

Biodata of the Scientist

Division/Section: Crop Production

A. Personal information

1. Name (With Title): Mr. Saravanan Raju

1.a. Qualification: M. Sc. (Plant Physiology)

2. Designation: Sr. Scientist (SG)

3. Address(Personal): TC 9/821, Sreenik, Durgadevi Temple Opp. Kallampally, Sreekariyam PO, Thiruvananthapuram., Kerala. PIN- 695017.

4. Phone Numbers:

(a)Residence _____ (b) Intercom 122 (c) Mobile +91-9544420800

5. Email: rajusar@gmail.com

6. Countries visited: None

B. Professional information

1. Area of specialization: Plant Stress Physiology & Phytochemistry

2. Area of interest: Abiotic stress tolerance, Post harvest Physiology & Phytochemistry

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

Title,	Durati on	Accomplishments	Individual / Collaborative
Seed germination, establishment, seed dormancy and breaking of dormancy in safed musli and guggal.	2001 – 2003	Seed germination and seedling vigor were studied in safed musli and guggal. Seed filling in guggal was studied and accession wise seed filling was reported.	Interdisciplinary
Diseases of medicinal plants and their management	2001 – 2004	Studied the downy mildew disease development in isabgol and the effect of soil nutrient status on disease intensity. Progression of disease with seasonal parameters were investigated.	Interdisciplinary
Collection, conservation, characterization and documentation of some medicinal plants	1995 - 1997	Studied the physiological and biochemical aspects of selected medicinal plants. Screened them based on the photosynthetic and other gas exchange parameters.	Interdisciplinary
Physiological and biochemical studies on Aloe (<i>Aloe barbadensis</i> Linn.) and Senna (<i>Cassia angustifolia</i>)	2006- Conti.	Studied the effect of season on growth and phytochemical changes in aloe. Studied the effect of different light intensity on growth and secondary	Individual

secondary metabolism		metabolites content in senna. Secondary metabolite production in aloe and senna are investigated.	
Characterization and documentation of <i>Tinospora cordifolia</i> germplasm	2007-conti.	Forty accessions of <i>T. cordifolia</i> were screened through physiological and growth parameters.	

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

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

Title of Projects (s)	Year	Project Outlay (Rs.)	Funding agency
Selection for high herbage yield and andrographolide content in <i>A. paniculata</i>	2002 – 2005	17 lakh	ICAR, India
Biotechnological approaches for production and cultivation of Patchoul	2003-2006	10 lakh	DBT, New Delhi
Studies on relationship between ecogeography of the chemotypic variation of nine important but highly threatened medicinal plant species and prospects of their cultivation. (NBRI, Lucknow, NRCMAP, Anand and NBPGR-RS, Bhowali)	2008-2012	123.12 lac for NRCMAP, Anand	NAIP, ICAR.

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

7. Number of students guided for a) Ph.D - b) M.Phil_c) M.Sc -3

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

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

9. Information on guide ship

Guide ship for Ph.D/ M.Phil/ M.Sc	University	Subject
M.Sc.	Sardar Patel University, Vallabh Vidya Nagar, Anand, Gujarat	Physiology & Biochemistry

10. Number of Research papers (Add list):

1. MAHESH KAWALE, SARAVANAN, R., SANDIP, A, PRAKASH PATEL, GAJBHIYE N.A., SANDIP PATEL AND MANIVEL, P. 2012. Pharmacognostic Characterization of *Desmodium gangeticum* (L.) DC - An Ayurvedic Medicinal Plant. International Journal of Pharmacognosy and Phytochemical Research 2011-2012; 3(4);119-126.
2. JATINDRA NATH SAMANTA, R. SARAVANAN, N. A. GAJBHIYE AND KUNAL MANDAL. 2012. Impact of soil moisture levels on growth, photosynthetic competence and oleo-gum-resin production of guggal (*Commiphora wightii*). *Journal of Tropical Forest Science (Malaysia)*. 24(4): 538-545.
3. R. SARAVANAN, SONAL SHAH, K.A. GEETHA AND SATYABRATA MAITI. 2011. Gas exchange characteristics and chlorophyll-a kinetics of two morphotypes of *Centella asiatica* under open and shaded conditions. *Indian Journal of Plant Physiology*. **16(1)**: 75-84.
4. SARAVANAN, R. KUNAL MANDAL, SRIDHAR GUTAM2, JATINDRA NATH SAMANTA1, AND V. SAROJ KUMAR. 2010. Changes in photosynthesis related parameters in isabgol (*Plantago ovata*) under downy mildew infection. *Indian Journal of Plant Physiology*. **15(4)**: 401-405.
5. SONAL SHAH, RAJU SARAVANAN AND NARENDRA ATMARAM GAJBHIYE 2010. Phytochemical and physiological changes in Ashwagandha (*Withania somnifera* Dunal) under soil moisture stress. *Braz. J. Plant Physiol.*, 22(4): 255-261.
6. SONAL SHAH, R. SARAVANAN AND N.A. GAJBHIYE. Leaf gas exchange, chlorophyll fluorescence, growth and root yield of Aswaghandha (*Withania somnifera* Dunal.) under soil moisture stress. *Indian J. Plant Physiol.*, Vol. 15, No. 2, (N.S.) pp. 117-124.
7. MANIVEL. P AND R. SARAVANAN. 2010. DPO 14 - An early maturing mutant of Isabgol (*Plantago ovata* Forsk). *Electronic Journal of Plant Breeding*, 1(5): 1371-1373.

8. APEXA PATEL AND R. SARAVANAN. 2010. Screening of *Plantago* species for physiological parameters in relation to seed yield. *Electronic Journal of Plant Breeding*, 1(6):1454-1460.
9. PHURAILATPAM, A.K., K.A. GEETHA, N.A. GAJBHIYE, **R. SARAVANAN**, S. MAITI. 2009. Comparative study of *Chlorophytum borivilianum* and *C. arundinaceum* – two safed musli species used as vital tonic in Indian Systems of Medicine. *Phytomorphology*. **59 (1 &2)** 85-90.
10. MANDAL. K., **R. SARAVANAN**, S. MAITI, KOTHARI, I.L. 2009. Effect of downy mildew (*Peronospora plantaginis*) disease on photosynthesis and chlorophyll fluorescence in blond psyllium (*Plantago ovata*). *Journal of Plant Diseases and Protection*. 116 (4): 164-168.
11. **R. SARAVANAN**, SUNIL KRISHTI, N.A.GAJBHIYE AND S. MAITI. 2009. Effect of plant population and soil moisture stress on herbage yield and andrographolide content in *Andrographis paniculata*. *Indian Journal of Horticulture* 66(1): 120-125.
12. MANDAL, K., **R. SARAVANAN**, AND S. MAITI. 2008. Effect of different levels of N, P and K on downy mildew (*Peronospora plantaginis*) and seed yield of isabgol (*Plantago ovata*). *Crop Protection* 27:988–995 (United Kingdom).
13. **R. SARAVANAN**, SUNIL KRISHTI, N.A.GAJBHIYE AND S. MAITI. 2008. Influence of light intensity on gas exchange, herbage yield and andrographolide content in *Andrographis paniculata* (Nees.). *Indian Journal of Horticulture* 65(2): 220-225.
14. RAVI, V. AND **SARAVANAN, R.** 2001. Characteristics of photosynthesis and respiration in cassava and sweet potato. *J. Root Crops* 27(1):221-225.
15. 13. RAVI, V. AND **SARAVANAN, R.** 2001. Photosynthesis and productivity of cassava under water deficit stress and stress free conditions. *J. Root Crops* 27 (1): 230-234.
16. RAVI, V. AND **SARAVANAN, R.** 1999. Proline metabolism and its relation to drought tolerance in sweet potato. *J. Root Crops* 25: 135-142.
- 17.

11. Number of Books/Book chapters (Add list):

1. Ravi, V and **R. Saravanan**. 2013. Crop physiology of sweet potato. *In: Sweetpotato* Nedunchezhiyan, M. and Byju.G. (Edt): Fruit, Vegetable and Cereal Science and Biotechnology. Published by GSP (U.K).pp 17-29.
2. MAITI, S AND **R. SARAVANAN**. **2008**. Three Decades of AINP Research on Betelvine. (Compendium of Four decades of AICRP Research in India).

12. Number of Technical Bulletins(Add list):

1. MAITI, S., **SARAVANAN, R.**, GEETHA, K. A. AND MANDAL. K. 2006. Good agricultural practices for patchouli, geranium and lemongrass. NRCMAP, Anand, Gujarat, India. pp-22.

13. Consultancies offered (Add list and give a brief description):

14. Technologies developed (Add list and give a brief description):

Single eye cutting of patchouli for rapid propagation

Single eye cutting of patchouli is developed for rapid multiplication of patchouli to accelerate the propagation of patchouli with minimum utilization of patchouli mother shoots as the dried shoot apex are used to extraction of patchouli oil and this technique will be useful for inducing variability through mutation . Attempts were made for raising plants from single leaf by elsewhere to increase the multiplication ratio from single source of planting material. However, it was reported that the complete plantlet development took nearly 160-180 days from the leaves. It was found that the leaves produce fully developed plantlets in 60 days at our green house condition. Hence the suitability of leaf pairs for the propagation of patchouli and the time taken for complete plantlet development was examined

15. Patents/Copyrights obtained (Add list and give a brief description):

Patent filed: Year 2008

Preparation of aloin from aloe

The objective of the invention is to obtain pure aloin from aloe with minimum loss using easier method in a shorter time. The present invention is for an improved method for purification of aloin from aloe leaf exudates or the derived products thereof. The yellow sap of aloe or the derived product is dissolved in pyridine and homogenised thoroughly using a mechanical stirrer and centrifuged at room temperature (25-30°C) at 5000rpm for 10-20 minutes. The precipitate is discarded and supernatant is taken in a container. The supernatant is dissolved in excess of ethyl acetate and the resulting precipitate is removed and yellow solution is concentrated in reduced pressure (220-190 mbar) to get thick brown syrup. The syrup is added with excess of ethyl acetate and the contents are kept under dark for 15-20 minutes for the impurities to settle. The yellow solution is again filtered twice and concentrated under reduced pressure at 55° C. The resultant brown residue is either purified again with addition of excess ethyl acetate or dried further to get a yellow crystalline powder which is washed with diethyl ether and dried to get a free flowing yellow crystalline powder which contains above 90% pure aloin with aloin A to aloin B in ratio of 3:1 and suitable for industrial purposes. The powder so obtained can also be

purified further by recrystallization in suitable alcohol to get a very high purity aloin product (95-97%).

16. Any other information: