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About the Institute

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

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

The Origins of Manihot esculenta

Manihot esculenta is commonly known as "yuca" in the Spanish-speaking countries of Latin America, "mandioca" in Brazil, "cassava" among the English-speaking colonies of the West Indies and British Guiana, and as "manioc" in various other places such as the French-speaking areas in Africa and in Madagascar. I shall hereafter refer to the plants of this species as "yuca."

"Yuca" is one of the world's largest crops. Dr. Mangelsdorf in his paper for last year's symposium mentioned cassava, or "yuca," as one of the 12 major crops of the world. "Yuca" is found in all the world's lowland tropics today, and even in some sub-tropical areas. For instance, the Seminole Indians in the Everglades of Florida cultivate "yuca." The plants of ~~this species~~ ^{*M. esculenta, the com, is highly*} are shrubs whose heights range from less than one meter to more than three meters. They are either low and frequently branched, or they are tall and unbranched. They have concentrations of a cyano-genetic glucoside which range from nothing

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to 1200 ppm. Aside from saying that the plants are native in the New World, what is the origin of this crop and what are the sources of its tremendous variability? To answer these two questions it seems prudent to make a study of the whole genus in order to get at some of the answers.

Geographically there seem to be two major species

centers--from Mexico to Guatemala is one center, and the states of northeastern Brazil as far west as Matto Grosso is the

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second major center. Seemingly, there are two secondary concentrations of species in Venezuela and Paraguay, although Paraguay might be considered as an extension of the major species area in eastern Brazil.

Most of the species of the genus are heliophiles and occur as members of open vegetation types. Few species are shade-tolerant. The moisture relationships of the species are quite variable, but the preponderant number of species ~~are quite variable, but the preponderant number of species~~ are found in more arid regions. If the species are from more mesophytic habitats, they are usually in either sandy soils or in rocky soils with good drainage. If the plants are found in heavier soils, they are almost always in low rainfall regions.

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bridization of Manihot species, largely between "yuca" and other species, indicate that there are few barriers to successful hybridization. In populations from various parts of the range of "yuca" it is rather easy to discern the effects of hybridization between the cultivars and the locally occurring wild species. In the genus there are many species that have some enlargement of the roots whether the plants be trees or shrubs. So far I have found no vines with enlarged roots. Apparently the enlargement of the root is not confined to the species of the drier habitats but is also found frequently among those in ^{so}mephitic conditions.

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A number of "species," as presently recognized, seem to be derivatives from the cultivated complex. These are barely in the class of weeds in the real sense, but they are found in "weed-type" habitats--roadsides, abandoned farms, blow-downs in the forest, and infrequently, volunteers in cultivated areas. These species are highly variable, with all the heterogeneity one might anticipate in any one population. These species help to account for about half the species names.

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Lights
Some of the species are deciduous, dropping their foliage during the dry season, and some of the cultivars raised in the south of Brazil also drop their leaves during the dry period.

As I have said previously, the predominant number of species of the genus are shrubs of varying height, habit, and habitat.

We have, then, a sufficient number of variations in types of plants in most of the native ranges in all of the geographic areas from which a cultivated complex could arise. Where then must we look for the origins? My conclusions are that no one center is responsible for today's cultivated complex of Manihot esculenta. I would not, as most previous workers have done, place the center of origin or the beginning of cultivation in northeastern Brazil. This seems to be a secondary center.

Why? Inasmuch as the botanical evidence is rather inconclusive as to a logical point of origin, we must turn to the records of people and their utilizations of the plants. In this area we are skating on thin ice because the archaeological records and researches for Latin America are so scanty.

In Colombia, near Barranquilla,

Reichel-Dolmatoff has found flat clay baking plates that he states were probably used for the preparation of cakes from "yuca." These he dated at about 1000 B.C. In Peru many pottery pieces with beautiful representations of "yuca" roots from the Mochica and Chimu cultures have been found. These are 500-800 years old. Junius Bird has uncovered some bits of roots, probably "yuca," along coastal Peru.