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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.

Yos. quinacine notes for letter press

Cotton (South America)

Notes to follow formal
descriptions, for Journal
of Academy

Q

5
2

Contrasty stipule

Simple
Entire leaves on 1st gr

Large and simple leaves
Large sized three lobed leaves

Few 5-lobed leaves,

(but ^{small} small-leaf plants so 5)
Three lobes on big branches

^{leaf}
One nectary

Entire margin of bracts

Three middle teeth of bracts large
+ often on prostrate base -

Gossypium guinaee

checked

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OCT 1926

Gos. quinace

Cotton (Ecuador) S. S. Guayaquil, May 13, 1926. Manta - Puerto Bolívar
pp. 175-178.

"Sea Island" cotton at Bahia, May 12, 1926, cp. p. 173. Bracts with very long slender teeth attaining 3.5 cm, or equal to the body of the bract; measured to the sinus. Large bracts 8/cm, 4.5 cm. body with 3.5 cm. teeth, width 4.5 cm; length on auricle 5 cm. Outer nectaries much smaller than on other species, round or subtriangular, usually in abrupt depressions though located rather prominently, often on a distinct swelling. The bracts united to only a slight extent at base, the auricles only moderately developed. Photographs taken on shipboard, probably ruined by the wind. Inner nectaries of moderate size or rather small, generally about equal to the outer, in form broadly triangular, about twice as wide as long, on a slightly prominent smooth area.

Leaf nectaries of irregular occurrence on the forelobes. Some of the large 7-lobed leaves of the main stalk have only one nectary, while others have two or three nectaries, the forelobe nectaries much further down, often uneven. Midlobe nectary 1.5 cm. from base, one forelobe ^{nectary at} 1 cm. the other 5 to 7 millimeters. Midlobe nectary a groove usually wider in the middle, 3 to 5 mm long. Only one nectary on leaves of fruiting branches, although ~~many~~ ^{of} the fruiting branch leaves are large and 5-lobed. Many of the leaves of vegetative branches are 5-lobed, but 7-lobed leaves occur frequently, and often with one or two teeth on the forelobes, not at the base but above the middle, forming a shouldered or tridentate tip.

Also the bolls of this type are more of the Egyptian shape than the Sea Island, with the body of the boll oblong or even oboval, rather than conical.

(over)

of the lobe

Cotton (Ecuador) S. S. Guayaquil May 13, 1926
Manta - Puerto Bolívar pp. 175-8

Gos. quinace

Sea Island cotton at Bahia, May 12, 1926,
cp. p. 173.

(See 5 x 8 card)

Thus it appears more doubtful that this plant represents our usual Sea Island type. In any event it seems to connect our Sea Island type to quite an extent with the Peruvian series. The plant was very thrifty and in fine condition. The large 7-lobed leaves have the sinus completely closed and often widely overlapping. The sidelobes often diverge from the midlobe at more than a right angle, but do not spread as widely as the forelobes. The back-lobes may be oblique, or perpendicular, directly backward. Comparison of the leaf-specimens should help to determine approximation to Sea Island type.

Petioles of the large leaves attain 15 to 16 cm. and are rather stout, about 5 mm. wide in the middle, the upper pulvinus scarcely thickened but rough with prominent oil glands, often on tall papillae. Callus more prominent underneath, with the veins more united than appears from above, the web being raised above between the ~~veins~~ veins to form ridges or "mite-pockets". Pedicels distinctly grooved, both on the sides and at the angles. Pedicels attaining 4 cm. Bolls if full-grown much exceeded by the teeth of the bracts. The flowers are large to very large, with a rather small petal-spot. Another plant was found in Bahia with no petal-spot. Bractlets were found on a few of the Sea Island involucre, but only a few.

Ess. quinacoe

Cotton (Ecuador) Bahia de Caraquez, Ecuador. May 21, 1926. pp. 198-202.

At Bahia de Caraquez, May 21, 1926. Sea Island plant, see p. 173, visited a second time. The plant has only one upright stalk, nearly 2 meters high with numerous large decumbent or horizontal vegetative limbs, 18 vegetative branches in all, the lower attaining 1.5 m. the upper 1 meter, also has vegetative shoots from some of the nodes that failed to set branches at first, and a few small vegetatives produced on some of the larger fruiting branches, from the first or second nodes of the fruiting branch. The fruiting branches attaining 85 cm. with joints measuring 22 cm., 10, 10, 9, 10, 10, 3, on main stalk internodes 4 to 5 cm. long, also those of the vegetative branches. Fruiting-branch leaves all with 5 lobes, with mostly 5-lobed leaves on the vegetative branches, though often 6 or 7 lobes. Teeth on lobes only seldom. One leaf had tooth on outer margin of forelobe, but not on midlobe.

Fruiting branch leaves have only one nectary. Vegetative branch leaves three nectaries, sometimes 2, the nectaries of the foreveins very close to the base, often only 3 or 4 mm. Nectaries, outer, generally small and round, sometimes absent. Inner nectaries usually larger than the outer of the same involucre, usually distinctly triangular, broader than long, or ~~a~~ subulate with the upper side distinctly concave or emarginate. The shape is broader than for most of the other South American forms described. The broad auricles of the bracts often overlapping the pedicels, but not closing around the nectary as in cycladenum calycatum auritum

Flowers very long, not opened beyond a cylinder, 9 to 9.5 cm. from the nectary to the end of the corolla. Bracts all united at base, but usually for 1 or 2 mm. ~~is~~ less than half of the inner margin of the auricles. Lateral margins sometimes flared as in evertum but not flared

Cotton (Ecuador) Bahia de Caraquez, Ecuador
May 21, 1926. pp. 198-202

Ess. quinacoe

At Bahia de Caraquez, May 21, 1926. Sea
Island plant see p. 173, visited a second time.

(See 5 x 8 card)

Cotton (Ecuador) Buenaventura, May 23, 1926. p.209.

Gossypium

"Sea Island" Bahia petiole 16 cm. long 4 mm. thick in middle on large veg. br. leaf 23 cm. on midrib, 25 on back lobe spread of forelobes 33 cm. of sidelobes 26 cm.; only two nectaries. Bracts more convex than in the other species.

"Sea Island" type at Bahia has several unusual features, as the absence of 3-lobed leaves, but with the tendency to high leaf-lobe contrasting with few nectaries. Only one nectary on fruiting branch leaves, and some of the other with only one or two, even some of the very large 7-lobed leaves with only one nectary. Hence paucadenum would be appropriate name. Among related forms the relatively small, pale colored boll is notable feature, distinctly exceeded by the bracts. Also the frequency of 2-locked bolls seems peculiar, especially in a plant of vigorous, luxuriant growth in full fruiting

condition. Others have only 3-locked bolls
but not 2-locked as far as noted. Relatively
small bract nectaries and calyx nectaries in accord
with reduction ^mleaves, might have been expected
to be larger on involucre, to compensate for leaf
nectaries.

small

Cotton (Ecuador) Bahia, May 12, 1926. pp. 173-4.

cos. guineae

A plant near the beach seems nearly typical Sea Island type with back lobes on some leaves and teeth on midlobes. Bracts rather large, growing under very favorable conditions. Bolls rather grayish, but still very young.

Another plant near the coast more like field cotton of Esmeraldas large bolls rather smooth surface, bracts overlapping around pedicel, but fiber rough and seeds fuzzy. Thirteen seeds in one lock.

Tip of bolls with few oil glands over the sutures, but numerous along the fissures. The base of the style, as shown in young bolls when the flower falls

(over)

copy for her

off is without oil-glands. Seeds with a dense tuft of fuzz at base, the funiculus with a large spur; also the raphe may have a prominent flange or caruncle below the micropyle. The bracts are united along the inner margins, or free nearly to the base and then somewhat flared apart, when seen from below. The calyx-lobes are truncate or very slightly and broadly rounded, becoming strongly incurved with the falling of the flower.

all of last part relates
to auritum

1. Read with copy
2. Revise forms of statement (incidental only, to get in usual form of expression regarding the plant features,
3. Cross out data directly stated in the formal descriptions - to be sent out from Washington.
4. Rearrange ^{the remaining} ~~and recast~~ ~~data~~ in the general order of the des species descriptions, not ~~exp~~ necessarily avoiding repetition of some of the facts that have been mentioned if they form a part of a ~~descript~~ discussion or ~~comparat~~ comparative statement.
5. ~~Also~~ ~~expand~~ ~~to~~ complete the discussion or add other similar and comparative material, especially state what species is nearest related and what the ~~most~~ striking or special characters are, ~~it~~ making use in this way of the material on new characters.

Note: In some cases the formal description might be shortened & the material placed in more complete form in the notes.

The native cotton from Summit has remarkably long divergent lobes, in proportions equal to Sea Island but different in shape. Many of the leaves are very flat, and the basal area is especially flat, the margins very regular and even, not wavy the sinus narrow or exactly closed but not overlapping. Plants differ somewhat in the proportions of the leaves that show the characteristic form but the stock appears fairly regular, as cottons go, and may be taken to represent a definite type. The involucre bracts are quite regularly narrow and so commonly only 3-lobed that this may be considered as the normal number of teeth, so this species may be considered very primitive, on a footing with *Thurberia*, almost, and very remote from *Davidsonii*. ^{in bract and leaf characters} Also leaves stand commonly at very small angles to the petioles, indicating very active pulvini. Stems usually are hairy, and also petioles, and lower surfaces of leaves. Usually the calyx is distinctly angled, but the angles not produced into teeth.

Natural size photos from three plants of short staple series at Summit taken at Ancon Apr. 7, 1925. First plant has buff-colored lint. External nectaries large, round, active, deep, colored deep red. Internal sometimes absent entirely or small and irregular, in a rather slight transverse groove, the larger narrowly reniform, sometimes divided in the middle. Bolls very regular in shape and size from the whole row, but may be larger earlier in the season. Surface nearly even like Upland cotton, color somewhat darker green, but not as in Egyptian or Sea Island becoming yellow with maturity so that the oil-glands appear very distinct and somewhat prominent. Surface of ripening bolls may also become very red.

Seeds closely fuzzy, no tendency to smooth, on any of the plants that

were examined. Only one leaf-nectary, even on the largest 5-lobed leaves, this short, triangular (Δ) low down, 1 cm. from base of midvein. The leaves show many examples of the vein-blight symptom of black-arm, as well general dark spotting where tissues turn deep red around dead points or small areas. Name for such a species might be tridens, with reference to the form of the involucrel bracts. Close-approximation in leaf-forms to Sea Island cotton should be noted and comparisons made, greater divergence of lobes &c. Seed characters suggest relationship with Florida wild cottons. Lint texture of these types is peculiar. Examine fibers with microscope. Seem very lustrous, and very tough.

SEPTEMBER (1911) NUMBER 6 VOLUME 9 1911 25-12-11

Like Peten cotton, erect open plants. Flowers pale yellow with pink-purple petal spot, rather pale as in some hybrids. One plant of distinctly Sea Island type of bolls and foliage but others affording ^{such} indication. Bracts with very few teeth, often only 3, commonly 4 or 5 none more than 5. Calyx not toothed. Scattered oil-glands appear prominent on inner face of bracts. Oil-glands of bolls in slight depressions. Leaf nectaries single, very small, round, rather close to the base. Fruiting-branch leaves mostly 2-lobed. Bolls thin-walled. Bolls 4-locked, one 3-locked. External nectaries regularly present, very deep set, round or transversely quadrate or subreniform. Bolls blunt pointed, the tips of the divisions prominent swollen, no indication of intercarpillary sutures. Inner nectaries usually distinct, rather shallow, transverse or very broadly triangular. Calyx not splitting, but slipping back as collar. Bolls very thin-walled. Petioles very hairy, the angle grooves often distinct in upper part.

Cossyrium tridens

checked

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OCT 1926

Cotton(Colombia)

Buenaventura

5-29-26.

pp. 244, 245, 246.

Gossypium tridens has broad three-lobed leaves, 4-lobed and 5-lobed on vegetative shoots. But only one nectary even on 5-lobed leaves. Pubescence not stellate mostly simple hairs, seldom two or three together confined to internodes, petioles, veins and margins of leaves, not on surfaces. Tree probably grows 20 ft. high had been cut back at 8 ft. Trunk 10 cm diameter about 2 ft up, 7 cm at 6 ft.

Gossypium tridens

Cotton (Colombia) Buenaventura, May 28, 1926. pp. 238, 239, 240, 241a

Remarkable small bract cotton with small round bolls, mostly 4-locked, a few three, very blunt at tip the stigma in a depression between the swollen ends of the divisions. Bracts are the smallest of any cotton and usually have only 3 teeth. Few oil-glands close to the fissures, conspicuous in very young bolls where oil-glands are more conspicuous than in adult bolls.

Pubescence in the form of long slender flexuous hairs, not on surfaces but on margins and veins of leaves, margins of bracts and especially on the petioles. Bracts widely separated below the inner nectaries, but usually connected by a distinct appressed rim, but sometimes united for 1 or 2 mm. Outer nectaries broadly oblong-oval, some nearly twice as broad as long, others rounded triangular, often covering about half the space between the angles of the bract, separated from the bract above by about the length of the nectary.

Fruiting branch leaves usually 2-lobed, sometimes 3-lobed; veg. branch leaves three-lobed, in a few cases 4-lobed, but only one leaf-nectary, usually 1 cm. or less from base, sometimes 1.2 to 1.3 cm. from base, the nectary short and small, but with rather prominent swollen rims, but the vein scarcely widened.

Inner nectaries transverse, broadly triangular to lineate in a broad short groove, usually with a single row of oil-glands between the nectary and the glandless rim between the angles of the bracts; calyx very short truncate-sinuate, with large oil glands often in rows and smaller glands along margins.

Surface of bolls smooth and even, nearly uniform green, the oil-glands deeply buried under the green epidermis. Bolls 2.5 cm. long, same diameter, broadest at the middle or slightly below but narrowed slightly toward the end, though the tip is very blunt or even retuse, the stigma less prominent than the swollen tips of the divisions, the fissures being rather deeply grooved in the upper part. The bracts are sprung away from the boll at base as though pedicellate, and stand at a more abrupt angle around the receptacle, so that the nectary appears to be located in a large depression.

the immersed oil-glands of bolls.

Gossypium tridens Buenaventura May 29, 1926. The bracts usually have only three teeth, but often have a small tooth on one side, or doubtless sometimes on both sides, about the middle of the bract, at the end of the section that may be considered as the auricle, of the bract. *(or stipular part)*

When the involucre is placed in alcohol the auricle sections are penetrated very soon while the middle sections retain air and appear opaque and whitish for much longer, indicating a difference in texture. Apparently only one pair of stipules is represented in these bracts; there is no occasion to assume a reduplication of stipules with these bracts. Measurements can be made from photographs or from the herbarium specimens. Attachment of bolls 8 mm across, appearing rather large. Calyx 6 mm long, with oil glands largely in rows, between the rather fine veins. A rather long zone without oil-glands at base of boll, 4 or 5 mm, the lower oil-glands small and sparse, the surface depressions often appearing as narrow longitudinal grooves.

Leaves of vegetative branches mostly 3-lobed but some 5-lobed or 4-lobed. A 5-lobed leaf measures 12 cm on midvein, 14 cm on auricle; foreveins, 9 cm and 10 cm; sideveins 6 cm and 7 cm; petiole 9 cm; the midlobe is 9.5 cm long 4.5 cm wide in the middle 3.8 cm at base but appears more narrowed because the margins are upturned at the sinus.

A three-lobed vegetative branch leaf measures 11.7 on the midvein, 13.4 on the auricle; foreveins 9.4 and 10 cm. A bilobed leaf 11 cm on midvein 8 cm on forevein; midlobe 8 cm long 4.7 cm wide but some narrower and longer than this. Two leaves with midlobes suppressed but margins ~~entirely~~ even, *not appearing a no no mutation indicated.*

Seeds in locks 6 or 7. Lint very silky not fluffing out, staple about one inch. Contrast in pubescence very strong with other South American cottons, which have the hairs clustered in tufts, or "stellate." Stigma short the stigmatic pronges not prominent, with two rows of oil-glands between.

Cotton (Colombia) Buenaventura 5-29-26 p. 241

Goss. tridens

The small narrow leaf cotton apparently has the lowest leaf of fruiting branches with three lobes and the others with two. This is the reverse tendency from Egyptian cotton where the first leaf of the fruiting branch is much more likely to be simple than the other

Goss. stenotum would be appropriate for this species on account of very narrow bracts, open at the base by not coming in contact. Tridens would also be a good name, in reference to the very small bracts, which apparently are the smallest for any true cotton yet described. Callus "decurrent" gradually narrowed to pedicel.

Cotton (Colombia) Buenaventura, May 28, 1926.

Gossypium tridens

pp. 238, 239, 240, 24D.

Remarkable small bract cotton with small round bolls, mostly 4-locked, a few three, very blunt

(See 5 x 8)

Gos. tridens has remarkably cylindrical pedicels especially the basal half or two-thirds. At the top the sides are flattened somewhat and slightly angled, with the angles very slightly grooved close to the bracts. The fruiting branches are slender about equal in thickness to the pedicels; length of pedicels about 1.2 cm. Fruiting branches joints 6 cm; 5.6; 6; 5.5; 4.5; 4; 4; 3.5; 2.5; another branch 6; 5; 5; 4; 4.5; 3.5; 3.5; 2.5; another branch 5.5; 4.5; 4; 2.5. Figures show relatively short first joint; in strong contrast with many cottons. Distinguished from other types by several features; Bolls short,

as broad as long, narrowed abruptly to a blunt point or an apical depression; bracts narrow usually with only three teeth, the auricles separated, not forming a closed involucre; pubescence of long simple hairs on stems, petioles, vein and leaf margins.

Alternative statement ~~from [unclear]~~? Bolls elongate often twice as long as broad narrowed gradually to a conical point. Bracts broadly triangular cordate, with 10 to 20 teeth, usually forming a closed involucre; pubescence of stellate hairs on stems and surfaces of leaves at least in young state.

COLE SUBCUTICLEA ...
...
... (COLE) ...

Checked

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SEP 1906

Esmeraldas, May 11, 1926. Field of cotton on steep hillside above town. Large perennial type, differing in several respects from any yet seen. The pedicels are distinctly longer attaining $\frac{1}{2}$ cm., the bracts are large with more numerous teeth usually seven on each side of the middle three, sometimes eight, thus varying between 17 and 19. The outer nectaries are very large and prominent, and often distinctly longer than broad, often twice as long, a tendency not shown in the other S.A. cottons thus far examined. The most striking difference is in the base of the bracts which is auricled to an extreme extent so that the inner margins of the sinus are often in contact or overlap across the pedicel, so that the nectaries are completely surrounded by the base of the bracts. Also in contrast with the other S. A. cottons the bases of the bracts are united to only a slight extent, seldom more than one or two millimeters, and often are nearly free, which makes it possible for the recurved corners to meet or overlap across the pedicel. The name cycladenum is suggested by the complete enclosure of the nectary by the base of the bract.

Bractlets are present occasionally but usually only one in an involucre. There are none of the peculiar wings or crests described in Gossypium pteradenum ~~calycetum~~.

The leaf nectaries are long on Gos. pteradenum as noted by Hubbard, while on this species they are very short, rounded triangular ovate or cordate, usually as broad or broader than long and remarkably close to the base of the vein, sometimes less than 1 cm. from the base even on leaves 15 to 19 cm. long. Such a leaf having the nectary .8 mm. from the base is 19 cm. long, ^{measured} on the sinus 24 cm. on the auricle. It spreads 30 cm. across the forelobes and 23 cm. across the sidelopes. It has only one nectary, and many large 5-lobed leaves have only one nectary. The nectaries of ^{forelobes} sidelopes are very small and very close to the base, often only 3 or 4 mm. The smaller leaves have only one nectary and this often extremely close. A leaf 9.5 cm. long has its midrib nectary only 3 millimeters from the base. As many of the smaller leaves are 5-lobed the tendency to reduce the nectaries and to place them low down is the more notable, in contrast with species like that from Cali with a tendency to put 3 nectaries on all of the 5-lobed leaves. The reduction of leaf-nectaries is also in contrast with the large involucre nectaries in this species.

calycetum over

The leaves are notably less hairy than in pteradenum though the nature of the pubescence is the same, in small tufts of very small hairs. But the tufts are more remote and have fewer hairs so that the surfaces appear nearly naked.

Some plants have the bracts less ample and the auricles less developed, so that the lower angles do not meet across the pedicel, although the margin curves sharply toward the pedicel as it leaves the point of attachment. The bolls are of the long Egyptian form and color, but the surface somewhat more even, smoother and more shining than in the bolls of pteradenum. The oil-glands appear to be numerous, but smaller. The fissures are deeply grooved in the upper part, with no indication of sutural grooves in either species. *(compare photographs)*

The teeth of the involucrel bracts are rather coarse on the longest involucre. Calyx truncate with very broad sinuations, some distinctly angled. Inner nectaries rather regularly triangular or obcordate, usually as long as wide, occasionally with a bractlet on one side. The position of the nectary is on a distinctly prominent area and the nectary is often a little above the surrounding surface. Four-locked bolls occur, though mostly three-locked. The large bract, and the large development of the midlobe of the leaves suggest Kidney cotton, but the bolls are of the Egyptian rather than of the Kidney type.

Leaves at the base with ~~sinuations~~ ^{sinuations} between the bases of the veins prominent on the upper side of the leaf, below with the web of the leaf not attached at the sides of the ribs but somewhat above so that a covered space is left between and above the margins of the veins, corresponding to the mite-pockets of other plants. Stipules very large, specimens in alcohol. Hubbard has flower notes, including divided stigma.

leafy *the folds or plications* *calycetum*

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ssp. auritum

More material from plant near coast at Bahia de Caraquez, showing leaves, stipules and bolls. stems and petioles becoming red. Leaves crumpled or bullate between the veins. Some leaves of fruiting branches 3-lobed or 4-lobed. Some of them with 2 nectaries. Leaves of veg. branches 5-lobed with 3 nectaries. Under surfaces of leaves distinctly hairy, but not densely. Bolls much larger and different texture, finer pits and smoother surface, compared with Sea Island type. Bracts shorter and relatively broader, triangular, cordate rather than oval-cordate, but similar. Teeth possibly fewer, 15 to 17. Large forelobes nearly

equal to midlobes, sidelobes relatively small, no back-lobes. Bolls with long beaks that have few oil glands. Swollen pulvinia and base of pedicel, not noted in the Sea Island type, but difference proves slight. Also the stipules of the fruiting branches are distinctly broader, to about 1 cm. The size and shape of the bolls is the most striking difference, but the texture of the surface of the bolls is distinctly variable in the Sea Island plant, and appreciably different between the base and the tip of the boll.

Gossypium auritum No. _____

Usually the inner margins are united at the base for only 1 or 2 millimeters, but in some cases the inner margins of the auricles are united for several millimeters, and then the lower and outer margins are held widely apart.

Cotton (Ecuador) Esmeraldas, May 11, 1926.
Eos. amilton S. S. Guayaquil pp. 166-172
Esmeraldas, May 11, 1926. Field of cotton
on steep hillside above town. Large perennial
type, differing in several respects from any yet
seen.

(See 5 x 8 card)

Gossypium calycotum

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SEP 1926

Cyclotum

Cotton (Ecuador) Esmeraldas, Ecuador, May 22, 1926. pp. 205-9

Cossypium calycatum

~~Gos. pteradenum or etc-calyx, the latter name perhaps more appropriate leaving paucadenum more available.~~ Has very broad three-lobed leaves on fruiting branches, or leaves with very small side-lobes, only tooth size. Usually 1 nectary but there may be a very small nectary on one of the side veins; three nectaries not found on such leaves, but only on main stalk leaf with well-developed side-lobes. Distance from nectary to base varies from 1.5 to 2.5 cm., with nectary of ^{side lobes} side lobes only 5 to 7 mm. from the base. The midvein nectary sagittate or fusiform with prominent raised rims; the ~~side vein~~ nectary small, narrowly oval.

Lower surfaces of leaves moderately pubescent, especially on the veins, with short tufted hairs. The pubescence of Cycladenum is longer and the hairs fewer in the tufts, and the difference is still greater with paucadenum (like Sea Island)

The leaf nectaries of Cycladenum at Bahia are much shorter and closer to the base than in pteradenum

The leaf-nectaries of paucadenum ^{auritum} while they have rather broad swollen margin and thus appear nearly as prominent as in the other species, have very little of the papillose secreting tissue. Some of the leaf-nectaries of paucadenum are closer to the base of the midvein at 6 to 7 mm. than any in pteradenum (-etc-calyx) calycatum

Lobing of leaves and fruiting branches gives notable contrast of paucadenum with other types, also texture and color of leaves, deep, fresh green while others have lighter green reminding of Upland cotton. Color of foliage of Bahia Cycladenum lighter than pteradenum. Gos. pteradenum has short petioles and relatively short basal joints of fruiting branches, as Joints 7, 10, 14 cm. Fruiting branch joints 14, 8.5, 7.5, 8.5, 2.5, 3.5, 5, 3.5.

Petioles 5 & 6 cm. on leaves with midveins 13 cm. Flowers looked for on all five plants but none found; possibility of "cleistogamy" by failure of corolla to develop? Such cases occur, one in bottle of cycladenum. Otherwise must be period when flowering was suppressed from some unknown cause.

Strong contrast in pteradenum between fruiting branch and vegetative branch leaves. Most of the leaves preserved were from fruiting branches. The vegetative branch leaves are 5 lobed and the middle lobe is relatively much longer than on the fruiting branch leaves, with the sinus deeper, so the shape of the two kinds are notably contrasted. The tendency to form large 3-lobed leaves on the fruiting branch is in notable contrast with paucadenum which had no three-lobed leaves, all 5-lobed on fruiting branches.

Two yellow leaves of pteradenum with fungus disease to be identified. Appears same as disease in Haiti.

Texture of pteradenum leaves not so heavy and firm as Bahia cycladenum. Also cycladenum has small five-lobed leaves on small fruiting branches and these or some of them have three nectaries. Contrast with paucadenum in the three nectaries with calycetum in the 5-lobes. Leaf-forms of this Bahia cycladenum remind of the purple cotton from Cali. Are they shared by the original cycladenum from the field at Esmeraldas?

The Bahia cycladenum has long basal joints of fruiting branches.

Flowers of Bahia cyclacarp have stigmas exceeding staminal column but little, 5 mm.

auritum

Gossypium calycotum

Cotton (Ecuador)

Esmeraldas

May 11, 1926

pp. 163-6

Esmeraldas, May 11, 1926. Remarkable type like ^{the} Tumaco cotton with the short bracts (see page 153) but the bracts not so short. ^{The} Bractlets have a unique development, often broadened into oblique crests extending from the lower margins of the nectaries along the calyx and meeting a similar crest from the next nectary, so that a double calyx or double involucre is formed. The fact that these crests start from the lower margins of the nectaries and do not extend or connect below the nectary seems to indicate a definite association with the ^{nectary} ~~organs~~, though the crests are often interrupted and may occur as separate small sections at any point between the nectaries but on a line with the complete crests. In a few cases the crests are united below the nectary, but only to a slight extent, ^{forming} ~~forming~~ ^{leaving} a deep notch. The insertion of the crest is not parallel with the base of the bract but rises rapidly on the calyx usually to about half the height of the calyx, but sometimes to the full height and fuses with the rim. Usually the surface of the calyx below the crest is white and without oil glands, but a few oil-glands may be found along the base of the calyx.

The very large, prominently placed nectaries are like those of Gos. evertum, but the bracts are broad, distinctly auricled and regularly united along the inner margins, with no tendency to evert or become concave on the outer face. They are distinctly convex below the middle at the bend around the boll, but the upper part is nearly flat with the teeth straight and erect. The middle 3 teeth show no tendency to be larger than the others, but often are more united at the base. Usually 4 or 5 other teeth on each side making 12 or 13 teeth. The length of the bracts is nearly equal to that of the full-grown bolls, the bract

teeth sometimes exceeding the tip of the boll, but usually somewhat shorter. The shape of the bracts is broadly triangular-cordate, with the teeth down to nearly the level of the sinus, but the auricles smooth and appressed.

Bolls ~~rather~~ ovoid-ovoid of the form and appearance of Egyptian cotton, of dark green color with numerous black oil-glands in deep punctations. Outer nectaries often 5 mm. broad to 3 m. long, more than half the width of the end of the pedicel, 8mm. Forms of nectaries often distinctly irregular on account of interfering superficial oil-glands, but immersed glands may occur under the nectary without the papillae being interrupted. The nectaries may have raised rims, abrupt or sloping, or the groove below may be carried into the nectary so that the surface is deeply excavate.

Inner nectaries usually very large, triangular or trapezoidal, ~~but~~ though sometimes small and round; usually longer than broad, bordered on each side by bractlets or broad, wing-like expansions from the surface of the calyx. The bracts are regularly united, usually for at least 3 mm., often for 4 or 5 mm.

Cotton (Ecuador) Esmeraldas, Ecuador, May 22, 1926

Gos. calycotum

p.p. 205, 206, 207, 208, 209

Gos. pteradenum or oto-calyx, the latter name perhaps more appropriate leaving paucadenum more available. Has very broad three-lobed leaves on fruiting branches, or leaves with very small side-lobes, only tooth size.

(See 5 X 8 Card)

The definite association of the bractlets with the inner nectaries in the South American cottons suggests another possible homology, namely that the inner nectaries represent a suppressed set of bracts which generally have been eliminated, but in some species are still shown in rudimentary form. The bractlets in this view would correspond to the basal section or lowest tooth of the large bracts. ~~Considering~~ The shape of the bractlet often correspond to that of a lower section of the calyx, but if the shape is homologized the position is reversed, in relation to the bract of which the bractlet would be considered as a part. But the

position of the bractlet in relation to the nectary would be explained as a part of a suppressed bract, corresponding to the base of a normal bract. Include in above that the outer face of the bractlet is toward the nectary, as with the corresponding

~~face of regularly developed~~ corresponding in position to the corners of the outer bracts, in relation to their overlaps

Cotton (Ecuador) Esmeraldas, Ecuador. May 22, 1926

^{calycotum}
Gossypium pteradenum Five plants examined, in
two places in Esmeraldas, apparently uniform type.
Material secured and seed cotton. Three bolls in
tin box for exhibition purposes. Every boll and
bud shows the large bractlet-excrecences that
may represent inner set of bracts.

The inner nectaries are longer than broad
being confined between the bractlets. The outer
nectaries often broader than long covering more than
half the width of the receptacle, placed upon an
abruptly prominent frustum, more conical, or less
abruptly peaked than the two species from Bahia.

Bolls also darker colored than the Sea Island
like type (gyniaca)

evertum

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Cotton (Colombia) Buenaventura 5-29-26 p. 244.

Gossypium evertum foliage ^{generally} appears ^{rather} pale; tips
of many leaves pale and crumpled, as in mosaic
disease.

Cotton (Colombia) Buenaventura May 26, 1926.
p. 217.

Gos. evertum Photos at Buenaventura, May 26, 1926 with three other "species" "Sea Is." from Bahia, coast plant from Bahia & Esmeraldas pteradenum, the latter two bolls without pedicels at bottom, next the very large bolls of "cyclotum" or cycladenum from Bahia coast plant evertum at top and Sea I second. Gos. evertum ends of veg. shoots showing very short joints and long stipules, longer than the joints first photo with bolls from original plants.

Cotton (Colombia) Buenaventura May 27, 1926
p. 227

Hubbard reports evertum with no simple leaves on several plants examined. More examples of the type found in Buenaventura, all with same characters with remarkable regularity. Would appear unusually uniform stock. Leaves of plants in vigorous growth have margins strongly undulate, as much as in the Mexican type hypadenum.

Cotton ^{evertum} (Colombia) Buenaventura Apr. 30, 1926 pp. 71-72
evertum

Fruiting branch joint, 13 cm., 6 cm., 4 cm. Stipules of fruiting branches very unequal, one commonly twice as broad and distinctly shorter than the other which is very narrow and slender. Photos show several stipules; those of main stalks and vegetative branches, equal narrow and slender.

evertum

At Buenaventura Apr. 30, 1926, a bush cotton 8-9 feet high with everted bracts, suggesting at once the name Gossypium evertum, the bracts usually dished backward with teeth turned away from the bud and the lateral margins rolled back, leaving a wide opening, in fact protecting the bud or boll as little as might be with bracts of that size. Bracts rather broad usually with 11-13 teeth, 4 or 5 on each side of the middle three, though these not accentuated by size or set up in the middle. Margins of bracts entire below and regularly united at base, though usually not to great extent. Bracts

broadly but not deeply auricled; broad bracts rather than large or long.

In addition to the everted bracts the species is characterized by very large outer and inner nectaries by remarkably smooth, naked surfaces, even on young growth, by great inequality of stipules. The leaves are not strongly auricled, the sinus is open but narrow, the lower margins undulate on each side of the sinus.

evertum

Buenaventura. Gos. evertum has outer and inner nectaries regularly present, often very large and prominent, especially around the rim, but usually with a depression in the middle, suggesting that the nectaries have out-grown the depression. But the nectary as a whole is prominent and unusually large.

The bolls have oil-glands nearly to the base, in this respect contrasting with Haiti and the Mexican series.

The seed is peculiar in having the seed nearly naked for about 1/3 up. In this respect suggests

the Guatemala San Lucas cotton with fuzz on lower
half of seed and lint on upper half. In ~~this~~ case
the white lint contrasted strongly with the green fuzz. *SS*

Buenaventura, Apr. 30, 1926. Oil glands of bolls numerous, and superficial as in Sea Island or Egyptian, located in distinct depressions, but prominent in the depression and appearing black instead of greenish. In reality glands are partly covered with green tissue, being distinctly larger below the surfaces than would appear from the black area on surface. Surface form of glands often longitudinally oval or elliptical, especially in lower part of boll, also in lower part many glands are deep-seated and show less distinctly on the surface. Only a narrow rim at base is without oil glands. Fissures deeply grooved on beak and in upper part of boll, but not below middle. A few very small glands along the fissure, some of them in or on the fissure. No interruption of glands over suture; no indication of sutural groove, except at extreme tip of boll.

Very young growth has hairs on lower surfaces of leaves and on teeth of bracts, ^{and} stipules, but these disappear very soon, so ~~the~~ ^{the} plant appears completely naked.

Large outer and inner nectaries regularly present, but somewhat variable in size, the outer round or transversely oval, the inner broadly triangular, both becoming deep red with age; not in depressions but usually more prominent than the surrounding surface, flat or concave on the actual secreting surface. Around young uncolored nectaries the oil-glands ^{of the oil glands sit} out in ^{the} nectary, show prominently, projecting from the margins into the nectary and sometimes, separate from the margin, though rarely, near the middle of the nectary. Partly on account of their large size the nectaries are not separated from the ^{base of the} bracts by as much as the length of the nectary, and usually for only half the length. Sides of pedicel broadly and rather deeply grooved below the nectaries, the angles rather prominent but rather thick and rounded, not distinctly ridged or grooved. Lower joint of fruiting branch rather sharply compressed or 2-angled, especially on short branches.

Calyx truncate or very broadly sinuate, no distinct indications of lobes, the oil glands partly in rows where veins are close together otherwise irregularly scattered, ^{keeping away} from the veins in the upper part of the calyx, often on the veins in the lower part, but

the first glands on the veins very small, also many very small glands close to the margin of the calyx. Glands at base of calyx round, near the margin transversely oval.

Lint not on lower third of seed and little or no fuzz so that the funicle shows its basal thickening and surrounding groove, with raphe on one side and ridges elsewhere. The fuzz thickens greatly just below the beginning of the lint, forming a distinct fuzzy zone, below the lint, or overlapping somewhat. The rest of the seed may be sparingly fuzzy under the lint, or there may be a distinct tuft of fuzz at the apex of the seed around the micropyle? A rim or patch of fuzz around the funicle is also found on some seeds, but the zone of abundant fuzz below the lint is a general feature, or a light coating of fuzz may be described for the lower part of the seed, a thick zone below the lint, and a light coating above, with the lint more abundant at the top, but the fuzz may be nearly lacking except around the band below the lint. Fuzz ^{is} brown, ^{at the apex of the seed} not greenish. ^{On the seeds, however, a light coating of fuzz may be described for the lower part of the seed, a thick zone below the lint, and a light coating above, with the lint more abundant at the top, but the fuzz may be nearly lacking except around the band below the lint.} ~~It is greenish (as before).~~

Nectaries of leaves sometimes distinctly ^{or} diamond-shaped or longitudinal. The 5-lobed leaves usually with 3 nectaries ^{the} side nectaries very close down only 3 to 4 mm. from base where middle nectary is ^{1.2} 1.2 cm. on leaf 14 cm. long, 17 cm. on auricle, ^{but} slender tips about 2 cm. Breadth of 5-lobed leaves greatest on forelobes, the tips of these spreading 18 cm. on above leaf. Pulvinus very small, the veins separate nearly to base, indicating slight movements of leaves. Larger 3-lobed leaves mostly with only 1 nectary. The larger nectaries seem to be covered with an outer fleshy layer, of whitish color sometimes rather conspicuous; apparently not redding like the involucrel nectaries.

Stamens rather deep yellow, deeper than Haiti, on very short filaments, showing 5 distinct rows.

Staminal column very distinctly and regularly ^{or} grooved, possibly from partial drying. Oil glands numerous on staminal column, bright yellow, same color as pollen grains; none ⁱⁿ filaments. ^{In} ~~staminal column~~ ^{dark} dark oil glands, very sparse, but the rows may be distinct. Petals also have numerous golden-yellow oil-glands. The oil-glands are reddish on the young bolls, when the flower comes off. Some of the small glands rather bright red, the larger ^{deeper colored.}

(Continued on page 2)

overturn
Another plant in town, ^{near school!} has longer fruiting branches with 10-12 joints. Has full-grown bolls, some beginning to open, 4.5 to 5 cm. long, 2 to 2.5 wide. Lint has very pale buff color, scarcely off white, but on some bolls distinctly appreciable. Shape of bolls a regular narrow conic, ~~bolls~~ same shape as Pima, but somewhat more slender. No difference appreciable in plants, but second had more recently opened bolls and others ready to open. Only 3-locked bolls seen. Locks hold well together, 7 seeds in each lock, in several cases counted. Lint attaining about 28 mm. 1-3/16 inches. Interesting Egyptian-type cotton.

Leaves of rather soft, thin fleshy texture, ~~when fresh bolls are~~ membranous, except in the very young stage entirely naked, of medium size, with 3 to 5 lobes often 4, but the side lobes not developed to spread wider than the forelobes, the basal auricles short, the sinus shallow and open.

Involucral bracts of medium size or rather small, relatively short and broad, the auricles moderately developed, with the margins regularly united at base.

Flowers large, pale yellow, with a slightly greenish tinge, closely twisted petals, not opening widely, the exposed corner sharply produced. Stamens rather few, on short filaments. Anthers golden yellow; style long protruding.

Bolls narrowly conic-oval.

Bractlets not found. Perhaps do not occur on cottons with bracts united?

Fruiting habits; with normal dimorphism of branches, long fruiting branches attaining 10-12 nodes developing numerous buds in rapid series, also on old plants short close-jointed vegetative shoots with numerous short-fruiting branches, often with only one joint and bearing one boll. This an alternative of the dicladium type of vegetative branch specialization, for large perennial plants.

Auricles of bracts only moderately developed, regularly united for 2 to 4 mm., with margins everted from above the union, that is, the bracts are strongly concave on the outside instead

of convex or flat as in most other cottons. Lateral margins of bracts usually entire, ^{that is} or not toothed more than half way down; the outer teeth usually small, but all of the teeth rather small and narrow, the middle three usually not specially enlarged or united ^{at base}.

Contrasting strongly with Haiti cottons in numerous features; large development and regular presence of inner and outer nectaries, regular union of bracts for short distance — not variable range of distance; auricles regularly moderate; anthers with short filaments showing 5 distinct rows. Prominent flat nectaries another peculiar feature, the inner nectaries especially have no indication of a groove or other depression but the region is full or somewhat inflated.

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Cotton (Gossypium evertum) Tumaco May 10, 1926
p. 156

At Tumaco. Stipules on vegetative shoots extremely narrow. 1.6 cm. long, 1mm. wide. Some of the leaves of veg. shoots with elongate nectaries attaining 2 mm. Petals have some of the oil-glands black in the parts exposed in the bud, elsewhere only yellowish oil-glands. Stamens deep yellow, on short filaments showing the five rows.

Cotton (Gossypium evertum) Tumaco May 10, 1926.
pp. 154-5.

Tumaco May 10, 1926. Same type as at Buenaventura, with all the characteristic features, except that the fuzz is greenish, but greenish fuzz on one plant at Buenaventura. Angled petals prominent. Deeply concave rolled-back bracts and large prominent nectaries. Some of the fruiting-branch leaves have five lobes and three nectaries. The lint appears to be a very light buff, scarcely tinged but a shade removed from white. Bracts light green, especially in middle and lower part.

Over

Cotton (Colombia) Buenaventura 5-1-26, pp.79-87
everatum (Str. Guayaquil)

Buenaventura, Apr. 30, 1926, oil glands of
bolls numerous and superficial as in Sea Island
or Egyptian, located in distinct depression, etc.

(See 5 x 8 sheet)

Cotton (Kidney)

Small-boll Kidney cotton at Buenaventura May 28, 1926 .

Very similar in general appearance to evertum but leaves darker green, naked with over-lapping auricles and closed sinus. May be hybrid. No tendency to everted bracts, the teeth of bracts rather coarse and short, broad at base with rather broad notches between. Rather deeply auricled, the inner margins united for most of their length, 4 to 5 mm. Bracts rather square and straight-sided, but sometimes with teeth nearly to the level of the nectary. Bracts turning black in advance of leaves in specimens kept in wax paper, reminding of discolored bracts of large Kidney cotton at Tumaco. A rather small fruiting-branch leaf with three lobes and one nectary, all other leaves collected with 4 or 5 lobes and 3 nectaries; mid-vein nectary short, usually broader than long, the forevein nectaries smaller but sometimes longer. All nectaries with prominent swollen rims. Bracts with 11 to 12 teeth; middle section of 3 teeth not prominent. Bolls very narrowly conic oval gradually but rather irregularly narrowed to slender tip with few oil glands. Stipules rather large but not equal to those at Tumaco. Outer nectaries rather large transversely oval or sub-triangular, with the upper margin transverse, much the same shape as the inner nectaries. Receptacle and margins of nectaries not prominent, inner nectaries forming shallow broad depressions in a nearly flat surface, nearly equal to external nectaries in size, triangular, but not much broader than long. Joints of fruiting vegetatives very short, that is vegetatives with numerous short fruiting branches, mostly one-jointed.

Surface of bolls uneven "bumpy" from pressure of seeds as in cottons with little fiber. Fruiting branch with broad stipule on one side, several times the width of the narrow stipule on the other side. Bracts at early stage very short and broad, nearly twice as broad as long.

At Tumsco May 10, 1926. Bolls with fissures not extending to base, about 1 cm. A short band around base entirely without oil-glands marked by a rather definite zone of very close very small glands, in small punctations; the surface over the small glands and the poreless zone has a short appressed pubescence. Large vegetative shoot leaf with petiole 25 cm. Blade 19 long to sinus 22 to auricle, 26 cm. across tips of forelobes, 20 across side-lobes, great development of forelobes in this type. This very large leaf has only one nectary about 2.5 cm. from base.

Between evertum and Kidney, with some resemblance to Cali cotton. The bracts are very broad and short, the seeds with no fuzz except a basal tuft, of rather long green fibers, elsewhere entirely naked after the lint is off. Color of fiber also seems whiter, though possibly not dead white as in Upland cotton. The bracts, seed-characters and leaf-forms might separate from evertum. Material inadequate but could be considered as variation or related form, with evertum.

At Tumaco, May 9, two types of cotton both with long slender bolls, but one much larger and with bracts of the greatest size. The other with short bracts relatively very broad and with rather small teeth across the broad margin but not at the sides. Belongs to series with erectum but bracts short and flat with moderately developed, well closed and appressed auricles, not at all flared. Nectaries not so large or so prominent often in distinct depressions. Less regularity of nectary occurrence on three-lobed and 5-lobed leaves than in Cali red cotton. Leaf-forms in some cases suggesting the Cali cotton with oval lobes. Leaf nectaries extremely short, less than semi-circular often transversely lunate; one involucre with a bractlet, though auricles are united, apparently with regularity.

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Cotton (Kidney)

Jumaco

Buenaventura

Cotton (Kidney) - S.S. Guayaquil May 10, 1926
Tumaco - Esmeraldas pp.160-1
at Tumaco May 10, 1926. Bolls with fissures
not extending to base, ~~for~~ about 1 cm. A short
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tips of forelobes, 20 across sidelobes, great
development of forelobes in this type. This very
large leaf has only one nectary about 2.5 cm.
from base.

Cotton (Colombia) Tumaco May 10, 1926 pp.155-6

Tumaco, May 9, 1926, also May 10, cp. p. 153. Between evertum and Kidney, with some resemblance to Cali cotton. The bracts are very broad and short, the seeds with no fuzz except a basal tuft, of rather long green fibers, elsewhere entirely naked after the lint is off. Color of fiber also seems whiter, though possibly not dead white as in Upland cotton. The bracts, seed-characters and leaf-forms might separate from evertum. Material inadequate but could be considered as variation or related form, with evertum.

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Cotton (Colombia) Buenaventura 5-29-26.
pp. 241,242,243,244.

Small-boll kidney cotton at Buenaventura
May 28, 1926.

(See 5 x 8)

Small-boll Kidney cotton at Buenaventura May 28, 1926. Very similar in general appearance to evertum but leaves darker green, naked with over-lapping auricles and closed sinus. May be hybrid. No tendency to everted bracts, the teeth of bracts rather coarse and short, broad at base with rather broad notches between. Rather deeply auricled, the inner margins united for most of their length, 4 to 5 mm. Bracts rather square and straight-sided, but sometimes with teeth nearly to the level of the nectary. Bracts turning black in advance of leaves in specimens kept in wax paper, reminding of discolored bracts of large Kidney cotton at Tumaco. A rather small fruiting-branch leaf with three lobes and one nectary, all other leaves collected with 4 or 5 lobes and 3 nectaries; mid-vein nectary short, usually broader than long, the forevein nectaries smaller but sometimes longer. All nectaries with prominent swollen rims. Bracts with 11 to 12 teeth; middle section of 3 teeth not prominent. Bolls very narrowly ~~convex~~ oval gradually but rather irregularly narrowed to slender tip with few oil glands. Stipules rather large but not equal to those at Tumaco. Outer nectaries rather large transversely oval or sub-triangular, with the upper margin transverse, much the same shape as the inner nectaries. Receptacle and margins of nectaries not prominent, inner nectaries forming shallow broad depressions in a nearly flat surface, nearly equal to external nectaries in size, triangular, but not much broader than long. Joints of fruiting vegetatives very short, that is vegetatives with numerous short fruiting branches, mostly one-jointed.

Surface of bolls uneven "bumpy" from pressure of seeds as in cottons with little fiber. Fruiting branch with broad stipule on one side, several times the width of the narrow stipule on the other side. Bracts at early stage very short and broad, nearly twice as broad as long.

Gossypium _____ (Cali type)

Plants perennial shrubs, with purple foliage, stellately hirsute, and with numerous prominent black oil-glands on the stems, petioles, pedicels, etc.

Leaves sparingly hirsute, entire or 3 to 5 lobed, usually 5-lobed on vegetative branches and 3-lobed on fruiting branches; lobes deeply cleft and strongly diverging, the forelobes about 30 degrees from the midlobe, and the sidelobes projecting backward to about 60 degrees from the midlobe, and on a line with the forelobe of the opposite side; shape of lobes oblong-elliptical, acuminate or apiculate, midlobes (sometimes forelobes) slightly constricted; auricles very short, sinus open on the 3-lobed leaves, but the diverging sidelobes usually close the sinus on 5-lobed leaves; petioles and large veins negro-papillate; nectaries three, ovate-cordate, shallow, with prominent rims.

Involucre rather small, light green tinged with purple, with large purple veins, and prominent black oil-glands scattered irregularly over the outer surface; bracts free or only slightly united at base, broadly ovate, subcordate; teeth very short, irregular, usually 10 to 12, towards the apex, basal portion entire; bractlets not found; outer nectaries present or wanting, usually at least one to each involucre, subrotund, transversely oval, very irregular in size, may be very large and prominent, or occasionally two small nectaries occur in the sinus

of the same bract; inner nectaries broadly triangular, sometimes very small or wanting, color pale, often interrupted by large black oil-glands; pedicels short, 3-angled, roughly papillate; calyx subtruncate, with several very small sinuate lobes or scallops, usually 7 or 8, often indistinct; veins large, purple, oil-glands prominent.

Flowers small, pale yellow; stamens numerous; filaments rather short, anthers medium sized, stigma exerted about 1 cm.

Bolls small, 3-locked, narrowly ovate, acuminate, oil-glands numerous, large and irregularly scattered; the fissures end about 6 or 8 mm. from base, and the carpels do not open beyond this point.

Seed very small, densely covered with brownish green fuzz; lint very fine, silky, about $1\frac{1}{4}$ inches long.

Ecuador (San Miguel)

Above note on bractlets drawn from material from San Miguel, May 17, 1926 with large inner and outer nectaries regularly present, often with rather prominent rims partly free from oil glands.

The leaves underneath and the outer surfaces of the bracts, with very short densely tufted pubescence.

Stamens abundant, with no indication of rows, with filaments of moderate length white at base becoming pale greenish toward the end. Connective white or yellowish, translucent; pollen distinctly yellow but not the deepest shade. Style and stigma not exposed, not exceeding the stamens. Staminal column slightly wrinkled longitudinally but not distinctly grooved, with numerous yellow oil-glands, both at the base and among the stamens; no oil glands detected in the filaments or in the connective. Stigmatic lobes rather broad, showing 3 or 4 irregular rows of oil-glands, dark red, nearly black, mostly larger than the pollen grains. The stigmatic ridges are but little prominent.

The outer nectaries are especially prominent, raised on a distinct frustum about 1 mm. above the surrounding surface of the receptacle, with a sharp declivity below, or very abrupt narrowing of the receptacle to the insertion of the pedicel. Sides of pedicel deeply grooved especially above, and the angles also grooved more or less distinctly. Bolls of typical Egyptian form and appearance, but apparently not close to Egyptian type in other respects. Closely pubescent leaves and bracts, short style, immersed stigma, greenish filaments and very prominent external nectaries are notable differences, but material very inadequate and no opportunity to determine regularity of any features. Petals with distinct purple spots, densely hirsute on exposed surfaces of bud, elsewhere with numerous yellow oil glands and many small chinks between the veins where the yellow pigment is lacking and the tissue is clear.

Check up bolls with photos.

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check up buds with photos

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Cotton (Ecuador) Guayaquil, May 18, 1926. pp. 192-4

Above notes ⁵¹⁷⁻²⁶ on bractlets drawn from material from San Miguel, with bare inner and outer nectaries regularly present, often with rather prominent rims partly free from oil glands.

(See 5 x 8 Card)

Buenaventura purple

Very tall plant, 15 to 18 ft. Purplish foliage and exposed surfaces of bolls. Suggests cali cotton, but may be different.

Leaf nectaries long 5 mm. and irregular, often only one, on vegetative branch often 2. On fruiting branches 5-lobed leaves usual, and with only 1 nectary. Three-lobed leaves on basal sprouts with 1 nectary, very close to the base, 5 to 8 mm., also these nectaries very short.

Leaf-surfaces nearly naked, except when very young, the pubescence delicate and fugacious, the hairs rather short, distinctly stellate. Outer nectaries small, often wanting located rather low down, in the upper end of the groove of the pedicel, separated from the insertion of the bract above by two or three times the length of the nectary. Surface of receptacle may be abruptly prominent above the nectary and at the sides, but not below, where the nectary-depression is continuous with the groove which is very deep in the upper part of the pedicel. Nectary often surrounded by several large prominent oil-glands.

Angles of pedicel rather strongly grooved, the ridges with prominent oil-glands. Base of pedicel abruptly broadened, with a special off-set at a right angle from the branch, see photo. Without this off-set from the ^{branch the} base of the pedicel would be larger than the place of attachment on the branch. Also the leaf-scars on the branches appear unusually large and prominent.

Inner nectaries larger than the outer, often twice as large, and regularly present; broadly triangular, about twice as broad as long, the lower margin commonly beset with large oil-glands, often in rather regular rows. Calyx with a slightly sinuate margin, the oil-glands often in rows between the veins.

Surface of boll rough and uneven, especially in the upper part, the oil-gland punctations deep and rather coarse. Upper part of boll prominent over the suture forming a low ridge which may be appreciable half way down. The ridge has few oil-glands, especially at the tip, so that the surface is much smoother than on either side. Boll-wall rather thick, the oil-glands penetrating half way or less.

Stipular rim of fruiting branch leaves appears rather prominent and oblique, the base of the larger stipule somewhat persistent.

Bracts of rather fleshy, brittle texture, of moderate size broadly triangular oval, slightly to moderately auriculate at base, in the sense of being produced but little below the point of attachment. Margins of bracts united but only to a slight extent, usually not more than one mm, the lower margins of the bracts usually flared apart, but not the lateral margins; teeth absent below greatest width of bracts, number of teeth variable from 10 to 15, usually 12 or 13 middle section of three teeth often irregular, not prominent. Fissures of bolls with prominent margins, roughened with deep oil-glands or abruptly shouldered; the largest depressions between the sutural ridges and the margins of the fissures in the form of deep grooves or wrinkles. Should show well in photographs. Lower part of boll smoother, only small deep-seated oil-glands near base only narrow basal zone without oil glands.

Sutural grooves distinct at tips of bolls, but very short, close to the stigma.

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Pneumococcus purple

Very Tall plant, 15 to 18 ft. Purplish foliage and exposed surfaces of bolls. Suggests cali cotton, but may be different. Leaf nectaries long 5 mm. and irregular, often only one, on vegetative branch often 2. On fruiting branches 5-lobed leaves usual, and with only 1 nectary. Three-lobed leaves on basal sprouts with 1 nectary, very close to the base, 5 to 8 mm., also these nectaries very short. Leaf-surfaces nearly naked, except when very young, the pubescence delicate and fugacious, the hairs rather short, distinctly stellate. Outer nectaries small, often wanting located rather low down, in the upper end of the groove of the pedicel, separated from the insertion of the bract above by two or three times the length of the nectary. Surface of receptacle may be abruptly prominent above the nectary and at the sides, but not below, where the nectary-depression is continuous with the groove which is very deep in the upper part of the pedicel. Nectary often surrounded by several large prominent oil-glands. Angles of pedicel rather strongly grooved, the ridges with prominent oil-glands. Base of pedicel abruptly broadened, with a special off-set at a right angle from the branch, see photo. Without this off set from the branch the base of the pedicel would be larger than the place of attachment on the branch. Also the leaf-scars on the branches appear unusually large and prominent.

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Cotton (Colombia) "Algodon morado" 5-28, -26.
Buenaventura pp. 234, 235, 236, 237, 238.

Very tall plant, 15 to 16 ft. Purplish
foliage and exposed surfaces of bolls.

(See 5 x 8)

Cali purple

Purple cotton collected by F. C. Baker at Cali, Colombia, May 1926, in door-yards. Remarkable leaf-forms with very wide divergence of forelobes, almost 180° to each other, and sidelobes turned into the position of back lobes, forming broad, overlapping auricles, although the auricle portion of leaf is only slightly developed.

Very large prominent oil-glands on internodes, petioles and veins. Surfaces beset with strongly tufted hairs.

Calyx large, firm and fleshy with thick prominent veins and large prominent oil-glands, the veins more prominent above the middle of the calyx and tinged with purplish red. Lighter reddish between the veins. Margin of calyx distinctly sinuate, but not regularly, 7 or 8 sinuosities may be counted, some broader than others.

Nectaries very large, prominent as in Buenaventura cotton (evertum) but very irregular, very large, small or absent on same involucre. Outer nectaries may be partly or completely divided into two, of equal or unequal size, sometimes very unequal. Inner nectaries as large as outer, broadly triangular or shield-shaped, rounded below, often irregular, the large prominent papillae spreading on the surface between oil-glands, and with frequent oil-glands in the nectaries, where papillae may be absent. Often a close row of large oil-glands below the inner nectaries, also between the nectaries and around the base of the calyx. Pedicels rather slightly and broadly grooved below the nectaries, distinctly grooved on the angles.

Leaf-nectaries on prominent thickening of the veins, short, broadly-triangular or semicircular; three nectaries on 5-lobed leaves, one nectary on three-lobed leaves, this closer to the base like the side nectaries of the 5-lobed leaves. The three-lobed leaves have the forelobes quite divergent but the form of the base is entirely different, with the auricles small and the sinus narrow and open. Stipules of veg. branch very long and narrow attaining 2.5 cm. by 2 mm. wide; on frtg. br. 1.5 cm. by 7 to 9 mm. sometimes with 2 to 4 teeth; other side, 4 mm. wide ^(.4¹) Callus prominent and ^{abnormally} ~~stipules~~ wrinkled, deep purple, the lateral veins distinctly united before joining the midrib.

Shape of leaf-lobes different as well as base on three-lobed leaves & 5-lobed. Only the latter have the broad, oval curve of the lobes with very abrupt short tips, reduced to a minute curved point.

Leaves apparently 3-lobed on fruiting branches, 5-lobed elsewhere. The number of nectaries apparently depends on form of leaf not on size; A 5-lobed leaf 4.5 cm. long, 7.5 cm. broad has 3 nectaries while a 3-lobed leaf 9.5 cm. long and 12 wide has only one nectary, but this is farther from the base than on most of the 3-lobed leaves. The small 5-lobed leaf has the side lobe turned back into the position of the auricle and measures that way 6.5 cm. long or 2 cm. more than to sinus, while the much larger three-lobed leaf is only one cm. longer to the auricle than to the sinus, 9.5 cm. at the sinus, 10.5 cm. at the auricle.

On the basis of this cotton a little study of leaf-forms should be made with reference to the positions of the back-veins in different types and the width between the back veins and the margins. In a 5-lobed leaf of this species the back veins lie nearly parallel with the petiole, or nearly opposite the midrib, and the area between the back vein and the margin is very narrow, the expansion of the leaf being accomplished by the broadening and flattening of the lobes, rather than by the enlargement of the base of the leaf. Thus it seems possible to have closed and overlapping auricles on leaves that may be quite different structurally, in the relation of the veins.

In some cases the back-veins unite with the side-veins before joining the fore-veins.

Bracts rather short and broad with 13 rather small teeth, often fewer, 7 or more. Pulvini moderately thickened, with prominent oil-glands.

Leaf nectaries not deeply excavate, although seated on a distinct swelling of the veins, corresponding with involueral nectaries in this respect.

The sinus between the midlobe and forelobe in 3-lobed leaves lies nearly flat and is broadly rounded, or forming nearly a right angle; in five-lobed leaves the sinus is folded. The closing and overlapping of the sinus on the 5-lobed leaves suggests the Mexican cottons. Compare features in detail.

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Cali purple

purple Cali

Cotton (Colombia) S.S. Guayaquil Buena Ventura - Tumaco May 8, 1926 pp. 134-139

Purple cotton collected by F. C. Baker at Cali, Colombia, May 1926, in door-yards. Remarkable leaf-forms with very wide divergence of forelobes, almost 180° to each other, and sidelobes turned into the position of back lobes, forming broad, overlapping auricles, although the auricle portion of leaf is only slightly developed. Very large prominent oil glands on internodes petioles and veins. Surfaces beset with strongly tufted hairs.

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4(?)

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Cotton (Colombia) S S Guayaquil, May 8, 1926 pp134-
Buenaventura - Tumaco 139

Purple cotton collected by F. C. Baker at Cali,
Colombia, May 1926 in door yards. Remarkable
leaf-forms with very wide divergence of forelobes,
etc.

See 5 x 8 sheet

GOSSYPIUM MONADENUM. New Species.

A woody perennial plant with rather slender stalks growing erect for a few feet in open places, but adapted for climbing or trailing widely over other vegetation; living many years and developing a thick vine-like trunk, the bark warted with large corky lenticels; main stalks and vegetative branches with short joints, 2 to 4 cm. long, the branches few near the ground but numerous above; fruiting branches slender, short-jointed often limited to 2 or 3 joints but sometimes with 6 or 7 joints; basal joint 6 to 8 cm. long, the other joints 2 to 4 cm.; nearly cylindric, slightly zig-zag - see if spiral can be determined at Chapman Field.

Surfaces of stalks, branches, petioles and pedicles with a dense covering of rather fine flexuous hairs. Leaves of medium or rather small size, attaining about 15 cm. in length and width; mostly 3-lobed, only a few of the larger leaves with small side-lobes; no sublobes; auricles rather short, the sinus usually open; texture rather firm and velvety; strongly pubescent underneath, especially on the veins, also the veins above distinctly (pubescent, lower surface of leaves much lighter, glaucous green, even where not pubescent; leaf-nectaries always single, about 1 cm. from the base on the larger leaves; nectaries small and short, rounded walls, triangular or shield-shaped with moderately prominent margins.

Involucral bracts rather small and short, round or broadly oval, the auricles rather long and broad with the margins usually entire to level of the point of attachment; usually with 7 well-developed teeth, 2 on each side of the middle 3; often with one or two small teeth below the others, in rare cases with the auricles so that 11 to 13 teeth may be counted; outer surface and margins of bracts rather densely pubescent, also the veins of the inner surface, in the upper part appressed hairs; calyx with short broad angled lobes, the apex in the lobe not produced, often minutely sinuate, notched or bidentate.

Flowers moderate large with rather short broad petals, pale cream color with a moderate purple spot near the base; stamens numerous, on long slender filaments; upper filaments longest, attaining nearly 1 cm.; anthers golden yellow contrasting notably with the filaments; staminal column with numerous pale yellow oil glands, no oil glands in the filaments; stigma exerted beyond the stamens--double lines of oil glands on each side of stigma.

Gossypium monadenum new species

a woody, perennial plant with
 rather slender ^{in a few feet in open places, but} stems
 adapted for ^{to be} trailing climbing
 or trailing ^{over} other vegetation,
 with ^{leaves} ^{12 to 15} ^{cent} ^{or} ^{more} ^{long}
 with ^{leaves} ^{12 to 15} ^{cent} ^{or} ^{more} ^{long}
 a length of ^{12 to 15} ^{cent} ^{or} ^{more} ^{long}
 becoming ^{12 to 15} ^{cent} ^{or} ^{more} ^{long}
 vine-like trunk, the bark
 warty with ^{large}
~~set~~ ^{with} ^{large}
~~and~~ ^{with} ^{large}
 and vegetative branches ^{with} ^{short}
 joints, ^{2 to 4} ^{cent} ^{long}
 the ground but suberous
 above; fruiting branches slender,
 short-jointed with often limited
 to 2 or 3 joints ^{but} ^{sometimes}
 with 6 or 7 joints, ^{depth} ^{3 to 5} ^{cent}
 6 to 8 cm long, the other joints 2 to 4
 to 5 cm; ^{fruit} ^{branches} ^{joint} ^{nearly}
 cylindrical, slightly 3-5-3-5 x see
 determined at Chapfud

Lower surface of leaves much lighter glaucous green, even where not pubescent.

Surfaces of stalks, branches, petioles and leaves (including pedicels of petioles) and ~~upper~~ ~~lower~~ ~~sur~~ ~~faces~~ with a rather dense covering of ~~rather fine~~ ~~simple~~ ~~and~~ ~~stellate~~ hairs, the individual hairs stand!


Leaves of medium ~~size~~ or rather small size, attaining about 15 cm in length (and width) ~~and~~ ~~the~~ ~~large~~ - only mostly 3-lobed, only a few of the larger leaves with small side-lobes; no sublobes; auricles rather short, the sinus usually open; texture ~~of~~ ~~rather~~ ~~firm~~, ~~the~~ ~~surfaces~~ ~~underneath~~, especially on the veins ~~also~~ ~~the~~ ~~veins~~ ~~above~~ ~~distinctly~~ ~~pubescent~~ ~~with~~ ~~leaf-nectaries~~ ~~along~~ ~~single~~ ~~about~~ ~~1~~ ~~cm~~ ~~in~~ ~~the~~ ~~base~~ ~~on~~ ~~the~~ ~~leaves~~; nectaries ~~small~~ ~~and~~ ~~triangular~~

Upper surface of leaves with moderate pubescence of hairs

Involucral bracts rather smelly
 and ~~narrow~~ ^{short}, oval round ~~or~~
~~oval~~ broadly oval, ~~at~~ the
 axils rather long and broad,
~~and~~ with ~~entire~~ ^{the} margins to the
 end usually entire to the level
 of the point of attachment;
~~teeth~~ usually with 7 well-developed
 teeth, ~~at~~ 2 on each side of
 the middle 3; often with one
 or two small teeth ~~on each side~~
 below the others, in rare cases with
 2 or 3 ~~or~~ minute teeth at the sides of
 the axils; ~~or~~ 11 to 13 teeth ^{and margins}
 may be counted; outer surface of
 bracts rather densely pubescent
 also ^{the veins of the} inner surface,
~~with~~ ^{in the} ~~upper part of~~ appressed
 pubes hairs; calyx with short
 broadly angled lobes, ~~not~~ ^{the apex}

On shell heaps of
Terra Ceia Island, near Bradenton, large perennial
type with hairy branches, petioles and leaves. No developed
side lobes; no indication of sidelobes except in shoots in
partial shade. Such leaves photographed. Could be described
as essentially 3-lobed with many and large simple leaves. Only
one leaf nectary. Midlobe large, often much larger than fore-
lobes. Little tendency to 2 lobed leaves, and the second lobe
very small and short, not deeply separated as in South American
G. tridens bilobed leaves, which are very frequent on the fruiting
branches.

The Florida cotton thus far seems to have no well-developed
fruiting branches, only one-jointed or with only one joint
functional.

Pubescence with many simple hairs; tufted hairs more fre-
quent at the bases of the veins underneath, but on branches,
petioles and leaf surfaces most of the hairs are simple or only
in 2's and 3's rather than tufted, though tufted hairs also
occur with 7 or more hairs together, especially on the veins
underneath. # Nectaries of leaves only one, usually short and
triangular, but sometimes long, to 5 mm and irregular  shaped.
The margins of the nectaries are thick and swollen, commonly as
wide as the nectary. Nectaries located rather close to the base,
usually 1 cm or less, sometimes only 6 to 7 mm. # Petioles with the
basal pulvinus rather strongly developed often bent abruptly
backward so that the petiole is brought downward parallel with the
branch. The upper side of the bent pulvini usually colored red.

Callus not large, also colored red, and the red color decurrent on the upper pulvinus, also the rugose and hirsute surface of the callus extends down on the pulvinus. Veins underneath not united much on each side, though forming distinct cavities above like the so-called "mite pockets", or to be described as leaves distinctly plicate between the veins above, though not so strongly as in some of the South American species.

Bolls mostly 4-locked, but often 3-locked, small, thin shelled, locks with 5 to 7 seeds, usually 5 or 6, the divisions pointed but rather short and straight, not with long strongly recurved beaks. Calyx with few oil-glands. Margin distinctly angled, but not produced. Base of calyx inside with deep band of hairs along nectary ring. Inner nectary set in deep transverse groove, the secreting surface apparently with rather few papillae and with hairs among them. Outer nectaries in a deep pit, densely hairy. Rim abruptly prominent.

Pedicels nearly round, not grooved on the sides or on the angles.

Seedling must have had about 20 leaves before beginning to be lobed.

Bolls rather light colored, but not a pale glaucous green like upland surface with very minute shallow punctations, but having minute shallow centers. No sutural band without oil glands, but distinct sutural grooves at tip. A distinct basal band without oil glands. Seeds held strongly in carpels, often showing rows of hairs, remaining attached along sides below the middle.

Miami cotton with longer hairs on new growth of branches, stronger tendency to 5-lobed leaves but still never large. Less tendency to large simple leaves. No tendency to large midlobes, but these rather small and narrow. Petioles commonly reddened throughout, or top and bottom reddened.

One of the most prominent differences in occurrence of leaf nectaries, these commonly 3, on all large leaves and often on small ones.

Oct 4, 1929

Photographs of Miami cotton Grad's show distinct intermediate veins on each side of the midvein, so that three veins go into the middle tooth. No indication of this in enlarged photo of Cape Sable Cotton. Middle tooth of exact more strongly developed in Miami cotton, as well as teeth much longer.

Lack of well-developed fruiting branches confirmed in Miami cotton. Vegetative branches go all up stalk to near the top, only 1 to 2 jointed at end, the 2nd joint not producing boll in any instance observed.

Miami cotton has leaves but little hairy underneath in comparison Terra Ceia. Calyx has very few oil-glands. Boll has scarcely any oil glands in lower third except close along the fissures, but fissures not reaching to base.

Cotton (Sea Island)

Chapman Field, Aug. 24, 1926.

At Chapman Field. More plants with white flowers than with yellow. One with pale spots and light green bolls evidently hybrid. Also great variation in boll shape shown in photo.

Seeds small, very densely coated with long fuzz of very firm texture the fibers easily straightened and showing a length of one-eighth to nearly one-quarter of an inch, of a dull greenish color. Lint very sparse, the

Lint pale flax-colored, of very uneven length, the longest fibers confined to the top of the seed, attaining nearly an inch and a half, the short fibers at the base of the seed only half an inch or less. In a cross section it appears that the inner layer of the seed coat is slightly thicker than in the East Coast species, and the oil glands of the embryo are darker in color and more numerous.

Cotton (Florida) Tena Ceia seed char

Seeds small, very densely coated with long greenish fuzz of very firm texture the fibers easily straightened and show a length of one-eighth to nearly one-quarter of an inch, of a dull greenish color. Lint very sparse, the

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Lint pale flax-colored, of ^{very} uneven ^{confined} length, the longest fibers at the top of the seed, ^{attaining} nearly $\frac{1}{2}$ an inch and a half, ~~longish~~ the ~~base~~ ^{apex} ~~of the fibers~~ reduced ~~at~~ ^{at the base} ~~only~~ ^{to} ~~half~~ ^{less} an inch or ~~less~~ ^{less}. ^{The inner} ~~seems to be~~ ^{cross-section} ~~thicker~~ ^{of the seed coat} ~~and~~ ^{is slightly} ~~than~~ ^{thinner} in the ~~East~~ ^{East} Coast species, and the

oil glands of the embryo
darker in color and
are ~~more~~ numerous, ~~and~~
ditto

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Cotton (Florida) East Coast Miami Compared with Terra Ceia

Greater tendency to lobing of leaves. Many small leaves with two and three lobes, instead of many large simple leaves on T.C. cotton. Five-lobed leaves more frequent and lobes larger on Miami cotton, but still only slightly represented in comparison with most cottons. Smaller development of midlobe in relation to sidelobes, shown especially on 3-lobed and 5-lobed leaves.

Larger leaves usually with 2 or 3 nectaries
Leaves nearly naked below except on the veins

Large inner nectaries

Bolls short and square; instead of oval
Bolls with scattering oil-glands, especially on sutural band.
Those of T.C. cotton with more numerous oil glands, and no sutural band

Seeds with white lint, otherwise naked in the middle; ~~fuzz~~
at apex with denser white fuzz, basal tufts of light buff fuzz

Cotton (Florida)

Characters shared by both types

Absence or slight development of 5-lobed leaves, shown especially on T.C. cotton

Hairy stems and petioles

~~Involucres with bracts united at base below the~~

Calyx with few oil-glands

Involucres with small bracts, few teeth, regularly united at base along the inner margins usually from 3 to 4 mm.

Flowers rather small, creamy white ? no petal spots

Seeds small

Inner nectaries in a deep transverse groove, bordered with a prominent rim below which bears the united auricles of the bracts

Stipules rather small, moderately falcate, somewhat broader on fruiting branches but scarcely unequal

Petioles with well-developed basal pulvini often abruptly flexed downward, so that the leaves are pendent

Surfaces of nectaries with hairs among the papillae, usual in clusters of

Cotton (Florida)

The features shared by the two types not recognized among the cottons of Mexico or Central America are as follows:

Involucres with rather narrow bracts, toothed at the end but not on the lateral margins or auricles, usually, along the inner margins of the auricles, or to a greater extent, often 1 cm. or more

Calyx rather long with very short rounded lobes, not sharply angled or tailed.

Inner nectaries commonly deficient, ~~Simple or~~

Leaves usually ^{simple or} with three lobes, seldom with five; only simple or very short-lobed leaves on fruiting branches

Cotton (Florida) Miami (habit)

Habit of growth rather short, robust and spreading, notably distinct from slender trailing Terra Ceia cotton, as shown more definitely by plants growing at Chapman Field. See photos, in June 1928. These grown from seedlings transplanted from plant photographed and studied south of Miami a few years ago.

Cotton (Terra Ceia)

Pedicels rather short, not attaining the length of the bolls, often only half as long, usually curved, or distinctly oblique, or both curved and oblique, that is not in line with the axis of the boll. Compare photographs, but the bolls often placed to appear straight, but all of the specimens are oblique.

Cotton (Miami)

Bolls flat-sided and somewhat angular in cross-section.

Oilglands scattered, appearing as rather large dark spots, surface even, not pitted over the glands; the glands becoming more scattered below the middle of the boll and the lower surface of the boll inside the calyx usually without any glands except a few close along the fissures.

Base of boll distinctly tapering, in comparison with the more abrupt boll of the Terra Ceia species.

Short, square, abruptly beaked bolls, somewhat tapered at the base. The lack of grooves on the fissures, except at the apex, adds to the smooth appearance of the bolls.

Oil-glands sparse also at the end of the boll, which is not the case in the Terra Ceia cotton.

Bolls have a tapering base and also are set up on a thicker receptacle, between the inner nectaries and the base of the calyx.

Cotton (Florida) Terra Ceia

? Calyx lobes very broad and short, rounded or angled
but not produced or "tailed".
for mucronate?

Involucral bracts see photo. net size at James Island.
No teeth on the auricles or lateral margins.

Nectaries with long hairs little papillose surface
not red. Bracts not reddened, ^{sometimes} slightly brownish on exposed side.

Pedicel subcylindric, slightly thickened at the base,
gradually thicker from above the base to the receptacle; not
grooved or angled at the corners, slightly flattened on the
sides below the nectaries, or sometimes with a short depression
or groove below the nectary.

The pedicels are distinctly thicker than the internodes
of the fruiting branches though not so much enlarged.

Inner nectaries form rather deep transverse or slightly
crescentic grooves, on the even slope of the calyx, or with a
slight prominence above the nectary; the lower boundary forming
a rather prominent rim usually with a distinct angle projecting
slightly between the bracts.

Cotton (Miami) Pubescence

Also notably hairy on young growth of late-season small branches, the hairs longer than in the Terra Ceia form and less numerous.

Nectaries

All of the large leaves with three nectaries and some of the small, down to 3.5 cm in length.

Even very small leaves of the late growth have 3 lobes, including those only 2 - 3 cm long. Simple leaves few and very small, 2 cm or less in width, 2.5 cm long.

On account of small midlobes the leaves are commonly as broad as long, or broader.

Nectaries not so close to the base ^{of the} midvein, even on very small leaves 4 to 5 mm from base, on larger leaves 12 to 15 mm. Nectaries of forelobes much lower, on the veins, often about half way down.

Cotton

Boll Characters

Miami species has bolls with fissures grooved only at the tip

Bolls abruptly tapering at the tip, with no intermediate sutural grooves

Oil glands rather large and scattering very few below the calyx except close to the fissures.

Terra Ceia cotton has bolls distinctly grooved the fissures more than half way down
Gradually tapered at the tip frequently with distinct sutural grooves near the tip.

Cotton (Terra Ceia)

Leaves rather closely pubescent especially on the lower side.

Seeds 6 to 7 per lock, in small bolls 4 to 5, in the smallest only 2 to 3 in the lock.

Nectaries only one on any of the small fruiting branch leaves collected this time. Look for previous notes on large leaves. Shape of nectary nearly round or elliptic or occasionally pointed at one or both ends, located very low on the vein, 3mm. or less, often only 2 mm.

Cotton (Terra Ceia) Boll characters

Bolls with no fibers on the sutures within.

Bolls rounded in cross-section not angular from being flat-sided as in the Miami cotton.

Oil glands numerous and close, showing as distinct pits on the surface; oil glands remaining abundant to near the base of the boll below the calyx.

? Bolls tapered conic-oval, rather gradually to the tip, rounded rather abruptly to the receptacle.

Bolls with 3 or 4 locks, no 5-locked (four 3's to 7 4's).

Oil glands continue numerous to near the tip of the boll.

Cotton (Florida) Miami. (habit)

rather short robust and spreading

Habit of growth notably distinct

slender trailing

as shown by

photo more definitely by

plants growing at Chapman Field

See photos in June 1928. These

grown from ~~seeds~~ ^{segments transplanted} ~~plants collected~~

from plant photographed and studied
Miami a few years south of
Miami a few years ago

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Cotton (Terra Ceia)

Pedicels rather short, not
attaining the length of the
bolls often only half as long,
usually ~~oblique~~ curved,
generally ~~oblique~~

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~~or~~ ~~or both~~ are distinctly oblique
not in line with
the axis of the boll.

compare photographs, but those
after bolls of the species to
appear straight, but all of the
specimens are oblique.

Cotton (Miami)

Bolls flat-sided and somewhat
cross-section ~~flat~~ angular in

NOV 6 1928
GOPIED

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GOPIED

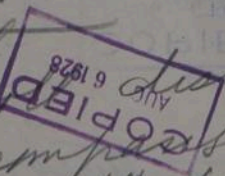
oil glands, ^{scattered,} appear rather large
~~as on the surface~~ as rather
large dark spots, but
~~under the green~~ ^{uniform}
~~even~~ surface, which
even not pulled over the
glands; the glands becoming
sparser at the ^{more}
scattered below the middle
of the boll and ~~with~~ the lower
surface of the boll inside
the calyx ~~with~~ ^{usually} without

Miami

any glands except a few ^{done} along the fissures

Shape of boll

Base of boll ^{distinctly} tapering, in comparison with the more abrupt boll of the Terra Ceia species



Short, square, abruptly beaked bolls, ~~some distinctly~~ somewhat tapered at the base. The leaf ^{of growth on the fissures except at the base adds to the smooth appearance of the} oil-glands sparse also at the end of the boll, which is not the case in the Terra Ceia etc

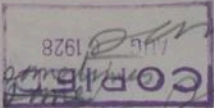
Bolls have a tapering base and also a distinct neck at the receptacle is longer above the by a lower receptacle the are set up on a thicker receptacle forming a space between the nectaries and the base of the calyx

Collm (Florida) Tenaculia

Calyx lobes very broad
and short, ~~are~~ rounded or
~~at~~ angled, but not produced
or "tailed"

Involucral bracts see photo
not size at James 2, no
teeth on the lobes auricles
or lateral margins

nectaries, ^{with long hairs} not red little yellow

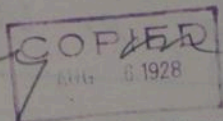
Bracts not reddened,  some light yellow

brownish on exposed side

over

Cotton (Miami) Pubescence

also notably hairy
young growth of late season
small branches, ~~But~~
~~but~~ the hairs longer than
in the Terra Ceia form
and less numerous



nectars

All of the large leaves with
3 nectaries, and some of the small,
down to 3.5 cm in length.

very very small leaves of the late
growth have 13 lobes, ~~it~~ include
three only 2-3 cm long. Simple leaves
few and very small, 2 cm or less in
width, 2.5 cm long.
on account of small midlobes the leaves

are often common as broad as
long, or broader

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Veinlets not so close to
the base of the veins
midvein, at least 4 to 5
even on very small leaves
4 to 5 ~~mm~~ mm for base,
on larger leaves 12 to 15
mm. Veinlets of side
lobes much lower on the
veins, often about half way
down

Cotyle : Bolle Char

Miami species has Bolles ^{with} ~~more~~
fissures grooved only ^{at the}
up

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1928

^{isles} abruptly taper at the tip, with no
intermediate ~~grooves~~ ^{subline} to indicate the
oil glands rather large and scattering
very few or none below the calyx
except close to the fissures

Teracee cotyle has bolles distinctly
grooved on the fissures more
than half way down
gradually tapered at the tip with
frequently with distinct subline groove
near the tip

Cotton (Ternstroemia)

Leaves ^{rather} ~~set~~ closely pubescent especially on the lower side

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Seeds ~~6 to 7~~ ^{6 to 7} per lock ⁱⁿ small bolls 4 to 5 ⁱⁿ the smallest ones

Small bolls with ~~2 or 3~~ ^{2 or 3} seeds

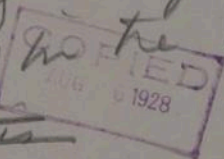
in the lock

Nectaries only one on any of the small fruit branch leaves collected this time. Look for previous notes on large leaves. These small ~~leaves~~ shape of nectary oval to nearly round or ^{at one or both ends} oval ^{pointing} above, elliptic or occasionally ^{very} low in the vein, often ^{with} ~~with~~ ² ~~2~~ mm usually 2 to 3 ^{or less} ~~or less~~

Cotton (Terra ceia) Boll char

Bolls with no fibers on the
sutures within

Bolls rounded ~~in~~ in cross-
section not angular from being
flat-sided as in the Miami
cotton ~~(see that this~~



Oil glands ^{etc} numerous and ~~close~~
~~to~~ ~~recept~~ ^{showing as} distinct pits
on the surface; oil glands
not continuous ~~not~~ ^{not} ~~de~~ remaining
numerous abundant to near
the base of the boll ~~well~~ ^{for}

below the calyx ~~rather narrow tapered~~
Bolls ^{rather narrower} ~~rather~~ ^{rather} ~~narrow tapered~~
^{conic} ~~rather~~ ^{oval} ~~rather~~ ^{rather} ~~narrow tapered~~
^{rather abruptly rounded} ~~rather~~ ^{rather} ~~abruptly~~
The receptacle ~~rather~~ ^{rather} ~~not~~ ^{not}

Bolls with ~~only~~ 3 or 4 locks
no 5 locked (from 3's to 4's)

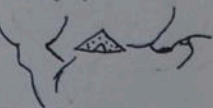
Oil glands continue numerous
to near the tip of the
boll

Flowers Flowers white faintly tinged with purplish below the middle, near the base a rather small dull purplish spot. Pollen golden yellow, stamens rather small, on long filaments, bolls 3-locked and 4-locked. *Habit* Bush is trailing shrub, would be nearly 20 feet high if stood erect, ^{or} is held upright; is supported by small tree, purplish tinge of flowers doubtless from afternoon.

Note Also at Bishop's Harbor about 3 miles north according to Mr. J. E. Wood who formerly lived there. Had it growing up in tree, gets no larger than a man's arm, but keeps running. The bark is quite rough on all of the old wood, not like the rather smooth bark of Davidsonii, except on the very old wood where it becomes strongly rimose, that is in Davidsonii.

Leaves Note No leaves with more than three lobes at this season. Small leaves at this season on account of dry weather in the spring in Florida. Is tax on vegetation that begins to grow with warm weather.

Involucral bracts regularly united at base for at least 1 mm., often for 2 mm. or more, the united angles supported by a triangular prominence of the receptacle surrounding the inner nectary like a small bracket on shelf with the nectary at the base of the triangle where it forms a groove with the calyx, meeting at a distinct angle often near a right angle.



This triangular shelf or prominence is distinct from the bases of the bracts which have no oil glands near the base on the inner surface and few on the outer surface, while the shelf has several large oil glands between the nectary and the insertion of the bracts. The shelf is narrow except at the angles but an appreciable rim with oil glands is ^{to be} seen in most involucre. May mean that the receptacle is broader than the bud or that the bud is narrower at base than usual. Comparison of alcoholic material with other species might show.

The inner and outer nectaries are both hirsute with compound hairs like the outer surface generally, but the inner surface has hairs only on the nectaries. The inner nectary is never large, is triangular, broader than long when distinct and often is small, and sometimes indicated only by a few hairs. Sometimes the shelf beyond the nectary is ^{inflated} strongly which places the nectary on the side of a deep groove.

Outer nectaries usually 3 and nearly equal, sometimes one small or rudimentary, nearly round or somewhat broader than long, forming a deep depression and with the surrounding surface usually strongly swollen or inflated. The lower rim of the depression is less prominent in the middle and often there is a distinct smaller depression just below the pore, but the pedicel below the pore often is not grooved at all as in many other kinds of cotton, nor is there any indication of grooves at the angles of the pedicels, which are more rounded in cross-section than in most other cottons, as well as more strongly hirsute than in most cases.

bracteoles

The prominent angle around the inner nectary, which may be supposed to represent a rudimentary bract not infrequently bears a very small slender bractlet on one side of the middle of the shelf. The form and position of the bractlets were the same in the several cases observed, very narrow with several rather long hairs at the tip.

The pedicels are stout, distinctly thicker than the branch or internode to which they are attached, tapering slightly to below the middle, but thicker also at the base. The lower half entirely round and usually also above the middle to near the level of the nectaries. ⁹ Fruiting branches with 6 or 7 joints were obtained but

pedicels

mostly short at this season, many with only one or two joints. The first joint may be scarcely longer than the others, or may be twice as long as the second, or the second also may be rather long; hence not a definite specialization in lengths of joints. Thus one branch with joints 2 cm, 1.5 cm, 2 cm, 2.5 cm.; next branch 3.5 cm, 3 cm, 4 cm; next 5 cm, 5 cm, 4 cm; next 6 cm, 3 cm. Branches commonly ending with a square or boll, that is the terminal bud usually abortive.

fruiting branches

Involut.
Involucral bracts not large, rather broad with rather short broad teeth, usually 5 to 7 teeth confined to the apical margin, the lateral margins and auricles entire.

Leaves
Leaves with only one nectary, close to the base of the mid vein, usually small and short rounded triangular to narrow and sub-sagittate, the vein scarcely widened and the rims not much swollen but the oil-glands appear ^{ing} larger and more prominent around the nectaries.

Leaves
Both surfaces of leaves hirsute especially on the veins, and the hairs notably compound. Also the pubescence is short and close, in comparison with Upland cotton and most other kinds.

Bolls
Bolls of pointed form as before, dark green color. Fissural grooves very shallow in lower part of boll sometimes showing scarcely any mark on the surface, but becoming rather deep above the middle, that is the surface is even with only a minute groove perceptible under a lens. The tips of the divisions are rather thick and fleshy at the tip.

Involut.
Perhaps a name will be needed for the area surrounding the inner nectary, in this species more prominent than usual and set off at a sharp angle from the base of the calyx. This area has oil glands well developed and doubtless corresponds morphologically to the surface of the lower side of the receptacle where the outer nectaries are inserted.

Fls.
Fresh flower is of the light creamy Upland color, with only the spot at base of petal. One flower with outer petal in simple oval form nearly as long as the others but much narrower. Specimen in alcohol.

Pistil moderately exserted, rather slender.

In greenhouse at San Antonio, has buff lint.

Leaves with strongly retrorse or pendent leaves on upright shoots. Petioles bent back at basal pulvinus. Leaves turn back same way on pendent branches indicating that this is a definite habit. Many leaves are laid back parallel with the branch. Requires special development of lower pulvinus. Large leaves have ample auricles and sometimes closed with slight overlapping. Smaller leaves with auricles also touching at the bottom of the sinus, by sudden widening around the callus.

Bracts regularly united at base well out, nearly to full depth of auricles. Auricles distinct on small buds nearly as deep as petiole is long. Teeth carried well down on margins of bracts, almost to point of union. Tuft of slender hairs in position of internal nectaries. Not short velvet hairs but rather loose spot of slender hairs.

Large leaves with 3 nectaries, the outer very close to base. Nectaries short and broad in greenhouse (planted) infected with black fungus.

Pedicels densely and persistently hairy, even in old opened bolls. Old dry pedicels distinctly triangular in cross-section, the angle slightly grooved.

One plant, on east side of door, has tendency to produce larger entire leaves than the other, also large leaves that are nearly entire, with ? forelobes, one or both indicated by small tooth. Also this plant has smaller leaves of broader form than the other.

In the normal pendent position of the larger leaves the blades are held vertical, with the upper side distinctly dishd, the lateral and upper margins gently incurved and the lobes lapped in some cases but not usually. Tips of lobes distinctly acuminate.

Very small tendency to produce side lobes and no tendency to produce back lobes separate from Sea Island.

Plant distinctly hairier than any of the Mexican cottons.

Stipules very wide and distinctly auricled bidentate or tridentate near the tip and often distinctly notched on the side above the auricle. One stipule larger, the other simple. Drawing of pair of stipules might be made.

Hubbard notes unusual persistence of hairs even on old stalks a year or two. New growth densely hairy, pedicels even more hirsute than internodes of fruiting branches.

Calyx with distinct teeth as in Sea Island, with tips entire or minutely 2 - 3 toothed, sometimes apiculate, but not tailed. Except when noted above the data, are from the west plant, though the other produced more seeds.

Hairs of petioles appear more than usually tufted.

Compare form of leaf-base with abrupt expansion of auricle into sinus with other types. Lower vegetative sprouts slender and pendent, with numerous short joints, 1 cm or less in length. But even on these pendent branches the older leaves are turned back strongly at the base of the petioles. Stipules also quite persistent on these.

Cotton (Miami) Relationships

Agreeing in several characters,

the smooth, ^{flat-} surfaced
bolls, ~~with~~ ^{the} ~~oil-gland~~

entire band ~~with~~ ^{few}
oil-glands, ~~long-~~

looked short-articled
bracts, with a species ~~described~~

~~on that~~ suggest a possible
~~affinity~~ appear in a

~~Mexican~~ species from western
Mexico *Gossypium confertum* ♀

but the bolls of that species are
much larger and broader the
calyx of that species also the calyx

in that species has ~~rather~~
~~the~~ ^{fewer} oil glands, ~~rather~~
few and scattering,
and some of the lobes are
produced into long "tails,"

Note: look for bolls of
Miami cotton at Washington
to see if "storm-proof"
characters are shared,
or seed characters,

Cotton (Florida) Miami Seed Characters

Seeds very small, coated rather sparsely with short white fuzz at the base with a dense tuft of longer fuzz of a distinctly brownish color. Lint about -

Lint pure white of rather even length less than an inch, moderately abundant but not extending to the base of the seed; texture rather soft and fine with a slight roughness like an upland cotton in comparison with the smooth silky texture of the West Coast species.

Get notes on the wild cotton in
San Antonio greenhouse -
Hairy type like *Terracina* fls white
with rather light purple spots.

Mr. Simpson has seen native cotton on Manatee River 15 feet high and stem 4 inches in diameter growing as very large shrubs. Specimens at Miami (Lower City?) 10 ft high; no leaves with more than 3 lobes. Might be more on very vigorous shoots but these plants in good condition. Fruiting branch leaves entire or with very blunt lobes. Much smaller than vegetative leaves. like

endozyme

exozyme

endozyme

exozyme

endyme

~~exyme~~

endyme

exyme

endyme

exyme

endozyme
exzyme

endymen

exymen

endyme

Endyme = garment
Endymis = a pretty one

~~endymen~~
~~exymen~~
~~endymen~~

Cotton (Florida)

Sent from Homestead, Florida, by H. A. Gunning, Sept. 15, 1926. From Redlands Dist., reported to be "a native of Florida". Sea Island type? Boll long beaked, oil-glands distinct. Outer nectaries large and rather deep, flat at bottom, nearly round. Seeds with very dense ^{felt?} felt of brownish fuzz around base, usually half way up or more, naked above or with tuft at back, but not at micropyle, long hood below micropyle raphe ridge high. Inner nectaries rather large, and regular, broadly triangular, or slightly obcordate, the upper edge sinuate in the middle, but not much broader than long, with a rather prominent ridge between the nectaries and the insertion of the bracts.

Calyx rather long, the margin evenly truncate. Receptacles around outer nectaries flat and smooth, with scattered prominent oil-glands. Calyx very distinctly reticulate. Bolls with sutural band indicated above, tip of boll nearly naked.

17
Cotton (Florida) Leaf-nectaries.

Miami species at Chapman Field has three nectaries in vegetative branch leaves and one nectary on leaves of fruiting branches, except that a large first leaf of a fruiting branch may have 3 nectaries (or 2?) but the leaves of other joints have only the one nectary.

The lower leaves of vegetative branches are often without lobes, and such leaves have only one nectary, also some of the leaves that have lobes may have only one or two nectaries, while the upper leaves have three nectaries with much regularity.

The west coast species is represented at Chapman Field by a single plant which has not made very vigorous growth. The leaves of the vegetative branches on this plant have only one nectary.

see NB

Cotton (Fla) ^{leaf-} Nectaries

Miami species at Chapman Field has three nectaries in ~~old fruit~~ vegetative branch leaves and one nectary on leaves of fruiting branches, except that the ~~the~~ ^a ~~first~~ ^{last} leaf of a fruiting branch may have ~~2 or 3~~ ^{2 or 3} nectaries (or 2?) ~~but the remaining~~ ~~other~~ ~~leaves~~ ~~of the branch~~ ~~have one~~ ~~nectary.~~ ~~Other leaves of other joints~~ ~~have~~ ~~single~~ ~~only~~ ~~the~~ ~~one~~ ~~nectary.~~

^{the west coast} ~~species~~ ^{is represented at} ~~Chapman Field?~~ ^{a single} ~~plant~~ ^{which has} ~~not made~~ ^{very} ~~origins~~ ^{growth.} ~~the leaves~~

~~if~~ ~~the~~ ~~vegetative~~ ~~branches~~ ~~have~~ ~~only~~ ~~one~~ ~~nectary~~ ~~at~~ ~~Chapman~~ ~~Field.~~ ^{on this plant}

~~if~~ ~~the~~ ~~lower~~ ~~leaves~~ ~~of~~ ~~vegetative~~ ~~branches~~ ~~are~~ ~~often~~ ~~without~~ ~~lobes~~ ~~and~~ ~~such~~ ~~leaves~~ ~~have~~ ~~only~~ ~~one~~ ~~nectary~~ ~~also~~ ~~to~~ ~~some~~ ~~of~~ ~~the~~ ~~lower~~ ~~leaves~~ ~~that~~ ~~have~~

lobes may have only one or
two nectaries, while the
upper leaves have three nectaries
with much regularity.

Cotton (Nectaries of leaves)

Sequence in development of n
leaves of main stalk, in relation to
size and forms of leaves, simple,
3-lobed, 5-lobed, or 7-lobed

Sequence on vegetative branches,
Parallel to main stalk, but ^{with} many
different numbers of leaves with small
joints and small leaves, which may have
only one nectary, or none

Sequence on fruiting branches

Usually only one nectary, more
in a few cases. Some cottons
have first leaf larger than
the others, ^{while} ~~some~~ have it
smaller, and ~~occasionally~~
simple.


Thickened bases of bracts, united and prominent below inner nectary, remaining alive on nearly mature boll. Stalks cylindrical, round, without prominent leaf-traces as in Egyptian. Stipules not strongly developed, possibly connected with deficient leaf-traces. Early deciduous? Lack of specialization of stipules, but no good fruiting branches seen if any are produced.

Lint characters should be studied under microscope, on account of peculiar texture and to see if the short lint at base of seed, about 1/2 inch long, is of same character as lint at tip of seed which attains at least 1 1/4.

Introduction of paper on Florida cotton should remark on interest of wild cottons.

This often considered as an escape of Upland or Sea Island, flowers yellow like Sea Island (?). Seeds fuzzy like Upland, but not much like, also very small.

Miami species young plant of last summer grown in pots in slat house. Bracts more deeply cut than Terra Ceia species and toothed further down on sides. Bolls with flat sides, smooth surfaces and widely scattered oil-glands. Fissural grooves distinct only near the tip, but the stria more distinct than in other species. Calyx of Miami species with sharp angles and tails. The bracts more deeply toothed the teeth with re-curved margins appearing narrow, also carried farther down in the margins. Bolls narrow, tapered to base. Calyx tooth and tail about 5 mm long.

Base of calyx at nectary forming a distinct angle above the nectary, the nectary set under the edge,  that is the nectary definitely in a groove below the calyx, not on the slope of a prominent shoulder that extends laterally from the nectary at a distinct angle, sometimes nearly a right angle as in Terra Ceia cotton. Instead there is in the Miami species a distinct groove or channel in a nearly vertical position funning down from the nectary to the angles where the bracts meet and are somewhat joined, but much less than in the Terra Ceia cotton, usually for only 1 mm. or less. Thus the bracts are narrowed at the base with relatively small auricles, diverging on the short inner margins from the petiole, instead of projecting backward nearly parallel with the petiole as in Terra Ceia Cotton.

Very small number of oil-glands in the involueral bracts especially in the lower portion. Bracts very pale on the two green bolls.

Pedicels, bolls relatively somewhat longer and more slender than in Terra Ceia cotton, less thickened above and the receptacle smaller. The outer nectaries not so definitely on the receptacle as in Terra Ceia cotton. More on the pedicel, forming very deep large depressions sometimes nearly round, sometimes much longer than broad, produced and pointed below, sometimes with a distinct short groove below the nectary, but often scarcely any groove, though narrow superficial grooves may appear on the sides and also on the angles, though the pedicel as a whole is nearly round, almost as in Terra Ceia cotton and also very hairy, the hairs rather coarser and longer.

The bracts are closely appressed at the angles even where not united so that the base of the involucre is definitely closed. The bolls are much more tapering at base while those of the Terra Ceia cotton are thickest near the base, those of Miami cotton thickest near the middle.

Calyx of Terra Ceia cotton is slightly angled or rounded and the margin is ciliate all along, while only the angles and tails are ciliate in the Miami cotton.

Surface of bolls smooth in Miami cotton, the oil glands apparent only from the color, the surface above the glands only slightly prominent, but usually not pitted or sometimes slightly pitted while the surface of the Terra Ceia bolls is closely and distinctly pitted with the glands forming slight prominences in the pits.

Cotton (Near Cape Sable)

Chapman Field-Cape Sable
May 13, 1927,

Involucers wide open at base below broad inner nectaries.
Flowers white, pollen yellow, anthers small long filaments
Petal spots rather large, Bolls dark, close-pitted oil-glands.

The section to which the inner nectary belongs may be considered as rudimentary base of inner bract, with the bractlets as stipular elements not entirely gone. Not strictly part of receptacle as of flower, since involucre is fused with usual floral again. Not a part of calyx, nor of receptacle, which can hardly be considered in strict sense as anything below calyx.

In green_houses at San Antonio all cut 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.

Very slender filiform fugacious stipules as generic character, are narrower 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 there are distinct secondary veins nearly as large as the principal vein. Outer nectaries sometimes distinct, often absent no inner nectaries
Bract auricles closely approach^{ing} and somewhat decurrent, but not united.
The pedicel grooved to the top, so that there is a groove under the corners of the bracts.

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

Cotton (Miami wild)

Chapman Field June 18, 1928.

Plants (two) transplanted from roadside near Coral Gables, and two raised from seed of these. Seem uniform type, with smooth flat-sided bolls, 3 to 5 locked, rarely 3, often 5. Bracts rather broad and short, the teeth stout, incurved or contorted, rather firm texture.

Base of bolls with few oil-glands underneath the calyx. Small fruiting branch leaves often simple or with 2 lobes, or 3-lobed. See photos.

Outer nectaries deep, strongly angled or decurrent below. Inner nectaries deep and broad with distinct angle below.

Cotton (Miami wild)

Chapman Field June 19, 1928.

Photo of plant at Chapman Field June 19, 1928
bearing good crop. Largest leaves have small sidelobes.

Cotton (Miami wild)

Chapman Field June 20, 1928.

Four plants opening crop of bolls and making new growth on basal shoots, but not forming any flowers; fruiting branches making only very small short internodes, the floral buds aborting at very small size, showing contrasted physiological states.

505 (Keraicia) notes

Fruity branches with a broad
conical sloping base, the swollen
section ~~rebed~~ ~~and with~~ like the
abscission ring of the pedicels.

~~of the~~ ~~to be~~ May be too look

for this on other cottons.

Also the stalk is widened at
the attachment, ~~so that all of the~~
the branch ~~to form~~ part of

~~of the proximal base~~ what
appears as the ~~ps~~ enlargement
does not belong to the branch.

The harkens area is defined by
below by a groove as though
the branches were inserted by a
socket like the pedicels -

NOTES

Key West Nov. 22,
1929
see other notes in
MB

COTTON (KEY WEST)

All cotton at Key West belongs to very distinct type, the plants very large, the branches, petioles pedicels bracts and leaves naked, the calyx truncate, the stamens short with golden yellow anthers.

The yellow pollen is like Terra Ceia cotton, but the filaments are much shorter, stigma not strongly exerted longer stamens on some plants than others, calyx with larger and denser oil-glands in the lower part, and especially around the inner nectaries.

Two locked bolls occur seed cotton forms compact locks, with some of the fibers attached at base fruiting branch internodes 10cm. 6cm., ^{another branch} 14cm. 6cm. 3cm.

Feitas cotton number one

General appearance of Sea Island. Bracts have form, appearance and fleshy brittle texture of Sea Island. Bracts united less regularly than on Johnson plant, sometimes ⁷⁻⁸ only 2-3 mm, sometimes 7-8 mm.

Leaf nectaries generally single sometimes 2 or 3. Long basal joint of fruiting branch like Sea Island fruiting branch.

♂ Pedicel short, often very short, more densely beset with larger oil-glands than the internodes of the branch

♀ Abnormal ^{stipule} stipule enlarged and carried up pedicel with bracts, more or less, in one case, ^{to base of bract as} shown with bract. ~~on photograph~~

♀ Oil-glands of bracts and calyx not on the veins or occasionally a very small gland on a vein.

Branches petioles, ~~and~~ pedicels, leaves and bracts naked, Very young leaves pubescent on under side, naked above; bracts slightly ciliate along the margins.

♀ Outer and inner nectaries very large, regularly present; outer in a distinct depression with moderately raised rims, round, oval or subquadrate, often longer than broad, placed rather low, nearly the length of the nectary from the ~~line of attachment of the bract in the middle.~~

Bolls rather closely and deeply pitted over the entire surface, except a very narrow rim confined to the groove around the base. ~~xxxxxxxx~~

The attachment of the bract forms a very high arch in this species on account of the large internal

which is
nectary, placed rather low ~~down~~.

Staminal column, rather long, the filaments short,
standing in pairs, 5 double rows of the paired stamens;
pollen deep yellow (orange or golden) contrasting
strongly with pale whitish pollen of Miami wild cotton.

Feitas second tree, back from street

Lighter foliage, fruiting but little at this ^{season,} ~~time~~

H Leaf nectaries: vegetative branch leaves.

2, 2, 2, 3, 3, 3, 2, 2, .

1, 2, 2, 3, 3, 2, 3, 2, 2, .

leaf nectaries: fruiting branch leaves. ~~Third tree.~~

1, 1,

1, 1, 1, 1,

1, 1, 1, 1,

A fruiting branch with skips, 2 leaves with 1 nectary then leaves with 3 nectaries; a change to vegetative branch, ^{Very} long narrow stipules

Bolls apparently narrower than ^{on first} plant ~~A~~. but young

Feitas fourth tree.

Transformed fruiting branch, above transformation

2, 2, 3, 3, 2.

Transformation apparently common

2, 2, 2, 2, 2. Bolls of this ^{definitely} ~~generally~~ narrower, subcylindric

Small fruiting branch

1, 1.

1

1

1, 1.

Internodes of fruiting branch: varied no doubt by conditions ^{with} respect to relative lengths

13, 5, 7.

3 joints

Kerr plant.

Larger side-lobes, bracts in several cases with recurved margins, like Gossypium evertum

Forelobes broad, nearly as large as midlobe, also blunt or angled with a minute point

Tendency to simple leaf on basal joint of fruiting branch which is very long

Three leaf-nectaries see specimens of leaves, also measurements of midlobes forelobes and side-lobes in notebook

Cotton (Key West)

Fernandez Chili, United St.

First plant near sidewalk, only one leaf nectary on leaves collected.

Bolls short tipped.

Second plant back from street, Four-lock bolls, 1 two-lock calyx with short, broadly rounded lobes distinct in early stages but truncate at young boll stage

Lint perhaps more distinctly buff or maybe stained.

Held well in bolls.

Leaf nectaries, some leaves with 2, main stalk leaves with 3 ~~nectaries~~. Some of the nectaries sagittate, but usually only hooked, one side decurrent, but not the other

Long fruiting branches.

Fruiting branch internodes

14, 7, 3, 1.5, 2.5, 3, 3.

15, 10, 6.5, 3, 1, 1.

18, 10, 8, 7.5.

13, 4.5, 0.5.

8.5, 7, 6, 4.5, 2, 1.5.

vegetative shoots short-jointed, the joints often 1 cm. or less.

Flowers with spot, stamens short ^{like} ~~light~~

Feltas plant photographed.

Cotton (Key West)

Nov. 22, 1929.

Johnson Cotton

♀ Leaf forms like Terra Ceia cotton and with only one nectary, but this rather far up from the base of the midvein, ~~not~~ not invariably present, but usually;

Outer nectaries } all three are often longer than broad,

♀ Bracts with rather long auricles, divergent from the pedicel, united for the entire length of the inner side, so that margins are held together and the outer surface generally is held unusually flat and well-closed in the early stages till pushed apart by the bud and later by the young boll.

Calyx with lobes extremely broad at the boll stage appearing completely truncate; ^{short} broadly rounded ^{short lobes in the flower stage}

♀ Flowers without oil glands, or at least not ^{as} conspicuous oil-glands as in Feitas plant. Stamens longer than in Feitas plant. (See pressed specimens)

Note: Union of auricles may be considered as result of auricles being narrowed more than in Feitas plant.

Large old plant, trunk nearly foot
thru at the ground