ICGN International Coffee Genome Network

INTERNATIONAL COFFEE GENOME NETWORK (ICGN)

http://www.coffeegenome.org

WHO WE ARE?

ICGN is a scientific network focused on building the foundation for **advancing agricultural research for sustainable coffee production worldwide** by developing genomic tools and resources to further our **understanding of the coffee genome** at the molecular, biochemical, and physiological levels.

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WHO ARE OUR MEMBERS?

ICGN networks scientific groups from universities, research institutes, and industry within coffee producing and consuming countries, including more than 50 individual and Institutional members **from Africa, America, Asia, and Europe**

ICGN meeting in conjunction with the 22nd ASIC International Conference on Coffee Science in Campinas, Brazil, September 16th, 2008

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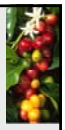


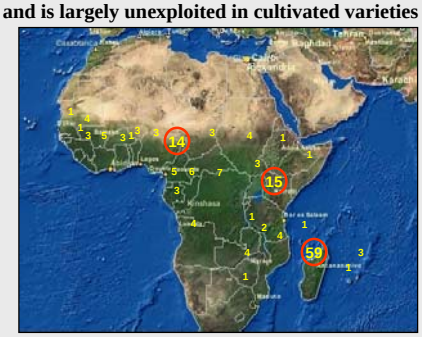
WHAT ARE OUR GOALS AND MISSION?

ICGN is committed to decipher the genetic and molecular bases of important biological traits in coffee tree species that are relevant to growers, processors, and consumers.

This knowledge is fundamental to allow efficient use and preservation of coffee genetic resources for the development of improved cultivars in terms of quality and reduced economic and environmental costs.

COFFEE BIODIVERSITY

Considerable diversity exists in *Coffea* species (>100) and is largely unexploited in cultivated varieties



3 highly divers zones: Mt Cameroon, East Africa, Madagascar

Coffee-tree Diversity (size, ecological adaptation…)

C. arabica

C. macrocarpa

C. ambongensis

Coffee-tree Diversity

Examples of berry diversity

C. kapakata

C. sessiliflora

C. arabica

C. pseudozanguebariae

C. liberica var. dewevrei

P. mannii

C. heterocalyx

C. canephora

Coffea arabica / Origin

The rainforests in the southwestern highlands of Ethiopia
=
the natural habitat & primary center of diversity of *C. arabica*

Coffea arabica / Ethiopia

Preservation and valorization of Arabica Ethiopian coffees diversity appear as a urgent task

Deforestation due to population pressure/migration

60% of undisturbed forest disappeared between 1975 and 1997.
Rate: 25 000 acres/year (Tadesse Woldemariam, 2002)

Recent deforestation near Teppi (Southwestern Ethiopia)

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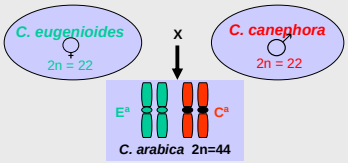
WHY DO WE WANT TO SEQUENCE COFFEE GENOME?

- ✓ **Genetic variation in wild coffee accessions is considerable and still largely unexplored**
- ✓ **Sequencing the coffee genome will help decipher the genetic and molecular bases of important biological traits**



The complete sequence of the allotetraploid *C. arabica* (1,300 Mb) will be established using the 2 constitutive genomes *C. canephora* (700 Mb) and *C. eugenioides* (600 Mb)

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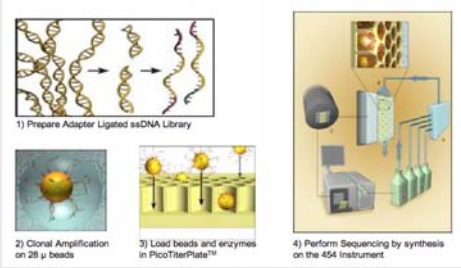
- ✓ **This knowledge will pave the way for the development of novel coffee cultivars comprising a large variety of high performance characteristics such as disease resistance and quality traits**
- ✓ **The considerable and expected continuing progress in improving sequencing throughput and reducing cost**

454 Process Overview



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WHAT ARE THE BENEFITS FROM THIS ICGN INITIATIVE TO THE COFFEE SECTOR?

- •Decipher the genetic and molecular bases of important biological traits in coffee that are relevant to growers, processors, and consumers.
- •Development of optimized characterization and conservation strategy for enhanced utilization of *Coffea* germplasm resources in breeding programs.
- •Ensure long term sustainable coffee production (from environmental, social, and economical point of views) in relation to climate changes
- •Possibility of innovation in terms of enhanced quality to increase consumer satisfaction and guarantee coffee supply (in term of quality/quantity/cost).

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WHY DOES ICGN NEEDS BROAD BASE SUPPORT?

- •This support is essential to give long term continuity to our international and multi-Institutional effort to ensure that the information generated will be for public use and freely available to the coffee scientific community.
- •In particular, broad base support is needed for a global strategy for conservation of *Coffea* genetic resources.
- •In addition, support is needed to encourage networking, long term database maintenance, and stimulate international genomics research in coffee.
- •To meet our long term goals, we need support from ICO, the private sector, and multi-governmental support.