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Some Ethnological Data
Concerning One Hundred Yucatan Plants
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SOME ETHNOLOGICAL DATA CONCERNING ONE HUNDRED YUCATAN PLANTS

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INTRODUCTION

During the last 9 years the author has spent considerable time among the Maya Indians of Yucatan and has become increasingly aware of the fact that the primitive life of these people is in constant intimate relation with nature. Not only do they depend upon the plant kingdom for their food, shelter, and clothing, but they rely upon it for many of their so-called cures. Consequently the ethnobotany of the region is rich in detail and color, offering a fertile field for the investigator who is interested in the Maya, their beliefs and customs, and their use of plants. This paper presents information collected by the author on 100 plants in the vicinity of Chichen Itza, where the Carnegie Institution of Washington maintains a base for its investigators.

There have been at least three important publications pertaining to the flora of Yucatan (Roys, 1931; Standley, 1930; Carnegie Publ. No. 461, 1936).¹ The study by Dr. Ralph L. Roys entitled "The Ethnobotany of the Maya" is primarily a translation study and comparison of the seventeenth- and eighteenth-century Maya medical texts. P. C. Standley's *Flora of Yucatan* is a classification of plants sent to the Field Museum in Chicago by various collectors. Both of these studies list ethnological data concerning the Maya. Botany of the Maya Area, a compilation of technical papers on plants, seldom considers the ethnobotanical significance of the plants included. None of these publications lists all the plants of the Maya area or all the uses ascribed to them by natives. It is hoped that the present report will add significant information on this interesting subject.

At the beginning of this study approximately 225 species of plants were collected, and all their uses as given by several native informants were recorded. Two sets of the plants were brought to the United

¹ For other references to plant life of Yucatan, see bibliography.

States, where they were identified by Dr. P. C. Standley, of the Field Museum of Natural History, and Dr. H. A. Gleason, of the New York Botanical Garden. The author gratefully expresses his thanks to these two men for their assistance.

Much of the material gathered in this manner duplicated that which has already been published. For 125 of the plants collected nothing new was learned, the information merely verifying that which is found in the literature. For the remaining 100 plants some new ethnological data were discovered, and it is the purpose of this paper to present only the new material. In a few instances facts appear which have already been published; they are added merely to make the picture more complete. It can be said, though, that for each of the plants described below some new information is published for the first time.

The spelling of most of the scientific names was taken from the book by Standley, while the Maya and Spanish spellings were checked from Roys' study. Page references are given to the works of these authors immediately following the scientific names of the plants considered, and the reader is referred to them for additional information.

The Maya names for plants often include prefixes describing the color or some other noticeable feature of the plant. The reader will benefit by knowing the most common of these. Chac in Maya means red: yax green; ya yax blue; zac, white; kan, yellow: and ox, black. The letter X before a word indicates the definite article. Che means tree, and cambal means a small, low bush. Xcambal, then, means "the small, low bush."

The 100 plants are arranged alphabetically according to their scientific names. Then follow the Maya and the Spanish names, a brief description of the plant, and the previously unpublished ethnological material. An alphabetical list of the plants arranged according to their Maya names appears at the end of the description of plants (p. 218).

DESCRIPTION OF PLANTS

1. *Abrus precatorius* L., X-oco-ak (Maya), Pionía (Spanish). Standley, 289; Roys, 296.

This climbing vine has purplish flowers and red and black seeds. The latter are used as beads to make eyes for Maya dolls. Babies who suffer from diarrhea, called ojo and caused by an "evil eye" or an "evil wind," are bathed in a decoction of the leaves of this plant. The leaves may also be roasted, ground, and made into a salve, which is applied to the heads of babies so afflicted.

2. *Abutilon trisulcatum* (Jacq.) Urban, Zac-xiu (Maya). Standley, 345; Roys, 307.

In Maya this plant is also called Zac-mizib, meaning white broom. Several branches of the shrub, which has small yellow flowers, are tied together and used as a broom. Medicinally, the leaves are crushed and rubbed on canker sores of the mouth. They are also ground and mixed with water and given to children suffering from asthma, the dose being two spoonfuls every hour.

3. *Acacia Collinsii* Safford, Zubin (Maya), Cornezuelo (Spanish). Standley, 275; Roys, 312.

The Zubin is a thorny tree whose leaves and flowers begin to appear in early April. There are no leaves on the tree during the dry season. The aromatic roots, eaten by moles, are used as bait in traps, especially constructed to catch the animals. Each large, hollow thorn is inhabited by a colony of red ants, which enters through a hole at the top of the spine. There is always just one hole in each pair of thorns, and two or more ants inhabit each pair. Wasps commonly hang their nests from the branches of this tree.

- 3 a. *A. Milleriana* Standl., Chimay (Maya). Standley, 276.

This is another species of *Acacia*. It is also armed with stout spines and grows on very poor soil called Tz-kel (Maya). The wood is used for the larger upright poles in the side walls of Maya houses and is further employed in making axles for carts and for planting sticks. In the dry season deer eat the fruit of this tree. Medicinally, the leaves are used in a concoction for coughs and colds.

4. *Achras Zapota* L., Ya (Maya), Zapote (Spanish). Standley, 378; Roys, 297.

The thick, white sap of this large, uncultivated tree furnishes the chicle of chewing gum. The fruit is round like an apple and has a rough skin; the fleshy part is a dark-orange color and is eaten by birds, wild mammals, and man. The wood is fine-grained. As a medicine the thick, rough bark is boiled and drunk for diarrhea. The gum is mixed with salt and held in the mouth for toothache.

5. *Acrocomia mexicana* Karw., Tuk (Maya), Cocoyol (Spanish). Standley, 217; Roys, 288. See plate 22, figure 1.

These palm trees are found in great numbers in Yucatan. The trunk and fronds of the palm are armed with long, black spines. Because these spines are very difficult to remove from the flesh, they often cause infection and as a consequence are thought to be poisonous. Rosaries and rings are made from the seeds, and people of wealth put gold inlays into the rings, thinking that they will bring good luck. The fruits resemble small coconuts and are eaten raw or cooked in honey, sugar, or molasses. The bark of the tree is some-

times used as a foundation for Maya elevated gardens called canche. Soil is placed in the bark container and vegetables are grown in it.

6. *Adenocalymna fissum* Loes., Ak Xux (Maya). Standley, 417.

Ak Xux is apparently a local name for this plant. Roys does not mention it and Standley lists the scientific name with several different Maya names. The words "Ak Xux" may be translated as vine basket. This vine, which grows only in the high bush, is used by the Maya in making their harvest baskets.

6 a. *A. punctifolium* Blake, Zac-bach (Maya). Standley, 417.

This is another species of the vine, the bulbs of which are used by the Maya in the treatment of asthma.

7. *Aloe vera* L., Hunpedz-kin-ci (Maya), Sabila (Spanish). Standley, 227; Roys, 246.

This stemless perennial herb, native of the Mediterranean, resembles a small henequen plant and grows abundantly in Yucatan. The leaves are made into soap which is an excellent shampoo and may be bought in the Merida market. The pulp from the leaves is applied locally for headache and neuralgia or it may be thoroughly washed and boiled with the roots of the Put Xiu (*Lepidium virginicum* L.), resulting in a concoction which is said to be good for coughs and colds.

8. *Alvaradoa amorphoides* Liebm., Bezinic-che (Maya), Palo de ormidas (Spanish). Standley, 312; Roys, 217. See plate 22, figure 2.

This tree grows 10 to 15 meters tall, has lacelike leaves, and grows abundantly in the Chichen Itza bush. It has small greenish flowers in long racemes. A decoction of the bark of the tree has been used consistently for skin diseases. One modern yerbatero (herb doctor) uses the leaves of this plant in the treatment of urinary disorders. Another mixes the leaves in warm water and prescribes the mixture as a bath for those suffering from rheumatism, while still another advocates giving a concoction of the leaves, honey, and corn silk to a patient with a hemorrhage.

9. *Annona Cherimola* Mill., Pox (Maya), Cherimoya (Spanish), Custard apple (English). Standley, 266; Roys, 279.

This large tree, cultivated for its fruit, grows high and has soft wood and rough bark. The round, thorny fruits have a strong smell and when ripe are of brown and yellow color. The sweet, yellow pulp is full of filaments between and around the seeds. Although the fruit is edible, the Maya believe that if one eats too much of it one will contract malaria. In Yucatan the pulverized seeds are used as an insecticide. A decoction of the leaves is mixed with deer's tallow and smeared on the feet of those suffering from fever.

9 a. *A. squamosa* L., Dzalmuy (Maya), Saramuyo (Spanish). Standley, 268; Roys, 313.

This species is a smaller tree which has narrow leaves. The heart-shaped edible fruits, known as sweet sops, are white when ripe and are sweet and pulpy. In Yucatan the seeds are ground to a powder and used to kill lice on human beings.

10. *Bauhinia unguolata* L., Chac-dzulub-tok (Maya), Pata de venado (Spanish). Standley, 283; Roys, 233.

Near Chichen Itza this rather small tree is called Chac-dzulimtok. It has red flowers and reddish-brown leaves. Because of their pliability, the young trees are used to bind together the upright poles which form the walls of Maya houses. A decoction of the leaves is said to alleviate urinary disorders and cases of diarrhea.

10 a. *B. divaricata* L., (Zac-dzulub-tok (Maya), Pata de vaca (Spanish). Standley, 282; Roys, 308.

This species of *Bauhinia* is also a small tree and grows abundantly in the Yucatan bush. An herb doctor of Piste says that dry coughs are cured by drinking a decoction of the flowers of this plant mixed with sugar. Boiled leaves are said to be good for complaints of the liver and kidney.

11. *Bignonia unguis-cati* L., Ek-kixil-ak (Maya). Standley, 418; Roys, 241.

This black, woody vine spreads over the ground. It has pointed, hooked tendrils and large, dark-green leaves. Since it is very durable, it is used commonly to tie beams and rafters in thatched Maya houses and to make wicker-work dcors. The most tender vines are used to make the Maya baskets, which are called xaac. As a medicine the tender stems and leaves are cooked and the water is drunk for cases of bronchitis and catarrh. Crushed raw leaves are applied to cuts or wounds to stop bleeding.

11 a. Another species of *Bignonia*, known locally as Zac-ak, is used for tying bundles of wood. The water in which the leaves and stems are boiled is used in a bath for cases of muscle twitching. Neither Roys nor Standley lists this plant.

12. *Bixa Orellana* L., Kuxub (Maya), Achiote (Spanish). Standley, 359; Roys, 260.

This moderately tall bush has large, oval leaves and white flowers. It grows wild but is occasionally cultivated. The orange-colored seeds, which grow in prickly husks, are used as a flavoring for stews and also as a coloring for Maya food. The independent reports of five local yerbateros regarding the medicinal value of this plant show that two use the leaves to alleviate headaches; two prescribe washing the seeds in warm water and giving the water to patients in the first stages of measles (this, they believe, causes the measles to develop

quickly); and one adds that this water is also good for patients suffering from asthma or stomach ache.

13. *Blechnum pyramidatum* (Lam.) Urban, Akab-xiu (Maya). Standley, 422; Roys, 214.

This is a small herb or weed which grows abundantly in the Chichen Itza area. In colonial times it was prescribed for coughs, snake bites, chills and fever. Today three herb doctors boil the leaves and use the water to bathe children who sweat unduly at night. The natives tell that often babies sweat so much that their skin appears to have salt on it. In such cases the leaves of the Akab-xiu are applied, either boiled or raw.

14. *Blepharodon mucronatum* (Schl.) Dene., Xhulkin Xiu (Maya).

This is a small vine which never attains a length of more than 1 meter. Its sparse, paired leaves have a biting, antiseptic quality. The older leaves have a purple undercolor, whereas the young leaves are dark green above and light green below. In the region of Dzitas the plant is known as Chac-cancel Xiu. The entire plant is crushed and the juice applied as an antiseptic. The crushed leaves are used for snake bites and to reduce swellings. Neither Standley nor Roys lists this plant.

15. *Bourreria pulchra* Millsp., Bacal-che (Maya). Standley, 395; Roys, 215.

This is a common tree which has a straight trunk and very thick bark. The scraped bark has the color of iodine and is applied to sores and wounds as an antiseptic.

16. *Bromelia Karatas* L., Chom (Maya), Piñuela (Spanish), Wild pineapple (English). Standley, 221; Roys, 238. See plate 22, figures 3 and 4.

This plant has large leaves along whose edges are hooked thorns which do not all point in the same direction on a given leaf. Thus one might find four or five thorns pointing downward and the next two or three curving upward. Consequently the Maya are particularly cautious when in close contact with this plant. The plant bears a cluster of blue flowers. Eaten raw, the fruits are irritating to those with delicate tongues and palates, since the fruits are covered with very small nettles. The Maya rub these nettles off on the ground, believing that if they are blown off the fruit becomes sour. When cooked, the fruits are agreeable in taste. Commonly they are cooked in the same kettle with corn, giving the Chom a special flavor. The skinned fruits are cooked with sirup and served as a dessert. There is a popular Maya riddle about the Chom. "Guess, guess, if you can, boy. A slothful man has corncrib in the bush." Answer: The Chom plant, because the appearance of the fruits as they grow on the plant closely resembles the appearance of the stacked corn and corncrib.

17. *Bryophyllum pinnatum* (Lam.) Kurz, Zizal-xiu (Maya), Siempreviva (Spanish). Standley, 274; Roys, 310.

This is a common plant which is exceedingly hardy. It will grow well if given water and soil even after remaining in a dry botany press for as long as 6 months. The cup-shaped flowers are in bunches and are used widely for ornamentation. The Maya believe that if a baby plays with the flowers of the Siempreviva he will have ill luck with raising chickens when he grows older. The flowers, they believe, leave an invisible stain on the hands which later affects the eggs.

18. *Bursera Simaruba* (L.) Sarg., Chacah (Maya), Palo mulato (Spanish). Standley, 313; Roys, 227.

The red bark of this common, large tree is thick and scaly. Its wood is soft and the sap produces an aromatic gum. The wood is used in making match sticks and boxes and for preparing a pib (underground fireless cooker). The charcoal obtained from the Chacah is mixed with gunpowder and used in assembling fire bombs and rockets. Fire can be made from the friction caused by rubbing together two pieces of this wood. The leaves are used to clean out the inside of beehives. The gum was formerly burned as incense in ceremonial rites. Because it burns slowly, the Chacah is often used on Maya hearths to keep a fire burning.

19. *Byrsonima bucidaefolia* Standl., Zac-pah (Maya), Nancen agria (Spanish). Standley, 314.

This is a small tree which grows wild in the Yucatan bush. Its fruit, eaten both by people and by deer, is extremely sour, but the Maya like it with salt or dipped in vinegar or aniseed liquor. Some cook it in sugar and make a dessert of it.

20. *Caesalpinia pulcherrima* (L.) Swartz., Chac zinkin (Maya), Flor de camaron (Spanish). Standley, 284; Roys, 232.

This is a small hardwood tree or shrub, the branches of which are armed with sharp spines. Various parts of this tree have been widely used in medicine for dysentery, ulcers, amenorrhea, and venereal diseases. One modern herb doctor prescribes drinking the liquid from the boiled root of this tree as a purgative. Another advocates a decoction of the flowers to be used for bronchitis and lung trouble. Still another mixes the leaves with water and uses the liquid in cases of diarrhea.

- 20 a. *C. platyloba* Wats., Chacté (Maya). Standley, 284; Roys, 232.

This species is also common. The hard, red wood is employed chiefly for corner posts or cross and horizontal poles in the construction of Maya houses.

21. *Callicarpa acuminata* HBK., Zac-puc-yim (Maya). Standley, 399; Roys, 306.

This small, spreading tree is common in the thickets of Yucatan. It has white, sweetly scented flowers and small black fruit. The leaves are crushed, mixed with water, and drunk in cases of dysentery. There is another variety of this tree, called Kan-puc-yim, which has yellow flowers. The leaves of this tree are crushed in cold water and drunk to cure diarrhea.

22. *Calocarpum mammosum* (L.) Pierre, Chacal haaz (Maya), Mamey (Spanish). Standley, 379; Roys, 228.

The Mamey is a large, spreading tree with soft, flexible wood, thick bark, and white sap. The leaves are sometimes more than a foot in length. The fruit is borne on the tree throughout the entire year and is eaten raw or made into preserves. The seeds of this fruit are roasted and ground into powder which, when mixed with water, is given to a sufferer to stop vomiting. The Maya have a riddle concerning the fruit of the Mamey. "Guess, guess, if you can, boy. A black man is lying in blood." Answer: It is the Mamey fruit, the pulp of which is red, and the seed, black.

23. *Capsicum frutescens* L., Max-ic (Maya), Chile del monte (Spanish). Standley, 408; Roys, 264.

This species of chile, growing wild in Yucatan, has very small pods and is extremely "hot." It is used as a seasoning when the species called X-muc-ic is not available. Birds eat the seeds of this plant. Although it was used widely in colonial times for medicine (see Roys, 1931), modern yerbateros do not use it. It is common knowledge to both doctors and yerbateros that the root is highly poisonous, and it is said to be used sometimes for purposes of deliberate poisoning.

24. *Casearia nitida* (L.) Jacq., Ixim-che (Maya). Roys, 249.

This is a low, spreading tree, the fruit of which is eaten by birds. Its bark is scaly, and in the dry season the tree sheds its leaves. The wood is used in house construction. It is said that there are two kinds of Ixim-che, one with small leaves and another with large leaves. For bile disorders and diseases of the spleen, the Maya bathe in water in which Ixim-che leaves have been boiled.

25. *Casimiroa tetrameria* Millsp., Yuy (Maya). Standley, 306; Roys, 301.

This tree has a thick trunk and soft, light wood which is used especially when burning limekilns. Its green or yellow fruit is eaten by human beings, birds, and deer. Wild bees produce a very sweet honey from the nectar of its small, greenish flowers. The trees are usually hollow and bees commonly build their hives in them.

26. *Cassia emarginata* L., X-tu-ab or X-tu-habin (Maya), Barba de jolote (Spanish). Standley, 286; Roys, 287.

This medium-sized tree has hard wood, thick branches, oval-shaped leaves, and yellow flowers. The wood is used in the building of Maya houses. Medicinally, the leaves are shredded and inhaled by those having a nosebleed. This is believed to stop the hemorrhage.

26 a. *C. villosa* Mill., Box-zal-che (Maya). Standley, 288; Roys, 308.

The leaves of this tree are considered to be efficacious in the treatment of skin irritations and fungus growths. The treatment calls for toasting the leaves in hot ashes, crushing them in salt, and applying them to the affected area.

27. *Cecropia obtusa* Trécul, X-koch-lé (Maya), Hoja de higuierilla (Spanish). Standley, 244; Roys, 256.

This is a tree 5 to 10 meters high which grows in black soil. The leaves are broad and resemble those of a horse chestnut. One yerbatero prescribes grinding the leaves with salt and applying them to the white spots developed on the skin in Pinto disease. He says that the spots will disappear in 3 days. Another herb doctor boils the flowers with sugar and gives a dose of 2 teaspoonfuls of this concoction to patients with colds. Four applications are usually sufficient to break up a cold.

28. *Cedrela mexicana* M. Roem., Kulche (Maya), Cedro (Spanish). Standley, 310; Roys, 258. See plate 23, figure 1.

The Kulche is a large tree with thick bark and medium-hard wood which furnishes perhaps the most widely used lumber of Yucatan. Its numerous small white flowers expel a pungent odor. The sticky sap is used by the Maya as mucilage. The fruits open up when dry, and Maya children make toys of them. There are no leaves on the tree during the dry season. When the leaves appear in May, it is a signal for the Maya to plant corn. They tell that many trees begin to send forth their leaves with the first rains in March and April, but not the Cedro, for it does not put forth its leaves until the real rains begin.

29. *Ceiba aesculifolia* (HBK.) Britt. & Baker, Piim (Maya), Pochote (Spanish). Standley, 352; Roys, 276.

The trunk of this large tree bears conical spines. The cotton surrounding the seeds is used for making pillows. The Maya believe that as the cotton is blown about by wind at noon, it is set on fire by the hot sun, and that if this blazing cotton falls on a thatched house, the house will burn. The boiled young fruits are eaten as a vegetable; the roasted seeds are also eaten. It is said that the young shoots were eaten in ancient days as a "hard times" food. Maya mothers object to their baby boys playing with the fruits of the

Piim; they think it will make them effeminate and have large breasts. They have the same belief concerning the fruit of the Yaxche tree (29 a).

29 a. *C. pentandra* (L) Gaertn., Yaxche (Maya), Cibo (Spanish). Standley, 352; Roys, 298.

This tree is also known as the Kapok tree.

30. *Celtis iguanaea* (Jacq.) Sarg., Zidz-muc (Maya). Standley, 242; Roys, 311.

This vine has alternate branches which are covered with spines. Its flowers are white and its yellow fruits are eaten by man and birds. The juice of the plant is used for sore eyes, but too much of it aggravates the condition and even causes blindness. The leaves are boiled and the water is used as a bath to reduce fever.

31. *Cereus undatus* Haw., Chac-uob (Maya), Pitahaya roja (Spanish). Standley, 367; Roys, 232. See plate 23, figure 2.

This large, spiny vine bears edible red-skinned fruits in July and August. The vine is crushed, put into cold water, and used as a shampoo by the Maya. There are two varieties of this plant, one called Chac-uob and the other, Zac-uob. In checking the Maya spelling, the informant insisted that it should be spelled "uo" instead of "uob."

32. *Chlorophora tinctoria* (L.) Gaud., Kanklische (Maya), Mora (Spanish). Standley, 245.

In Yucatan this is a common tree, often bearing long spines. The strong, hard wood is customarily used for the pestles of chocolate mixers. The sap is applied to cotton and put into a decayed tooth to relieve toothache.

33. *Cissus rhombifolia* Vahl, X-tab-canil (Maya). Standley, 342; Roys, 281.

This is a large, woody vine with red or green flowers. The fruits are small, black berries. The vine is not tough like other lianas and is, therefore, not used in house construction. Occasionally, the medicine men use it to construct their tables for temporary ceremonies. Medicinally, the bark, crushed in water, is used to wash wounds and sores. When the wound is thoroughly clean, the crushed bark is applied.

34. *Citrus Aurantium* L., Zudz-pakal (Maya), Naranja (Spanish). Standley, 307; Roys, 273.

Like all citrus fruits, sour oranges are of Spanish importation. Although extremely sour and unappetizing, these fruits are sometimes eaten raw or are used in washing game meat and fowl to remove the game taste. The sour juice is used as vinegar.

34 a. *C. sinensis* Osbeck., Chuhuc-pakal (Maya), Naranja de China (Spanish), Standley, 308; Roys, 239.

From the flowers of this sweet orange a distillate is made which is used widely in Yucatan for flavoring refreshments. A refreshing beverage is also made from its leaves. Another citrus fruit called X-mek-pakal (Maya) has a unique flavor not unlike that of the tangerine. The fruit is rough-skinned, as if infected with disease.

35. *Clusia flava* Jacq., Chunup (Maya). Standley, 358; Roys, 240.

This large, hardwood tree is frequently found in Yucatan. It has large, thick leaves, yellow flowers, and fleshy fruit. It is useful as a shade tree. The Maya heat the leaves of the Chunup and apply them to a protruding navel.

36. *Coccoloba Schiedeana* Lindau, Bob or Bob-che (Maya). Standley, 253; Roys, 217.

This is a large, tall tree with thick leaves and white flowers. Its large leaves are used to wrap tortillas and the Spanish candy, Melcocha. Its fruit is eaten by birds. After the removal of the bark, the hard wood is used in house construction, particularly for the center beams.

37. *Colocasia esculenta* (L.) Schott., X-cucut-macal (Maya), Macalito (Spanish). Standley, 224.

This is an annual plant which is planted during the rainy season. It has very large leaves and an edible root, which is cooked and eaten with honey. The Maya believe that a man who owns setting hens must not eat this plant, for if he does the eggs will not hatch. However, if the hen itself is fed a peeled and cooked macal, the eggs will hatch.

38. *Corchorus siliquosus* L., Chichibe (Maya), Malva bisco (Spanish).

This plant has many seeds, and it ranges from 3 centimeters to 1 meter in height. Its small, pointed leaves are eaten by chickens, turkeys, and pigs. It is used by modern Maya to relieve the bite of a pic bug (*Triatoma dimidiata*). This plant, also called Xmichiyuc by some Maya, is not listed by either Roys or Standley.

39. *Cordia globosa* (Jacq.) HBK., Hau-che (Maya). Standley, 397; Roys, 244.

This shrub has a woody root, strongly scented white flowers, and red fruit. Because the leaves are utilized solely as a seasoning in the cooking of the armadillo to remove its peculiar, disagreeable smell and taste, the plant is called oregano uech, which is half Spanish and half Maya meaning, literally, "seasoning the armadillo."

40. *Crescentia Cujete* L., Luch and Huaz (Maya), Jicara (Spanish). Standley, 418; Roys, 262.

There are two varieties of this small tree, both of which have thick bark. One variety is called Luch and the other, Huaz. The former is the cultivated variety, which bears round fruits. The latter is the wild variety, bearing oval-shaped fruits whose pulp has a stronger odor than that of the Luch. Both varieties belong to the species *Cujete*. When cut in half, the gourd is called a jicara and is employed as a dish or bowl. The Maya believe that the Luch must be planted on the 24th of June for St. John the Baptist; if planted on any other day, the fruits will fall off. If the tree does not bear, the Maya beat the tree (this holds true for other fruit trees as well) with a bejuco, nine lashes, on the 24th of June; it must not be beaten any other time. The Maya also hang the heads of horses, the horns of cattle, and pigs' heads in the Luch tree to make it ashamed of itself for not bearing fruit.

41. *Croton humilis* L., Ic-aban (Maya). Standley, 321; Roys, 247.

This low, slender, aromatic shrub is commonly found in Yucatan. The natives say that it is a poisonous plant possessing such a strong scent that it causes the eyes to water. If cows or horses hit its branches with their heads, their eyes become sore, and they will be blind unless their eyes are washed with salt water. Ticks breed in its white flowers. It is used as a broom to sweep the fleas from Maya homes.

42. *Dalbergia glabra* (Mill.) Standl., Cibix (Maya). Standley, 293; Roys, 225.

This common vine has small, white flowers. The Maya use its strong and flexible bark as rope to bind together the heavy beams in their thatched houses and, instead of chains, to lift water containers from norias (wells). The roots are believed to have a beneficial effect in the treatment of dysentery.

43. *Diospyros cuneata* Standl., Silil (Maya). Standley, 377.

This tall tree grows chiefly in the southern part of Yucatan and its fruit is eaten by birds, particularly parrots. The wood is burned on the hearths and in limekilns. It is rarely used for house construction, as it disintegrates very rapidly.

44. *Diphyssa carthagenensis* Jacq., Dzudzuc (Maya). Standley, 294; Roys, 316.

This tall tree, which has light-yellow flowers, grows abundantly in the bush near Chichen Itza. It has been used consistently throughout Yucatan history for sores and open wounds, and independent statements from five Indian herb doctors stress the value of the sap of this tree in such cases today. One adds, "Nine drops of the raw juice from the leaves of this plant when taken in a small amount

of water are good for red dysentery." Another says that five or six applications of the sap of this tree will cure the chiclero ulcer.

45. *Ditaxis tinctoria* (Millsp.) Pax & Hoffm., Pixton ojo (Maya). Standley, 323.

The Maya boil the leaves of this small herb and in the resulting water they bathe their babies who are believed to have been bewitched by the "evil eye" of a drunken person. This plant is especially efficacious on Mondays and Fridays. Babies who have just been weaned are also bathed in such water.

46. *Dorstenia Contrajerva* L., X-cambalhau (Maya), Contrayerva (Spanish). Standley, 245; Roys, 222. See plate 23, figure 3.

This small perennial plant has large, deeply lobed leaves and grows abundantly in sahcab holes (limestone pits) around Chichen Itza. It has been used consistently over a long period to alleviate disorders of the alimentary canal, especially the stomach, and may be bought as a root or extract in the Merida drug stores. In early times X-cambalhau was prescribed for a great variety of ailments, including colds, pain in the heart, insect bites, diarrhea, dysentery, indigestion, childbirth, irregular menses, blood-vomit, liver complaint, sores, gout, tumors, skin diseases, and infected gums (Roys, 1931, p. 222). Today the plant is known to modern doctors in Merida as an antidote for all poisons and is employed as a stimulant tonic and diaphoretic in fevers, dysentery, diarrhea, and indigestion. Among the herb doctors the plant is used chiefly to cure digestive disorders and to treat poisonous snake bites. For digestive disorders the root is generally cooked with sugar or honey and the concoction taken by the spoonful. Sometimes the root is toasted and then ground into a powder and mixed with pozole or coffee.

47. *Ehretia tinifolia* L., Bec (Maya), Sancó (Spanish). Standley, 397; Roys, 217.

This very large, hardwood tree, known commonly by the Spanish name Roble as well as by those given above, is common in Yucatan forests and grows profusely in white soil (sahcab). It has thick bark, and its wood is sometimes used to make furniture—benches and tortilla tables. The Maya say that the wood must be cut by the full moon to prevent its decaying. During the entire dry season some leaves remain on this tree. Orange shoots may be grafted onto the trunk of the Bec with success. For pyorrhoea the leaves of the Bec tree are cooked and the liquid used as a mouth wash. The treatment calls for three or four applications a day. Baths for sores and wounds are prepared by boiling the leaves of this tree. The fruits are eaten by birds and mammals.

48. *Elytraria squamosa* (Jacq.) Lindau., X-cabal-xaan (Maya). Standley, 423; Roys, 221.

This small, common weed has short, leafy stems and purple spike flowers. It is called X-cabal-xaan because it resembles a small palm tree. The Maya say that a whole plant boiled in a half quart of water is given to women suffering from venereal diseases.

49. *Erythroxylon brevipes* DC., Ici-che (Maya). Standley, 304.

This is a small, spreading tree which has tiny, white flowers and beanlike fruits with black seeds. The hard wood is used widely in house construction for the roof poles which support the thatch.

50. *Eupatorium odoratum* L., Tok-aban (Maya). Standley, 444; Roys, 286.

This is a rather uncommon shrub in the vicinity of Chichen Itza. In colonial times it was used in the treatment of gonorrhoea and malaria. One modern herb doctor uses a decoction of the leaves in cases of stomach ache and kidney trouble. Another uses the root boiled in salt water as a purgative, and two others emphasize the value of the cooked leaves in the treatment of kidney trouble.

51. *Euphorbia hirta* L., Xanab-mucuy (Maya), Yerba de pollo (Spanish). Standley, 325; Roys, 293. See plate 23, figure 4.

This small, common weed, also known as Golondrina in Spanish, spreads over the ground along the roadsides in Yucatan. Its leaves are small and the light-red stems contain a milky sap. It has been used consistently from colonial times to the present to alleviate sore eyes. Four of the six modern herb doctors consulted stated that they use the juice of this plant to reduce inflammation of the eyes. One added that the boiled leaves are used in cases of dysentery and still another said that three or four of the plants should be boiled and the liquid drunk as a diuretic for bladder and kidney trouble, adding that this liquid dissolves "the sand in the kidneys."

52. *Ficus cotinifolia* HBK., X-Copó (Maya), Alamo (Spanish). Standley, 245; Roys, 226. See plate 24, figure 1.

This is a very large tree with aerial roots (see pl. 24, fig. 1). It is one of the first trees to appear on dirt-covered stone ruins in Yucatan and its spreading roots, after taking hold in the ground, soon cover the entire mounds. The milky sap contained in the branches is said to be good for healing cuts and bruises.

53. *Gliricidia sepium* (Jacq.) Steud., Zac-yab (Maya), Madre de cacao (Spanish). Standley, 295; Roys, 307.

This tree is commonly found in Yucatan. It has showy, pinkish flowers and extremely hard wood which is used for many purposes, especially for the corner posts of Maya houses. The Maya relate that the wood is so hard that axes are often broken when used to cut down these trees.

54. *Guettarda elliptica* Sw., Cib-che (Maya), Arbol sabroso (Spanish). Standley, 249.

Cib-che is a small tree which was employed in colonial times (Roys, 1931, p. 224) as an antidote for spider and snake bites and to alleviate cases of dysentery. Today it is no longer used medicinally, according to the four yerbateros consulted. Another tree, *Myrica mexicana*, or wax tree, is also known as Cib-che and is listed as such by Roys (1931, p. 224).

54 a. *G. Combsii* Urban, X-tez-lob (Maya). Standley, 429.

This tree does not attain a great circumference but it does grow tall. It has broad, rough leaves and a very thin bark. It is used in the construction of houses, especially for the slanting poles which support the thatched roof.

55. *Hamelia patens* Jacq., X-kanan (Maya). Standley, 429; Roys, 250.

This small tree has red, acid fruits which are sometimes eaten by man. The leaves are toasted over a fire, crushed, and applied to hands having blisters. This is believed to harden the blisters. The treatment is also used for sores, wounds, and cases of eczema.

56. *Helicteres baruensis* Jacq., Zutup (Maya). Standley, 355; Roys, 313.

This shrub is about 2 meters high and bears red flowers. Its hard and woody fruit is spiral in shape. If a Maya child is slow in learning to talk, the fruit is twisted over the baby's tongue, after which the Maya say that the baby soon will begin to talk. This method was used on the brother of the author's informant. It is said that this boy did not learn to talk until he was 5 years old, however.

57. *Indigofera suffruticosa* Mill., Choh (Maya), Añil (Spanish), Indigo (English). Standley, 296; Roys, 238.

The Choh is a common weed with a stiff, gray stem and dark blue-green leaves. The fruits hang from the stem in short pods in clusters of 12 to 15. Indigo was formerly made from the plant and extensively cultivated for exportation, but this practice has been discontinued. The bluing extracted from the small oval leaves was used as a bleaching agent. The Maya sometimes used this material to make blue marks on the foreheads of children suffering from stomach trouble caused by an "evil eye."

58. *Ipomoea Nil* (L.) Roth., Tzotz Kabil (Maya). Standley, 391.

This greenish-yellow vine is thin and hairy and has blue, pink, or purple flowers. It causes much trouble in the milpas. It is gathered like Ramon, *Brosimum Alicastrum* Sw., for horse feed.

58 a. *I. Batatas* (L.) Lam., Iz (Maya), Camote (Spanish), Sweetpotato (English). Standley, 390; Roys, 249.

The sweetpotato is not widely cultivated by the Maya. The leaves of the vine are said to be used in the treatment of snake bites.

59. *Jatropha aconitifolia* Mill., Chay (Maya), Chaya (Spanish). Standley, 328; Roys, 234.

The Chay is a small tree or shrub with soft wood, thick, soft bark, and milky sap. It bears white flowers. The green leaves, which are armed with nettles, are boiled with salt and eaten by the Maya as we eat spinach. The sap is used as mucilage. It is also said to be used in the treatment of urinary diseases. The Maya believe in evil spirits called Uays. For example, Uay Uacax is an evil spirit which takes the form of a cow, and Uay Keken is an evil spirit in the form of a pig. For a sheep, it is Uay Taman; for a goat, Uay Chivo. To beat these Uays, the Maya use the branch of a Chay bush. They believe that the more you beat with it, the stiffer the Chay becomes. They have also a snake called Chay Can which is thought to eat the leaves of the Chay bush. This snake is said to have two tails and is thought to pursue nursing women. The Maya say that this snake sucks the breasts of the women, and while doing so, inserts the two tails into the nostrils of the woman, causing her death.

59 a. *J. Gaumeri* Greenm., X-pomol-che (Maya), Piñon (Spanish). Standley, 329; Roys, 278.

This shrub, which grows 2 or 3 meters high, is very common in the dry forests of Yucatan. It has soft, thick bark, very milky stems, and large leaves. The hollow stems are used by children for blowing soap bubbles, and the branches are used for making whistles. The herb doctors use the ground root of the plant in the treatment of snake bites. The water in which the leaves of the plant have been boiled is said to reduce malarial fever.

60. *Krugiodendron ferreum* (Vahl) Urban, Chim-tok (Maya). Standley, 341; Roys, 237.

This is a tall tree, known only in Yucatan (Standley, 1930, p. 342). Its hard wood is used in house construction. Because of the hardness of the wood the milperos, when cutting their fields, often leave the Chim-tok standing. The bark and roots have been used in Yucatan from colonial times to the present as a mouthwash for toothache and gum trouble. One yerbatero adds that the roots of this tree can be boiled and the liquid drunk as a purgative. He warns, however, that while using this medicine, the patient should not eat chile, pork, or any form of lard.

61. *Lagenaria siceraria* (Molina) Standl., Lec (Maya). Standley, 435; Roys, 261.

This large vine, a cultivated plant of Yucatan, is planted annually in May and is not to be found in the dry season. Its large leaves have a disagreeable smell. It has showy, white flowers, and dry, hard, fruitlike gourds. These gourds are used by the Maya as dippers. Medicinally, the leaves are applied to stomachs of babies with diarrhea.

62. *Lasiacis ruscifolia* (HBK.) Hitchc., Zit (Maya). Standley, 204; Roys, 310.

The Maya refer to this coarse, woody shrub with grasslike leaves as Zit. Standley and Roys list it as Mehen Zit. The fruits are like small bullets. The stems are knitted into carpets by Maya women. The hollow reeds are used as whistles by Maya boys and also for sucking up water from a low haltun (shallow water hole).

63. *Leucaena glauca* (L.) Benth., Uaxim (Maya). Standley, 278. See plate 24, figure 2.

This tree is found frequently in Yucatan growing in black soil. It grows rapidly and has white flowers and lacelike leaves. It is said by the Maya that when horses eat the leaves of the tree, the hairs of their tails fall out. Don Juan Martinez, an eminent Maya scholar, said that all Maya people believe this to be true, although there is no scientific proof to substantiate the belief. He adds that they are as convinced of this as they are that a guava tree will grow where an apple seed is planted. The Maya do not burn the wood of the Uaxim tree in their fires, because the Maya women use wood ashes to soften water, and ashes from the Uaxim tree mixed with water are very irritating to the skin.

64. *Lonchocarpus longistylus* Pittier, Balche (Maya). Standley, 296; Roys, 216.

This is a rather large hardwood tree having purplish flowers. Much has been written about the intoxicating drink, Balche, made from the bark of the tree (Standley, 1930, pp. 296-297; Roys, 1931, p. 216). The Maya have various mythological beliefs concerning the tree; e. g., they believe that if a man has setting hens he must not drink Balche, for then the eggs would not hatch, the chicks dying in their shells.

65. *Lucuma hypoglauca* Standl., Chooch (Maya), Zapote blanco (Spanish). Standley, 380; Roys, 238.

This medium-sized tree has large leaves and fruit with a thick, hard, brownish-green husk. Its acid pulp has a pleasant flavor. Concerning the fruit of the Zapote blanco, an informant says that when ripe it is not edible, because it has fermented. However, just before it is ripe, the Maya will pound it and roll it in hot wood ashes, saying each time until it becomes soft:

Ocen takan
Hoken Cheche
Ocen takan
Hoken Cheche.

Then it is broken and eaten and is said to be delicious. The meaning of the first Maya phrase, "Ocen takan," is "Go out, greenness," or "Come into maturity." "Hoken Cheche" means, "Ripen, please."

and don't stay green any more." The Maya believe that the words make the fruits edible.

66. *Malmea depressa* (Baill.) Fries., Box elemuy (Maya).

Medium in size, this hardwood tree has thick bark and medium-sized leaves. The wood is used in house construction and for ax handles. Medicinally, the root is cooked with corn silk and the water drunk by those suffering from gonorrhoea. It is also drunk to alleviate kidney and bladder trouble. Neither Standley nor Roys lists this plant under either the common or scientific name.

67. *Metastelma Schlechtendalii* Dcne., Chimes ak (Maya). Standley, 389.

This slender vine, with its whitish flowers, is frequently found in Yucatan. The root is boiled and the liquid used to rinse the mouth in case of canker sores. The rinse may be repeated several times, but one must not swallow the liquid.

68. *Metopium Brownei* (Jacq.) Urban, Box chechem (Maya), Palo de rosa (Spanish). Standley, 334; Roys, 234.

This is a large tree which has hard wood and small, round leaves. Its flowers are white, its fruits purple. Bees produce black-combed honey from the flowers. The wood is poisonous when in contact with the skin. To counteract this poisonous action, urine is applied to the skin. In addition to this use of urine, the Maya use it in the following ways: (1) Maya people often put urine in their bath water to stave off a cold. (2) If the placenta is not forthcoming when a Maya woman is in labor, she is given a cupful of urine (generally from the father). When the woman coughs or tends to vomit because of the urine, she expels the placenta with the same force. (3) Fever patients are washed with urine to cool their brows. (4) When making poultices of leaves and plants, urine is often used as a solvent. (5) If children have earache, urine is poured into the ears and it is said to cause immediate relief. The urine of small boys is said to be most effective.

69. *Mimosa hemiendyta* Rose & Robinson, Zac-catzim (Maya), Pepinillo blanco (Spanish). Standley, 279; Roys, 303.

This tree, which grows about 3 to 5 meters high, has pink flowers, small leaves, and trunk and branches armed with short spines. The hard wood is used in Yucatan for the corner posts of thatched houses. This plant was used in colonial times to cure coughs and colds. (Roys, 1931, p. 303). Today the yerbateros use it in the same manner. One says that the bark of this tree is boiled with salt and the liquid drunk at night for coughs and colds. He adds that the other species, Box-catzim (69 a), can also be used but that it is less effective.

Another yerbatero adds that it is just as effective for a patient with a cold to chew the bark.

69 a. An unidentified species of *Mimosa* is called locally Boxcatzim (Standley, 1930, p. 279). The dry limbs of this tree are always used for starting milpa fires and as torches by the Maya when traveling over a trail at night. The wood is used in house construction and for making husking pins at corn harvesting time. It also produces good charcoal.

70. *Morinda yucatanensis* Greenm., X-hoyoc (Maya), Piñuela (Spanish). Standley, 430; Roys, 245.

X-hoyoc is a slender vinelike shrub with small leaves and white flowers which grows in the bushlands of Yucatan. Its fruits are eaten by chachalacas (birds like pheasants). The fruit, although spherical, is divided into many segments. It has the appearance of sore eyes, according to the Maya. The Maya call granulated eyelids "X-hoyoc," and the juice of this plant is used for its treatment.

71. *Musa sapientum* L., Haaz (Maya), Guineo (Spanish), Banana (English). Standley, 235; Roys, 244.

The banana tree was probably brought to Mexico shortly after the arrival of the Spaniards. There are at least five varieties to be found in Yucatan. Their names in Spanish are Blanco, Morado, Manzano, Barbaro, and Curro. The fruits are generally smaller than those grown in the West Indies.

72. *Neomillspaughia emarginata* (Gross) Blake., Zac-itza (Maya). Standley, 254; Roys, 304.

In the brushlands and low forests of Yucatan this is a common tree with large and tough leaves. Its white flowers, from which bees make honey, grow in clusters. The straight-grained wood is used for the handles of the Maya machetes and for parts of the looms on which cotton cloth and sabucans are woven. However, its extensive root system causes a great deal of trouble in the milpas. The leaves are boiled and the liquid drunk for coughs and colds.

73. *Ocimum micranthum* Willd., X-cacal-tun (Maya), Albahaca (Spanish). Standley, 406; Roys, 221.

This small, annual weed is aromatic and very common in Yucatan. It has a tiny stem and branches, and small, white flowers. The curly whitish leaves are rubbed on horses to prevent the bites of horseflies. The Maya plant this weed near graves and also put it in a flowerpot and on the altar of the church. The whole plant is boiled and the liquid drunk to cure cases of dysentery.

74. *Persea americana* Mill., On (Maya), Aguacate (Spanish), Avocado, or alligator pear (English). Standley, 269; Roys, 271.

This tall tree, a native of Central America, is used especially for its fruit. It has soft wood and oval, fragrant leaves and grows wild in the dry cenotes (water holes) or in cultivated gardens. In Yucatan

it flowers in March, and the edible fruit ripens in August. In case of fever, fresh leaves from this tree are applied to the feet of the patient. Very young and tender leaves may be boiled with sugar and the liquid used as a cough medicine.

75. *Petrea arborea* HBK., Opp-tzimin (Maya), Bejuco de caballo (Spanish).

This vine has rough, thick, sandpaperlike leaves and purple-blue flowers in clusters. These flowers are very attractive for ornamentation. Horses feed on the plant.

76. *Phaseolus vulgaris* L., Buul (Maya), Frijol (Spanish). Standley, 300; Roys, 218.

There are several varieties of beans in Yucatan. The Buul, or common black bean, is used extensively for food, as is another small black bean, called X-pelon in Maya.

76 a. *P. lunatus* L., Ib (Maya), Frijol (Spanish), Lima bean (English). Standley, 300; Roys, 247.

The lima bean grows both wild and cultivated in Yucatan. The Maya believe that the pods of the Ib are poisonous to pigs. A variety called Ib ceh has brown seeds. The Maya say that a disease called X-cel imil which affects only women and begins in the breast, causing first pain followed by chills and fever, can be stopped in 2 or 3 days by applying Ib ceh leaves to the breasts. If this plant is not found and used, pus soon develops and a severe illness ensues. The pain is said to resemble that caused by the bite of a tiger ant.

77. *Phyllanthus glaucescens* HBK., Ppix-thon (Maya). Standley, 332; Roys, 276.

This shrub, called Ppix-thon-ojo by the Maya of Piste, bears round fruits with hard shells and has large, oval leaves. The Maya believe that the plant is efficacious, especially on Mondays and Fridays, for bathing babies who have diarrhea. They recommend it as a curative for illnesses caused by evil eyes. When a Maya child is weaned, it is given a ceremonial bath in the liquid from the boiled leaves. The Maya children make a plaything of the fruit. The leaves are cooked and used as a bath in cases of pellagra.

78. *Phytolacca icosandra* L., X-tel-cox (Maya). Standley, 262; Roys, 284.

This is a large, juicy herb with a thick root and purple berries. It has big leaves and light-pink flowers. The fruits of the plant are boiled and the resulting liquid is drunk to cure smallpox. The informant related that this medicine caused the pox to "break out," for if it remained "inside," the patient died. The raw leaves of this plant are crushed and rubbed on pimples and sores.

79. *Piscidia communis* (Blake) Harms., Habin (Maya). Standley, 301; Roys, 242.

In the dry forests of Yucatan this tree is commonly found. Its large, fragrant, pinkish flowers grow in clusters, and its hard brown-

colored wood is very durable, making it excellent for the construction of doorframes, railway sleepers, corner posts of Maya houses, and corner floors. It is very attractive when inlaid with cedar and other softwoods. The bark is cut off the tree and shaped to hold the Maya jicaras. To cure coughs and colds, a cough syrup is made by boiling nine tender leaves with sugar.

80. *Pisonia aculeata* L., Beeb (Maya), Uña de gato (Spanish). Standley, 261; Roys, 217.

Common in the thickets of Yucatan, this shrub or thick-stemmed vine has long and drooping branches which are armed with stout spines. The wood is soft. The club-shaped fruits and the white flowers secrete an exceedingly sticky substance. Modern herb doctors recommend that the root of the shrub be ground to a powder and mixed with that of *Hybanthus yucatanensis* (Zac-bacal can) for local application in cases of snake bites. Small plants are boiled and malaria patients bathe in the resulting liquid to reduce their fever. A use for Beeb branches is to place them over the open parts of chicken coops so that bats become entangled in the thorns, which are so strong and peculiarly hooked that the Maya also use them to retrieve buckets that have fallen into wells.

81. *Plantago major* L., Yanten (Maya), Llanten (Spanish). Standley, 425; Roys, 298.

This is a perennial herb with small, green flowers and large, thick, leathery leaves. The young leaves are boiled and the liquid used as a medicine for diarrhea. It is considered an excellent medicine for babies.

82. *Pleiotoma diversifolium* (HBK.) Bur. & Schum., Ne-maax (Maya), Rabo de mico (Spanish). Standley, 398; Roys, 269.

The Maya use the term "Ne-maax" for two plants—*P. diversifolium* and *Heliotropium angiospermum* Murr. The plant called Ne-maax in this description refers to *P. diversifolium*. It has wrinkled leaves, and its long spine of fruit resembles a monkey's tail—hence its name Ne-maax. According to one herb doctor, the leaves of this plant are boiled with honey and the liquid taken four times a day by women to stop premature labor in childbirth. According to three other yerbateros, it is said to alleviate dysentery. Still another herb doctor uses this liquid as an enema.

83. *Pluchea odorata* (L.) Cass., Chal-che (Maya), Santa Maria (Spanish). Standley, 451; Roys, 233.

This is a tree or shrub which grows about 5 meters high in the region of Chichen Itza. It grows in towns and rarely in the dense bush. Its flowers are pink and appear in clusters; its fruits hang in bunches; its large leaves are aromatic. It has been used consistently for aches and pains, for complaints of the womb, and to

regulate the menstrual flow. The six yerbateros consulted regarding the medicinal uses of this tree are from various parts of Yucatan, and since their prescriptions are so varied they all are given below, along with the names of the yerbateros and their locations in Yucatan.

Benito Cauich (Piste)—The leaves of the Chal-che and the leaves of the sour orange are cooked together with honey. This concoction is used as a tonic, for an aching chest and stomach, and to regulate menstrual periods in women. The prescription calls for 1 tablespoonful every hour. When using this medicine the diet also must be regulated; for example, no pork, lard, or cold water may be used; beef is permissible.

Marcelino Cante (Pencuyut)—The leaves and branches of this tree are cooked, and an individual who is troubled with twitching muscles is told to bathe in this water for relief. This twitching of the muscles is thought to be caused by evil winds of the woods.

Louis Zapata (Chapab)—About an ounce of the leaves of this plant are cooked with some honey and given in three doses to women suffering from amenorrhea.

Epifanio Ceme (Chan Kom)—For bad cases of rheumatism the leaves of this tree are warmed and applied to the legs, and then wrapped on securely with cloths.

Martiniano Dzib (Piste)—The leaves of this tree are boiled, and the water is used to give the Maya woman her first bath after childbirth. Sometimes the leaves of the sour-orange tree are also used.

Pedro Castillo (Dzitas)—The leaves are used for relieving fever by covering them with tallow which has been mixed with ground coffee and binding them tightly over the soles of the feet. A decoction of the boiled leaves is given to women in labor.

84. *Plumeria alba* L., Zac-nicte (Maya), Flor de Mayo blanco (Spanish). Standley, 383; Roys, 306. See plate 24, figure 3.

This medium-sized tree, extensively cultivated in Yucatan, has soft wood and white sap. It has grayish-white bark, large leaves, and brilliant white or red flowers in bunches. The Maya believe that the Uay, or witches, use these flowers in their ceremonies. The sap of the red-flowered tree is used to reduce swellings.

85. *Portulaca oleracea* L., Xucul (Maya), Verdolaga (Spanish), Pusley (English). Standley, 263; Roys, 296.

This common, low-spreading weed has tiny, yellow flowers and small, oval leaves. Since chickens, turkeys, and pigs eat it, the pusley is sold in the Merida market for them. One modern herb doctor says that a decoction of this plant is an efficacious remedy for worms.

86. *Psidium Sartorianum* (Berg) Niedenzu., Pichi-che (Maya). Standley, 373; Roys, 276.

The Pichi-che is a tall tree nearly 20 meters high frequently found near Chichen Itza, and it is not to be confused with the Pichi or guava (see No. 87). It has smooth, gray bark and juicy red or greenish-yellow fruit which has a spicy flavor. The fruits are small and not edible for man but are eaten by the wild pig. The hard wood is used for the poles of Maya houses and for machete handles. There

have been no consistent medicinal uses for this plant. In colonial times, "The leaves [were] boiled and the decoction given for epilepsy or employed as a bath. The toasted leaves [were] squeezed into the ear to cure earache" (Roys, 1931, p. 276). Today two herb doctors prescribe a decoction of the leaves as a bath for pimples and skin eruptions. Another uses the decoction as a bath for relieving night sweats. One herb doctor says that the roots are cooked and the liquid is drunk by those suffering from dysentery.

87. *Psidium Guajava* L., Pichi (Maya), Guayaba (Spanish). Standley, 373; Roys, 276.

The Pichi, one of the most common fruit trees of tropical America, grows to be 5 to 7 meters high and has hard wood and smooth, shiny bark of medium thickness. It bears white flowers. There is also a wild guava tree which the Maya use for house construction. The leaves of this variety are placed in bath water and are said to induce perspiration. A further use for the water is to soothe skin irritations.

88. *Psychotria microdon* (DC.) Urban, Bacelac (Maya). Standley, 430.

This is a stout shrub bearing long, greenish-white flowers. The leaves are boiled and the water is used for bathing babies having diarrhea.

89. *Rauwolfia heterophylla* Roem. & Schult., Cabal-muc (Maya). Standley, 385; Roys, 220.

This plant is also known as X-cambal-muc. It is a common low shrub about 1 meter high, containing a milky sap and bearing white odorous flowers from which bees gather nectar to make honey. The fruits are nearly black at maturity. The bark is used by tobacco farmers to give odor and color to tobacco. In Yucatan the juice of this plant has been used consistently since the colonial period in the treatment of sore eyes. Care must be taken, however, that only a small amount be used, for too much causes blindness. The directions call for only one application a day. One yerbatero adds that the root of this shrub is ground to a powder and applied to open wounds in which fly maggots have already appeared.

90. *Ricinus communis* L., X-koch (Maya), Higuerilla (Spanish), Castor-bean (English). Standley, 332; Roys, 255.

This soft-stemmed herb, very common in Yucatan, produces the castor-bean from which castor oil is made. It has large, slender leaves and reddish beans. Oil from the seeds is used as a purgative. To prepare castor oil, the natives roast the beans in the husk and then shell the beans and grind them. This material is boiled and the oil which rises to the surface is skimmed off and used. When a woman desires to stop her flow of milk in weaning her baby, she selects 13 small twigs of the X-koch tree and ties them about her neck.

91. *Ruellia tuberosa* L., X-cabal-yaxnic (Maya), Yerba de la calentura (Spanish). Standley, 425; Roys, 221.

This is a perennial herb with small, blue flowers and opposite leaves. The leaves are boiled and the liquid is drunk for chronic chest colds, called Postemas. Maya mothers, when annoyed by their children, say, "Hach postema ech," which means, "You are just a chest cold."

92. *Sesamum orientale* L., Zicil-puuz (Maya), Ajonjoli (Spanish). Standley, 416; Roys, 309.

This plant, a native of the East Indies, has white or pink flowers. The seeds, which are very tiny, round, and flat, are used to thicken broth and for sweetmeats. One of the rich Maya dishes, papa-Dzul, is prepared with these seeds. Mexicans also prepare a rich dish called mole with the seeds. The seeds are ground, mixed with masa, and given to nursing mothers to increase their milk flow. The seeds of the Ramon tree (Ox in Maya and *Brosimum Alicastrum* Sw., scientifically) are used more extensively for this purpose.

93. *Smilax mexicana* Griseb., X-co-ceh (Maya), Zarpaparilla (Spanish). Standley, 229; Roys, 225.

This thorny vine is common in the Yucatan bush. It has a hard, thorny stem and long, flexible, thorny leaves; the small flowers are purplish brown; the fruit is a black berry. From this plant the Maya make the crown of thorns for the figures of Christ which are found in some of the churches.

94. *Spondias purpurea* L., Abal-ac (Maya), Ciruela (Spanish). Standley, 335; Roys, 213, See plate 24, figure 4.

The Abal is a small, very common tree with few thick branches. Its red or purple flowers produce small red or green fruits, varied in size and shape, which ripen in April and resemble plums. When eaten raw, they remind one of preserved green olives because of their size and large seeds. The plums are boiled with meat in stews. There are several varieties of the Abal, for example: hantunil abal, Campech abal, Tuxpana abal, Zabac abal, Tuxile and Houen abal. Our slang expression for a beautiful girl is "peach." In Maya, the people say, "Bey chiabale," which implies, "She's very pretty—nice, fat, and smooth."

95. *Thouinia paucidentata* Radlk., Kan-chunup (Maya). Standley, 340; Roys, 251.

This is a tall tree which, according to Standley, is endemic in the Yucatan Peninsula. Its hard wood is used in the construction of Maya houses. The bees make very sweet honey from the nectar of its whitish flowers. The Maya believe that the tree contains a charm against bad or evil winds. A modern yerbatero recommends boiling its bark for treating snake bites. For a severe cough, the bark of this tree is boiled in salt water and a half cup of the liquid drunk

at night. The leaves of the chunup are also used for healing the chiclero ulcer, or the sap may be applied directly to the wound.

96. *Tragia yucatanensis* Millsp., Ppoppox (Maya), Ortiguilla (Spanish). Standley, 333; Roys, 278.

This is a climbing vine with small leaves. The stems are armed with nettles. The Maya formerly used this plant to whip their children when they were naughty, especially if they were inclined to run away from home. Rubbing the leaf on an aching part of the body causes an irritation which feels good. The boiled roots are said to be used in the treatment of gonorrhoea. The roots are boiled and the water is drunk to relieve stomach ache.

97. *Urera caracasana* (Jacq.) Griseb., Laal (Maya), Ortiga de caballo (Spanish). Standley, 248; Roys, 261.

This shrub, frequently found in Yucatan, is covered with nettles. Its green flowers produce small, red fruits. The plant is used widely for medicinal purposes. The roots are boiled with honey and the liquid is used for stomach ache and as a vermicide. The leaves are also boiled and crushed for their juice, which is mixed with the juice of 9 or 13 oranges. The mixture is then heated and the resulting concoction given to babies with diarrhoea. The leaves, wrapped in a cloth and tied on the head, are said to be good for headache.

98. *Viguiera dentata* (Cav.) Spreng. var. *helianthoides* (BHK.) Blake, Tah (Maya), Romerillo de la costa (Spanish). Standley, 455; Roys, 281.

This common weed is tall and branching. The stems are used for sky rockets, and in Pencuyut they are used to make corn bins by tying the stems together in the form of a mat.

99. *Zea mays* L., Ixim (Maya), Maize (Spanish), Corn (English). Standley, 210; Roys, 249.

In Yucatan, maize grows tall, sometimes as high as 5 meters, and often produces two or three small ears on each stalk. The kernels are rather soft and generally white or yellow in color. The Maya cultivate maize by a method known as "milpa culture," which consists of cutting and burning the bush and planting the maize in the unplowed field. The corn plot is used for only 2 or 3 years, after which it is allowed to revert to the bush and a new area is selected. Maize is the chief source of food of the Maya, comprising 75 to 85 percent of their diet. They hold maize in very high esteem, calling the growing corn "Chichpan gracia," which may be translated as "beautiful grace" or more freely "beautiful gift." They believe that if one is not careful about preserving loose kernels of corn, one will soon come to misery.

100. *Zuelania guidonia* (Swartz) Britt. & Millsp., Tamay (Maya), Volador (Spanish). Standley, 362.

The Tamay is a tall tree with thick bark and large pointed leaves. It bears small, greenish-white flowers in dense clusters, and its berry-

like, fleshy fruit is edible. The fruits are roasted before being eaten. Its wood is used in house construction. One herb doctor said that the leaves of this tree are boiled with the leaves of the X-taben-tun tree and the water is used as a bath to reduce fevers.

ALPHABETICAL LIST OF MAYA NAMES OF PLANTS IN THIS STUDY

Maya name	Scientific name	Plant No.
Abal-ac	<i>Spondias purpurea</i> L.	94
Akab-xiu	<i>Blechnum pyramidatum</i> (Lam.) Urban	13
Ak Xux	<i>Adenocalymna fissum</i> Loes	6
Bacal-che	<i>Bourreria pulchra</i> Millsp	15
Bacelac	<i>Psychotria microdon</i> (DC.) Urban	88
Balche	<i>Lonchocarpus longistylus</i> Pittier	64
Beeb	<i>Pisonia aculeata</i> L.	80
Beec	<i>Ehretia tinifolia</i> L.	47
Beznic-che	<i>Alvaradoa amorphoides</i> Liebm	8
Bob or Bob-che	<i>Coccoloba Schiedeana</i> Lindau	36
Box-catzim	<i>Mimosa</i> sp.?	69 a
Box chechem	<i>Metopium Brownei</i> (Jacq.) Urban	68
Box elemuy	<i>Malmca depressa</i> (Baill.) Fries	66
Box-zal-che	<i>Cassia villosa</i> Mill	26 a
Buul	<i>Phaseolus vulgaris</i> L.	76
Cabal-muc	<i>Rauwolfia heterophylla</i> Roem. & Schult	89
X-cabal-yaxnic	<i>Ruellia tuberosa</i> L.	91
X-cacal-tun	<i>Ocimum micranthum</i> Willd.	73
X-cambalhau	<i>Dorstenia Contrajerva</i> L.	46
X-cabal-xaan	<i>Elytraria squamosa</i> (Jacq.) Lindau	48
Chacah	<i>Bursera Simaruba</i> (L.) Sarg	18
Chacal haaz	<i>Calocarpum mammosum</i> (L.) Pierre	22
Chac-cancel Xiu	<i>Blepharodon mucronatum</i> (Schl.) Dene	See 14
Chac-dzulub-tok	<i>Bauhinia unguolata</i> L.	10
Chacté	<i>Caesalpinia platyloba</i> Wats	20 a
Chac-uob	<i>Cereus undatus</i> Haw	31
Chac zinkin	<i>Caesalpinia pulcherrima</i> (L.) Swartz	20
Chal-che	<i>Pluchea odorata</i> (L.) Cass	83
Chay	<i>Jatropha aconitifolia</i> Mill	59
Chichibe	<i>Corchorus siliquosus</i> L.	38
Chimay	<i>Acacia Milleriana</i> Standl	3 a
Chimes ak	<i>Metastelma Schlechtendalii</i> Dene	67
Chim-tok	<i>Krugiodendron ferreum</i> (Vahl) Urban	60
Choh	<i>Indigofera suffruticosa</i> Mill	57
Chom	<i>Bromelia Karatas</i> L.	16
Chooch	<i>Lucuma hypoglauca</i> Standl	65
Chuhuc-pakal	<i>Citrus sinensis</i> Osbeck	34 a
Chunup	<i>Clusia flava</i> Jacq	35
Cib-che	<i>Guettarda elliptica</i> Swartz	54
	<i>Myrica mexicana</i>	See 54
Cibix	<i>Dalbergia glabra</i> (Mill.) Standl.	42
X-co-ceh	<i>Smilax mexicana</i> Griseb	93
X-Copó	<i>Ficus cotinifolia</i> HBK.	52
X-cucut-macal	<i>Colocasia esculenta</i> (L.) Schott	37

ALPHABETICAL LIST OF MAYA NAMES OF PLANTS IN THIS STUDY—Continued

Maya name	Scientific name	Plant No.
Dzalmuy	<i>Annona squamosa</i> L.	9 a
Dzudzuc	<i>Diphysa carthagenensis</i> Jacq.	44
Ek-kixil-ak	<i>Bignonia unguis-cati</i> L.	11
Haaz	<i>Musa sapientum</i> L.	71
Habin	<i>Piscidia communis</i> (Blake) Harms	79
Hau-che	<i>Cordia globosa</i> (Jacq.) HBK.	39
X-hoyoc	<i>Morinda yucatanensis</i> Greenm.	70
Huaz	<i>Crescentia Cujete</i> L.	40
Hunpedz-kin-ci	<i>Aloe vera</i> L.	7
Ib	<i>Phaseolus lunatus</i> L.	76 a
Ib cch	<i>Phaseolus lunatus</i> L., variety	See 76 a
Ic-aban	<i>Croton humilis</i> L.	41
Ici-che	<i>Erythroxyton brevipes</i> DC.	49
Ixim	<i>Zea mays</i> L.	99
Ixim-che	<i>Casearia nitida</i> (L.) Jacq.	24
Iz	<i>Ipomoea Batatas</i> (L.) Lam.	58 a
Kan-chunup	<i>Thouinia paucidentata</i> Radlk.	95
X-kanan	<i>Hamelia patens</i> Jacq.	55
Kanklische	<i>Chlorophora tinctoria</i> (L.) Gaud.	32
Kan-puc-yim	<i>Callicarpa</i> sp.?	See 21
X-koch	<i>Ricinus communis</i> L.	90
X-koch-lé	<i>Cecropia obtusa</i> Trécul.	27
Kulche	<i>Cedrela mexicana</i> M. Roem.	28
Kuxub	<i>Bixa Orellana</i> L.	12
Laal	<i>Urera caracasana</i> (Jacq.) Griseb.	97
Lec	<i>Lagenaria siceraria</i> (Molina) Standl.	61
Luch	<i>Crescentia Cujete</i> L.	40
Max-ic	<i>Capsicum frutescens</i> L.	23
X-mek-pakal	<i>Citrus</i> sp.?	See 34 a
Ne-maax	<i>Pleonotoma diversifolium</i> (HBK.) Bur. & Schum. or <i>Heliotropium angiospermum</i> Murr.	82
X-muc-ic	<i>Capsicum</i> sp.?	See 23
X-oco-ak	<i>Abrus precatorius</i> L.	1
On	<i>Persea americana</i> Mill.	74
Opp-tzimin	<i>Petrea arborea</i> HBK.	75
Pichi	<i>Psidium Guajava</i> L.	87
Pichi-che	<i>Psidium Sartorianum</i> (Berg) Niedenzu.	86
Piim	<i>Ceiba aesculifolia</i> (HBK.) Britt. & Baker.	29
Pixton ojo	<i>Ditaxis tinctoria</i> (Millsp.) Pax & Hoffm.	45
X-pomol-che	<i>Jatropha Gaumeri</i> Greenm.	59 a
Pox	<i>Annona Cherimola</i> Mill.	9
Ppoppox	<i>Tragia yucatanensis</i> Millsp.	96
Ppix-thon	<i>Phyllanthus glaucescens</i> HBK.	77
Put Xiu	<i>Lepidium virginicum</i> L.	See 7
Silil	<i>Diospyros cuneata</i> Standl.	43
X-tab-canil	<i>Cissus rhombifolia</i> Vahl.	33
Tah	<i>Viguiera dentata</i> (Cav.) Spreng. var. <i>helianthoides</i> (HBK.) Blake.	98

ALPHABETICAL LIST OF MAYA NAMES OF PLANTS IN THIS STUDY—Continued

Maya name	Scientific name	Plant No.
Tamay	<i>Zuelania guidonia</i> (Swartz) Britt & Millsp.	100
X-tel-cox	<i>Phytolacca icosandra</i> L.	78
X-tez-lob	<i>Guettarda Combsii</i> Urban.	54 a
Tok-aban	<i>Eupatorium odoratum</i> L.	50
X-tu-ab or X-tu-habin	<i>Cassia emarginata</i> L.	26
Tuk	<i>Acrocomia mexicana</i> Karw.	5
Tzotz Kabil	<i>Ipomoea Nil</i> (L.) Roth.	58
Uaxim	<i>Leucaena glauca</i> (L.) Benth.	63
Xanab-mucuy	<i>Euphorbia hirta</i> L.	51
Xhulkin Xiu	<i>Blepharodon mucronatum</i> (Schl.) Dene.	14
Xucul	<i>Portulaca oleracea</i> L.	85
Ya	<i>Achras Zapota</i> , L.	4
Yanten	<i>Plantago major</i> L.	81
Yaxche	<i>Ceiba pentandra</i> (L.) Gaertn.	29 a
Yuy	<i>Casimiroa tetrameria</i> Millsp.	25
Zac-ak	<i>Bignonia</i> sp?	11 a
Zac-bacal can	<i>Hybanthus yucatanensis</i>	See 80
Zac-bach	<i>Adenocalymna punctifolium</i> Blake	6 a
Zac-catzim	<i>Mimosa hemiendyta</i> Rose & Robinson	69
Zac-dzulub-tok	<i>Bauhinia divaricata</i> L.	10 a
Zac-itza	<i>Neomillspaughia emarginata</i> (Gross) Blake	72
Zac-nicte	<i>Plumeria alba</i> L.	84
Zac-pah	<i>Byrsonima bucidaefolia</i> Standl.	19
Zac-puc-yim	<i>Callicarpa acuminata</i> HBK.	21
Zac-uob	<i>Cereus undatus</i> Haw.	See 31
Zac-xiu	<i>Abutilon trisulcatum</i> (Jacq.) Urban	2
Zac-yab	<i>Gliricidia sepium</i> (Jacq.) Steud.	53
Zicil-puuz	<i>Sesamum orientale</i> L.	92
Zit	<i>Lasiacis ruscifolia</i> (HBK.) Hitchc.	62
Zidz-muc	<i>Celtis iguanaea</i> (Jacq.) Sarg.	30
Zizal-xiu	<i>Bryophyllum pinnatum</i> (Lam.) Kurz	17
Zubin	<i>Acacia Collinsii</i> Safford	3
Zudz-pakal	<i>Citrus Aurantium</i> L.	34
Zutup	<i>Helicteres baruensis</i> Jacq.	56

DISCUSSION

The reader is reminded that in the main the material presented herein is new and does not include the abundant data which have already been published on the flora of Yucatan except for isolated pertinent facts which are necessary for descriptive purposes. As a result of careful editing and the omission of reiterative material, this study comprises only 100 plants; but the uses accredited to them by the Maya are great in number and diversified in nature. On the practical side these plants include woods used for various parts of

house construction and for furniture, toys, torches, skyrockets, ox-carts, ax handles, and animal traps. Some of the plants are employed in making common household articles such as soap, shampoos, and mucilage, while others are used for ornamentation in the form of rings and similar jewelry. A number of them provide food for man, wild animals, birds, and insects. Their most prevalent use is to cure diseases, 46 of which are said to be efficaciously treated by 60 of the plants herein listed.

The art of healing among the Maya is a precarious procedure at best, for the Indians know little or nothing of modern medical practices, and their own brand of medicine is a mixture of folklore, superstition, and herbal concoctions. Ordinarily geographically far from and often mentally indifferent to scientific medical assistance, the Maya resort to treatment by their native *yerbateros* (herb doctors) or medicine men (or women), who have no scientific training but recommend treatments which they have learned from practice, from other herb doctors, or from their own parents. Their remedies are prepared and administered with a maximum of supernatural rites. Certain numbers they consider important, nine especially. Many concoctions call for nine leaves of a plant, or nine drops of a medicine comprise a dose. A *yerbatero* is not always called in to treat a patient, for the Maya mothers have "home" remedies which they administer independent of the herb doctor.

Whether or not there is a pharmacological science involved in medicinal uses of plants by primitive people is often questioned. It is sometimes suggested that such studies be assigned entirely to the sphere of folklore. It is true that folklore is the prevailing influence in native medicine, and it is the author's opinion that a large percentage of such prescriptions have no curative value whatever other than their psychological effect upon the patient.

There seem to be four categories into which the Maya practice of cures can be divided. The first is that of pure superstition, based on taboos and necromancies, with no recognition of symptoms or specificity of treatment. The uses of *Abrus precatorius* L., and *Indigofera suffruticosa* Mill. (plants Nos. 1 and 57) are proofs of this point. They are used in the treatment of disorders caused by the "evil eye" or bewitchment.

The second category includes those diseases which are recognized definitely and are not accredited to any supernatural causes. Unfortunately, the cures prescribed are not often efficacious. For instance, the Maya recognize diabetes and its symptoms. They know that diabetic urine contains sugar, for one informant explained that ants gather around a container of diabetic urine to eat the sugar. Yet their cure for this malady is not to go to the hospital for insulin, but

to use the roots and fronds of *Acrocomia mexicana* Karw. (plant No. 5). Samples of the roots were analyzed by the Squibbs Institute of New Brunswick, N. J., and were found to be inert as far as a cure for diabetes was concerned.

The third group includes those diseases which involve a simple or an elaborate curative process, but where the end results seem to depend upon the psychological factors involved. An interesting example of this is to be found in the Maya method of inducing or inhibiting human milk flow by the use of plants Nos. 90 and 92. *Brosimum Alicastrum* Sw., or Ox in Maya, a plant not considered in this study, is employed even more widely for inducing the flow of milk by both Maya and Spanish women. Stories are told by responsible persons of women, some as old as 60 years, who, by the use of vapor baths and additional feeding, are able to produce enough milk to supply nourishment for newly born babies. One such case the author has no occasion to doubt. It concerns the death of a young mother 3 days after her child was born. The child's grandmother, who was about 60 years old, began to nurse the child and at the same time to eat nourishing food made from squash seeds, chaya leaves, and the seeds of the Ox tree. In a few days she began to produce "good thick milk" in sufficient quantities to nurse her grandchild until the child was 2 years old.

Seeds from the Ox tree were tested by Dr. Robert W. Bates, biochemist at the Carnegie Institution of Washington at Cold Spring Harbor, N. Y., and were found to be inert as far as the crop-gland reaction in pigeons was concerned. The author believes that the Ox seeds have very little to do with the production of milk by the Maya women. It seems more plausible that the combination of nourishing food, vapor baths and massaging, and the tremendous desire on the part of the women to produce milk when it is desperately needed, are enough to start the flow of milk in some women. The nursing child is probably responsible for the increase in the amount and for the continuation of the milk output.

The fourth group of diseases includes those which are recognized by the Maya and for which remedies are used that appear to have some therapeutic value. Certain purgatives are prepared from plants and are efficacious. The leaves of *Valleriana*, a plant used by the Maya for smelling salts, does have a pungent, sharp smell which has a stimulating action similar to our ammonia. A ginger tea is used as a sudorific and for stomach trouble, much in the same manner as we use it.

In summarizing the medicinal uses of plants, it can be said that 60 percent of the plants in this study have therapeutic properties ascribed to them by the Maya. They are used to treat a great variety

of diseases, including canker and other sores, insect bites, blisters, headaches, muscle twitching, vomiting, fevers, skin diseases, ulcers, and digestive, respiratory, and reproductive disorders. The diseases mentioned in this study and the numbers of the plants described in the text which are used to treat them are shown in the following alphabetical list.

Diseases treated by plants and other specific uses of plants in human hygiene, as mentioned in this study

Diseases treated and other hygienic uses	Plants used (indicated by Nos. assigned in text)
Amenorrhea and other menstrual disorders	20, 83.
Asthma.....	2, 6 a, 12.
Coughs, colds, bronchitis, and catarrh....	3 a, 7, 10 a, 11, 20, 27, 69, 72, 74, 79, 91, 95.
Diarrhea and dysentery.....	1, 4, 10, 20, 21, 42, 46, 51, 61, 73, 77 a, 81, 82, 86, 87, 97.
Fever, night sweats, and malaria.....	9, 13, 30, 59, 74, 80, 83, 86, 100.
Headache.....	7, 12, 97.
Hemorrhage and nose bleed.....	8, 11, 26.
Liver, kidney, and urinary disorders.....	8, 10, 10 a, 24, 50, 59, 66.
Miscellaneous:	
Antidote for poisons.....	46.
Protruding navel.....	35.
Muscle twitching.....	11 a, 83.
Disease of the breast.....	76 a.
Blisters on hands.....	55.
To stop vomiting.....	22.
To induce milk flow.....	92.
To stop milk flow.....	90.
Measles and smallpox.....	12, 78.
Purgatives and stomach ache.....	12, 20, 50, 57, 60, 90, 96, 97.
Rheumatism.....	8, 83, 96.
Skin diseases, eczema, pimples, and pel- lagra.	8, 26 a, 27, 55, 77, 86, 87.
Sore eyes.....	30, 51, 89.
Snake and insect bites.....	14, 38, 58 a, 59 a.
Toothache and pyorrhea.....	4, 32, 47, 60.
Veneral diseases.....	20, 48, 66, 96.
Vermicides and insecticides.....	9, 9 a, 85, 97.
Wounds, sores, and ulcers.....	2, 14, 15, 20, 33, 44, 52, 55, 67, 78, 89, 95.

The economic importance of the native vegetation is great to the Maya, for trees and plants are used in all phases of house construction and in making household furniture. The Maya follow a definite pattern in building a bush house, using special trees for each step. Thus, the Zubin (No. 3), the Zac-yab (No. 53), the Zac-catzim (No. 69), and the Habin (No. 79) are used for corner posts because they are

hard and durable woods. The small, upright side poles are generally made from the Pichi-che (No. 86), while the poles supporting the thatched roof are from the Ici-che (No. 49). Certain vines or lianas are used to bind the upright poles of the houses, and the center beams and doorframes are constructed from trees whose wood is suitable for such purposes.

Household articles and utensils are likewise made from specific plants. The customary broom for sweeping Maya houses consists of a bundle of the tough branches from the Zac-xiu (No. 2), whose leaves do not drop off readily. Another type of broom is made from the Ic-abau (No. 41), which has such a strong scent that it causes the eyes to water. It is this type which is used to sweep the fleas from Maya homes.

Because of the differences in the burning properties of various types of wood, the Maya select the soft, quickly burning Silil (No. 43) for cooking and for burning limekilns. Another tree, the Chacah (No. 18), contains a gummy sap which renders the wood slow to burn. Consequently it is used on the hearths to keep a fire going when no cooking is being done. The Zac-catzim (No. 69 a) is employed for torches with which the milperos light the fires in their cornfields. Other selective uses of wood are to be found in the making of sky-rockets, the manufacture of mucilage, and the fashioning of baskets, toys, and crowns of thorns for the images in the Maya churches. There are even special leaves which are crushed and rubbed on horses to keep away bothersome horseflies.

In the raising of maize, the chief source of food of the natives, the Maya wait until the Kulche (No. 28) puts forth its leaves. Trees with very hard wood are left standing in the milpa, for to cut them down would mean arduous work for the milpero. The Chechem tree (No. 68) is also allowed to remain in the milpa, because its wood is poisonous when in contact with the skin.

As some American children become greatly excited when they see a dragonfly, which they believe "will sew up mouths," so do the Maya have certain unfounded beliefs about the relation of certain plants and animals. For example, they believe that the seed pods of *Phaseolus vulgaris* L. (No. 76 a) are poisonous to pigs and that another plant is poisonous to parrots. The long spines of *Acrocomia mexicana* Karw. are said to be poisonous, but it is the author's opinion that these spines are so long and sharp that they penetrate deeply into the flesh, causing infections which are interpreted as poisons by the Maya. If the Luch tree (No. 40) fails to bear fruit (which when dried supplies the dishes used on the Maya table), it is beaten with nine lashes on the 24th of June. Many other examples of these beliefs are given in the text, but these suffice here to show that the Maya

are steeped in superstition concerning the plant life around them. In fact, nature is an integral part of the lives of these people. At times it may bother and even terrorize them, but from nature they also receive some of their greatest comforts and satisfactions.

EXPLANATION OF PLATES

PLATE 22

1. *Acrocomia mexicana* Karw., Tuk (Maya), Cocoyol (Spanish). The trunk and fronds of this common palm tree are armed with long, black spines which, upon entering the flesh, sometimes cause infection and are, therefore, thought by the Maya to be poisonous.
2. *Alvaradoa amorphoides* Liebm., Bezinic-che (Maya), Palo de ormigas (Spanish). A decoction of the bark of this tree has been used consistently since early times by the Maya to alleviate skin diseases.
3. *Bromelia Karatas* L., Chom (Maya), Piñuela (Spanish). The wild pineapple has large, slender leaves with hooked barbs along the edges and bears blue flowers in a palmlike stem.
4. The long, pointed fruit of the wild pineapple (*Bromelia Karatas* L.). Juice may be sucked out of the end of the fruit. Ordinarily it is boiled, for the fruit is covered with nettles which are irritating to the mouth.

PLATE 23

1. *Cedrela mexicana* M. Roem., Kulche (Maya), Cedro (Spanish). Logs of the Kulche (Spanish cedar), which furnishes perhaps the best lumber of Yucatan. The tree has a very sticky sap, which is used by the Maya for mucilage.
2. *Cereus undatus* Haw., Chac-uob (Maya), Pitahaya (Spanish). This spiny, vinelike cactus, shown growing on a wall, also grows in trees. Crushed in cold water, it is used as a shampoo by the Maya.
3. *Dorstenia Contrajerva* L., X-cambalhau (Maya), Contrajerva (Spanish). This plant grows abundantly in limestone pits. It has been used consistently to alleviate disorders of the alimentary canal. Modern doctors employ it as a stimulant tonic and diaphoretic.
4. *Euphorbia hirta* L., Xanab-mucuy (Maya), Yerba de pollo (Spanish). The milky sap of this weed has been used since colonial times to reduce inflammation in sore eyes. The boiled leaves are believed to cure dysentery.

PLATE 24

1. *Ficus cotinifolia* HBK., X-Copó (Maya), Alamo (Spanish). The leaves of this huge tree furnish fodder, and its sweet fruit is edible. Note the hanging roots which have taken hold in the ground.
2. *Leucaena glauca* (L.) Benth., Uaxim (Maya). This is a rapidly growing tree which bears white flowers. The Maya believe that if horses eat the lacelike leaves of Uaxim trees they will lose the hairs from their tails.
3. *Plumeria alba* L., Zac-nicte (Maya), Flor de Mayo blanco (Spanish). This medium-sized tree, extensively cultivated in Yucatan, bears exceedingly beautiful red flowers, which are used as decorations. The sap of the tree is used to reduce swellings.
4. *Spondias purpurea* L., Abal-ac (Maya), Circuela (Spanish). This small tree has no leaves during February and March. It bears small fruits which resemble plums and are commonly eaten by the Maya.

BIBLIOGRAPHY

CARNEGIE INSTITUTION OF WASHINGTON

1936. Botany of the Maya area. Misc. Pap., 1-13. Publ. No. 461.

CUEVAS, B.

1913. Plantas medicinales de Yucatan y guia medica practica domestica. Merida, Yucatan, Mexico.

1913. a. Ilustraciones de la obra "Plantas medicinales de Yucatan." Merida, Yucatan, Mexico.

GODMAN, F. D., and SALVIN, O., EDITORS

1879-1888. Biologia Centrali-Americana, vols. 1-5, London.

LANDA, F. DIEGO DE

1937. Yucatan before and after the conquest, with other related documents, maps and illustrations. Trans. with notes by William Gates. Baltimore.

LUNDELL, CYRUS LONGWORTH

1933. The agriculture of the Maya. Southwest Review, vol. 19, No. 1, p. 65.

1934. Preliminary sketch of the phytogeography of the Yucatan peninsula. Appendix, The grasses of the Yucatan peninsula, by Jason R. Swallen, Contr. Amer. Archeol., vol. 2, No. 12, Carnegie Inst. Washington Publ. No. 436, pp. 255-355.

MARTINEZ, MAXIMINO

1933. Las plantas medicinales de Mexico. Mexico D. F.

MILLSPAUGH, CHARLES FREDERICK

1895. Contribution to the flora of Yucatan. Field Columbian Mus., Publ. 4, Botanical Ser., vol. 1, No. 1.

1896. Contribution II to the coastal and plain flora of Yucatan. Field Columbian Mus. Publ. 15, Botanical Ser., vol. 1, No. 3.

1898. Contribution III to the coastal and plain flora of Yucatan. Field Columbian Mus., Publ. 25, Botanical Ser., vol. 1, No. 4.

ROYS, RALPH L.

1931. The ethno-botany of the Maya. Tulane Univ. Middle Amer. Research Ser., Publ. No. 2. New Orleans.

STANDLEY, PAUL CARPENTER

1930. Flora of Yucatan. Field Mus. Nat. Hist., Publ. 279, Botanical Ser., vol. 3, No. 3.

SWALLEN, JASON R. See LUNDELL, CYRUS LONGWORTH, 1934.



1. *Acrocomia mexicana* Karw.



2. *Alvaradoa amorphoides* Liebm.



3. *Bromelia Karatas* L.



Fruit of *Bromelia Karatas* L.



1. *Cedrela mexicana* M. Roem.



2. *Cereus undatus* Haw.



3. *Dorstenia Contrajerva* L.



4. *Euphorbia hirta* L.



1. *Ficus cotinifolia* HBK.



2. *Leucaena glauca* (L.) Benth.



3. *Plumeria alba* L.



4. *Spondias purpurea* L.