NABS News Letter

National Academy of Biological Sciences

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Contents

From the Desk of President...

Dear NABSians,

New year greetings from NABS.

Let this New Year brings you all new hopes and fulfillment. All the members of NABS continue to commit for the cause of NABS and we are able to reach greater heights every year because of your unconditional support and guidance. Let us all resolve to make NABS with one thousand members and more by end of 2014 which will be a great strength to NABS.

The News Letter is being brought out in time because of the dedicated team of Editorial Board and I wish the News Letter gets transformed to a regular journal in the years to come. Recently NABS has organized a National seminar on 'Microbes and Human welfare' on 20 & 21 July, 2013 in collaboration with Department of Microbiology, Bharathidasan University, Tiruchirappalli, Tamil Nadu. Dr. Kirti Singh, Chairperson, World Noni Research Foundation was conferred with Prof. S. Kannaiyan Memorial Award during the inaugural function of the seminar. Thirteen members were conferred with NABS Fellowship and one with Associate Fellowship. NABS-Best Research Paper Award was introduced for the first time and one member was awarded. Thirty three papers were presented in four technical sessions. Poster session was also arranged. Best Oral and Poster presentations were awarded with a certificate. The Seminar was a grand success which attracted more number of post graduate students from various Universities of Tamil Nadu.

On behalf of the NABSians, I place on record our gratitude to Prof. P. I. Peter for his continued support in providing all facilities to run our secretariat. I am grateful to the Committee which spent midnight oil for nearly a week to finalise and revise the guidelines for various awards including the Fellowships. Even the score card and criteria for award are finalised and put in our website. Many new awards are being contemplated to encourage scientists in their scientific endeavour. The notable among these awards is the "Lifetime Achievement" award, another highest award equivalent to Prof. S. K. Memorial award.

The present issue will carry more of our activities and I invite suggestions from NABSins to improve the News letter.

Commit, Contribute and Conquer!

President, NABS

2. From Editor's Desk

At the outset, I wish all NABSians a very happy and happening 2014.

When we look back, what gladdens our heart is that the Academy, from being a fledgling realm, has grown into a broader, deeper and even more influential platform that blends together scientists, researchers, policy makers and the common man. It has been a remarkable journey of discovery, and has brought together scientific findings and personal experiences that has helped in uncovering secrets of biology. The academy through its meaningful and purposive deliberations has given us the unique ability to combine scientific acumen, sophistication and ingenuity with freshness and curiosity. Also, the getting together of individuals from diverse fields has been awe inspiring and the progress made gives us immense satisfaction. Simultaneously, it reminds us of the rapid changes that are happening in science. The invention insect egg remover- patented by one of our NABS member, Dr. S. Mohan, Professor of Entomology, TNAU is one such classic example. Another major breakthrough that has been patented by our members Dr. M. Anandaraj and R. Dinesh of Indian Institute of Spices Research, Kozhikode is a novel method of delivery of PGPR / biocontrol agents through biocapsules.

Be that as it may, exciting times are ahead and sweeping changes in scientific paradigms are on the anvil. To keep pace, we need to instill in us the unique meaning, purpose, confidence and the resilience that would transform us from being an ordinary scientist to a scientist extraordinaire. This is exactly where NABS come in, and has been setting the tone and enabling the smooth transition of each one of us to a level that is nothing short of world class. We are into our tenth year and as we look into 2014, we are more than ever determined to make a difference in accelerating the path of new scientific inventions and discoveries, thereby making the dream of our beloved late Prof. S. Kannaiyan a reality. While the editorial committee thanks all of you for the efforts and contributions to sustain the academy, I sincerely urge each and every one of you to contribute to the corpus fund of Prof. Kannaiyan Memorial Award and bring in new members to our fold. This would make us stronger than ever.

Let's set the target, let's set the pace and let the caravan move on with renewed vigour.

M. Anandaraj

National Academy of Biological Sciences
Congratulates Prof. C. N. Rao
for having been conferred with the prestigious
'Bharat Ratna'

National Academy of Biological Sciences
Congratulates Prof. M. S. Swaminathan
Fellow of National Academy of Biological Sciences
for having been selected as one of the 25 greatest
Living Global Legends by NDTV

3. About National Seminar & Annual Meeting

The National Seminar on 'Microbes and Human Welfare', 6th in its series of Interactive Workshop / Seminar was organized in collaboration with Department of Microbiology, Bharathidasan University (BDU), Tiruchirappalli on 20 & 21 July, 2013 at the University Campus.

Inaugural Function

The Inaugural function commenced with Thamizhthai Vaazhththu and two minutes silence to pay homage to the departed souls in Uttarakhand tragedy.

Prof. T. Marimuthu, Secretary, NABS welcomes

Prof. T. Marimuthu, Secretary, NABS welcomed. Prof. E. Ram Ganesh, Registrar i/c, BDU inaugurated the National Seminar. The guests on dais were honored by Dr. V. A. Parthasarathy, President, NABS and Dr. N. Thajuddin, Coordinator of the National Seminar. Dr. D. J. Bagyaraj, Vice-President, NABS gave an overview of NABS while Dr. M. Anandraj, Editor-in-Chief of NABS News Letter briefed about NABS News letter. The President of NABS offered his brief remarks on the National Seminar and the activities of NABS.

A view of delegates

Dr. K. Ramasamy, Vice-Chancellor, Tamil Nadu Agricultural University, Coimbatore released the Abstract of the Seminar and delivered Keynote Address. The abstract was received by Dr. K. V. Peter, Director, World Noni Research Foundation, Former Vice-Chancellor, Kerala Agricultural Univerisity, Kerala & Member of National Advisory Committee.

Dr. P. Gunasekaran, Vice-Chancellor, Thiruvalluvar University, Vellore, Tamil Nadu released the NABS News Letter and a book edited by Dr. K. V. Peter which were received by Dr. D. P. Ray, Member of National Advisory Committee and Former Vice-chancellor, Orissa University of Agriculture and Technology, Bhubaneswar. Dr. P. Gunasekaran offered his felicitations.

Prof. P. I. Peter, Chairman, Noni BioTech and Corporate Fellow of NABS presented NABS- Best Research Paper Award for 2013 to Dr. D. Prasath, Indian Institute of Spices Research, Calicut, Kerala.

Dr. K. Muthuchelian, Vice-Chancellor, Periyar University, Salem, Tamil Nadu conferred Prof. S. Kannaiyan Memorial Award on Dr. Kirti Singh, Chairperson, World Noni Research Foundation and Former Chairman, Agricultural Scientists Recruitment Board (ICAR), New Delhi and Former Vice-Chancellor, NDUAT, Faizabad, HPKV, Palampur (HP), and IGKV, Raipur (Chhattisgarh). He felicitated Dr. Kirti Singh for his contribution in the field of Agriculture and Horticulture and congratulated the organizers for having chosen a theme very relevant to today's need.

Dr. Kirti Singh, the recipient of Prof. S. Kannaiyan Memorial Award delivered Prof. S. Kannaiyan Memorial Oration, 'Noni (*Morinda citrifolia L.*) - A Treasure for Wellness'.

The inaugural function concluded with vote of thanks by Dr. G. Muralitharan, Organizing Secretary of National Seminar.

Awards presented during Inaugural Function

A. Prof. S. Kannaiyan Memorial Award for 2013

Dr. K. Muthuchelian Presents 'Prof. S. Kannaiyan Memorial Award' to Dr. Kirti Singh

Dr. Kirti Singh delivers 'Prof. S. Kannaiyan Memorial Oration'

B. NABS- Best Research Paper Award-2013

Name of Scientist	Title of Paper awarded
D. Prasath	Hybrid performance for yield components in cardamom *(Elettaria cardamom)* - *D. Prasth, M. N. Venugopal, R. Senthilkumar and N. K. Leela, published in Euphytica (2009) 168 (1): 49-60.*

Technical Sessions

Oral Presentations

The deliberations of National Seminar on Microbes and Human Welfare were made in four technical sessions *viz.*, Microbes in Agriculture and Forestry, Microbes in Human and Animal Health, Microbes in Biotechnological Innovations and Diversity and Conservation of Microbes. Each technical session was preceded by lead papers.

Technical Session I: Microbes in Agriculture and Forestry

The session was chaired by Dr. D. J. Bagyaraj, Chairman, Centre for Natural Biological Research and Community Development, Bangalore, Co-chaired by Dr. M. Anandaraj, Director, Indian Institute of Spices Research, Calicut, Kerala. Dr. Syed Jahangir, Coordinator, Department of Microbiology and Biotechnology, Jamal Mohamad College, Tiruchirappalli was the convener.

Dr. George Thomas presented a lead paper on 'Diversity, functional traits and application of PGPR in plantation crops'. In all seven oral presentations were made out of ten listed.

A view of Technical sessions

Technical Sessions II: Microbes in Human and Animal Health

The session was chaired by Dr. Renu Agrawal, Chief Scientist, Central Food Technological Research Institute, Mysore, Karnataka. Dr. R. Thirumurugan, Associate Professor, Department of Animal Sciences, Bharathidasan University, Co-Chaired. Dr. M. Manickavasagam, Assistant Professor, Bharathidasan University was the convener.

Dr. P. Selvam presented a lead paper on 'HIV-integrase/Lense Epithelial Derived Growth Factor inhibitor (LEDGF) - As novel therapeutic agent for treatment of HIV/AIDS'. Dr. Renu Agrawal presented another lead paper on 'The role of probiotics in improving human health'. In all three papers were presented out of five listed.

Technical Sessions III: Microbes in Biotechnological Innovations

This session was chaired by Dr. M. Vivekanandan, Emeritus Professor, Bharathidasan University and Co-chaired by Dr. P. Selvam, Nova college of Pharmaceutical Education & Research, Andhra Pradesh. Dr. R. Vijayakumar, Assistant Professor, Department of Microbiology, Bharathidasan University was the convener.

Dr. P. Chowdappa, Indian Institute of Horticultural Research, Bangalore presented a lead paper on 'Biotechnological approached for management of fungal diseases of crop plants'. In all seven papers were presented out of ten listed.

Technical Sessions IV: Diversity and Conservation of Microbes

The technical session was chaired by Dr. M.V. Rao, Coordinator, School of Life Sciences, Bharathidasan University, Co-chaired by Dr. D. Dhanasekaran, Department of Microbiology, Bharathidasan University. Dr. T. Senthilkumar, Assistant Professor, Bharathidasan University was the convener.

Dr. D. J. Bagyaraj, Chairman, Centre for Natural Biological Research and Community Development, Bangalore presented a lead paper on 'Mycorrhizal diversity and conservation of microorganisms'. In all three papers were presented out five listed.

Poster Presentations

Separate session on Posters was also organized and many students and young biologists participated in the Poster Session. In all seventeen posters were presented in four technical sessions.

Plenary and Valedictory function

The Plenary and Valedictory function of was presided over by Dr. V. A. Parthasaraty, President, NABS. Dr. T. L. Baskaran, Treasurer, NABS welcomed the dignitaries on the dais and delegates. Dr. N. Thajuddin, Professor of Microbiology, BDU and Coordinator presented the proceedings and recommendations of two day deliberations.

Prof. G. Subramanian, Founder Director, National Facility for Marine Cyanobacteria and Former Head, Department of Microbiology, BDU was the Chief Guest and delivered valedictory address.

The Chief Guest also presented Best Oral and Poster Presentation Awards to the scientists / students.

Dr. G. Muralitharan, Organizing Secretary of National Seminar proposed vote of thanks. The two day deliberations was concluded with National Anthem.

Valedictory Function

Dr. T. L. Baskaran
Welcomes

Dr. G. Subramanian
delivers valedictory address

Dr. N. Thajuddin,
Coordinator presents
summary of two day
deliberations

Dr. G. Subramanian,
Founder Director, NFMC & Chief Guest
for Valedictory function with
NABS office bearers & Fellows

Dr. G. Muralitharan,
Organizing Secretary
proposes vote of
thanks

Best Oral and Poster Presentation Awards

Best Oral Presentation Award

Name of Scientist	Title of presentation made
Technical Session I: Microbes in Agriculture and Forestry	
B. Meena	Exploitation of biocontrol agents fro the management of root rot of medicinal *Coleus- B. Meena, SA. Ramyabharathi and R. M. Vijayakumar*
Technical Session II: Microbes in Human and Animal Health	
S. Latha	Investigation of acid and bile tolerance of resident actinobateria of chicken by growth and survival- *S. Latha, D. John Dickson Calvin and D. Dhanasekaran*
Technical Session III: Microbes in Biotechnological Innovations	
F. Lewis-Oscar	Outdoor semi-continuous cultivation of Chlorella sp. BUM 11008 for biodiesel production- *R. Praveenkumar, F. Lewis-Oscar and N. Thajuddin*
Technical Session IV: Diversity and Conservation of Microbes	
N. Reehana	Biodiversity of microalgae in the Puliyanthangal lake of Ranipet of Tamil Nadu, India- *N. Reehana, A. Suresh, A. Parveez Ahamed and N. Thajuddin*

Best Poster Presentation Award

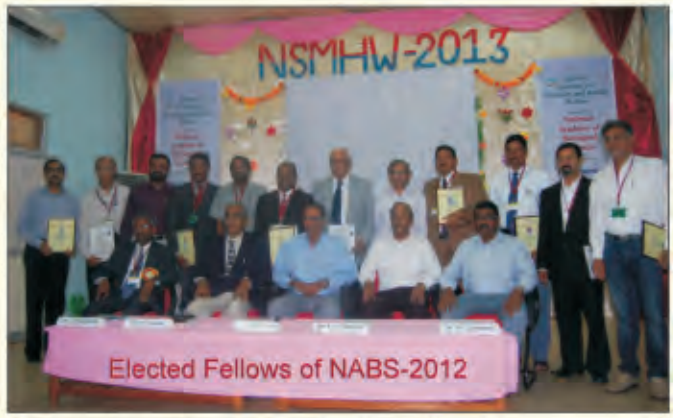
Name of Scientist	Title of presentation made
Technical Session I: Microbes in Agriculture and Forestry	
SA. Ramyabharathi	Bacillus subtilis EPCO16: A potential microbial agent against Fusarium wilt of Tomato- *SA. Ramyabharathi, B. Meena and T. Raguchander*
P. Priya Dharsini	Allelopathic properties of herbicidal compound from actinobacteria *- P. Priya Dharsini and D. Dhanasekaran*
Technical Session II: Microbes in Human and Animal Health	
K. Subha	Primary isolation of Helicobacter pylori from human saliva and its antibacterial activity of salt pan fungi- *K. Subha, K. Kanimozhi and A. Panneerselvam*
Technical Session III: Microbes in Biotechnological Innovations	
R. Vijaya Abinaya	Biosynthesis, characterization and evaluation of antimicrobial efficacy of silver nanoparticles using cyanobacterial extract- *R. Vijaya Abinaya, N. Prasanna Balaji, Sathish Kumar and G. Muralitharan*
Technical Session IV: Diversity and Conservation of Microbes	
S. Deepa	Biodiversity of actinobacteria isolated from mangroves of Vellappalam, Nagapattinam district of Tamil Nadu- *S. Deepa, K. Kanimozhi and A. Panneerselvam*

Best Oral Presentation awards: L to R: B. Meena, S. Latha, F. Lewis Oscar, N. Reehana

Best Poster Presentation awards: L to R: SA. Ramyabharathi, P. Priya Dharsini, K. Subha, R. Vijaya Abinaya, S. Deepa

Annual Meeting of NABS cum Fellowship Award Ceremony

The 7th Annual Meeting of NABS was presided over by Dr. V. A. Parthasaraty, President, NABS. Dr. D. J. Bagyaraj, Vice-Presient, Dr. M. Anandaraj, Editor-in-Chief were persent.



A view of Annual Meeting: Secretary calls upon the elected members to receive the Fellowship; President offers his remarks; Treasurer proposes vote of thanks; President confers Fellowship; NABS office bearers with Elected Fellows

Prof. T. Marimuthu, Secretary, NABS welcomed the fellows and delegates. Dr. V. A. Parthasarathy conferred the Fellowship and Associate Fellowship on NABS members. Thirteen members were conferred with Fellows and one with Associate Fellow. President, NABS congratulated the elected Fellows and Associate Fellows.

Dr. V. A. Parthasarathy in his Presidential remarks highlighted the significance of the annual meeting and requested all the members to actively participate in the activities of NABS. Dr. T. L. Baskaran, Treasurer proposed vote of thanks.

4. Awards and Recognition received by members of NABS

Congratulations to all the NABSians who received awards and recognition from various institutions and organizations in the country and outside during 2013.

Name of Member	Name of Award /Recognition received
Prof. M. S. Swaminathan	• Indira Gandhi Award for International Understanding.
Arunachalam, A.	• Eminent Scientist of the year 2013 by National Environmental Science Academy for R & D accomplishments • Fellow of Indian Academy of Environmental Sciences, Hardwar for contributions in natural resource management.
Bagyaraj, D.J.	• NBRI Diamond Jubilee Lecture Award- 2013 by National Botanical Research Institute, Lucknow, India. • Distinguished Professor Award during 2013 by University of Agricultural Sciences, Bangalore recognizing the contributions to Agricultural Microbiology and Sustainable Agriculture.
Brahma Singh	• HIS- Shivashakthi Life Time Achievement Award 2013 by Horticultural Society of India for the significant contribution to Horticulture Science.
Chowdappa, P.	• Award of Excellence conferred by Indian Institute of Horticultural Research, Bangalore for Outstanding contributions in horticulture during last five years
Gautam, P.L.	• Appointed as one of the members of Executive Board of Global Crop Diversity Trust by the Governing Body of International Treaty on Plant Genetic Resources for Food and Agriculture for a period of three years starting from January 2014.

Name of Member	Name of Award /Recognition received
Kaliraj, P.	• Senior scientist Oration Award- 2013 by Indian Immunology Society, New Delhi & • Life-time Achievement Award- 2013 by Biotech Research Society of India for the contribution made in Immuno-diagnostics and Immuno prophylactics for elimination of Human Lymphatic Filariasis.
Krish Jayachandran	• Presidential Excellence Award for Agroecology Programme- 2013 by Florida International University, Florida.
Mahadevappa, M.	• Life Time Achievement Krishi Rushi Award- 2013 by Lt. Amit Singh Memorial Foundation • Rotary Vocational Excellence Award-2013 by Mysore North Rotary International District 3180 • Suvarna Sri Award-2013 by Vibhuthi Muth, Bengaluru
Murty, USN	• ICMR award for Biomedical Research by ICMR for 2010 conferred during 24, September, 2013.
Paroda, R. S.	• Krishi Shironmani Samman by Mahindra and Mahindra Ltd. for life time achievement in Agriculture. • D.Sc. (*Honoris Causa*) by University of Agricultural Sciences, Dharwad, Karnataka for outstanding contribution in Agriculture. • VDS Samman by Vaigyanik Drishtikon Society for outstanding achievements during Rajasthan Science Congress.
Parthasarathy, V.A.	• Chairman, Task Force on DUS guidelines, PPV & FRA, GOI, New Delhi. • Chairman, Research Advisory Committee, Directorate of Floriculture (ICAR), New Delhi. • Member, QRT, Central Plantation Crops Research Institute, Kasaragod. • Delivered Keynote address in National Seminar on *"Application of Bioinformatics in Agriculture"* at 11th November, 2013, CPCRI, Kasaragod, Kerala (invited as President, NABS). • Delivered special lecture on *'Biotechnology in Horticulture with special reference to Noni'* at Noni Search-2013- 8th National symposium on Noni for Sustainable Wellness" held on 29 & 30 October, 2013 at UAS, Bangalore (invited as President, NABS).
Prakashkumar, R.	• Elected as Vice President, Kerala Academy of Sciences, Kerala.
Raveesha, K. A.	• Centre for Innovative Science and Engineering Education [CISEE] sanctioned by Vision Group on Science and Technology (VGST), Government of Karnataka for establishing a Centre for Innovative Studies in Herbal Drug Technology.
Renu Agrawal	• Nominated as a Team Leader leading a scientific delegation for Asian Meet at Indonesia, Bali in November, 2013 to discuss on Food Policies.
Sajeena, A.	• Best Paper Award, 'Ganoderma- a noval and safe pesticide for plant disease management' by Kerala Science Congress, Thiruvananthapuram, 29 January- 1 February, 2013 organized by Kerala State Council for Science, Technology and Environment [A certificate, cash award of Rs.10,000/- and one lakh project sanctioned for two years].

Name of Member	Name of Award /Recognition received
Selvam, P.	• Service Excellence Award 2013 by Noni Biotech, Chennai, Tamil Nadu.
Senthil Kumar, T.	• Fellow of Indian Botanical Society (FBS)-2013 by Indian Botanical Society for contribution in Ecology and Biodiversity.
Sharangi, A.B.	• FULBRIGHT-Nehru Visiting Lecturer Fellowship by Fulbright Selection Board (FSB), Washington DC, USA and the Fulbright House, United States India Education Foundation (USIEF), New Delhi.
Swaminathan, C.	• Dinamalar-Best Teacher in South Tamil Nadu presented by Chief Educational Officer, Madurai.
Tilak, K.V.B.R.	• Life Time Achievement Award by AMI during Platinum Jubilee Celebrations held at Haryana.
Vincent, S.	• Eminent Scientist Award by Education Today and Kuppuswamy Trust for the contributions made to Life Sciences.
Paul Khurana	• Shivshakthi Life Time Achievement Award by Horticultural Society of India. • J.C. Bose Memorial Award by Indian Science Congress Association, 2014.

Note: Full address of members is available in website of NABS [www.nabsindia.org]

5. Research notes and short communications

i. Influence of certain abiotic factors on the efficacy of entomopathogenic nematode, *Steinernema thermophilum*

The economic importance of Entomopathogenic nematodes belonging to the genera *Steinernema, Heterorhabditis* and *Neosteinernema* (Rhabditida: Nematoda) is increasing because of their potential use in biological control of different insect pests and pathogenicity to insects caused by symbiont bacteria, *Xenorhabdus or Photorhabdus species* carried by them. EPN's are not effective at high temperatures; sensitive to UV light and require adequate moisture and high relative humidity for survival for reasonable length of time to be virulent and effective.

Considering these factors, this study was undertaken to document influence of certain abiotic factors on the efficacy of entomopathogenic nematode, *Steinernema thermophilum*. It was recorded that temperature, moisture and UV had a significant influence on the efficacy of *S. thermophilum. S. thermophilum* (20IJ/larvae) caused 100 per cent mortality of rice moth, *Corcyra cephalonica* at the temperature of 30 and 35°C. Highest number of IJ emerged from *C. cephalonica* at 30°C. *S. thermophilum* caused cent per cent mortality of *C. cephalonica* at the maximum moisture level of 100 per cent. At this moisture level, the IJ of *S. thermophilum* emerged from the body of the insect very quickly. Ultraviolet radiations emitted from UV lamp of 15 W caused cent per cent mortality of *S. thermophilum* after the exposure period of 240 min. The IJ exposed to UV light failed to cause infection in *C. cephalonica.*

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ii. Plant Growth Promoting Rhizobacteria mediated suppression of root knot nematode, *Meloidogyne incognita* in tomato, *Lycopersicon esculentum* Mill.

Tomato (*Lycopersicon esculentum* Mill.) is seriously affected by root knot nematodes (*Meloidogyne* spp.) resulting in and estimated loss of 40% yield (Dasgupta, 1998). One of the promising alternative is the use of plant growth promoting rhizobacteria (PGPR) *viz.*, *Pseudomonas fluorescens* (Oostendorp and Sikora, 1989).

In the present study, thirty five native isolates of *Pseudomonas* were collected from the tomato rhizosphere from different districts of Tamil Nadu and the cultures *viz.*, Pfbv 22 and Pf 1 were collected from the culture collection centre of the Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore and used as standard checks. All the native isolates were characterized by biochemical studies and confirmed by molecular analysis.

Among the two promising isolates, antibiotic production *viz.*, 2, 4-DAPG, pyoluteorin, phenazine and pyocyanine and plant growth promotion (roll towel) was well pronounced in Pf 128 with the highest vigour index of 3324.4 when compared with control (2506.8). *In vitro* efficacy of Pf 128 was studied against root knot nematode, *M. incognita* at different concentrations (5, 15 and 25 %). Minimum egg hatching (5.33 juveniles/egg mass) and maximum juvenile mortality (92.67 %) was observed with 25 per cent concentration of Pf 128. This

isolate was prepared as liquid formulation in nutrient broth (NB) amended with different chemicals *viz.*, glycerol (10 mM), trehalose (5 mM), sorbitol (5 mM), glycine (10 mM) and mannitol (10 mM) and the stickers *viz.*, starch (2 %), liquid paraffin (2 %), PVP (2 %) and gum acacia (2 %) which were added separately to a litre of NB. Addition of these amendments enhanced the population of the bacterium up to a maximum period of 210 days whereas control (NB without any amendments) recorded the population level only up to one month. Standardization of dosage of liquid formulation was done in tomato seeds and seedlings under laboratory condition. Inoculum level of 15 ml/kg seeds and 200 ml/ha seedlings were found to be the optimum dose for seed treatment and seedling root dip respectively.

Effect of liquid formulation of *P. fluorescens,* Pf 128 was tested under glass house and field condition with tomato cv. Co 3 against M. incognita. Under glass house condition, plants treated with Pf 128 recorded significant increase in plant growth parameters (29 cm shoot length; 13.19 g shoot weight; 18.03 cm root length; 7.17 g root weight) and reduced nematode population (11.33 females/g root; 181 juveniles/250cc soil) when compared with control which recorded 18.33cm shoot length; 9.67 g shoot weight; 11.60 cm root length; 4.50 g root weight and nematode population of 31.33 females/g root and 282 juveniles/250 cc soil).

Under field condition, Pf 128 increased the plant growth (84 cm), fruit yield (22.99 t/ha) of tomato with a maximum reduction in nematode population (15.33 females/g root; 241juveniles/250 cc soil) whereas control plants recorded lowest plant growth (58.60 cm), fruit yield (20.26 t/ha) and harboured severe nematode population (45.33 females/g root; 463.33 juveniles/250 cc soil). Application of *P. fluorescens*, Pf 128 significantly enhanced the activity of defense enzymes *viz.*, peroxidase, polyphenol oxidase, phenylalanine ammonia lyase and chitinase and total phenol content in the plants which induced systemic resistance of the plants against nematode infestation.

Thus application of *P. fluorescens* Pf 128 was found to be an effective alternative method in the management of nematodes.

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iii. Studies on antioxidant activity with different extracts of Acalypha indica and Euphorbia hirta

Oxidation is a basic part of the aerobic life and metabolism. During oxidation many free radicals are produced which have an unpaired, nascent electron. Biological antioxidants are compounds that protect biological systems against the harmful effects of processes. Total phenolic content in the extracts was determined by the method with some modifications using the Folin- Ciocalteu reagent. The total flavonoid concentration of the extracts of the aerial parts of Acalypha indica and Euphorbia hirta was determined by using aluminium chloride. The total flavonones content in the extracts of *A. indica* and *E. hirta* was determined by the method using 2,4- dinitrophenyl hydrazine. Total tannin content in the extracts was determined by the method with some modifications using the Folin-Ciocalteu reagent. Total alkoloid content in the extracts was determined by the method with some modifications using the tropaeolin "OO" reagent. The extract was dissolved in a known volume of methanol. The scavenging ability of the inherent antioxidants of the extracts towards the relatively stable free radical DPPH assay was determined by using sample 1.5 ml with 3ml of 200µM DPPH solution. The total Antioxidant activity of the extracts of the aerial parts of *A. indica* and *E. hirta* was determined by using ABTS radical scavenging assay. Total phenolic content in the extracts of the aerial parts of *A. indica* and *E. hirta*, the ethyl acetate and methonolic extracts of the aerial parts of *A. indica* and *E. hirta* showed higher levels of total phenolic contents than the diethyl (201.80+_SD),(22.43+_SD)and ethanolic extracts (245.05+_SD), (105.05+_SD). The ethyl acetate (209.68+_SD), (200.97+_SD)and methonolic extracts (206.09+_ SD),(148.67+_SD) of the aerial parts of *A. indica* and *E. hirta* showed higher levels of total flavonoid contents than the diethyl ether and ethanolic extracts. Recently the flavonoids and flavonones have aroused considerable interest because of their potential beneficial effects on human health. They have been shown to have, antialergic, anti-inflammatory, anti-platelet, antioxidant, anti tumor and antiviral activities. The total tannin content of the extracts of the aerial parts of *A. indica* and *E. hirta*, the ethyl acetate(10.15+_SD),(12.10+_SD) methonolic (7.60+_ SD), (11.90+_SD) and ethanolic extracts(8.81+_ SD), (9.59+_ SD) of the aerial parts of both the plants *A. indica* and *E.hirta* showed higher levels of total tannin contents than the diethyl ether extracts. The presence of tannin in the plants implies that they may have astringent properties and in addition, could quicken the healing of wounds and burns. The diethyl ether (0.31+_SD), (0.06+_ SD) and ethanolic extracts (0.20+_ SD),(0.08+_ SD) of the aerial parts of both the plants *A. indica* and *E. hirta* showed higher levels of total alkaloid contents than the other extracts. Alkaloids are the most efficient therapeutically significant plant substance. Pure isolated alkaloids and the synthetic derivatives are used as the basic medicinal agent because of their analgesic antispasmodic and bacterial properties. The DPPH scavenging effects of the extracts of the aerial parts of plants *A. indica* and *E. hirta*, The extracts had significant scavenging effects on the DPPH radical. The positive DPPH test suggests that the samples are free radical scavengers. These results indicate that the extracts of the aerial parts of plants *A. indica* and *E. hirta*, particularly the ethyl acetate extracts (86.03+_SD),(98.92+_SD) exhibit the ability to quench the DPPH radical, suggesting that the extracts are good antioxidants with radical scavenging activity. The extracts had significant scavenging effects on the ABTS radical. These results indicate that the extracts of the aerial parts of plants *A. indica* and *E. hirta*, particularly the ethyl acetate(96.37+_SD), (95.81+_SD) and methanolic extracts(91.08+_ SD),(94.04+_ SD) exhibit the ability to scavenge the ABTS radical, suggesting that the extracts are good antioxidants with radical scavenging activity.

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6. An appeal to contribute for Corpus Fund

You are aware that the Corpus Fund for Prof. S. Kannaiyan Memorial Award is being mobilized. We profusely thank all the members who have contributed to the cause.

NABS thankfully acknowledge the contribution to Prof. S. Kannaiyan Memorial Corpus Fund.

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We earnestly appeal to all the rest of the Life members, NABS Fellows / Associate Fellows, Corporate Life Members, Corporate Fellows and well wishers to contribute to this noble cause. The amount may be paid as Cash or through a Demand Draft / Multicity Cheque drawn in favour of National Academy of Biological Sciences payable at Chennai.

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