

## Dr. A. Ganapathi

### Professor, UGC-BSR Emeritus Faculty

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## Area of Research

- ✓ Plant Genetic Engineering
- ✓ Plant Molecular Biology
- ✓ Secondary Metabolites Production
- ✓ Plant Tissue Culture

### AWARDS / HONORS ETC.,

**As per the Scopus citation database rating my *h* index is 13 and Overall Citations is 429**

**Cumulative impact factor is reached 103**

**Awarded UGC-BSR Faculty Fellowship**

- Elected as Fellow of The Linnean Society (London)
- **IAPTC&B Fellowship Award (2002)** - International Association for Plant Tissue Culture & Biotechnology (IAPTC&B), Florida, USA
- Recipient of prestigious-**Brain Pool Fellowship** (2006-2008), South Korean Federation of Science Technology( April 2007- March 2008)

- Recipient of **INSA** bilateral exchange visiting fellowship to South Korea (2006), Govt. of India, New Delhi
- Elected as Fellowship of Scientific Research (FSR-2010)-Tamil Nadu Scientific Research Organization (TNSRO), Arimalam, Pudukkottai-622 201
- Awarded one **additional increment** by Bharathidasan University for significant research contributions and mobilization of research grant to the tune of 1.5 Crore.

#### **Membership in Academic Bodies:**

- Member, Editorial Board “Legume Research”
- Member, Editorial Board “ERRC news letter” (Environment resource Research)
- Member, Editorial Board “Plant Molecular Biology and Biotechnology
- Member, Indian Plant Tissue Culture Association.
- Member, International Plant Tissue Culture Association & Biotechnology.
- Member, Cucurbit Genetics Cooperative.
- Member, Institutional Biosafety Committee, Bharathidasan University
- Member, Institutional Biosafety Committee National Research Center for Banana (NRCB)
- Member, DST, PURSE Grant implementing group
- Member, University building committee
- Member – Society for In Vitro Cellular and Developmental Biology.
- Member of Senate, Bharathidasan University.
- Member-Library Reform Committee, Bharathidasan University.
- Member-Academic Council, Govt. Women’s College, Kumbakonam
- Member-Executive Committee, Institute for Entrepreneurship and Career Development (IECD)
- Co-ordinator to conduct UGC-JRF, Lectureship Exam of UGC at Bharathidasan University
- Member- Academic Council, Seethalakshmi Ramaswami College, Tiruchirappalli
- Member, Board of Studies, Microbial Biotechnology, Bharathiar University, Coimbatore
- Member, Board of Studies, Biotechnology, Periyar University, Salem
- Member, Board of Studies, Biotechnology, Thiruvalluvar University, Vellore
- Reviewer - Plant Cell Tissue and Organ Culture Journal

- Reviewer - Plant Cell Reports Journal.
- Reviewer - In Vitro Cellular and Developmental Biology-Plant Journal
- Member- Research Journal of Biological Sciences
- Member- Academic Council, Nehru Memorial College, Puthanampatti
- Member- Academic Council, Poompohar College, Mayiladuthurai

### Research Projects:

S.No.	Title	Funding Agency	Year of Starting	Year of Completion	Total Grant Lakhs
1.	Transformation and transfer of Sucrose-phosphate synthase gene into sugarcane	UGC*	2012	2015	12.72
2.	<b>Industrial collaboration</b> To Produce insect resistant soyabean.	Bejo* Sheetal Seeds	2012	2013	7.5
3	Development of <i>Agrobacterium</i> mediated genetic transformation and transfer of pinorexinol synthase gene into <i>Podophyllum hexandrum</i> Royle (syn. <i>P. emodi</i> Wall. ex Hook.f. & Thomas) to improve the Podophyllotoxin content". (PI)	DRDO	2008	2011	21.37
4	Somatic embryogenesis and transfer of $\gamma$ - tocopherol methyl transferase gene into Indian Soybean to increase $\alpha$ -tocopherol(Vitamin E) Content in seeds. (PI)	DBT	2008	2011	47.00
5	Mass culture of Adventitious roots and elicitor treatment to improve the secondary metabolite production in <i>Withania somnifera</i> (L.) Dunal.	CSIR	2008	2011	20.25
6	Transfer of chitinase gene(s) into Sugarcane ( <i>Saccharum officinarum</i> L.) to assess fungal resistance (PI)	UGC Major	2006	2009	06.00

7	Developing in vitro culture and transformation systems in sugarcane <i>Saccharum officinarum</i> L.) (PI)	UGC Major	2002	2005	06.67
8	Development of an efficient regeneration protocol through somatic embryogenesis in three important <i>Vigna</i> species to be used in transformation (PI)	DBT	2001	2004	25.00
9.	Biotechnological and molecular aspects of sex determination in <i>Cucumis</i> . (PI)	DST	1998	2001	30.00
10.	Evolving Micropropagation protocols for Cashew	TNFD	1995	1997	01.50
11.	To evolve <i>in-vitro</i> protocols to improve <i>Pigeonpea</i> productivity (PI)	UGC	1998	1999	00.15
12.	Application of tissue culture technique to improve Cashewnut Productivity (PI)	TNSCST	1996	1999	03.24
13.	Studies on Taxonomic Characterization Of mulberry (Co-In)	CSB	1991	1994	13.00
14.	Application of <i>in-vitro</i> selection principle to improve mulberry Productivity (PI)	CSB	1991	1995	07.15
15.	Biosystematic studies on <i>Physalis</i> L (PI)	UGC	1990	1992	00.13

\*\* Ongoing

UGC	–	University of Grants Commission New delhi
CSB	–	Central Silk Board, Ministry of Textiles, New Delhi
TNSCST	–	Tamilnadu State Council for Science and Technology
TNFD	–	Tamilnadu Forest Department, Govt. of Tamilnadu
DST	–	Department of science and Technology, New Delhi
DBT	–	Department of Biotechnology, New Delhi
CSIR	–	Council for Scientific and Industrial Research, New Delhi
DRDO	–	Defence Research Development Organization, New Delhi

## Students Guided/working

	<b>Ph.D. Students</b>	<b>M.Phil., students</b>
<b>Completed</b>	<b>27</b>	<b>28</b>
<b>Working</b>	<b>8</b>	<b>3</b>

## Visits abroad

1. Visited Delaware University, 15 Innovation Way, Delaware Biotechnology Institute, Newark, DE 19711, USA during 12<sup>th</sup>-28<sup>th</sup> June, 2010 as a visiting Scientist.
2. Visited St. Louis, Missouri, USA during 06-11<sup>th</sup>, June, 2010 for oral presentation of the paper entitled “An Improved Strategy for Somatic Embryogenesis in Indian Soybean Cultivars”.
3. Visited Dong-A University, Busan, South Korea (11.03.2008-21.03.2008) to deliver series of lecture on soybean Biotechnology.
4. Visited Pai Chai University, South Korea during 01.04.2007- 31.03.2008, one year under Brain Pool Fellowship, KOFST, South Korea.
5. Visited Temasek Life Science Institute, National University Singapore, during 05.11.2006 to 08.11.2006 collaborative program.
6. Visited Kangwon National University, Chungbuk National University, Pai Chai University, South Korea during 07.09.2006 to 04.11.2006, 2 months under INSA bilateral collaborative exchange Program.
7. Visited University of Florida, University of Georgia, Athens, Texas A&M University (Department of Plant Biology), USA during 2002, 3 months under IAPTC & B fellowship.
8. Visited Bar-Ilan University, Tel Aviv, (1998 and 2000 - 6 months each), Israel as a Collaborative Researcher and enriched the practical knowledge on plant molecular techniques.
9. Visited Adelaide Botanical Garden, Australia (1994) - as a Visiting Scientist.

## Conferences/ Workshop Organized

1. Organized Short term training course on Molecular Tools and Technique in Plant and Animal Biotechnology during 11<sup>th</sup> -25<sup>th</sup> March 2011.
2. Organized Workshop on Advanced Techniques in Plant Molecular Biology during 23<sup>rd</sup> – 28<sup>th</sup> February, 2004. (Sponsored by TANSICHE & BARD)
3. Organized Workshop on Plant Molecular Biology during 1<sup>st</sup> –13<sup>th</sup> March 2002. (Sponsored by DBT, CSIR, BARD and TANSICHE)
4. Organized Workshop on Plant Tissue Culture and Gene Transfer during 19<sup>th</sup> – 24<sup>th</sup> February, 2001.
5. One of the Organizers of the 9<sup>th</sup> Botanical Conference held at Bharathidasan University, Tiruchirappalli (1989)

## Refresher Courses /Training Courses attended

1. Refresher Course "Plant cell, tissue and organ culture", sponsored by UGC, Dept of Plant Science, Bharathidasan University, Tiruchirappalli 620 024, Tamil Nadu (March 5-April 1, 1996)
2. National workshop on "The Molecular Biology of the Gene" (Centre for Plant Molecular Biology), Department of Genetics, Osmania University, Hyderabad (Nov. 11-30, 1995)
3. Environmental Remote Sensing Refresher course (Dept. of Earth Sciences) Bharathidasan University, Tiruchirappalli-620 024 Tamil Nadu. (March 11-30, 1995)
4. Recent Advances in Plant Molecular Biology, and Tissue culture (Centre for Plant Molecular Biology), Dept. of Genetics, Osmania University, Hyderabad (Feb 3-23, 1992)
5. Training Under DBT Pilot Plant for Commercial tissue culture of *Eucalyptus* and Bamboo at Tissue culture unit, National Chemical Laboratory, Pune, under NABARD - Tamil Nadu forest Plantation corporation, collaborative project on Technology transfer and biotechnological evaluation of *Eucalyptus*, Bamboo and *Salvadora*. (May 8-23, 1992)
6. UGC - Refresher course-Plant Animal Interaction - Department of Botany, Bharathidasan University, Trichy-24 (June-July, 1992)

## I. List of Publications:

Number of Papers Published in International Journal	: 70
Number of Papers Published in National Journal	: 31
Book chapters	: 09
<b>Total Number of Publications</b>	<b>:110</b>

### List of Publications [Last Five Years] – Some Important Publications

1. Sivanandhan, G., Arun, M., Mayavan, S., Rajesh, M., Jeyaraj, M., Kapil Dev, G., Manickavasagam, M., Selvaraj, N., **Ganapathi, A.** (2012) Optimization of Elicitation Conditions with Methyl Jasmonate and Salicylic Acid to Improve the Productivity of Withanolides in the Adventitious Root Culture of *Withania somnifera* (L.) Dunal. Applied Biochemistry and Biotechnology. Published online [DOI: 10.1007/s12010-012-9809-2].
2. Mariashibu, T.S., Subramanyam, K., Arun, M., Mayavan, S., Rajesh, M., Thebora, J., Manickavasagam, M., **Ganapathi, A.** (2012) Vacuum infiltration enhances the *Agrobacterium*-mediated genetic transformation in Indian soybean cultivars. Acta Physiologiae Plantarum. Published online [DOI: 10.1007/s11738-012-1046-3].
3. Suprasanna, P., Patade, V., Desai, N S., Devarumath, R. M., Kawar, P G., Pagariya, M C., **Ganapathi, A.**, Manickavasagam, M., Babu, K H., (2011) Biotechnological Developments in Sugarcane Improvement: An Overview Sugar Tech.13:322-335.
4. G.Sivanandhan, M. Arun, S. Mayavan, M. Rajesh, T.S. Mariashibu, M. Manickavasagam, N. Selvaraj, **A. Ganapathi.** (2012). Chitosan enhances withanolides production in adventitious root cultures of *Withania somnifera* (L.) Dunal. Industrial crops and products.35 (1):124-129
5. Sivanandhan, G., Mariashibu, T.S., Arun, M., Rajesh, M., Kasthuriengan, S., Selvaraj, N., **Ganapathi, A.**, (2011). The effect of polyamines on the efficiency of multiplication and rooting of *Withania somnifera* (L.) Dunal and content of some withanolides in obtained plants. Acta Physiologiae Plantarum.33(6):2279-2288
6. Mathiyazhagan, M., **Ganapathi, A.**, Jaganath, B., Renganayaki, N., Sasireka, N., (2011) Production of Biodiesel from Non-edible plant oils having high FFA content. International Journal of Chemical and Environmental Engineering. 2(2): 119-122.
7. Selvaraj, N., Kasthuriengan, S., Vasudevan, A., Manickavasagam, M., Choi, C.W., and **Ganapathi, A.**, (2010). Evaluation of green fluorescent protein as a reporter gene and phosphinothricin as the selective agent for achieving a higher recovery of transformants in cucumber (*Cucumis sativus*) L. cv. Poinsett76) via *Agrobacterium tumefaciens*. In Vitro Cellular and Developmental Biology-Plant. 46: 329-337

8. Udayakumar, R., Kasthuriengan, S., Vasudevan, A., Mariashibu, T.S., Joseph, J.J., Choi, C.W., **Ganapathi, A** and Kim, S.C. (2010). Antioxidant Effect of Dietary Supplement *Withania somnifera* L. Reduce Blood Glucose Levels in Alloxan-Induced Diabetic Rats. *Plant Foods for Human Nutrition*.65 (2):91-98.
9. Muruganantham, M., Amutha, S., and **Ganapathi, A.**, (2010). Somatic embryo productions by liquid shake culture of embryogenic calluses in *Vigna mungo* (L.) Hepper. *In Vitro Cellular and Developmental Biology-Plant*. 46:1:34-40.
10. Udayakumar, R., Kasthuriengan, S., Mariashibu, T.S., Joseph, J.J., Kim, S.C., Choi, C.W. and **Ganapathi, A.** (2010). Antioxidant Activity of Phenolic Compounds Extracted from the Roots and Leaves of *Withania somnifera* (L.) from Different Geographical Locations in India. *Functional Plant Science Biotechnology*.4: 28-33.
11. Udayakumar, R., Kasthuriengan, S., Mariashibu, T.S., Rajesh, M., Ramesh Anbazhagan, V., Kim, S.C., **Ganapathi, A.**,and Choi, C.W. (2009). Hypoglycemic and Hypolipidaemic effect of *Withania somnifera* root and leaf extracts on Alloxan-induced diabetic rats. *International Journal of Molecular Science*.10:2367-2382.
12. Lee, YS., Choi, CW., Kim, JJ., **Ganapathi, A** ., Udayakumar R and Kim SC(2009).Determination of Mineral Content in Methanolic safflower(*Carthamus tinctorius* L.) Seed Extract and its effect on Osteoblast Markers. *International Journal of Molecular Science*.10,292-305.
13. Vasudevan, A., Oh, TK., Park, JS., Lakshmi, SV., Choi, BK., Kim, SR, Lee, HJ., Kim, JR, **Ganapathi, A.** and Choi, CW (2008). Characterization of resistance mechanism in transgenic *Nicotiana benthamiana* containing Turnip crinkle virus coat protein. *Plant Cell Reports*.27:1731-1740.
14. Vasudevan, A., Selvaraj, N., **Ganapathi, A.**, Ramesh Anbazhagan, V., Kasthuri Rengan, S. and Manickavasagam, M. (2008). Leucine and Spermidine enhanced in vitro shoot multiplication in Cucumber (*Cucumis sativus* L.). *In Vitro Cellular and Developmental Biology-Plant*. 44:300-306
15. Jae Sung Park, Min Yong Lee, Laxmi Sumitra Vijayachandran, Vasudeavan Ayyappan, **Andy Ganapathi** and Chang won Choi (2007).Expression of VP2 protein of Canine parvovirus(CPV) in Solanaceae plants using Tobacco Mosaic Virus (TMV) vector. *The Plant Pathology Journal*, 23(4):370-371.
16. Muruganantham, M., Amutha, S., Selvaraj, N., Vengadesan, G. and **Ganapathi, A.** (2007). Efficient *Agrobacterium*-mediated transformation of *Vigna mungo* using immature cotyledonary-node explants and Phosphinothricin as the selection agent. *In Vitro Cellular and Developmental Biology - Plant*. 43: 550 557.
17. Vasudevan, A., Selvaraj, N., **Ganapathi, A.**, Ramesh Anbazhagan, V., Manickavasagam, M., and Kasthuri Rengan, S. (2007). Direct plant regeneration from Cucumber embryonal axis. *Biologia Plantarum*. 51 (3): 521 524.



18. Selvaraj, N., Vasudevan, A., Manickavasagam, M., Kasthuri Rengan, S. and **Ganapathi, A.** (2007). High frequency shoot regeneration from cotyledon explants of Cucumber *via* organogenesis. *Scientia Horticulturae*.112: 2-8.

#### List of Publications:

Total Number of Papers Published in National Journal : 31

#### Last Five Years – Some Important Publications

1. Mathiyazhagan, M., **Ganapathi, A** (2011) Factors Affecting Biodiesel Production. *Research in Plant Biology*, 1(2): 01-05.
2. Logesh, P., Settu, A., Thangavel, K., **Ganapathi, A** (2011) Direct *in vitro* regeneration of *Withania somnifera* (L.) Dunal through leaf disc culture. *International Journal of Biological Technology* (2010) 1(3):1-4.

#### K. Chapters written in Books:

1. Manickavasagam, M., Sudhakar, B., Selvaraj, N., Mayavan, S., Vasudevan, A. and **Ganapathi, A.** (2006). Biotechnological achievements in sugarcane – A Review. In: *Plant Tissue Culture and Biotechnology* (Ed.) P.C.Trivedi, Pointer Publishers. pp. 269-293
2. Udayakumar, R., **Ganapathi, A.**, Saravanan, R., Gopal, R., Sohanabanu, M. and Thirupurasundari, G. (2005). Hypoglycaemic, hypolepidimic and antioxidant effect of *Withania somnifera* fruits on alloxan induced diabetes in experimental rats. In: *Recent Advances In: Medicinal Plants Research*, Editors: Prabhuji, SK., Rao, GP. & Patil, SK. pp. 373-392.
3. Sudhakar, B., **Ganapathi, A.**, Prema, S. and Manickavasagam, M. (2005). *In vitro* and *Agrobacterium* mediated genetic transformation studies in sugarcane (*Saccharum officinarum* L.).Ed.Dr.Jeyabalan, APH Publishers, New Delhi. pp. 29-39.
4. **Ganapathi, A.**, Anbazhagan, VR., Amutha, S. and Prem Anand. R. (2003). Organogenesis in legumes. In: *Biotechnology for the improvement of Legumes* (eds. Pawan K. Jaiwal and Rana P. Singh.) Kluwer Academic Publisher, Netherlands. pp. 65-85.
5. **Ganapathi, A.** and Rafael Perl Treves. (2000). *Agrobacterium* mediated transformation in *Cucumis sativus* L. *Acta Horticulturae*. 510: 405 – 407.
6. Anathakrishnan, G., Ravikumar, R., Vengadesan, G., Prem Anand, R., and **Ganapathi,**

- A. (1999). In vitro plant regeneration from embryo axis of cashewnut. Plant Tissue Culture and Biotechnology: Emerging Trends. (Ed.) P.B.Kavi Kishor, Universities Press, pp. 123-128.
7. Sudhakaran, S., and **Ganapathi, A.** (1999). Biosystematics of South Indian Physalis In: M.Nee, D.E. Symon, R.N. Lester and Jessop (Eds.). Solanaceae IV, Royal Botanic Gardens, Kew. Pp. 335-340.
  8. Kathiravan, K., Shajahan, A. and **Ganapathi, A.** (1997). Selection of salt tolerant mulberry callus tissue culture from cultured hypocotyls segments. In Frontier's in Plant Science (Ed.) Irfan Khan, pp. 311-313.
  9. Sudhakaran, S., Thirupurasundari, G. and **Ganapathi, A.** (1996). Tissue culture studies on Physalis pubescens L. In recent advances in Biotechnology (Eds.) S.K Bhatnagar and K.S Bhanaganar, Society for Plant Research, Bareilly, pp. 133-138.

**L. Paper presented in conference/ Seminar:**

**International Conference: 14**

**National Conferences: 28**