type" selected by Watt not like
Sea Island and the "mass of seeds and wool" also unlike "it".

The identity of this species has been established by Watt on the basis of specimens in the herbarium of Linnaeus, the use of which is justified also by the fact that a previous work of Linnaeus, Hortus Upsaliensis, is the first reference given in the species plantarum. The Hortus Upsaliensis specimen, of which a photo is given by Watt (Pl 24. Fig. A) may be considered as the true type of the species. The "Habitat in America" must be considered, however, as a error or at least held in question, since there seems to be no definite evidence that such a plant was ever cultivated in America. The supposition that it was is based on references to cotton having been brought from the Levant, but it is not certain that this was not an Upland cotton.

The type of this is determined by Watt from the fact that Linnaeus refers to Miller's Dictionary, and that Miller's specimen is extant in the Sloane Herbarium. Watt gives a photograph (Pl. 29 Fig. A). The fact that one of the old specimens, though not the type, has purple spots on the petals justifies the association of the species with the eastern small-boll cottons, such as King and Simpkins. On plate 34 Watt matches a specimen of King sent by Mr. Tyler with one of Miller's old specimens, which seems to agree very well.

The next question is how far this identification with G. hirsutum is to be extended into our cultivated Upland forms.

Incidentally Watt seems to have made a mistake in the colored drawing on p.30 in which the flower is yellow, which is never true of King, and very seldom of other Upland stocks, a so-called yellow bloom variety is known, however.

Cotone

~~Coccythia~~ (Asiatic)

Washington, D. C., 4-13-16, p. 13.

All of the Asiatic seedlings raised in the greenhouse have distinctly lobed leaves from the first. Internodes notably hairy, with two kinds of hairs, apparently quite distinct, short compound hairs and long simple hairs. First true leaf in one case has no nectary - no nectaries on cotyledons. Petioles of cotyledons widened gradually above passing gradually into blade. Veins not omitted at base in a definite manner as in true leaves.

Cotton

(*Gossypium*)
(South America)

Isenham

7-4-16

P. 28.

Mr. Curren says that cotton in Colombia thought to be variety called Peruvian does not stain in the bolls, although in rainy season. Point may be of general application and relate to oil glands of boll. Look up specimens in Herb.

Cotton

Gossypium (Cuba)

Washington, D. C., 5-11-16, p. 20.

A variety of cotton sent from Camagüey, Cuba, seen at Washington, May 31, 1916. Has very coarse stiff fiber, like Asiatic. Large bolls with long hooked carpels in dry state- Deep green fuzz. Lint very strong 1 in. sq.? From Robt. L. Luaces, Director Granja Escuela, Lint 41% Index 10.4. Seed weight at the rate of 14.85 grams per 100.

Cotton

Gossypium sturtii?

San Antonio, Texas, 8-30-16. p.64.

Plant at San Antonio has leaves completely glabrous, the tip with a sharp needle-like point, otherwise broadly rounded, not at all acuminate as figured by Watt for this species. Nectary long narrow and shallow, not short and deep. All surfaces completely glabrous and somewhat glaucous, except for very prominent glands on the petiole. Leaves ovate-orbicular with a shallow basal sinus. Succulent sub terete stems and petioles. No distinct pulvinus at either end of the petiole.

Brandegia. The plant at San Antonio noted under Gossypium sturtii may be related to this species, which is described as completely glabrous, though said to have angled or faintly three-lobed leaves. The absence of hairs, together with the difference in texture, etc., would seem to be a character of much importance. G. harknessii is said to have a deciduous involucre, or "caducous as the fruit ripens".

Cotton

(Gossypium?)

San Antonio, Texas, 8-30-16. p.65.

Watt p.370 refers to "De Vica: (Discovered wild cotton in Texas in 1536)" On p.17 includes Louisiana.

Cotton

Gossypium davidsonii.

San Antonio, Texas, 8-31-16. p.68.

To be considered as a cotton with only one form of leaves, like the entire leaves of seedlings of American Upland cottons. These and related American types represent best evidence that cottons are truly American. Out of the question for them to have been introduced.

Cotton

Gossypium Harknessii, etc.

San Antonio, Texas, 9-1-16. p.71.

Compare forms of leaves, small entire or with broadly rounded lobes with those that occur on small shoots from old stalks of Upland varieties. Samples of such from stumps of Lone Star at San Antonio, Texas, 8-31-16.

Of genus sturtia, readily distinguished by the leaves which are all entire and naked, and the involueral bracts also entire. All others have with the leaves lobed or the bracts toothed, usually both.

Cotton

Gossypium. (Classification)

San Antonio, Texas, 9-5-16. p.94.

Is made difficult because of wide variation of leaf-forms, running from entire through broadly lobed to narrow lobed leaves. This is a polymorphism of leaves as shown by related plants, okra, etc., and not even peculiar to cotton. Hence general lobing is not in itself a very essential character, as shown by occurrence of "okra-leaved" mutations. It is rather the texture proportions of lobes, etc., that must be considered rather than the general lobing. Other characters of nectaries, stipules, involucre, bolls, lint and seed may be more significant than much more striking foliage differences.

extm

Gossypium purpurascens.

San Antonio, Texas, 9-6-16. p.95.

Watt's figures Pl. 44 show broad quadrate leaves of Upland form. The species is supposed to represent the "Siam" cotton. May refer to our long-staple Uplands. Watt, however, also identified it with "Wild cotton growing near the Subtropical laboratory, Miami." But cottons from Key West and south Florida are placed under G. punctatum, (Watt p.170).

Cotton
(Gossypium)

Sacaton, Arizona. 9-22-16. p.176

"Paraguay tree cotton", C. B. 162, is remarkable as representing extreme of deep lobing among Sea Island forms. The folds are prominent and extend down to the pulvinus. In some leaves there is a small vein on each side of the midvein, that is, lowest veinlet of midvein is moved down to pulvinus. See specimen.

Cotton
(Gossypium.)

Sacaton, Arizona. 9-22-16. p.176

Paraguay from Villarica, C. B., 204 a. Not very deeply lobed and without teeth on midlobes. Simple and entire leaves remarkably broad, the latter wider above the middle than near the base. Broadly obovate, a form not noticed in other types. See specimen.

Coll. A. W. Anthony, Socorro Is., March - June 1897.

Small broadly three-lobed type with rather long light buff
lint. Calyx long-toothed. Bracts only three to five toothed.
The teeth . . .

Cotton

(Gossypium. (Generic Char.))

So. Pacific Ry., 10-9-16. p.235

Although the linnaean sexual system of classification of plants is no longer followed or taught, it still governs very largely the methods and standpoints of systematic work. Nobody questions the fact that floral characters are of very great significance as indicating the relationship of plants, there is increasing recognition of the fact that the significance of floral differences is not the same in the different groups of plants. Some families show great similarity in the forms of flowers, and others great diversity. There is more and more of a tendency to recognize the significance of other characters, particularly that of the fruit, but there seems to be no truly biological reason why any specialized features of the plant body should not be taken into account in classification as well as in the study of plants from other points of view.

The need of using for purposes of diagnosis other differences than those of the floral parts is greatest, of course, in cases where the flowers have remained essentially alike, while other parts have become more specialized. The cultivated cotton plants and their relatives afford a good example of such a group. Many of the genera that have been varied have had no general acceptance among botanists, because little or nothing in the way of floral differences could be alleged, even in cases where the plants were radically different in form structure and habits.

(*crasypium*)

Cotton. (Paraguay)

Sacaton, Arizona, 10-23-16. p.267.

C. B. 204a. Villarica. No. 18 at Sacaton, 1916. Curious Sea Island type with broad lobes. Bracts short, squared off at the tip more than in other types. Middle tooth distinctly broadened at base. One two-bracted involucre with extremely broad bract. One four-bracted apparently represents extreme example of bract-like leaf, with bract inside of this reduced. Bracts often united at base.

C. B. 210. Genuine Upland. Bolls pitted and four bracts, often pitted like Tuxtla. Bolls of ideal shape, elliptic oval. Bracts broad and square, not very strongly auricled, and often united at the base. Marshall says pictures were taken by Meade at San Antonio. Leaves differ from Tuxtla in much smaller development of side lobes. Sides square, these lobes but little separated, the difference lying chiefly in the depth of this sinus. The square sided form seems unusually prominent. Compare three-lobed leaves of fruiting branches. Seems to be a tendency of fruiting branches to grow a joint at a time. Many have only one joint on vegetative branches. Four bracted involucres seem never to have more than three nectaries and the fourth bract is usually much under sized.

(Kampin)
Cotton. (Kidney)

Sacaton, Arizona, 10-28-16. p.272.

Queensland P. B. 855. Leaves attain length midrib 30cm., width 45cm. One small leaf had suffered abortion of principal veins, reduction or shortening leaving deep notches in place of tops of lobes. Shows possibility of such abortion apart from tomosis.

(Gossypium)

Cotton. (Kidney?)

Sacaton, Arizona, 10-29-16. p.273.

B.1304, Peruvian rough with very large wingfolds on base of midvein. Has very prominent oil glands on petiole. Leaves ..?.. to side, that is the midlobes nectary of midvein very far up nectaries on three veins.

(Cassipou)
Cotton. (Brazil)

Sacaton, Arizona, 10-29-16. p.273

C.B.222 has small narrow nectaries far up. Veins united at base in two bundles. See natural size, Sacaton, Oct. 28, 1916.

(Lycopersicon)
Cotton. (Nigeria)

Sacaton, Arizona, 10-29-16. p.276.

C.B.224 has pedicels grown to internodes and large bract-like leaves.

(*Gossypium*)

Cotton. (Sierra Leone)

Sacaton, Arizona, 10-29-16. p.276.

C.B.200B Tande-wa or Fande-wa. Photo at Sacaton, Oct. 29, 1916. Has frequent adnations of pedicels with internode. Also bract-like leaves much like Egyptian. Plant with naked reddish stems distinctly channeled like Egyptian. Relation of leaf-lobes and texture of leaves much the same, also tendency to enlarge stipules, but the stipules tend more to keep the same elongated form, though many are distinctly broadened as in Egyptian.

Three plants show individual differences, but keep to Egyptian proportion of lobes. One plant has a few midlobes with single teeth. Bolls small, like Egyptian small boll recisions? To be considered as nearest to Egyptian.

(Lycium)
Cotton. (Sierra Leone)

Sacaton, Arizona, 10-29-16. p.277.

C.B.200 and "Kwondi"? Distinct species. Upland-like hairy broad leaves, short lobes, belongs to same general series as C.B. 213B "Bemoty" from Madagascar, but latter naked, with fewer and longer teeth on bracts, etc. Has pale yellow petals very short exceeded by the bracts (perhaps seasonal condition), many involucres with four bracts, each with distinct nectary outside. Also four inner nectaries, one sometimes small but distinct. (Involucre)

Cotton
(Gossypium) sturtii.

San Antonio, Texas, 1031-16. p.286.

Complete absence of hairs a peculiar feature, also glaucous foliage, almost alike on both sides. Lobes of leaves indicated only by small spine-like projections from the two fore veins, the same as from the midvein, but the fore veins are produced on only a few leaves, usually the larger, like the lobing of cotton. Sinus nearly closed but auricles not strongly developed. Nectar-ies confined to midvein, small, narrow, rather close to base. Stipules slender, caducous, provided with numerous oil-glands.

Cotton

Gossypium (Classification)

Southern Ry., 11-5-16. p.312.

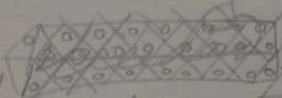
Todaro had a species maritimum which Watt reduces to a variety of barbadense. Todaro described the Egyptian cotton as a variety B. jumelianum under G.maritimum. Lamarch's vitifolium which as treated in Watt would probably include Canto, etc., was based on a cotton from Celebes. May be considered as a distinct species or as a synonym of barbadense.

(*Gossypium*)
Cotton (Venezuela)
^

Feb. 17, 1917, p. 315

Dr. Rose has two very interesting specimens one from Caracas and one from Porto Cabello. Latter naked, Upland-like. To be looked up in case of study of Peruvianum or Upland species.

Erosium

Terminal joints of
fruit branches often very short,
1 cm or less,  squarrelled
or occluded by the stipules.
Also the leaves of these
short joints are greatly
reduced, but have relatively
long petioles

Erosium

Look up publications by Hartland
on crinkled dwarf cactus in
Sea Island which may be
the same form.

Look for photos & notes
1922 + 23, also following years.
Separate ms may have been
mislaid.

Prosum

Original plants found 1922
abt 12 plants pure seeded in 1923

Pure seeded failed to come up 1924.

Found generally in Sea Is Fields.

Look for notes 1922 & 23

Plants of 1924 were from
open-pollinated "peak" plants

Must have been self-
pollinated seeds, which set
in bolls that had been cross-
pollinated with plants of
normal form.

Ballard also has

So @ Harland has published on this,
acc. to Ballard. "West Indian
bulletin 16" published in 1916
on the crinkled dwarf
progeny in Sea Is fields

Agrie. News 19:29 Jan 1920

Erosum

~~Probably~~
The flowers often are notably
proterogynous, with the stigma
emerging from the bud at
a rather early stage, several
days before normal anthesis -
not only the stigma but also
the staminal column may
protrude in advance of the
development of the petals, though
in such flowers the petals may
remain rather short.

Write Philippi to make
preliminary work on walls
on either side of the tall
wind-beck at entrance of

Drossan my
organize general
stent

Erosum

Relation to Tomosis

Mutation could be considered as constitutional tomosis.
Lengthening of petioles as compensation for defective blades.
Different texture and form of leaves may indicate reversion
or previous crossing with Upland. Analogy with slick-seed
variations in Upland.

2/20/20

Relation to Tommas's

Mutation ~~can~~
~~can be~~ plants could be
considered as constitutional
Tommas's Lentheny
petioles as compensation
for defective blades.

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SEP 14 1908

Different texture and form
of leaves may indicate
reversion or previous
crossing with Mpl.
Analogy with such seed
varieties in Upland.

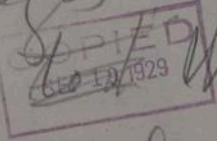
COPIED
SEP 19 1929

Gossypium erosum

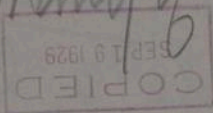
Tendency to abnormal bracts may mean that blade element of the bracts is defective or abortive. Study of bract variations and intermediate stages indicates that only middle three teeth represent blade of leaf, while the other teeth are formed as expansions or reduplications of the stipules.

Have we illustrations of bract abnormalities of Sea Island cotton? Many of Egyptian and Upland.

Zos. eroum

Tendency to abnormal bracts
may mean that blade element
of the bract is defective or
abortive. ^{study of bract variations ago} Only middle tooth
intermediate stages indicates that
only middle  three teeth
represent blade of leaf or possibly
~~of the~~ while the other

teeth are formed as expanding
w/ reduplications of the
stipules. # Have we # Illustrations of insect
abnormalities of Sea Island
cotton? Many of Egyptian &
Upland.



Gossypium erosum

James Island, S. C.,
August 4, 1929.

Look for notes in field books in 1924 and subsequently.
Perhaps manuscript can be found.

Braets with three middle teeth small, slender and close together, the veins that subtended them often much farther apart, by curving of the outer of the three away from the middle. Since this middle section of the leaf is derived from the blade element its small size may be connected with the general reduction of the leaves.

Calyx with the lobes rather long, but rounded at the tip. Outer nectaries wanting, inner nectaries mostly wanting, or in a few involucre an occasional small rudimentary nectary may be found, as groups of papelliform cells on a nearly even surface.

Braets small, short, broadly cordate, with a deep basal sinus and broad rounded auricles often overlapping the pedicel.

Ballard says cotyledons appear to be entirely normal.

Gos. erosum

June 25 Aug 4, 1929

Look for notes in
and subsequent

field books in 1924

Perhaps this can be
middle

Bracts with 3 ~~of~~ middle
teeth small slender and
close together, the veins that
subtend them ~~are~~ much farther
apart, the two by curving
the outer pair as of the
three away from the middle,
~~since the~~ ~~the~~ ~~the~~
the ~~one~~ this middle section
of the leaf is derived from
the blade demand its small
size may be connected
with the general
the leaves, (over)

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SEP 19 1929

with the lobes rather long, but
Calyx rather long lobes
rounded at the tip

Outer nectaries wanting

Inner nectaries mostly
wanting, ^{in a few involucres} ~~in some~~ ^{an}

occasionally ~~to~~ single
~~small sub~~ rudimentary

nectary may be found, as
groups ^{papillate papilliform cells}
on a nearly even surface.

Bracts small, short, broadly
cordate, ~~the three mid~~ with
a deep basal sinus and ^(and)
rounded auricles often
overlapping the peduncle
pedicel

Ballard says cotyledons appear
to be ^{normal} -

Erosum

One selfed boll produced in 1928 produced 4 or 5 seedlings in 1929. This from a different plant found in a field of Sea Island in 1928. Two other plants in same field.

Erosium

~~But~~ ^{one} selfed boll produced

in 1928 produced 4 or 5

a few seedlings in

1929. This from

a different plant found

in a field of Sea Is

in 1928. Two or

the other plants in same
field,

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SEP 19 1929

Erosium

The first plants were brought to my attention by Messrs. D. M. Simpson and W. H. Jenkins, in 1922, and seed was saved which produced a few plants of the same type in 1923, with others that seemed to be entirely normal Sea Island. Some of the flowers on both kinds of plants were self-pollinated by Mr. W. W. Ballard. The seed was planted in 1924, but no germination was obtained from any of the self-fertilized bolls of 1923. From the self-fertilized seed of the "normal" plants a small proportion of erosium was obtained, 6 mutants to 52 normal, while from several open-pollinated bolls of 1923 several mutants and a few normal plants were grown in 1924. (Check up from note book).

Groom

The first plants were brought to
my attention ~~in 1922~~ by Messrs
Mr. D. M. Simpson and Mr. H. St.
Jenkins, in 1922, ~~they~~
~~Precautions of pure seedling were~~
~~not applied in that year~~
~~seed was saved~~ seed was
~~saved~~ and seed was saved which
for which a few plants
which produced a few
plants of the same type in
1923, with others of that
~~type~~ appeared to ~~seemed to~~
be entirely normal. See
Island. Both kinds of
plants were self flowers
A 60 On both kinds
Some of the flowers in both

COPIED
SEP 11 1929

1923 several mutants and a few normal plants were grown in 1924. (Black up for note book)

Kinds of plants were self-pollinated by Mr. W. W. Ballard, and the seed planted in 1924.

In 1924, when this seed was planted in 1924, but no plants germination was obtained in any of the ^{self-fertile} bolls that were had been self-fertilized in 1923.

From the self-fertilized seed of the "normal" plants a small proportion of normal plants was obtained, 6 plants out of ~~six~~ 52 normal mutants, ^{while from} open-pollinated bolls of the ~~mutant~~ 1923 a few normal

Normal

Gas musum
photos

26450-1-2

26460-1-2

26466-7-8-9

26470-1-2

26478

29136-29145

Essyrium nodum

Photos see

23704 15

23716

Gossypium erosum

James B. Coe, 19, 1929.

a change of the
Such a change of characters,
if it resulted in the formation of
a normal plant would
afford the ~~direct~~ the long-sought
evidence of evolution ~~by~~
of species by mutation.
Not so abnormal as to
render reproduction impossible,
would be of interest to follow
its breeding through several
generations, to see if the
stock remained the same
or showed differences in
different lines of descent.

Cotton (Mexico) Yaqui Valley Dec.12, 1925 pp.90-
& 104

"Wild" in yard at Ontogata, near Cajeme.
Many plants all of one type with very small
3-locked bolls sparse lint & naked seeds.

(See 5 x 8 card)

Cotton (Florida Wild) San Antonio 10-22-26 p.18.

In greenhouse at San Antonio all out back.
Downward flexure of basal pulvinus a prominent
feature of all the plants. Large median lobe
feature also prominent, and close pubescence.
Cylindrical branches and small narrow stipules
on the vegetative branches. Rather large simple
leaves. Only one leaf-nectary. Darker green spot
around nectary shows on pale leaves. Small shoots
with simple leaves are closely like davidsonii in
general appearance but leaves have more slender
produced tips. Stipules though very small are
much larger than in *Davidsonii*.

Cotton (Aboriginal) Arizona. Tucson, Ariz. 12-28-20
p. 111.

Specimens of bolls and seed cotton from
northern Arizona in the University Museum at
Tucson, seeds apparently of Hopi and Aboriginal
Pima type nearly naked. Also "yarn" and numerous
fabrics, including quite elaborate embroidery or
open-work designing, some that would not seem
out of place among Peruvian fabrics. These
could be photographed and reproduced for ar-
ticle on aboriginal cotton industry. Also seeds
could be compared more closely with modern
Moqui and Pima seeds.

"Wild" in yard at Ontogota, near Cajeme. Many plants all of one type with very small 3-locked bolls sparse lint & naked seeds. Grows tall shoots 10 feet high, one photographed alone standing erect in partly shaded place by side of irrigation ditch. Flowers white of medium size white no spot leaves & bracts attain relatively large size, the leaves often with closed overlapping auricles but less extreme than in Chinaman's plants. Cocorit Long fruiting branches to 10 joints at 2 ft. length. Large leaves of uprights with the overlapping auricles. New plants apparently come up from root sprouts along ditch bank. Foliage much smaller in open place with stems & bracts colored red also pulvinus & nectaries red. This is a large old plant but cut off & new sprouts coming up about 5 ft. high 2 flowers showing bracts well on account of dark color. About 40 bolls collected, 2 with 2 locks, 2 with 4 locks, the rest 3 locks. Plants photo. at Ontogota. Bolls & bracts photo'd at Los Mochis. Appear remarkable in being more naked, less hairy than any of the similar types at Los Mochis, also in having the stamens so short, flower shown in photo. Bolls almost spherical, some even broader than long the end nearly flat vary abruptly apiculate, or the point may be very small or lacking. One 4-locked boll in large number examined, and one two-locked, but three locked with much greater regularity than others yet seen.

Belongs to general series with short bracts narrowed at base rather than auriculate, but not so narrow as Guaymas form. Photo of bolls at Los Mochis with D6 and D3 which seem closest approach. Bract texture and form in D6 is different, but closest approach in boll shape. Bracts of D3 are more similar but bolls distinctly longer. Calyx rarely with a tailed lobe, but lobes mostly with sharp angles.

Cotton
(Gossypium)

Miami, Fla., 3-23-14, p. 184

Native Florida cotton growing wild on the Deering Estate at Buena Vista, a few miles north of Miami. Photo by Fairchild and specimens including ripe bolls, March 23, 1914. Quite uninjured by frost. Plants in excellent condition. Possibility of fall planting? or late planting to open up in winter. The flowers of this type have no spot at base, but are distinctly yellow, though paler than those of the Sea Island or Egyptian type. The negro living near called it a Sea Island cotton, doubtless on account of the smooth seed. But the habits of growth are also more like Sea Island cotton.

Gossypium sturtii.

San Antonio, 4-6-17, p. 51

Stalks have grown several inches during the winter,
in some cases a foot.

Leaves do not have a specialized callus with bases of veins enlarged and united into a transverse structure, that is the forevein and sideveins uniting before joining with the midvein. Also the leaf is flat around the junction of the veins instead of puffed on the upper by the leaf tissue being inserted on the top of the vein, as usual in other types of cotton.

Slender branches and trailing habit of davidsonii to be mentioned in generic description. Plant in full leaf, but none found with lobes.

Very slender filiform fugaceous stipules as generic character, are narrowed to single vein with web on each side scarcely wide enough for oil-glands which are few and prominent while in very small cotton stipules these are distinct secondary veins nearly as large as the principal veins. Outer nectaries sometimes distinct, often absent; no inner nectaries. Bract auricles closely approaching and somewhat decurrent, but not united. The pedicel grooved to the top, so that there is a groove under the corners of the bracts.
(over)

Complete absence of inner nectaries may be interpreted as a single involucre. Cotton has double involucre, the inner series of bracts ~~XXXX~~ usually represented by nectaries, occasionally by bractlets also. No nectaries or bractlets in Davidsonii?

JOHN H. WATSON

1898-1899
1898-1899

Gossypium davidsonii San Antonio. 11-21-15.
p. 755.

Has habit of *Thurberia*, with woody stems somewhat more compact and short-jointed. Leaves densely hairy on both surfaces. Involucre as in cotton, but no external nectaries? Even small branches very tough and woody. Involucre and bud densely hirsute with stellate hairs.

Gossypium davidsonii Esperanza Dec. 10, 1925
p.84

Collected at San Carlos Bay Guaymas, Dec. 7
Photos at Esperanza Dec. 10. Calyx truncate &
large involucre shows that plant with narrow
involucral bracts not to be considered as cross
with davidsonii.

Capsules closely similar to those of *Thurberia*.
Leaves indifferently lobed and entire.

Stems slender but very woody. A branching woody
shrub. Bracts definitely decurrent & joined at base.
Texture of bracts very tough difficult to break
away, though thin. Capsule very thin-walled like
Thurberia. Remarkably similar in size, shape and
texture. Must be additional tissues in *Gossypium*

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But the habits of growth are also more like Sea
Island cotton.

COTTON (Gossypium) HYBRID. No. 2-22-10. 1910

In greenhouse at San Antonio. Flowering in October. Has rather small petal spot, the red color not solid but streaked with yellow on the veins, the spots as a whole wedge-shaped or the base excised. Stigmatic ridges extend down among the stamens in all cases no exposure of the style. Flower between ridges show green oil-glands not reddish or black. May be due to shade in greenhouse. Stamen mass and pollen rather dull light buff yellow, not lemon or orange yellow. Tip of stigma often contorted, but not separated. The

(over)

Gossypium davidsonii Torrey Pines 11-17-26.
pp. 55-57.

At Torrey Pines one plant, rather low and spreading but large and fruitful. Bolls nearly all 5-locked. Only 5 four-locked bolls and 4 six-locked bolls. The 5-lock bolls were separated roughly into two classes, those with supernumerary carpels and those without, but difficult to

(See 5 x 8 card)

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One of the supernumerary carpels with an ovule, and almost large enough to contain a full-grown seed.

(Over)

Seeds with a surface coating of matted closely adherent lint hairs. Not short fuzz but 3/16 or 1/4 inch long. So closely adherent as to be difficult to remove. Perhaps need wetting or soaking to get off without breaking, or possibly could be combed out. Raphe distinct, interrupting the hairs.

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Univ. Calif. Herb. has specs. T. S. Brandgu, Magdalena Is., Jan. 1889 No. 109134.

Edw. Palmer, No. 244, Guaymas, 1887. No. 109130.

T. S. Br San Jose del Cabo Sept. 1890. 109131.

Carlos Crabendorfer, 1899.

On low ground shrub 1-1/2 - 2 m. bl. March.

Location: Algodon coyote (may be native name).

Has one boll with 7 carpels.

T. S. Brandgu, San José del Cabo Oct. 1899. 134104.

A. W. Anthony, " March, June 1897. 134105.

Katharine Brandgu, San Diego (Garden) 1906 198463.

This has flowers deep golden yellow, other flowers also yellow if not dark stained. Do our specs. from Texas darken in drying? Some of the specs. look as hairy as ours but others much less, notably the San Diego spec. which also shows definitely lobed leaves, while Lower California specs. give only slight indications of lobes. Magdalena Is. spec. quite different in having very broad round broad-toothed bracts. Also leaves, petioles and branches are much less hairy than in San José del Cabo specs.

Large field of native cotton along the road below Sta Rosa, belonging to the estate. Regular culture in good condition. Plants 10-12 feet high. Carried over as a perennial. "Egypto" also grown here, an Upland long staple of excellent quality. Length about $1 \frac{1}{4}$.

Has habit of Thurberia, with woody stems somewhat more compact and short-jointed. Leaves densely hairy on both surfaces. Involucre as in cotton, but no external nectaries? Even small branches very tough and woody. Involucre and bud densely hirsute with stellate hairs.

S Nos. 547 and 3717 identified by Garcke as
G. herbaceum appear to be Sea Island and Upland types, but both
likely to be peculiar.

Coll. C. Wright in Cuba Orientali 1859, 1860, apparently a rather rank growth of Sea Island, in Missouri Bot. Gard. specimen 5-lobed and 2-lobed leaves represented.

Schott's No. 602 in Herb. Missouri Bot. Gard. Merida 1865, "Xchup, Maya" is extreme "okra" with rather light rusty brown lint, rather large, deeply divided bracts. Looks like the foliage of Acala "mutation" at San Antonio. Compare also with parent of buff-linted hybrids(?) at San Antonio, 1916. May be distinct from "Culluche". Latter seems to run much more to simple or 3-lobed leaves, also smoother or more naked and the lint is white instead of buff, in the specimen at St. Louis. Look up Schott in Watt. Used as basis of species there?

Mexico, Purpus 587, San Jose Del Cobo 1901. Identified in Herb. Missouri Bot. Gard. as "herbaceum". May prove interesting. Bracts have very strong median tooth, and all teeth are very long, not much cordate at base. Flowers may have been yellow. Leaves rather coarsely hairy below. Petioles densely hairy above, Sea Island or Upland. Leaves too broadly lobed for former? Peruvian series? No bolls or seeds.

Several other Mexican sheets may be interesting, including Wislizenus, No. 329, Monterey, May, 1847, spontaneous.

No. 313 C. A. Purpus San José del Cobo Jan.-Mar. 1901, flowering specimen in Herb. Missouri Bot. Gard. with flowers. Leaves, petioles and branches densely stellate hairy, also pedicels and bracts, when young becoming less dense on mature bracts. Leaves mostly simple, a few distinctly angled in place of lobes. Bracts with about 10 teeth, distinctly cordate, like Upland cotton. Leaf nectaries not close to base of vein. Stipules also very hairy, narrow, early deciduous. Incolucral nectaries not clearly made out, but probably present, ^{if} but ^{if} so small or hairy like the rest of the surface. Pedicels angled as in *Gossypium*, but more slender and longer in proportion, attaining about 1 inch. Distinctly angled as in *Gossypium*, but hidden by hairs.

Palmer's No. 384, Acapulco 1895. Good specimen of
"Culluche", apparently.

Several specimens of wild cotton from Mexico in Missouri Bot. Gardens Herb. from Engelman Herb., collected by Dr. J. Gregg 1848-9. Leaves poor but bolls, lint and seeds well represented.

Copy :

Cotton (Miami)

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SEP 17 1929

Cotton (Miami) Chapman Field August 16, 1929.

Leaves of main stalk and large vegetative branches all have 3 nectaries, the forelobe nectaries about two-thirds as far from the base as the midlobe nectaries. Smaller vegetative branches usually have 2 or 3 basal leaves with 1 or 2 nectaries, the others with 3.

Following counts from successive vegetative branches taken upward along stalk:

2, 2, 1, 3, 3, 3, 3, 3, 3, 3
1, 1, 3, 2, 3, 3, 3, 3, 3, 3
fr? 1, 1, 1, 2, 3, 3, 3, 3
1, 2, 3, 3, 3, 3, 2, 3
fr? 1, 1, 1, 1, 3, 3
fr? 1, 2
1, 2, 3, 1, 2, 3
fr 1, 1, 1, 1
fr 1, 1
0
fr 1, 1(sq)
fr 1, 1(sq)
fr? 1, 1, 1, (no squares)
fr 1(sq)
fr 1(sq)

The branches indicated as fr? showed fruiting branch characters near the base in shorter joints, angled internodes and were somewhat zig-zag, but bore no squares and became more cylindrical toward the end. The suggestion of a transformation from vegetative to fruiting branches is supported by the leaves of the later joints showing three nectaries. The longer joints of the vegetative branches are in contrast with the conditions found in some cottons, as Egyptian where the basal joints of the fruiting branches are very long while those of the vegetative branches may be much shorter.

Vegetative branches from old wood have several short joints at the base, only 1 to 2 cm in length, some less than 1 cm. May be 10 or 12 such joints or only 2 or 3. But veg. branches formed near the tops of the plants on new growth of vigorous stalks have the basal joints much longer, often 12 to 15 cm. This long basal joint may be considered as transition stage to fruiting branches. Basal joints on lower fruiting branches 7-8 cm long. The transition in this species is not abrupt, some of the branches with the basal joint angled like a fruiting branch still having no sign of floral buds or scars to show abortion of buds at early stages. Veg. branch nectaries as follows:

(Chapman Field Aug. 17, 1929)

- , 2, 1, 3, 3, 2*, 3, 3, 3, 3
- , 2, 2, 1*, 3, 3, 2*, 3, 3, 2*, 3, 3
- 1, 1, 3, 2, 3, 3, 3, 3, 3 (1st not upper)
- 1, 2, 3, 2*, 3, 3, 3, 3, 3
- 1, 2, 3, 1*, 3, 3, 3, 3, 3
- 1, 1, 3, 2*, 3, 3, 3
- 1, 1, 3, 2*, 3, 3, 3
- 2, 2, 2*, 3, 3, 3, 3 *top
- 1, 2, 3, 2*, 3, 3, 1
- 1, 2, 3, 1*, 3, 3
- 1, 1, 3, 1*, 3
- 1, 1, 3, 2* (lowest joint angular)
- 1, 1, 3,

Another shoot from ^{from} 3-1/2 feet from ground, other shoot with previous count was from the ground -

- ftg - - small (7 cm) branch 2 nodes leaves gone
- ftg - -, 1, 1 (9)
- ftg(- -, 1, 1 (22 cm)
- veg(- 1, 2, 1, 2, 2, 2, (16 cm) (small short veg.)
- ftg - -, 1, 1 (11 cm)
- " - 1, 1, 1, 1 (26 cm)
- " (1, 1, 1, 1, 1 (34 cm)
- veg(1, 1, 1, 2, 2 (9 cm) very small
- veg 1, 2, 3, 2, 3, 3, 3, 3, 3 (45 cm)
- ftg(1, 1, 1, 1, 1 (34 cm)
- veg(1, 3, 3 (3 cm) very small
- ftg 1, 1, 1, 1
- veg 1, 2

ftg (1, 1, 1, 1
veg (1
ftg (1, 1, 1, 1
veg (1, 1, 1
ftg (1, 1, 1
veg (1, 2
ftg (1, 1, 1
veg (1
ftg (1, 2, 1 (2 very minute)
veg (1, 2, 1

abn *, 1, 3, 1, 3 no sq
ftg 3, 1 with squares
ftg 3, 1 " "
ftg 3, 1 " "
ftg 3, 1 " "

*Abn. leaf transformed to small intermediate bract
branch then vegetative

(Chapman Field Aug. 18, 1929)

The branches of intermediate character noted August 16 are peculiar in having 3 or 4 leaves with single nectaries before increasing to 2 or 3 nectaries, which is not the case in regular vegetative branches recorded August 17. The reduction to smaller numbers of nectaries on leaves of the upper side of the branch may be considered as a form of anisophylly. The leaves of the upper side of the stalk are somewhat smaller in size, but the difference in number of nectaries is more definite.