



भारतीय रबर गवेषण संस्थान
THE RUBBER RESEARCH INSTITUTE OF INDIA
(वाणिज्य मन्त्रालय, भारत सरकार)

(Ministry of Commerce & Industry, Government of India)

Phone : 91-481-2353311(10 line)
Grams : RUBRBOARD
Fax : 91-481-2353327
Email : rrii@rubberboard.org.in
Website : <http://www.rubberboard.org.in>

रबर बोर्ड
RUBBER BOARD
कोट्टयम - 9
KOTTAYAM 686 009

2/88/RF-RFScheme/2010/Res

09.08.2010

NOTIFICATION

Rubber Research Institute of India (RRII), Rubber Board, Kottayam-9, invites applications from qualified candidates for selection as Junior Research Fellows under the RRII Research Fellowship Scheme. A total of seven openings are now available in the projects shown below. Suitable candidates will be selected through a written test conducted by RRII at the RRII Headquarters at Kottayam followed by an interview at RRII, Kottayam. Proposed curriculum for the written test for each discipline is given along with this notification. Candidates who find themselves suitable and competent for the positions only need apply.

1.	<u>Jr. Research Fellow:</u> No. of vacancies - One Title of the Project - Preparation and Application of Nano-dispersions in Latex Technology (Project Code 01) Principal Investigator - Dr. Siby Varghese Qualification - M.Sc. (Chemistry / Polymer Chemistry / Analytical Chemistry) with minimum 60% marks
2.	<u>Jr. Research Fellow:</u> No. of vacancies - One Title of the Project - Cambial Activity and Chemical Constitution of TPD Affected Trees of <i>Hevea brasiliensis</i> (Project Code 02) Principal Investigator - Dr. Vinoth Thomas Qualification - Master's degree in any branch of Plant Science with 60% marks Desirable - Experience & expertise in plant anatomy/microtechnique / microscopy / histochemistry and computer applications
3.	<u>Jr. Research Fellow:</u> No. of vacancies - One Title of the Project - Development of Rubber Based Information System Using Remote Sensing and GIS. (Project Code 03) Principal Investigator - Sri. Shankar Meti Qualification - M.Sc. in Agriculture, Forestry, Botany, Environmental Science or Geology with 60% marks Desirable - Experience in remote sensing & GIS application, database management and analysis

4.	<p><u>Jr. Research Fellow:</u> No. of vacancies - Title of the Project -</p> <p>Principal Investigator - Qualification -</p>	<p>One Identification of potential areas for rubber cultivation in N – E India using satellite data, long term climatic data and soil fertility status (Project Code 04)</p> <p>Dr. James Jacob M.Sc. in Agriculture, Forestry, Botany, Environmental Science or Geology with 60% marks. Desirable as in 3 above.</p>
5.	<p><u>Jr. Research Fellow:</u> No. of vacancies - Title of the Project -</p> <p>Principal Investigators - Qualification -</p> <p>Desirable -</p>	<p>One Developing a Microarray of Stress Responsive Genes from Hevea brasiliensis and Characterization of Genes Responsible for Stress Tolerance (TPD cold & Ethylene) (Project Code 05)</p> <p>Dr. Mohamed Sathik, Dr. R. Krishnakumar 1st Class Masters Degree or equivalent Post – Graduate qualification in Biological Science/ Biotechnology / Biochemistry / Microbiology / Plant Sciences/Agriculture with specialization in Plant Biotechnology/Plant Molecular Biology Experience in Plant Biotechnology/Molecular Biological techniques such as DNA/RNA isolation, PCR/Real Time PCR techniques, cloning, subtractive hybridization, microarray preparation, etc.</p>
6.	<p><u>Jr. Research Fellow:</u> No. of vacancies - Title of the Project -</p> <p>Principal Investigators - Qualification -</p> <p>Desirable -</p>	<p>One Developing Screening Tools for Potential Physiological Traits for Early Evaluation in Hevea brasiliensis (Project Code 06)</p> <p>Dr. K. Annamalainathan, Dr. S. Sreelatha 1st class Masters Degree or equivalent in Plant Sciences/Biotechnology/Plant Physiology /Biochemistry/Botany with 60% marks. Experience in protein chemistry, gene cloning, recombinant protein synthesis, protein isolation & purification, ELISA techniques, handling of radioactive materials etc.</p>
7.	<p><u>Jr. Research Fellow:</u> No. of vacancies - Title of the Project -</p> <p>Principal Investigator - Qualification - Desirable -</p>	<p>One Morphological Characterisation of Rubber Clones for Evolving Descriptors (Project Code 07)</p> <p>Dr. Jayasree Madhavan M.Sc (Botany) or M.Sc. (Ag) in Agri. Botany or Genetics and Plant Breeding with minimum 60% marks. Knowledge of Plant Morphology, Anatomy, Genetics, Plant breeding, field experimentation and biometrical/ statistical analysis of data</p>

Other requirements for the selection of Research Fellow under Research Fellowship Scheme in Rubber Research Institute of India:

1. Only bonafide Indian citizens are eligible for the Fellowships and they will be attached to any laboratory or Field Station under the RRII either at Kottayam or anywhere in the country.
2. Age limit:
Upper age limit is 30 years as on 1.9.2010, relaxable upto 5 years in the case of SC/ST, physically handicapped and OBC applicants.
3. Selection procedure :
The selection for award of Junior Research Fellowships will be made on the basis of a competitive written test conducted by RRII at the RRII headquarters at Kottayam – 9. The syllabus for the competitive examination is given at the end. Those candidates who qualify the written exam will have to appear for an interview, the same day.
4. Registering for Ph.D:
The selected candidate is free and is encouraged to register for a Ph.D. with a University which recognizes RRII as a research centre in which case the guide/supervisor or atleast one co-supervisor or co-guide should be from RRII.
5. Stipend & Tenure :
The tenure of JRF will be initially limited to one year and extendable upto three years after assessment annually. During this period, the JRF will receive Rs.12,000/- per month as stipend (Consolidated). There will not be any contingent grant. Since the Fellow will be working on a project of RRII's choice, the required infrastructure including chemicals, consumable, etc. will be met from RRII's ongoing project activities. If the Fellows have to travel to experiment sites or Regional Stations or any other place for official purpose, RRII will provide the Fellow with TA/DA as applicable to the entry cadre of Scientist A of RRII.

On completion of two years as JRF, the Fellow shall be assessed for his/her progress and achievements through an interview by a committee which will include an external expert member, and if found suitable, the JRF can be upgraded to Senior Research Fellowship (SRF) which will have a consolidated emolument of Rs.14,000/- per month. If the JRF is not found fit for upgradation to SRF, the Fellowship can be either terminated or the tenure of the JRF can be extended for another year without upgrading to SRF. SRF also will not have any annual contingent grant but will be eligible for TA/DA as entitled to Scientist B of RRII. The total duration of JRF or JRF + SRF will not exceed five years.

Candidates possessing the above qualifications and requirements may send their applications in the prescribed format appended below, to the Director of Research, Rubber Research Institute of India, Rubber Board, Kottayam-686 009 so as to reach on or before 5.00 pm, 20th September, 2010, in sealed covers superscripting "**Application for Junior Research Fellowship**". Separate applications should be submitted for each position.

Deputy Secretary (Admn.)

To

1. Notice Board, RRII
2. Notice Board, RRII Main Gate
3. Notice Board, HO
4. Notice Board, Training Dept.
5. Notice Board, RO, Kottayam
6. Notice Board, RRDTC, Manganam
7. Website

PROFORMA

APPLICATION FOR JUNIOR RESEARCH FELLOWSHIP AT RUBBER RESEARCH INSTITUTE OF INDIA

Affix your recent
passport size
photo here

1. Name of the Candidate :
2. Title of the project for which Applied and Project Code :
3. Full address with telephone No. and email id :
4. Age: : Age relaxation claimed / Not claimed
(Attach relevant certificate)
5. Date of Birth :
6. Marital status ; Sex : M / F
7. Educational Qualifications :

Course	Subject	% marks	Class	Rank if any
S.S.L.C.				
BSc.				
MSc.				
Other degrees/ qualifications				

8. Research Experience :
9. No. of publications :
10. Title of PG Dissertation / Projects :
11. Signature :

RRII Fellowship Scheme : Syllabus for Written Test

Project I. Preparation and Applications of Nano- dispersions in Latex Technology (Project Code 01)

- Structure and Bonding: Atomic orbitals, electronic configuration of atoms and the periodic properties of elements, symmetry elements and point groups for simple molecules, structure of simple ionic and covalent solids, lattice energy.
- Acids and Bases : Bronsted and Lewis acids and bases, pH and pKa, acid-based concept in non-aqueous media ;
- Redox Reactions: Oxidation numbers, redox potential, electrochemical series, Redox indicators.
- Energetics and Dynamics of Chemical Reactions: Basic laws of thermodynamics, rates of chemical reactions, arrhenius equation and concept of transition state, colligative properties of solutions, methods of determining rate laws, collision theory of reaction rates, theory of absolute reaction rates
- Aspects of s, p, d, f, Block Elements: General characteristics, coordination chemistry; structural aspects, isomerism, octahedral and tetrahedral crystal – field splitting of d-orbitals, radioactivity.
- IUPAC nomenclature of simple organic compounds, common organic reactions and mechanisms: reactive intermediates, nucleophilic, electrophilic, radical substitution, addition and elimination reactions.
- Elementary principles and applications of electronic, vibrational, NMR, EPR and mass spectral techniques to simple structural problems.
- Topics in Analytical Chemistry: Chromatography, solvent extraction, application of atomic and molecular absorption and emission spectroscopy in quantitative analysis, light scattering techniques, thermo gravimetric analysis, differential thermal analysis, differential scanning calorimetry.
- Aromaticity: Huckel's rule and concept of aromaticity (n) annulenes and heteroannulenes, fullerenes (C60).
- Spectroscopy: Applications of mass, UV – VIS, IR and NMR spectroscopy for structural elucidation of compound.
- Polymers: Methods of polymerisation, classification and characterisation of polymers,
- Colloids: Classification of colloids stabilisation and destabilising a colloidal dispersion, tyndall effect.
- Rubbers and Thermoplastics: General aspects of natural and synthetic rubbers, chemistry of vulcanisation, factors affecting degradation of polymers, general application of rubbers.

Project II. Cambial Activity and Chemical Composition of TPD affected Trees of *Hevea brasiliensis* (Project Code 02)

- General Botany (Master's degree level)
- Plant Anatomy (General anatomy, developmental anatomy, vascular tissue, cambium, senescence, plant adaptations etc.)
- Response of plants to different forms of stresses (structural, histochemical, biochemical and physiological)
- Microtechniques (killing and fixing, embedding, sectioning, vital dyes, buffer preparation etc.).
- Microscopy (LM & EM, biophysics, polarization, birefringence, phase contrast, fluorescence, optics) and computer applications.
- Recent developments in plant anatomy research (immunocytochemistry, confocal microscopy, ESEM, EDAX, XRD etc)

Project III: Development of Rubber Based Information System Using Remote Sensing and GIS. (Project Code 03) &

Project IV: Identification of potential areas for rubber cultivation in the NE India using Satellite data, long term climatic data and soil fertility status (Project Code 04)

- Fundamentals and applications of remote sensing in agriculture and forestry
- Digital image processing, geo coding and image classification.
- Basic concept of projection and co ordinate system.
- Fundamentals of data structure and GIS
- Fundamentals and concept of GIS database creation
- GIS analysis – concept and methodology.
- Vector and raster spatial analysis.
- Application of remote sensing and GIS in agriculture, forestry and geology

Project V. Developing a Microarray of Stress Responsive Genes from *Hevea brasiliensis* and Characterization of Genes Responsible for Stress Tolerance (TPD Cold & Ethylene) (Project Code 05)

- Photosynthesis, crop productivity, chloroplast structure, development and function, photo systems, ecological aspects of photosynthesis.
- Plant growth regulators, hormones, receptors, signal transduction; hormonal regulation of gene expressions, senescence, abscission and PCD.
- Response of plants to abiotic stresses: reactive oxygen species (ROS); ROS scavenging systems, stress tolerance mechanisms.
- Structure of DNA and RNA; genome organization in prokaryotes and eukaryotes; mitochondria and chloroplast genomes; transcription, expression and regulation, recombinant DNA technology, vectors, tissue specific expression of genes.
- Extraction of proteins and nucleic acids, quantification, electrophoresis, western, southern and northern, RFLP & RAPD analysis, PCR & DNA sequencing, ELISA & RIA, cDNA synthesis, subtractive hybridization, quantitative PCR transcriptome sequencing microarray.
- Bio-information analysis, various softwares for nucleotide/protein sequence analysis, structural comparisons, genome projects.

Project VI: Developing Screening Tools for Potential Physiological Traits for Early Evaluation in *Hevea brasiliensis* (Project Code 06)

Photosynthesis and Respiration

- Structure and function of cell and cell organelles, photosynthesis, canopy level photosynthesis, photorespiration and significance of photorespiration.
- Respiratory metabolism, generation of ATP, significance of ATP.
- Methodologies related to measurement of photosynthesis, respiration and bioenergetics

Stress Physiology

- Concept of water potential, movement of water in soil and plant, transpiration and evapotranspiration, water use efficiency of crops.

- Photophysiology, photoinhibition, abiotic stresses, oxidative stress in plants, drought tolerance mechanisms in plants, free radical and reactive oxygen species (ROS) production and scavenging mechanisms.

Protein Biochemistry

- Biosynthesis of proteins, protein separation and purification, antigen and antibodies, ELISA, RIA and western blotting.
- Enzymes and isozymes in plants, heat shock and stress responsive proteins, their role in plants stress tolerance.

Project VII: Morphological characterisation of Rubber clones for Evolving Descriptors (Project Code 07)

Taxonomy of Angiosperms

- (a) Units of classification : Taxonomic hierarchy; Concepts of Genus, species, family.
(b) Identification strategies of angiosperms : Concepts of character; Correlation of characters; sources of taxonomic characters ; practical identification of plants; preparation of key based on morphological characters

Anatomy of Angiosperms

- (a) Anatomy of stem, leaf, flower, fruit and seeds (b) Ontogeny , structure and function of leaf (c) Classification of stomata & trichomes (d) Xylem; Phloem; Cambial activity; secondary thickening

Plant Micro technique and Microscopy

- (a) Killing & fixation of plant tissues, (b) Tissue processing (Principles & methods of dehydration, infiltration etc.), (c) Tissue embedding techniques (Paraffin/resin), (d) Principles & methods of Microtomy, (e) Stains & Staining methods, (f) Mounting & mounting media, (g) Whole mounts, Cytological methods , Maceration & Micrometry, (h) Microscopy (Light microscopy, Stereo microscopy, Phase contrast microscopy, Fluorescence microscopy , Photomicrography)

Genetics and Plant Breeding

- (a) Classical Genetics, (b) Genotypes and Phenotypes, (c) Linkage, crossing over & gene mapping, (d) Plant breeding, (e) Molecular approaches to plant breeding (Somatic hybridization, Gene technology, Transgenic plants, (f) Hybridization techniques in self & cross pollinated plants.

Statistics

- (a) Collection & classification of data (b) Population & sampling techniques (c) Measures of central tendency (mean, median, mode) (d) Measures of dispersion (mean deviation, standard deviation, standard error, co-efficient of variation (e) Test of significance (f) Associations (regression & correlation) (g) Experimental designs (introduction, principles, replications , randomization, ANOVA, CRD, RBD).