

The Use of *Cyperus canus* J. Presl as Raw Material for Handicrafts in Tabasco

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Abstract— This paper explores the use of Cañita by artisans of Nacajuca, Tabasco, Mexico to elaborate commercial crafts. This plant occurs naturally, but its demand by artisans has increased, which could lead to the gradual extinction of wild populations. The aim of this study is to provide introductory information on Cañita (*C. canus*): botanical description, agricultural production and artisanal use. The conclusion is that despite the economic and agronomic advantages of this plant, the system of artisanal production and the socio cultural environment of the families that work with it do not contribute to the sustainability of the production of Cañita, which is the limiting factor for the production processes related to commercial tourism and the capacity of artisans to make long-term decisions.

Keywords— *artisans, extinction, agricultural production, socio cultural.*

I. INTRODUCTION

Handicrafts are decorative and utilitarian objects which integrate economic, social and cultural aspects that reflect the worldview of indigenous peoples^[24]. These decorative objects play multiple roles: some indigenous groups elaborate handicrafts for the needs of the "uses and customs" of their ethnic group, while others elaborate handicrafts to fulfill domestic needs and those of a tourist market. Within the uses and customs of different ethnic groups, handicrafts may have ceremonial use, they can be used as symbols, as art objects for everyday use, for ritual or sumptuary use. Commercial handicrafts compete with industrial products made in production lines with sophisticated processes. A common raw material for handicrafts is the plant called Cañita (*Cyperus canus* J. Presl and *C. Presl*). This plant material is known in other places as "tule negro" or "tule de petate"; the core of the stem is extracted, and is called "metate" or heart^[8]. Cañita is used for making handicrafts such as "petates", mainly, but also baskets, bags, tablecloths, tortilla warmers, mats, hats and various figures of birds and characters depicting everyday images taken from the immediate and common environment of the artisans^[1]. In the municipality of Nacajuca, in the state of Tabasco, artisans use Cañita as raw material for making commercial handicrafts^[16]. The intensive use of this plant, and the lack of knowledge about how to manage its agricultural production, could cause the gradual extinction of wild populations^[21]. This study aimed to contribute to the understanding of family workshops in which tourism serves as a driving force for cooperation between groups without business and agricultural experience, in order to establish community intervention guidelines for the creation of jobs and local development models^[8]. Given the importance of Cañita, artisans of the municipality of Nacajuca, Tabasco try to cultivate it using empirical methods, without any technical support^[5]. The aim of this study is to provide introductory information on Cañita (*C. canus*): its botanical description, importance, agricultural production and artisanal use.

II. HANDICRAFTS

Handicrafts are objects that are representative of a country, a region, a culture and an identity. The more artisans stick to the original techniques in terms of raw materials, labor and traditional tools, the more their products will be imbued by the feelings, skill and cultural significance that makes them works of art^[24]. The Maya-Chontal produce utilitarian, ceremonial and tourist handicrafts. Traditionally, the most important artisanal activity was the construction of dugout canoes, of which there were two styles, one built with mahogany and one with cedar. This custom was lost with the passage of time, and with it the interest in forest conservation. The communities continue to make drums, "tunkules" and flutes for the music played in dances, ceremonies and cultural celebrations. Maya-Chontal artisans also make "jícaras" (gourd bowls) of different types, as wooden figures and spoons for the tourist market. They also make tiny ceramic objects used as offerings to the supernatural beings of the forest, and as toys^[19, 11]. One of the factors that forces artisans to sell their products at low prices is that many indigenous communities produce the same product, resulting in market saturation and benefiting intermediaries, who buy

handicrafts at very low prices and resell them elsewhere at a higher price^[19]. The area of Nacajuca produces "cinta" for chontaleño hats and other palm products that are sold in the Southeast of the country^[2]. According, this cinta is used mainly for weaving baskets and mats^[14]. All the parts of this plant are used, including the stem core and the bark; the latter is used to make various products such as hats, mats, fans, bags, etc. The artisans who make handicrafts with this plant are chontales located in the municipality of Nacajuca, Tabasco.

III. CAÑITA

Cañita (*C. canus*) is obtained by extracting the heart of the plant, which is called "mecate" or "corazón de cañita" ^[13]. Initially it was used to make only "petates" or bedrolls, whose use is still common among indigenous communities in Nacajuca and surrounding places, but now it is also used to make baskets, bags, tablecloths, tortilla warmers, mats, hats and various figures of birds and characters^[1].

Cañita is a round rush that grows in damp areas (Figure 1). The name "cañita" is used by the residents of Nacajuca. This plant belongs to the genus Cyperus, kingdom Plantae, division Magnoliophyta, class Liliopsida, order Cyperales, family of Cyperaceae. This genus is composed of about 600 species distributed across all continents in both tropical and temperate regions^[13]. These plants are annual or perennial, growing in low lying areas. The species vary in size from only 5 cm high up to 5 m high^[13]. Includes several species of Cyperaceae under the term tule: C. tenerrimus J. Presl & C. Presl., C. canus J. Presl & C. Presl, C. articulatus, L. Schoenoplectus (Scirpus), S. validus (Vahl) A. (Scirpus lacustris L.), y S. validus (Vahl) A. (Scirpus), (Eleocharis palustris) Volkart ex Schinz, and S. validus (Vahl) A^[22].



FIGURE 1. The plant cañita (Cyperus canus J. Presl and C. Presl) in Nacajuta, Tabasco

The roots of this plant are adventitious, growing from a rhizome, which gives rise to new plants^[7]. Stems can have circular or triangular cross-sections, usually without leaves along the entire length of the stem; there are whole leaves in the basal area of the plant and spiral leaves at the apex of the flower stems. Leaves are almost reduced to pods; the flowers are greenish and grow clustered between the apical leaves ^[20]. The flowers are regularly arranged in opposite rows; they consist of one spikelet, hairy, ovate to linear-oblong, flattened, 20 mm long and 2.5 mm wide, of clear red-brown color, with rachilla persistent; scale broadly ovate 1.6 to 2 mm long and 1 to 2 mm wide, nerved almost to the margins, deciduous; stamens with anthers 0.7 to 1 mm long. Comments that the flowers are greenish and grow clustered between the apical leaves^[18]. The fruit is roundly trigonous, ellipsoid, 0.4-0.6 mm long and 0.2-0.3 mm wide, dotted, brown. The seed is a small grain that is spread by the wind for pollination^[9]. The habitat are tropical zones; it grows in lowlands, mainly in those with weeds, occasionally in swamps and creeks and other undisturbed areas.

IV. PROPAGATION

Cañita propagates vegetatively: A) rhizomes, B) buds, C) underground layering, D) cuttings or shoots and E) direct seeding (Figura 2). A) By rhizomes. Says this is the best propagation method for Cañita. The method involves extracting whole rootstocks from the ground and then separating the rhizomes into three 10 cm long stems^[17]. These stems are planted in bags, burying the rhizomes and part of the stem (Figure 2d)^[3]. This method produces root sprouts eight days after planting. In the

nursery, it is advisable to keep the plants under constant humidity, watering every third day in order to avoid water stress, which could stunt plant growth^[20]. B) By buds, this method consists in collecting buds from the adult plant, removing the leaves with disinfected pruning shears and leaving about 2 cm of the petioles of the leaves and 2 cm of stem. The appropriate size of the bud should be about 6 cm, including a part of the leaves, bud and stem. Afterwards, the buds are planted in bags, burying all the stem and taking care that the bud is covered with little earth, since that is from where the plants will grow. By underground layering. This method consists in bending the stems of adult plants and burying the buds without removing them from the rootstock. Entering into contact with earth causes the bud to grow axillary buds, which can produce up to 10 plants per bud. This method is used to replace plants within the same plantation. D) By cuttings or shoots. This method involves collecting stem cuttings and extracting shoots that grow from it, and E) Direct seeding (underground layering and cuttings and shoots methods) methods are the most recommended and also the most used by artisans to propagate Cañita. This is because these methods yield faster and better plant growth^[4].

V. FIELD TRANSPLANTATION

The plants propagated by rhizomes in a nursery can be transplanted to the field 60 days after planting (Figure 3). The plants obtained from buds are ready to be transplanted to the field after 90 days; the delay is caused by the cutting of leaves and stem from the buds. The number of plants obtained by this method varies from 2 to 3 per bud, and their growth and development is slow^[20].



FIGURE 2. Cañita propagates vegetatively: a) direct seeding, b) cuttings or shoots, c) buds underground layering, and d) rhizomes.

In field, planting is done with 2 x 2 m spacing for a population of 5,000 rootstocks per hectare. Producers say that the planting is done simultaneously so that the plants have a uniform height; sometimes they also plant certain fruit plants such as bananas, cassava and "hoja de toó", which allows for sustainable land use. It is recommended to perform the transplantation in the rainy season, which runs from June to November, although it is possible to plant throughout the year, provided there is enough moisture in the soil. It is not recommended to plant during the heat period, since heated earth affects the plant engraftment^[2].

VI. AGRONOMIC MANAGEMENT

Foliar fertilization was used both in the nursery and in field, using grofoll at 5 g per liter of water, with good experimental results. However, artisans use no fertilization because they establish their plantations on the best soils in their fields or in small plots around their houses. Soil fertilization was used in the nursery of the Academic Division of Agricultural Sciences, with 3, 5 and 10 g of triple 17 per plant; there were no differences with unfertilized plants^[20].

There are no reports of pests affecting Cañita crops. But ants are a common problem during harvest; producers from Nacajuca deal with them by spraying cypermethrin a week before harvest, applying 30 ml per 20 liters of water to remove the nests that ants make in the furrows^[21, 6]. Common diseases of Cañita include some types of leaf rust (*Puccinia recondita* f. sp. Tritici), but these do not affect the production of healthy stems^[16]. Weed control can be done manually using hand tools; it is not necessary to apply herbicides because the incidence of weeds in Cañita plantations is very low. Cañita itself

prevents the incidence of weeds^[5]. The only treatment needed by the fields where Cañita is going to be planted is weeding, because weeds are very invasive and can spoil the transplantation.



FIGURE 3. The plant Cañita propagated by rhizomes.

VII. HARVESTING AND DRYING THE CAÑITA

Cañita is harvested and dried using hand tools when plants are 8 to 12 months of age; this is done during the dry season, in March, April and May, as sunny days are needed to dry the plant material. It is advisable to consider harvesting the plants when the moon is waning, because that is when the stems of the plants contain less water, which prevents the harvested material from decaying or being damaged by fungi and insects. Another harvesting method is to pull the stems off by hand.

The base of the stems has modified leaves or scales that are cut during harvest (this work is called "destute"); apical leaves or umbrellas are also removed during the harvest, and left on the ground to serve as organic fertilizer (this work is called "despunte")^[10]. Cañita is dried by spreading it on the ground and exposing it to the sun; the drying process lasts 4 to 5 days. After the stems are completely dry, they are classified according to their length (Figure 4)^[23].

The stems are considered dry when they turn yellow; at that moment, they are stored in a high place where they are exposed to natural air. Craftswomen stored Cañita in bundles wrapped with nylon to protect them from insects.



FIGURE 4. a) The Cañita and b) Cañita are dried by spreading.

Plantations with a larger supply of water produce a more manageable tule than plantations with less water. Once stored, the material lasts up to one year, as long as it remains in a dry place^[12, 18]. A second crop is obtained from a plantation where tule has been harvested in the dry season. The second crop is called "tule de culebra" (snake tule) because the stems are thinner and can measure up to three meters; from this crop is obtained the fruit called Macoya, which provides tule seeds^[15]. The separation of the bark and medulla is done manually by the artisans dividing with the purpose of having two materials for the production of different crafts^[23].

VIII. CONCLUSION

The cultivation of Cañita among Chontal populations of Nacajuca, Tabasco, has changed rapidly in recent years; it has been affected by livestock grazing and the geographical proximity of the main Chontal settlements to the state capital and oil production oil areas, all of which has accelerated the loss of population of this plant. This study found that the producers of Cañita in Nacajuca are not organized and do not employ adequate agronomic management methods for the production of their raw material and the marketing of their products. This research was an agronomic study of the use and production of Cañita. This study contributes to increase the knowledge of this plant species, which can be used at different educational levels by artisans of the region studied.



FIGURE 5. a) The manually by the artisans for the production of different crafts, b) medulla is done manually c) the artisans dividing with the purpose of having y d) two materials for the production of tapete

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