

AVOCADO EXPLORATION IN MEXICO- MAY, 1952

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Previous visits by members of the Foreign Exploration Committee to the areas of Mexico where avocados are indigenous have resulted in the knowledge of several new localities from which "wild" avocados are reported but which have not been explored by members of the committee or other horticulturists. It was in an attempt to trace down some of these reports and to obtain propagation materials of some species definitely known to exist in the areas that Harlan B. Griswold and I had planned to spend three weeks in Mexico in May, 1952. Upon the invitation of a committee member, Henri Gilly, who lives near Atlixco in the state of Puebla, we covered several thousand miles by air, bus and private car and examined a wide range of avocado plant materials. Traveling by air from Tijuana, Mexico, we left on May 9th for Mexico City, where Mr. Gilly met us the following day. The three of us drove in Gilly's car northward about 150 miles to picturesque Tomasunchale, from which, heading northward and westward for about twenty miles, we reached a small village, Xilitla, located in the mountains at perhaps 2,500 feet elevation. Carl Crawford, who has visited many parts of Mexico in search of "wild" avocados, had been aware of the avocado type from this area. The local flora and crops of mango, coffee and papaya indicated the semitropical aspect of the climate which exists there. Along the roadsides and growing uncultivated except as shade, we observed the "wild" avocado of Xilitla, the objective of this particular side trip. The trees were not plentiful, but were scattered over the mountainsides and in the coffee plantations. Some specimens attained heights of 40 or 50 feet with trunk diameters of 15 or more inches at waist height. The leaf form of these trees was typical of cultivated avocado. Upon crushing the leaf, however, no indication of the anise odor could be detected in several specimens which were tested. The fruits were of two types, nearly round and long pyriform. They were of small size, the largest about two inches in length. Some of the fruits had attained nearly full maturity and were partially black colored. It is possible that some of the green fruits observed would have maintained the green skin color even *K* maturity. The seed of these fruits was large, the flesh ranging in thickness from an eighth to somewhat less than a quarter of an inch. We learned upon inquiry that this fruit is seldom eaten and almost never harvested. Such fruits are known as "aguacate cimmaron" or the true "wild avocado" of that area. Seed and scions of the specimens were brought back to California. Only the seed have survived. The cultivated avocados in the area of Xilitla appear to be of two kinds: the typical Mexican type, "aguacate oloroso," and the West Indian, "Pauhua," the latter having very large fruit. Fruits of the latter two kinds were not mature at the time of our visit, so their quality was not ascertained.

A specimen of *Nectandra* sp., a relative of the avocado *Persea americana* was also

observed in the area, but it was without fruit. Scionwood of this species failed to survive the fumigation treatment when brought to California.

Returning via Puebla we stopped at Xahuentla, the hacienda of Mr. Gilly, to observe the spectacular development and excellent fruit crop in his extensive avocado orchard. He is developing commercial orchards of two varieties, Fuerte and Hass, both of which appear to be well adapted and fruitful in this area, only three miles from Atlixco, the home of the parent Fuerte tree. We left Mr. Gilly at Atlixco and traveled by bus southward to Oaxaca, a distance of about 300 miles through countryside similar to that found in the more arid rolling hills of California and Arizona. Organ pipe cactus and *Ocotlea* dominated a considerable portion of the flora. This arid landscape was terminated in the verdant Oaxaca Valley. After a brief stay of three days in Oaxaca we again took a local bus twenty-five miles eastward to Mitla, which lies in an arid area at the base of the mountains. Arrangements had been made at Mitla to meet Boone Halberg, a young man from California who lives in the mountains some fifty miles east of Mitla. Mr. Halberg was to take us on animals to the village where he has lived high in the mountains on the edge of a high tropical rain forest, where the avocado grows wild in many places. He has found the "wild" avocado of that area growing under apparent adverse conditions of very high rainfall and in wet soils. Because of the failure to obtain animals and the exceedingly heavy spring rains which inundated the area at that time, it was considered advisable to postpone the trip indefinitely. We had not allotted sufficient time nor were we prepared physically to hike for six days in heavy rains over mountain ranges at elevations of ten and eleven thousand feet to reach the avocado trees, hence our objective in that area was not attained. The reports of the avocado specimens growing where the rainfall is 200 or more inches per year is very alluring. This area should definitely be explored when proper arrangements can be made to approach the forest in the proper season and with adequate equipment. We were sadly disappointed at our inability to reach the desired goal, but were partially compensated by a pleasant afternoon visiting the local Indian ruins of Mitla with their exquisite inlaid tile mosaics.

We returned to Oaxaca by bus and thence by plane to Mexico City. Again via bus we passed eastward through colorful Puebla Valley and arrived at Orizaba, in the state of Vera Cruz. Orizaba is a town of interest and memories to members of the California Avocado Society who participated in the 1948 Mexican tour and to several of the Foreign Exploration Committee who have stayed there at Hotel de France at various times.

Previous attempts to reach the nearby town of Huatusco had failed primarily because of unsatisfactory transportation to the then inaccessible area. A new modern highway and the excellent bus service now available make this mountain town an easy objective. Huatusco is located in the mountains between Orizaba and Jalapa on the northeast slope of Mt. Orizaba. It is from this area that an old German botanist, Dr. Purpus, reported the occurrence of wild avocados of several types. We were fortunate to contact an American, George Williams, who has lived in Mexico for many years and who then lived near Huatusco. Through him and other townspeople we attempted to locate the trees reported by Dr. Purpus. It was determined that these unusual types of avocado probably were those growing near some small Indian villages still higher up the surrounding slopes of Mt. Orizaba, but these areas could only be approached by

horseback of one or two days' duration. Again our lack of preparation of time and equipment for such a journey prevented the exploration of the higher mountain areas.

When we explained to George Williams the purpose of our trip, namely to obtain avocado rootstock materials which might be resistant to wet and poorly aerated soils, he immediately suggested that we look for seed of the chinnini, *Persea schiedeana*, which he frequently had observed growing in heavy rainfall areas in south Mexico in the state of Chiapas. He told us of some specimens of the same chinnini which were growing near the bottom of a small canyon near his home on the outskirts of Huatusco. He had observed these specimens for several years and had noticed they exhibited some degree of frost resistance compared to the surrounding flora. We went to see the trees. Upon examination of the specimens and the environment we noted that the trees were growing in a heavy soil, high in clay and saturated with moisture. The trees were near the bottom of a small ravine which was a natural drainage basin for a considerable area. The soil must have been saturated for a greater portion of the year under these conditions, yet there was no indication of root-rot or signs of die-back on the specimens. The adverse conditions under which the trees thrived indicated that possibly some degree of resistance might be found in their root systems. We collected scions and seed of one of the specimens and sent them to California. The seedlings are now under observation and experiment, but the scions failed to survive.

George Williams walked with us back to the town of Huatusco. We observed several cultivated avocado trees in the fincas and dooryards along the road, but none of unusual nature. We then returned to Orizaba by bus in a fast ride downhill.

The numerous coffee fincas in and near the town of Orizaba also have as shade trees the chinnini, *Persea schiedeana*. As we walked along several of the quaint side roads toward the northeastern edge of town a number of chinnini trees were observed in fruit. The trees were large, up to 50 or 60 and more feet in height, some with considerable spread of top. The fruits exhibited a wide range of size and quality. None of these trees are propagated vegetatively, hence no horticultural varieties have been established. Some fruits are long, up to 6 or 8 inches, with slender necks, large, long-pointed seed and little flesh. Other fruits are more spherical with smaller seeds. The quality of the flesh is variable from poor to only moderately good. I have not tasted a chinnini fruit which is equal to any medium quality avocado grown in California.

Another unusual type of avocado fruit was found in the market in Orizaba. Apparently it was grown in the nearby countryside but its exact place of origin could not be determined. The fruit was oblate in form, about three inches in diameter and light green in color. The skin was medium thick, but not leathery, the flesh light colored and sparse, and the seed large and distinctly oblate in form. Some seed was collected and sent to California. The seedlings are now growing in the experimental collection. I have not observed this type of avocado in other parts of Central America or Mexico. The seedlings which are now growing differ slightly from ordinary cultivated avocados in the general appearance. These will be observed with considerable interest.

A brief journey was made by car to the mountain town of Aquila near Orizaba, where the species *Persea floccosa* was obtained during our 1947 expedition. We examined the few available specimens of this species which were easily accessible, but found no

fruits this year. Budwood was collected but it failed to survive. We now have the species well established in California from the previous importation, so were not disappointed at the failure of the budwood.

We returned to Mexico City from Orizaba on May 28th by bus and immediately took a plane for Tijuana. The large package of budwood of the various collections was surrendered to the agricultural officers at the border, where it was forwarded to San Francisco for proper entry and fumigation. The entire collection of budwood was dead upon arrival at its ultimate destination as the result of the fumigation treatment required by law. We were fortunate enough to have collected seed of nearly all the specimens. These seed were forwarded to California through official channels to be grown under post-entry quarantine for experimental purposes and for scientific observation. A high percentage of the seed materials has survived and is now growing under observation. Thus we were able to successfully introduce into California *Persea schiedeana* from at least three clonal sources and two probable new species of avocado, one from Orizaba and one from Xilitla.