

EXPLORING FOR PERSEA IN ECUADOR

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Figure 1. Area explored for *Persea* in Ecuador

Ecuador with an area of 104,479 square miles is split by the Andes in South America, thus has variable climates, ranging from tropical and subtropical to cold climates. Even though this country is crossed by the Equator line, it has both mild and cold climates.

The area explored for *Persea* (see Figure 1) is part of the high-lands, that include Quito, 9,320 feet above sea level, and at similar altitudes Otavalo and Ibarra. The highlands in the Cotacachi region (Figure 2) are inhabited by natives that include certain indian Inca groups. Latitude zero was crossed to travel to Ibarra from Quito, Ibarra being the capital of the province of Imbabura.

Some collections had been made in Ecuador in 1956 by G. A. Zentmyer, but the trip by

E. Schieber early in 1974 provided opportunity for more extensive collections and trips to other parts of the country. Notes from the 1956 trip are as follows: "With the exception of the experimental plantings most of the avocados in Ecuador are Mexican-type seedlings with small fruit, some purplish, some remaining green.



Figure 2. Cotachi region and volcano seen from Otavalo.

Occasional trees were found which look like Mexican types but have no anise odor in the leaves; this type was particularly common at the Hacienda San Vicente in the Chota Valley, an isolated valley in the north of Ecuador near the Colombian border. Some huge old trees were seen, 80 to 90 feet in height. No native species of *Persea* were found in Ecuador, though it is rumored that there are *P. americana* types in the eastern part of the country."

Zentmyer's report of 1956 also commented that no *Phytophthora cinnamomi* was found in Ecuador, though several cultures were made. Verticillium wilt, Dothiorella canker, and Armillaria root rot were found in the Guayllabamba Valley in Ecuador at that time, however. In 1956, collections were made of *P. americana* types from Ibarra, Chota Valley, and Tumbaco.

During March, 1974, the exploration for *Persea* was made by the senior author in Ecuador. The explorations were carried out in the Provinces of Pichincha and Imbabura, north from Quito towards neighboring Colombia.

In the Pichincha province, the valley of "Guayllabamba" was explored, and in the province of Imbabura, the regions of "Atuntaqui" "San Antonio de Ibarra" and "Ibarra." Market collections were made in Otavalo near Ibarra, where materials from the "Valle del Chota" were obtained. Twenty-six collections were made during this visit to Ecuador.

We were astonished to find here a large population of *Persea drymifolia* (typical "Mexican" race of avocado) trees starting in Guayllabamba down to the Chota Valley. These are called "Nacional" or "Nacionales" as the word "Tzitzí" is used for similar types of avocado trees in Chiapas, Mexico. However, these "Nacionales" were possibly

introduced to this region hundreds of years ago by the Spanish missionaries. A natural cross between "Nacional" and the "Antillano" of Ecuador may have produced the varieties known in Ecuador as "Guatemaltecos."

What actually is widely grown are first the "Nacionales" (as the Tzitzit types of Chiapas, Mexico) and the "Guatemaltecos." In addition we saw great quantities of "Fuerte" in the markets, the variety that has been expanded greatly in Ecuador. Future plantings are planned with this variety.

REGIONS EXPLORED

1. Valley of Guayllabamba.

Sixty-four kilometers north from Quito is the valley of Guayllabamba, at an elevation of 2,139 meters above sea level, driving toward Ibarra. It is still in the Province of Pichincha and not in Imbabura. Fruit collections were made of "Nacional" (*P. drymifolia*) and one of "Guatemalteco." Some "Nacionales" trees were over 100 years old in this region.

In the huerta de Espinoza we could observe some of the "Guatemaltecos" varieties like Ecuador 14371 that is also called Guatemalteco. This Guatemalteco is a cross between an "Antillano" from Ecuador and a Mexican (*P. drymifolia*). A total of 16 collections were made in Guayllabamba valley, most of these "Nacionales."

2. Atuntaqui Region

At 2,200 meters above sea level, Atuntaqui is situated in the Imbabura Province near Ibarra.

Here many *P. drymifolia* trees were observed. Among these was Ecuador 17, with strong anise odor of vegetative parts, a tree approximately 30 years old. This variety is called Nacional but is of course Mexican with fruit round and purple like "Matuloj" trees in Guatemala and with green flesh and somewhat pointed seed.

3. San Antonio de Ibarra Region

Near Ibarra, trees of "Nacionales" (*P. drymifolia*) were observed in almost every campesino's (small farmer) property as in Chiapas, Mexico. The avocado trees are planted between corn. Zinc deficiency was evident in some trees as observed also in Guayllabamba.



Figure 3. Market scene in Otavalo, Province of Imbabura.



Figure 4. "Nacionales" (Mexican race) in Otavalo.

4. Ibarra Region

At 2,205 meters above sea level, is the capital of Imbabura province.

Here at the "Granja Agrícola" of the Ministry of Agriculture, we could see the first introductions made by Tamayo and Manuel Chico in 1935-37 from Guatemala through Dr. Wilson Popenoe. Among these: Fuerte, Nabal, and Puebla. The propagation of Fuerte in Ecuador has been made from this Granja originally.

A disease is present in younger trees which has the characteristic symptoms of avocado root rot. Dying rootlets were examined. Soils here are heavier than in Guayllabamba valley. Zentmyer reported in 1959 "Armillaria root rot" from the

Guayllabamba valley (1). It could be that the disease observed at Ibarra is the same, however in the future, isolation work is needed at Ibarra to clarify the identity of the pathogen.

Agronomists that accompanied the senior author, said that there is a wild avocado called "aguacatillo" in the mountains of Ibarra.

5. Chota Valley

At 1,800 meters near the equator this is a sub-tropical area. All collections made of valle del Chota, were made at the Otavalo market. Nine collections mainly Nacionales were made from this region.

LITERATURE CITED

1. ZENTMYER, G. A. 1959. Avocado Diseases in Latin America. Plant Disease Reporter. Vol. 43(12)-1229.

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