THE VEGETATION OF CHACACHACARE ISLAND

By Johanna Darlington.

The vegetation of Chacachacare Island is affected by the low rainfall (45" per annum). It has been classified by Marshall (1934) as "Tropical Semi-Deciduous Forest" and by Beard (1946) as "Deciduous Seasonal Forest", the deciduous phase being in the middle of the dry season. The map of the Vegetation of Crown Lands (prepared by Beard and published under Crown Copyright in 1946) shows the part of the island surrounding Chacachacare Bay as "Naked Indian-Savonette" series, "Saltfish Wood Type". (Neither naked indian, **Bursera simaruba** (L.) Sarg., nor savonette, **Lonchocarpus punctatus** H. B. K., were collected during the T. F. N. C. expedition or appear in the U. W. I. Herbarium catalogue, hence they are omitted from the Flora List below). Beard mentions (p. 103) that there is a "very distinct littoral society" which extends up to 300-400 feet on Chacachacare.

The T. F. N. C. expedition was made at the end of the dry season, when some tree species, (notably saltfish wood, **Machaerium robinifolium**) had already put on new leaves, while others had not. The dry leaf litter seen in most places was probably a transient feature, since Beard states (p. 102) that "the annual leaf-fall decomposes rapidly in the ensuing rainy season". Beard also comments upon the dry nature of the forest and lack of ground cover, and the paucity of epiphytes. During the present survey the epiphytic bromeliad **Tillandsia flexuosa** was collected from two sites, but it was sparsely distributed, and no other epiphytes were seen. No ferns or liverworts were found, but low-growing moss occurred in places. Cacti and agaves were abundant, often reaching a height of about fifteen feet. Grasses were poorly represented, only a single clump of a single species, **Setaria barbata**, having been found in the forest (at site 6, see below) though five other species occur along the roadsides and beaches and at site 1.

During the T. F. N. C. expedition (May 28-30, 1966) a brief survey of the vegetation of the western part of the island was attempted. "Sites" were selected in which the vegetation appeared to be fairly uniform, and the structure of the vegetation cover was described. Any soil profiles exposed were examined. Samples of as many plant species as possible were collected from each site, and were kindly identified by Mr. M. Bhorai of the Botany Department, U. W. I. Descriptions of the eight sites chosen (see map) follow, and a table of species distribution in six of them. An alphabetical flora list for the island is appended.

All samples except from sites 5 and 6 were collected from the tarmac road or from tracks, because of the difficulty of moving about in the forest.

Some of the species recorded are probably not typical of the forest at all, but of the roadside habitat.

SITE 1

On the hilltop, around the lighthouse is an area of grassland, presumably cleared artificially. This has a continuous ground cover of the tall grass **Panicum maximum.** It gives way to shrubs downhill, with clumps of bamboo beside the road. Some common Trinidad arable weeds occur here which have not been found elsewhere on the island, including **Tridax procumbens, Bidens pillosum, Desmodium frutescens** and **Borreria verticillata.** These have probably been introduced accidentally with garden material at the lighthouse.

Some species appear to have spread from here down the road, presumably dispersed by the jeep and by foot traffic. The herb **Borreria verticillata** extends a mile or more into site 2 but grows only on the roadside. The grass **Chloris gayana** occurs sparingly on the roadside all the way down to the quay, and reappears on the area of old concrete beside the small salt pond, but has not been found in the forest.

SITE 2

The forest has an incomplete tree canopy about 30 feet high, consisting almost entirely of **Machaerium robinifolium** (saltfish wood). There is a moderately-developed shrub layer which includes young saltfish wood saplings and a quantity of woody creepers. Lower strata are very weakly represented, the forest floor being mainly covered by a layer of dry leaf litter a few inches deep, or locally by a low-growing moss.

To judge from the appearance of the canopy, this site is representative of the type of forest covering the first valley east of the road.

This is probably an area referred to by Marshall in his book "Silviculture of the Trees of Trinidad and Tobago" (1939). He writes of the saltfish wood (p. 83) "In Chacachacare it forms almost pure crops in places, but it is probable that it is mainly second growth . . . ". Certainly many trees near the road have grown up as a cluster of poles from an old cut stump, but the present survey was not extended far enough into the forest to see if this is general.

Soil profiles are frequently exposed in the face of the road cutting. In general they show a very weakly humified root mat 2-5 ins. deep (sometimes with moss growing on the surface), overlying 1-6 feet of soft, reddish, rubbley soil. Beneath this is the bedrock, a soft reddish mica-schist whose laminae show small-scale irregular folding. Large roots penetrate deep into the bedrock. Locally there is a diffuse belt of iron deposition

some 20 ins. below the surface, and in one place there is a clear, inch-wide belt of black material 18 ins. down which might be a weak humus pan.

A remarkable profile is exposed in the roadside at the top of the steep hill down to La Tinta Bay (at the junction of site 2 with site 3). Beneath the shallow root mat is a belt of light grey, leached soil, about 20 ins. deep in most places but extending to 4 feet in one place. Below this there is an abrupt transition to red-brown soil. This arrangement of layers is similar to the classical Podzol (Russian : "ash-earth") profile found under coniferous forest and acid heath land in the North Temperate zone. The vegetation here consists of a sparse shrub layer of coppice saltfish wood, and a good ground cover mainly of the herb **Evolvulus tenuis** with some **Agave** spp.

SITE 3

The forest occupying the steep slope down to La Tinta Bay has a weakly-developed tree canopy at about 20 feet. More than half the trees are saltfish wood, but other species are much more frequent than in site 2, notably **Hippomane mancinella** (manchineel). The shrub layer is moderately developed. Moderate to poor ground cover is given by the herb **Wedelia caracasana**, cacti of the genus **Cereus**, and **Agave** spp. The herbs **Alternanthera ramosissima** and **Isocarpha oppositifolia** seem characteristic of this site.

SITE 4

Where the forest comes down to a rocky shore, it seems to continue with little structural change to the water's edge. A sandy shore (as at the campsite on Perruquier Bay) is colonised by manchineel. On muddy shores, as near the quay on Perruquier Bay and round by the small salt pond on Stanislas Bay, **Laguncularia racemosa** (white mangrove) occurs, and also the sedge **Fimbristylis ferruginea.** The eroding headland between is colonised by a succulent, creeping plant, **Sesuvium portulacastrum**, near the water level. A few coconut palms, **Cocos nucifera**, grow by La Tinta Bay. **Gossypium barbadense** (sea island cotton) and **Pithecallobium unguis-cati** (campeche) are invading the old concrete areas and ruins near the quay and the small salt pond.

SITE 5

South-west of La Tinta Bay the ground rises steeply, falling as a cliff to the sea on the west and dipping more gently to the east. Along the cliff top the vegetation is extremely sparse, consisting of stunted, wind-distorted shrubs. These are **Callinandra cruegeri** (a species which has not been collected for the Herbarium since 1861) and one other species (Rosaceae ?). Virtually nothing else grows there, and reddish rubbley

schist is exposed. To the east the shrubs increase in density and height, and diversify in species.

SITE 6

Beyond the crest of the rise there is a moderately developed shrub layer at 10-15 feet, of a variety of species including tall cacti of the genus **Cereus**, and creepers are frequent. The herbs **Evolvulus tenuis, Wedelia caracasana** and others, and **Agave** sp., give incomplete ground cover ,and there is some accumulation of dry litter.

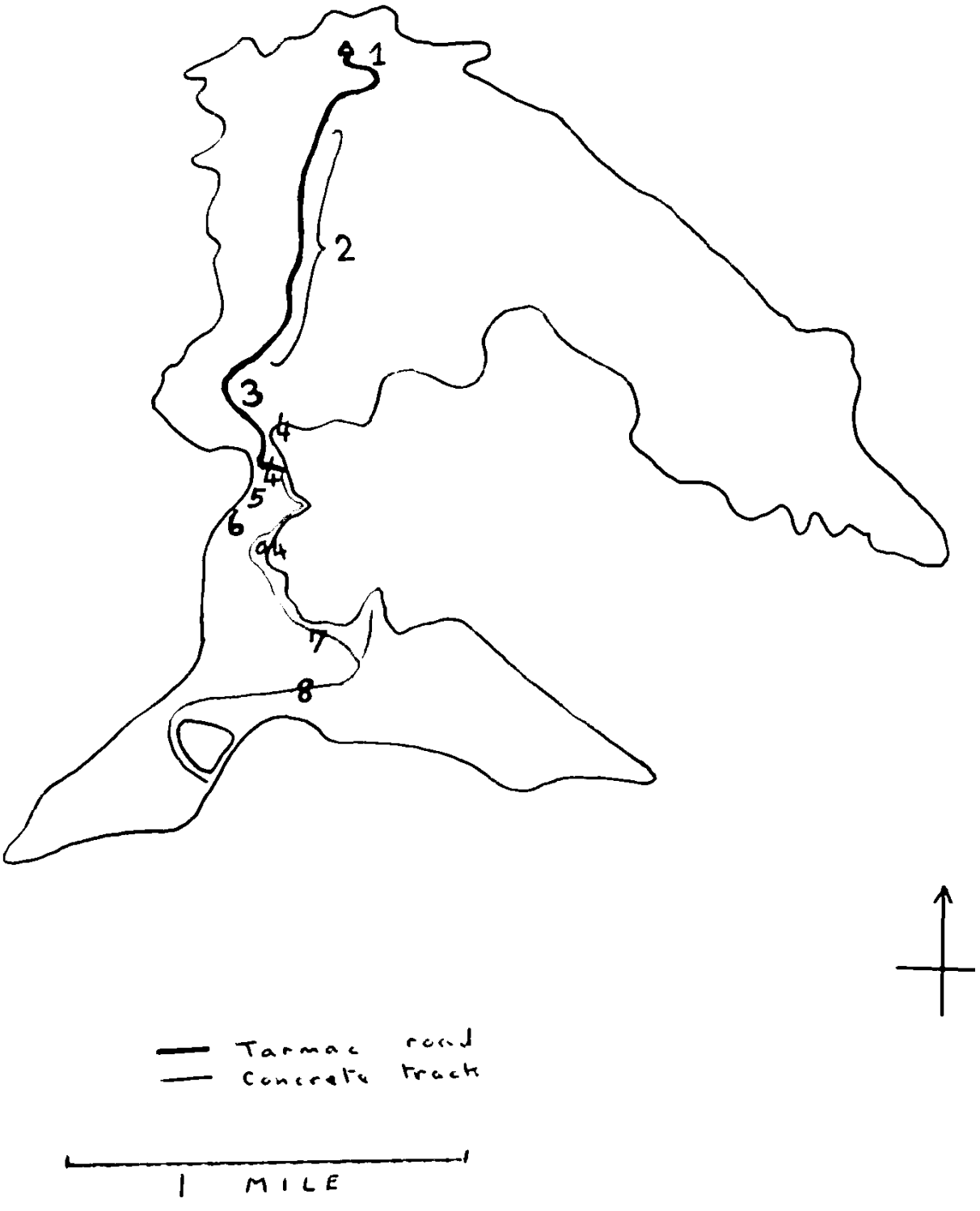
SITE 7

This site is on a fairly steep, north-facing slope. The forest has a sparse tree canopy at about 30 feet of mixed species, saltfish wood being common. The shrub layer is moderately developed and the ground is thinly covered with herbs. Locally, beside the track, there is a marked development of pure saltfish wood coppice as a shrub canopy, with a continuous ground cover of **Sansevieria thyrsifolia** (bowstring hemp, a naturalised introduction from Africa). The track is overgrown with **Gossypium barbadense** (sea island cotton) and **Lantana camara**, but neither seems common in the forest itself. No soil profiles are well exposed.

SITE 8

The steeper south slope has a forest cover similar to site7, but little coppicing of saltfish wood was seen. **Evolvulus tenuis** is the main herb and the ground is locally well covered with moss. Soil profiles show a weakly-developed humus layer a few inches deep, over unleached rubbley soil 1-2 feet deep. The bedrock beneath is penetrated by roots.

The species distribution table shows that sites 1 and 6 (and 3 to a lesser extent) have a considerable number of species peculiar to them, whereas sites 2, (3), 7 and 8 have most of their species in common. The tree **Machaerium robinifolium** (saltfish wood) and the woody herb **Wedelia caracasana** were found at every site, and appeared to be forest plants. **Evolvulus tenuis** seemed a typical (and often abundant) forest herb. **Hippomane mancinella** (manchineel) occurred widely but was most abundant at low altitude near the sea. **Pithecallobium unguis-cati** is common on the island especially at low altitudes.



CHACACHACARE ISLAND – Vegetation Sampling Site

Species Distribution

	Sampling Sites					
	1	2	3	6	7	8
Panicum maximum	✓					
Chloris inflata	✓					
C. gayana	✓	✓				
Tridax procumbens	✓					
Bidens pillosum	✓					
Borreria verticillata	✓	✓				
Euphorbia hirta	✓					
E. hypericifolia	✓					
Desmodium frutescens	✓					
Stachytarpheta jamaicensis	✓					
Dioclea guianensis	✓					
Passiflora foetida	✓					
Tecoma stans	✓					
Securidaca diversifolia	✓					
Pluchea odorata	✓					
Bambosa vulgaris	✓					
Wedelia caracasana	✓	✓	✓	✓	✓	✓
Bauhinia cumanensis	✓	✓				
Lantana camara	✓	✓	✓		✓	
Lantana sp.	✓	✓				
Cordia curasavica	✓	✓	✓		✓	
Gossypium barbadense	✓	✓	✓		✓	✓
Machaerium robinifolium	✓	✓	✓	✓	✓	✓
Pithecallobium unguis-cati	✓	✓	✓			
Capparis odoratissima	✓		✓	✓	✓	✓
C. coccolobifolia		✓	✓			
Steriphoma elliptica		✓				
Jacquemontia nodiflora		✓				
Jacquinea barbasco		✓	✓			
Humboldtiella arborea		✓				✓
Serjania caracasana		✓	✓			✓
Ruellia tuberosa		✓	✓			
Solanum ierensa		✓				

	Sampling Sites					
	1	2	3	6	7	8
Evolvulus tenuis		✓		✓	✓	✓
Hippomane mancinella		✓	✓		✓	
Alternanthera ramosissima			✓			
Isocarpha ramosissima			✓			
Isocarpha oppositifolia			✓			
Capparis flexuosa			✓	✓	✓	✓
Agave sp.			✓	✓		
Cereus sp.			✓			
Copaifera officinalis			✓	✓		✓
Bastardia viscosa			✓			
Malvastrum spicatum			✓			
Passiflora serratula			✓			
Sida acuta			✓			
Cynanchum parviflorum			✓			
Jatripha urens			✓			
Capparia biflora			✓			
Calliandra cruegeri				✓		
Tillandsia flexuosa				✓		✓
Helicteris baruensis				✓		
Cocoloba novogranatensis				✓		
Pollalesta milleri				✓		
Pisonia fragrans				✓		
Gravisia aquilega				✓		
Justicia sp.				✓		
Setaria barbata				✓		
Sanseviera thyrsiflora					✓	
Erythroxylum ovatum					✓	✓
Cienfugosa heterophylla						✓

Flora List of Chacachacare Island

This flora list was compiled from material collected during the Trinidad Field Naturalists Club expedition, and all plant specimens listed in the U. W. I. Herbarium catalogue from 1930 to 1966 as having been collected on Chacachacare. Nomenclature follows the "Flora of Trinidad & Togago" (Williams et al. 1928 onwards) as far as possible, with further references to the "Index Kewensis" (Hooker and Jackson 1895). Common names are taken from Williams 1951 and Marshal 1939.

I wish to thank Mr. Bhorai of the Herbarium, Botany Department, U. W. I., for his help in compling the list.

✓✗Collected on T.F.N.C. expedition, but not in Herbarium catalogue.

✓Collected on the T.F.N.C. expedition, and present in Herbarium catalogue.

Not found in T.F.N.C. expedition, but present in Herbarium catalogue.

Abutilon giganteum (Jacq.) Sweet	Malvaceae	
Acacia riparia H.B.K.	Leguminosae, Mimosaceae	
✓✗Agave sp.	Agavaceae	
✓Alternanthera ramosissima (Mart.) Fires	Amaranthaceae	
Anemopaegma carrerense Armitage	Bignoniaceae	
✓Avicennia nitida Jacq.	Verbenaceae	Black mangrove.
✓Bastardia viscosa (L.) H.B.K.	Malvaceae	
✓Bauhinia cumanensis H.B.K.	Leguminosae, Caesalpiniaceae	
✓✗Bidens pillosa L.	Compositae	Railway daisy.
✓✗Borreria verticillata (L.) Mayer	Rubiaceae	White broom.
Bredemeyera lucida (Benth.) Kl. ex Hassk.	Polygalaceae	
Bryopsis pennata Iam.	Bryopsidaceae (Algae)	
B. plumosa (Huds.) C. Agardh	Bryopsidaceae (Algae)	
Bumelia buxifolia Willd. ex R. & S.	Sapotaceae	
Caesalpina coriaria (Jacq.) Willd.	Leguminosae, Caesalpiniaceae	Divi-divi.
Calea solidaginea H.B.K.	Compositae	
✓✗Calliandra cruegerii Griseb.	Leguminosae, Mimosaceae	
C. marginata Griseb.	Leguminosae, Mimosaceae	
✓✗Canavalia maritima (Aubl.) Thon.	Leguminosae, Papilionaceae	
✓Copaifera officinalis L.	Leguminosae, Caesalpiniaceae	Balsom.

Capparis coccolobifolia Mart. ex Eichl.	**Capparidaceae**	Mabouya.
C. flexuosa L.	**Capparidaceae**	Mabouya.
C. odoratissima Jacq.	**Capparidaceae**	Olive wood.
Capraria biflora L.	**Scrophulariaceae**	
Cassia fruticosa Mill.	**Leguminosae, Caesalpiniaceae**	
Caulerpa fastigiata Mont.	**Caulerpaceae (Algae)**	
C. racemosa (Forsskal) J. Agardh	**Caulerpaceae (Algae)**	
C. sertularioides (Gmel.) Howe	**Caulerpaceae (Algae)**	
Cereus sp.	**Cactaceae**	
Chloris gayana Kunth	**Gramineae**	
C. inflata Link	**Gramineae**	
Cienfugosia heterophylla (Vent.) Garcke	Malvaceae	
Cladophora repens (J. Agardh) Harv.	**Cladophoraceae (Algae)**	
Coccoloba coronata Jacquin	**Polygonaceae**	
Cocos nucifera L.	**Palmaceae**	Coconut.
Conocarpus erectus L.	**Combretaceae**	Button mangrove.
Cordia curasavica (Jacq.) R. and S.	**Boraginaceae**	Black sage.
Coursetia arborea Griseb.	**Leguminosae, Papilionaceae**	
Coutarea hexandra (Jacq.) Schum.	**Rubiaceae**	
Cracca caribbaea (Jacq.) Benth.	**Leguminosae, Papilionaceae**	
Croton niveus Jacq.	**Euphorbiaceae**	
Cynanchum parviflorum Sw.	**Asclepiadaceae**	
Dactyloctenium aegypticum (L.) Richt.	**Gramineae**	Crowfoot grass.
Dalechampsia scandens L.	**Euphorbiaceae**	
Desmodium frutescens (Jacq.) Schindl.	**Leguminosae, Papilionaceae**	**Sweethearts.**
Dicliptera assurgens (L.) Kuntze	**Acanthaceae**	
Dictyota ciliolata Kutz.	**Dictyotaceae**	
D. dichotoma (Huds.) Lamx.	**Dictyotaceae**	
Dioclea guianensis Benth.	**Leguminosae, Papilionaceae**	
Erythroxylum ovatum Cav.	**Erythroxylaceae**	
Eupatorium odoratum L.	**Compositae**	Christmas bush.
Euphorbia hirta L.	**Euphorbiaceae**	Milkweed.
E. hypericifolia L.	**Euphorbiaceae**	
E. thymifolia L	**Euphorbiaceae**	

✓Evolvulus tenuis Mart. ex Choisy	**Convolvulaceae**	
Fagara pterota L.	**Rutaceae**	
✓ Fimbristylis cymosa R. Br.	**Cyperaceae**	
✓F. ferruginea Vahl.	**Cyperaceae**	
F. spadicea Vahl.	**Cyperaceae**	
Galactia striata (Jacq.) Urb.	**Leguminosae, Papilionaceae**	
✓Gossypium barbadense L.	**Malvaceae**	Sea Island cotton.
✓Gravisia aquilega (Salisb.) Mez.	**Bromeliaceae**	
Halophila baillonii Aschers.	**Hydrocharideae**	
✓Helicteris baruensis Jacq.	**Sterculiaceae**	
Heteroperis nervosa Juss.	**Malpighiaceae**	
✓Hippomane mancinella L	**Euphorbiaceae**	Manchineel
✓Humboldtiella arborea (Griseb.) Herman	**Leguminosae, Papilionaceae**	
Ipomoea tuba (Schl.) G. Don.	**Convolvulaceae**	
✓Isocarpha oppositifolia R. Br.	**Compositae**	
✓Jacqmontia confusa Meissn.	**Convolvulaceae**	
✓Jacquinea barbasco (Loefl.) Mez	**Theophrastaceae**	
✓Jatropha urens L.	**Euphorbiaceae**	
✓Justicia sp.	**Acanthaceae**	
Lactuca intybacea Jacq.	**Compositae**	
✓Laguncularia racemosa (L.) Gaertn.	**Combretaceae**	White mangrove.
✓Lantana camara L.	**Verbenaceae**	Wild sage.
L. lockhartii (Griseb.) G. Don.	**Verbenaceae**	
Maba inconstans Griseb.	**Ebenaceae**	
✓ Machaerium robinifolium (D. C.) Vogel.	**Leguminosae, Papilionaceae**	**Saltfish wood.**
✓Malvastrum spicatum (L.) A. Gray	**Malvaceae**	
✓Mariscus ligularis Urb.	**Cyperaceae**	
Melochia tormentosa L.	**Sterculiaceae**	
Ouratea guildingi (Planch.) Urb.	**Ochnaceae**	
Padina gymnosperma Hoyt	**Dictyotaceae (Algae)**	
✓P. vickersiae (Kutz) Vickers	**Dictyotaceae (Algae)**	
✓Panicum maximum Jacq.	**Gramineae**	
✓Passiflora foetida L.	**Passifloraceae**	
✓P. serratula Jacq.	**Passifloraceae**	

Paulanea sp.	**Sapindaceae**	
Phoradendron sp. "chacachacarense"	**Loranthaceae**	
Pisonia fragrans Dum. Cours.	**Nyctaginaceae**	
Pithecallobium oblongum Benth.	**Leguminosae, Mimosaceae**	
P. unguis-cati (L.) Mart.	**Leguminosae, Mimosaceae**	Campeche
Pluchia odorata (L.) Cass	**Compositae**	
Pollalesta milleri (Johnstin) Gleason	**Compositae**	
Ruellia tuberosa L.	**Acanthaceae**	Minnie root.
Ruppia maritima L.	**Potamogetonaceae**	
Sansevieria thyrsiflora Thunb.	**Liliaceae**	Bowstring hemp.
Sarcostemma clausum (Jacques) R. and S.	**Asclepiadaceae**	
Sargassum filipendula C. Agardh	**Sargassaceae (Algae)**	
S. vulgare C. Agardh	**Sargassaceae (Algae)**	
Securidaca diversifolia (L.) Blake	**Polygalaceae**	
Serjania caracasana (Jacq.) Willd.	**Sapindaceae**	
Sesuvium portulacastrum L.	**Aizoaceae**	
Setaria barbata (Lam.) Kunth	**Gramineae**	Gamalot.
Sida acuta Burm.	**Malvaceae**	Broom weed.
S. cordifolia L.	**Malvaceae**	
Solanum ierense Britt.	**Solanaceae**	
S. lanceaefolium Jacq.	**Solanaceae**	
S. seaforthianum Andr.	**Solanaceae**	
Sporobolus virginicus Kunth.	**Gramineae**	
Stachytarpheta indica Vahl.	**Verbenaceae**	
Steryphoma elliptica Spreng.	**Capparidaceae**	
Stigmaphyllon convolvulifolium (Cav.) Juss	**Malpighiaceae**	
Tecoma stans Juss	**Bignoniaceae**	Christmas hope.
Thalassia testudinum Konig	**Hydrocharidaceae**	
Tillandsia flexuosa Sw.	**Bromeliaceae**	
Trichilia trifolia L.	**Meliaceae**	
Tridax procumbens L.	**Compositae**	
Trixis radiale Lag.	**Compositae**	
Turnera odorata Rich.	**Turneraceae**	
Urvillea ulmacea H.B.K.	**Sapindaceae**	
Waltheria indica L.	**Sterculiaceae**	
Wedelia caracasana Jacq.	**Compositae**	

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NOTE

Professor Purseglove of the Botany Department, University of the West Indies, informs me that the cotton found on Chacachacare is **Gossypium hirsutum** var. marie-galante, and not **G. barbadense** as reported in this article.

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