

EDIBLE ARRACACHAS OF THE SIBUNDOY

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The arracacha, *Arracacia xanthorrhiza* Bancroft (Umbelliferae), is an important edible root crop in the northern Andes. It was brought to my attention by Richard E. Schultes in southern Colombia in mid-1962 while on a botanical collecting trip in the company of Alvaro Fernández Pérez and Leslie Garay. We encountered the plant in cultivated fields in the highlands around Pasto, Departamento de Nariño, and around El Encano and the Valley of Sibundoy in the mountainous part of the Comisaría del Putumayo. Sibundoy lies at an elevation of 2200 meters just north of the Equator in a region of extremely high rainfall, about 5 meters annually.

Richard Schultes had first learned of some of the unique plants of the Sibundoy people through the 1935 plant collections of Hernán García-Barriga. Schultes had visited the Sibundoy in 1942, in 1946 with Villarreal, and in 1953 with Angel Cabrera, and had found several of their endemic *Arracacia* and *Datura* (Brugmansia) cultivars. One of the latter had such an extraordinary floral morphology that in 1955 he proposed for it the endemic genus *Methysticodendron* (6). Schultes' notes on the Sibundoy arracacha cultivars were shared with Walter Hodge who published a series of cultivar names (cf. below) in 1949 (5).

In 1962-63 I returned to the Valley of Sibundoy for 13 months to investigate the ethnobotany of the Sibundoy people and to write a doctoral dissertation to complete my studies in the Department of Biology at Harvard University. The endemic cultivars of tree *Datura* were a focal point of my fieldwork and their morphology, cytology, taxonomy and ethnobotany were described in 1969 (4). The complex vegetation of the Sibundoy planting fields also occupied my attention, especially in terms of the process of plant domestication in a primitive agroforestry setting (3). Among the

240 plant species and cultivars integrated into the Sibundoy agroecosystem in 1963 there were at least 13 clones of *Arracacia xanthorrhiza*, most of them known only from this valley.

The genus *Arracacia* consists of 45 species of coarse herbs and subshrubs in the American tropics and subtropics, especially in mountainous regions. *Neonelsonia* is a closely allied genus of two species; and one, *N. acuminata* Coult. & Rose ex Drude is called 'wild Arracacha' by the Sibundoy (cf. below) (1).

The arracacha is an acaulescent herb with many long-petioled, ternately decomposed leaves and several conical, edible roots 10 to 15 cms. long and 3 to 5 cms. in width at the upper end. The plants rarely flower. The species is cultivated in moderate climates from Venezuela to southern Peru and also somewhat in the Caribbean region. In Colombia, where its cultivation is most intensive, it ranges in elevation from 1500 to 2700 meters.

CULTIVARS

Hodge, in a noteworthy review on the arracacha, cites eleven cultivar names in Kamsá, the Sibundoy language, together with approximate Spanish equivalents, information furnished to him by Schultes (5). I was able to locate and cultivate five of the cultivars recorded by Schultes as well as six others. The following key distinguishes the eleven cultivars grown by the writer both at Sibundoy and at the Arnold Arboretum in Jamaica Plain, Massachusetts, USA.

VEGETATIVE KEY TO CULTIVARS OF *Arracacia xanthorrhiza* BANCROFT

- I. Leaves entirely green (some with slight purple striae), margins slightly purple 'Mantequillishá.'

II. Leaves more or less purple.

A. Petioles deep red-purple, pigment reaching smallest veins of lamina.

1. Petiole bases red-purple, root vascular cylinder not colored.

- a) Root cortex white . . . 'Uatub(f)tseng-uatshe-isha'
- b) Root cortex light yellow . . . Collection no. 18.

2. Petiole bases white or pinkish, root cortex yellow.

- a) Root vascular cylinder blue-purple . . 'Uatshe-celestesha'
- b) Root vascular cylinder not colored . . . Collection no. 17.

B. Petioles more or less red-purple, lamina and veins (except leaflet midribs from above) green.

1. Petiole bases white.

- a) Petioles deep red-purple, root cortex yellow. 'Uatsase-isha.'
- b) Petioles light or dull red-purple, root cortex white . . . 'Uabshajans-uabajatesha.'

2. Petiole bases colored.

- a) Root cortex white; petiole slightly glaucous, root vascular cylinder blue. . . . 'Uatshe-uachoros-sha.'
- b) Root cortex light yellow.
 - (1) Petiole base pink, petiole heavily glaucous (gray appearing); root vascular cylinder blue-purple 'Bolador-celestesha.'
 - (2) Petiole base red-purple, petiole slightly glaucous (not gray appearing).
 - (a) Root vascular cylinder blue-purple. Collection no. 21.
 - (b) Root vascular cylinder not blue-purple. Collection No. 20.

Because the cultivation of a large number of arracacha cultivars had been declining for several decades, many of them were uncommon in 1963. Most Sibundoy knew the names of only two or three cultivars, and for some, no name was encountered. Preliminary botanical and linguistic investigations suggest the presence of eighteen distinct clones of which the Sibundoy recognize fourteen.

HISTORY

While the arracacha is cultivated in the West Indies, Central America and the Andean region south to southern Peru, its cultivation by both European and native peoples is most intensive in Colombia (5). Because the Sibundoy grow a much larger number of cultivars than is known elsewhere in the New World, it seems likely that the Valley of Sibundoy has been a geographical center in the selection, development and maintenance of cultivars of this species. Sufficient time for the process to have occurred within the valley is indicated by the presence of ancient agricultural terraces now in ruins. Indeed, the arracachas, more than any other

starch sources now grown in the valley, give the greatest indication of cultivation in antiquity and perhaps were the basis of subsistence for that culture which was associated with the terraces. The cultivar 'uatsengelestesha' is thought to be one of the oldest in the valley. Several of the cultivars, such as 'Uatsase-isha' and 'Mantequillishá', are seldom cultivated today and an unusual one with round roots, 'Uashatsequesha', is thought to be extinct. The loss of a cultivar in a particular garden occurs quickly—within one month after harvest—unless it is deliberately replanted. With so few natives growing the rarer cultivars, it is likely that these, too, will become extinct in the valley. In 1963, I attempted to preserve these remnants of ancient cultivation by sending eleven clones (those in the key above) to the Instituto Tecnológico Agrícola, Pasto, Nariño, Colombia, and to the University of Puerto Rico Agricultural Experiment Station, Rio Piedras, Puerto Rico, for further study. Unfortunately, not all the clones have survived outside the Valley of Sibundoy.

The reason for the decrease in cultivation of several clones during recent decades is their moderate yield and the limited possibilities of marketing them to the large European population arriving in this century. The immigrants prefer the white cultivars and especially one they brought with them, perhaps about 1950, 'Shcungve' (Kamsa: 'foreign'), which probably has the highest yield of all. It is similar to 'Uabshajans-uabajatesha', but has larger foliage and larger roots. It was much cultivated by the Sibundoy soon after its introduction, both for their own consumption and to sell to the European population.

COMMON NAMES

1. General terms.

Kamsá: *Iengo, ingo, ingosha*. (see below under descriptive terms for the distinction here.)

Spanish: *Arracacha*, from Quechua *racacha*.

2. Cultivar terms.

The following names of cultivars are those given by Schultes in Hodge (5) and confirmed by the writer's investigations as well as several additional ones encountered in use by the Sibundoy in 1962-63. Only an approximate idea of their meaning is given here.

boladorushq—very white

btsi-isha—large

jojoashq—tender

mantequillishq—butter

shcungve—foreign

tsáshi-ingq—yellow

uabshajans-quetoquensesha – cotton
uabshajans-uabajatesha – gray-petioled, white
 root
uabshajants-sha – white
uaselest-morqasha – purple-ringed
uashatsequesha –
uashetsecacasha –
uatatutubjans-sha –
uatsase-isha – yellow
uatsengelestesha – blue-ringed
uatshe-celestesha – blue-ringed
uatshe-uabajatesha – gray-petioled
uatshe-uachoros-sha – coarse
uatub (f) tseng-uatshe-isha – purple petiole,
 yellow root

The Sibundoy language, Kamsá, is written here according to the system of notation devised by the writer in 1962 (2). Efforts at pronunciation will be most successful within the framework of the Spanish language.

The number of these cultivar names does not indicate the number of cultivars known to the Sibundoy, since some cultivars have more than one name, while others may have none.

3. Descriptive terms.

These Kamsá words apply to parts of the plant and are applicable to all cultivars.

Iengo, ingo – ‘the food of *A. xanthorrhiza*,’ i.e. the several swollen roots (Spanish: *guaguas* ‘babies’) and the central, enlarged caudex (Spanish: *madre* ‘mother’).

Ingosha – ‘the plant’, as a whole; also ‘arracacha cutting’ used in planting.

Jenasha, jenavia – ‘arracacha cutting’ for planting the crop. (Spanish: *colino*, or *malqui* from Quechua).

Ingoshache – ‘arracacha leaf.’ –*qche* is the combining form of *tsubuanache* ‘leaf’.

The cutting, with its enlarged base and green petioles, not only has the potential to become a new plant (*ingosha*), but is symbolic of it as seen in the extension to the cutting of the term *ingosha*.

CULTIVATION AND HARVEST

Planting procedures begin at harvest time. The plant is pulled up with both hands and all the leaves (about 80 per plant) are quickly removed with a machete leaving 10-15 cms. of the petioles. The 25 or so cuttings (*jenasha*), which are technically branches, are broken off and tossed into a pile. The three to five engorged roots are broken

from the enlarged caudex and thrown into another pile. The caudex itself is scraped free of dirt with the machete and thrown with the roots. When several plants have been taken up in this fashion, attention is turned to the pile of *jenasha*. The larger ones are removed and loose soil and any rotting leaf bases are carefully scraped off with the machete. These *jenasha* are left in a separate pile for later planting. During the drier months of December-February such a pile is covered with weeds to prevent drying. Thus, the preparation for planting is accomplished, and the harvest is completed by loading the edible roots and caudices into one of the open-weave baskets (*svarũco*) and carrying it to the house using a tumpline. If pigs are being fattened, as is usually the case, the smaller *jenasha*, those not selected for planting another crop, are also brought in from the garden in a basket.

The problem of storage is largely avoided by making small plantings throughout the year and harvesting a few plants at a time as desired. If necessary, the harvested roots may be buried for two to three weeks but they cannot be stored in this way for much longer.

The time of planting is determined by the stage of the moon, the fifth day of the first quarter being the optimal date. It is thought that the roots will not enlarge if the *jenasha* are planted during the other quarters. Because of this restriction on the time of planting, harvest time must be one to three weeks earlier (“before the new moon”) in order to provide the desired latent period for the *jenasha*. During this period the more vigorous cuttings send out a new leaf, and the few which do not are not planted.

The preferred planting site for arracachas is one with very sandy soil, and if possible one near where *Neonelsonia acuminata* C. & R. is growing. However, there are so few specimens of this species (*ingoshaĩtsn*) growing in the Sibundoy agricultural area that this companionship seldom occurs. Usually the *jenasha* are planted in patches among maize and other plants or in rough rows alternating with rows of maize. They are spaced a meter or more apart.

The planting procedure is to loosen the soil either with a machete or with a pointed stick, in this case called *jenanu(p)fta*. Weeds are removed from an area about 40 cms. in diameter and this is done very carefully if the troublesome weed *kikuyu* (*Pennisetum clandestinum* Hochst.) is growing there. One *jenasha* is thrust diagonally into the loosened soil at each spot.

During the first two months one or two weedings may be required, but there is no further care of the plantings until the arracachas are ready

to be harvested in five or six months. As harvest time approaches, the plantings are inspected to determine the degree of maturity, and if any plants have begun to flower — a rare occurrence — the young flower stalks are removed. (If photoperiodicity is involved in the failure of the species to flower in the Valley of Sibundoy, it should be noted that daylength here close to the equator is constant throughout the year.)

UTILIZATION

Most of the arracacha eaten by the Sibundoy is prepared simply by boiling both the roots and the caudices cut into chunks. Many say it is best when eaten with meat of the guinea pig, *tsājana* (*Cavia*

porcellus L.). Among the various edible tubers grown by the Sibundoy, arracachas are preferred for their excellent taste.

The cultivar 'Uatub(f)tsəng-uatshe-isha', with a yellow root, was formerly much eaten during the old holidays, now abolished by the Christian authorities. It was also ground and fermented to make *chicha* on such occasions.

The cultivar 'Shcungvə' ('foreign'), recently introduced in the valley, is much cultivated by the natives for sale to the European population.

A single medicinal use was reported, the hollow leaf petioles being boiled to make an infusion for bathing feet afflicted with "savañones, a microbe between the toes".

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