THE CAPE GOOSEBERRY AND THE MEXICAN HUSK TOMATO

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The increasing horticultural importance of two species of the genus Physalis, the Cape Gooseberry (P. peruviana L.) and the Mexican Husk Tomato (P. ixocarpa Brot.), as evidenced by current literature in the files of the Morton Collectanea of the University of Miami, has inspired their recent introduction and trial in South Florida, the Bahamas, Puerto Rico and Jamaica. The following presentation is based on a review of the literature referred to and on the personal observations and experience of the authors.

The genus Physalis, of the family Solanaceae, includes annual and perennial herbs bearing globular fruits each enclosed in a bladder-like husk which becomes papery on maturity. Of the more than 70 species, only a very few are of economic importance. Perhaps one of the best known is the Alkekengi, Winter-cherry or Chinese Lantern-plant, Physalis alkekengi L. (P. franchetii Hort., P. alkekengi var. franchetii Makino), widely grown in home flower gardens and by florists for its showy orange-red bladders. Another, familiar in northern gardens, is the Strawberry Tomato or Ground Cherry, Physalis pruinosa L., grown for its small yellow fruits used for sauce, pies and preserves. Though more popular with former generations than at present, it is still offered by seedsmen.

A species which bears a superior fruit is the Cape Gooseberry, Physalis peruviana L. (P. edulis Sims), one of the two subjects of this paper. Reportedly native to Peru and Chile, this species has been widely introduced into cultivation in tropical and subtropical and even temperate areas. It is said to succeed wherever tomatoes can be grown. The plant, growing to 3 ft. in height, has velvety, somewhat heart-shaped leaves and yellow, bell-shaped flowers. After the flower falls, the calyx expands, ultimately forming a straw-colored husk much larger than the fruit it encloses. The berry is globose, about $\frac{1}{2}$" in diameter, with smooth, orange-yellow skin and juicy pulp containing numerous very small seeds. When fully ripe, the fruit is sweet but with a pleasing, grape-like tang.

In Hawaii, where it is called Poha, it is extensively grown commercially. In South Africa, the jam is a staple commodity and the canned whole fruits are exported as “Golden Berries.” In Australia, the Cape Gooseberry is grown on a large scale in New South Wales, where the fruit is apparently marketed primarily in the fresh state after removal of the husk. According to reports from New Zealand, “the housewife is sometimes embarrassed
by the quantity of berries (Cape Gooseberries) in the garden," and government agencies are active in promoting increased culinary use. In China, India and Malaya, the Cape Gooseberry is commonly grown but on a lesser scale.

In England, it was first reported in 1774. Since that time, it has been grown there in a small way in home gardens, and, in recent years, has been carried commercially to a limited extent. Despite this background, early in 1952, the senior author noted advertisements of the Stanford Nursery, of Sussex, announcing the "Cape Gooseberry, the wonderful new fruit, especially developed in Britain by Richard I. Cahn." Concurrently, jars of Cape Gooseberry Jam from England appeared in South Florida markets and the product was found to be attractive and delicious.

With a view to encouraging Cape Gooseberry culture in Florida and the West Indies, seeds have been repeatedly purchased from the Stanford Nursery by the senior author and distributed for trial. No success has yet been achieved in growing the species in South Florida, so far as is known. In the Bahamas, the first seeds sent to Donald Lawrance in Nassau in the late summer of 1952 produced healthy plants and a continuous crop of fruits for three months during the following winter. Additional seeds procured from England and sent to the co-author in Nassau were planted on April 17, 1953. Plants started to blossom in mid-July and from September on continued to flower and set fruit, although no fruits remained on the plants to maturity until the cooler months of winter when a good yield was obtained. Seeds were again planted the following November. Thirteen weeks later, the first fruits were ripening, and by mid-May of the current year a heavy crop was harvested, some plants producing more than 300 fruits each. In late June, the plants were still growing and flowering profusely but only a few fruits were being set and these failed to develop to maturity. This condition continued into September, by which time some of the more robust plants had reached 57" in height with much lateral growth. It is expected that, as in the previous year, there will be abundant fruiting during the winter months. It would appear that the heat of summer is unfavorable for fruit development and, therefore, the best time to plant the Cape Gooseberry in the Bahamas is in the fall so that fruit can be set during the cooler weather and harvested in late spring or early summer. No diseases were manifested in these trials. The leaves of the plants were suddenly riddled by what were apparently flea beetles of the family Chrysomelidae, but dusting with 5% D.D.T. gave effective control. Specimens of Bahamian-grown fruits are shown in the accompanying photograph.

In Jamaica, the initial planting of Cape Gooseberries in late January of this year (1954) made slow growth until June when development accelerated. On August 17th, Mr. J. H. Haughton, Chief Agricultural Officer of the Crop Agronomy Division, Department of Agriculture, reported by letter that the plants had at that time reached 15" in height with much lateral growth, and were flowering and setting fruit. White fly attacks on the very young plants had been controlled by spraying with Gamelin. Flea beetles on the flowering plants were being controlled by regular spraying with nicotine sulfate.

The Cape Gooseberry, an annual in temperate regions and a perennial in the tropics, is best treated as an annual even in tropical cultivation. Some growers have kept plants in production for as long as four years by cutting back after each harvest, but these plants have been found more susceptible to pests and diseases. Seedlings are generally set 1800 to 2150 to the acre with yields of approximately 3000 lbs. of fruit per acre. The fruits are usually picked from the plants by hand, although some growers prefer to shake the plants and gather the fallen fruits from the ground in order to obtain those of more uniform maturity.

In addition to being canned whole and as jam, the fruit is made into sauce, used in pies, puddings, chutneys and ice cream, and eaten fresh in fruit salads and fruit cocktails. The Cape Gooseberry is a good source of vitamins A and B and is high in phosphorus and iron. It is surprising that it has received so little attention in this country in view of its having been reported on with enthusiasm by the late Dr. David Fairchild in his well-loved book, "The World Was My Garden." He there tells of its fruiting "enormously" in the garden of his home, "In The Woods," in Maryland, and of the cook's putting up over a hundred jars of what he called "Inca Conserve" which "met with universal favor."
The Mexican Husk Tomato

The second species of Physalis which is advancing horticulturally is the Mexican Husk Tomato, or Tomatillo (Physalis ixocarpa Brot.). This plant, which is an annual, may attain a height of 4 to 5 ft. but is often prostrate. Its branches and leaves are smooth, not downy, and the flowers are % or more in diameter, with yellow border and brown-spotted throat. The fruit attains 2' or more in diameter and often bursts its straw-colored, tightly-fitting husk. When ripe, the skin of the fruit may be yellow, purple, or, more rarely, reddish or still green, the flesh is pale-yellow, crisp and subacid, and the general character of the fruit strongly suggests a small tomato. The species abounds in Mexico and the highlands of Guatemala where the fruits are commonly seen in the native markets. Until recent years, it had been sparingly introduced into the United States and only occasionally found as an escape, especially in the West. Mr. Sun Jue, now growing asparagus at Belle Glade, Florida, cultivated some 20 acres of Mexican Husk Tomatoes near Los Angeles, California, from 1930 to about 1939, supplying the fruits to the Mexican markets. In 1945, the American Fruit Grower publicized this species under the name "Jamberry" as a new fruit introduced from Ecuador by scientists at Iowa State College. Correspondence was initiated with Dr. I. E. Melhus, Director of the Iowa State College-Guatemala Tropical Research Center and, in 1953, he advised the senior author that the College, as a result of 6 years' testing, was then distributing a strain to which they had given the name, "Mayan Husk Tomato." In a recent letter, Dr. Melhus states: "Last year, 4,000 packets (of seed) were distributed in Iowa and adjoining States. Sampling data to 200 people that grew the plant show over 60% were successful and liked the fruit." In test plantings at Ames, the fruit yield averaged 2½ lbs. per plant, equal to approximately 9 tons per acre. This strain is now offered also by the Earl May Seed Company of Shenandoah, Iowa. An apparently independent introduction was made by Glecklers, Seedmen, of Metamora, Ohio, and first offered by them as "Jumbo Husk Tomato" in 1952. Seeds secured by the senior author from Dr. Melhus, also from Glecklers, and from fruits purchased in the Mexican markets by George Rosner of the University of Miami, were distributed for trial to the co-author in Nassau, to Dr. Taylor R. Alexander of the University of Miami, Dr. R. Bruce Ledin of the University of Florida's Subtropical Experiment Station, Prof. Clery G. Salazar of the University of Puerto Rico's College of Agriculture, and the aforesaid Mr. Haughton in Jamaica. The two trials in Florida were at first promising, the plants flowering and setting fruit satisfactorily. However, as the fruits began to mature, they were attacked within the husk by a species of cutworm and only a few mature fruits were harvested.

In Nassau, seeds were planted by the co-author on April 17, 1953. By mid-September, the plants were fruiting heavily, the better ones yielding 64 to 82 fruits each. The accompanying photograph shows representative specimens of the fruits with and without their husks, and also cut open. The plants were entirely free from insect attack and there was only a slight incidence of leaf spot. The plants reseeded themselves and a vigorous clump of "volunteers" is now growing on the site of the 1953 planting.

In Puerto Rico, seeds planted by Prof. Salazar at Mayaguez produced an abundant crop in the winter of 1953-4. The following report of his second planting has been recently received: "Seed from the previous crop kept well for 6 months without refrigeration, germinating about 80%. Seedlings were ready for the field 21 days after sowing. This crop was fertilized at the rate of 2 oz. per plant, side dressing, of 9-8-8 fertilizer. The plants were staked and tied twice and grew to a height of 5 ft. As a result of a heavy rain, they bent down at the highest tie (2.5 ft.), and the tips touching the ground were found to root easily and grow vigorously. No diseases were observed, despite frequent rains, and no insects attacked the plants. The first fruits were harvested about 18 weeks after sowing the seed. Average weight per fruit was approximately 1 oz., with individual fruits weighing 2 oz. Diameter of the largest fruits was almost 2". Color of the fruit at full maturity (drops) was bamboo yellow."

Mr. Haughton, in Jamaica, was less fortunate. In a letter of August 17th, he reported that seeds planted in late January produced vigorous and precocious plants which flowered when only 4' high. Fruit-setting began in May and a high yield was expected but nearly
all of the fruits were damaged by caterpillars before reaching maturity. Means of controlling the caterpillar infestation will be sought in future plantings.

With the Mexican Husk Tomato, falling of fruits before ripening is not uncommon, and according to Dr. Melhus they may be allowed to remain on the ground until fully colored. The above-mentioned Mr. Jue advises that the green-skinned variety grown commercially by him was harvested as soon as it burst its husk, and the crop was then kept on hand 2 to 4 weeks for the husk to dry before the fruit was considered acceptable to the consumer. This species, in contrast with the Cape Gooseberry, is used more largely as a vegetable than as a dessert fruit. In Mexico, it is commonly made into a sauce for meats, alone or together with chili peppers. Suggestions for use distributed by Iowa State College include recipes for stewing, frying, baking, cooking with chopped meat, making into soup, salad, marmalade and dessert sauce. In culinary trials in Nassau, the fruit was found a most acceptable addition to soups, to which it seemed to impart a definite chicken flavor. In South Africa and in Queensland, Australia, the Mexican Husk Tomato has fruited prolifically. According to Dr. Margaret Menzel, an authority on the genus, the so-called Physalis macrocarpa, or "Golden Nugget Cape Gooseberry," offered by seedsmen in Australia, is really a yellow-fruited form of the Mexican Husk Tomato, P. ixocarpa. It has been utilized commercially for jam in Australia but the product is there
considered inferior to that made from the true Cape Gooseberry (*P. peruviana*).

In Yucatan, the Mexican Husk Tomato is reported to be a good source of iron, calcium and phosphorus and an excellent source of Vitamin C. It is quite possible that the chemical analyses of “Tomatillos” and “Miltomates” made by Munsell, Williams, et al., and published in “Composition of Food Plants of Central America II. Guatemala” (Food Research, Vol. 15, No. 1, 1950) and attributed to *Physalis pubescens* L., and *Physalis aequata* Jacq., are applicable rather to *P. ixocarpa*, for various species of *Physalis* have been subject to much confusion in literature and in the trade.

Further tests of both the Cape Gooseberry and Mexican Husk Tomato will be made in Florida. Both species may eventually prove to have some value as quick crops for Florida gardens.

**SELECTED REFERENCES**


Melhus, I. E. Personal communication. May 8, 1953.

**MEXICAN HUSK TOMATO (Physalis ixocarpa Bro.)**

Grown by Oris S. Russell, Government Experiment Station, Nassau, Bahamas. (Photo by Minns.)
Photography is a profession which, until recently, had been practiced by relatively few people. Simplification of the mechanics of photography by faster image registration of film and smaller, handier cameras has opened the field to practically everyone. Many people still believe that photography is not for them. However, in gardening these same people can remember the Latin names of their plants, can tell when the plants need fertilizing and spraying, possibly even know what materials will injure certain plants and not others.

It is probably true this knowledge was not inborn but acquired through trial and error and by diligent study. Little study is necessary to learn to operate a camera and exposure meter. The directions for operations of each is written in such a manner as to be understandable to the average person. The equipment available is variable and individual preferences vary. In 1951, Mr. Pasco Roberts gave a paper before this society presenting some of the equipment for use in photographing flowers and plants.

Color and black and white film are available for most cameras. Most people interested in taking photographs of their gardens are using color film. The resulting photograph is usually more pleasing to them than black and white photographs even though the colors may be off-shade, the photograph covering too large an area or the background blending with the subject.

The two things which probably result more often in unsatisfactory photographs are light and conflicting background. Both are essential parts of a color photograph. The camera being a machine is not capable of adjusting itself for intensities of light or disregarding the background such as is the case with the human eye.

Both types of film register colors and shades—the difference is, black and white film registers them in shades of grey while color film registers nearly exact colors. Registration of color by shades of grey on black and white film often results in the subject being registered in the same or similar shades of grey as that of the background. The photograph produced is often not up to the expectations of the photographer. Mr. Roberts emphasizes the use of light filters to remedy the similar registration of colors on black and white film.

Registration of color by color film is in colors as nearly correct as is possible. The film is tested for color correctness by the registration of color exposed under the daylight conditions of Washington, D. C. It has been noticed by a number of color photographers operating in Florida especially in southern Florida, that photographs taken in full sunlight were overexposed. Trial and error of several commercial color photographers found the average color photographer could use a Skylight filter without previous experience in the use of filters. The results obtained indicate that the filter gives a truer color rendition under Florida light conditions than is obtained without its use. The proper rendition of the colors registered by color film is very dependent upon the intensity of the light reflected from the subject. Use of an exposure meter is al-