

## Trinidad and Tobago, the Birthplace of the world-famous Trinitario cocoa

Frances Bekele

Cocoa Research Centre, The University of the West Indies

*This is a serendipitous love story – the tale of how two cacao varieties, the charmingly sweet Criollo and the macho Forastero met up on the island of Trinidad and, after a long romance, produced a little ‘mixed Trini’ that was as strong as his father and as flavourful as his mother. They called him ‘Trinitario’, and the world came to love him.*

Every chocolate lover should know that Trinidad and Tobago is the **birthplace** of Trinitario cacao trees that produce Trinitario cocoa beans. Criollo and Trinitario beans are among the select (premium) cocoa beans collectively known as “fine or flavour” cocoa that is used to manufacture fine (dark or gourmet) chocolates and couvertures, and commands premium prices on the world market. For those Trinbagonians, who enjoy dark chocolate, and indeed all others, being the ‘cradle’ of Trinitario cacao and cocoa is a very laudable distinction for our twin-island republic (also the birthplace of steelpan).

Trinitario cacao is not known in the wild state; it is not found at the presumed centre of genetic diversity of cacao, *Theobroma cacao* L. (in the vicinity of the headwaters of the Amazon River, South America). It only exists in cultivated areas. The term “Trinitario” was coined by the Spaniards, most likely in Venezuela, and means “from Trinidad”. Trinitario cacao is the product of crossing, which first occurred in Trinidad, between the Criollo (“native”) cacao, originally introduced by the Spanish colonists into the island in the 16th or early 17th century, and Forastero (“exotic”) cacao that was later brought in from Venezuela after a “blast”, in 1727, destroyed the original Criollo planting (<https://doi.org/10.1080/15427528.2012.663734>). This crossing (hybridisation) occurred between these imported Forasteros and the surviving Criollo

plants **in Trinidad**. The Forasteros were most likely “Amelonados” (‘Calabacillos’) from the Orinoco estuary. The crossing did not occur previously, in the wild, since the Criollo and Forastero cacao there were separated by physical barriers such as mountains.

### **The journey of *Trinitarios***

The term, “Trinitario”, was possibly first used to designate vigorous cacao planting material from Trinidad that was introduced into Venezuela in 1825. This planting material was the product of crossing between Criollo and Forastero that had occurred in Trinidad & Tobago post 1727. Later, Venezuelan Trinitario, known as “Trinitario de Venezuela” or “Carúpano”, resulted from crosses between the introductions from Trinidad & Tobago and Criollo in Venezuela. Currently, Venezuelan “Carenero” and “Rio Caribe” Trinitario varieties are very highly regarded due to the fine quality of the chocolates produced from their beans.

Trinitarios were later transferred from Trinidad & Tobago and Venezuela to other countries in the Caribbean such as to Dominica, the Dominican Republic, Guadeloupe, Guyana, Haiti, Jamaica, Martinique, St. Lucia, St. Vincent & the Grenadines and Suriname, and further afield to Central and South America (including Costa Rica and Mexico and Ecuador, respectively), and to Fiji, Indonesia, Papua New Guinea, Madagascar and Samoa in S.E. Asia, and the African countries of Cameroun, Ghana and Nigeria. In fact, Trinitario cacao is currently found wherever there has been or exists a mixture of Criollo and Amazon Forastero cacao planting material in close proximity.

In Ecuador, hybridisation occurred between Trinitarios, introduced from Trinidad in 1890 (according to the late Dr Francis J. Pound in 1938), and the prized “Cacao Nacional”. In the 1970s, 90% of the production of cocoa in Ecuador was obtained from Trinitario plantations. Some of the Trinitario types in Ecuador were called “Venezolano verde” (with green pods) or “Venezolano morado” (with red pods) and were introduced from Venezuela between 1930 and 1940. They replaced much of the original “Nacional” cacao, from which the highly valued “Arriba” cocoa is derived, due to their relative “resistance” to Witches’ Broom disease and vigour.

In Mexico, a Trinitario variety resulted from hybridisation between the Forastero “Ceylan” and existing Criollo types. The hybrid was called “Criollo type”. In Southern Mexico and other Central American countries, the Central American Criollos, domesticated over 1500 years ago, and later introduced Forasteros, are parents of the Trinitarios arising there. Some of the outstanding Trinitario accessions in Central America include the United Fruit (UF) clones in Costa Rica.

Several Trinitarios with red fruits were reportedly introduced from South America into Cameroun. From these, open-pollinated seeds were collected and distributed to farmers. Some of the Trinitario material from Cameroun was later taken to Samoa. These introductions and others from Sri Lanka and Java, Indonesia were reportedly transferred to Papua New Guinea (PNG) in 1900. In 1944, the late Dr. Peter Posnette took budwood of open-pollinated seedlings of several famous Trinidadian Imperial College Selections (ICS) (Trinitarios), previously transferred from Trinidad to Nigeria, from Nigeria to Ghana.

The Djati Roenggo (DR) clones were selected in Central Java, Indonesia. The cotyledon (seed leaf) colour of the seeds of these types was originally white due to the absence of anthocyanin pigment (purple in colour) (absence of anthocyanin pigment in cacao seeds/beans is widely regarded as a Criollo trait). However, the original Criollo selections must have hybridized with introduced Venezuelan Trinitario and thus the original DR clones became “white-bean variants of a Trinitario population” with pale, mottled, violet or purple beans.

### **Physical traits of Trinitario cacao**

The Trinitarios form a very variable group, displaying extreme physical (phenotypic) and genetic diversity. The late Botanist, Dr F.J. Pound, while based in Trinidad, described Trinitario cacao as “most influenced by man and reminiscent of “Criollo de la [Montaña] Montagne”, which occurs in the upper tributaries of the Orinoco”, while also having features of the more robust pods such as the “Cacao del Pais” of Southern Colombia, Lower Amazon types (probably from the Guianas), and “finer” types of the Central Cordilleras in Colombia. Pound noted that in Trinitarios, in Trinidad, “pale beans or seeds occur alongside dark purple ones, and that in some

fruits/pods the beans are uniformly light or dark purple while a range of various hues occur in others”, including mottled ones.

Similarly, the late Botanist, Prof E.E. Cheesman, in 1944, while based in Trinidad, wrote that “within the total range of variation of Trinitario cacao [in Trinidad], it is possible to find individual trees with pods to match externally almost any kind of Criollo or Amazonian Forastero as well as some types not found in either of those groups.” He reported that the same applies for bean characters; size, shape and cotyledon (seed) colour, and that the seedlings of a single tree may “exhibit a range of variation as wide as the whole population”. These observations have been confirmed by numerous studies over the years at the Cocoa Research Centre in Trinidad.

### **Some famous Trinitario cacao groups**

#### ***The Imperial College Selections (ICS)***

The Imperial College Selections (ICS) were selected by the late Dr. F.J Pound, in the 1930s, from among 50,000 cacao trees in Trinidad & Tobago as a representative sample with outstanding characteristics. This collection represents over 200 years of cultivation and farmer selection. One hundred trees were finally selected based on pod production per tree, pod index or yield potential per tree, annual yield and average bean weight of 1.0 – 1.2 g ([https://www.researchgate.net/publication/235456464\\_Field\\_Guide\\_to\\_the\\_ICS\\_Clones\\_of\\_Trinidad](https://www.researchgate.net/publication/235456464_Field_Guide_to_the_ICS_Clones_of_Trinidad)).

#### ***The Trinidad Selections (TRD)***

The TRD (Trinitario) types were selected and collected by Dr John Warren and Thakurani Cassie on 10 abandoned cocoa estates in Trinidad between 1991 and 1992. Their aim was to obtain relic/old Trinitario/Criollo material. Collection sites included Lopinot, Sangre Grande, Cumaca, Blanchisseuse, Maracas (St. Joseph), and Mt. St. Benedict, Tabaquite, Rio Claro and two other estates in North-East Trinidad. A total of 119 clones were collected of which 68 have survived to date: (<https://dl.sciencesocieties.org/publications/cs/abstracts/49/2/564>).

### **Grenada Selections**

In 1940, Grenada adopted a cacao selection programme similar to that implemented in Trinidad & Tobago in the 1930s by the late Dr. F.J. Pound. The late Prof. F.W. Cope made 79 Grenada selections (GS) on the basis of mainly high yield and bean size among the local Trinitario plantings that had been introduced into Grenada since 1714. Field trials with these selections were established in 1948. Some clones were found to be more adaptable to different environments than others. The following clones appear to be adapted to a wide range of conditions: GS 3, 17, 29, 36, 46, 50, 57 and 78 (according to Cruickshank and Murray: Cruickshank AM, Murray DB (1966) Grenada Selections. Annual Report of the Cocoa Research Unit for 1965, The University of the West Indies, p 23–25).

### **Utilisation of Trinitario cacao planting material globally**

Fine/flavour cocoa producing countries endeavour to ensure that their planting material remains largely Criollo, Trinitario or Nacional *etc.* to protect their flavour reputations or brands. However, the producers of bulk cocoa, which accounts for roughly 95 % of the cocoa traded in global cocoa market, are typically not keen to exploit the range of variation that exists among Trinitario cacao planting material (including for flavour) largely due to fear of increased disease susceptibility. To date, the West African Amelonado cacao (Lower Amazon Forastero) and Upper Amazon Forasteros in West Africa (which produces about 70 of the world's cocoa) have shown good tolerance to Cocoa Swollen Shoot disease, a serious constraint in Ghana. Only fairly recently has Ghana embarked on a project to produce Trinitario (fine/flavour) cocoa from Imperial College Selections (Trinitarios selected in Trinidad & Tobago): (<http://pubs.iied.org/pdfs/16036IIED.pdf>).

### **Trinitario cocoa**

The niche market for fine or flavour cocoa comprises roughly 5% of the global cocoa market. Fine or flavour cocoa commands a premium price over 'bulk' cocoa beans, which are produced by Forastero cacao trees. The price of bulk cocoa was US \$2172 per tonne on the London

Futures market in August 2018. Fine or flavour cocoa can currently fetch upwards of US\$5,000 per tonne. There are only 23 cocoa producing countries marketing this specialty cocoa with 10 being exclusive producers of fine or flavour cocoa: Trinidad & Tobago, Bolivia, Costa Rica, Dominica, Grenada, Madagascar, Mexico, Nicaragua, St. Lucia and Venezuela.

Wherever Trinitario developed over long periods of time, it acquired unique characteristics. Fine flavours include fruit (fresh and browned, mature fruits), floral, herbal, and wood notes, nut and caramel notes along with balanced chocolate bases. For example, Trinitario cocoa from Trinidad & Tobago is characterised by a full cocoa flavour with pleasant ancillary flavours such as molasses, liquorice, caramel and raisin, and is simply described as fruity

([https://www.researchgate.net/publication/283794106\\_The\\_History\\_of\\_Cocoa\\_Production\\_in\\_Trinidad\\_and\\_Tobago](https://www.researchgate.net/publication/283794106_The_History_of_Cocoa_Production_in_Trinidad_and_Tobago)). Some manufacturers of specialty cocoa products consider this cocoa as superior and of the highest quality.

### **A national treasure**

The unique and geographically distinct characteristics of Trinitario cocoa **are** valued by chocolate connoisseurs since this variation is also manifested in the distinctive flavours that single origin dark chocolates possess. The latter delight and tantalize our discriminating fine or flavour chocolate palates. Furthermore, the health benefits of consuming dark chocolates (with cocoa solids content of 60% and more) are now well documented.

Trinitario cocoa is indeed a valuable commodity worldwide and is a national treasure. There is much to gain from fully exploiting the world-famous Trinitario and hybrid cacao planting material in Trinidad & Tobago

([https://www.researchgate.net/publication/283794106\\_The\\_History\\_of\\_Cocoa\\_Production\\_in\\_Trinidad\\_and\\_Tobago](https://www.researchgate.net/publication/283794106_The_History_of_Cocoa_Production_in_Trinidad_and_Tobago)).

With all stakeholders working together to maximise production, productivity, quality and economic returns of Trinitario cocoa production in Trinidad & Tobago, and through the application of Good Agricultural Practices (GAPs) and Good Manufacturing Practices (GMPs) as well as proper organisation and support for the local cocoa industry, Trinidad & Tobago should

be able to fully realise the distinct advantage of being the *birthplace* of this valuable cacao and cocoa. The outlook is already favourable with the mushrooming in numbers of local artisans and entrepreneurs producing delectable dark chocolates, truffles and a fine array of value-added products, including chocolate rum, butter and liqueur.

The saga continues!