

CACAO

It's Diversity and Place in Modern Marketing



Written by:
Frederick Schilling

Introduction:

There have been innumerable journals written on the subject of cacao and its genetic biodiversity, so I will not be going into detail in this summary. This short document is intended for the newbie on the subject of cacao, its origins and expresses general opinions about the need for diversity in the cacao cultivar and terminology around the term “heirloom”.

I will assume that the reader, who has further curiosity on the subject, will conduct her/his own research and come to his or her own educated assumptions on this majestic plant. This document is simply to serve as a general overview of the generally accepted varieties of cacao that exist in the world and their passage to other continents of the earth.

Cacao is an incredibly complex and interactive plant species, whose virtues have not been fully laid to paper and, most likely, never will be. Scholarly botanists who have devoted the greater part of their life studying cacao, its origins, its migration and interaction with the human species still conclude their findings with a scratch on the head and rubbing of the chin. There are still many mysteries and there is still much to learn. Most definitive conclusions rest in the same cradle as the final gift cacao gives us – the cradle of subjectivity and how each one of us perceives the flavor of chocolate, the feelings we create when we think of chocolate, smell chocolate and consume chocolate.

To start, there are currently 3 main varieties of Cacao:

- Forestero
- Criollo
- Trinitario

Forestero:

Forestero is believed to be native to the Amazonian Region. This includes the current countries of Brazil, Venezuela, Surinam, French Guiana, Guyana, Columbia, Ecuador, Peru and Bolivia. Obviously, this is a vast area and the potential and probable occurrences of genetic mutations, and therefore diversity, to exist is high. So, it is probably safe to say that under the title of “Forestero”, a wide base of characteristics can and do exist.

But general characteristics that are given to Forestero are, but not limited to; rounder and melon like in shape, smoother pod husk, dark purple beans, stronger more resilient tree, higher productivity and generally more bitter beans. This variety makes up the vast majority of the world’s production.

Criollo

Criollo is believed to be endemic to the Circum-Caribbean region. This includes the current countries of Mexico, Guatemala, Belize, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Columbia, Venezuela and the Caribbean Islands. As with the Forestero, genetic diversity exists within the “Criollo” variety and many sub-strains exist.

General characteristics of the Criollo variety are, but not limited to; longer and narrower pod with a characteristic nipple on the end, rougher or wartier pod husk, lighter to white beans, more susceptible to disease and weather conditions, lower productivity and milder tasting beans.

It is believed that only 5-15% of the world’s cacao production is of the Criollo variety.

*It needs to be stated that the term Criollo, for this document, refers to the cacao that is endemic to the Circum-Caribbean region and tends to have lighter to white beans. This is a generally accepted reference in the international chocolate industry. In many Latin American countries, farmers refer to their cacao as Criollo, no matter what the actual variety is. In Spanish, Criollo refers to ‘native’ in translation. Many farmers refer to their

cacao as Criollo, simply because it was growing on the land when they inherited it from their family or when they purchased the land.

Trinitario

Trinitario is a “relatively new” variety that is romanticized as being created on the island of Trinidad when planted Criollo trees were destroyed by some kind of disaster (the actual disaster is unknown and could have been disease or hurricane). The trees were replaced with the stronger variety of Forestero. The remaining Criollo trees crossbred with the newly planted Forestero and the Trinitario variety was born.

The Trinitario, being born of both the Criollo and Forestero, has traits of both primary varieties. These being, better resilience to disease and higher productivity than pure Criollo and milder flavor than pure Forestero. These are generalizations and must be regarded as such.

A 4th?...

Arriba Nacional

The term “*Arriba Nacional*” came from the reference to where the cacao came from. Prior to around 1890, cacao from Ecuador was referred to as ‘Guayaquil’. When germplasm was introduced to Ecuador around 1890 from Venezuela, Nacional was used to distinguish the native cacao that tended to come from the north (high or up) part of Guayaquil; hence, *Arriba Nacional*.

Guayaquil, *Arriba Nacional* or *Aroma de Fino* are not variety names, they are simply reference names given to the regional cacao. *Nacional* would be the more appropriate of these terms, simply because it has been used for over 100 years to describe this kind of cacao.

There is a movement that wants to create a fourth variety for the Forestero strain that is found mostly in Ecuador, known as Arriba Nacional. The Arriba Nacional is a Forestero – *it is not Criollo as is sometimes claimed* - that tends to have floral aromatic characteristics.

It is safe to say that most countries that grow cacao have their own reputation for a certain general flavor profile. Madagascar is renowned for its quality and flavor. Brazil has Pará-Parazinho-Maranhão, the albino ‘heirloom’ forestero called Catongo and the wonderful hybrid, Scavina.

Venezuela is regarded as having the world's highest quality cacao, yet they don't have their own strain. The same for Columbia.

It is my opinion that if the Arriba Nacional were to be given it's own definitive variety title, based solely on it's general aromatic traits, then every country where the terroir of it's cacao is unique should also be warranted it's own varietal titling.

Migration of Cacao

The Philippines was the first country to receive cacao outside of the New World when the Spanish brought it there from the Soconusco region of Mexico in the 1600's. And shortly after the Philippines, the cacao found it's way to Indonesia where it was planted on Java and it became legendary as one of the world's best cacaos and most demanded in Europe; the Java Criollo. And from there it was a quick jump to Bali and the rest of the Indonesian Archipelago. And it kept going to Sri Lanka where, again, this variety was regarded as one of the best in the world. Ceylon was one of the most expensive cacaos for many years. And from there to Madagascar, where to this day, Madagascar cacao remains one of the most highly regarded amongst specialty chocolate makers.

All this migration from a few individual plants that the Spanish carried over on their galleons from Soconusco, Mexico, and planted in the Philippines. And it should be noted that the Aztecs regarded the cacao from Soconusco as the most prized. In particular, the Criollo substrain of Theobroma Pentagones. Wars were fought over the cacao orchards of this thin strip of land between the Sierra Madres and the Pacific Ocean. Still fertile to this day, cacao trees have been replaced with mangos; which are regarded for their high quality, I might add. I have been there and tasted them, and yes, they are delicious.

As cacao has moved around the world, it has taken its rightful place as a citizen plant of our earth. Just as apples have been planted on many continents outside of its native Eastern Europe or the potato has been planted outside it's native Andean biome, it is the way of the transmigration and evolution for all species. Plants and animals have been migrating around this earth for millennia and it is the opinion of the author, that it is a beautiful and natural flow of life. All species explore different lands and to say that cacao from Ecuador is superior to Bali cacao is like saying an Ecuadorian is superior to a Balinese human. Or that a Mexican who lives in

Mexico is superior to a Mexican that now lives in Australia. Or that a Canadian who married a Korean and then had a child... is that child any less than an Inuit child?

I believe in diversity and I believe in the ability and need for species to crossbreed with one another, simply to create more diversity. And to say that there still exists a pure strain of cacao is similar to saying there exists a pure strain of any fruit that has been domesticated and planted for commercial purposes. Farmers' plant crops that will provide yield so they can sell their crops and feed their families. Farmers will plant varieties and hybrids that provide greater output in order to maximize their land's value. This is nothing new and has been the way of farming for millennia. There is nothing wrong with this, in my opinion. We all maximize ourselves in order to strengthen our own bodies, mind and heart. We do this by cross-pollinating with other humans, by experiencing new things and by sharing. Some of us choose mates in order to create an offspring of a desired outcome. Cacao, in it's own way; through it's own plant consciousness, has spread itself around the world and has diversified itself to be where she is now.

Cacao is a beautiful plant and offers an incredible flavor no matter where it is planted. Each soil provides it's own unique array of nutrients. Each tree tells it's own story. Diversity of cacao, not only benefits our sensory of taste, but also benefits cacao itself. Perhaps it was the plant intelligence of cacao that swayed humans to carry her around the world and plant her everywhere she would grow. Who is to say that humans aren't simply doing the will of the plants by carrying them across the oceans of the world?

Heirloom

There is something special about knowing that you are buying something that hasn't been industrially commercialized, like the heirloom tomato from the farmer's market. It's big, irregular in shape and unique in color. And it's usually really juicy!

Yet what is an "heirloom" tomato? Is this a tomato whose genetic lineage has been kept constant and has never changed since the Garden of Eden? Is it a tomato that is just grown on a small farm instead of an industrial farm?

Well, that heirloom tomato, in simple definition, has simply been openly bred with other tomatoes, allowed to have sex as it wants, instead of the

farmer intentionally breeding it with another variety of tomato to achieve a certain desired outcome. The later is referred to as hybridization – a cultivar produced by cross-pollinating plants to achieve desired characteristics. (This is a common practice in marijuana cultivating, and as a non-smoker, I would assume most marijuana smokers are very happy with smoking hybrid varieties instead of the “heirloom” varieties that pirate ship ropes were made from.)

Hybridization is common with industrialized farming, where a nice looking round tomato is desired for visual appeal or a strong skin to prevent bruising during transport. Because non-heirloom varieties are, for the most part, associated with the advent of industrialized farming, we must recognize that non-heirloom cultivars are a relatively recent creation, as industrialized farming has only gained traction in the last 50 years, at most. But we must also recognize the fact that humanity has been crossbreeding plants and animals for millennia in order to achieve a desired outcome; so hybrids are really nothing new. Even “ancient grains” are results of hundreds, if not thousands, of years of hybridization.

For this paper, I will state the following; a generally accepted definition of an “heirloom” plant is a cultivar that was commonly grown before industrialized farming came into practice and is allowed to breed as the wind blows and as the bees buzz. What does this mean? In short, heirloom cultivars are what happen what we just let plants pollinate via non-human direct intervention.

Heirloom tomatoes exist in the New World and the Old World, even though it is originally from South America. So, heirloom cultivars, no matter what species of plant we are referring to, are not limited to the region the cultivar was endemic to. In fact, the argument could be posed that transcontinental migration and planting of species creates greater “heirloom-ness” because the gene pool can be all the more diversified and mutated, by influence of new environments.

Like the heirloom tomato you buy at the farmer’s market, there is a romantic notion for heirloom cacao. But does “heirloom cacao” really exist? It is the opinion of the author that heirloom cacao does in fact exist. In fact, it is very, very common, based on the definition of “heirloom”.

Cacao is one of the most under industrialized consumed commodities in the world. Impoverished small holders scattered around the equatorial belt of the earth's tropics grow 95% of the world's cacao. These farmers tend to grow a multitude of crops on their plot of land, which on average is between 1-5 hectares. These farmers tend to live hand to mouth and are often in debt to middlemen who forward them money, in exchange for discounted prices on the cacao.

The heirloom idea of cacao is also further propagated by the fact that most farmers, when wanting to plant new seedlings, simply take a cacao seed and stick it in soil. From the seed grows a tree and the tree will bear fruit.

Now, what many people do not realize is that the cacao tree is like an apple tree, in that, if you were to take a seed from a Fuji apple and put it in the ground, you would not get a Fuji apple tree. The tree goes back to its 'wild' cultivar. The only way to preserve that Fuji apple trait is via grafting. Cacao is the same. Once the farmer takes a seed from the pod and plants it in the ground, no matter what hybridization took place in the mother stock, the offspring will revert back to its 'wild' cultivar. By 'wild', I refer to a non-hybridized lineage. The only way to preserve a cacao tree's genetic lineage is by grafting – also known as, *cloning*.

If the practice of grafting is considered a form of hybridization, then Arriba Nacional has, in fact, become a hybridized cultivar by the simple act of maintaining a constant genetic lineage in order to preserve a certain desired trait. I can guarantee the reader, by means of being a first hand witness to, that Arriba Nacional is in fact grafted at the farm level to preserve the genetic traits of this variety. I have been to Ecuador many times and have seen, numerous times, grafted Arriba Nacional trees. I have no problem with this practice.

Furthermore, if Arriba Nacional trees are being grafted in order to preserve its inherent genetic traits, it is also safe to say that *Arriba Nacional has become a cloned stock of cacao*. It is common knowledge in the chocolate industry that Nacional trees are on the decline in Ecuador, simply because of disease and cross-pollination with other varieties that were introduced to Ecuador over the last 100+ years. The best way to preserve the wonderful traits that the Nacional strain of cacao has is to clone the trees by way of grafting. This is a common practice in all parts of the world. While it does pose its own inherent problems by stymieing the genetic diversity of this

certain cultivar, it is currently the only way to preserve a genetic lineage of a fruit tree and preserve the desired traits.

Industrialized Cacao Farming

It must also be noted that Ecuador is home to probably the world's largest experiment in cacao hybridization, ever. There exists a strain of cacao by the name of CCN-51. This strain of cacao is extremely resilient to disease, has very high output and produces some of the largest beans I have ever seen. It is a farmer's dream tree! Plant the tree, double the production, less work and larger beans? Sold!

The problem is the flavor is less than desirable for many fine chocolate makers. This is actually a pretty small problem, seeing that the specialty chocolate market is very small in relation to the global chocolate industry.

And so, CCN-51 is being planted like corn; row after row after row after row. The first time I witnessed this, I could not believe it. CCN-51 is so hardy that it can grow in full sun. Most cacao in the world is grown under shade trees, which further supports biodiversity. Yet, in Ecuador where CCN-51 is being planted very quickly, the landscape is turning into a mono-cropped landscape that looks like cornfields of Iowa. Except, it's CCN-51 cacao trees in Ecuador.

Now, when there is such pervasive planting of any one cultivar, cross-pollination is bound to happen, no matter how careful you are. The organic farming industry is experiencing this with GMO crops. So, in Ecuador, where Arriba Nacional is being marketed as a pure heirloom variety, the author has to question the basis of this claim, based on the facts presented above. I have seen Arriba Nacional trees being grafted, which presents itself not only as a hybrid, but also as a clone. I have seen CCN-51 planted near Arriba Nacional, which means cross-pollination.

Because of the basic realities of cacao cultivation, how it is grown, where it is grown and the sheer inefficiencies and convoluted supply chain that it has created for itself, instigating a large scale and continuous hybridization program is near impossible to achieve on a global scale.

It is the opinion of the author that any cacao that is not grafted is, for all intensive purposes, an heirloom, simply because it freely pollinates or goes back to 'wild' gene stock when planted from seed.

Original Heirloom Cacao

Can “original” cacao exist? Yes. Yet this original germplasm will not be available for commercial resale, as it will exist deep within the realm of where most humans don’t venture; deep within the Amazon jungle. A place where wild cacao trees have existed for millennia untouched and unfettered by human curiosity. They exist, this I am sure of.

As, as stated above, give the cacao tree some time and it will eventually find it’s way back to wild. If the human species were to ascend off the earth tomorrow and the plant kingdom left to move unhindered by human will, cacao trees would seed themselves and over time, the genes that have allowed the tree to live so long, would once again become the dominant genes and allow the tree to grow as it has.

Cats, after 7 generations without purebred breeding, will return to wild tabby. 7 generations. Seems this is a common thread in generational thinking. Perhaps it’s the same for cacao.

The second week of May 2010, I will be venturing into the remote locales in the Amazon Basin of Brazil, with a scientist and journalist, to investigate where such “original” trees exist and to bring samples of the cacao back to “civilization” to propagate the seeds into seedlings and into trees. Why? Because I’m human and I’m curious.

In Conclusion

To summarize this brief paper, I would like to quote one of the individuals that probably contain the most knowledge on cacao, Dr. Basil Bartley.

As a result of these activities it has become an established fact that the Amazonian region is the storehouse of virtually all of the diversity of the species. The scale of diversity and the state of availability of information about it are such that no single persona has a conception of the total range of the genetic variability that the species contains. In view of this situation it becomes necessary to attempt to gather together as much as is known about how the diversity is constituted and its nature in order to provide the users of genetic variability with a wider conception of the subject that has hitherto been at their disposal.

Because of the limitations and space, this large subject cannot be treated in its entirety. The most that can be done in the circumstances is to present as much of an overview as possible, which would be of benefit to persons with an interest in the subject and with the need to utilize the germplasm for various purposes.

In this way, it cannot be claimed that we have reached the stage at which we possess a comprehensive knowledge about the species' genetic diversity.

In conclusion, I have and will continue to use the comparative analogy that cacao is like the human species. We move around the world, we breed with one another freely to create wonderful and unique offspring and we are divine in our nature, no matter what color, shape or flavor we have. We are all divine and to claim one is superior over another is an expression of prejudice whose time has passed, long ago.

Frederick Schilling

www.frederickschilling.com

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