

Curriculum Vitae of A.Sait Sahul Hameed

Name: A. Sait Sahul Hameed
 Father's Name: K.E. Azeez
 Designation: Associate Professor of Zoology (Rtd.)
**Current Position: Director, Aquatic Animal Health Laboratory
 (NABL Accredited ISO 17025: 2017)**

Institution: C. Abdul Hakeem College
 Date of Birth: 01.05.1960
 Religion: Muslim
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Educational qualifications

Degree	Date awarded	University \ Institution	Subject taken	Percentage marks
B.Sc.	1982	University of Madras	Zoology	77
M.Sc.	1984	University of Madras	Zoology with Fishery Science	Grade 'A' 63
M.Phil.	1985	IBMS, University of Madras	Medical Physiology	65
Ph.D.	1991	Central Marine Fisheries Research Institute, Cochin	Mariculture (Shrimp Diseases)	Awarded
D.Sc.	2021	Alagappa University	Viral diseases shrimp and prawn	Awarded

Employment Record

Designation with Institution	Period From- To	Nature of work
Lecturer, C.Abdul Hakeem College,	03/03/1990 – 05/04/1995	Teaching (UG & PG) and Research
Lecturer (Senior scale), C.Abdul Hakeem College,	06/04/1995 – 28/03/1999	Teaching (UG & PG) and Research
Reader, C.Abdul Hakeem College,	29-03-1999 – 31.12.2005	Teaching (UG & PG) and Research
Associate Professor C.Abdul Hakeem College,	01-01-2006 – 31.05.2018	Teaching (UG & PG) and Research
Director, AAHL, C.Abdul Hakeem College	01.06.2018 – till date	Research

Teaching & Research experience:

Classes	College in which taught	Duration	Total Experience
B.Sc., M.Sc. & M.Phil. and guiding Ph.D. students	C.Abdul Hakeem College, Melvisharam	1990 to till date	30 years of teaching & Research

Publications: (Annexure I) (Google Scholar Data & Research Gate data - enclosed)

International Publications:	139 (SCI Journals)
National Publication:	04
Books (International – OIE Manual)	01 (the only Indian Contributor)
Total Impact Factor:	300
Total citations:	4905
h – index	42
i10 - index	87

Research Projects: (Details given in Annexure II)

Total No. of research projects:	36
No. of research projects completed:	32
No. of projects ongoing:	04
International Project:	04 (with France, Norway, UK and Sri Lanka)
Total outlay of the projects:	Rs. 25 crores
Funding Agencies:	UGC, DBT, DST, ICAR, MoES, IFCPAR, NFDB, BBSRC, BIRAC

Research Guidance Experience: (Annexure III)

Institute in which research work is being carried out	Duration	Specialization	No. Ph.D. students - produced	No. of Ph.D. students – guiding	No. of M.Phil. – produced	No. of M.Phil. – guiding
C.Abdul Hakeem College, Melvisharam	1990 – till date	Aquaculture Biotechnology: Diagnostics and vaccines for Aquatic animals	24	01	15	0

Referee for the following International Journals:

- Aquaculture
- Archives of Virology
- Journal of Virological Methods
- Virology
- Journal of Fish Diseases
- Journal of Invertebrate Pathology
- Journal of Fish Biology
- Fish & Shellfish Immunology
- Diseases of Aquatic Organisms

Technology Transfer and commercialization:

1. Technology to detect shrimp viruses has been transferred to an Industry (Poseidon Biotech, Chennai) for commercialization for the benefit of the farmers. The kit is in the market under the brand name of **Dr.Sahul's Kit. (Sold 750 kits worth of Rs. 75 lakhs till today)**. Indian market and exported to Tanzania, Sri Lanka and Madagascar **(Letter is enclosed)**
2. Herbal Immunostimulant for disease resistance in shrimp (Technology transferred to Poseidon Biotech, Chennai). This product has been commercialized under brand name of **"Immuzone"**. **(Sold 50,000 litre of herbal immunostimulant worth of Rs. 5 crores till today)**. **(Letter enclosed)**
3. Developed thirty-three cell lines from freshwater, brackishwater and marine fish for scientific research. **Established DBT funded National Repository for fish cell lines for maintenance and supply to research organizations.**
4. **Established National Repository for Viral pathogens of aquatic animals. Maintenance and supply to various National and International Organizations for diagnostic purpose.**

Research Collaboration

National Level:

- a. Centre for Biotechnology, Anna University, Chennai
- b. Central Institute of Brackishwater Aquaculture, Chennai
- c. Department of Inorganic Chemistry, University of Madras, Chennai
- d. National Environmental Engineering Research Institute, Nagpur
- e. National Centre for Cell Sciences, Pune
- f. Cochin University of Science and Technology, Cochin
- g. VIT University, Vellore
- h. Department of Zoology, University of Madras, Chennai
- i. Department of Botany, University of Madras, Chennai
- j. Annamalai University, Chidambaram
- k. Agharkar Research Institute, Pune

International Level:

- a. University of Montpellier, France (IFCPAR – project)
- b. Institute of Marine Research, Bergen, Norway (Indo-Norway project).
- c. School of Veterinary Sciences, Oslo, Norway (Indo-Norway project)
- d. University of Kelaniya (Indo Sri Lanka project)
- e. University of Southampton, UK (Indo UK Project recommended)
- f. National University of Singapore, Singapore (Collaborative research)
- g. University of Kaiserslautern, Germany (Collaborative research)

Industry Level:

- a. Poseidon Biotech, Chennai
- b. GPS Biotech, Hyderabad

Awards won:

State Level:

- a. Tamil Nadu Senior Scientist Award – 2016 by Government of Tamil Nadu
- b. Tamil Nadu Scientist Award – 2008 by Government of Tamil Nadu
- c. Young scientist award by Govt. of Tamil Nadu for research work – 1995

National Level:

- a. Tata Innovation Fellowship Award (Only four from Tamilnadu received in last five years – it is highly prestigious award) by DBT, Government of India – 2013.
- b. Fellow of National Academy of Agricultural Sciences (FNAAS) - 2017
- c. Indian Best Fisheries Scientist Award for the year 2005 by Professional Fisheries Graduates Forum, Mumbai
- d. Certificate of Appreciation by Professional Fisheries Graduates Forum, Mumbai, 2003
- e. National Biotechnology Associateship by DBT, Govt. of India - 1996
- f. JRF award by CSIR – 1985
- g. SRF award by ICAR – 1985

Special Assignment:

International Level:

- a. OIE expert designated by World Organization for Animal Health (OIE), Paris (**the only OIE Expert in India**) (www.oie.int) (**Annexure VI**)
Our laboratory has been recognized by OIE as reference laboratory for WTD and myself designated as OIE expert (the only OIE expert in India).
- b. **Chair, Study Group – *Nodaviridae* by International Committee of Taxonomy of Virus (ICTV)**
(<https://talk.ictvonline.org/information/members-606089945/w/members/502/nodaviridae-and-sarothroviridae-study-group>)
- c. Consultant, Kuwait Institute for Scientific Research, Kuwait
- d. Visiting Professor in Institute of Aquaculture, University of Terengganu, Malaysia.
- e. As a consultant to train scientific personnel to detect WTD in prawn in Institute of Aquaculture, Can Tho University, Vietnam
- f. As a reviewer to review the projects submitted under Indo-UK programme in London, UK on request from BBSRC, UK and Govt. of India.
- g. Member in the Editorial Board – Journal of Fish Diseases

National Level:

- a. Task Force Member in Aquaculture and Marine Biotechnology, DBT, Govt. of India, New Delhi.
- b. Member in Expert Group constituted by Ministry of Agriculture, Govt. of India to suggest both short term and long-term measures for creating an appropriate and effective legal and institutional framework for management and control of aquatic animal diseases
- c. Task Force Member in Twining Programme for Northern East Regions – DBT, Govt. of India.
- d. Member in the Expert Committee to establish National Institute of Marine Biology and Biotechnology funded by DBT, Govt. of India.

University Level

- a. Academic council member in DKM College (Autonomous), Vellore
- b. Academic council member in Islamiah College, (Autonomous), Vaniyambadi
- c. Academic council member in C.Abdul Hakeem College, Melvisharam
- d. Member in Board of Studies in Biotechnology, Islamiah College, Vaniyambadi
- e. Member in Board of Studies in Zoology, Auxilium College, Vellore
- f. Member in Board of Studies in Zoology, The New College, Chennai
- g. Member in Board of Studies in Zoology, Thiruvalluvar University, Vellore
- h. Acted resource person, presenter and invited speaker in many colleges and universities in Tamil Nadu, other states and
- i. Chairman, Board of Research Studies, Thiruvalluvar University, Vellore

Conference Participated: (Annexure - VII)

International:	12
National:	20

Consultation and Extension Services

International Level:

1. Our Aquaculture Biotechnology Laboratory has been recognized as OIE Reference Laboratory for WTD of prawn with Dr.Sahul Hameed as OIE Expert by World Organization for Animal Health, Paris to provide consultation and extension services to 172 OIE member countries and territories for diagnosis and other aspects related to white tail disease of prawn (**Our Laboratory is only OIE Reference Lab in India and Dr.Hameed is the only OIE expert in India**).
2. Service rendered to various International Organizations by providing materials and conducting workshop for diagnosis of WTD of prawn.
 - a. Training program conducted in Can Tho University, Vietnam to train scientific staff to diagnose WTD of prawn.
 - b. Helped the faculties of Institute of Tropical Aquaculture, University of Malaysia Terengganu to achieve research and academic excellence.
 - c. Provided research materials and diagnostic reagents developed in our laboratory for diagnosis of WTD of prawn to Philippines, Vietnam, Brunei, Malaysia, Australia, Bangladesh, Brazil, Austria, Canada, Sri Lanka, Singapore, Fiji, Korea etc.
3. Developed a “Disease Card on WTD for “Network of Aquaculture Centres in Asia-Pacific (NACA)” (www.enaca.org), Bangkok, Thailand for global circulation to understand the white tail disease of prawn (2005).
4. Contributed one Chapter on WTD for Manual of Diagnostic Tests for Aquatic Animals (6th Edition in 2009 and 7th Edition in 2012) published by World Organization for Animal Health (OIE), Paris.

National Level:

1. Service is being rendered to various National research Institutes, Universities, private organizations and shrimp/prawn farmers by providing research materials developed in our research lab.
 - a. Central Institute of Freshwater Aquaculture, Bhubaneswar.
 - b. Central Institute of Fisheries Education, Mumbai.
 - c. Central Institute of Brackishwater Aquaculture, Chennai.
 - d. Kerala Fisheries University, Cochin
 - e. Bharathiar University, Coimbatore
 - f. Periyar University, Salem, TN
 - g. Marine Products Export Development Authority, Cochin
 - h. Jawaharlal Nehru University, New Delhi
 - i. Guwahati University, Guwahati, Assam
 - j. Fish and shrimp farmers and hatchery operators
 - k. Central Agricultural Research Institute, Andaman
2. Helped private entrepreneurs to establish PCR diagnostic labs for shrimp along the coastal line of Andhra Pradesh and Tamilnadu.
3. Acting as consultant for Poseidon Biotech, an aquaculture based company for its R & D activities to develop products for aquaculture industry and commercializing the products developed in our laboratory. Also acted as consultant for the SBIRI project funded by DBT, Govt. of India to this company (2008-2009).
4. Prepared a report on WTD of prawn and its impact on prawn culture industry in India in response to the request from the Ministry of Agriculture, Govt. of India in 2009.
5. Prepared a Compendium on the outcomes of DBT-sponsored projects sanctioned under Aquaculture and Marine Biotechnology Taskforce (2004 – 2010) for Department of Biotechnology, Govt. of India (2012).
6. Prepared the comments on different chapters on aquatic animal diseases to be included in the 2012 edition of OIE Manual of Diagnostic Tests for Aquatic Animals in response to the request from the Ministry of Agriculture, Govt. of India.
7. Acting as consultant for GPS Biotech, Hyderabad its R & D activities to develop dsRNA based antiviral drug for WSSV infection in shrimp in collaborative project funded by SBIRI, DBT, Govt. of India (2015-2016).
8. Prepared a Compendium on Fish Cell lines available in India for scientific research based on a request from Department of Biotechnology, Govt. of India (2013).

9. Prepared a Compendium on the outcomes of DBT-sponsored projects sanctioned under Aquaculture and Marine Biotechnology Taskforce (2011 – 2014) for Department of Biotechnology, Govt. of India (2015).

Organizational activities

Institutional Level:

My research works contribute considerably in the development of College. Internationally recognized laboratory in the field of aquatic animal health has been established in C.Abdul Hakeem College and service is being provided to various National and International Organizations for research purpose related to aquatic animal diseases. The laboratory is well equipped with equipments like ultracentrifuge, real time PCR, gradient PCR, fermentor, virology laboratory, cell culture laboratory, animal lab etc. After seeing the facilities in the lab, NAAC in 2005 has recommended to start M.Sc. Biotechnology for the benefit of students in this region and M.Sc. Biotechnology was introduced in 2006. Our research work has contributed significantly to get PG development fund for two times from UGC. Our college has been selected for funding from DST under FIST program for the year 2009. This program was initiated and is being monitored by me as a **Project Coordinator**. Our research laboratory and research work have been appreciated nicely by NAAC Peer Team who visited our College in 2012 for reaccreditation and our College has been reaccredited with Grade 'A' and gave nice report on our Aquaculture Laboratory.

National Level

- a. As a Task Force Member in Department of Biotechnology, Govt. of India, the research projects are being reviewed regularly and recommending for funding. The funded projects are being monitored. Acted as mentor for various research projects submitted to DBT for funding by investigators (**Annexure – IX**).
- b. Responsibility was assigned to me by DBT, Govt. of India to prepare a Compendium regarding the outcome of R&D projects funded by DBT for two times (2010 and 2015). The Compendium was prepared and released recently in 2012 and 2015.
- c. Another responsibility was given to me by DBT, Govt. of India to compile the details of cell lines developed from Indian fish. More than fifty fish cell lines have been developed as the outcome of more than 20 R&D projects funded by DBT and this compilation would help the scientific community working in the field of fish virology, ecotoxicology and gene manipulation studies. A compilation on fish cell lines was and released in 2013.
- d. A National level program on surveillance of aquatic animal diseases has been initiated by OASTC – MoES, Andhra University and I have been assigned as Team Leader for this program.
- e. As OIE Expert, the comments on the Chapters of OIE Manual of Diagnostic Tests for Aquatic Animals – 2012 were prepared in response to the request from the Ministry of Agriculture, Govt. of India.
- f. Acted as a member in the Expert Committee to prepare DPR and EFC to establish National Institute of Marine Biology and Biotechnology (DBT, Government of India funded).

International Level

As an OIE Expert, I am responsible to help 172 OIE member countries for diagnosing white tail disease of prawn, providing positive samples and diagnostic reagents, and training the personnel. Research consultancy in this regard has been provided to many countries and being provided regularly.

Regular annual report regarding the international activities related to WTD globally is being prepared and submitted to OIE, Paris.

Official Overseas Visits:

1. National Institute of Veterinary Sciences, Oslo and Institute of Marine Research, Bergen, Norway (14.3.2007 to 17.03.2007) for preparing collaborating research projects funded by Indian and Norwegian Governments. (DBT from Indian side).
2. University of Montpellier, France (21.05.2007 to 21.06.2007) to carry out research work under collaborative research project funded by Indo French Center for Promotion of Advanced Research (IFCPAR).
3. Southeast Asian Fisheries Development Center (*SEAFDEC*), Bangkok (04.12.2007 to 09.12.2007) as an invited speaker.
4. Department of Aquaculture, Can Tho University, Can Tho city, Vietnam (03.03.2008 to 07.03.08) to train the scientists for detection of viral disease in prawn.
5. TLL, National University of Singapore, (8.03.2008 to 09.03.2008) for collaborative research work on WSSV of shrimp.
6. University of Montpellier, France (09.05.2008 to 07.06.2008) to carry out research work under collaborative research project funded by Indo French Center for Promotion of Advanced Research (IFCPAR).
7. University of Montpellier, France (27.04.2009 to 12.05.2009) to carry out research work under collaborative research project funded by Indo French Center for Promotion of Advanced Research (IFCPAR).
8. Institute of Aquaculture, University of Terengganu, Malaysia (24.10.2009 to 06.11.2009) as a visiting professor to help the faculty of the university.
9. Strasbourg, France to present the final report of IFCPAR-sponsored project in May, 2010.
10. Paris, France to attend the OIE expert meeting in June, 2010.

11. Oslo and Bergen, Norway for project meeting in September, 2010.
12. Oslo and Tromso for project review meeting in 6th – 9th June, 2011
13. Visited Saudi Arabia to attend project meeting held in King Abdulla University in May, 2013
14. Visited UK to review the projects submitted under Indo-UK programme.
15. Visited University of Kelaniya, Sri Lanka in January, 2014
16. Visited South Korea to attend OIE meeting in October, 2014

Achievements made:

1. White spot syndrome virus (WSSV) of shrimp was isolated for the first time in India by our team (Sahul Hameed et al., 1998). (Annual loss about Rs.1200 crores due to this virus in India)
2. Occurrence of white tail disease of prawn was reported for the first time in India by our team (Sahul Hameed et al., 2004).
3. Developed India's first marine fish cell line in our laboratory and subsequently developed thirty-three fish cell lines for scientific research (Sahul Hameed et al., 2006).
4. Transferred two technologies to aquaculture based company for commercialization (Dr.Sahul's PCR kit for shrimp viruses and Herbal Immunostimulant – Immuzone for shrimp).
5. Generated nearly Rs. 14 crores from different funding agencies for our research work and completed 30 major research projects for the past 15 years.
6. Published more than 120 International publications in SCI Journals with total impact factor of 205 and 3684 citations with h-index 37 and i10 index 74.
7. OIE recognition for our Biotechnology Laboratory (the only OIE Reference Laboratory in India) and Dr.Sahul Hameed is the only OIE designated Expert in India by World Organization for Animal Health, Paris.

8. Dr.Sahul Hameed is the only Indian contributor in the Manual of Diagnostic Tests for Aquatic Animals (6th Edition in 2009 and 7th Edition in 2012) published by World Organization for Animal Health (OIE), Paris.

9. Having National and International research collaborations and providing research materials to various National and International Organizations for scientific research.

Annexure I

List of Publications

1. **Sahul Hameed, A.S.** 1993. A study of the aerobic heterotrophic bacterial flora of hatchery-reared eggs, larvae and post-larvae of *Penaeus indicus*. *Aquaculture*, 117 (3/4): 195-204 (IF: 2.044) (No. of Citations: 35)
2. **Sahul Hameed, A.S.** and Rao, P.V. 1994. Studies on the chemical control of a *Vibrio campbellii* – like bacterium affecting hatchery-reared *Penaeus indicus* larvae. *Aquaculture*, 127 (1): 1-9. (IF: 2.044) (No. of Citations: 19)
3. **Sahul Hameed, A.S.** 1994. Reduction in *Chaetoceros* population growth by anti-microbials. *Asian Fishery Sciences*, 7: 273-275.
4. **Sahul Hameed, A.S.** 1994. Experimental transmission and histopathology of brown spot disease in shrimp (*Penaeus indicus*) and lobster (*Panulirus Indicus*). *Journal of Aquaculture in Tropics*, 9, 311-322. (IF: 0.6) (No. of Citations: 14)
5. **Sahul Hameed, A.S.** 1995. Susceptibility of three *Penaeus* species to *Vibrio campbellii* – like bacterium. *Journal of World Aquaculture Society*, 26: 315-319. (IF:0.839) (No. of Citations: 32)
6. **Sahul Hameed, A.S.** 1995. Mortality of larvae of *Penaeus indicus* due to infestation of *Nitzschia closterium* in a hatchery. *Journal of Aquaculture in Tropics*, 10: 337-342. (IF: 0.6)
7. **Sahul Hameed, A.S.,** Rao, P.V., Farmer, J.J., Hickman-Brenner F.W., and Fanning, G.R. 1996. Characteristics and pathogenicity of a *Vibrio campbellii* – like bacterium affecting hatchery-reared *Penaeus indicus* (Milne Edwards, 1837) larvae. *Aquaculture Research*, 27: 853-863. (IF: 1.186) (No. of Citations: 18)
8. **Sahul Hameed, A.S.** 1996. Mortalities in protozoae and mysis of *Penaeus indicus* and *P. semisulcatus* by *Leptomonas*-like parasite in the hatcheries. *Indian Journal of Fisheries*, 43(4): 389-391.
9. **Sahul Hameed, A.S.** 1997. Quality of eggs produced from wild and captive spawners of *Penaeus indicus* H.Milne Edwards and their bacterial load. *Aquaculture Research*, 28: 301-303. (IF: 1.186) (No. of Citations: 1)
10. **Sahul Hameed, A.S.,** Anilkumar, M., Stephen Raj, M.L., Kunthala Jayaraman., 1998. Studies on the pathogenicity of systemic ectodermal and mesodermal baculovirus and its detection in shrimp by immunological methods. *Aquaculture* 160, 31-45. (IF: 2.044) (No. of Citations: 116)
11. **Sahul Hameed, A.S** and Balasubramanian, G. 2000. Antibiotic resistance in bacteria isolated from *Artemia* nauplii and efficacy of formaldehyde to control bacterial load, *Aquaculture*, 183, 195-205. (IF: 2.044) (No. of Citations: 70)
12. **Sahul Hameed, A.S.,** Xavier Charles, M and Anilkumar, M. 2000. Tolerance of *Macrobrachium rosenbergii* to white spot syndrome virus. *Aquaculture*, 183:207- 213. (IF: 2.044) (No. of Citations: 94)

13. Yoganandhan, K., **Sahul Hameed, A.S.** 2000. Evaluation of red gram, *Cjanus cajan*, and black gram, *Vigna mungo*, husks as food for brine shrimp *Artemia* sp., culture. ***Journal Applied Aquaculture***, 10(2):79-85. (No. of Citations: 3)
14. **Sahul Hameed, A.S.**, Yoganandhan, K., Sathish, S., Murugan, V., Rasheed, M., Kunthala Jayaraman. 2001. White spot syndrome virus (WSSV) in two species of freshwater crabs (*Paratelphusa hydrodomous* and *P. 12ndian1212e*), ***Aquaculture*** 201, 179-186. (IF: 2.044) (No. of Citations: 80)
15. **Sahul Hameed, A.S.**, Murthi B.L.M., Rasheed, M., Sathish, S., Yoganandhan, K., Murugan, V., Kunthala Jayaraman. 2002. An investigation of *Artemia* as a possible vector for white spot syndrome virus (WSSV) transmission to *Penaeus indicus*. ***Aquaculture*** 204, 1-10. (IF: 2.044) (No. of Citations: 45)
16. Yoganandhan, K., Thirupathi, S., **Sahul Hameed, A.S.** 2003. Biochemical, physiological and hematological changes in white spot syndrome virus (WSSV) – infected shrimp, *Penaeus indicus*, ***Aquaculture*** 221, 1-11. (IF: 2.044) (No. of Citations: 57)
17. Yoganandhan, K., Murugan, V., Sathish, S., **Sahul Hameed, A.S.** 2003. Screening the organs for early detection of white spot syndrome virus in penaeid shrimp by histopathology and PCR techniques, ***Aquaculture***. 215, 21-29. (IF: 2.044) (No. of Citations: 43)
18. **Sahul Hameed, A.S.**, Rahuman, M.H., Alagan, A., Yoganandhan, K. 2003. Antibiotic resistance in bacteria isolated from hatchery-reared larvae and post-larvae of *Macrobrachium rosenbergii*, ***Aquaculture***.217, 39-48. (IF: 2.044) (No. of Citations: 55)
19. Yoganandhan, K., Narayanan, R.B., **Sahul Hameed, A.S.** 2003. Larvae and early post-larvae of *Penaeus monodon* (Fabricius) experimentally infected with white spot syndrome virus (WSSV) show no significant mortality. ***Journal of Fish Diseases***.26 (7): 385-391. (IF: 1.603) (No. of Citations: 10)
20. Yoganandhan, K., Sathish, S., Narayanan, R.B., **Sahul Hameed, A.S.** 2003. A rapid non-enzymatic method of DNA extraction for PCR detection of white spot syndrome virus in shrimp. ***Aquaculture Research***, 34, 1093-1097. (IF: 1.186) (No. of Citations: 2)
21. **Sahul Hameed, A.S.**, Balasubramanian, G., Syed Musthaq, S., Yoganandhan, K. 2003 Experimental infection of twenty species of Indian marine crabs with white spot syndrome virus (WSSV) ***Diseases of Aquatic Organisms***, 57, 157-161. (IF: 1.572) (No. of Citations: 91)
22. **Sahul Hameed, A.S.**, Yoganandhan, K., Sri Widada, J., Bonami, J.R. 2004. Studies on the occurrence and of *Macrobrachium rosenbergii* nodavirus and extra small virus-like particles associated with white tail disease of *Macrobrachium rosenbergii* in India RT-PCR detection. ***Aquaculture***, 238, 127-133. (IF: 2.044) (No. of Citations: 78)
23. Yoganandhan, K., Syed Musthaq, S., and **Sahul Hameed, A.S.** 2004. Production of polyclonal antiserum against recombinant VP28 protein and its application for the white spot syndrome virus in crustaceans. ***Journal of Fish Diseases***, 27: 517-522. (IF: 1.603) (No. of Citations: 20)

24. Sathish, S., Selvakkumar, C. **Sahul Hameed, A.S.**, Narayanan, R.B. 2004a. 18-kDa protein as a marker to detect WSSV infection in shrimps. *Aquaculture*, 238, 39–50. (IF: 2.044) (No. of Citations: 18)
25. Sathish, S., Syed Musthaq, S., **Sahul Hameed, A.S.**, Narayanan, R.B. 2004b. Production of recombinant structural proteins from the Indian WSSV isolate. *Aquaculture*, 242: 69-80. (IF: 2.044) (No. of Citations: 6)
26. **Sahul Hameed, A.S.**, Yoganandhan, K., Sri Widada, J., Bonami, J.R. 2004. Experimental transmission and tissue tropism of *Macrobrachium rosenbergii* nodavirus (MrNV) and its associated extra small virus (XSV). *Diseases of Aquatic Organisms*, 62: 191-196. (IF: 1.572) (No. of Citations: 44)
27. Yoganandhan, K., Sri Widada, J., Bonami, J.R. and **Sahul Hameed, A.S.** 2005. Simultaneous detection of *Macrobrachium rosenbergii* nodavirus and extra small virus by a single tube, one-step multiplex RT-PCR assay. *Journal of Fish Diseases*, 28, 65-69. (IF: 1.603) (No. of Citations: 14)
28. **Sahul Hameed, A.S.** 2005. White Tail Disease – disease card. Developed to support the NACA/FAO/OIE regional quarterly aquatic animal disease (QAAD) reporting system in the Asia-Pacific. *NACA, Bangkok, Thailand*. 7 pp.
29. **Sahul Hameed, A.S.**, Parameswaran, V., Syed Musthaq, S., Sudhakaran, R., Balasubramanian, G and Yoganandhan, K. 2005. A simple PCR procedure to detect white spot syndrome virus (WSSV) of shrimp, *Penaeus monodon* (Fabricious). *Aquaculture International*, 13: 441-450. (IF: 0.88) (No. of Citations: 15)
30. Yoganandhan, K, Syed Mustaq, S, Sudhakaran, R and **Sahul Hameed, A.S.** 2006. Temporal analysis of VP28 gene of Indian white spot syndrome virus isolate (WSSV) in different crustacean hosts. *Aquaculture*, 253, 71-81. (IF: 2.044) (No. of Citations: 12)
31. Syed Musthaq, S., Yoganandhan, K., Sudhakaran, R. Rajesh Kumar. S and **Sahul Hameed, A.S.** 2006. Neutralization of white spot syndrome virus of shrimp by antiserum raised against recombinant VP28. *Aquaculture*, 253, 98-104. (IF: 2.044) (No. of Citations: 33)
32. Syed Musthaq, S., Sudhakaran, R., Ishaq Ahmed, V.P., Balasubramanian, G., **Sahul Hameed, A.S.** 2006. Variability in the tandem repetitive DNA sequences of white spot syndrome virus (WSSV) genome and suitability of VP28 gene to detect different isolates of WSSV from India. *Aquaculture*, 256, 34-41. (IF: 2.044) (No. of Citations: 21)
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Annexure II

List of Research Projects:

Sl No	Sponsors name	Project title	Amount Sanctioned	Period of Project	Year of completion
1.	UGC	Studies on inactivation of WSSV by physical and chemical agents, and plants	4.37 lakhs	2000-2004	Completed (2004)
2.	DOD	Rapid survey of prevalence and geographic distribution of WSSV	12.45 lakhs	2002-2005	Completed (2005)
3.	DBT	Development of cell lines of Sea bass (<i>Lates calcarifer</i>)	19.03 lakhs	2003-2006	Completed (2006)
4.	DBT	Confirmed anti-wssv compound from an Indian plant (identification, development of anti-wssv formulation and technology transfer)	5.208 lakhs	2004-2005	Completed

					(2005) & Technology Transferred
5.	ICAR	Studies on White Tail Disease in <i>Macrobrachium rosenbergii</i> (Disease diagnosis and Control)	13.73 lakhs	2003-2006	Completed (2006)
6.	Indo-French (IFCPAR)	Studies on Viruses(MrNV/XSV and WSSV) Pathogenic to <i>Macrobrachium rosenbergii</i> in India (International Project with France)	85 Lakhs	2006-2009	Completed (2009)
7.	DBT	Development and characterization of cell lines from grouper (<i>Epinephelus tauvina</i>), carp and catfish.	35.8 Lakhs	2006-2009	Completed (2009)
8.	UGC	Cloning and expression of <i>Vibrio anguillarum</i> outer membrane porin for the development of recombinant and DNA vaccine, and their efficacy in the field	5.7 Lakhs	2007-2010	Completed (2010)
9.	MoES	A viral survey of marine fishes (<i>Lates calcarifer</i> and <i>Epinephelus</i>) along the costal line of India using our established sea bass cell lines.	16.69 Lakhs	2007-2010	Completed (2010)
10.	DBT	Development & Characterization of cell lines from <i>Etroplus</i> for Virology & toxicological application.	37.16 Lakhs	2007-2010	Completed (2010)
11.	DBT	Characterization and development of diagnostics for viral nervous necrosis in seabass (<i>Lates calarifer</i>) and mullet (<i>Mugil cephalus</i>).	10.72 Lakhs	2007-2010	Completed (2010)
12.	DBT	Development of antiviral therapy using double stranded RNA (dsRNA) against Shrimp Viruses,WSSV,MBV and HPV.	27 Lakhs	2008-2011	Completed (2011)
13.	DBT	Application of established fish cell lines for evaluating the toxicity of industrial effluents.	12 Lakhs	2007-2010	Completed (2010)
14.	DBT	Development of <i>in vitro</i> system from <i>Penaeus indicus</i> and freshwater crab, <i>Paratelphusa hydrodomous</i> for WSSV replication, pathogenesis and quantification.	29.3 Lakhs	2009-2011	Completed (2011)
15.	DST	Potential use of Nanoparticles for DNA vaccine delivery in fish model to control bacterial and viral disease.	24.4 Lakhs	2008-2011	Completed (2011)
16.	Indo-Norwegian	Indo Norwegian platform of fish and shellfish vaccine development. Sub – Development of viral vaccines against nodavirus and IPNV (International Project with Norway)	59.76 Lakhs	2009-2013	Completed (2013)
17.	DBT	Characterization and maintenance of cell lines of fish and crab	9.78 lakhs	2012-2014	Completed (2014)
18.	UGC	Development of vaccines against <i>Aeromonas caviae</i>	9.43 lakhs	2012-2015	Ongoing
19.	DBT	Antimicrobial and Immunstimulatory Activities of Actinomycetes for Aquatic Animal Health Management	43.8 lakhs	2012-2015	Completed

20.	DBT	Development of white spot syndrome virus free brooders for seed production: using indigenous shrimp, <i>Penaeus indicus</i> as a model	42 lakhs	2013-2016	Ongoing
21.	DST	Potential use of biodegradable nanoparticles to deliver recombinant protein vaccine in shrimp to control WSSV (Indo-Sri Lanka collaborative project)	22.17 lakhs	2013-2016	Completed
22.	DBT	Tata Innovation Fellowship - project on immune genes of shrimp	27 + 18 lakhs	2013-2016	Completed
23.	ICAR – NFDB	National Surveillance Programme for Aquatic Animal Diseases – Tamilnadu State (Selected Districts)	80 lakhs	2013-2019	Ongoing
24.	DBT	Development of field level nanoparticles based immunodiagnostics for viral pathogens of shrimp and prawn	50 lakhs	2015-19	Completed
25.	SIBIRI-BIRAC	Control of WSSV using nano formulated dsRNA	25 lakhs	2014 – 16	Completed
26.	DBT	Herbal immunostimulant formulated feed to protect shrimp from WSSV infection	32 lakhs	2015 – 2019	Completed
27.	Indo-UK	Poverty alleviation through prevention and future control of the two major socio-economically important pathogens in Asian aquaculture	199 lakhs	2016 – 2019	Completed
28.	DBT	National Repository of Fish Cell Lines in NBFGR (Phase II) and access center in C.Abdul Hakeem College and research on application of cell lines virology, toxicology and gene expression studies	133 lakhs	2017-2020	Completed
29.	DBT	Molecular screening, cell culture-based isolation characterization of finfish and shellfish viruses establishment of National Repository	91 lakhs	2017-2020	Completed
30	DBT	Development of diagnostics and preventive measure for suspected fish viral diseases encountered in Assam	58 lakhs	2018-2021	Completed
31	DBT	Development of fish nodavirus vaccine and its delivery	65 lakhs	2018-2021	Ongoing
32	DBT	Development of fish viral vaccines	60 lakhs	2021-24	Ongoing
33	DBT	Application of Fish Cell lines in toxicology and gene expression studies	3.29 crores	2021-24	Ongoing
34	ICMR	Burden of scrub typhus infection and identification of chigger mite vectors transmitting the disease in Kerala, South India	30 lakhs	2022-2025	Ongoing

Total cost of the projects: Rs. 20.06 crores

List of Ph.D. candidates produced:**Annexure III**

S. No.	Name of Candidates	Title of Thesis	Date of Award	University in which awarded
1.	Dr. K. Yoganandhan	Development of Molecular Diagnostic Approaches to Identify White Spot Syndrome In Marine Shrimp and White Tail Diseases in Freshwater Prawn	09/01/2006	University of Madras
2.	Dr. G. Balasubramanian	Studies of the inactivation of White Spot Syndrome Virus of shrimp by physical and chemical agents and antiviral plants.	13/11/2006	University of Madras
3.	Dr. V. Parameswaran	Establishment and Characterization of Cell lines from Sea bass (<i>Lates calcarifer</i>)	04/07/2007	Thiruvalluvar University
4.	Dr. R. Sudhakaran	Studies on white tail disease (wtd) caused by <i>Macrobrachium rosenbergii</i> Nodavirus (<i>MrNV</i>) and extra small virus (XSV) in <i>Macrobrachium rosenbergii</i> (a molecular biology approach)	09/08/2007	Thiruvalluvar University

5.	Dr. S. Syed Musthaq	Genetic variations in 28ndian isolates of White Spot Syndrome Virus (WSSV) and development of recombinant vaccine against WSSV in shrimp	28/12/2007	Thiruvalluvar University
6.	Dr. S. Rajesh Kumar	Development and Efficacy of DNA vaccine against fish bacterial pathogen (<i>Vibrio anguillarum</i>) and shrimp viral pathogen (White Spot Syndrome Virus)	10/07/2008	Thiruvalluvar University
7.	Dr. M. Sarathi	Silencing the genes of White Spot Syndrome Virus (WSSV) by RNA interference and shrimp immune response against WSSV	14/08/2008	Thiruvalluvar University
8.	Dr. V.P. Ishaq Ahmed	Development and Characterization of fish Cell Lines for Virological, Toxicological and Gene Expression studies	18/08/2008	Thiruvalluvar University
9.	Dr. C. Venkatesan	Development of an Alternate Technology to neutralize the venom of 28ndian cobra, <i>Naja naja</i>	22/04/2010	Thiruvalluvar University
10.	Dr. M.Ravi	Studies on <i>Macrobrachium rosenbergii</i> nodavirus (<i>MrNV</i>) and extra small virus (XSV) of <i>macrobrachium rosenbergii</i> (surveillance, structure, cloning, expression of capsid protein gene and molecular pathobiology)	01/11/2010	Thiruvalluvar University
11.	Dr. A. Nazeer Basha	Studies on Appendages Deformity Syndrome (ADS) of farm reared <i>Macrobrachium rosenbergii</i>	10/02/2011	Thiruvalluvar University
12.	Dr. John Thomas	Studies on Ulcerative disease in 28ndian walking catfish <i>Clarias batrachus</i> (Identification Of Causative Organism, Pathology And Control Measures)	02/03/2011	Thiruvalluvar University
13.	Dr. V. Sarath Babu	Application of Fish Cell Lines for Nodaviral Propagation and Development of Diagnostics and Vaccine	01/08/2011	Thiruvalluvar University
14.	Dr. G. Taju	Application of Fish Cell Lines for Toxicological Studies: An Alternative to Fish	29/08/2012	Thiruvalluvar University
15.	Dr.N.Sunder Raj	Development of an <i>in vitro</i> model for replication of white spot syndrome virus (WSSV) of shrimp and immune gene expression in shrimp	10/04/2013	Thiruvalluvar University
16.	Dr.N.Madan	Study on <i>Penaeus monodon</i> densovirus (<i>PmDENV</i>) of shrimp	03/09/2014	Thiruvalluvar University
17.	Dr.S.Vimal	Development and protective efficacy of recombinant and DNA vaccines against fish nodavirus	10/12/2014	Thiruvalluvar University
18.	Dr.Farook	Development of antibody based diagnostics and immunostimulant for white tail disease of giant freshwater prawn, <i>Macrobrachium rosenbergii</i> (De Man 1879)	16/06/2015	Thiruvalluvar University
19.	Dr.K.S.Nathiga Nambi	Development and application of zebrafish (<i>Danio rerio</i> , Hamilton 1822) cell lines for toxicology, wound healing and <i>in vivo</i> transplantation	12/03/2015	Thiruvalluvar University
20.	Dr.S.Abdul Majeed	Development, characterization and application of cell lines from <i>Channa striatus</i> (Bloch 1793)	16/06/2015	Thiruvalluvar University
21.	Dr.T.Rajkumar	Antiviral, Antibacterial and Immunomodulatory activities of Bioactive Compounds from Actinomycetes for Aquatic Animal Health Management	29/10/2018	Thiruvalluvar University
22.	S.Sivakumar	Studies on new strain of WSSV in Indian shrimp culture system	2021	Thiruvalluvar University
23.	S.Santosh Kumar	Studies on IMNV and EHP of shrimp	2021	Thiruvalluvar University
24.	S.Tamizhvanan	Mechanism of resistance against WSSV in <i>Macrobrachium rosenbergii</i>	2021	Thiruvalluvar University