



Dr. Basanta Kumar Das

Principal Scientist

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Department	Fish Health Management Division
Institute/University	Central Institute of Freshwater Aquaculture (Indian Council of Agricultural Research)
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Tel	2465 421 (0674)
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Date of Birth	20 th March 1966 (Age 45 years)
Sex	Male

Academic Record: M.F.Sc.; Ph.D. (Aquaculture) and Post. Doc. (U.K.)

Academic Qualifications

Exam/ Degree/ Diploma	Institute/ Board/ University	Year	Subject(s) with major field	Class/ Grade/ Division/ %marks	Rank/ Medal/ Award, if any
HS	Utkal University	1984	Physics, Chemistry, Math, Biology	1 st , 68%	Merit Scholarship
Graduation	O.U.A.T.	1988	Fisheries, Aquaculture	1 st , 80%	Honours (ICAR- HRD Fellowship)

Masters	O.U.A.T.	1991	Aquaculture	1 st , 84%	First class first/ Gold Medallist (JRF-ICAR)
Ph. D	O.U.A.T	1998	Aquaculture	8.18	SRF(ICAR)
Post-Doc	FRS Marine Lab, Aberden, Scotland, UK	2006	Molecular Immunology	Nov. 2005- Nov. 2006	One Year
Other	Not Applicable				

Professional experiences

Organization/ position	Institution & Place of posting	Period	
		From	To
ICAR/ Scientist	Aquatic Animal Health Division, CIFA	July 1994	July 1998
ICAR/Scientist (Sr. Scale)	Aquatic Animal Health Division	July 1998	July 2003
ICAR/ Sr. Scientist	Fish Health Management Division, CIFA	July 2003	till date

Brief summary of current areas of Research

(i)	Research Experience	
	(a) Years of Research Experience	17 years
	(b) General Research interests	Fish Health Management, Microbial Molecular genetics, Fish cytokine genes, Drug delivery system, Development of medicines from herbs and plankton, Application of nanobiosensor in fisheries and aquaculture
	(c) Present research interests (Please attach additional sheets if required)	<ol style="list-style-type: none"> 1. DNA fingerprinting of fish microbial pathogens with special reference to bacterial pathogens 2. Molecular epidemiological study of various fish diseases

		<ol style="list-style-type: none"> 3. Anti-viral gene expression studies of carps 4. Development of protein markers for bacterial diseases of fishes 5. Design and development of medicines against ornamental fish diseases 6. Development of Immunostimulants and bioactive compounds from algae and plant derivatives
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Publications	<ol style="list-style-type: none"> (i) Research 80 (ii) Book chapter 05 (iii) Seminar/ symposia 18 (iv) Popular articles 14 (v) Books/ Bulletin/ Report 03 (vi) Training Manual 16
Students' Guidance	Master of Science: 12 Ph.D. : 05

Honours/Awards/ Professional recognitions such as Fellowships of Academies and societies

a.	National Level	<ul style="list-style-type: none"> ❑ Awarded Gold medal for outstanding Field Experience Training (FET). Team activities for Group dynamics at National Academy of Agriculture and Research management, Hyderabad in January, 1995. ❑ Jawaharlal Nehru Award for outstanding post graduate research for the year 1999 conferred by ICAR ❑ Dr. Hiralal Chaudhuri Annual Awards 2001-2002, Best Young Scientist for his contribution to the Fish Pathology. ❑ Lal Bahadur Shastri Young Scientist Award conferred by ICAR for the biennium 1999-2000 ❑ Krushakbandhu Award by Orissa Krushak Samaj on World Food Day for outstanding research on fish disease control for the farmers. October, 2011 ❑ Dr. M.S. Swaminathan Award for Best Indian Fisheries Scientist-2011 by Professional Fisheries Graduates Forum
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		<ol style="list-style-type: none"> 1. Rank First in M.F.Sc. (Aquaculture) and Awarded Gold Medal by the Orissa University of Agriculture and Technology in 1995. 2. Awarded Junior Research Fellowship under CAS/ UNDP during M.F.Sc. (Aquaculture) in Oct. 1989 3. Awarded Senior Research Fellowship (ICAR) for Ph.D.(Aquaculture) study 4. Awarded ICAR merit cum Mean Scholarship for B.F.Sc. in august, 1984 5. Awarded ICAR (HRDP) scholarship in 2nd, 3rd, and 4th year B.F.Sc in August 1985 6. Selected for ICAR (JRF) in Fishery Technology under 1988-1989 programme in January, 1988
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Research Publications

i.	International publications	<ol style="list-style-type: none"> 45. Das B.K., Pradhan J., Sahu S., Marhual N.P., Mishra B.K. & Eknath A.E. 2012. <i>Microcystis aeruginosa</i> (Kütz) incorporated diets increase immunity and survival of Indian major carp <i>Labeo rohita</i> (Ham.) against <i>Aeromonas hydrophila</i> infection. <i>Aquaculture Research</i>. 1-10. (accepted) 44. Marhual N.P., Das B.K., Pradhan J., Swain P., Mishra B. K. and Eknath A. E. 2011 RAPD-PCR and Outer membrane Protein Characterization of <i>Vibrio alginolyticus</i> and <i>Vibrio parahaemolyticus</i> isolated from diseased shrimp <i>Penaeus monodon</i> to <i>The Israeli Journal of Aquaculture- Bamidgeh</i> 43. Pradhan J., Das B.K., Sahu S, Marhual N.P., Swain A. K., Mishra B.K. and Eknath A.E. 2011. Traditional antibacterials of freshwater microalga <i>Spirulina platensis</i> to aquatic pathogens. <i>Aquaculture Research</i>. 1-9. (accepted) 42. Das B.K., Tlili C., Badhulika S., Cella L. N., Chen W., Mulchandani A. 2011 Single-walled carbon nanotubes chemiresistor aptasensor for small molecules: Picomolar level detection of adenosine triphosphatase. <i>Chem. Commun.</i>, DOI: 10.1039/C0CC04733C 41. Rajesh, Das B.K., Srinives S., 1 and Mulchandani A. 2011 ZnS nanocrystals decorated single-walled carbon nanotube (SWNT) based chemiresistive label-free DNA Sensor. <i>Applied Physics Letters</i> 40. Behera T., Nanda P.K., Mohanty C., Mohapatra D., Swain P., Das B.K., Routray P., Mishra B.K., and Sahoo S.K. 2010 Parental
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- immunization of fish, *Labeo rohita* with Poly D, L-lactide-co-glycolic acid (PLGA) microparticle encapsulated antigen stimulates both acquired and innate immune parameters through parenteral immunization in fish. *Fish and shellfish immunology*, 28:320-325.
39. Swain P., Behera T., Mohapatra D., Nanda P. K., Nayak S. K., Meher P. K., and **Das B. K.** 2010 Derivation of rough attenuated variants from smooth virulent *Aeromonas hydrophila* and their immunogenicity in fish. *Vaccine*, 28:4626-4631.
38. Marhual N.P., **Das B.K.**, Sadique M, Swain A. K., Mishra B. K., Maiti N. K. and Eknath A. E. 2010 Molecular identification and typing of *Vibrio alginolyticus* and *Vibrio parahaemolyticus* strains isolated from black tiger shrimp *Penaeus monodon*. *Journal of Aquaculture in Tropics*.25, 25-33.
37. **Das, B.K.**, Pradhan, J. and Sahu, S. 2009 The effect of *Euglena viridis* on immune response of rohu, *Labeo rohita* (Ham.). *Fish and Shellfish Immunology*. 26: 871-6.
36. Marhual N.P. and **Das B.K.** 2009 Use of Random Amplified Polymorphic DNA (RAPD) and Restriction fragment length polymorphism (RFLP) for typing of *Vibrio alginolyticus* isolated from Black tiger shrimp *Penaeus monodon*. *Journal of Pure and applied Microbiology* 3:75-82.
35. **Das B.K.**, Debnath C., Patnaik P., Swain D.K., Kumar K., Mishra B.K. 2009 Effect of b-glucan on immunity and survival of early stage of *Anabas testudineus* (Bloch). *Fish and Shellfish Immunology*, 27:678-683.
34. **Das, B. K.**, Collet, B., and Ellis, A.E. 2009 Induction and persistence of Mx protein in tissues, blood and plasma of Atlantic salmon parr, *Salmo salar*, injected with poly I:C. *Fish & Shellfish Immunology*, 26:40-48.
33. Misra, C. K., **Das, B. K.**, Mukherjee, S. C. 2009 Immune response, growth and survival of *Labeo rohita* fingerlings fed with levamisole supplemented diets for longer duration. *Aquaculture Nutrition*, 15:356-365.
32. Dash, S. S., **Das, B. K.**, Pattnaik, P., Samal, S. K., Sahu, S. and Ghosh, S., 2009. Biochemical and serological characterization of *Flavobacterium columnare* from freshwater fishes of Eastern India. *Journal of World Aquaculture Society*, 40(2):236-247.
31. Sahu, S., **Das, B. K.**, Mishra, B. K., Pradhan, J. and Sarangi. N. 2008. Effect of dietary *Curcuma longa* on enzymatic and immunological profiles of rohu, *Labeo rohita* (Ham.), infected with *Aeromonas*

- hydrophila*. *Aquaculture Research*. 39: 1720-1730.
30. Khuntia, C.P., **Das, B.K.**, Samantaray, B.R., Samal, S.K., Mishra, B.K. 2008. Characterization and pathogenicity studies of *Vibrio parahaemolyticus* isolated from diseased freshwater prawn, *Macrobrachium rosenbergii* (de man). *Aquaculture Research*, 39. 301-310.
 29. Samal S.K., Samantaray B.R. and **Das B.K.** 2008 Genetic analysis of *Aeromonas hydrophila* MTCC 646 by random amplified polymorphic DNA. *Journal of Pure and Applied Microbiology*, 2: 239-244.
 28. **Das, B.K.**, Nayak, K.K. Fourier, M., Collet, B., Snow, M. and Ellis, A.E., 2007 Expression of Mx protein in tissues of Atlantic salmon post-smolts- An immunohistochemical study. *Fish & Shellfish Immunology*, 23:1209-1217.
 27. **Das, B.K.**, Collet, B., Snow, M. and Ellis, A.E., 2007. Expression of kinetics of ISG15 and viral major capsid protein (VP2) in atlantic cod (*Gadus morhua* L.) fry following infection with infectious pancreatic necrosis virus (IPNV). *Fish & Shellfish Immunology*, 23:825-830.
 26. **Das, B. K.**, Collet, B., Snow, M. and Ellis, A.E., 2007. Expression of Interferon types I and II, Mx and γ IP genes in the kidney of Atlantic salmon, *Salmo salar*, is induced during smolting. *Fish & Shellfish Immunology*, 23:514-520.
 25. Sahu, S., **Das, B. K.**, Mishra, B. K., Pradhan, J. and Sarangi. N. 2007. Effect of *Allium sativum* on the immunity and survival of *Labeo rohita* infected with *Aeromonas hydrophila*. *Journal of Applied Ichthyology*, 23(1): 80-86.
 24. Sahu, S., **Das, B. K.**, Pradhan, J., Mohapatra, B. C., Mishra B. K. and Sarangi N. 2007 Effect of *Magnifera indica* kernel as a feed additive on immunity and resistance to *Aeromonas hydrophila* in *Labeo rohita* fingerlings. *Fish & Shellfish Immunology*, 23:109-118.
 23. Misra, C.K., **Das, B. K.**, Mukherjee, S.C. and Pradhan, J. 2007. Effects of dietary vitamin C on immunity, growth and survival of Indian major carp *Labeo rohita*, fingerlings. *Aquaculture Nutrition*, 13 (1): 35-44.
 22. **Das, B. K.**, Samal, S. K., Samantaray, B. R., Sethi, S., Pattnaik P., and Mishra, B. K. 2006. Antagonistic activity of cellular components of *Pseudomonas* species against *Aeromonas hydrophila*. *Aquaculture*, 253(1-4): 17-24.
 21. Misra, C. K., **Das, B. K.**, Mukherjee, S. C. and Pattnaik, P. 2006 Effect of multiple injections of β -glucan on non-specific immune

- response and disease resistance in *Labeo rohita* fingerlings. *Fish & Shellfish Immunology*, 20(3): 305-319.
20. Misra, C. K., **Das, B. K.**, Mukherjee, S. C. and Pattnaik, P. 2006. Effect of long term administration of dietary β -glucan on immunity, growth and survival of *Labeo rohita* fingerlings. *Aquaculture*, 255 (1-4): 82-94.
 19. Rao, Y. V., **Das, B.K.**, Pradhan J. and Chakrabarti, R. 2006. Effect of *Achyranthes aspera* on the immunity and survival of *Labeo rohita* infected with *Aeromonas hydrophila*. *Fish & Shellfish Immunology*, 20 (3): 263-273.
 18. Misra, C. K., **Das, B. K.**, Mukherjee, S. C. and Meher, P. K. 2006. The immunomodulatory effects of tuftsin on the non-specific immune system of Indian Major carp, *Labeo rohita*. *Fish & Shellfish Immunology*, 20(5): 728-738.
 17. Sethi, S., Mukherjee, S. C., **Das, B. K.**, Samal, S.K. and Soni, S. 2006. Physiological Changes in Indian River Prawn *Macrobrachium malcolmsonii* Experimentally Infected with *Vibrio alginolyticus* and *Vibrio anguillarum*. *Asian Fishery Science*. 19(2): 131-139.
 16. **Das, B. K.**, Pradhan, J., Pattnaik, P., Samantaray, B. R. and Samal, S. K., 2005. Production of antibacterials from the freshwater alga *Euglena viridins* (Ehren). *World Journal of Microbiology and Biotechnology*, 21:45-50.
 15. **Das, B. K.**, Samal, S. K., Samantaray, B. R., Meher, P. K., 2005. Protein fingerprinting profiles in different strains of *Aeromonas hydrophila* isolated from diseased freshwater fish. *World Journal of Microbiology and Biotechnology*. 21:587-591.
 14. **Das, B. K.**, Pattnaik, P. and Mishra, B. K. 2005. Observation on Haematological and Enzymatic Changes on Spontaneous Papillomatous Condition of *Anabas testudineus* (Bloch). *Asian Fishery Science*. 18(1): 33-38.
 13. Sahoo, B., Sethi, S., Mishra, B. K. and **Das, B. K.** 2005. Effects Elicitors on Prophenoloxidase and Superoxide Anion Activities of Freshwater Prawn, *Macrobrachium malcolmsonii*. *Asian Fishery Science*. 18(4): 345-353.
 12. Misra, C. K., **Das, B. K.**, Pradhan, J., Pattnaik, P., Sethi, S. and Mukherjee, S. C., 2004. Changes in lysosomal enzyme activity and protection against *Vibrio* infection in *Macrobrachium rosenbergii* (De Man) post larvae after bath immunostimulation with β -glucan. *Fish & Shellfish Immunology*. 17:389-395.
 11. Nayak, A. K., **Das, B. K.**, Mukherjee, S. C. and Kohli, M. P. S. 2004.

- The immunosuppressive effect of α -permethrin on Indian Major carp, rohu, *Labeo rohita*. *Fish and Shellfish Immunology*. 16:41-50.
10. Das, P. C., Ayyappan, S., **Das, B. K.** and Jena J. K. 2004. Nitrite toxicity in Indian major carps: sublethal effect on selected enzymes in fingerlings of *Catla catla*, *Labeo rohita* and *Cirrhinus mrigala*. *Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology*. 138(1): 3-10.
 9. Das, P. C., Ayyappan, S., Jena J. K. and **Das, B. K.** 2004. Nitrite toxicity in *Cirrhinus mrigala* (Ham.): acute toxicity and sub-lethal effect on selected haematological parameters. *Aquaculture*, 235(1-4): 633-644.
 8. Das P. C., Ayyappan S., Jena J. K. and **Das B. K.** 2004. Effect of sub-lethal nitrite on selected haematological parameters in fingerling *Catla catla* (Hamilton). *Aquaculture Research*, 35 (9): 874-880.
 7. Das, P. C., Ayyappan, S., Jena, J. K. and **Das, B. K.** 2004. Acute toxicity of ammonia and its sub-lethal effects on selected haematological and enzymatic parameters of mrigal, *Cirrhinus mrigala* (Hamilton) *Aquaculture Research*, 35 (2): 134-143.
 6. **Das B. K.** and Mukherjee, S. C. 2003. Toxicity of cypermethrin in *Labeo rohita* fingerlings: biochemical, enzymatic and haematological consequences. *Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology* 134(1): 109-121.
 5. Swain, P., Mukherjee, S. C., Sahoo, P. K., **Das, B. K.**, Pattnaik, P., Murjani, G., Nayak, S. K., 2001. Dot-Enzyme-Linked Immunosorbent Assay (Dot-ELISA) for the Diagnosis of *Edwardsiella tarda* Infection in Fish. *Asi. Fish. Sci.* 14:89-93.
 4. **Das, B.K.** and Mukherjee, S.C. and Murjani, G. 2000. A histopathological study of carp (*Labeo rohita*) exposed to hexachlorocyclohexane. *Veterinarski Arhiv* 70(4):169-180.
 3. **Das, B.K.** and Mukherjee, S.C. 2000. Sub lethal effect of quinalphos on selected blood parameters of *Labeo rohita* (Ham.) fingerlings. *Asian Fisheries Science*, 13: 225-233.
 2. **Das, B.K.** and Mukherjee, S.C. 2000. Chronic toxic effects of quinalphos on some biochemical parameters in *Labeo rohita* (Ham.). *Toxicology Letters*, 114:11-18.
 1. **Das, B. K.** and Mukherjee, S.C. and Murjani, G. 2002. Acute toxicity of Neem *Azadirachta indica* in Indian Major carps. *Journal of Aquaculture in the Tropics*, 17(1): 23-33.

ii.

National publications

32. Sahu I., **Das B.K.**, Marhual N.P., Samanta M., Mishra B.K. 2011 Toxicity of crude extracellular product of *Aeromonas hydrophila* on rohu, *Labeo rohita* (Ham). *Indian Journal of Microbiology*.
31. Behera T., Swain P., Sahoo S.K., Mohapatra D. & **Das B.K.** 2011. Immunostimulatory effects of curcumin in fish, *Labeo rohita* (H.). *Indian Journal of Natural Products and Resources*. 2: 184-188.
30. Pradhan J., Sahu S., Marhual N.P., Mishra B.K. and **Das B.K.** 2011 Antibacterial properties of freshwater *Microcystis aeruginosa* (Kütz) to bacterial pathogen – a comparative study of bacterial bioassays. *Indian Journal of Animal Sciences*. 81(12): 79-00 (accepted)
29. Mohanty, K., **Das, B.K.**, Marhual, N.P. and Roy, P. 2011 Random amplified polymerephic DNA-PCR typing of *Pseudomonas aeruginosa* isolated from diseased freshwater fish. *Indian J. Soc. Nat. Sci.* 1(1):1-10.
28. **Das B. K.** and Pradhan, J. 2010 Antibacterial properties of selected freshwater microalgae against pathogenic bacteria. *Indian Journal of Fisheries*. 57: 61-66.
27. Samal, S.K., **Das, B. K.**, Ghosh, S and Sahu, S., 2009 *In vitro* susceptibility of *Pseudomonas sp.* isolated from freshwater fish to antimicrobial agents. *Indian Journal of Fishery*, 56(3): 227-230.
26. Samantaray, B.R., Khuntia, C. P., and **Das B. K.**, 2009. Antibacterial activity of crude mucus extract of *Ompok pabda* against common bacterial fish pathogen. *Environment and Ecology*, 27:1657-1659.
25. **Das, B. K.**, Samal, S.K., Samantaray, B.R., and Mishra, B.K. 2009. Genetic diversity of *Pseudomonas putida* field population revealed by RAPD fingerprinting from freshwater fishes. *e-planet*. 7(2):1-7.
24. Marhual, N.P. Samal, S.K. and **Das B.K.** 2009. Random amplified polymorphic DNA-PCR typing of *Vibrio parahaemolyticus* isolated from black tiger shrimp *Penaeus monodon*. *e-planet*. 7 (1):1-6
23. Panigrahi, A., Azad, A.S., **Das, B.K.**, Dandpat, J. Das, G., Behera, S. and Mishra, S.S. 2009. Probiotic induced immunomodulation: investigation into cellular and molecular mechanism involved. *Research Journol of Biotechnology*. 4(3):7-13.
22. Sahu, S., Mishra, B.K., Pradhan, J., and **Das, B.K.** 2005. Antibacterial activity of *Curcuma longa* on fish microbial pathogens. *Journal of Aquaculture* 13.9-16.
21. Sahoo, P.K., Tripathy, S., Mishra, B. K., Adhikari, S., **Das, B. K.**, Nandi, S., Hari Babu, P., Sarangi, N. and Ayyappan, S., 2005. Is appendage deformity syndrome caused by *Macrobrachium*

- rosenbergii* nodavirus? *Current science*, 88(9):1374-1375.
20. **Das, B. K.**, Pattnaik, P., Mishra, B. K., Murjani, G. and Dey, R. K. 2004. Changes in the serum enzymes of grass carp, *Ctenopharyngodon idella* (Valenciennes) treated with aflatoxin B₁. *J. Aqua.*, 12:69-71.
 19. Das, P. C., Ayyappan, S., Jena, J. K. and **Das, B. K.**, 2004. Effect of sub-lethal nitrite toxicity on the haematological parameters of fingerlings of rohu, *Labeo rohita* (Ham.). *Indian J. Fish.*, 51(3):287-294.
 18. Das, P. C., Ayyappan, S., Jena, J. K. and **Das, B. K.**, 2002. Histopathological changes associated with sub-lethal ammonia toxicity in fingerlings of the Indian major carps. *J. Aqua.*, 10:9-19.
 17. **Das, B. K.**, Pattnaik, P., Murjani, G., & Mukherjee, S.C. 2001. *Edwardsiella tarda* endotoxin as an immunopotentiator in singhi, *Heteropneustes fossilis* fingerlings. *Ind. J. Exp. Biol.*, 9: 1311-1313.
 16. **Das, B. K.** and Mukherjee, S. C. 2001. Effect of nuvan on haematology of rohu *Labeo rohita*(Ham.) *Ind. J. Fish*, 48(1):85-92.
 15. **Das, B. K.** and Mukherjee, S. C. and Murjani, G. 2000. Histopathological studies on the myxoboliasis of *Cirrhinus mrigala* (Ham.). *Ind. J. of Fisheries* 47(1):61-64.
 14. **Das, B. K.**, Mukherjee, S. C., Sahu, B. B. and Murjani, G. (1999). Neem (*Azadirachta indica*) extract as an antibacterial agent against fish pathogenic bacteria. *Ind. J. Expt. Biology*. 36: 1097-1100.
 13. **Das, B. K.**, Sahu, B. B. and Mukherjee, S. C. 1999. The acute toxicity of Neem *Azadirachta indica* to fresh water prawn, *Macrobrachium lamarrei* (H. Milne Edwards). *J.Appl. Zool. Res.* 10(2): 163-164.
 12. **Das, B. K.** and Mukherjee, S. C. 1999. A pathoanatomical study of myxoboliasis of fingerlings of Rohu. *J. Biosciences*. 18(2): 79-84.
 11. **Das, B. K.** and Mukherjee, S. C. 1999. Effect of Sub lethal concentration of Nuvan on enzymatic profile of *Labeo rohita* (Ham.). *J. Aqua.* 7:43-50.
 10. Nayak, K. K., Mukherjee, S. C. and **Das, B. K.** 1999. Observation on different strains of *Aeromonas hydrophila* from various diseased fishes. *Ind. J. Fisheries* 46(3): 245-250.
 9. Kanaujia, D.R., **Das, B.K.** and Mohanty, A.N. 1998. Mass larval mortalities in Indian river prawn, *Macrobrachium malcolmsonii* under hatchery conditions and their control by application of antibiotics. *Journal of Aquaculture in the Tropics* 13(3): 171-179.
 8. **Das, B. K.** and Mukherjee, S.C. 1998. Behavioural and

		<p>histopathological changes associated with urea toxicity in fingerlings of Rohu. <i>J. Aquaculture</i>. 6:73-80.</p> <ol style="list-style-type: none"> 7. Das, B.K. and Mukherjee, S.C. 1998. Pathology of Black spot disease in fry and finger lings of rohu <i>Labeo rohita</i> (Ham.). <i>Geobios</i> 25:102-104 6. Das, B. K. and Mukherjee, S.C. 1998. Symptomatology and histopathology of Epizootic Ulcerative Syndrome in Rohu (<i>Labeo rohita</i>, Ham.). <i>Indian J. Fisheries</i>, 45(3): 315-319. 5. Das, B. K. and Mukherjee, S.C. 1997. Variation of Nucleic Acid Content in rohu, <i>Labeo Rohita</i> exposed to sub- Lethal concentration of Malathion. <i>J. Appl. Zool. Res.</i> 8(2): 145-146. 4. Das, B. K. and Mukherjee, S.C. 1997. Pathobiology of <i>Aeromonas</i> infection in rohu, <i>Labeo rohita</i> (Ham.). <i>J. Aquaculture</i>. 5:89-94. 3. Mohapatra, B.C., Das B.K., Mohanty, B.P., Tosh, C., Kar, M. and Shanmugam, S. 1997. Agricultural and Social development in Jaganthpur Village of Orissa - a case study. <i>J. Rural Development</i>. (NIRD), Hyderabad, India. pp. 531-539. 2. Thankappan, A., Das, B.K., Barman, H.K. & Samal, S.K. 2008 Genetic fingerprinting of <i>Aeromonas hydrophila</i> isolated from diseased freshwater fishes of Eastern India. <i>E-planet</i>. 6(2): 1-6. 1. Das, B.K. and Mukherjee, S.C. 1999. Bacterial flora in fry and fingerlings of Indian major carp Rohu (<i>Labeo rohita</i>) in India. <i>J.Aqua. Trop.</i> 14(2) 165-172.
iii.	Popular articles	<ol style="list-style-type: none"> 1. Das, B. K. 1993. Epizootic Ulcerative Disease in India, Fishing Chimes, pp.43-45. 2. Das, B. K., Mukherjee, S. C. and Nayak. K. 1994. Chemotherapeutics in fish diseases. Fishing Chimes pp. 40-42. 3. Mohapatra, B.C., Das, B. K. and Nayak, K. K. 1994. Mycotoxins in different feeds. Fishing Chimes Oct., 1994, pp 17-18. 4. Swain, S.K. and Das B. K. 1996. Effect of micronutrients in immune response and disease resistance of fish. Fishing chimes 16(7): 21-23. 5. Mohanty, B.P., Mohanty, S. and Das, B.K. 1997. Breeding and culture of Indian River prawn <i>Macrobrachium malcolmosonii</i> (H.Milne Eds.) Fishing Chimes 17(8): 7-13. 6. Kanaujia, D.R., Mohanty, A.N. and Das B.K. 1997- Breeding and culture of Indian River prawn <i>Macrobrachium malcolmosonii</i> (H. Milne Eds.) Fishing Chimes 17 (8): 7-13. 7. Swain, S.K., Singh, H. and Das, B.K. 1994. Aflatoxins in feed ingredients and their effects on fish. Fishing Chimes 18(10): 67-69.

		<p>8. Nayak, K.K., Das, B.K. and Mukherjee, S.C. 1999. Vaccines in Aquaculture Fishing Chimes. 18(11): 11-13.</p> <p>9. Das, B.K., Kanaujia, D.R. Mohanty, A.N. 1999 Hormonal control of reproduction in prawns Fishing Chimes. 19(6). 15-17.</p> <p>10. Mukhi, S.K., Das, B.K., Madhavi, B., Mishra, C.K and Paniprasad, K. 2001. Shrimp farm waste and its management. Info fish international. 1:50-55.</p> <p>11. Mishra, C. K., Das. B. K. & Mohanta, K. N. 2003. Feed management in aquaculture. Fish Farmers. 26 (1 & 2). P 16-17.</p> <p>12. Mishra, C.K., Mukherjee, S.C.; Das, B.K.; Pal, A.K.; Pani Prasad, K. 2006: Immunostimulant in Carp Culture. Fishing Chime, Vol.26(3) :20-22</p>
<p>iv.</p>	<p>Books/ Journals edited</p>	<p>1. Mishra, B.K., Swain, P., Sahoo, P.K., Das, B.K., and Sarangi, N. (2007). Disease management in freshwater pisciculture. Agrotech Publishing Academy, Udaipur, 288pp.</p> <p>2. Aquaculture Technology for farmers (ICAR) Jena, J.K., Das, P.C., Das, B.K., and others 2005.</p> <p>3. Souvenirs on Responsible Fisheries and Aquaculture Jena, J.K., Das, B.K. and others 2004.</p> <p>4. Abstracts and proceedings 40th Annual conferece of Association of Microbiologists of India, Bhubaneswar Ayyappan, S., Adhikari, S.P., Das, B.K. and others 22-24 January –2004.</p> <p>5. CIFA Technologies Sarangi, N., Jena, J.K., Das, B.K., and others 2004.</p> <p>6. Vision 2020; Sarangi, N., Jena, J.K., Sahoo P.K., Das, B.K 2007</p>
<p>v.</p>	<p>Book Chapter</p>	<p>1. Das, B.K. Ecotoxicants and Fish Immne system: fish and shellfish immunology: an introduction pp. 245-258 ed. P. Swain, P.K. Sahoo, S. Ayyappan.</p> <p>2. Das, B.K., Bacterial diseases of fish and their control in Disease Management: Freshwater Pisciculture ed. B.K. Mishra, P. Swain, P.K. Sahoo, B.K. Das & N. Sarangi</p> <p>3. Major diseases of ornamental fishes and their control pp. 86-93ed. B.K. Mishra, P. Swain, P.K. Sahoo, B.K. Das & N. Sarangi</p> <p>4. Das, B.K. Disease diagnosis and control in freshwater prawn hatchery and grow out culture system pp. 151-162 ed. B.K. Mishra, P. Swain, P.K. Sahoo, B.K. Das & N. Sarangi</p> <p>5. RAPD- principles and its application in microbial genome studies</p>

		<p>pp. 183-188 ed. B.K. Mishra, P. Swain, P.K. Sahoo, B.K. Das & N. Sarangi</p> <p>6. B.K. Das Ecotoxicants and fish Immune System pp. 246-261 ed. B.K. Mishra, P. Swain, P.K. Sahoo, B.K. Das & N. Sarangi</p>
vi.	Review Articles	<p>Swain, S.K. and Das, B.K. 2004. Ornamental fish breeding and Culture: a successful economic enterprise. In Technologies on livestock and fisheries for poverty alleviation in SAARC countries, SAIC, Dhaka, Bangladesh, 135-144pp.</p>

Other Publications

i. Leaflet		
a.	Oriya	<ol style="list-style-type: none"> 1. Madhurajala Machhachasa pain pokhari prastuti O Chasapojogi Machha chayan 2. Janal Utpadan 3. Madhura jala Machha Chasa 4. <i>Ardha satabdira madhura jala krushi</i> Das, B.K. & Rath S. 2004
b.	Hindi	<p><i>Rangin Machaliya ka prajanann aur palan</i> Swain, S.K., Chandra, S., Das, B.K., and Others 2005</p>
c.	English	<ol style="list-style-type: none"> 1. Pond Preparation and Selection of Fish Species for Freshwater Aquaculture 2. Seed Rearing of Carps 3. Composite Fish Culture

Presented in seminars/symposia	<ol style="list-style-type: none"> 1. Das, B.K. and Mukherjee, S.C. 1994. Differential biochemistry and mortality in Rohu fingerlings due to various pesticides. Abst. Nat. Sem. Indian. Toxicol. Soc. Dec 10-12, OVC Bhubaneswar pp.81. 2. Das B.K. and Mukherjee, S.C. 1994. Effect of Endosulfan on some clinical and biochemical parameters of Rohu fingerlings. Abst. Nat. Sem. <i>On Indian Toxicol. Soc.</i> Dec. 10-12 1994. 3. Das, B.K., Sahu, B.B. and Mohanty, J.M. 1994. Oxygen intake in rohu,
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- Labeo rohita* (Ham.) exposed to three pesticides- A comparative study. Abst. Nat. Ser. On Ind. Toxicol. Soc. Dec. 10-12,1994, OVC, Bhubaneswar
4. Mohanty, B.P. and **Das B.K.** 1995. Biotechnology in Aquaculture. Nat. Sem. on Curr. & Emerg. Trends in Aqua. and its impact on rural Development. 14-16 Feb.1995. College of Fisheries, Orissa.
 5. Sahu, B.B., Mukherjee, S.C., **Das, B.K.**, Mohanty, J and Sahu P.K. 1995. A study on tail and appendages necrosis in *Macrobrachium rosenbergii*. Abstr. Nat. Sem . on current and Emerg. Trends in Aquaculture and its impact on rural development 14-16 Feb. 1995. College of Fisheries, Orissa.
 6. **Das, B.K.** and Mukherjee, S.C. 1996. Variation of Nucleic acid content in Rohu, *Labeo rohita* exposed to sublethal concentration of Malathion. (Abst.) II AZRA conference on Applied Zoological Research for Food Production and Environmental Safety. 27-29 Dec. Cuttack.
 7. Sahu, B.B., Mukherjee, S.C., **Das, B.K.** and Murjani, G. 1996 Aquanem, effective Bactericides. Natl. Sem. on Diseases in aquaculture. ARTC (CIFE), Kakinada, March 5-6.
 8. Mukherjee, S.C., Kanaujia, D.R., **Das, B.K.**, Routray, P. and Sahu, B.B. 1996. Safe application level of Aquanem to fish prawn and plankton .Natl.Sem. on Diseases in aquaculture. ARTC (FIFE), Kakinada, March. 5-6
 9. **Das, B.K.** and Mukherjee S.C. 1997. Pathology of Tail and Fin rot diseases in rohu *Labeo rohita* (Ham.)(Abst.) Workshop on Development of Intensive Aquaculture in Fresh and saline water in Haryana .PP.23.
 10. Kanaujia, D.R., Mohanty A.N. and **Das B.K.** 1998 . Efficiency of freshwater river prawn *Macrobrachium malcolmsonii* in polyculture. Natl. workshop on Aquaculture Economics pp.17.
 11. Kanaujia, D.R., **Das B.K.** and Mohanty A.N. 1998. Biodiversity of *Macrobrachium sp.* in India. Nat. Sem., on Faunistic (Bio) diversity and Biotechnology. Haridwar, Feb. 6-9, 1998.
 13. Kanaujia, D.R., **Das B.K.**, Mohanty A.N.1998. Role of endocrine control of reproduction in prawns. Natl. workshop on Recent Advances in Hormonal Physiology of Fish and Shellfish Reproduction pp 60.
 14. Sarangi, N., B.C. Mohapatra, **B.K. Das**, H. K. De, S. Chandra, D.N. Chattopadhyay, P. Patnaik, D. Swain, S. Ghosh and A. Mallick, 2007. Aquaculture: a means of livelihood for rural poor in Orissa. 2nd International Convention on Globalisation and Rural

	<p><i>Development</i>, 9-10 February, 2007, World Trade Centre, Mumbai.</p> <p>15. Sarangi, N., B.C. Mohapatra, B.K.Das, H. K. De, S. Chandra, D.N. Chattopadhyay, P. Patnaik, D. Swain, S. Ghosh and A. Mallick, 2007. Livelihood development of rural poor through aquaculture in Orissa. <i>Fisheries and Aquaculture: Strategic Outlook for Asia</i>, 20-23 November, 2007, 8th Asian Fisheries Forum, Cochin. Full-length paper has been communicated.</p> <p>16. Sarangi, N., B.C. Mohapatra, B.K.Das, P. Patnaik, S. Ghosh, D. Swain and A. Mallick, 2008. Seed production of cultivable carps in FRP hatchery: An alternative means for livelihood generation in rural areas. <i>International Conference on Biodiversity Conservation and Management- BIOCAM 2008</i>, 3-6 February, 2008, CMFRI, Cochin.</p>
<p>Sequences Submitted To NCBI Data Base</p>	<ol style="list-style-type: none"> 1. Acession Number HM237346- Das B.K., Patnaik S, Marhual N.P, Nandi S, Mishra B.K, Eknath A. (2010) <i>Labeo rohita</i> Mx protein (Mx) mRNA, partial cds. 2. Acession Number HQ269831- Das,B.K., Pattanaik,D., Marhual,N.P., Mishra,B.K. and Eknath,A.E. (2010) <i>Catla catla</i> Mx protein (Mx) mRNA, partial cds. 3. Acession Number JF966212 - Marhual N.P Das B.K., Mishra B.K, Eknath A.(2011) <i>Vibrio alginolyticus</i> CPVAR2 16S ribosomal gene partial cds. 4. Acession Number JN645057- Marhual N.P., Das B.K. and Pattanaik D. (2011) <i>Vibrio alginolyticus</i> CPVA110 16S ribosomal gene partial cds. 5. Acession Number JN645056- Marhual N.P., Das B.K. and Mishra B.K. <i>Vibrio alginolyticus</i> CPVA210 16S ribosomal gene partial cds. 6. Acession Number JN645056- Marhual N.P., Das,B.K. and Mishra,B.K. <i>Vibrio alginolyticus</i> CPVA18 16S ribosomal gene partial cds. 7. Acession Number JF966210 - Marhual N.P. Das B.K., Mishra B.K, Eknath A.(2011) <i>Vibrio parahaemolyticus</i> CPVPR7 16S ribosomal gene partial cds. 8. Acession Number JF966211 - Marhual N.P., Das B.K., Mishra B.K, Eknath A.(2011) <i>Vibrio parahaemolyticus</i> CPVPP7 16S ribosomal gene partial cds. 9. Acession Number JN540809 - Marhual,N.P., Das, B.K. and Sahu,I. (2011) <i>Vibrio parahaemolyticus</i> CPVP15 16S ribosomal gene partial cds. 10. Acession Number JN540810- Marhual N.P., Das, B.K., Pradhan,J. and Mishra,B.K.(2011) <i>Vibrio parahaemolyticus</i> CPVP16 16S ribosomal gene partial cds.

11. Accession Number JF966213- Marhual,N.P., **Das, B.K.** and Sahu,I. (2011). *Vibrio alginolyticus* CPVAG2 gyraseB gene partial cds.
12. Accession Number JN193565- Marhual N.P., **Das, B.K.** and Roy,P. (2011). *Vibrio alginolyticus* CPVA10 gyraseB gene partial cds.
13. Accession Number JN 896879- Marhual N.P., **Das, B.K.**, Sahoo D.R and Pradhan J. (2011). *Vibrio alginolyticus* CPVA18 gyraseB gene partial cds.
14. Accession Number JN 896880- Marhual N.P., Das, B.K. Sadique M and Mishra B.K (2011). *Vibrio alginolyticus* CPVP7 gyraseB gene partial cds.
15. Accession Number JN 896880- Marhual N.P., **Das, B.K.** and Sahu I (2011). *Vibrio parahaemolyticus* CPVP7 gyraseB gene partial cds.
16. Accession Number JN 896881- Marhual N.P., **Das, B.K.** Sahu I and Mishra B.K (2011). *Vibrio parahaemolyticus* CPVP15 gyrase-B gene partial cds
17. Accession Number JN 896882- Marhual N.P., **Das, B.K.** Samal S.K and Sahoo D.R (2011). *Vibrio parahaemolyticus* CPVP16 gyraseB gene partial cds.
18. Accession Number JF966209- **Das, B.K.**, Sahu I. Marhual N.P Mishra B.K, Eknath A.(2011). *Aeromonas hydrophila* (CAHH10) 16S ribosomal gene partial cds
19. Accession Number JF330411- **Das, B.K.** (2011). *Aeromonas hydrophila* (CAHH14) 16S ribosomal gene partial cds
20. Accession Number JQ412853- **Das, B.K.**, Nayak N, Marhual N.P, Mishra B.K (2012). *Vibrio alginolyticus* (CPVA2) OMPK gene partial cds
21. Accession Number JQ412854- **Das, B.K.**, Marhual N.P, Roy P, Swain P (2012). *Vibrio alginolyticus* (CPVA10) OMPK gene partial cds
22. Accession Number JQ412855- **Das, B.K.**, Sahoo D. R, Marhual N.P, Pradhan J (2012). *Vibrio alginolyticus* (CPVA18) OMPK gene partial cds
23. Accession Number JQ412856- **Das, B.K.**, Marhual N.P, Sahoo D, Sahoo I (2012). *Vibrio parahaemolyticus* (CPVP7) OMPK gene partial cds
24. Accession Number JQ429754- Marhual,N.P., Das,B.K., Sahoo,D.R. and Mohanty,S. (2012). *Vibrio parahaemolyticus* (CPVP15) OMPK gene complete cds
25. Accession Number JQ429753- Marhual,N.P., Das,B.K., Sahoo,D.R. and Senapati,T. (2012). *Vibrio parahaemolyticus* (CPVP16) OMPK gene partial cds

	<p>26. Accession Number JQ429749 - Das, B.K., Sahu I, Marhual N.P, Tripathy G (2012) <i>Staphylococcus aureus</i> (CLRSA1)16S ribosomal gene partial cds.</p> <p>27. Accession Number JQ429750 - Das, B.K., Sahu I, Sahoo D.R, Swain P (2012) <i>Staphylococcus aureus</i> (CLRSA3)16S ribosomal gene partial cds.</p> <p>28. Accession Number JQ429751 - Das, B.K., Sahu I, Mishra B.K, Swain P (2012) <i>Staphylococcus aureus</i> (CLRSA4)16S ribosomal gene partial cds.</p> <p>29. Accession Number JQ429752 - Das, B.K., Sahu I, Dahmodharan K, Marhual N.P Sahoo D.R, Swain P (2012). <i>Staphylococcus aureus</i> (CLRSA5)16S ribosomal gene partial cds.</p> <p>30. Accession Number JF966211 – Mahammad S, Das B K, Maiti P, Marhual N.P Pradhan J (2012) Sialic acid synthase of <i>Channa punctatus</i>.</p> <p>31. Accession Number JN621033 - Das, B.K., Sahu I, Marhual N.P (2011). <i>Aeromonas hydrophila</i> (CAHH15) 16S ribosomal gene partial cds.</p> <p>32. Accession Number JN621034 - Das, B.K., Sahu I, Marhual N.P (2011). <i>Aeromonas hydrophila</i> (CAHH8) 16S ribosomal gene partial cds.</p>
<p>Commercialization</p>	<p>A product called CIFACURE for controlling bacterial and fungal infection that occurs commonly in freshwater ornamental fishes has been commercialized. This product can be very well used in the aquarium and other outdoor tanks where the ornamental fish is grown. It can control many bacterial diseases like haemorrhagic septicemia, ulcers, finrot, tailrot, eye disease and mouth fungus and fungal infections. This product has been commercialized for the first time.</p>
<p>Product development</p>	<p>During the period two products namely Aquaherbicare and CIFACURE have been developed. Aquaherbicare is a herbal product which is a immunoenhancer where as CIFACURE is a chemical formulation meant for ornamental fish diseases. Both the products were released by the institute. The first product was released by Secretary, DAHD & F where as the second one is released by the Hon'ble Union Minister of Sri Sarad Powar. Another two products is in the process of development.</p>
<p>Patent filed</p>	<p>Title: “A method of producing antibacterial extracts from fresh water algae”</p> <p>Application No. 749/KOL/2011</p> <p>Contributors: Dr. B.K. Das; Mrs. J. Pradhan; Dr. B.K. Mishra; Dr. A. E. Eknath</p>

