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Los extraordinarios usos para el guamúchil *(Pithecellobium dulce)*

Extraordinary uses for guamúchil *(Pithecellobium dulce)*

Hernández-Neri Dulce Citlali[a], Maricela Ayala-Martínez[a], Sergio Soto-Simental[a], Armando Zepeda-Bastida[a], Juan Ocampo-López[a], Apáez-Barrios Jairo[a,b]

Abstract:

Guamúchil (*Pithecellobium dulce*), is a tree legume, appreciated for its many uses, as well as being rustic and with high growth capacity, it is distributed throughout Mexico; which allows it to be used as a live fence, forage, land boundary, timber resource, medicinal plant, in addition to the fact that its fruit is used in Mexican gastronomy; for this reason, *Pithecellobium dulce* is considered to be a little-known and minimally exploited resource, so this research aims to publicize the potential uses of guamúchil.

Keywords:

Pithecellobium dulce, Legume, Medicinal plant, Plant protein

Resumen:

El guamúchil (*Pithecellobium dulce*), es una leguminosa arbórea, apreciada por sus múltiples usos, además de ser rústico y con la alta capacidad de crecimiento, se encuentra distribuido en todo México; lo cual permite que sea aprovechada como cerca viva, forraje, delimitante de terrenos, recurso maderable, planta medicinal, además de que su fruto es utilizado en la gastronomía mexicana; por tal motivo, se considera que el *Pithecellobium dulce* es un recurso poco conocido y mínimamente aprovechado, por tal motive, esta investigación tiene como objetivo dar a conocer los usos potenciales del guamúchil.

Palabras Clave:

Pithecellobium dulce, Leguminosa, Planta medicinal, Proteína vegetal

Introduction

Pithecellobium dulce are found in the neotropical region, where it shares geographic space with evergreen and xerophilous mesophilic trees and shrubs with heights of up to 20 m; they extend from Mexico, passing through Central America, Colombia, and Western Venezuela. In Mexico it is known by various names such as "Guamúchil", "Huamúchil", "Guamuti" or "Pinzan". Its main characteristics are tetrafoliated leaves, flowers in head; dehiscent, linear, curved, or coiled pods and black seeds covered by a fleshy red, pink, or white aril attractive to birds and edible to man 2. Due to its rapid growth and adaptability in dry seasons, it is used for food, timber, and ornamental purposes 4; as well as live fence on farmland or rural roads; its bark is highly appreciated in herbalism, as well as for leather tanning 11, the leaves have been used as fodder for animal feed 1, 6, 7.

General characteristics of *Pithecellobium dulce*

It is considered a species of easy and fast growth that is propagated by seed, tolerates drought, supports constant cutting, and grows in poor soils, it is also resistant to pests. In addition to being used for different purposes, human consumption of fresh or processed fruit, as forage in animal feed, medicinal, cosmetic industry, for tanning skins and timber 11. *Pithecellobium dulce* belongs to the Fabaceae family (Table 1), to which green acacias, mimosas, blackheads also belong 19.

Edible use

Guamúchil fruit has two types of flavours, mainly sweet and bitter; the sweet is used for the elaboration of atole

[a] Universidad Autónoma del Estado de Hidalgo, Instituto de Ciencias Agropecuarias. Ave. Universidad s/n. Ex Hacienda de Aquetzalpa, Tulancingo, Hidalgo. MÉXICO. Dulce Citlali Hernández Neri, talitha2008bebeshita@gmail.com, https://orcid.org/0000-0003-2134-5852; Maricela Ayala Martínez, ayalam@uaeh.edu.mx, https://orcid.org/0000-0001-5554-218X; Sergio Soto Simental, sotos@uaeh.edu.mx, https://orcid.org/0000-0002-6923-0926; Armando Zepeda Bastida, azepeda@uaeh.edu.mx, https://orcid.org/0000-0003-0572-5206. Juan Ocampo López, jocampo@uaeh.edu.mx, https://orcid.org/0000-0002-9208-7216; Jairo Apáez Barrios, ap415669@uaeh.edu.mx, https://orcid.org/0000-0001-6503-0348.

[b] Autor de Correspondencia, Universidad Autónoma del Estado de Hidalgo, https://orcid.org/0000-0001-6503-0348, E-mail: ap415669@uaeh.edu.mx.

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and the bitter is used for the preparation of sauces; Although, excessive consumption of this fruit is not recommended, since it contains considerable amounts of tannins, which can cause irritation of the throat and may put the health of the consumer at risk, the fresh fruit is consumed as a snack or snack, however , the nutritional composition of the guamúchil fruit (Table 2) depends on the ripening stage it is in 5, 9, 15, 16; except the content energy (3.94 Mcal Kg^{-1}), which remains stable 19.

Table 1. Taxonomy of *Pithecellobium dulce* 19.

Kindom	*Plantae*
Subkindom	*Tracheobionta*
Divisio	*Magnoliophyta*
Class	*Magnolipsia*
Subclass	*Rosidae*
Order	*Fabals*
Family	*Fabaceae*
Genus	*Pithecellobium*

Table 2. Nutritional characteristics of *Pithecellobium dulce* fruit 15, 16, 19.

Nutrient	Amount
Dietary fiber%	5.83-6.12
Energy Kcal/100 g	78
Protein %	11
Lipids %	4
Sucrose %	92
Lisin %	7.8
Sulfur amino acids %	2.8
Water (Fresh fruit) %	77.8
Dietary fiber %	1.2
Vitamins (mg/100 g)	
C	133
A	15
B1	0.24
B2	0.10
B6	0.60
Macrominerals (mg/100 g)	
Ca	13
P	42
Fe	0.5
Na	19
K	222

Medicinal use

Several parts of *Pithecellobium dulce*, are important in traditional medicine for the treatment of various diseases, its pulp has been used as astringent and haemostatic, to treat gum ailments, toothaches and bleeding in any wound; the cortex to treat chronic diarrhea, dysentery, constipation, and tuberculosis; the extract of the leaves for indigestion, prevent miscarriage, gallbladder pain and from wash the wounds; ground seed to treat ulcers, diabetes mellitus, inflammation, cancer, tuberculosis, venereal diseases, biliary disorders, fever, cold, sore throat, malaria, skin pigmentation, acne, dark spots, conjunctivitis, irritable bowel syndrome, pain , eczema and leprosy 10. In addition, the components of guamúchil (Table 3), they have been used in cytoprotective mechanisms, antioxidants, enzyme inhibitors, lipid lowering, antiparasitic, spermicidal, antidiabetic, antiseptic, antibacterial and anticonvulsant 8,17,13.

Table 3. Components with antioxidant capacity of *Pithecellobium dulce* 15, 16.

Component	Amount
Vitamin C (mg/ 100 g)	79.7-82.6
Total phenols (mg/10 g)	517
Anthocyanin (mg/100 g)	29.5
Antioxidant activity (vitamin C equivalent)	ABTS, 224 mg, DPPH, 223 mg

Maderable use

Wood obtained from *Pithecellobium dulce* for its resistance and hardness, is used as firewood or charcoal, to build houses, fences, bars, posts; handles for tools, furniture or crafts; The latter are made by carving the trunk, which is considered very difficult, because the seeds are intertwined in it 7.

Use in livestock

Tree *Pithecellobium dulce* has been used as shade, because in the dry season it does not lose the foliage 7, in addition to making its trunks fences to delimit land or roads, the purpose of which is not only the aforementioned, but also in order to create natural barriers to dampen prevailing winds and prevent erosion or floods 3. In addition to its foliage being used in grazing cattle, sheep, and goats, as a complement (protein banks) in pastures, in tropical regions, because it contains 24% protein 14. In addition, derived from its rusticity and resistance to drought, it gives greater importance in the dry season, however, producers do not use it as the main ingredient for feeding ruminants due to its bitter taste, which reduces its palatability 18.

Other uses

Bark of *Pithecellobium dulce*, has been used as a vegetable tanning agent, mainly due to the high amount of tannins it contains 11. In addition, to that it can be used as a flavouring, adhesive, colorant and for making soaps 19.

Conclusion

Although tree *Pithecellobium dulce* has been given various uses, it is necessary to continue researching its components, mainly medicinal and nutritional, to propose it as a nutraceutical ingredient.

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