

Chromosome Number of Cubú, *Solanum sessiliflorum* Dunal, a Solanaceous Fruit of the Brazilian Amazonas

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INTRODUCTION

Several South American species of Solanaceae produce edible fruits mainly used by local Indian tribes (1,2).² One of the less known of these fruits is *cubú*. The plant grows especially in the westernmost part of the Estado da Amazonas, along the Solimões River, where it is found both wild and cultivated. Evans *et al.* reported that "the fruits are said to be edible" (2).

The vernacular Nengatú name *cubiyú* is applied in the Colombian Vaupés to several species of *Solanum* (2). It seems to be a rather generic name used for a number of species of *Solanum* with edible fruits. In the Manaus region of the Brazilian Amazonas the name *cubú* applies to *Solanum sessiliflorum* Dunal.

Being in possession of a small sample of *Solanum sessiliflorum* Dunal seeds, and feeling that this species might be useful for a breeding program of naranjilla, *Solanum quitoenses* Lamarek, we sowed them in order to study the basic characteristics and chromosome number of the plant.

MATERIALS AND METHODS

A *cubú* fruit bought from a Manaus street vendor by Dr. Niilo Virkki in June 1964, provided the initial seeds for this study. The fruit was identified by Dr. William Rodrigues, Botanist at the Instituto Nacional de Pesquisas do Amazonas, Manaus, Brazil.

The original seeds were planted on the farm of Dr. Niilo Virkki in Cupey, P.R., in August 1964. Flowers were fixed in Newcomer's fluid or with acetic alcohol. Both methods provided identical results. The anthers were macerated in hot *N* HCl with several drops of iron-acetocarmine. Anthers were crushed with the use of forceps, and then squashed in the stain with a simple wooden press designed by Dr. Veikko Sorsa.³

Seeds from the first mature fruit produced at Dr. Virkki's farm were

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² Italic numbers in parentheses refer to Literature Cited, p. 251.

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sowed in sterilized soil under greenhouse conditions. Root and leaf tips were collected from the young plants that germinated. They were pre-treated in 1-percent colchicine solution for 2 hours; later they were fixed in acetic-alcohol (1:3). Maceration was performed in *N* HCl heated over an alcohol lamp and then they were stained with iron acetocarmine. They

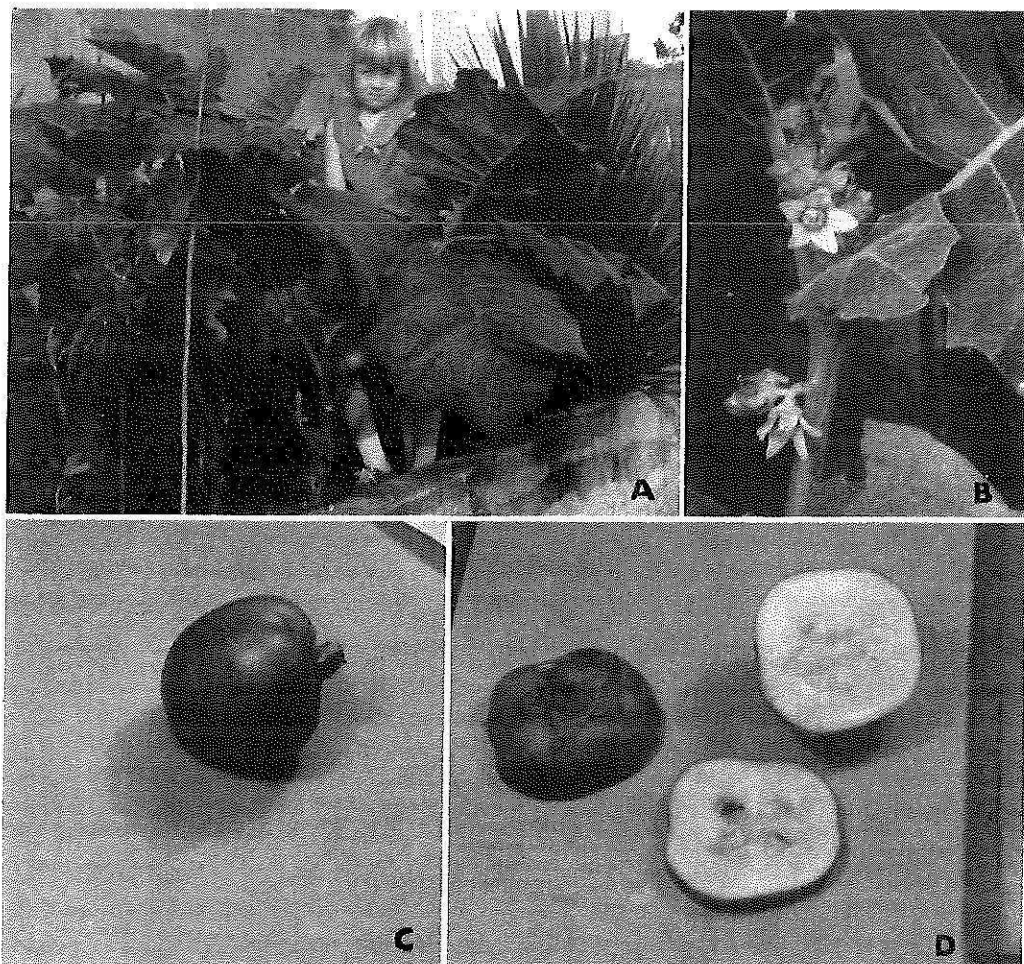


FIG. 1. A, Cubin plant after 8 months, 80-100 cm. in height--notice smooth texture of the leaves; B, Inflorescence; C, mature fruit; D, transverse cut of a mature fruit.

were crushed with forceps and squashed in the stain the same way that were the anthers.

The photomicrographs were taken with a Leitz Makam camera mounted on a Leitz Ortholux research microscope; final magnifications 820 \times .

OBSERVATIONS

Even though the seeds were planted during the month of August, we are sure that it would have been a better practice to do this during the

summer, because the Puerto Rican winter is too cold for this Amazonian plant. The first flowers appeared during November of the same year.

Apparently the inflorescence is similar to that of naranjilla, as well as other morphological characters. They differ in the total absence of spines in the cubú, while several *S. quitoenses* varieties have them (fig. 1,B). Four months later, March 1965, the first ripe fruit was harvested, (fig. 1,C-D). The fruit is ovoid, purple-red when ripe and covered with easily deciduous white hairs. The pulp is yellowish. The ripening fruit turns from yellow to purple-red when it is ripe. Seeds are very numerous, flat, oval in outline, about 2 mm. in diameter, and yellowish white. In April 1965, when the plants were 8 months old, they had reached a height of 80 to 100 cm. Even when they were growing in Múcara clay, a type of soil with very little humus, and with irregular additions of fertilizer (only Vertagreen was added) they grew to be very healthy and strong (fig. 1,A).

It was observed that the plants were attacked by two different insects. The *Psara periosalis* Walker, caused a great deal of damage during the months of August and November. A mealy bug, *Pseudococcus* sp., attacked continuously the young parts of the plants without causing serious damage to it.

Most of the anthers studied presented tapetum divisions while none presented PMC divisions.

Figure 2,A, presents 24 chromosomes in anther mitosis.

Besides root-tips, several cotyledons were chosen to be studied in cases when the seeds took a longer time to germinate. They proved to be better material than the root-tips because they are softer. In this material the chromosome number ($2n = 21$) found in the anther tapetum was confirmed (fig. 2,B).

DISCUSSION

According to Patiño (3) "one of the imperfectly understood aspects of economic botany in South America seems to be the use of the edible fruits of sundry species of *Solanum*!"

The cubú is systematically close to the naranjilla which was introduced to Puerto Rico from Ecuador, with Pl. Nos. 152343 and 163169, and is indigenous to the equinoctial region (3). The naranjilla suffers from bacterial wilt in Puerto Rico.

It is expected that species from humid tropical lowlands have developed more resistance towards all kinds of pests than plants from a more specialized climate. Therefore plant introductions from humid Tropics may prove to be more suitable for Puerto Rico than introductions from other tropical sites. Even species with low utility as such could serve as sources of genes for resistance. A detailed study of the possible resistances of cubú is in progress.

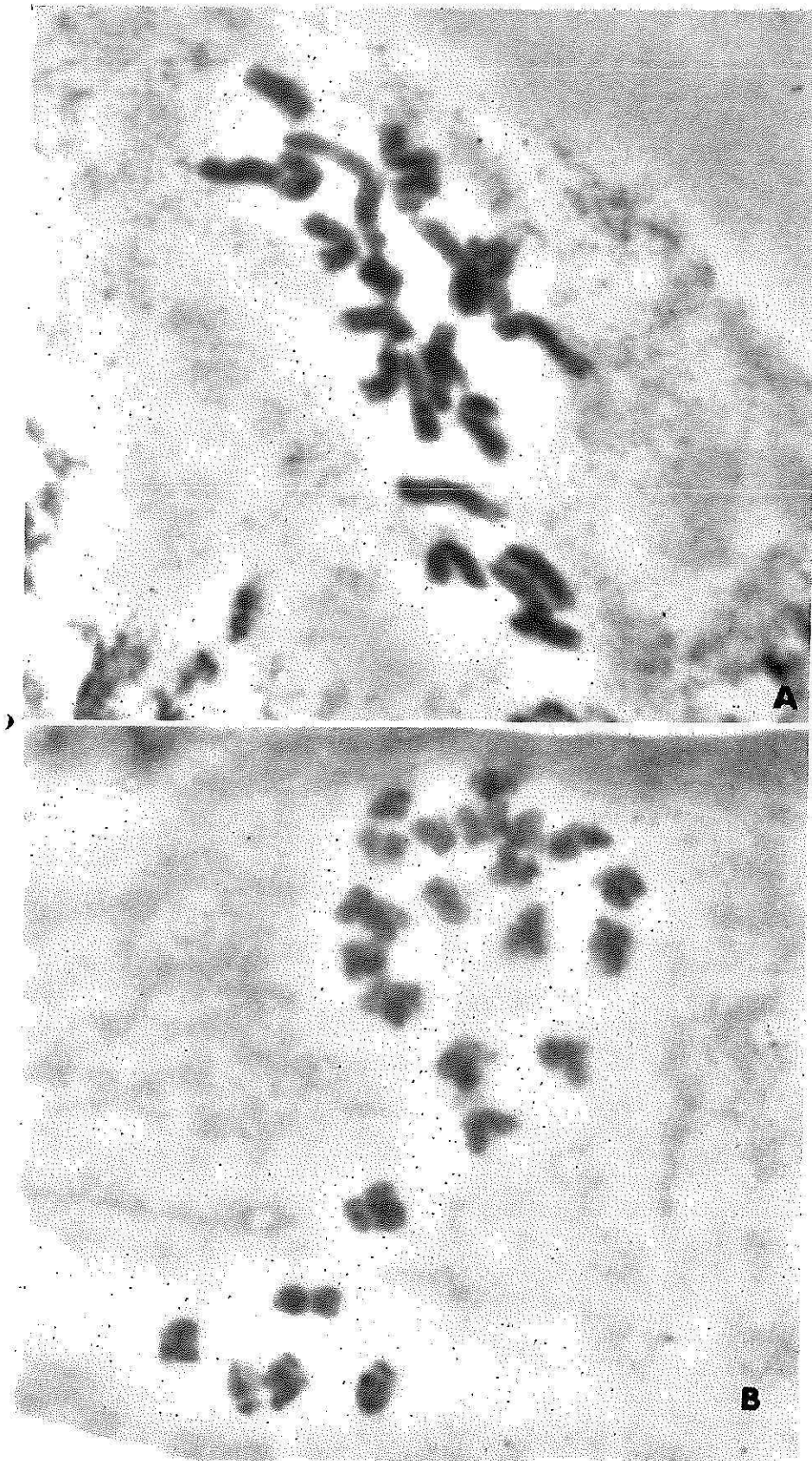


FIG. 2.- A, Metaphase of anther mitosis of cubiu plant; B, metaphase encountered in the cotyledon tissue, $2n = 21$.

The group of wild or half-cultivated Solanaceans of South America deserves the attention of the breeders, because: 1, New useful fruits could be developed by crossing and selecting, and 2, genes influencing other characteristics like diseases and insect resistance, could be incorporated with existing cultivated Solanaceans.

SUMMARY

Cubíu, *Solanum sessiliflorum* Dunal, is an Amazonian relative of the naranjilla (*Solanum quitoenses* Lamarek), an equatorial fruit plant introduced earlier in Puerto Rico. The chromosome number has been determined and proved to be $2n = 21$. It is being studied for resistance to bacterial wilt and will be checked for other pests that attack Solanaceans in Puerto Rico.

RESUMEN

El cubíu, *Solanum sessiliflorum* Dunal, es una especie de las solanáceas de la Región del Amazonas, que tiene afinidad botánica con la naranjilla (*Solanum quitoenses* Lamarek), planta frutal de la Región Ecuatorial que se introdujo a Puerto Rico previamente. Se determinó que el número de cromosomas del cubíu es $2n = 24$. Se están haciendo estudios con esta planta para determinar su resistencia o susceptibilidad a la marchitez bacteriana (*bacterial wilt*) y otras enfermedades que afectan a las solanáceas en Puerto Rico.

LITERATURE CITED

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