

### **Biodata of the Scientist**

Division/Section: Division of Crop Protection

#### **A. Personal information**

1. Name(With Title): Dr.T.Makeshkumar

1.a. Qualification: M.Sc (Agri.), Ph.D (Plant Pathology)

2. Designation: Principal Scientist

3. Address(Personal): TC 55/1233(1), Akshya Nagar, Neeramankara, Kaimanom (PO), Thiruvananthapuram - 695017

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5. Email: [makeshctcri@gmail.com](mailto:makeshctcri@gmail.com)

6. Countries visited: USA, Belgium, Germany, Switzerland, The Netherlands, Uganda

#### **B. Professional information**

1. Area of specialization: \_Plant Pathology

2. Area of interest: \_Plant Disease Diagnosis & Characterization, Plant Pathogen interaction, Transgenics for disease resistance

3. Number of institute projects completed(Add list): 5

4. Number of Institute projects being handled(Add list): 1

5. Number of externally funded projects completed(Add list): 2

6. Number of externally funded projects being handled(Add list): 1

7. Number of students guided for a) Ph.D\_Nil b) M.Phil Nil c) M.Sc 31

8. Number of students being guided for a) Ph.D 5 b) M.Phil 0 c) M.Sc 2

8.a. information about the students under your guidance

Name of the student	Course undergoing (Ph.D/M.Phil/M.Sc)	Title of the project/Thesis	E-mail address
B.S.Prakash Krishnan	Ph.D (Part time)	Replicase (AC1) gene mediated resistance in cassava (Manihot esculenta Crantz) against Indian cassava mosaic virus	<a href="mailto:Praku4u@gmail.com">Praku4u@gmail.com</a>
Merlin, M.C	Ph.D	Molecular characterization & diagnosis of sweet	<a href="mailto:Merlinmc85@gmail.com">Merlinmc85@gmail.com</a>

		potato leaf curl virus	
Dhanya Jayaseelan	Ph.D	Developing virus resistance in cassava ( <i>Manihot esculenta</i> Crantz) by RNA interference	<a href="mailto:meetdhaya@gmail.com">meetdhaya@gmail.com</a>
Deepthi D.C	Ph.D	Molecular characterization of symptom recovery in cassava genotypes during cassava mosaic disease infection	<a href="mailto:deepthidc@gmail.com">deepthidc@gmail.com</a>
Kamala.S	Ph.D	Development of resistance to Dasheen mosaic virus in <i>Amorphophallus paeoniifolius</i>	<a href="mailto:Kamala.ajith@gmail.com">Kamala.ajith@gmail.com</a>
Leen Abraham	M.Sc (Integrated Biotechnology), KAU	Genetic transformation of Elephant foot yam ( <i>Amorphophallus paeoniifolius</i> (Dennst.) Nicolson)	<a href="mailto:Lenazz111@gmail.com">Lenazz111@gmail.com</a>
Adil Hakkim	M.Sc (Integrated Biotechnology), KAU	Molecular characterization of viruses in taro ( <i>Colocasia esculenta</i> (L.) Schott)	<a href="mailto:aadhiaddz@gmail.com">aadhiaddz@gmail.com</a>

#### 9. Information on guide ship

Guide ship for Ph.D/ M.Phil/ M.Sc	University	Subject
Ph.D	University of Kerala	Biotechnology (Applied Science)


10. Number of Research papers(Add list): \_25
11. Number of Books/Book chapters(Add list): 5
12. Number of Technical Bulletins(Add list): 1
13. Consultancies offered(Add list and give a brief description): Nil
14. Technologies developed(Add list and give a brief description):
15. Patents/Copyrights obtained (Add list and give a brief description):
16. Any other information:

### **ACADEMIC DISTINCTIONS / HONORS / AWARDS**

- 2008** Department of Biotechnology overseas Associateship to undergo advanced level training in Germany for one year period (September 2008 – September 2009) at DSMZ, Braunschweig, Germany
- 1998** Jawaharlal Nehru Award for Post graduate Agricultural Research for the outstanding contribution in the field of Plant Pathology , **awarded by** Indian Council of Agricultural Research, New Delhi.
- 1997** Prof. M.J. Narasimhan Academic Award **for best Ph.D. thesis presentation, awarded by** Indian Phytopathological Society, New Delhi
- 1995 – 96 Council of Scientific and Industrial Research Senior Research Fellowship
- 1992 – 94 Indian Agricultural Research Institute Senior Research Fellowship
- 1992 **Banaras Hindu University medal** for standing first rank in M.Sc.(Ag.) University examination in Mycology & Plant Pathology, 1992, awarded by Banaras Hindu University, Varanasi.
- 1986 –90 Indian Council of Agricultural Research Post Matric Scholarship

“International summer school 2009: RCA based diagnosis of plant viruses” organized by Department of Molecular Biology and Plant virology, Institute of Biological Sciences, University of Stuttgart, Stuttgart, Germany during 3-15, August, 2009

## Project list

### Completed

#### Institute

1. Characterisation and management of sweet potato virus diseases
2. Studies on emerging viral disease problems in Sweet potato
3. Studies on variability in viruses affecting Cassava mosaic disease and their management through transgenic technology
4. Investigation on Induced Resistance, Antiviral Plant Extracts and Reversion Phenomenon for the Management of Cassava Mosaic
5. Molecular studies on Cassava mosaic disease- Diagnosis, symptom expression and disease resistance

#### External

1. Development of transgenic cassava resistant to cassava mosaic disease through pathogen derived resistance (NATP-CGP)
2. Development of transgenic cassava resistant to cassava mosaic disease through pathogen derived resistance (NATP-CGP)

## LIST OF PUBLICATIONS

Binoy Babu, Hegde, V., **Makeshkumar, T.**, Jeeva, M.L. 2012. Rapid and sensitive detection of Potyvirus infecting tropical tuber crops using genus specific primers and probes – *African Journal of Biotechnology* 11(5):1023-1027

Anitha Jose, **Makeshkumar, T** and Edison, S. 2011. Survey of cassava mosaic disease in Kerala. *J. of Root crops*. **37(1)**:41-47

Babu Binoy, Hegde, V., **Makeshkumar, T.**, Jeeva, M.L. 2011. Molecular Detection and identification of *Dasheen mosaic virus* infection *Amorphophallus paeoniifolius*- *Archives of Phytopathology and Plant Protection*. 44(13),1248-1260; <http://dx.doi.org/10.1080/03235408.2010.490398>

Babu Binoy, Hegde, V., **Makeshkumar, T.**, Jeeva, M.L. 2011. Development of non-radioactive probes for specific detection of *Dasheen mosaic virus* infecting *Amorphophallus paeoniifolius* - *Current Science* 100(8): 1220 – 1225

- Babu Binoy, Hegde, V., **Makeshkumar, T.**, Jeeva, M.L. 2011 Detection and Identification of *Dasheen mosaic virus* infecting *Colocasia esculenta* in India- *Indian Journal of Virology* 22(1):59-62.
- Babu Binoy, Hegde, V., **Makeshkumar, T.** and Jeeva, M.L. 2011. Characterisation of the coat protein gene of *Dasheen mosaic virus* infecting Elephant foot yam - *Journal of Plant Pathology* – 93(1) 199-203.
- Rajitha, M., Dhanya Jayaseelan, M.K. Dhanya, V. Hegde, **T. Makeshkumar** and M. L. Jeeva. 2011. *In vitro* Growth Response of different Varieties of Greater yam (*Dioscorea alata* L.). *Journal of Root Crops*. 37 (1):54-59
- Babu Binoy, Hegde Vinayaka, **Makeshkumar, T.** and Jeeva M.L. 2010. Rapid detection and identification of potyvirus infecting *Colocasia esculenta* ( L.) Schott. by reverse transcription –polymerase reaction. *Journal of Root Crops* 36(1): 88-94
- Deepa, I. C. Mohandas, **T. Makeshkumar**, J.V. Siji, B.S. Prakash Krishnan and Binoy Babu. 2010. Identification of New Entomopathogenic Nematodes (EPNs) based on sequences of D2-D3 Expansion Fragments of the 28S rRNA. *Journal of Root Crops* 36(2): 227-232.
- Ravi.V., Naskar, S.K., **Makeshkumar,T.**, Binoy Babu and Prakashkrishnan,B.S.2009. Molecular physiology of storage root formation and development in sweet potato. *Journal of Root crops*. **35(1)**: 1-27
- Angel,G.R, **Makeshkumar,T**, Mohan.C, Vimala, B, Nambisan,B. 2008. Genetic Diversity Analysis of Starchy *Curcuma* Species using RAPD Markers. *Journal of Plant Biochemistry and Biotechnology*. 17(2): 173-176.
- Anitha Jose, **Makeshkumar,T** and Edison,S.2008. Host range of Sri Lankan cassava mosaic virus. *J. of Root crops*. **34**:21-25
- Antony, B, Lisha, V. S., Palaniswami, M.S., Sugunan, V.S., **Makeshkumar, T.**, and Henneberry, T.J. 2006. *Bemisia tabaci* and Indian Cassava Mosaic Virus Transmission. *International Journal of Tropical Insect Science* 26(3): 176-182
- Jeeva,M.L., Hegde,V., Vimala,B., **Makeshkumar,T.**, Nair,R.R. and Edison,S. 2006. First report of *Rhizoctonia solani* causing blight on Yam bean (*Pachyrrhizus erosus*) in India. *Plant Pathology* 55:302
- Makeshkumar, T.**, Anoopankar, Nair, R.R and Edison, S. 2005. Detection of Indian cassava mosaic virus through Polymerase chain reaction and Nucleic acid Hybridisation techniques. *J. of Root crops* 31(1): 1-6
- Jeeva,M.L., Hegde,V., **Makeshkumar,T.**, Nair,R.R. and Edison,S. 2005. *Dioscorea alata* - a new host of *Sclerotium rolfsii* in India. *Plant Pathology* 54:574

- Jeeva, M.L., Balakrishnan, S., Edison, S., Umamaheswaran, K. and **Makeshkumar, T.** 2004. Characterization, purification and serology of SPFMV in India. *Journal of Root Crops*. 30(1): 24-30.
- Jeeva, M.L., Hegde, V., **Makeshkumar, T.**, Sriram, S., Nair, R.R., Edison, S. and Mathur, N. 2004. Rust of Queensland Arrow Root (*Canna edulis*) caused by *Puccinia thaliae* : A new record from India. *Plant Pathology* 53:261
- Makeshkumar, T.**, Varma, A., Singh, K.K., Malathi, V.G. and Duttagupta, M. 2002. Coat protein mediated resistance against potato virus Y in transgenic tobacco. *Indian Phytopathology*. 55(2): 187-194.
- Nair, N.G. and **Makeshkumar, T.** 2001. Use of Sago in in vitro culture of tropical tuber crops. *Journal of Root crops*. **27**: 118-122.
- Makeshkumar, T.**, Sriram, S., Nair, R.R., Edison, S. and Thankappan, M. 2001. Symptomatology and characterization of sweet potato virus diseases. *Journal of Root crops*. **27**: 296-302.
- Thankappan, M., **Makeshkumar, T.** and Edison, S. 2000. Management of virus diseases in tropical tuber crops. In *Proc. of International Conference on Integrated Plant disease management for sustainable Agriculture*, Indian Phytopathological society, Pp 1173-1175
- Singh, K.P., P. Bandyopadhyay, R.A. Stephen, S.S. Vaish and **T. Makeshkumar.** 1998. Techniques for selective isolation, semiquantification and rapid virulence testing of *Catenaria anguillulae*. *Mycological Research*. 102(6): 658-660.
- Singh, K.P., R.A. Stephen, and **T. Makeshkumar.** 1993. Development of *Catenaria anguillulae* in *Heterodera cajani*. *Mycological Research*. 97 (8): 957-960.
- B. S. Prakash Krishnan, Abhi Mohan, **T. Makeshkumar**, M. R. Beena and J. Sreekumar. 2011. Devising Suitable Parameters for Achieving Successful Transformation in Cassava (*Manihot esculenta* Crantz.) cv. H226. Proceedings of the National Seminar on Climate change and Food security.: Challenges and Opportunities for Tuber crops (NSCFT 2011) (pub. Secretary, ISRC) pp.380-385

#### Technical Bulletin

- Hegde Vinayaka, Jeeva M.L., **Makeshkumar, T.**, Misra R.S. and Veena S.S. 2010. *Diagnostic techniques for diseases of tropical tuber crops*. Technical Bulletin Series 50, Central Tuber Crops Research Institute, Thiruvananthapuram pp.56

- **Book chapter:**

- S. Edison, Vinayaka Hegde, T. Makesh Kumar, T. Srinivas, G. Suja and G. Padmaja. 2009. Sweetpotato in the Indian Sub-Continent. In *The Sweetpotato*. Loebenstein, Gad; Thottappilly, George (Eds.) , Pages 391-414, Springer, Netherlands.\
- Makesh Kumar, T., Jeeva, M.L and Hegde, V. Diagnosis of diseases of tropical tuber crops. Chapter submitted in Biotechnology in Horticultural crops.
- Makesh Kumar, T. 2010. Nanotechnological application in diagnosis of plant viral diseases with special emphasis on tropical tuber crops. In “Application of Nanotechnology in Agriculture: An Indian Perspective” book edited by H.P.Singh et al ( In Press)
- Hegde V., **Makesh Kumar, T**, Jeeva M.L. and S. Edison. 2010. Status of cassava mosaic viruses occurring in India In Howeler R. H edited book on “ *A New feature of cassava in Asia: Its use as Food, Feed and Fuel to the benefit of poor-* Proceedings of the Eighth regional Workshop held in Vientiane, Lao PDR, Oct 20-24, 2008. CIAT publication P: 630-639
- Hegde, V. , **Makesh Kumar T**, and Jeeva M.L. 2011. Development of Diagnostics for diseases of tropical tuber crops . In B. P. Singh et. al edited *Production of disease free quality planting material propagated through tubers and rhizomes* CPRI, Shimla p;131-145