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ETHNOBOTANY OF THE SOUTHERN TEPEHUAN OF DURANGO, MEXICO: I. EDIBLE MUSHROOMS

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ABSTRACT.—The Southern Tepehuan is an indigenous group living in the southern part of Durango State and the northern part of Nayarit State in North-west Mexico. Gathering is still a very important traditional practice among them; in particular reharvestable edible mushrooms are in great demand during the rainy season when they represent an important dietary complement for the people. This paper describes the Tepehuan group, their environment, and how they know and use at least fourteen species of edible fungi. Comments are made with regard to some other edible species of fungi found in the area during the field work as well as to Tepehuan knowledge of poisonous fungi.

RESUMEN.—Los Tepehuanes del sur son un grupo étnico que habita en el sur del Estado de Durango y en el norte del Estado de Nayarit, en el noroeste de México. La recolección es una práctica tradicional entre los tepehuanes; los hongos silvestres comestibles, en particular, tienen una gran demanda durante la época de lluvias, cuando representan un complemento importante en la dieta de esta gente. En este trabajo se hace una semblanza del grupo tepehuano y de su medio ambiente, y se describe como utilizan cuando menos catorce especies de hongos silvestres comestibles. Se hacen comentarios acerca de algunas otras especies comestibles encontradas en el área durante el trabajo de campo y acerca del conocimiento que los tepehuanes tienen de los hongos venenosos.

RÉSUMÉ.—Les Tepehuans du Sud sont un groupe ethnique qui habite au sud-est de l'état de Durango et au nord de l'état de Nayarit au nord-ouest du Mexique. La cueillette est une pratique traditionnelle très importante parmi les Tepehuans. Les champignons sauvages comestibles y sont particulièrement très demandés pendant la saison des pluies quand ils représentent un complément alimentaire important. Dans cet article sont décrits le groupe Tepehuan, son environnement, et son utilisation d'au moins quatorze espèces de champignons sauvages comestibles. Des commentaires sont faits sur les autres espèces comestibles trouvées dans la région lors de cette étude et sur le savoir des Tepehuans sur les champignons vénéneux.

INTRODUCTION

The Northern Mexican mycological flora has been poorly studied in contrast to that of the South of Mexico (Valenzuela 1982). This is especially evident in the State of Durango where recent research has revealed a large number of new

records. Quintos et al. (1984), for example, cite 92 of 100 species included in their paper for the first time for Durango. Perez and Aguirre-Acosta (1985) reported 81 new fungi for Durango in their study, which included 132 species. Both papers are taxonomically oriented; they do not include local information on utilized species. On the other hand, there are no ethnomycological studies for indigenous groups living in the Sierra Madre Occidental in the North of Mexico. Information on this topic is scarce. Pennington (1963) reports the names of eight edible mushrooms in the Tarahumara language, and, in his exhaustive work on the material culture of the Tepehuans of Chihuahua (Pennington 1969), gives the common names of the three main edible mushrooms used by the Northern Tepehuans, *hongo de la tierra* or *hongo rojo*, *hongo del pino*, and *hongo del encino*. Mares (1982) includes in his work four species of edible mushrooms, *Amanita caesarea* (*hongo del tiempo de aguas*), *Ustilago maydis* (*hongo del maíz*), and two undetermined species, *hongo de temporal* and *hongo blanco de las aguas*.

It is the aim of this paper to present our current knowledge of the edible wild mushroom species used by the Tepehuan people of southern Durango, their harvest times, and methods of preparation. Although not a linguistic study, this work is intended to contribute to the study of Tepehuan ethnobotanical nomenclature by including the Tepehuan name of each species included in this study.¹

In 1984, when field work was started in the Tepehuan area, it soon became apparent that gathering is still a very important activity among the Tepehuan and that, in particular, reharvestable edible fungi are in great demand during the rainy season.

The Tepehuan diet is limited to several non-irrigated agricultural products such as corn, beans, and squash. This diet is enriched by gathered foods such as roots and other underground plant parts, fruits, greens, by-products and different parts of *Agave* spp., and also various species of mushrooms which play an important role in their diet.

The information presented in this article is part of a comprehensive study of useful wild plants from the Mexican State of Durango. The aim of this research is to make an inventory of all the plants used for food, medicine, building materials, industry, and other purposes.

THE TEPEHUAN AND THEIR ENVIRONMENT

From an ethnographic point of view, the Tepehuan culture from southern Durango has been poorly studied. It is known that Tepehuan is a Uto-Azteca language which belongs to the Piman family (Sanchez 1980) but little is known about the group's past, their prehispanic settlements, or their relationships with other native groups.

The Tepehuan are geographically and linguistically divided into two groups, the northern and southern Tepehuan. The former live in southern Chihuahua and have as neighbors the Tarahumara; the latter live in southern Durango. The southern Tepehuan's closest indigenous neighbors are the Cora and Huichol (Fig. 1). The past relationships between these two Tepehuan groups and the timing of their separation are still controversial matters.

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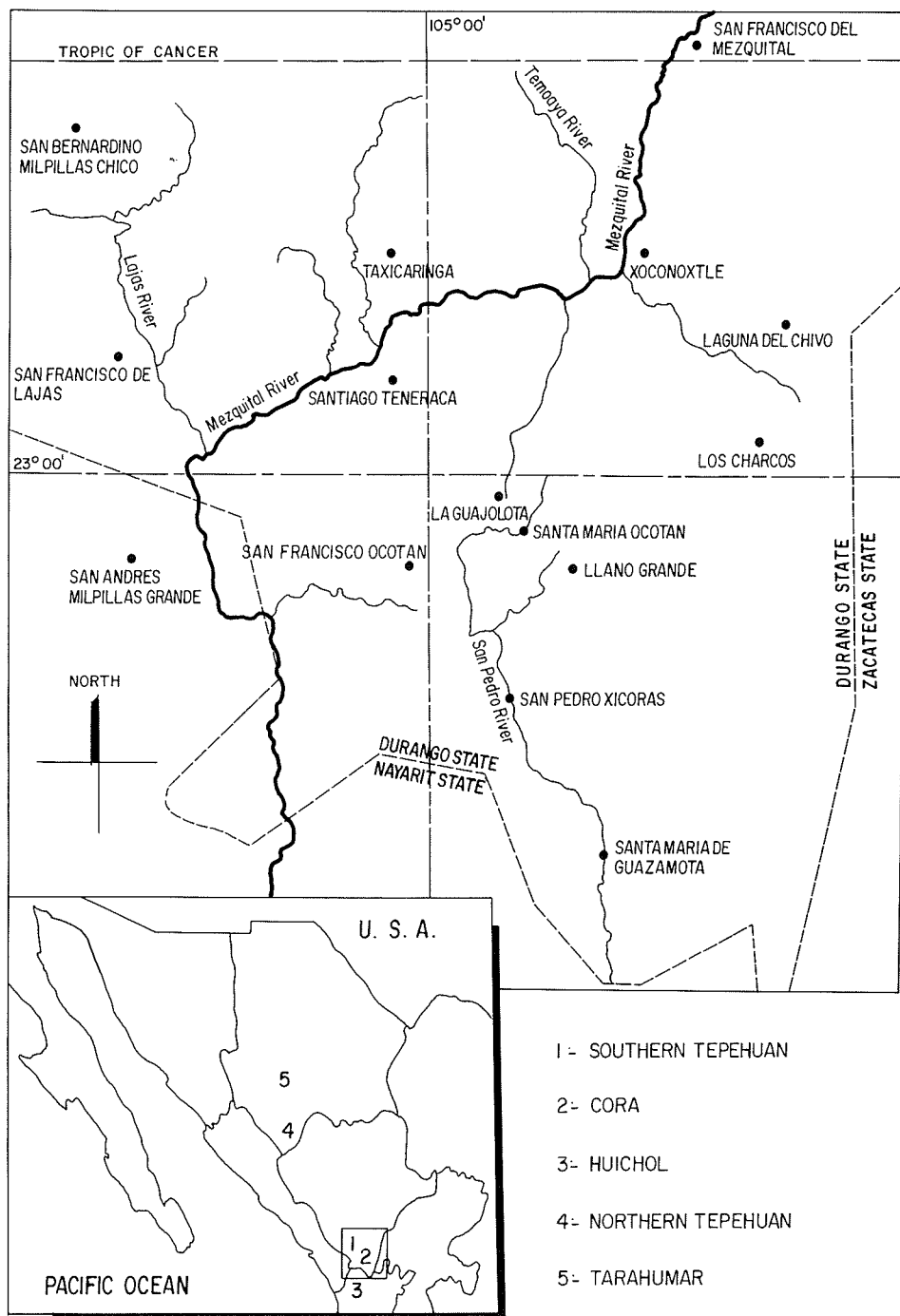


FIG. 1.—Map of southern Durango and northern Nayarit showing the location of indigenous groups and Tepehuan *comunidades* discussed in the text.

Spanish historians assumed that the northern and southern Tepehuans belonged to one group which occupied a large extension of the State of Durango, so they called them *Nación tepehuana* (Sanchez 1980). Rinaldini, in an eighteenth century Jesuit document (Pennington 1969), claims that the Tepehuan spread hundreds of kilometers north and south during the great rebellion in the period between A.D. 1616 and 1618. However, Mason (1948) argues, based on language differences, that the separation took place long before the Spaniards arrived.

Today, the southern Tepehuan territory occupies an area of about 9,380 square kilometers in the Sierra Madre of southwestern Durango, extending from 22°20' to 23°31' north latitude and from 104°10' to 105°50' west longitude. The presence of the majestic Mezquital River canyon and the river tributaries which traverse the zone results in the most rugged topography found in Durango. The altitudinal range is from 600 m at the deepest part of the Mezquital canyon to a maximum of 3,250 m at the top of Cerro Gordo. The ruggedness of the land and the diversity of soils and elevations present result in a variety of vegetation types which include three of the main types of vegetation found in Mexico. These are, according to Rzedowski (1978), Coniferous Forest, *Quercus* Forest, and Tropical Deciduous Forest (Gonzalez 1984).²

The southern Tepehuan territory is divided into seven *comunidades*: Santa Maria Ocotan, San Francisco Ocotan, Santiago Teneraca, Santa Maria Magdalena de Taxicaringa (all in the Municipio of Mezquital, Durango), San Bernardino Milpillas Chico, San Francisco de Lajas (all in the Municipio of Pueblo Nuevo, Durango), and San Andres Milpillas Grande (Municipio of Huajicori, Nayarit) (Fig. 1). Each *comunidad* has a political-religious center, several *anexos* (small settlements) and innumerable *rancherías* (one or two family houses isolated from centers of population). Concerning the ownership of land, Santa Maria Ocotan is organized as an *ejido* in which individual members are given the right to exploit individual parcels of land. The rest of the *comunidades* are communally organized. From a linguistic point of view, these *comunidades* also differ; the Mexican Secretary of Public Education (SEP) recognizes three dialects of Tepehuan language (Secretaría de Educación Pública 1986).

Because of the poverty and limited productivity of the land, many of the Tepehuan are forced to leave their communities and work seasonally in the cities, especially during the dry season. Due to this constant movement, it is difficult to determine the exact number of Tepehuan. A recent census made by the SEP reports 25,000 people.

The Tepehuan culture has lost many of its distinctive prehispanic features, such as political and religious organization. However, native language, men's clothing, feasts, and economic activities such as gathering are traditional practices that continue to exist.

MATERIALS AND METHODS

Field work was conducted from 1984 to 1986 in Santa Maria Ocotan, the most important political-religious center of the Tepehuan, and in several of its *anexos*: Llano Grande, Charcos, Laguna del Chivo, and La Guajolota. Sporadic visits were also made to the *comunidades* of San Francisco Ocotan, San Bernardino Milpillas

Chico, Santa Maria Magdalena de Taxicaringa, and San Francisco de Lajas. In each area ethnobotanical information was obtained by interviewing several local informants and on most occasions specimens were collected with the help of these informants.

During interviews, photographs and freshly collected specimens of each mushroom species were shown and the informant asked about the Tepehuan name of the fungus, its edibility, method of preparation, and harvest season. At the same time, informants were asked about other edible fungi and their habitats. This information was then checked through field work.

The freshly collected mushrooms were identified using Guzman (1977), Moser (1983), and Singer (1975). Once dried, specimens were labeled and sent to the ENCB (Herbario, Departamento de Botánica, Escuela Nacional de Ciencias Biológicas, Instituto Politécnico Nacional, Mexico City, D.F., México) where each specimen was examined and determinations confirmed by Ricardo Valenzuela, who is the curator of mycology at this herbarium. Voucher specimens were deposited at the Centro Interdisciplinario de Investigación para el Desarrollo Integral Regional (CIIDIR) Herbarium in Durango city. The species included in this study are illustrated in the taxonomic references cited above or in Von Frieden (1969).

RESULTS

Fourteen species of edible fungi used by the Tepehuan were identified during this study. These are discussed below. The following information is given for each species: scientific name, Tepehuan name (different linguistic forms are given, followed by place of collection), literal translation from Tepehuan into English, habitat, harvest time, form of preparation, and voucher specimen reference, following Bye (1986).

Agaricus campestris L.: Fr. *kabai pbich* (Santa Maria O.), "horse excrement"; *soi nano* (San Francisco O.) "grasshopper eggs"; *pbur pbich* (Lajas and Taxicaringa) "donkey excrement."

This mushroom is harvested after the first rains in May or June. It is common in open, level ground. It is prepared by boiling or roasting over charcoal. M. Gonzalez 1676, CIIDIR.

Amanita caesarea (Scop.: Fr.) Grev. *jixbá' yakua*, *jix'uam yakua*, *jixchua yakua* (Santa Maria O., San Francisco O.) "red mushroom", "yellow mushroom", "white mushroom"; *bápi' nakai*, *jixata nakai*, *jix'am nakai* (Lajas, San Bernardino) "red mushroom", "white mushroom", "yellow mushroom."

This is a well known and preferred mushroom, found in August in humus in pine forests. It has several names in the Tepehuan language according to the color of the pileus, which can be orange, yellow, or very light yellow (red, yellow, and white, respectively, according the Tepehuan people).

The Tepehuan prefer these mushrooms when young and prepare them by roasting over charcoal, boiling, or stewing with pork lard, spiced, and garnished with cheese. M. Gonzalez 1414, CIIDIR.

Hypomyces lactifluorum (Schw.:Fr.) Tulasne. *nak* (in most communities) "ear"; *pbuchi nak* (Lajas) "daughter-in-law ear."

This is a parasitic fungus on *Russula brevipes*, *Lactarius salmonicolor*, and *L. deliciosus*, three edible species of mushrooms which it deforms. This is one of the most well-known and preferred mushrooms in this region. It is collected mainly in June and July. It is prepared simply boiled or crushed, stewed with tomato and onion, and garnished with cheese. M. Gonzalez 2014, CIIDIR.

Hygrophoropsis aurantiaca (Wulf.: Fr.) Mre. *guin'xacan* (Santa Maria O., Taxicaringa) "delightful"; *kia's gio'* (Taxicaringa, Lajas) "iguana lard."

This mushroom is found in humus in pine forests and is harvested from July until September. It is roasted over charcoal or boiled and garnished with cheese. M. Gonzalez 1370, CIIDIR.

Hygrophorus sp. *gigira'* (in all communities) "gathering of people."

This mushroom is a viscous one with a very light brown and slimy pileus; it grows in July in groups in pine forest humus. It is boiled in salted water. M. Gonzalez 1764, CIIDIR.

Lycoperdon umbrinum Pers. *kapxia'* (in all communities) "ball"; *ju'ba'pbich nakai* (Lajas) "star excrement fungus."

This fungus is found in moist areas. It is collected in June after the first rains; when young, specimens provide one of the earliest available edible fungi. After slicing it is roasted over charcoal or simply boiled in salted water. M. Gonzalez 1910, CIIDIR.

Macrolepiota procera (Scop.: Fr.) Sing. *is yakua* (Santa Maria O., Taxicaringa) "elbow mushroom"; *jixtata nakai* (Lajas) "white mushroom."

This mushroom grows mainly in open places in *Quercus* forest in July and August. It can be eaten either roasted over charcoal or stewed. It is preferred stemless and roasted over charcoal. M. Gonzalez 1767, CIIDIR.

Pleurotus spp.

This mushroom grows as a shelf fungus on damp, rotten logs. The Tepehuan distinguish two different species:

P. ostreatus (Jacq.: Fr.) Kumm. *tasnara* (in all communities) "mushroom"; *tu tuata'mkan nakai* (Lajas) "mushroom borne on log"; *hongo blanco de mayo* (in all communities) "white mushroom of May."

This fungus grows on pine logs, appearing early in the year (i.e., from the middle of April through May). It can be eaten boiled in salted water, crushed or sliced and stewed with spices, or dried in the sun for later consumption. M. Gonzalez 1748, CIIDIR.

P. dryinus (Pers.: Fr.) Kumm., *tua tasnara* (in all communities) "oak mushroom."

This fungus grows on oak logs. It is harvested in July and prepared the same way as *P. ostreatus*, but it is less appreciated. M. Gonzalez 1773, CIIDIR.

Ramaria spp.

The Tepehuan consume two species:

R. botrytis (Fr.) Rick. *basik jut* (Santa Maria O., Taxicaringa) "nail rat."

This fungus grows in groups in pine forest humus. It is gathered in June and July, and prepared boiled in salted water or cooked with cheese. M. Gonzalez 2015a, CIIDIR.

R. flava (Fr.) Quel., *basik jut* (Santa Maria O., Taxicaringa) "nail rat"; *dius nobi nakai* (Lajas) "God hands mushroom."

This fungus is harvested in July. The Tepehuan prefer it when young and prepare it the same way as *R. botrytis* M. Gonzalez 2015b, CIIDIR.

Russula lepida Fr. *kurat mo'* (Santa Maria O., San Francisco O., Taxicaringa) "woodpecker head."

This mushroom grows on pine or oak forest humus. It is gathered in June and July, and is prepared boiled, stewed, or roasted over charcoal. It is not easily discriminated from certain poisonous mushrooms, however, therefore the Tepehuan usually do not use it. M. Gonzalez 1819, CIIDIR.

Rhizopogon sp. *tora'n* (Santa Maria O.) "chest"; *bonkox tora'n* (Santa Maria O.) "squirrel chest"; *tur jura'* (Lajas) "bull heart."

This is an hypogeous fungus found in *Quercus-Pinus* forests. It is gathered in July, and eaten fresh or roasted over charcoal. While Guzman (1977) classifies *Rhizopogon* sp. as a non-edible fungus, the results of this study indicate that the Tepehuans consume it. M. Gonzalez 1931, CIIDIR.

Ustilago maydis (DC.) Corda. *jaro'i* (Santa Maria O.); *jura'* (Taxicaringa) "heart."

This fungus, a parasite on corn cobs, is gathered in August and September. A day before eating it the mushroom is lightly roasted over charcoal, then sliced and crushed together with corn. The next day *atole*, a thick beverage, is prepared with this mixture. M. Gonzalez 2066, CIIDIR.

DISCUSSION

It appears that most Tepehuan know and use at least five of the 14 mushrooms discussed above: *Agaricus campestris*, *Amanita caesarea*, *Hypomyces lactifluorum*, *Pleurotus ostreatus*, and *Ustilago maydis*.

In addition to the 14 fungi listed above some informants also gave information about another edible mushroom which was not found during field work. Based on their descriptions and identifications from photographs it seems probable that this mushroom, *Sparassis crispa* Fr., also grows in this zone. The Tepehuan names for this fungus are *boka'n* "cow rumen"; *basik nak* "rat ear"; and *bonkox nanak* "squirrel ears". It is prepared boiled in salted water or stewed with cheese, onion, and tomato. It is also sun-dried for later consumption.

Concerning poisonous mushrooms found in this zone, the Tepehuan identify *Amanita muscaria* (L.: Fr.) Hook. and *A. pantherina* (DC.: Fr.) Krombh., both called *tirok yakua* "lagarto mushroom" or "scraping mushroom", because of "warts" on the cap. The Tepehuan use the word *maimda'kam* as a generic term to refer to those poisonous mushrooms that make people feel dizzy or drunk.

Although other known edible mushrooms such as *Boletus edulis* Bull.: Fr. and *Boletus pinicola* Vitt. were observed in the area, the Tepehuan do not gather them. They are considered animal food since cows eat them. However, it is also possible that the number of mushrooms used for human food has decreased in recent years.

Gathering is an important activity throughout the year, and it is a very popular and rewarding activity during the rainy season. Edible mushrooms still play an important role in Tepehuan diet in spite of the introduction of canned and processed foods in the remote communities of the Sierra Madre Occidental. Gathering is practiced mainly among the older generation; nevertheless, young people are also familiar with the most common mushrooms and include them in their diet. To a certain extent it is true that knowledge about the use of edible mushrooms is being lost due to modernization of the younger Tepehuan, but it is also true that changes to habitats preferred by mushrooms have made these resources less available.

CONCLUSIONS

Wild edible mushrooms represent a dietary complement for the Tepehuan, especially during the rainy season. Fourteen edible mushroom species are discussed in this paper. *Agaricus campestris*, *Amanita caesarea*, *Hypomyces lactifluorum*, *Pleurotus ostreatus*, and *Ustilago maydis* are the most preferred among the Tepehuan. One species which was not collected during field work (probably *Sparassis crispa*) is also very much appreciated by this indigenous group. Roasting over charcoal and boiling are the most common methods of preparing fungus among the Tepehuans.

Rhizopogon sp. and *Ustilago maydis* were newly registered for the mycological flora of the State of Durango. The former is recorded for the first time as an edible fungus; the latter is prepared in a unique way not documented before (i.e. *atole*).

NOTES

¹The transcription system of the Tepehuan language elaborated by the Secretary of Public Education of Mexico is here used. The inventory of the symbols includes the vowels *a, e, ɛ, i, ɨ, o, u*, and the consonants *b, ch, d, dy, g, j, k, l, hl, m, n, ñ, p, pb, r, s, t, x, y, '.* Word stress is most often on the first syllable.

²Translation by the author.

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BOOK REVIEW

Aztec Medicine, Health, and Nutrition. Bernard R. Ortiz de Montellano. New Brunswick, NJ and London: Rutgers University Press, 1990. Pp. xvi, 308. 2 maps, 19 illustrations, 24 tables. ISBN 0-8135-1562-9. \$40.00 (Hardcover), \$15.00 (Paper).

The knowledge of bioactive properties of the varied flora of Mexico was extraordinarily well developed. In fact, the Aztec possessed undoubtedly a wider and probably a much more practical ethnopharmacological acquaintance with their flora than their conquerors had of the plants of Europe. Their interest went far beyond the presumed medicinal value of plants and included ideas concerning nutrition and health in general.

It is fortunate that amongst the Spanish conquerors there were a few individuals whose educational level permitted them to show an interest in native life and customs and an intrinsic interest in what the conquered society could offer. It is to these men that we owe much of our present knowledge of the great civilization of Mexico. Many of these men were ecclesiastics such as Sahagún, but perhaps the best prepared chronicler was Dr. Francisco Hernandez, personal physician to the King of Spain, who was sent to study over a period of several years the medicinal plants of the Aztecs.

Dr. Ortiz de Montellano has published a masterly treatise on the medicine and ideas of nutrition and health of the Aztec. I cannot recall any volume so thoroughly inclusive of this most significant ethnopharmacological aspect of the great civilization that was all but destroyed by the Spanish invaders. Ortiz has not only faithfully searched documents written by Sahagún, Hernandez, and others, but has reported the Aztec monuments, paintings, and other archaeological remains and has given us the interpretation of their message concerning medical, health, and nutritional beliefs.

The book is profusely illustrated. There are eight chapters: 1) Aztec culture; 2) Aztec religion; 3) Population and carrying power of Mexico's basin; 4) Diet and food sources; 5) Epidemiology; 6) Diagnosing and ideas of illness; 7) Curing; and 8) Syncretism in Mexican folk-medicine. The two appendices discuss nutritional values and amino acid content of Aztec medicinal plants. There follow six pages of detailed notes, 25 pages of bibliography, and a detailed index of 15 pages that makes it easy for the reader to find the wealth of interdisciplinary information presented in the book.

Ortiz is to be highly complemented; many investigators will thank him for such a valuable contribution to historical ethnobotany. And we shall all be grateful to the Rutgers University Press for publishing in a paperback edition such a significant piece of research.

Richard Evans Schultes
Harvard Botanical Museum
Cambridge, Massachusetts