

# MULTI-PHASE COLLECTING MISSIONS FOR COTTON (I)

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A multi-phased collecting mission for spontaneous cotton has been supported by the IBPGR in association with the Institut de recherches du coton et des textiles exotiques (IRCT) since 1980. This report deals with a phase of the mission made from January to March 1980 during the dry season in a group of islands of the Caribbean Sea (Fig. 1). It will be followed by reports on collecting in French Guiana, Venezuela and Colombia (January to March 1981), Peru (October 1981) and Mexico (February to March 1982). The second of the reports follows in this issue of the Newsletter; subsequent reports will appear in the next issue.

Martinique (MTQ): AS 00001 to AS 00038 (38 samples, 7 were lost during replanting). (a) Gossypium hirsutum "Marie-Galante" (25 samples), (b) G. barbadense var. brasiliense (6 samples).

Cotton is grown there on a small-farm or garden scale, especially in the south of the island (Diamant area) and the seed cotton is harvested. Nevertheless, significant genetic erosion is underway. Spontaneous plants can be seen along roadsides, but are generally represented by only single plants with the exception of a population in the Caravelle peninsula. The phenotypical variability is low but fibres in the cotton show variation.

In the north of Martinique (Le Prêcheur village), G. barbadense var. brasiliense (probably from seeds originating in South America) was found in several gardens. The seed cotton is hand-ginned.

Dominica (DMA): AS 00039 to AS 00049 (11 samples, 5 lost), G. hirsutum "Marie-Galante" (6 samples).

Spontaneous cottons are rare and are present only along the west coast. Located 2 kms north of Colihaut village a spontaneous population was distributed over 300 m along the road; it exhibited great morphological diversity.

St. Barthelemy Island (GLP): AS 00050 to AS 00066 (17 samples), G. hirsutum "Marie-Galante" (17 samples).

"Marie-Galante" cotton has been cultivated for several centuries on this dry island. Considering the reduced extent of cultivation it was surprising to find numerous samples with important diversity.

St. Martin Island (GLP and ANT): AS 00067 to AS 00072 (6 samples), G. hirsutum "Marie-Galante" (6 samples).

Great morphological diversity was found.

Dominican Republic (DOM): AS 00073 to AS 00098 (26 samples, 1 lost). (a) G. hirsutum "Marie-Galante" (18 samples), (b) G.

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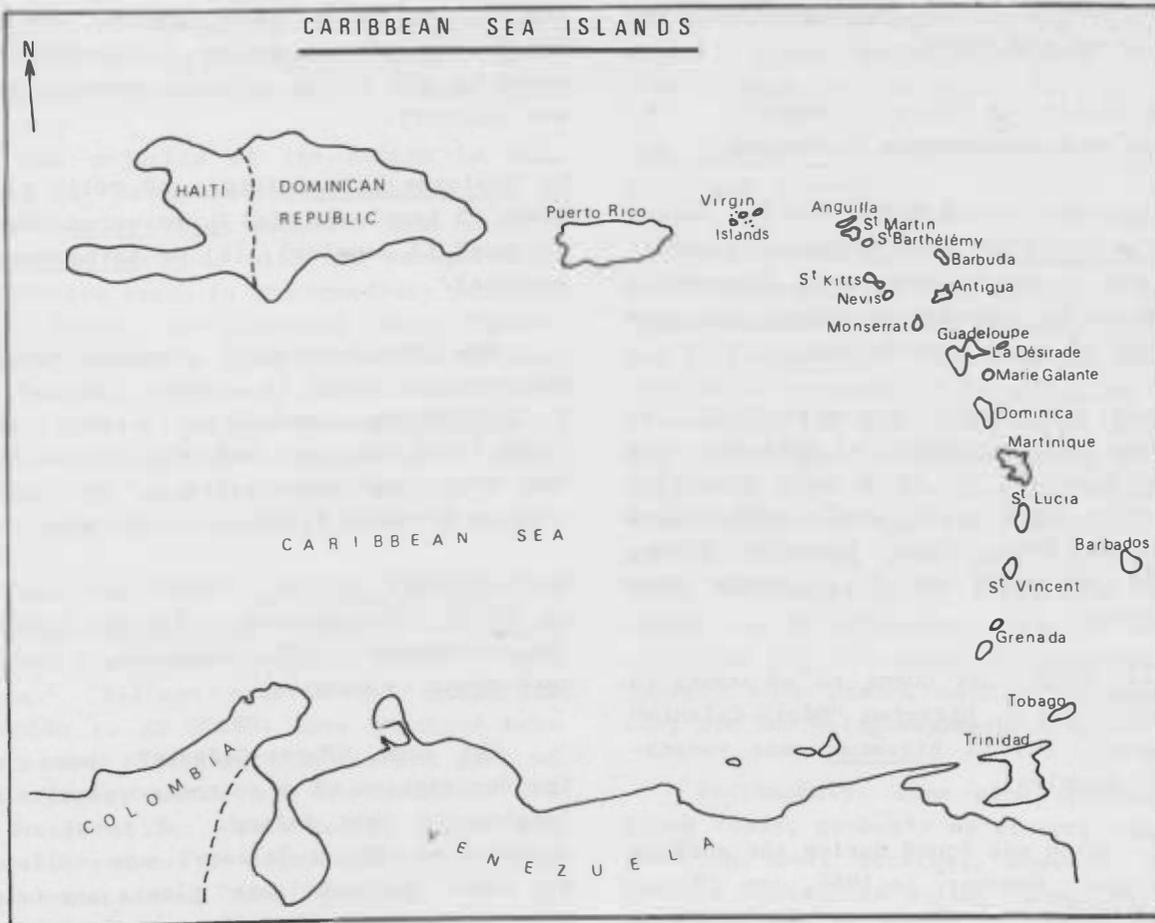


Fig. 1: Caribbean Sea islands where cotton was collected

barbadense (4 samples), (c) G. hirsutum race yucatanense (3 samples).

The plant population is not homogeneous. Fibre characteristics permit distinction of the population into three regions:

- (a) between Azua and San Juan: an exceptionally thin and mature fibre,
- (b) between La Vega and Monte-Christi: coarser fibre,
- (c) La Romana region (west of Santo Domingo); thin and very resistant fibre. In this area, numerous "Marie-Galante" samples can be found growing along the road between San Pedro and La Romana. They are probably escapes from garden cultures and not harvested.

Along the road which connects Azua to Barahona there is a desertic zone with cactus and other xerophytic vegetation, with a remarkable cotton population (between PK 51 and 47). These plants bear small and round bolls, containing small seeds covered with a brown fuzz and a short brown fibre. They are most probably related to G. hirsutum race yucatanense.

Haiti: AS C0099 to AS 00133 (35 samples, 3 lost). (a) G. hirsutum "Marie-Galante" (29 samples), (b) G. barbadense (3 samples).

Cottons are distributed in a homogeneous way all over the country and are carefully harvested. The "Marie-Galante" type is the most important, perhaps due to preference by the local people, or as a consequence of deliberate selection in the 1930's. Numerous samples display an unusual phenotype, e.g. purple pigmentation, brown fibre, entire (toothless) bracts, rounded bolls.

Two samples of G. barbadense possess purple stems and leaves.

Antigua (ATG): AS 00134 (1 sample). G. hirsutum race yucatanense (1 sample).

A variety called Montserrat Sea Island (G. barbadense) has been intensively cultivated, but is now disappearing. Systematic eradication of spontaneous cotton has been supported by local authorities.

Only one sample was discovered, at Half Moon Bay (southeast of Antigua, near the seashore). It is a very primitive cotton with small bolls, small seeds tufted with brown fuzz, light brownish fibre, probably belonging to G. hirsutum race yucatanense.

St. Kitts (KNA): AS 00681 to AS 00685 (5 samples). (a) G. hirsutum "Marie-Galante" (1 sample), (b) G. hirsutum race yucatanense (4 samples).

No cotton was found during the authors' first visit. However, in 1982, one "Marie-Galante" sample was found in the northwest part of the island and four samples of a primitive type were found in the central parts. This one was probably present all over the area between Salt Pond (near Frigate Bay) and Muddy Pond, but today this area is subject to tourist development.

Nevis (KNA): AS 00136 (1 sample). G. hirsutum "Marie-Galante" (1 sample).

Red plant with small bolls was found.

#### Montserrat (MSR)

No spontaneous cottons were found. The Montserrat Sea Island variety is grown in some fields. Yields are poor due to insufficient insecticide treatments.

Les Saintes Islands (GLP): AS 00137 to AS 00141 (5 samples). (a) G. hirsutum "Marie-Galante" (2 samples), (b) G. barbadense (3 samples).

The two "Marie-Galante" samples have a surprisingly long fibre (nearly 35 mm),

the G. barbadense being shorter (29 mm). These two species during cultivation are mixed in the field, but they maintain their own identity.

La Desirade Island (GLP): AS 00142 to AS 00146 (5 samples). (a) G. hirsutum "Marie-Galante" (3 samples), (b) G. barbadense (2 samples).

The "Marie-Galante" phenotype is normal but the fibre is coarse. One of the G. barbadense samples has a very short fibre (22.7 mm), poor resistance (75400 PSI), but very high micronaire (7.54), which gives a standard fineness of 467 mtex.

Marie-Galante Island (GLP): AS 00147 to AS 00179 (32 samples). (a) G. hirsutum "Marie-Galante" (27 samples), (b) G. barbadense (5 samples).

The name "Marie-Galante" comes from the description of a cotton population belonging to this island. A total of 27 samples of "Marie-Galante" was collected but other "Marie-Galante" plants may exist. There were about 20 different plants of G. barbadense and five of them were collected. On this small island, one can observe a large population of subsynchronous cottons, two-thirds of which are "Marie-Galante" and one-third is G. barbadense.

The present "Marie-Galante" population is quite certainly a relic of more intensive culture, especially during colonial times. It is very well adapted to the climatic conditions of the islands which have a long dry season. There is important morphological diversity.

G. barbadense cotton is widespread, considering the fact that this species is more adapted to humid conditions. This population is certainly not an escape from anterior Sea Island cultures as its fibre characteristics are very different (low ginning percentage, short length, high micronaire).

Guadeloupe (GLP): AS 00179 to AS 00205, AS 00273 to AS 00300, AS 00686 to AS 00699 (67 samples). (a) G. hirsutum "Marie-

Galante" (45 samples), (b) G. barbadense including var. brasiliense (7 samples), (c) G. hirsutum race yucatanense (15 samples).

The majority of the cotton on this island is "Marie-Galante", probably due to preference by local people. Most samples come from gardens, with the exception of the eastern area, in the immediate proximity of Pointe des Chateaux, where "Marie-Galante" seems to have become established as a natural component of the vegetation. Genetic diversity is displayed in plant, petal or pollen colour; petal spot; shape of boll or seed and fibre colour. The fibre also exhibits a high level of diversity.

The brasiliense variety certainly results from seed exchange with French Guiana. Fifteen samples (AS 00300 and AS 00686 to AS 00699) were obtained near Pointe des Chateaux, the eastern part of this island, which has low rainfall and salt-sandy soils. This cotton looks very primitive and may be related to G. hirsutum race yucatanense and perhaps to G. mustelinum from northeast Brazil (Ano et al., 1982). They have remained unknown until this discovery.

St. Vincent (VCT): AS 00206 to AS 00207 (2 samples), G. hirsutum "Marie-Galante".

They are similar in morphology.

St. Lucia (LCA): AS 00208 to AS 00219 (12 samples, 1 lost). G. hirsutum "Marie-Galante" (11 samples).

Cotton is present only along the west coast. Some differences exist for seed pilosity and fibre colour but there appears to be a very high degree of diversity in the fibre.

Barbados (BRB): AS 00220 to AS 00227 (8 samples), G. hirsutum "Marie-Galante" (8 samples).

Since Montserrat Sea Island variety is still cultivated in the south of the island, especially around the airport, the government has sought eradication of spontaneous cottons. Eight samples were

gathered, all having about the same phenotype. Great differences were found in fibre length and uniformity ratio.

#### The present situation of cotton in the Caribbean Islands

Two cotton species are represented in the area covered in this report: G. hirsutum "Marie-Galante" (by far the most important) and G. barbadense. They have not been subjected to intensive cultivation or selection except the Sea Island varieties. Cotton has traditionally been used by local people to make pillows and mattresses, and fibre qualities have been neglected. Important sampling sites were local gardens where cotton is still cultivated for its fibre, as an ornamental tree, to maintain tradition or for medicinal purposes. It appears that plants tend to disappear as they are not being regenerated in all cases.

Fortunately, some grow spontaneously along roads, probably as escapes from cultivation. Their survival, however, is not assured because of mowing along the roads, urbanization, or governmental policies of eradication in order to maintain the integrity of cultivated varieties and protect them from pests.

"Marie-Galante" is well adapted to ecological conditions of this area, because of its resistance to dryness, a necessary attribute to survive occasional long periods without rainfall. Its large extension may also be explained because of preference by the local people.

Of special note is the occurrence in the islands of Guadeloupe, St. Kitts, Antigua and the Dominican Republic of a very primitive cotton which resembles G. hirsutum race yucatanense. This type generally grows near the sea and may also be related to G. mustelinum.

Some samples have been lost because at some sites only unripened bolls were present or only poor-quality seeds were obtained. The seeds from the other samples were sown on an experimental station in Guadeloupe to complete the phenotype des-

cription as specified in the IBPGR cotton descriptor list and to obtain seed multiplication. This proved difficult in some cases as flowering was insufficient.

Seed and fibre characteristics were analyzed in the IRCT laboratories at Montpellier. Seeds are kept in cold storage at the IRCT genebank. An electrophoretic survey of isozyme diversity has been underway since October 1982.

#### References

Ano, G. et Schwendiman J. Rapport de mission 1980 dans l'Arc Antillais sur la préservation des ressources génétiques du

cotonnier. FAO/IBPGR, AGP:IBPGR/80/36, janvier-mars, 1980, 54 pp.

Ano, G., Fersing J. et Lacape, J.M. Les cotonniers de l'île de Marie-Galante. Cot. Fib. trop., 37:4, sous presse.

Ano, G., Schwendiman, J., Fersing, J. et 1982 Lacape, J.M. Les cotonniers primitifs G. hirsutum race yucatanense de la Pointe des Châteaux en Guadeloupe et l'origine possible des cotonniers tétraploïdes du Nouveau Monde. Cot. Fib. trop., 37:4, sous presse.

# COTTON COLLECTING IN THREE SOUTH AMERICAN COUNTRIES (II)

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The preservation of genetic diversity in the genus Gossypium is of great importance for future breeding. For a variety of reasons, spontaneous or traditionally cultivated cottons tend to disappear very quickly. This report focuses on collecting missions for cotton in three South American countries from January to March 1981.

French Guiana (GUF): AS 00228 to AS 00272 (35 samples, 1 lost). (a) G. hirsutum "Marie-Galante" (4 samples), (b) G. barbadense var. brasiliense (30 samples).

Among the 35 samples collected in French Guiana, 31 belong to G. barbadense and only 4 to G. hirsutum "Marie Galante". This is a reverse situation to that in the Caribbean Islands but it is important to note that most of the samples were picked

up in two Indian villages. G. barbadense is frequently found in association with human activity, whereas "Marie Galante" is more able to survive spontaneously. Nevertheless, it is obvious that G. barbadense adapts itself better to wet areas, which is the case in Guiana and this is a possible explanation of its more frequent occurrence.

In this report, emphasis is laid on characters that differ from the classical species description. For G. barbadense, some samples had a red-green coloration of stems and leaves, leaf pubescence, cream-coloured petals, no petal spots (in 12 samples), cream-coloured pollens and short styles. Bolls were always large, acuminate and contained big naked tuted seeds (except AS 00264 with fuzzy seeds). Another

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