Faculty Profile of Dr. K. Murugan

Dr. K. Murugan
CSIR-Emeritus Scientist
Department of Zoology

Email:kmvvk@buc.edu.in

Phone No:9894832849

Research Area

- Predatory Copepods and Mosquito Vector Control
- Chitosan Nanoparticles from Crab and Biological Functions
- Chitosan Nanoparticles and mosquito Borne Diseases
- Chemical Ecology of Insects, Climate Change, Butterflies

Education & Career

Professor Dr. K. MURUGAN, who is presently working as CSIR-Emeritus Scientist (CSIR-Govt. of India) on “Biocidal effect of quinoline derivatives against mosquito vectors, malarial parasites and dengue virus and bioinformatics molecular docking with Covid-19 spike protein “for the period of 5 years from 2022, at Department of Zoology, School of Life Sciences, Bharathiar University,

Coimbatore, India.

Formerly, Senior Professor and Head, Department of Zoology, and Registrar, i/c, Bharathiar University, Vice-Chancellor at Thiruvalluvar University (State University), Vellore, TN, India during 2016-2019 (3 years). He has also served as Additional Director at the DRDO-BU – Centre for Life Sciences, Ministry of Defence, at Bharathiar University for 7 years. He was a Vice-Chairman, Tamil Nadu Science and Technology Centre, Govt. of Tamil Nadu.

He is World Top Scientist 2% at Global Level (Mycology and Parasitology), Stanford University Ranking –Consecutive years for 2020, 2021, 2022 & 2023. Top Scientist in India (16th position) in Biology and Biochemistry 2022 by Research Com ranking.

He has 35 years of Research and Teaching experience and for his Scientific Knowledge, he was recognized with prestigious awards from (a) STA fellow, 1995 (Science and Technology Agency, Japan), FAO-Forest Award, Italy,1997 (b) Commonwealth Fellow by the Association of Commonwealth Universities)- UK 2000 (Oxford University) (c) CAS-TWAS fellow 2006, Italy (d) DBT, Crest Award – 2011, (e) One Time Grant Awardee, University Grants Commission, India (f) Green House 2011 Awardee, CSIRO, Australia, Water Award, Wuhan University (g) Chris Lomer Awardee for Insect Pathology 2012, USA. Awarded JSPS Invitation fellow Japan (2015), and 100 Talent Awardee, Shanxi University, China, 2017. His recent citations 19897 h-index:74 and i10-index: 366 and his cumulative impact factor more than 1500. He is visiting scientist at National Taiwan Ocean University, Taiwan. From his supervision 53 Ph.D. scholars received the degree.

Projects

Research Guidance

Research Publication

Dinesh D , Kadarkarai Murugan and Jiang Shiou Hwang (2024) Multifaceted applications of chitosan-capped nanoparticles: Implications for dengue vector control, bacterial pathogen inhibition, and antioxidant enzyme activity in non-target copepod predation. Sci Rep (press)

Balamurugan Chandramohan, Kadarkarai Murugan, Murugan Vasanathakumaran, Jiang-Shiou Hwang et al. (2024) Phyto-functionalized silver-gold alloy nanoparticles integrating medicinal plants (Smilax zeylanica L.) as potential mosquito vector larvicidal agents. Sci Rep (press)

Kadarkarai Murugan, Rajapandian Rajaganesh, Jiang-Shiou Hwang, Lan Wang, Murugan Vasanthakumaran, Hans-Uwe Dahms, Chellasamy Panneerselvam, Yugal Kishore Mohanta, Saravanan Muthupandian, Ranganathan Babu Janarthanam, Fajun Chen, Naser Ahmad Hamad Alkenani, (2023) Smoke toxicity effect of bio-fabricated mosquito coil for the sustainable management of mosquito vectors,Journal of Natural Pesticide Research,Volume 6,2023,100048,ISSN 2773-0786,https://doi.org/10.1016/j.napere.2023.100048.

Suriyakala, G., Sathiyaraj, S., Balasundaram, M. Kadkarkarai Murugan (2023) Plumeria alba flower extract-mediated synthesis of recyclable chitosan-coated cadmium nanoparticles for pest control and dye degradation. Bioprocess Biosyst Eng 46, 1483–1498 (2023). https://doi.org/10.1007/s00449-023-02915-z
Murugan, K., Hwang, J.S., Wang, L., Vasanthakumaran, M., Dahms, H.U., Panneerselvam, C., Mohanta, Y.K., Muthupandian, S., Janarthanam, R.B. and Chen, F., (2023) Smoke toxicity effect of bio-fabricatedmosquito coil for the sustainable management of mosquito vectors. Journal Natural Pesticide Research, June 2023; Journal of Natural Pesticide Research 6(8):10004; DOI:10.1016/j.napere.2023.100048

Murugan K, Panneerselvam C, Subramaniam J, Paulpandi M, Rajaganesh R, Vasanthakumaran M, Madhavan J, Shafi SS, Roni M, Portilla-Pulido JS, Mendez SC, Duque JE, Wang L, Aziz AT, Chandramohan B, Dinesh D, Piramanayagam S, Hwang JS. (2022) Synthesis of new series of quinoline derivatives with insecticidal effects on larval vectors of malaria and dengue diseases. Sci Rep. 2022 Mar 19;12(1):4765. doi: 10.1038/s41598-022-08397-5. PMID: 35306526; PMCID: PMC8933857.

Arokia Vijay Anand Mariadoss, Ramachandran Vinayagam, Vijayalakshmi Senthilkumar, Manickam Paulpandi, Kadarkarai Murugan, Baojun Xu, K.M. Gothandam, Venkata Subbaiah Kotakadi (2019). Phloretin loaded chitosan nanoparticles augments the pH-dependent mitochondrial-mediated intrinsic apoptosis in human oral cancer cells. International Journal of Biological Macromolecules 130 (2019) 997–1008.

Akon Higuchi, S. Suresh Kumar, Giovanni Benelli, Qing-Dong Ling, Hsing-Fen Li, Abdullah A. Alarfaj, Murugan A. Munusamy, Tzu-Cheng Sung, Yung Chang,

Kadarkarai Murugan, (2019). Biomaterials used in stem cell therapy for spinal cord injury, Progress in Materials Science,Volume 103,2019,Pages 374-424,https://doi.org/10.1016/j.pmatsci.2019.02.002.

Pandiyan Amuthavalli, Jiang-Shiou Hwang, Hans-Uwe Dahms, Lan Wang, Jagannathan Anitha, Murugan Vasanthakumaran, Arumugam Dhanesh Gandhi, Kadarkarai Murugan, Jayapal Subramaniam, Manickam Paulpandi, Balamurugan Chandramohan, Shivangi Singh (2021)Zinc oxide nanoparticles using plant Lawsonia inermis and their mosquitocidal, antimicrobial, anticancer applications showing moderate side effects. Sci Rep 11, 8837 (2021). https://doi.org/10.1038/s41598-021-88164-0

Kadarkarai Murugan, Lan Wang, Jaganathan Anitha, Pandiyan Amuthavalli, Devakumar Dinesh, MururganVasanthakumaran, Manickam Paulpandi, Jiang-Shiou Hwang (2020) Insecticidal effect of chitosan reduced silver nanocrystals against filarial vector, Culex quinquefasciatus and Cotton Bollworm, Helicoverpa armigera. Advances in Nano-fertilizers and Nano- pesticides Application for Crop publication in Elsevier. Edited by: Sudisha Jogaiah, Harikesh Bahadur Singh,... Renata de Lima. Advances in Nano-Fertilizers and Nano-Pesticides in Agriculture:A Smart Delivery System for Crop Improvement:A volume in Woodhead Publishing Series in Food Science, Technology and Nutrition Book • 2021 - DOI:10.1016/B978-0-12-820092-6.00019-7 In book: 2021 In book: Advances in Nano-Fertilizers and Nano-Pesticides in Agriculture (pp.469-486) https://doi.org/10.1007/978-3-030-67028-3_16

Murugan K, Anitha J, Dinesh D, Suresh U, Rajaganesh R, Chandramohan B, Subramaniam J, Paulpandi M, Vadivalagan C, Amuthavalli P, Wang L, Hwang JS, Wei H, Alsalhi MS, Devanesan S, Kumar S, Pugazhendy K, Higuchi A, Nicoletti M, Benelli G. Fabrication of nano-mosquitocides using chitosan from crab shells: Impact on non-target organisms in the aquatic environment. Ecotoxicol Environ Saf. 2016 Oct;132:318-28. doi: 10.1016/j.ecoenv.2016.06.021. Epub 2016 Jun 24. PMID: 27344400.

Murugan, K., Anitha, J., Suresh, U. et al. Chitosan-fabricated Ag nanoparticles and larvivorous fishes: a novel route to control the coastal malaria vector Anopheles sundaicus?. Hydrobiologia 797, 335–350 (2017). https://doi.org/10.1007/s10750-017-3196-1

Kadarkarai Murugan, Anitha Jaganathan, Rajapandian Rajaganesh, Udaiyan Suresh, Jagan Madhavan, Sengottayan Senthil-Nathan, Aruliah Rajasekar, Akon Higuchi, Suresh S. Kumar, Abdullah A. Alarfaj, Marcello Nicoletti, Riccardo Petrell,

Loredana Cappellacci, Filippo Maggi, Giovanni Benelli (2018). Poly(Styrene Sulfonate)/Poly(Allylamine Hydrochloride) Encapsulation of TiO2 Nanoparticles Boosts Their Toxic and Repellent Activity Against Zika Virus Mosquito Vectors. J Clust Sci. 29, 27–39

Kandasamy Kalimuthu, Chellasamy Panneerselvam, Chi Chou, Showe-Mei Lin, Li-Chun Tseng, Kun-Hsien Tsai, Kadarkarai Murugan, Jiang-Shiou Hwang. (2017). Predatory efficiency of the copepod Megacyclops formosanus and toxic effect of the red alga Gracilaria firma-synthesized silver nanoparticles against the dengue vector Aedes aegypti. Hydrobiologia, 785(1), 359-372.

Kadarkarai Murugan, Anitha Jaganathan, Udaiyan Suresh, Rajapandian Rajaganesh, Sudalaimani Jayasanthini, Akon Higuchi, Suresh Kumar, Giovanni Benelli. (2017). Towards Bio-Encapsulation of Chitosan-Silver Nanocomplex? Impact on Malaria Mosquito Vectors, Human Breast Adenocarcinoma Cells (MCF-7) and Behavioral Traits of Non-target Fishes. Journal of Cluster Science, 28(1), 529-550.

Kandasamy Kalimuthu, Chellasamy Panneerselvam, Chi Chou, Li- Chun Tseng, Kadarkarai Murugan, Kun-Hsien Tsai, Abdullah A Alarfaj, Akon Higuchi, Angelo Canale, Jiang-Shiou Hwang, Giovanni Benelli. (2017). Control of dengue and Zika virus vector Aedes aegypti using the predatory copepod Megacyclops formosanus: Synergy with Hedychium coronarium-synthesized silver nanoparticles and related histological changes in targeted mosquitoes. Process Safety and Environmental Protection, 109, 82-
48 96.

Vasu Sujitha, Kadarkarai Murugan, Devakumar Dinesh, Amuthvalli Pandiyan, Rajasekar Aruliah, Jiang-Shiou Hwang, Kandasamy Kalimuthu, Chellasamy Panneerselvam, Akon Higuchi, Al Thabiani Aziz, Suresh Kumar, Abdullah A. Alarfaj, Baskaralingam Vaseeharan, Angelo Canale, Giovanni Benelli (2017) Green-synthesized CdS nano- pesticides: toxicity on young instars of malaria vectors and impact on enzymatic activities of the non-target mud crab Scylla serrata. Aquatic Toxicology, https://doi.org/10.1016/j.aquatox.2017.04.015.

Dinesh Kumar S, Singaravelu G, Ajithkumar S, Murugan K, Nicoletti M and G Benelli. (2016). Mangrove-mediated green synthesis of silver nanoparticles with high HIV-1 reverse transcriptase inhibitory potential. Journal of Cluster Science [Springer] DOI 10.1007/s10876-016-1100-1.

Akon Higuchi, S. Suresh Kumare, Qing-Dong Ling, Abdullah A Alarfaj, Murugan A. Munusamy, Kadarkarai Murugan, Shih-Tien Hsu, Giovanni Benelli, Akihiro Umezawa (2017). Polymeric design of cell culture materials that guide the differentiation of human pluripotent stem cells. Progress in Polymer Science, 65, 83-126. (Impact factor 25.766).

Kadarkarai Murugan, Chellasamy Panneerselvam, Jayapal Subramaniam, Pari Madhiyazhagan, Jiang-Shiou Hwang, Lan Wang, Devakumar Dinesh, Udaiyan Suresh, Mathath Roni, Akon Higuchi, Marcello Nicoletti, Giovanni Benelli (2016) Eco-friendly drugs from the marine environment: spongeweed-synthesized silver nanoparticles are highly effective on Plasmodium falciparum and its vector Anopheles stephensi, with little non-target effects on predatory copepods Environ Sci Pollut Res DOI 10.1007/s11356-016-6832

Chandramohan B, Murugan K, Kovendan K, Panneerselvam C, Mahesh Kumar P, Madhiyazhagan P, Dinesh D, Suresh U, Subramaniam J, Amaresan D, Nataraj T, Nataraj D, Hwang JS, Alarfaj AA, Nicoletti M, Canale A, Mehlhorn H, Benelli G* (2015) Ovicidal, larvicidal, pupicidal and adulticidal properties ofAcorus calamus-synthesized silver nanoparticles against the malaria vector Anopheles stephensi: do nanoinsecticides impact predation of Mesocyclops edax copepods against mosquito larvae? In: “Nanoparticles in the fight against parasites” (Editor Heinz Mehlhorn), Parasitology Research Monographs, Springer, ISSN: 2192-3671, in press (Invited Chapter) (Impact factor: 2.098).

Kadarkarai Murugan, Giovanni Benelli, Suganya Ayyappan, Devakumar Dinesh, Chellasamy Panneerselvam, Marcello Nicoletti, Jiang-Shiou Hwang, Palanisamy Mahesh Kumar, Jayapal Subramaniam, Udaiyan Suresh (2015) Toxicity of seaweed-synthesized silver nanoparticles against the filariasis vector Culex quinquefasciatus and its impact on predation efficiency of the cyclopoid crustacean Mesocyclops longisetus Parasitol Res DOI 10.1007/s00436-015-4417-z (Impact factor: 2.098).

Murugan K, Benelli G, Panneerselvam C, Subramaniam J, Jeyalalitha T, Dinesh D, Nicoletti M, Hwang JS, Suresh U, Madhiyazhagan P (2015) Cymbopogon 92ffectiv-synthesized gold nanoparticles boost the predation efficiency of copepod Mesocyclops aspericornis against malaria and dengue. Exp Parasitology 153:129-38. Doi: 10.1016 (Impact factor: 1.638)

Kandasamy Kalimuthu, Kadarkarai Murugan, Li-Chun Tseng, and Jiang-Shiou Hwang (2013) Mosquitocidal activity of Hedychium coronarium rhizome extract and Copepod Megacyclops formosanus for the control of dengue vector, Aedes

aegypti. Journal of Marine Science and Technology, Vol. 21, Suppl, pp. 258-266 (2013) DOI: 10.6119/JMST-013-1223-4

Kandasamy Kalimuthu, Chia-Hsiang Wang, Shiu-Mei Liu, Li-Chun Tseng, Kadarkarai Murugan, and Jiang-Shiou Hwang (2013) Mosquito larvicidal activity of Broussonetia papyrifera compound Marmesin by blocking protein aescp-2, docking strategies, and combined effect of copepod, Megacyclops formosanus against dengue Vector Aedes aegypti (Diptera: Culicidae). Journal of Marine Science and Technology, Vol. 21, Suppl, pp. 308-315 (2013), DOI: 10.6119/JMST-013-1223-8

Kandasamy Kalimuthu, Show-Mei Lin, Li-Chun Tseng, Kadarkarai Murugan, Jiang-Shiou Hwang (2013) Bio-efficacy potential of seaweed, Gracilaria firma with copepod, Megacyclops formosanus for the control larvae of dengue vector Aedes aegypti. Hydrobiologia, DOI 10.1007/s10750-013-1745-9. (Impact Factor: 2.275)

Kadarkarai Murugan, Kandasamy Kalimuthu, Palanisamy Mahesh Kumar, Jiang-Shiou Hwang, Marcello Nicoletti (2013). Larval and pupal toxicity effects of Plectranthus amboinicus, Bacillus sphaericus and predatory copepods for the control of the dengue vector, Aedes aegypti. Phytoparasitica 41: 307-316. (Impact factor: 1.062).

Mahesh Kumar P, Murugan K, Kovendan K, Panneerselvam C, Prasanna Kumar K, Amerasan D, Subramaniam J, Kalimuthu K, Nataraj T. (2012) Mosquitocidal activity of Solanum xanthocarpum fruit extract and copepod Mesocyclops thermocyclopoides for the control of dengue vector, Aedes aegypti Parasitol Res DOI 10.1007/s00436-012-2876-2 (Impact factor: 2.098).

Kadarkarai Murugan, Jiang-Shiou Hwang, K. Kovendan, K. Prasanna kumar, C. Vasugi and A. Naresh Kumar (2011) Use Of Plant Products And Copepod For The Control Of Dengue Vector, Aedes aegypti, Hydrobiologia (2011) 666:331–338 (Impact Factor: 2.275)

Alumini Reflections: