

ENTOMOLOGY RESEARCH INSTITUTE

ACTIVITY PROFILE

- a. Insect Biodiversity: Insect collection and identification are carried out to generate data for future use. Laboratory rearing of some economically important insects is also done.
- b. Ethnobotany: Biodiversity of medicinal plants used by tribal and local people of Western and Eastern Ghats of Tamil Nadu are carried out. Data on the medicinal use of the collected and the voucher specimens are preserved in the form of herbarium for future use. Rare and endangered medicinal plants (nursery) are being supplied to the local and tribal healers with a view to protect the flora.
- c. Bio pesticides: Formulation of new botanical pesticides using plants and oils of plant origin and test them against several pests both in the laboratory and field. We distribute bio pesticides to the farmers. We train women farmers to prepare bio pesticides.
- d. Biological Control: There are some beneficial insects which are useful as bio control agents. We collect them and identify them and preserve for future use.
- e. Molecular Biology: Using molecular techniques, variations in populations of both insects and plants are identified and used in phylogenetic analysis. PCR, RFLP and RAPD techniques are routinely employed.
- f. Microbiology: Bioactive molecules isolated from plants and microbes are screened for their antibacterial, antiviral and antifungal activities. Many micro organisms from marine environment are also screened for their enzyme production and other useful parameters.
- g. Genetic Engineering: Genetic engineering of many cereals and pulses is being pursued with a view to produce insect resistant crops. Fungal resistant crops are also raised. Besides these, some work is done on sugarcane. Gene targeting of rice is also going on. Edible vaccine to fight tuberculosis is also in progress.
- h. Tissue Culture: Many of the threatened and endangered plants are raised through tissue culture and rehabilitated in the natural environment.
- i. Biochemistry: Studies related to treating diabetes, cancer, obesity and inflammation using plant compounds are taken up. Various biochemical parameters are assessed.
- j. Microbial Control: Works are going on to control disease causing bacteria and fungi using plant based molecules. Isolation of antimicrobial agents from actinomycetes are also carrying out.

k. Medicinal Chemistry: Many medicinal plants are collected and active biochemical molecules are isolated and their structures are elucidated. We have also collected medicinal plants from various sources and documented them.

l. Extension Programme: Training programmes are conducted for the benefit of the farmers on sustainable agriculture and environmental protection. So far we have trained 6000 farmers. Training on preparation of botanical pesticides and vermicompost is provided to farmers and SHGs. We have formed many ecoclubs.

RESEARCH SCHOLARS

Mr. A. Premkumar, M.Sc., M.Phil.- Specialization: Genetic Engineering
Ms. B. Scholastica Mary Vithiya - Specialization: Phytochemistry
Mr. V. Anbalagan, M.Sc. - Specialization: Insect Biodiversity
Mr. P. Antonisamy, M.Sc. - Specialization: Ethnopharmacology – Inflammation
Mr. P. Pandikumar, M.Sc. - Specialization: Phytochemistry – Diabetes, Obesity
Mr. M. Ramar, M.Sc. - Specialization: Botanicals in Mosquito and Insect Control
Mr. M. Dhanasekeran, M.Sc. - Specialization: Ethnopharmacology –Cancer
Mr. N. Prakash Babu, M.Sc. - Specialization: Ethnopharmacology –Inflammation
Mr. S. Sasikumar, M.Sc. - Specialization: Conservation of Endangered Medicinal Plants
Mr. S. Raveendar, M.Sc. - Specialization: Plant Biotechnology
Mr. K. Baskar, M.Sc., M.Phil. - Specialization: Botanical Pesticides
Mr. R. Maheswaran, M.Phil. - Specialization: Botanicals in Mosquito and Insect Control
Mr. S. Ezilvendan, M.Sc. - Specialization: Biopesticides and Molecular Entomology
Mr. K. Balaraju, M.Sc. - Specialization: Plant Biotechnology
Mr. R. Balamurugan, M.Sc., M.Phil. - Specialization: Ethnopharmacology – Diabetes
Mr. S. Lingathurai, M.Sc., M.Phil. - Specialization: Botanical Pesticides
Mr. G. Nattudurai, M.Sc., M.Phil. - Specialization: Botanical pesticides
Mr. V.I. Hairul Islam, M.Sc. - Specialization: Microbiology
Mr. M. Saravanan, M.Sc. - Specialization: Ethnopharmacology – Diabetes
Mr. S. Sellamuthu, IAS - Specialization: Botanical Pesticides
Mr. S. Antony Ceasar, M.Sc., M.Phil. - Specialization: Genetic Engineering
Mr. P.V. Ramachandran, M.Sc. - Specialization: RNA Interference in Cancer
Mr. Melvin A. Daniel, M.Sc. - Specialization: Genetic Engineering
Mr. Abdul Rashid War, M.Sc. - Specialization: Botanical Pesticides
Mr. G. Rajiv Gandhi, M.Sc., M.Phil. - Specialization: Ethnopharmacology – Diabetes
Mr. S. Gnanasekaran, M.Sc., M.Phil. - Specialization: Vector Control
Mr. M. Karunairaj, M.Sc. - Specialization: Pharmacology
Mr. C. Sunil, M.Pharm - Specialization: Ethnopharmacology-Diabetes
Mr. C. Sankar, M.Sc. - Specialization: Phytochemistry
Mr. C. Balachandran, M.Sc. - Specialization: Microbiology
Mr. V.K. Kinsalin, M.Sc. - Specialization: Microbiology
Mr. A. Daniel Reagan, M.Sc. - Specialization: Mosquitoe control and Diversity
Mr. S. Mutheeswaran, M.Sc., M.Phil. - Specialization: Ethnobotany and Diversity
Mr. S. Chellapandi, M.Sc., M.Phil. - Specialization: Ethnobotany and Diversity.

RESEARCH PUBLICATIONS

INTERNATIONAL PAPERS

1. Duraipandiyan, V., Indwar, F. and Ignacimuthu, S., 2009. Antimicrobial activity of Confertifolin from *Polygonum hydropiper*. *Pharmaceutical Biol.*, doi: 10.3109/13880200902902471.
2. Ignacimuthu, S., Mariapackiam, S., Murty, U.S.N., Umashankar, V. and Vincent, S., 2008, In Silico Docking of Karanjin with Carboxypepsidase enzyme of *Helicoverpa armigera* (Hub.), *Bioinformatics Trends*, 3, 65-71.
3. Dhanasekaran, M., Albert Baskar, A., Ignacimuthu, S., Agastian, P. and Duraipandiyan, V., 2009, Chemopreventive potential of Epoxy clerodane diterpene from *Tinospora cordifolia* against diethylnitrosamine-induced hepatocellular carcinoma, *Invest. New Drugs*, 27, 347-355.
4. Duraipandiyan, V., Kannan, P. and Ignacimuthu, S., 2009, Antimicrobial activity of *Sphaeranthus indicus* L. *Ethnobotanical Leaflets*, 13, 320-325.
5. Prakash Babu, N., Pandikumar, P. and Ignacimuthu, S., 2009, Antiinflammatory activity of *Albizzia lebbek* Benth., an Ethnomedicinal plant in acute and chronic animal models of inflammation, *J. Ethnopharmacol.*
6. Pandikumar, P., Prakash Babu, N. and Ignacimuthu S., 2009 Hypoglycemic and antihyperglycemic effect of *Begonia malabarica* Lam. in normal and streptozotocin induced diabetic rats, *J. Ethnopharmacol.*, 124, 111-115.
7. Thillairajasekar, K., Duraipandiyan, V., Perumal, P. and Ignacimtuhu, S., 2009, Antimicrobial activity of *Trichodesmium erythraeum* (Her) (microalga) from South East Coast of Tamil Nadu, India, *Int. J. Integrat. Biol.*, 5 (3), 167-170.
8. Sunil, C., Latha, P.G., Suja, S.R., Shine, V.J., Shyamal, S., Anuja, G.I., Sini, S., Rajasekharan S, , Agastian, P., Ignacimuthu, S. and Kalichelvan, V., 2009. Effect of ethanolic extract of *Pisonia alba* Span. leaves on blood glucose levels and histological changes in tissues of alloxan-induced diabetic rats, *Intl. J. Appl. Res. Nat. Prod.*, 2(2), 4-11.
9. Dhanasekaran, M., Ignacimuthu, S. and Agastian, P., 2009, Potential hepatoprotective activity of ononitol monohydrate isolated from *Cassia tora* L. on carbon tetrachloride induced hepatotoxicity in wistar rats, *Phytomedicine*, 16, 591-595.

10. Ignacimuthu, S., Pavunraj, M., Duraipandiyan, V., Raja, N. and Muthu, C., 2009, Antibacterial activity of novel quinine from the leaves of *Pergularia daemia* (Forsk.), a traditional medicinal plant, *Asian J. Trad. Medi.*, 4(1), 36-40.
11. Ayyanar, M. and Ignacimuthu, S., 2009, Herbal medicines for wound healing among tribal people in Southern India: Ethnobotanical and Scientific evidences. *Int. J. Appl. Res. Nat. Prod.*, 2(3), 29-42.
12. Eliza, J., Diasy, P., Ignacimuthu, S. and Duraipandiyan, V., 2009. Antidiabetic and antilipidemic effect of eremanthin from *Costus speciosus* (Koen.) SM., in STZ-induced diabetic rats, *Chemico Biol. Interact.*, 182, 67-72.
13. Ayyanar, M. and Ignacimuthu, S., 2009, some less known ethnomedicinal plants of Tirunelveli hills, Tamil Nadu, *J. Econ. Taxon. Bot.*, 33, 73-76.
14. Antoni Ceasar, S., Lenin Maxwell, Bhargav Prasad, K., Karthigan, M. and Ignacimuthu, S., 2009, Highly efficient shoot regeneration of *Bacopa monnieri* (L.) using a two-stage culture procedure and assessment of genetic integrity of micropropagated plants by RAPD. *Acta Physiol Plant.*, DOI 10.1007/s11738-009-0419-8.
15. Sheeba, M., Emmanuel, S., Revathi, K. and Ignacimuthu, S., 2009, Wound healing activity of *Cassia occidentalis* L. in Albino Wistar rats. *Int. J. Integrat. Biol.*, (8)2: 1-6.
16. Baskar, K., Maheswaran, R., Kingsley, S. and Ignacimuthu, S., 2010, Bioefficacy of *Couroupita guianensis* (Aubl) against *Helicoverpa armigera* (Hub.) (Lepidoptera: Noctuidae) larvae, *Spanish J. Agricult. Res.*, 8(1): 135-141.
17. Antonisamy, P. and Ignacimuthu, S., 2010, Immunomodulatory, analgesic and antipyretic effects of violacein isolated from *Chromobacterium violaceum*. *Phytomedicine*, 17, 300-304.
18. Duraipandiyan, V., Sasi, A.H., Islam, V.I.H., Valanarasu, M. and Ignacimuthu, A., 2010, Antimicrobial properties of actinomycetes from the soil of Himalaya. *J. Mycologie Medicale*, 20, 15-20.

NATIONAL PAPERS

1. Duraipandiyan, V., Muthu, C. and Ignacimuthu, A., 2009, Antifungal Properties of Some Medicinal Plants, *ICFAI Journal of Life Sciences*, May 2009.
2. Gabriel Paulraj, M., V. Anbalagan and S. Ignacimuthu, Distribution of Grasshoppers among different host plants and habitats in two districts of Tamil Nadu, India. *Journal of Threatened Taxa*, 1(4): 230-233, 2009.

3. Sasikumar, S., Raveendar, S., Premkumar, A., Ignacimuthu, S. and Agastian, P., 2009, Micropropagation of *Baliospermum montanum* (Willd.) Muell. Arg.— A threatened medicinal plant, *Indian Journal of Biotechnology*, 8, 223-226.
4. Praveena, P. and Ignacimuthu, S., 2009, In silico docking of ligand 3-hydroxy methyl xylitol with target protein ZnT-8 involved in Type II diabetes. *Ind. J. Biotechnol.*, 8, 453-455.
5. Balaraju, K., Maheswaran, R., Agastian, P. and Ignacimuthu, S., 2009. Egg hatchability and larvicidal activity of *Swertia chirata* Buch. - Hams. ex Wall. against *Aedes aegypti* L. and *Culex quinquefasciatus* Say. *Indian J.Sci.Technol.* 2(12): 46-49.
6. Kannan, P., Ignacimuthu, S. and Gabriel Paulraj, M., 2009, Buffering capacity and membrane H⁺ conductance of protease producing facultative alkaliphilic bacterial *Bacillus flexus* from mangrove soil, *Ind. J. Biochem & Biophys.*, 46, 261-265.

PAPERS PUBLISHED IN CONFERENCE PROCEEDINGS

- 1 Ayyanar, M. and Ignacimuthu, S., 2009, Medicinal Plants used by tribal inhabitants in the forest area of Tamil Nadu: A review, In: *Indigenous Ethnomedicinal Plants* (Eds. P.C. Trivedi), Pointer Publishers, Jaipur, pp. 94-111.
- 2 Gabriel Paulraj, M. and Ignacimuthu, S., 2010. Feeding Deterrent and Lethal Effects of Mangrove Plant Extracts Against *Epilachna vigintioctopuncta* Fab. (Coleoptera: Coccinellidae) and *Attractomorpha crenulata* Fab. (Orthoptera: Pyrgomorphidae). In *Non-chemical Insect Pest Management*, Elite Publishing House, New Delhi, pp. 32-38.
- 3 Lingathurai, S., Gabriel Paulraj, M. and Ignacimuthu, S., 2010. Toxicity and Feeding Deterrent Effect of *Acalypha fruticosa* Linn. (Euphorbiaceae) against *Spodoptera litura* Fab. (Lepidoptera : Noctuidae) larvae, In *Non-chemical Insect Pest Management*, Elite Publishing House, New Delhi, pp.46-53.
- 4 Lingathurai, S., Abdul Rashid War, Gabriel Paulraj, M. and Ignacimuthu, S., 2010. Antifeedant and Insecticidal Activities of Some Plants Against *Helicoverpa armigera* Hubner (Lepidoptera: Noctuidae) larvae. In *Non-chemical Insect Pest Management*, Elite Publishing House, New Delhi, pp.58-63.
- 5 Ezilvendan, S., Gabriel Paulraj, M. and Ignacimuthu, S., 2010. Glutathione S-transferase activity and larval mortality caused by Taxifolin 3-rhamnoside, a plant compound in *Helicoverpa armigera* Hub. and *Spodoptera litura* Fab. (Lepidoptera: Noctuidae). In *Non-chemical Insect Pest Management*, Elite Publishing House, New Delhi, pp. 64-71.

BOOKS AND MONOGRAPH PUBLISHED

1. S. Ignacimuthu and B.V. David (eds.), 2010, Non-chemical Insect Pest Management, Elite Publishing House, New Delhi p. 266.
2. M. Gabriel Paulraj and S. Ignacimuthu, 2010. Vermicompost (kz;GO cuk;), Entomology Research Institute, Loyola College, Chennai. p. 24. (monograph)

PROJECTS IN OPERATION

Principal Investigator - Dr. S. Ignacimuthu, s.j.

S. No. -Title of the Project -Agency -Duration

1. Augmenting the Livelihood of Women Farmers and Women through Self Help Groups through Training on Biopesticides and Vermicompost Production for sustainable Agriculture (9.33 lakhs) - DBT Sci.& Soc., New Delhi -2009-2012
2. Development of Insect Resistant *Abelmoschus esculentus* (Linn.)(11.21 lakhs) - UGC, New Delhi - 2009-2012
3. Identifying antidiabetic principles from *Aegle marmelos* Corr., A traditional antidiabetic medicinal plant (15.96 lakhs) - CSIR (Emeritus Scientist Scheme) -2009-2012
4. Documentation of Local Health Traditions practiced by herbal practioners in three districts of South Tamil Nadu and Encourage them to cultivate medicinal plants to enhance their livelihood (18.71 lakhs) - AYUSH, New Delhi - 2010-2012
5. Antihepatotoxic activity of *Abelmoschus esculentus* and *Datura metel* used by the herbal healers (4.69 lakhs) - NIF-ICMR - 2009-2010

ERI FUNDED PROJECTS

1. Genetic engineering of plants for insect and fungal resistance
2. Biodiversity of Insects
3. Screening of Actinomycetes for useful products
4. Anticancer and Antiinflammatory study of some medicinal plants

DST-YOUNG SCIENTIST PROJECT

- Evaluation of Novel Botanical Formulations Prepared From Mangrove Plant Extracts Against Vegetable Crop Pests -
Awardee: Dr. M. Gabriel Paulraj

CSIR SPONSORED SRF FELLOWSHIPS

- Isolation of novel cytokine modulator from *Clerodendrum phlomides* using adjuvant arthritis Awardee: N. Prakash Babu.

SYMPOSIA/ SEMINAR/ WORKSHOPS

1. This Institute is conducting an in-house seminar every Saturday relating to the Research activities of the faculty and students

PH.D. DEGREE AWARDED

1. A. Albert Baskar – Chemopreventive Potential of Some Selected Medicinal Plants – In vitro and In vivo Study
2. P. Subash Babu – Antidiabetic Potential of *Nymphaea stellata* Wild and *Abelmoschus esculentus* Linn.

PH.D. THESIS SUBMITTED

1. Sujatha Jose - In planta expression of the 10kDa TB antigen and mining for the 1-Sucrose:sucrose fructosyl transferase promoter
2. M. Dhanasekaran - Potential anticancer activity of some medicinal plants – in vitro and in vivo study
3. M. Valan Arasu - Actinomycetes from the Western Ghats of Tamil Nadu with Antimicrobial properties
4. K. Balaraju - In vitro Studies of Two Important Endangered Medicinal Plants, *Swertia chirata* Buch. Hams. Ex Wall and *Pterocarpus santalinus* L. and their Biological Activities
5. P. Kannan - Development of Fungal Resistant Pearl Millet (*Pennisetum typhoides* L. R. Br.) Through Genetic Engineering
6. M. Ramar – Biological activities of chosen plant essential oils on the filarial vector mosquito, *Culex quinquefasciatus* Say. (Insecta: Diptera: Culcidae)

PH.D. REGISTERED:

1. Mr. S. Gnanasekaran
2. Mr. C. Sankar
3. Mr. G. Rajiv Gandhi

PATENTS OBTAINED

1. S. Ignacimuthu, A. Jeyasankar and N. Raja. A process for the preparation of an active compound 2,5 Diacetoxy-2-(Phenyl Methyl), 4,4,6,6-Tetra Methyl 1-1, 3- Cyclohexanedione having insecticidal property, 579/CHE/2005, 30-07-2004 (Patent No. 236541). Patentee - Entomology Research Institute.
2. S. Ignacimuthu, N. Raja, M. Pavunraj and V. Duraipandiyan. A process for preparation of 6-(4,7-dihydroxy-heptyl) quinine with antifeedant and antibacterial activity, 494/CHE/2006, 18-03-2006 (Patent No. 232206). Patentee – Savarimuthu Ignacimuthu.
3. S. Ignacimuthu and S. Mariapackiam. A Phytopesticidal Formulation ‘PONNEEM’ for controlling insect pests, 657/CHE/2006, 10-04-2006 (Patent No. 234081). Patentee - Savarimuthu Ignacimuthu.

AWARDS

1. Karmaveerar Kamarajar Environmental Award 2008 for Environmental Management awarded by Department of Environment, Govt. of Tamil Nadu – Awardee – S. Ignacimuthu