

## **Professor Aboubakry SARR**

### **Position held:**

Professor of Genetics - Head of : Genome and Plant Evolution group

### **Place of current employment:**

University "Pierre et Marie Curie" - Paris VI - Bât B 4<sup>ème</sup> étage Boîte Courrier  
94, 9 Quai St Bernard Jussieu - 75252 PARIS Cedex 05. Tel 01 44 27 36 84

### **Office address:**

LAB. ESV. UPRESA/CNRS 8079 – Université - PARIS XI, Bat 362 -91405  
ORSAY - Tel: 01 69 15 53 12 - Fax: 01 69 15 46 97  
e-mail:Aboubakry.Sarr@ese.u-psud.fr

### **Home address:**

9 Résid. Les Amonts - 91940 LES ULIS (France)

### **FIELDS OF EXPERTISE :**

Fundamental and applied Research in Evolutionary Genetics-Biodiversity  
Assessment .(Molecular Biology,Biotechnology,Population Genetic tools  
) ,Genetic Resources Conservation and sustainable uses.  
Team leading and lab management.  
Consultancies council ,review for Research organisms : Strategic  
plans,scientific project and individuals evaluation ,research policies.  
Education and research capacity building.

### **UNIVERSITY QUALIFICATIONS**

#### *• List of degrees*

- 1) Doctorat d'Etat ès sciences (1987) (highest degree in french Education system)  
,Mention très Honorable avec Félicitations du Jury (University Paris XI)
- 2) Docteur ingénieur (1975) (equivalent to PHD) - University Paris XI (Orsay) Mention  
très Honorable avec les Félicitations du jury)
- 3) Ingénieur agronome (1972) : ( Ecole Nationale Supérieure Agronomique Toulouse)
- 4) Licence ès sciences (1972) - University Paul Sabatier - Toulouse
- 5) Miscellaneous degrees : AEA phytotechnie 1972 - Toulouse  
ORSTOM Genetic and plant breeding specialisation degree 1973  
DEA plant-breeding - University Paris XI (Orsay)(1973)

### **SUMMARY OF WORK EXPERIENCE AND SKILLS**

**Whole career in research ,and educational activities .This experience  
concerns evolutionary genetic, plant breeding, agronomy and the**

## **implications of these scientific fields for Biodiversity assessment and genetic resources enhancement.**

### **Teaching, Training and Academic Responsibilities**

Fields: Fundamental genetic, Population Genetic, including Molecular Evolution topics, Quantitative Genetics and biometry; Botany and Plant Physiology; Genetic Resources and Conservation Biology.

- \*I've been involved in teaching these topics at all the university levels for many years (at University Paris XI (1978-1983), University Lille I (1984-1985) and University Paris VI (1986-1988), as "Maître de Conférences" and since 1988 (University Paris VI) as **Professor**.

\*Director over 10 years (one of the 4) of the "DEA" "Ressources Génétiques et Amélioration des plantes". (prerequisite for doctoral thesis preparation) delivered jointly by 3 Universities in Paris and The School of Agronomy of Montpellier.

\*Director of The DESS: "Gestion de la Biodiversité" (Master degree aiming at training scientific specialists with high level skills in Biodiversity assessment: Markers, Cytogenetics, Phylogenies, and methodologies in conservation Biology)

\*Organizing advanced schools for training young and senior scientists in the field of molecular genetics and the use of molecular markers in plant Genetic Resources research field, for example: -Ecole thématique, Ressources Génétiques enjeux biologiques et sociétaux (Bamako 02/1997); -Marqueurs moléculaires et Gestion des Ressources Génétiques (Niamey 11/1998). This School was organized in the frame of an E.U Project I was coordinating

\* Head of undergraduate degrees programs in Molecular / cellular biology and Genetics, including Molecular genetics, genetic engineering, Population and evolutionary Genetics

### **Research**

During 10 Years Co-Director of Evolution and Systematic lab within the department of Ecology (University Paris XI)

- Leader of a research group " Evolutionary Genomics in plants", working on processes involved in the evolution of crop plants. Domestication process is taken as a general model. We are unravelling the genetic components of domestication process of some cereals mainly tropical ones such as pearl millet. This is developed with a multidisciplinary approach: general genetic, population genetics and quantitative genetics, QTL tagging, Molecular cytogenetics. We have recently demonstrated that a few number of QTL localised on a small number of linkage groups are controlling the adaptation Domestication Syndrome in pearl millet. In the frame of international researches on Cereal crop evolution, we are tackling now comparative genomic studies between Pearl millet, rice, maize and foxtail millet.

Furthermore, transgressive phenotypes were observed in segregant populations exhibiting positive effects of wild alleles at some loci. This trend was also

evidenced in *Setaria italica* despite the differences in breeding system between these two models,(outcrosser/selfer respectively).

These results were applied in a pre-breeding programme aiming at a wide introgression of genes from wilds forms into the genomes of landraces of pearl millet (EU project).This project benefits also from original data acquired previously on reproductive Biology (Pollen competition and Gametophyte/Sporophyte overlapping...) and gene flow control between wild and cultivated forms of pearl millet.(1978-1988)

Phylogeny studies using DNA sequencing (ITS), genome size and molecular cytogenetic markers on pennisetum gene pools have been used ,to elucidate Gene pool organization of millet species..We have demonstrated the trend of basic chromosome number evolution in pearl millet I'm also involved in genome comparative mapping of Pennisetum sp, Setaria sp, Sorghum sp, oryza genepools.This project is based on mapping and genomic organisation (repeated sequences cloning and localisation on chromosomes) studies.

I worked before this period as the Head of a multidisciplinary Research team (Groupe d'Amélioration des Mils (GAM)) at the National Center for Agronomic Research (CNRA - Bambey - Senegal). This project was aiming at the developpement of high yielding varieties of pearl-millet for intensive agriculture condition. I've acted also as the head of cereal department during this period (scientific and administration duties)

#### • *Some relevant professional activities and honorary positions*

##### 1) **Doctorate theses supervision**

In the last 10 years, many doctoral theses (over20) has been achieved under my scientific supervision. The research subject were in the field of evolutionary and population Genetic in crop gene pools.The theoretical and experimental data from these studies were also relevant to the general concern on Biodiversity assessment and sustainable uses.

Member of many Doctorate jury and PhD viva (over 40)

##### 2) **Scientific and advisory committees membership**

\* Elected member of the French Academy of Agriculture ( Membre correspondant de l'Académie d'Agriculture de France).

\* Member of scientific and technical committee for Forest Genetic Resources (France)(1992-1995).

\* Member of scientific advisory committee(crop science) for the International Foundation for Science (IFS), Stockholm.

\* Member of scientific Committee on Conservation Biology.

\* Member of many audit committees for Research Laboratories and Institutions.

\* Member of Scientific committee(Biological and Medical Sciences ) of IRD (Institut Recherche pour le Developpement.former ORSTOM) Two mandates. de

\* Vice President of CNECA,Genetic section ( French national committee in charge of the evaluation of scientific activities in so called "Grandes Ecoles Agronomiques et Vétérinaires")

- \* Permanent member of my University steering board( Genetic and Cell Biology ).
- \* Member of the Scientific Committee on Desertification.( Comité Scientifique Français sur la Desertification ) created in the frame of the International Convention on Desertification.
- \* Member of Scientific Committee on «transgenic organisms» advisory and Scientific projects Steering committee.
- \* Member of evaluation panels for E.U w(Biodiversity Program )(1996)
- \* Member of scientific evaluation Panel of French Board for plant genetic resources.(BRG)

***list of some relevant publications***

- A. SARR, M. SANDMEIER and J. PERNES (1988), Gametophytic competition in pearl millet. *Genome 30: 924-929.*
- SARR.A,& PERNES.J (1989),Analyses multivariées de rétrocroisements et mise en évidence de distorsions de ségrégation de caractères quantitatifs chez le mil (Pennisetum thyphoïdes.(Burm)Stapf et Hub.) *Genome 30: 411-421*
- ROBERT.T,SARR.A et PERNES J.(1989),Sélection sur la phase haploïdechez le mil:Effets de la température. *Genome 32:946-952.*
- ROBERT.T,LESPINASSE.R,PERNES.J & SARR.A (1991),Gametophytic competition as influencing gene flow between wild and cultivated forms of pearl millet. *Genome 34:195-200.*
- T. ROBERT, F. LAMY and A. SARR (1992), Evolutionary role of gametophytic selection in the domestication of of pearl millet : A two locus asymmetrical model. *Heredity 69: 372-381.*
- K. LE THI, T. ROBERT and A. SARR (1992), Gametophyte-Sporophyte Genetic overlapping in pearl millet :evidence of post meiotic expression of isozyme loci. *J.Hered 83: 26-30.*
- T. ROBERT and A. SARR(1992) ,Multivariate analysis of Recombination between wild and cultivated genomes within the primary gene pool of pearl millet *Genome 35-208-219.*
- ROBERT . T,LAMY .F,SANDMEIER .M & A. SARR (1992), Pollen competition as an Evolutionary Parameter of allogamous cereal :a two locus symmetrical Model of the Evolution on sympatric conditions of wild and cultivated populations of pearl millet. *Springer verlag,inc.Angiosperm pollen and ovules.E.Ottaviano et al .ed*
- SARR.A et al(1992),Domestication as general model for Genetic Resources enhancement in: *Complexes d'espèces ,Flux de Gènes et Ressources Génétiques(BRG.ED)*
- KHALFALLAH.N,SARR.A,SILJAK-YAKOVLEV.S (1993),Karyological study of some cultivated and wild stocks of pearl millet from Africa. *Caryologia 46(2-3):127-138*
- LeTHI.K,LESPINASSE.R,SILJAK-YAKOVLEV.S,ROBERT.T,KHALFALLAH.N& A.SARR(1993),Karyotypic modifications in androgenetic plantlets of pearl millet *.Caryologia 47,1:1-10*
- RICROCH.A,PEFLEY.EB,BAKER.R,ROUAMBA.A,SILJAK-YAKOVLEV.S& A. SARR(1993)

- Physical organisation of DNA sequences in *Allium cepa* chromosomes. *Acta Horticulturae*.358:165-169
- ROUAMBA.A, RICOCH.A, A.SARR(1993), Collecting onion Germplasm. *Plant genetic Resources Newsletter*.94:1577
- ROUAMBA.A, RICOCH.A, SANDMEIER.M, ROBERT.T & A.SARR(1993) Enhancement of Genetic Resources (*Allium cepa*) in west Africa. *Acta Horticulturae*;358:173-181
- LAMY.F, ANDRE.S, ROBERT.T & A.SARR(1994), Use of isozymes and RFLP markers to assess genetic diversity in introgression procedures between Adapted and non Adapted maize populations (*Zea mays*). *Hereditas* 120:346-354
- MARTEL.E, PONCET.V, PANAUD.O and A. SARR(1995), Genomic relationships between Pennisetum species with:  $2n = 2x = 14$  chromosomes using genomic in situ hybridisation. *Chromosome Research Supplement*:55-56
- Global Biodiversity Assessment*. UNEP. V.H. HEYWOOD. ED(1995) Cambridge press. (Contributing author, ch.4/Maintenance and loss of Biodiversity.
- E. MARTEL, A. RICOCH and A. SARR(1996). Assessment of Genome organisation among diploid species ( $2n = 2x = 14$ ) belonging to primary and tertiary gene pools of pearl millet, using fluorescent in situ hybridisation with rDNA probes. *Genome*, 39(4):680-687
- ROUAMBA.A, ROBERT.T, SARR.A, A. RICOCH(1996) A Preliminary Germplasm Evaluation of Onion landraces from West Africa. *Genome*, 39 : 1128-1132
- E. MARTEL, DE NAY.D, SILJAK-YAKOVLEV.S, BROWN.S, and A.SARR(1996), Genome size variation and base composition in pearl millet and fourteen related pennisetum species. *J. Heredity*, 88:139-143.
- S. SILJAK. YAKOVLEV, S. BENMALEK, M. CERBAH, T. COBA DELA PENA, N. BOUNAGA, S.C. BROWN., A. SARR(1996), Chromosomal sex determination and heterochromatin structure in date palm. *Sex. Plant. Reprod*, 9:127-132
- N. MACHON, LEFRANC.M, BILJER.I, MAZER.S and A. SARR(1997) Allozyme variation in *Ulmus* species from France: Analysis of differentiation. *Heredity*, 78:12-20
- M. Le THIERRY d'ENNEQUIN, O. PANAUD, S. BROWN, S. SILJAK-YAKOVLEV, and A. SARR(1998), First Evaluation of Nuclear DNA content in setaria genus by Flow Cytometry. *J. Heredity* 89(6):556-559
- V. PONCET, F. LAMY, J. ENJALBERT, H. JOLY, A. SARR, T. ROBERT(1998) Genetic analysis of the domestication syndrome in pearl millet (*Pennisetum glaucum* L.): inheritance of the major characters. *Heredity*(81):648-658
- M. Le Thierry d'ENNEQUIN, O. PANAUD, B. TOUPANCE and A. SARR(2000) Assessment of genetic relationships between *Setaria italica* and its wild relative *S. viridis*, using AFLP markers. *Theoretical and appl. Genetics* 100(7):1061-1066
- V. PONCET, F. LAMY, K. DEVOS, M.D. GALE, A. SARR, T. ROBERT(2000), Genetic control of Domestication traits in pearl millet. *Theoretical and Appl. Genetics*.:100: 147-159
- V. ZOLDOS. S. SILJAK-YAKOVLEV. D. PAPES A. SARR. O. Panaud(2001) Representational difference analysis reveals DNA differences between *Q. robur* and *Q. suber*; an implication in the study of genome evolution in *Quercus* genus. *Mol Genet Genomics* 265: 234-241
- O. PANAUD, A. CHAIB and A. SARR(2001). Dynamic conservation of apricot (*Prunus armeniaca*) in saharian oases : use of AFLP markers to assess genetic diversity in traditional orchards . *Euphytica*. In press.

V PONCET, S ALLOUIS, KM DEVOS, F LAMY, A SARR, T ROBERT. (2002). Comparative analysis of QTLs affecting domestication traits among two domesticated x wild pearl millet (Pennisetum glaucum L., Poaceae) crosses and cereals. *Theoretical and Applied genetics*.:104:965-975

O. PANAUD, C. VITTE, J. HIVERT, S. MUZLAK, J. TALAG, D. BRAR, A. SARR (2002)  
Characterization of transposable elements in the genome of rice (*Oryza sativa* L.) using Representational Difference Analysis (RDA)  
*Mol Genet Genomics* 268:113-121

- **KNOWLEDGE OF LANGUAGES**

Pulaar	mother tongue
Walaf	bilingual
French	bilingual
English	Working

**GEOGRAPHIC AREAS OF FIELD EXPERIENCE:**

- Africa (Sahelian and Northern areas) ; India, Europe (France).

*Date of Birth: 02/06/1946*

*Nationality: Senegalese*