ICGN International Coffee Genome Network

MINUTES ICGN MEETING, CAMPINAS, BRAZIL
SEPTEMBER 16, 2008

The ICGN meeting took place in conjunction with the 22nd ASIC International Conference on Coffee Science in Campinas, Brazil on September 16th, 2008. The list of participants is provided in the enclosed Annex. A total of 37 scientists representing 11 countries attended the ICGN meeting.

Agenda ICGN meeting Campinas, Brazil

1. Review progress of the working groups present.

2. Update progress of working group 3 of the ICGN towards funding an international initiative for the construction of a coffee physical map and sequencing of the coffee genome.

3. Invite ICGN members to participate in the upcoming 2nd Coffee Genomics Workshop at the Plant and Animal Genome Meeting in San Diego, California, USA, to be held January 11, 2009.

4. Follow up ICGN meeting among Steering Committee Members present.

Summary ICGN meetings

During the meeting September 16, 2008, updates were given by coordinators of the five working groups present. In addition, Philippe Lashermes, Chair of the ICGN Steering Committee presented an update of the ICGN proposal to sequence the coffee genome. This initiative was also presented to the entire coffee community at the ASIC section on Coffee Genomics and Biochemistry, September 18, 2008.

As part of the ICGN meeting, short updates were given by five of the working groups:

***Working group 2*: Genetic Mapping** coordinator present Thiery Leroy. The main activity conducted among ICGN members as part of this working group has been marker exchange between teams in France (CIRAD/IRD, Nestlé), Brazil (IAPAR, CENARGEN), Colombia (CENICAFE) and Italy (Trieste University). Some new markers have been developed (EST-SSR, COS markers) and work has been initiated on linkage disequilibrium in *Coffea canephora* species. ICGN interest on having a reference map for *C. arabica* and *C. canephora* was discussed. For *C. canephora*, the Nestlé map could be used, but its availability is not known. A new population of 250 individuals has been developed by CIRAD in French Guyana in the frame of the ICGN network to be used as reference population. The future objectives to be developed include: comparative mapping using intra- and inter-specific populations and advanced markers such as SSRs, COS and SNPs; and development of comparative studies between physical and genetic maps in both species.

***Working group 3*: Physical Mapping and Coffee Genome Sequencing** coordinators present Philippe Lashermes and Juan Carlos Herrera (see update of this working group in the next section).

***Working group 4:* Transcriptomics** coordinator present Alan Andrade. The main activities reported were the pooling of available ESTs from coffee species as to provide free access to these resources for the coffee scientific community. The release of these resources was announced to be in the beginning of next year. It was also mentioned that a number of experiments using microarrays and the new generation of sequencing technologies are underway by different groups and concern was stressed about the necessity of a strong Bioinformatics group to

store and process these data for the benefit of the coffee science.

***Working group 5*: <u>Gene validation</u>.** Please note that a Compendium of "*Coffee Transgenesis Protocols*" is being prepared by the coordinators of this working group: H. L. Sreenath and Herve Etienne, and will be distributed once completed to all ICGN members.

***Working group 6*: <u>Bioinformatics</u>** coordinator present Felipe Rodrigues Da Silva. Lukas Mueller also coordinator of this working group could not attend but sent as representative Aureliano Bombareli who presented recent developments of the SOL site. Please note that Lukas Mueller is now affiliated as faculty to the Boyce Thompson Institute for Plant Research.

Update working group 3: Construction of a coffee physical map and sequencing of the coffee genome

Rod Wing, Director of the Arizona Genomics Institute (AGI) at the University of Arizona, is working with group 3 of the ICGN towards an international initiative for the construction of a coffee physical map. Physical map construction will be based on a combination of BAC fingerprinting, BAC-end sequencing, and high density anchored markers covering the complete genome. We will also look into next generation sequencing technologies to develop a cost-efficient strategy for sequencing the coffee genome.

Construction of two *Coffea canephora* BAC libraries (*Eco* RI and *Hind* III) is on going with Rod Wing's group in AGI. The libraries were contracted by Alexandre de Kochko and Philippe Lashermes from IRD/CIRAD, and the cost of construction of the two *C. canephora* BAC libraries was covered by their programs. The BAC libraries were constructed from a doubled haploid *C. canephora* genotype that was mapped previously by IRD so that the physical map can be anchored to the molecular map. The BAC libraries will be kept at AGI for three years. These BAC libraries are available to anyone from the ICGN community and can be obtained (clones and filters) at a cost recovery base by signing a simple MTA.

A proposal to BACend sequence the two *C. canephora* BAC libraries submitted by the French ICGN members (IRD and CIRAD with support of the private sector, Syndicat Français du Café) to ANR (The French National Research Agency) is going to be approved for funding and the sequences could be available next year. In addition, a proposal was prepared and submitted to FONTAGRO (Fondo Regional de Tecnología Agropecuaria) by Marcela Yepes (Cornell University)

and CENICAFE with ICGN members ICAFE (Costa Rica) and PROMECAFE (Central América) to fingerprint the two *C. canephora* BAC libraries at AGI and construct, fingerprint and BAC-end sequence a BAC library for *C. eugenioides* (the maternal ancestor of *C. arabica*). Decision on the funding of this proposal is still pending.

The strategy proposed to sequence the coffee genome given the complexity of the allotetraploid *C. arabica* will be to sequence the two diploid parental genomes *C. canephora* and *C. eugenioides* as framework to sequence the *C. arabica* genome. Funding to sequence the genomes of *C. canephora*, *C. eugenioides* and *C. arabica* is being searched internationally on behalf of the ICGN by working group 3. We have already contacted on this regard Genoscope and the InterAmerican Development Bank (IDB). In addition, ICGN will contact the International Coffee Organization (ICO) and private companies that may be interested to help co-fund this effort.

A second draft version of the "coffee white paper" describing the strategy to sequence the coffee genome will be circulated among ICGN members shortly. This document is especially important to help coordinate the search for funding for this international initiative on behalf of the ICGN. Please submit any comments or suggestions to help us improve the coffee white paper. Also, please indicate if you and/or your Institution will be willing to endorse the proposal to help us raise the funding to sequence the coffee genome.

We are looking also into a pilot project based on shotgun sequencing using new sequencing technologies (FLX454/ Solexa technology). Once we determine costs and strategy, we will share the information among ICGN members in order to develop a coordinated strategy.

Coffee Genomics Workshop and ICGN meeting to be held at the upcoming Plant and Animal Genome (PAG) meeting in San Diego, California, USA, January 10-14, 2009

Please submit abstracts (for oral or poster presentation) if interested to attend. Although, abstracts for the overall meeting were officially due October 3rd, 2008, we will make every effort to accommodate participants. Please send your abstracts as soon as possible to one of the three workshop coordinators (http://www.intl-pag.org/17/17-coffee.html) via e-mail: Philippe Lashermes (philippe.lashermes@mpl.ird.fr), Marcela Yepes (my11@cornell.edu), or Rod Wing (rwing@Ag.arizona.edu). For general information about the meeting please see: http://www.intl-pag.org. The coffee genomics workshop is an excellent opportunity to present our coffee genomics network to the international

plant and animal genomics community and to bring up advances on coffee genomics research to help us attract international funding to sequence the coffee genome. All ICGN members are encouraged to participate.

ICGN membership information

Efficient dissemination of information among ICGN members continues to be an important effort of the network. The Steering Committee discussed this aspect in a separate meeting also held in Campinas. In addition, André Charrier informed the ICGN assembly that BioVersity International kindly expressed interest to continue supporting at no-cost the ICGN secretariat.

Please feel free to distribute this ICGN minutes to other scientists or groups that may be interested on becoming ICGN members. A reminder that to become an official ICGN member you should register your membership on-line (http://www.coffeegenome.org/about/members.php).

APPENDIX

List of Participants (37 scientists from 11 countries)

Picture from the ICGN meeting held Sep 16, 2009

Alan Andrade	EMBRAPA, Brazil
Luis Vieira	IAPAR, Brazil
Felipe Rodrigues da Silva	EMBRAPA, Brazil
Felipe Pereira	EMBRAPA, Brazil
Ramon Vidal	EMBRAPA, Brazil
Juan Carlos Herrera	CENICAFE, Colombia
Alvaro Gaitán	CENICAFE, Colombia
Huver Posada	CENICAFE, Colombia
Carmenza Góngora	CENICAFE, Colombia
Diana Villareal	CENICAFE, Colombia
José Bustamante	Instituto Nacional de Investigaciones Agrícolas, Venezuela
Endashaw Bekele	Addis Ababa University, Department of Biology, Ethiopia
Kassahun Tesfaye Geletu	Addis Ababa University, Genetics Research Laboratory, Addis Ababa, Ethiopia
Girma Adugna	Ethiopian Institute of Agricultural Research, Jimma Agricultural Research Center, Jimma, Ethiopia.
Bellachew Bayetta	InterAfrican Coffee Organization, Abidjan, Cote d'Ivoire
Chrispine Omondi	Coffee Research Foundation, Ruiru, Kenya
Elijah Gichuru	Coffee Research Foundation, Ruiru, Kenya
Pascal Mousoli	Coffee Research Institute, Uganda

Manoj Kumar Mishra	Central Coffee Research Institute (CCRI), Karnataka, India
R. A. S. Jayarama	CCRI, Chikmagalur, Karnataka, India
Nayani Prakash	CCRI, Narsipatna, Andhra Pradesh, India
André Charrier	MontpellierSupAgro, France
Philippe Lashermes	IRD, France
Alexandre de Kochko	IRD, France
Alessandra Ribas	IRD-CIRAD, France (CNPq grant)
Bertrand Benoit	CIRAD, France
Thierry Leroy	CIRAD, France
Pierre Marraccini	CIRAD, France
David Pot	CIRAD, France
Pierre Charmetant	CIRAD, France
Petit Hugenin	CIRAD, France
Marc Berthouly	CIRAD, France
Pierre Broun	Nestlé, Research and Development, Tours, France
Giorgio Graziosi	University of Trieste, Italy
Furio Suggi Liverani	ILLY Café, Trieste, Italy
Chifumi Nagai	Hawaii Agriculture Research Center, Aiea, Hawaii, USA
Aureliano Bombareli	Boyce Thompsom Institute for Plant Research, USA
Marcela Yepes	Cornell University, USA

Additional delegates could not attend the meeting September 16th but participated in the ASIC genomics session on Thursday 18th September: Jorge Ramirez (ICAFE, Costa Rica), Ronald Peters (ICAFE, Costa Rica), Edgar Figueroa (ANACAFE, Guatemala), Francisco Anzueto (ANACAFE, Guatemala).

A list of the participants in the ICGN group picture taken September 18th is enclosed below:

Picture ICGN group ASIC meeting Brazil Sep 18, 2008

Back row from left to right: Kassahun Tesfaye (Ethiopia), Andre Charrier (France), Nayani Prakash (India), Ramon Vidal (Brazil), Alessandra Ribas (Brazil), Manoj Kumar Mishra (India), Elijah Gichuru (Kenya), B. K. Jarayama (India), Chifumi Nagai (USA), Alexandre de Kochko (France), Paola Eichler (Portugal), Ronald Peters (Costa Rica), Carmenza Gongora (Colombia), Aureliano Bombareli (USA), Juan Carlos Herrera (Colombia), Pierre Maraccini (CIRAD), M. Loureiro (Brazil), ---- (Brazil), Marcela Yepes (USA).

Front row from left to right: José Bustamante (Venezuela), Furio Suggi Liverani (ILLY Café, Trieste, Italy), Giorgio Graziosi (Italy), Philippe Lashermes (France), Alan Andrade (Brazil), Alvaro Gaitan (Colombia), Jorge Ramirez (Costa Rica), Edgar Figueroa (Guatemala), Francisco Anzueto (Guatemala).