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The Pejibaye Palm (Bactris gasipaes) Comes of Age

CHARLES R. CLEMENT AND JORGE MORA URPÍ

Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil and Escuela de Biologia, Universidad de Costa Rica, San José, Costa Rica

In 1921, Wilson Popenoe and Otón Jiménez published the first modern article on Pejibaye pointing out the enormous nutritive and commercial potential of this palm (see Journal of Heredity 12(4): The Pejibaye: a neglected food plant of Tropical America). Since that article various persons at various times have initiated studies on Pejibaye resulting in a certain amount of information, most of which supported Popenoe and Jiménez's thesis. Unfortunately these beginnings did not have the required continuity. As a result, knowledge about Pejibaye expanded slowly and irregularly until the mid-1970's. At this time several individuals and institutions turned their attention to Pejibaye and contact between these interested groups in different countries became more regular. The result of this international attention to Pejibaye in Latin America was that on 29–30 September 1980, the First International Meeting on Pejibaye Genetic Resources was held at CATIE, Turrialba, Costa Rica, sponsored by the International Board of Plant Genetic Resources—IBPGR. This report is a brief outline of the discussions and recommendations of the reunion.

The taxonomy of Pejibaye was found still to be unclear. Evidence from diverse authors seems to indicate that *Guilielma* should be recognized at some taxonomic level. Martius described the genus, and it was accepted by Dahlgren and Bailey. Tomlinson, in his Anatomy of Monocotyledons—Palmae, supports this thesis on an anatomical basis. However, McBride, in the Flora of Peru, suggests its maintenance as a subgenus, while Glassman denies its existence by putting all *Guilielma* spp. into *Bactris*. Unfortunately, no new taxonomic information was available at this time, and it was therefore recommended to follow the recent trend of using *Bactris gasipaes* HBK, while acknowledging the possible usefulness of *Guilielma* as a taxon, indicating a probable evolutionary relationship among these species. A request was made at the reunion for international help to sponsor a detailed morphological, anatomical, palynological, and taxonomic revision of this complex to clarify the classification and to identify the closest wild relatives of *B. gasipaes*. The hypothesis that Pejibaye may be of hybrid origin was put forward so that this alternative could also be included in the proposed study.

The principal objectives of the meeting were to determine the state of Pejibaye germplasm collections in the participating countries (Brazil, Colombia, Costa Rica, Panamá), to study the origins of these collections, and to determine the areas for priority exploration and collection in order to obtain the most promising genetic resources as soon as possible. Because Costa Rica has given greater emphasis to Pejibaye research for more years than any other country, it has the most ex-

tensive collection, both in terms of numbers and origin of the material. Brazil and Colombia follow with relatively small collections which reflect the more recent origins of their programs. Panamá, with the most recently initiated program, has the smallest collection. Other countries within the area of distribution of Pejibaye have not yet organized germplasm collections.

Discussion of the origins of these collections showed that most acquisitions are from reconnaissance surveys covering approximately 15% to 20% of the total area of distribution of Pejibaye. Only about 1% of this area has been well explored, primarily in Costa Rica and in small areas of Colombia and Brazil. Not all of the remaining areas needing exploration are of equal interest in terms of germplasm for breeding programs. However, it was recognized that future germplasm needs are largely unknown and that most of the existing genetic variability should be collected. Because of the vast area in which the Pejibaye occurs and the need to obtain representative samples of as many ecotypes (especially the most immediately important ones) and related wild species as possible, a list of priority exploration areas was drawn up. Due to the extensive distribution of Pejibaye these priorities will still only cover about 25% to 30% of the known area of distribution, with emphasis on a few populations known to be especially promising because of fruit characteristics and spinelessness. Included also in the list were areas known to contain populations that are not so immediately valuable but appear to be threatened with extinction, either by the eradication of small farms by cattle ranching, by a lack of interest in the crop, or by the substitution of newly introduced Pejibaye with better fruit characteristics. Including these less immediately important genotypes in the collections ensures that they will be available for future breeding programs.

The importance of extensive germplasm collections was also recognized as a source of resistance to diseases. This observation was made while considering the exchange of material and quarantine. Although Pejibaye is not now attacked seriously by any disease, it was recognized that several palm diseases occur in the Caribbean region, notably lethal yellowing and hartrot. This second is already in Surinam, which is within the distribution of Pejibaye, and although it attacks several cocosoid palms in that country, no information was available about Pejibaye's susceptibility or resistance. No documented information was available about lethal yellowing and Pejibaye. It was therefore recommended that IBPGR help to arrange studies on these diseases in relation to Pejibaye, and in the meantime, strong palm quarantine measures be applied when genetic material is transported between affected and non-affected areas.

A partial annotated bibliography was prepared for the meeting; this can be obtained from the Biblioteca Conmemorativa Orton, CATIE, Turrialba, Costa Rica. For those who are interested, a copy of the detailed report, from which this summary was drawn, can be obtained by writing to the International Board of Plant Genetic Resources—IBPGR, FAO, Via delle Terme di Caracalla, Rome 00100, Italy.

This meeting brought together the principal researchers presently active in Pejibaye studies. Although the meeting was specifically about genetic resources of this crop, many other subjects were discussed. One of the principal observations made was that the number of people working, and the

importance that institutions are attaching to this work, indicates that there is now sufficient international, if not national, cooperation to take the studies in Pejibaye to their logical conclusion—that of developing this palm as a major humid tropical, perennial crop to supply carbohydrates, oils, proteins, vitamins, and income to the people of this region, just as Popenoe and Jiménez pointed out 60 years ago.

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NOTES ON CULTURE

Get Those Palms in the Ground

Almost without exception, palms grow faster with their feet in the ground. Once a container is filled with roots and the nutrients have been used up, growth will slow appreciably. The theory that palms enjoy being rootbound is a myth. The part of the palm we see above ground is directly proportional to the size and health of its root system.

We surface dwellers only enjoy the portion of the palm above the surface, but if we could share the view of the earthworm, we would appreciate how extensive palm root systems are. This spring, while putting in new plantings, I was suprised to find palm roots growing many feet beyond their drip line. Large, fleshy roots were growing horizontally at a depth of 1 to 3 feet.

Many of us water only around the base of a palm or to the drip line. Instead of frequent, shallow watering, less frequent, and deeper soaking of an area several times larger than the palm head would be more effective. To conserve water and direct it to the plant, a large basin should be constructed.

The method I use for palm planting and basin construction is as follows: a suitable location is selected and the hard surface of the soil is soaked for a few days before digging. A soil amendment is spread to a depth of 4 or 5 inches, or about 2 wheelbarrows full for a five gallon palm. For an amendment, any organic material such as nitrogen-treated saw dust or well-rotted manure is suitable. Using a rotary tiller, I go back and forth over the area until the soil has been thoroughly mixed with the amendment to a depth of about 10 inches. This homogenized mixture is then easily dug out with a shovel and piled to the side of the hole. This process is repeated several times until the walls of the hole become too steep to use the rotary tiller. A large rectangular hole about 18 inches deep can be dug using this method. If additional depth is required, the soil at that depth is soft and can easily be dug with a shovel. The hole should be at least 6 inches deeper than where the root ball will rest, then partially refilled with the loose mixture from the hole. The palm, in its container, is set into the hole and soil is either added or taken away until the proper planting depth is determined.

The palm is removed from the hole and the bottom of the hole is watered. The palm (previously soaked for several days with a vitamin B-1 solution) is removed from its container and placed in the hole. The root ball is quickly covered with the homogenized mixture, minimizing root exposure to sun and wind. Firm the backfill material with your hands or the heel of your shoe until three-fourths full. Water thoroughly to settle the plant and eliminate air pockets, and check to see that the top of the root ball is slightly above soil grade, as some fur-