Curriculum vitae

Nirala Ramchiary
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Education

Institute (s)	Period	Qualification (Inc. main subjects)
University of Delhi South Campus, New Delhi, India	March 2002 to March 2007	**Ph.D. Genetics** • Molecular markers (AFLP, RFLP, SSRs, SNPs etc.) • Molecular mapping of quantitative trait loci (QTL) • Application of MAS in plant breeding • Mapping and dissection of genes involved in glucosinolate biosynthesis • Evolutionary genomics • Comparative genomics Thesis: Molecular mapping of yield components and seed glucosinolate traits in *Brassica juncea*.
University of Agricultural Science (UAS), Dharwad, Karnataka, India	Sep 1999 to Aug 2001	**M.Sc. (Genetics & Plant Breeding)** Distinction with 92.4% • Molecular Genetics; • Seed science and technology; • Host Plant Resistance (Plant pathology course) • Quantitative Genetics • Molecular Cytogenetics • Plant breeding • Tissue culture in Plant Breeding Minor: Biochemistry • General Biochemistry; • Statistical methods and biometry. Thesis: Evaluation and characterization of rice germplasm collections under upland ecosystem
Assam Agricultural University (AAU) Jorhat, India	Jan 1995 to Aug 1999	**B.Sc. (Agriculture)** Distinction with 8.33/10 • Core Subjects of Agricultural Science; • Major courses in Genetics and Plant Breeding including General Genetics; Cytogenetics; Biometry and Population Genetics

- Proficient in Molecular biology techniques including
  - PCR methodology DNA manipulation and cloning techniques
  - DNA sequencing using automated DNA sequencer
  - Molecular (RAPD, SSR, AFLP, RFLP,SNP genotyping) markers
  - High performance liquid chromatography (HPLC) and Near infrared spectroscopy (NIR)
  - Quantitative trait loci (QTL) mapping and
  - Maintenance, evaluation and characterization of germplasm
  - Breeding self and cross pollinated crop
  - Genome mapping, comparative genomics and evolutionary biology
  - Having good knowledge of statistical methods used in crop breeding

Software Skills

- Good working knowledge of NTSYSpc; DNASTAR, JoinMap, MapQTL, MapInspect, Mapchart and WindQTLCartographer.

Summary of skills

- Highly motivated, confident, industrious, enthusiastic and objective orientated focus with positive frame of thinking to meet the duties and demands of the job.
- Good organisation and leadership skills managed large team efforts to achieve research objectives and worked with staff at all levels from field and laboratory technicians to senior research staff.
- Ability to analyse, find and solve scientific and technical problems.
- Developed a comprehensive range of scientific and communication skills including experimental design, laboratory analysis, data interpretation and preparation of final report.

Academic distinctions/fellowships

- Awarded Senior Research Fellowship (SRF) by Council of Scientific & Industrial Research (CSIR), India (Jun 2004)
- Awarded Junior Research Fellowship (JRF) for PhD by CSIR, India and University Grant Commission (UGC), India (Jun 2001)
- Awarded JRF for Masters by Indian Council of Agricultural Research (ICAR), India (Jun 2001)
  University Merit Scholarship, AAU, India (1995-1999)

Conferences and symposia

- Attended conference on “Biotechnology- Concepts to Commercialization” by Biotechnology Society of India, Jawaharlal Nehru University, New Delhi (Dec 2005)
- Participated workshop on “Bioinformatics and Its Application to Biology” University of Delhi South Campus, India (Mar 2003)
- Attended symposium on “Advances in Genetics and Plant Breeding – Impact of DNA Revolution” by Indian Society of Genetics and Plant Breeding, UAS, India (Oct 2003)

Other qualifications

- Qualified National Eligibility Test (NET) for lectureship in Genetics conducted by Agricultural Scientist Recruitment Board (ASRB), ICAR, New Delhi (2004)
- Qualified National Eligibility Test (NET) for lectureship in Life Sciences conducted by University Grant Commission (UGC) (2001).
- Qualified National Eligibility Test (NET) for lectureship in Plant Breeding conducted by ASRB, ICAR, New Delhi (2001)

Personal details

Date of Birth : 20/09/74 Sex : Male Marital status : Single

Reference

1. **Prof. Akshay K. Pradhan**
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Publications

Ramchiary, N., Padmaja, L., Sharma, S., Sodhi, Y.S., Gupta, V., Pental, D. and Pradhan, A.K. (2006). **Mapping of yield influencing QTL in Brassica juncea: Implications for breeding of a major oilseed crop of dryland areas** (manuscript communicated)

Ramchiary, N., Bisht, N.C., Gupta, V., Mukhopadhyay, A., Arumugam, N., Sodhi,Y.S., Pental, D. and Pradhan, A.K. (2006). Genetic dissection of aliphatic glucosinolates in *Brassica juncea* genome using anonymous markers and candidate gene approach (in the process of communications)

Ramchiary, N., Bisht, N.C., Padmaja, L., Sharma, S., Gupta, V., Pental, D. and Pradhan, A.K. (2005). *Brassica juncea* genome*:* - dissecting aliphatic glucosinolates from QTLs to genes. *Proceedings of the* souvenir of Conference organized by Biotechnology Society of India from December 22 to-24th December 2005 on the theme" "**Biotechnology- Concepts to Commercialization"**, at Jawaharlal Nehru University, New Delhi, India (adopt any standard way of citing conference proceedings, this is not souvenir, it is conference proceedings)

Pradhan, A.K., Gupta, V., **Ramchiary, N**., Mukhopadhyay, A., Arumugam, N., Sodhi, Y.S., Pental, D. (2003). A high density linkage map in *Brassica juncea. Proceedings of 11th International Rapeseed Congress,* Copenhagen, Denmark, 6-10 July , pp164-165.

Ramchiary, N., Gupta, V., Mukhopadhyay, A., Arumugam, N., Sodhi, Y.S., Pental, D. and Pradhan, A.K (2003). Molecular mapping and QTL dissection of quality traits in *B. juncea*. *In* souvenir of symposium " **Advances in Genetics and Plant Breeding – Impact of DNA Revolution**" organized by Indian Society of Genetics and Plant Breeding from 30th to-31st October 2003, at University of Agricultural Sciences, Dharwad, Karnataka, India

Brief statement of Research Done in PhD

2002 -till date Ph.D: **Research topic** "**Molecular mapping of yield components and seed glucosinolates traits in *Brassica juncea***",-**The first** objective of project was to develop a high density and saturated molecular genetic map in Indian mustard, *Brassica juncea* using AFLP, RFLP and SSR markers besides putting some known genes from *Arabidopsis thaliana* into the *B. juncea* genome map so that each and every part of genome is covered with at least one marker. Under this objective I have developed extensive knowledge of genome mapping and comparative genomics.

The second objective of the research project was to dissect quantitative trait loci (QTLs) for agronomic and quality trait .*Brassica juncea* is an amphidiploid derivative of diploids *B. rapa* (AA, 2n=20) and *B. nigra* (BB, 2n=16) and both the genome plays major role in expression of quantitative and qualitative traits. During the process, I have studied the role of A and B sub genomes in the expression of traits in amphidiploid *Brassica juncea* (AABB, n=18) and found that east European and Indian *Brassica juncea* gene pools evolved independently after formation of polyploidy i e. Genotypes in Indian *Brassica juncea* gene pool are selected towards *B. rapa* genomic traits while from east European gene pool are selected towards *B. nigra* genomic traits. This was proved by the molecular mapping of yield related and quality traits where most of the Loci in A genome were contributed by Indian parent and loci in B genome were contributed by east European Parent. Further major QTL clusters were observed in Linkage 14 and Linkage 18 of A sub genome of *B. juncea*. Overall, I have observed that A sub genome was dominant and played major role in expression of most of the agronomically important traits in *Brassica juncea*. Based on the QTL mapping result we have proposed breeding strategy to be followed in Indian mustard. Presently we are trying to put more candidate gene for major agronomic traits in *B. juncea* genome and look for differential regulation with respect to these candidate genes in east European and Indian *B. juncea*.

The third and major project of the research was to study the detail genetics of aliphatic glucosinolates biosynthesis pathway in Indian mustard, so that this sulphur containing secondary metabolite can be manipulated in Indian mustard for development of canola quality Indian mustard. Genetic study of aliphatic glucosinolates biosynthesis patway using four populations F_1DH, F_3 BC_1DH and BC_4DH populations showed that biosynthesis aliphatic glucosinolates is a complex genetic system involving at least 6 loci. Mapping of loci involved in glucosinolate biosynthesis pathway was done in F_1DH and advanced backcross generation BC_4DH populations. Comparison of QTL detection F_1DH and BC_4DH population revealed finding of new QTLs in BC_4DH population which were not detected in F_1DH population and disappearance of already detected QTLs in BC_4DH population. Using Candidate gene

approach I have cloned and mapped *GSL-BjELONG* and *BjGSL-ALK* genes which are involved in aliphatic glucosinolates biosynthesis pathway in *B. juncea* and positions of few of these mapped genes were perfectly found to be correlated with glucosinolates QTLs that were mapped by anonymous markers. These genes are placed in biosynthesis pathway of aliphatic glucosinolates in *B. juncea*. These low and high allele (for glucosinolates) specific markers are being used for marker assisted breeding to develop low glucosinolates *B. juncea* variety (canola quality). The expression analysis and regulation of each gene (*BjGSL-ELONG* and *BjGSL-ALK*) are being in progress. The screening of natural allelic variation of glucosinolate loci in *B. juncea* germplasm is in progress.

1999 - 2001. Worked on research project "**Evaluation and Characterization of Rice Germplasm Collections Under Upland Ecosystem"** in the Department of Genetics and Plant Breeding, University of Agricultural Sciences, Dharwad, Karnataka, India towards partial fulfilment of Master of Science Degree Program. During that period I have developed the expertise of germplasm collection, cataloguing, maintenance, evaluation and characterization techniques besides knowledge of hybrid as well as pure line breeding. As a minor, I took course on **HOST PLANT RESISTANCE**, where I have learned interactions of host plant and plant pathogens in causing plant diseases, gene to gene interactions etc including calculations of disease index.

1995-1999 Studied various courses of agriculture and allied sciences in undergraduate level including plant pathology courses such as principles of plant pathology, diseases of vegetables and field crops etc**.** During that period I gathered extensive knowledge and was exposed to basic agricultural sciences including basics of genetics and plant breeding, insect pest and diseases of crop plants.