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ACADEMIC QUALIFICATION:

- <u>Ph.D.</u> from Jadavpur University, Kolkata, India.
  <u>Title of the Thesis</u>: *Study on nonlinear dynamics to control the disease of Jatropha curcas plant and to optimize biodiesel production from Jatropha oil.* <u>Supervisor:</u> Prof. Priti Kumar Roy.
- <u>B.Sc. and M.Sc.</u> from Department of Mathematics, Jadavpur University, Kolkata, India

POST-DOCTORAL RESEARCH EXPERIENCE:

Dr. D.S. Kothari Post-doctoral Fellow (2017 - 2019): Post-Doctoral Mentor: Prof. Santanu Ray, Department of Zoology, Visva-Bharati Unversity, Santiniketan, West Bengal, India.

AWARDS:

1. Received Dr. D.S. Kothari Post-doctoral Fellowship, The UGC, India (2017)
2. Selected as a Research Fellow for UGC Major Research Project (41/768/2012/SR): 2012 - 2015.
3. Received International Travel Grant for attending Conference in UK, April, 2020.

DETAILS OF PUBLICATION:

- SCI & SCIE

1. Amar N. Chatterjee, **FA Basir**, Basir Ahmed: Fractional order Compartmental Model of Vaccination for COVID-19 with the Fear Factor, *Mathematics, MDPI*, 10(9), 1452, 2022.

2. C. Maji1, **Fahad Al Basir**, D. Mukherjee, K.S. Nisar, C. Ravichandran, COVID-19 propagation and the usefulness of awareness-based control measures: a mathematical model with delay, *AIMS-Mathematics*, Vol. 7 (7), 2022.

3. S. Adhurya, **Fahad Al Basir**, Santanu Ray, Stage-structure model for the dynamics of whitefly transmitted plant viral disease: an optimal control approach, *Computational and Applied Mathematics*, *Springer*, 2022.

4. J. Chowdhury, **Fahad Al Basir**, Xianbing Cao, Priti Kumar Roy, Integrated pest management for Jatropha Carcus plant: An Impulsive control approach, *Mathematical Methods in the Applied Sciences, Wiley*, 2022.

5. **F Al Basir**, Santanu Ray: Modeling the transmission dynamics of plant viral disease using two routes of infection, nonlinear terms and incubation delay, *International Journal of Biomathematics*, Vol. 15(6), 2022. https://doi.org/10.1142/S1793524522500322.

6. **F Al Basir**, M H Noor, A model for pest control using integrated approach: impact of latent and gestation delays, *Nonlinear Dynamics*, Springer, 2022. https://doi.org/10.1007/s11071-022-07251-7.

7. A. Kumar Roy, **Fahad Al Basir**, P. Kumar Roy, A. N. Chatterjee, "A model analysis to measure the adherence of Etanercept and Fezakinumab therapy for the treatment of psoriasis", *Nonlinear Analysis: Modelling and Control*, 2022. https://doi.org/10.15388/namc.2022.27.26483.

8. S Ghosh, **F. Al Basir**, G Chowdhury, S Ray, S Bhattacharya: Is the primary helper always a key group for the dynamics of cooperative birds? A mathematical study on cooperative breeding birds, *Ecological Modelling, Elsevier,* 2021.

9. B. Rahman, S. H. A. Khoshnaw, Grace O. Agaba, **F Al Basir:** How Containment Can Effectively Suppress the Outbreak of COVID-19: A Mathematical Modelling, *Axioms, MDPI,* 2021, 10, 204.

10. T Abraha, **F. Al Basir**, LL Obsu, DFM Torres: Farming awareness-based optimum interventions for crop pest control, *Mathematical Biosciences and Engineering*, AIMS, 2021. Vol 18(5), 5364-5391.

11. **F.A. Basir**, Y. Kyrychko, K B Blyuss, S Ray, Effects of vector maturation time on the dynamics of cassava mosaic disease, *Bulletin of Mathematical Biology*, *Springer*, 2021. https://doi.org/10.1007/s11538-021-00921-4

12. T Abraha, **F Al Basir,** LL Obsu, DFM Torres: Pest control using farming awareness: impact of time delays and optimal use of Biopesticides, *Chaos, Solitons and Fractals* 146 (2021) 110869.

13. F. Al Basir, Pankaj K Tiwari, S Samanta, Effects of incubation and gestation periods in a prey-predator model with infection in prey, *Mathematics and Computers in Simulation* 190 (2021) 449–473.

14. A. N. Chatterjee, **F. Al Basir**, M. A. Almuqrin, J. Mondal, I. Khan, SARS-CoV-2 infection with lytic and non-lytic immune responses: A fractional order optimal control theoretical study, *Results in Physics*, *Elsevier*, 26 (2021) 104260.

15. A. N. Chatterjee, **F. Al Basir***, Y. Takeuch, Effect of DAA therapy in hepatitis C treatment-an impulsive control Approach, *Mathematical Biosciences and Engineering,* vol. 18, no. 2, 2021.

16. **F. A. Basir***, Y. Takeuchi, S. Ray, Dynamics of a delayed plant disease model with Beddington-DeAngelis disease transmission, *Mathematical Biosciences and Engineering*, vol. 18, no. 1, 2021.

17. **F.A. Basir***, A Banerjee, S Ray, Exploring the effects of awareness and time delay in controlling malaria disease propagation, *International Journal of Nonlinear Sciences and Numerical Simulation, 2020.*

18. AN Chatterjee, **F. Al Basir***, A model for SARS-CoV-2 infection with treatment, *Computational and Mathematical Methods in Medicine*, Hindawi, 2020. https://doi.org/10.3934/mbe.2021272

19. **Fahad Al Basir**, S Adhurya, M Banerjee, E Venturino, S Ray, Modelling the effect of incubation and latent periods on the dynamics of vector-borne plant viral diseases, *Bulletin of Mathematical Biology, Springer,* (2020) 82:94

20. **Fahad Al Basir***, A multi-delay model for pest control with awareness induced interventions - Hopf bifurcation and optimal control analysis, *International Journal of Biomathematics*, 2020.

21. PK Roy, AK Roy, E. N. Khailov**, F Al Basir**, E. V. Grigorieva, A Model of the Optimal Immunotherapy of Psoriasis by Introducing $IL-10$ And $IL-22$ Inhibitor, *Journal of Biological Systems, 2020.*

22. **F Al Basir**, S Ray, Impact of farming awareness based roguing, insecticide spraying and optimal control on the dynamics of mosaic disease, *Ricerche di Matematica*, Springer, 2020. DOI: 10.1007/s11587-020-00522-8.

23. Konstantin B. Blyuss, **Fahad Al Basir**, Victoria A. Tsygankova et al., Control of mosaic disease using microbial biostimulants: insights from mathematical modelling, Ricerche di Matematica, 2020. DOI: 10.1007/s11587-020-00508-6.

24. Santanu Ray, **Fahad Al Basir**, Impact of incubation delay in plant-vector interaction, Mathematics and Computers in Simulation, Vol. 170, 2020, pp. 16-31.

25. AK Roy**, F Al Basir**, PK Roy, A vivid cytokines interaction model on psoriasis with the effect of impulse biologic ($TNF-\alpha$ inhibitor) therapy, Journal of Theoretical Biology, Elsevier, 474 (2019): 63-77.

26. N Rakshit, **F Al Basir**, A Banerjee, S Ray, Dynamics of plant mosaic disease propagation and the usefulness of roguing as an alternative biological control, Ecological Complexity, Elsevier, 38 (2019): 15-23.

27. J. Chowdhurya, **F. Al Basir**, Y. Takeuchi, M. Ghosh, PK Roy, A mathematical model for pest management in Jatropha curcas with integrated pesticides - An optimal control approach, Ecological Complexity, Elsevier, 37 (2019): 24-31.

28. Fahad Al Basir, Arnab Banerjee, Santanu Ray, Role of farming awareness in crop pest management - A mathematical model, Journal of Theoretical Biology, Elsevier, Vol. 461, 2019, Pages 59-67. 2018 (6)

29. **F. Al Basir**, Konstantin B. Blyuss, Santau Ray, Modelling the effects of awareness-based interventions to control the mosaic disease of Jatropha curcas, Ecological Complexity, Elsevier, 36, pp.92-100, 2018.

30. **F A Basir**, E Venturino, Santanu Ray, PK Roy, Impact of farming awareness and delay on the dynamics of mosaic disease in Jatropha curcas plantations, Computational and Applied Mathematics, Springer, 37, no. 5 (2018): 6108-6131.

31. **F A Basir**, Santanu Ray, Ezio Venturino, Role of media coverage and delay in controlling infectious diseases: A mathematical model, Applied Mathematics and Computation, Elsevier, 337, 2018, 372–385.

32. PK Roy, Zhang Yanhui, P. Ghosh, J. Pal, **F A Basir**, Role of Antibiotic Therapy in Bacterial disease: A Mathematical Study, International Journal of Biomathematics, World Scientific, 2018.

33. **Fahad Al Basir**, PK Roy, Dynamics of mosaic disease with roguing and delay in Jatropha curcas plantations, *Journal of Applied Mathematics and Computing,* Springer, 2018, Vol., Issue 1–2, pp 1–31.

34. **Fahad Al Basir**, Ezio Venturino, PK Roy: Effect of Awareness Program for Controlling Mosaic Disease in Jatropha Curcas Plantations", *Mathematical Methods in the Applied Sciences, John Wiley & Sons*, 40(7), pp.2441-2453, 2017.

35. Xianbing Cao, Abhirup Datta**, Fahad Al Basir**, Priti Kumar Roy: Memory Induced Fractional-Order Model of Psoriasis: A Control Based Mathematical Approach, *Journal of Systems Science and Complexity, Springer*, vol. 29, pp. 1-20, 2016.

36. Fahad Al Basir, Siddhartha Datta, Priti Kumar Roy, "Studies on Biodiesel Production from Jatropha Curcas Oil using Chemical and Biochemical methods – A Mathematical Approach", *Fuel, Elsevier,* Vol. 158, pp. 503–511, 2015.

37. Priti Kumar Roy, S Saha, Fahad Al Basir, Effect of Awareness Programs in controlling the disease HIV/AIDS: An Optimal Control Theoretic Approach, *Advances in Difference Equations, Springer,* (2015) 2015:217, DOI 10.1186/s13662-015-0549-9.

38. P. K. Roy, Siddhartha Datta, Sumit Nandi, Fahad Al Basir, Effect of Mass Transfer Kinetics for Maximum Production of Biodiesel from Jatropha Curcas Oil: A Mathematical Approach, *Fuel, Elsevier*, Vol.134 pp. 39–44, 2014.

- **ESCI & SCOPUS:**

39. S. Sarwardi, S. Hossain, **F. Al Basir,** S. Ray: Mathematical analysis of an ecological system using a non-monotonic functional response: Effects of gestation delay and predator harvesting, *Int. Journal of Dynamics and Control*, Springer, 2022

40. **F. Al Basir,** J. Chowdhury, S Das, S ray: Combined impact of predatory insects and bio-pesticide over pest population: impulsive model-based study, *Energy Ecology Environment*, Springer, 2022.

41. T Abraha, **F. Al Basir**, LL Obsu, DFM Torres. Controlling crop pest with a farming awareness based integrated approach and optimal control, *Computational and Mathematical Methods*, Wiley, 2021.

42. S. Mandal, **F. Al Basir**, S Ray: Additive Allee effect of top predator in a mathematical model of three species food chain, *Energy, Ecology and Environment*, Springer, 2020.

43. X. Cao, **F Al Basir,** Xue-Zhi Li, P. K. Roy: Effect of Enfuvirtide and Protease Inhibitors as Combined Therapy for HIV - A double impulsive approach, *Int. J. Appl. Comput. Math., Springer*, 2020.

44. Xianbing Cao, Amit Kumar Roy, **Fahad Al Basir,** Priti Kumar Roy, Global dynamics of HIV infection with two disease transmission routes - a mathematical model, *Commun. Math. Biol. Neurosci*, 2020 (2020), Article ID 8.

45. **F. A. Basir**, A. M. Elaiw, S. Ray, Effect of time delay in controlling crop pest with farming awareness*, Int. J. Appl. Comput. Math,* Springer, 5, no. 4 (2019): 110.

46. **F. A. Basir**, PK Roy, Study on enzyme inhibition in biodiesel synthesis: Effect of stepwise addition of methanol and removal of glycerol, *Energy Ecology and Environment*, Springer, 4, no. 2 (2019): 75-84.

47. **F. A. Basir**, Dynamics of infectious diseases with media coverage and two-time delay, *Mathematical Models and Computer Simulations, Springer*, 10 (6), 770–783, 2018.

48. **F. A. Basir**, PK Roy, S Ray, Impact of roguing and insecticides spraying on mosaic disease in Jatropha curcas plantation, *Control and Cybernetics*, Polis Academy of Science, 46 (4), 2017.

49. E Venturino, Priti Kumar Roy, **Fahad Al Basir**, and Abhirup Datta. A model for Jatropha Curcas plantations affected by the mosaic virus, *Energy, Ecology, and Environment*, Springer, pp. 1-10, 2016.

50. D. Biswas, P. K. Roy, Xue-Zhi Li, **Fahad Al Basir**, J. Pal, "Role of Macrophase in the Disease Dynamics of Cutaneous Leishmaniasis: A Delay induced Mathematical study", *Commun. Math. Biol. Neurosci*., Science & Knowledge Publishing, USA, Vol. 2016, 2016:4

51. J Chowdhury, **F Al Basir**, J Pal, PK Roy, Pest control for Jatropha curcas plant through viral disease: A mathematical approach, *Nonlinear Studies* (2016), 23 (4), 515-530.

52. **Fahad Al Basir**, PK Roy, Stability Analysis and Optimal Control of a Fractional Order Model for HIV Infection, *WSEAS Transactions on Mathematics*, Vol 16, pp. 152-162, 2017.

53. **Fahad Al Basir**, Long Term Dynamics of Infectious Diseases with Awareness Campaign and Time Delay, *WSEAS Transactions on Mathematics*, Vol 16, pp. 152-162, 2017.

54. **Fahad Al Basir**, PK Roy, Optimization of Biodiesel Synthesis in a Batch reactor using Maximum Principle, *WSEAS Transactions on Environment and Development*, Volume 13, 2017.

55. S. Chakraborty, Jing-an Cui, J. Pal, **F. Al Basir,** Priti K. Roy, The generalization of an n-patch model for Leishmaniasis*, Commun. Math. Biol. Neurosci*., SCIK.ORG (2017).

56. **Fahad Al Basir**, Rupa Bhattacharyya, Priti Kumar Roy, Delay Induced Oscillation in a Biochemical Model and Its Control, Nonlinear studies, Vol. 22(3), pp. 453-472, 2015.

57. Priti Kumar Roy, Xue-Zhi Li, **Fahad Al Basir**, Abhirup Datta, Jahangir Chowdhury, Effect of Insecticide Spraying on Jatropha curcas Plant to Control Mosaic Virus: A Mathematical Study*, Commun. Math. Biol. Neurosci,* Science and Knowledge Publishing, 2015, 2015:36

58. **Fahad Al Basir**, Ahmed M. Elaiw, D Kesh, Priti Kumar Roy, Optimal Control of a Fractional-Order Enzyme Kinetic Model, *Control & Cybernetics*, vol. 44, Iss. 4, 2015.

59. **Fahad Al Basir**, Priti Kumar Roy. Production of Biodiesel using Enzymatic Transesterification of Jatropha Curcas Oil: A Mathematical Study, *Journal MESA*, Cambridge Scientific Publisher, UK, Vol. 5 No 2, pages 175-184, 2014.

- BOOK CHAPTERS/CONFERENCE PROCEEDINGS:

60. Eenezer Bonyah, **Fahad Al Basir**, and Santanu Ray. *Hopf bifurcation in a mathematical model of tuberculosis with delay, In: Mathematical Modeling,* Optimization, Analytic and Numerical Solutions, *Springer Nature*, 2020.

61. **Fahad Al Basir**, Dynamics of infectious diseases with periodic awareness campaigns, In: Int. Conf. Mathematical Analysis and Applications in Modeling-ICMAAM, *Springer Verlag*, 2020.

62. **Fahad Al Basir**, Sushil Kumar, Xianbing Cao, and Priti Kumar Roy: Effect of Glycerol kinetics and mass transfer during Enzymatic Biodiesel Production from Jatropha oil, Industrial Mathematics and Complex System, Publisher: *Springer Verlag*, ISBN 978-981-10-3758-0.

63. Priti Kumar Roy, **Fahad Al Basir**: Enhance Biodiesel Production from Jatropha Curcas Oil: A Mathematical Approach through Control on Backward Reaction, In: Proceedings of 4th Scientific Colloquium, Publisher: *Institute of Chemical Technology, Prague*, p. 178-189, 2014.

64. **Fahad Al Basir**, S Nandi, Priti Kumar Roy, R Bhattacharyya, M K Ghosh: Study on Bi-Substrate Enzymatic Reactions through Variational Iteration Method, In: *Proceedings of 4th Scientific Colloquium, Publisher: Institute of Chemical Technology, Prague*, p. 157-167, 2014.

65. J. Chowdhury, **F. A. Basir**, P. K. Roy, Renewable energy biodiesel: A mathematical approach from ecology to production, in: IHMOTEP Conference proceedings: *African Journal of Pure and Applied Mathematics*, 3(1), 95-115, 2016.

66. A.N. Chaterjee, **F. A. Basir**, Role of Immune effector responses during HCV infection: a mathematical study, Mathematical Analysis of Infectious Diseases, *Elsevier*, 2022.

67. A.N. Chaterjee, **F. A. Basir**, Modelling of the effects of media in the course of vaccination of Rota virus, *Advances in Epidemiological Modeling and Control of Viruses***,** Elsevier. 2022.

68. **F Al Basir**, S Adhurya, S. Ray, Impact of periodic farming awareness campaign through media for crop pest control management: A mathematical study, CRC PRESS, Tailor & Francis. In press, 2022.

- OTHER PUBLICATIONS (PEER-REVIED):

69. **Fahad Al Basir**, PK Roy, *Optimization of Biodiesel Production through Enzymatic Transesterification of Jatropha curcas Oil*, Int. J. Systems Applications, Engineering & Development, Vol. 11, 2017.

70. Jayanta Mondal, Priti Kumar Roy, **Fahad Al Basir**: A mathematical model for the control of HIV infection - An optimal control approach, Int. J. Mathematics and Computers in Simulation, Vol. 11, 2017.

71. M.K. Ghosh, **F.A. Basir**, P.K. Roy, S. Datta, S. Nandi, *Modeling of a Delay Induced Biochemical System for product Optimization, Communications in Optimization Theory,* UK, 2017, Article ID 8, p. 1-23, DOI: 10.23952/cot.2017.8

72. **Fahad Al Basir**, Priti Kmar Roy, Santanu Ray, A fractional order mathematical model for enzymatic biodiesel synthesis and its optimization, *Int. J. Mathematical Models and Methods in Applied Sciences*, Volume 11, 2017.

73. J. Chowdhury, X. Cao, **Fahad Al Basir**, Priti Kumar Roy. Effect of Mass transfer and Reaction Kinetics in Transesterification of Jatropha curcas oil, *Int. J. Mathematical Models and Methods in Applied Sciences*, Volume 11, 2017.

74. **Fahad Al Basir**, Priti Kumar Roy. Effects of Temperature and Stirring on Mass Transfer to Maximize Biodiesel Production from Jatropha Curcas Oil: A Mathematical Study, *Int. Journal of Engineering Mathematics, Publisher: Hindawi,* Vol. 2015, pp. 1-9, 2015.

75. **Fahad Al Basir**, Sumit Nandi, Priti Kumar Roy, Optimal Control on Saponification to Maximize Biodiesel Production from Jatropha Curcas Oil, *Mathematical Sciences International Research Journal*, Volume 3, Issue 1 (2014).