

CURRICULUM VITAE

Name : **Dr. Arunakumar G. S.**
Designation : Scientist-B
Qualification : M. Sc. (Agri.), Ph. D., PGDMM, PGDMCJ, PGDRD
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Academic qualification

Degree / Exam Passed	University / College / School	Subjects	Year of Passing
Ph. D.	University of Agricultural Sciences, Dharwad, Karnataka, India	Plant Pathology	2013
M. Sc. (Agri.)	University of Agricultural Sciences, Dharwad, Karnataka, India	Plant Pathology	2008
B. Sc. (Agri.)	University of Agricultural Sciences, Bangalore, Karnataka, India	Agricultural, allied subjects and basic sciences	2006
PGDMM	Karnataka State Open University, Manasagangotri, Mysore, Karnataka, India	Marketing Management	2011
PGDMCJ	Karnataka State Open University, Manasagangotri, Mysore, Karnataka, India	Mass Communication and Journalism	2012
PGDRD	Indira Gandhi National Open University, New Delhi, India	Rural Development	2014

Academic Research Experience

Ph. D.

(Guided by Dr. I K Kalappanavar)

“Mechanism of slow leaf rusts, molecular characterization in bread wheat and variability in *Puccinia triticina* Eriks.”

Objectives:

1. Survey, surveillance and race identification of wheat leaf rust in wheat growing regions of Karnataka
 - Roving survey method was adopted
 - Disease infection types and severity was recorded by using international standard scale proposed by Loegering and Peterson.
 - Race identification work was conducted at Directorate of Wheat Research, Regional station, Flowerdale, Shimla, Himchal Pradesh
2. Study of genetic diversity in *Puccinia triticina* population of Karnataka through molecular techniques
 - Predominant leaf rust races and different isolates collected from various wheat growing regions were subjected to DNA profiling by using EST-SSR markers
 - Genetic variability was analyzed by using NTSYS PC 2.0 software programme
 - Dendrograms were generated by following unweighted pair group using arithmetic mean algorithm (UPGMA).
3. Identification of wheat slow leaf rusts.
 - Elite bread wheat genotypes were collected from different wheat improvement centers in India and also from CIMMYT, Mexico
 - Two year field evaluation was done to characterize different slow rusting components like ACI, AUDPC, Pustule size & density, and rate of infection
 - Pustule size was measured by using DIC microscope
 - Molecular characterization of elite bread wheat genotypes for slow leaf rust resistance genes (*Lr34*, *Lr46* and *Lr67*) by using STS and SSR molecular markers
 - SRT and gene postulation was done at DWR, RS, Shimla (HP)
 - Isozymes expression study was done by using native PAGE
4. Evaluation of identified slow leaf rusts for quality traits.
 - Protein content of grain was analysed by using NIR systems Infra tech grain analyzer (FOSS, Hillerod, Denmark) and Gluten content was measured by Gluten analyzer (Erkaya, GW 2200[®], Ankara, Turkey).
 - Damaged starch estimation was done with SD-Matic, Chopin Technologies, Villeneuve la Garenne, France
 - Alveograph characteristics were determined by Alveolink-NG software (Chopin Technologies)
 - The amounts of micronutrient determined by using double beam Atomic Absorption Spectrophotometer (Elico[®] SL 176, Hyderabad, Andhra Pradesh, India).

5. Management of leaf rust through chemicals.
 - Novel chemicals in combinations or alone were selected to find new molecule which can replace existing molecule to manage rust
 - In two year field experiment we could able to obtain very interesting result and the new molecule which is in pipeline showed highly effective against ever evolving rust pathogen.

M. Sc. (Agri.)
(Guided by Dr. Kamanna B. C.)

**“Studies on leaf blight of chrysanthemum caused by *Alternaria alternata*
(Fr.) Keissler”**

Objectives:

1. To undertake a survey for leaf blight in chrysanthemum growing areas.
 - A roving survey was conducted to know the per cent disease incidence (PDI) of leaf blight disease of chrysanthemum in the farmer’s field of northern Karnataka.
2. Isolation, identification and proving the pathogenicity of the fungus.
 - Collection and isolation of the pathogen (*A. alternata*)
 - Single spore isolation
 - Maintenance of the culture
 - Identification of the pathogen
 - Proving the pathogenicity
3. To study the disease development in relation to environmental factors.
 - The effect of weather factors like temperature (max. and min.), RH (mor. and eve.) in RF (mm) and number of rainy days on the incidence and development of leaf blight were studied in the farmer’s field
 - The observations were made on disease incidence and severity starting from first day of its appearance and till the end of the crop.
 - It was correlated with weather parameters by correlation and regression.
4. To evaluate fungicides, botanicals and bioagents against the pathogen.
 - ***In vitro* evaluation of fungicides:** The efficacy of non-systemic fungicides and systemic fungicides against *Alternaria alternata* were assessed by poisoned food technique
 - ***In vitro* evaluation of plant extracts and bioagents:** The present investigation was aimed to study the antifungal activity of some plant extracts and bioagents.
 - ***In vivo* evaluations of fungicides, botanicals and bioagents:** Effective fungicides, botanicals and bioagents at *in vitro* level were selected in the field evaluation against *Alternaria alternata*.

Research Work Experience

<p>09-11-2013 to 30-10-2015</p>	<ul style="list-style-type: none"> • Worked as a Research Associate under project entitled “Increasing the productivity of the wheat crop under conditions of rising temperatures and water scarcity in South Asia”, Funded by BMZ, Germany and CIMMYT, Mexico, operating at Wheat Scheme, MARS, University of Agricultural Sciences, Dharwad, Karnataka, India. • Evaluated more than 3000 wheat genotypes obtained from CIMMYT, Mexico against wheat rust and other foliar diseases • Recorded various Physiological, Agronomic and Quality parameters. • Experience on Planning, Monitoring and Regulating different trials.
<p>31-05-2010 to 08-11-2013</p>	<ul style="list-style-type: none"> • Worked as Senior Research Fellow under the project entitled “Generating new wheat germplasm with enhanced drought/heat tolerance using AB genomes genetic diversity under generation challenge programme”, operated at Wheat Scheme, MARS, University of Agricultural Sciences, Dharwad. <ul style="list-style-type: none"> ➤ Evaluation and selection of parental synthetic hexaploid wheat materials for crossing programmes ➤ Generation advancement and off season maintenance of newly generated materials ➤ Off-season evaluation at IARI, regional station, Wellington Tamil Nadu, India
<p>August, 2009 to May, 2010</p>	<ul style="list-style-type: none"> • Worked as Territory Production Manager (SPR) in Syngenta India Ltd. at Ranebennur, Karnataka, India. <ul style="list-style-type: none"> ➤ Identification and discussion of practical problems in seed production ➤ Designing of experiments to address practical problems by combining technical methods ➤ Identification and experimentation of new areas for seed production ➤ Conservation of disease free areas by adopting integrated disease management measures
<p>July, 2008 to July, 2009.</p>	<ul style="list-style-type: none"> • Served as Marketing Executive in Mangalore Chemicals & Fertilizers Ltd. at Coorg, Karnataka, India
<p>April, 2006 to July, 2006</p>	<ul style="list-style-type: none"> • Worked as Field trainee in Bayer Crop Science Ltd. at Chikmagalore, Karnataka, India

International/National conferences / workshops /meeting/training attended

- South Asia Seed Conference of Syngenta Ltd. at **Dubai, UAE**, 4th – 7th March, 2010
- International Group Meeting at **UAS, Dharwad, Karnataka, India**, 9th – 12th February, 2011
- National Symposium on “Integrated Disease Management Strategies in relation to Climate change in south India” held at University of Agricultural Sciences Dharwad from 14th & 15th October, 2011
- Borlaug Global Rust Initiative (**BGRI**), **Technical workshop at New Delhi, India**, 19th – 22nd August, 2013
- **ICAR-CIMMYT molecular breeding / course in wheat at Karnal, Haryana, India**, 25th – 27th August, 2013.
- National symposium on “Pathogenomics for diagnosis and management of plant diseases” held at **CTCRI, Thiruvananthapuram** from 24th & 25th, October 2013
- Training on “Techniques and procedures in crop health monitoring and field evaluation of host resistance in wheat and barley” at **DWR, ICAR, Karnal, Haryana** from 29th – 31st January, 2014.
- National symposium on “Plant pathology in genomic era and 66th Annual Meeting of IPS” held at **IGKV, Raipur (C. G)** from 26-28th, May 2014
- Annual Review & Work Plan Meeting on BMZ and CSISA Wheat breeding (Objective 4), 10th -14th September 2014, **Kathmandu, Nepal**.
- National symposium on “Plant Diseases: New Perspectives and Innovative Management Strategies” held at University of Agricultural Sciences, Dharwad, Karnataka from 11th & 12th December, 2014.
- National symposium on “Understanding host-pathogen interaction through science of omics” held at **ICAR-IISR, Kozhikode (Kerala)** from 16th & 17th, March 2015.
- Training programme by CSR&TI, Mysuru on “**Orientation training on seed officers and analysts**” from 19th to 20th November, 2015.
- National workshop on “**Innovative technologies and best practices in sericulture**” at CSR&TI, Mysuru, on 17th & 18th November, 2015.
- Training programme on “**Phenotyping for drought adaptive traits with special reference to stable isotopes**” held between 18th to 23rd January, 2016 at University of Agricultural Sciences, Bangalore.
- International workshop on “**Fluorescence microscopy, image acquisition, processing and analysis**”. held between 23rd to 25th January, 2016 jointly organized by Sri Jayachamarajendra College of Engineering, University of Mysuru, Stellenbosch University, South Africa and Carl Zeiss, India.
- “**Foundation training for young CSB Scientist’s**” from 29th Feb, 2016 to 16th March, 2016 at three different places viz.,CSB, Bengaluru, CSRTI, Mysuru and CMERTI, Lodaigarh.

Awards received

- **UAS-Gold Medal** for Ph. D. in plant pathology by University of Agricultural Sciences, Dharwad, Karnataka, India during May, 22nd 2014
- **Gold medal** for first place in **1500m athletic running event** during 7th All India Inter University Sports and Games Meet at Udaipur, Rajasthan, India, 23rd – 27th February, 2006
- **‘Best in Sports’ award** during 2005-06 academic year from **College of Agriculture, Shimoga UAS, Bangalore,**
- **Best prefector award** 4th June, 2009 PG hostel day celebrations **College of Agriculture, Dharwad, UAS, Dharwad,**
- **Award of excellence** for outstanding performance in achieving a turnover of **Rs. 10 million** in **Mangala INM products** during 2008-09 in Madikeri territory.
- **Best presentation of Ph. D. research work for “Prof. M. J. Narasihman Award”** at National Symposium on **“Pathogenomics for Diagnosis and Management of Plant Diseases”** at Thiruvananthapuram, Kerala, India.
- **K. P. V. Menon best poster award (2013)** during 66th Annual meeting of the Indian Phytopathological Society (IPS) and National Symposium on “Plant pathology in Genomic Era” held at IGKV, Raipur (CH) on May 26th -28th , 2014.

Research publications

Publications	Total Numbers
Full length Research Papers	: 12
Books	: 1
Book chapters	: 1
Research abstracts	: 20
Popular articles	: 1

List most important recent five publications

1. Pradeep, P. E., Kalappanavar, I. K. and **Arunakumar, G. S., 2014**, Molecular analysis of mutants of tetraploid wheat against spot blotch caused by *Bipolaris sorokiniana* (Sacc.) Shoem. *Bioinfolet*, 11 (2A): 373-380.
2. **Arunkumar, G. S.** and Kalappanavar, I. K., 2014, Effect of leaf rust on grain yield and end use grain quality of slow leaf rusting Indian bread wheat genotypes, *Vegetos*, (Under Press)

3. **Arunkumar, G. S.,** Kalappanavar*, I. K., Pradeep, P. E. and Bharadwaj S. C., 2013, Survey and race analysis of *Puccinia triticina* Eriks. causing leaf rust disease in wheat; Evidence for secondary foci of infection in *Puccinia* path, *Vegetos*, 26 (special) : 21-29.
4. **Arunkumar, G. S.,** Kamanna B. C. and Benagi, V. I., 2011, Management of chrysanthemum leaf blight caused by *Alternaria alternata* (Fr.) Keissler under field condition. *Plant Archives*, 11(1): 553-555.
5. **Arunkumar, G. S.,** Kamanna B. C. and Benagi, V. I., 2011, Effect of environmental factors on leaf blight disease development in chrysanthemum. *Plant Archives*, 11(1): 575-578.