

Collecting Pouterias (*Pouteria* spp.), Sapodilla (*Manilkara zapota*) and Caimito (*Chrysophyllum cainito*) on the Pacific Coast of Costa Rica and Nicaragua

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***Abstract.** The pouterias, sapodilla and caimito are all members of the family Sapotaceae native to Central America. These fruit are important local commodities throughout Tropical America, and with sapodilla, in Tropical Asia as well. These crops have considerable potential in the Americas and throughout the tropical world as local and export commodities; however, considerable obstacles remain in terms of horticultural management. Furthermore, genetic resources are poorly understood and generally lacking for the systematic development of these crops. Fairchild Tropical Botanic Garden (FTBG) located in Coral Gables, FL, USA has been active in the collection of these crops for the last decade throughout Central America. Collecting has intensified in the last two years with a concentration on collaborating with local contacts in Costa Rica and Nicaragua who are directly involved in the harvesting and marketing of the local fruit. Such collaborations have allowed for the identification, collection and importation of superior selections of each of these crops, nearly exclusively from seedling trees within home gardens on the Pacific Coast of Costa Rica and Nicaragua. New collections of the pouterias have concentrated on 3 species (*Pouteria sapota*, *P. viridis*, *P. fossicola*) and possibly hybrids among them. Emphasis has been placed on selections for the fresh market with superior production, fruit quality and horticultural traits of the tree. With sapodilla an emphasis has been placed on the selection of superior fresh fruit and also trees with superior horticultural traits. Caimito collections have been more modest due to difficulty in propagation, and the emphasis has been on the selections of superior fresh fruit. Collections have also been made of other species in the Sapotaceae with potential as rootstocks for commercial use.*

The pouterias, sapodilla and caimito are all members of the Sapotaceae and are important fruit crops in Tropical America, both as subsistence crops and as local and export commodities. The sapodilla and to a lesser extent the caimito have also become important crops in Tropical Asia, where they are grown for local consumption and increasingly for export. The potential of these fruit crops is considerable in Tropical America and in Asia, but there are considerable obstacles to their horticultural development. In order to address these challenges for their horticultural development, diverse, well documented genetic collections must be made available to breeders and growers. However, for all of these crops there is a serious lack of systematic work on genetic preservation.

Fairchild Tropical Botanic Garden has been active in the collection and conservation of living genetic collections of the pouterias, sapodilla and caimito for the last decade, and in the last 2 years efforts have been intensified, particularly in Central America. The objectives of this paper are to present an overview of our collection activities with these crops over this time period.

Fairchild Tropical Botanic Garden was successful in securing funding for plant collecting in the last 3 years (Campbell, et al., 2006). These grants allowed for hiring of plant collectors and the use of funds with collaborators in Central America. Our efforts have concentrated on local collaborations throughout Central America, with those directly involved in the harvesting and marketing of the local

fruit. Such collaborators have personal experience with the identification and collection of superior selections of each of these crops. Collections have focused on seedling trees within home gardens on the Pacific Coast of Central America. Scion material was collected from each tree and grafted within collaborating nurseries in Central America. The bare-rooted, grafted trees were subsequently imported to Coral Gables, Florida, USA, where they served a quarantine for pests and diseases and then into the field.

Pouterias. The designation of this group is based on nearly two decades of collecting experience of *Pouteria* species throughout Central America. FTBG horticultural scientists have begun to look at the pouterias as more of a continuum of closely related species throughout Central America. These species separate out by latitude and altitude, but there is some evidence of hybridization and where humans are involved (which is nearly always) the lines of separation are further blurred. New collections of the pouterias have concentrated on 3 species (*Pouteria sapota*, *P. viridis* and *P. fossicola*) and possibly hybrids among them. Emphasis has been placed on selections for the fresh market with superior production, fruit quality and horticultural traits of the tree.

Figure 1. Pouterias from the Pacific coast of Costa Rica and Nicaragua.



Hot spots of diversity for pouterias have been identified in several regions, including the Central Pacific Coast of Costa Rica and near Lake Nicaragua in southern Nicaragua (Carrara et al., 2003; Carrara et al., 2004). These two regions have shown the greatest diversity in form and quality of the fruit and the trees of pouterias. We currently have a total of 45 new selections from Tropical America in the genetic collections at FTBG. The most important distinctions in these new selections are skin color and texture, flesh color and quality and also in the total production of the tree and multiple cropping. The oldest trees in the field are less than 3 years of age, thus it is not possible to determine if these traits will be consistent under our conditions. Blooming has begun on some selections, but it is

not clear if these selections are more precocious or if the blooming is due to specific environmental conditions.

Sapodilla. With sapodilla an emphasis has been placed on the selection of superior fresh fruit and also trees with superior horticultural traits. Unlike the pouterias, the sapodilla diversity throughout Central America has been more difficult to locate. Wild-type sapodilla are common throughout all of Central America, but the greatest diversity of quality selections has come from a single farm in southern Nicaragua, near Rivas. This 10-ha farm has a surrounding windbreak row of seedling sapodilla planted nearly 80 years ago. Among these seedlings are fruit from 100 to over 900 g in weight, flesh colors ranging from brown to white and even yellow and a wide range of growth habits. Collections have been made from this farm and are now in the field at FTBG in South Florida, USA.



Figure 2. New sapodilla selections from southern Nicaragua.

We have no good explanation for the wide diversity of sapodilla material found on this single farm in Nicaragua and we have been unable to locate other regions of high-quality diversity for sapodilla. There are 25 new accessions of sapodilla from Tropical America in the FTBG genetic collections. Our collections of sapodilla also include quality clones from Tropical Asia (Campbell and Ledesma, 2003). Many of these Asian clones possess much superior growth habits to those of the Tropical American selections. As with the pouterias, the sapodilla are young and not yet fruiting appreciably.

Caimito collections have been more modest due to difficulty in the location of superior selections and challenges in propagation. The emphasis has been on selections from the Pacific coast of Costa Rica in the region of Esparza. These selections are purple and green skinned and were selected for superior production and fruit quality. We have been unsuccessful in the identification of regions with a wide diversity of quality selections.



Figure 3. Caimito selection from the Pacific Coast of Costa Rica.

Literature Cited.

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