CURRICULUM VITAE

Panchanan Nath

Designation: Professor of Zoology

Address & Telephone:

Prof. Panchanan Nath
Department of Zoology
Visva- Bharati University
Santiniketan-731235
WestBengal
E-mail-: pnath1614@rediffmail.com
Phone : (03463) 261268(off)
Fax: (03463) 261268, 262672
(03463) 264619(Res)
Mobile: 9434375139

General Information:

Date of Birth : 1.10.1950
Sex : Male
Category : General
Nationality : Indian

Academic Record including professional career

Degree	University	Year
B.Sc. (Hons.)	Sambalpur University	1971
M.Sc.	University of Delhi	1973
Ph.D.	University of Delhi	1979
Lecturer	Dyal Singh College (Univ.of Delhi)	1979-80
Lecturer	Visva-Bharati University	1980-87
Reader	Visva-Bharati University	1987-95
Professor	Visva-Bharati University	1995 on wards.

Research experience: Since 1973 working in the field of Reproductive Physiology and Endocrine biochemistry especially in fish vitellogenesis.

Publication : 91 (full papers and abstracts)

Research Project undertaken: Eight; sponsored by UGC, CSIR, ICAR, and DST

Ph.D. produced: Elevan

Ph.D. students: Two (at present)

Award:

1. Received "Hari Om Ashram Trust Award" of ICAR in 1983 in Animal Science jointly with late Professor B.I. Sundararaj and Professor S.V. Goswami. Department of Zoology, University of Delhi, Delhi.

2. Rastriya Gourav Award (2004), Organized by India International Friendship Society (IIFS). New Delhi

Visiting Professor:

Invited as visiting scientist to Laboratoire de physiologie Generale et Comparee, Museum National d'Histoire Naturelle, 7rue cuvier Paris, France in 1987 and 1989 for a collaborative Research with Professor Y.A. Fontaine and Dr. E. Burzawa Gerard.

Attended International Symposia held in Canada,Singapore and Thailand

Membership of Scientific Societies :

i.Ex- President of Indian Society for comparative Endocrinology
ii.International Federation of Comparative Endocrine Societies
iii. Asia Oceania Society for comparative Endocrinology
iv. Asian Fisheries Society
v. Inland Fisheries Society of India
vi. Indian Pineal Study Group

Administrative experiences:

1. Vice-principal (Deputy Dean), Siksha Bhavana (Institute of Science), Visva-Bharati University, Santiniketan: Two years
2. Head, Department of Zoology, Visva-Bharati University, Santiniketan: Three years

Research publications of Professor Panchanan Nath, Fish Endocrinology laboratory, Department of Zoology, Visva-Bharati , Santiniketan 731 235, West Bengal

1. Nath, P. and Sundarraj, B.I. (1976). Biological and immunological properties of partially-purified gonadotropin from catfish. *Heteropneustes fossilis* (Bloch). Proceeding of the All India Symposium on Comparative Endocrinology, Abs. 17, P. 17, University of Mysore, Manasa Gangotri, Mysore (November 4-6, 1976).
2. Nath, P. and Sundararaj, B. I. (1977). Inhibition of vitellogenesis in catfish. *Heteropneustes fossilis* (Bloch) by antiserum raised against partially-purified conspecific gonadotropin. Anatomical record, 187 773-774.
3. Sundararaj , B.I., Nath , P. and Halberg, F. (1977).Catfish body weight gain influenced by circadian meal timing in relation to lighting regimen. 27th International Congress of Physiological Sciences, Paris ,France, 1977, Proceeding of the International Union of Physiological Sciences, Vol.13,728,Abs. 2164
4. Sundararaj, B.I. and Nath .P.(1978). Introduction of Vitellogenesis in the catfish, *Heteropneustes fossilis* (Bloch).: effect of steroids and protein hormones. Anatomical record.197.623
5. Nath, P. and Sundararaj, B. I. (1978) . Endocrine control of vitellogenesis in the catfish .*Heteropneustes fossilis* . In: Comparative Endocrinology, Gailard , P. J. and Boer, H.H. (eds) P.90. Elsevier/North Holland Biomedical Press , Amsterdam.
6. Sundararaj, B. I., Nath, P . and Virendar Jeet (1978).Role of circadian and circannual rhythems in the regulation of ovarian cycles in fishes : a catfish model. In: Comparative Endocrinology , Gailard, P . J. and Boer , H.H. (eds.) pp.137-140 Elsevier/North Holand Biomedical Press , Amsterdam
7. Nath ,P. and Sundararaj , B.I. (1979) Role of protein and steroid hormones in vitellogenesis in the catfish ,*Heteropneustes fossilis* .Proceeding of the Indian National Science Academy.B45; 491—496
8. Nath P and Sundararaj, B. I. (1980) Hormonal regulation of vitellogenesis in the catfish *Heteropneustes fossilis* .Proceeding of the Symposium on General and Comparative Endocrinology Abs 15, pp.14-15 University of Delhi (November24-26 1980)
9. Nath , P. and Sundararaj , B. I. (1981) Isolation and identification of female-specific serum lipophosphoprotein (vitellogenin) in catfish, *Heteropneustes fossilis* (Bloch) . Gen .Comp Endocrinology .43. 184-190
10. Nath , P. Sundararaj ,B. I. (1981) Introduction of vitellogenesis in the

hypophysectomized catfish , *Heteropneustes fossilis* (Bloch) Effects of piscine and mammalian hormones , Gen . Comp. Endocrinol. 43-191-200

11. Sundararaj, B. I. and Nath , P. (!981) Steroid induced synthesis of vitellogenin in the catfish, *Heteropnustes fossilis*, (Bloch) Gen. Comp. Endocrinol. 43, 201-210
12. Nath, P. and Sundararaj ,B.I. (1981) Identification and hormonal regulation of vitellogenin synthesis in the catfish, *Hetropnustes fossilis* (Bloch) Proceedings of All India Seminar on Fish Biology Abs. 40 P. 38 , Bihar University , Mujaffarpur, Bihar (November 20-24, 1981)
13. Sundararaj ,B.I., Nath ,P. and Halberg , F.(1982). Circadian meal timing in relation to lighting schedule of optimize catfish body weight gain. J Nutrition . 112 : 1085-1096
14. Sundararaj, B. I., Ntah , P. and Burzawa- Gerard , E. (1982) Synthesis of vitellogenin and its uptake by the ovary in the catfish, *Heteropnustes fossilis* (Bloch) in response to carp gonadotropin and its subunits . Gen.Comp. Endocrinol. .46, 93-98
15. Mukherjee, J., Nath , P. and Bhattacharya, S. (1984) Seasonal and hormonal regulation of vitellogenesis in murrel. *Channa punctatus* .Proceedings of the symposium on Comp Endocrinol. Abs 58 p. 58 Banaras Hindu University, Varanasi,(December 29-31 1984).
16. Nath, P. and Sundararaj ,B. I. (1985) Effects of conspecific gonadotropin on ovarian maintenance, maturation and ovulation in the catfish *Heteropnustes fossilis* (bloch) Proceeding of sixth annual symposium of Reproductive Biology and Comp. Endocrinol., Abs 42 ,Jawaharlal Institute of Post Graduate Medical Education and Research, Podicherry (June 21-22, 1985)
17. Banerjee, P. P. , Bhattacharya, S. and Nath , P (1985) Development of fish gonadotropin radioimmunoassay and determination of its seasonal profile. Proceeding of VII All India Symposium on Comparartive Animal Physiology ,Abs39 p.37 University of Kalyani, Kalyani (December 28-30 ,1985)
18. Banerjee , P. P. , Bhattacharya , S. and Nath ,P. (1986) . Fish gonadotropin hormone : Nature and Properties. Procc . 17 th Ann. Meeting Endo. Society India (Bombay , Nov 4-8 ,!986),.In: Endocrinology (eds C.P. Puri and T.C.anand kumar) pp.86-93.
19. Banerjee, P.P., Jamaluddin, Md., Bhattacharya,S., Nath,P., Kobayashi, M., Aida,K. and Hanyu, I. (1987). Development of heterologous radioimmunoassy for Indian carp and Murrel gonadotropin hormone. Indian J.Exp.Biol.25: 220-227.
20. Mukherjee, J. , Bhattacharya, S. and Nath, P. (1987).Hormonal regulation of vitellogenesis in murrel , *Channa punctatus* (Bloch). In : Reproductive Physiology of Fish 1987(eds. D.R.Idler, L.W.Crim and J.M.Walsh) p .208. Memorial University of Newfoundland, St. John's , Newfoundland, Canada,ISBN 0-9692692-)-X.

21. Nath , P. , Mukherjee , J. and Bhattacharya , S. (1987). Effects of steroid hormones on vitellogenin synthesis in murrel , *Channa punctatus* (Bloch). Proc. 1st Congress Asia Oceania Soc. Comp Endocrinol . (AOSCE). (eds. E. Ohnishi., Y. Nagahama and H. Ishizaki) pp. 165-166, Nagoya University Corporation , printing section.
22. Nath, P. , Mukherjee. J.and Bhattacharya, S. (1988). Role of steroid hormones on the induction of vitellogenesis in murrel, *Channa punctatus* . Proc. All India Symposium.Comp. Endocrinol. Nagpur University, Nagpur. (Jan.23-25 , 1988) Abs. 3.12, P. 29.
23. Bhakta . M., Mitra. K, and Nath . P. (1988). Identification of the yolk precursor protein (vitellogenin)in Indian major carp .*Labeo rohita*. Proc.All India Symp. Comp. Endocrinol. Nagpur University. Nagpur (Jan. 23-25, 1988) Abs. 3.13, P.30-31.
24. Chattopadhyaya, K. and Nath, P. (1988). Seasonal variation in alkali-labile phosphorus and DNA, RNA and protein metabolism during ovarian growth in the catfish, *Clarias batrachus*. Proc. All India Symp. Comp. Endocrinol. Nagpur University, Nagpur (Jan. 23-25,1988) pp.58-59.
25. Dasgupta, S. and Nath, P. (1988). The pineal gland and its role on gonadal growth in the catfish *Clarias batrachus* in relation to different photoperiod and temperature. Proc.All India Symp. Comp. Endocrinol. Nagpur University, Nagpur (Jan.23-25,1988) . pp.60-61.
26. Nath , P. , Chattopadhyay, K. and Dasgupta, S. (1988). Effects of protein and steroid hormones on the synthesis of vitellogenin in teleost: a synergystic approach. Proc.Nat. Symp. Curr. Status Gen. Comp. Endocrinol. Univ. of Delhi, Delhi(Nov.25-27,1988) pp. 43-44.
27. Mitra, K. and Nath, P. (1988). Identification and partial purification of egg yolk precursor protein of murrel, *Channa punctatus*. Proc.Nat. Symp. Curr. Status Gen. Comp. Endocrinol. Univ. of Delhi, Delhi(Nov.25-27,1988) pp.55-56.
28. Dasgupta, S. and Nath. P. (1988). Effects of photoperiod and temperature on ovarian growth in catfish, *Clarias batrachus*. Proc.Nat. Symp. Curr. Status Gen. Comp. Endocrinol. Univ. of Delhi, Delhi(Nov.25-27,1988) pp.96-97.
29. Banerjee, P. P., Bhattacharya, S. and Nath, P. (1989). Purification and properties of pituitary gonadotropic hormone from Indian teleost: fresh water murrel (*Channa punctatus*) and carp (*Catla catla*). Gen. Comp. Endocrinol. 73:118-128.
30. Mukherjee, J., Bhattacharya, S.and Nath ,P. (1989). Annual changes in Ovary and vitellogenin content of liver ,serum and ovary of murrel *Channa punctatus* (Bloch).Ind.J.Exp.Biol.27:764-769.
31. Nath, P. and Mitra, K.(1991).Developement of Enzyme-linked immunosorbent assay for yolk protein and vitellogenin of the murrel, *Channa punctatus*. In:Current themes in Comparative Endocrinology (R.N.Saxena, K. Murlidhar, L. Bhagat, N. Sehgal< T. Saxena, P. Kaushal, eds.). p-116, Proc. 2nd Cong. AOSCE, New Delhi(Dec.. 3-6, 1991).

32. Mitra, K. and Nath, P. (1991).Isolation and purification of yolk proteins of murrel, In: current Theames in Comp.Endocrinol. (R.N. Saxena, K. Murlidhar, L. Bhagat, N. Sehgal, T. Saxena, P. Kaushal, eds.)pp. 275-258. Proc. 2nd Cong. AOSCE, New Delhi(Dec.. 3-6, 1991).
33. Burzawa-Gerard, E., Nath, P. Baloche, S. and Peyon, P.(1991). ELISA (enzyme-linked immunosorbent assay) for vitellogenin and vitellus in eel (*Anguilla anguilla*) and in the Indian major carp (*Labeo rohita*). In: Reproductive Physiology of fish (A.P. Scott, J.P. Sumpter, D.E. Kime, M.S. Rolfe,eds.) P. 319, Fish Symp 91, Sheffied, U.K.
34. Nath, P. , Bhakta, M. and Mitra, K. (1992). Demonstration of two forms of vitellogenin in serum of estradiol-17β- treated Indian major carp, *Labeo rohita.* Ind. J. Exp. Biol. 30: 464-467.
35. Mitra, K. and Nath, P. (1992). Purification of vitellogenin(Vg)from estradiol-17β (E_2)-treated male murrel, *Chana punctatus*. Proc. Third Asian Fisheries Forum, P. 112. Singapore.
36. Garg, S.K. , Trehan, N. and Nath, P. (1993). Purification of Plasma vitellogenin of a fresh water carp. In : Progress in Comparative Endocrinology. (M.R.P. Varabudhi, S. Lorlowhakorn, eds.) ISBN 974-7571-22-6. pp. 61-63.
37. Nath, P. and Chatterjee, S. (1994). Effect of inealectomy on vitellogenesis in the catfish , *Clarias batrachus*. In: Third Asian Fisheries Forum,(L.M. Chou, A.D.Munro, T.J.Lam, T.W.Chen, L.K.K.Cheong, J.L.Ding, K.K.Hooi, H.W.Khoo, V.P.E.Pheno, K.F.Shuim, C.H.Tan, eds.) pp.814-817. Asian Fisheries Society, Manila.Phillippines.
38. Bhakta, M. and Nath, P. (1996). Isolation and identification of yolk proteins in Indian major carp, *Labeo rohita*. J. Biosci. 21 : 711-722.
39. Nath, P., Bhakta, M ., Maitra, S. and Mukherjee,G. (1996). Effects of autologus vitellogenin on the ovary of the catfish, *Clarias batrachus* . In: Environmental& Conservation Endocrinology (Jean Joss, ed.) pp. 278-279. Proc. Third. Cong. AOSCE, Mecquarie University, Sydney, Australia.
40. Nath, P. and Grag, S.K.(1996). Assessment of sexual differences of salmon gonadotropin(GtH II) in the catfish, *Heteropneustes fossilis* (Bloch) . In:Environmental & Conservation Endocrinology (Jean Joss, ed.) pp.276-277. Proc. Cong.AOSCE, Macqurie University, Sydney, Australia.
41. Nath, P. and Chatterjee, S. (1996). Role of pineal on photo thermal control of fish reproduction: the catfish, *Clarias batrachus* as a model. Proc. Ind. Soc. Chronobiol. Pp. 16-17. All India Institute of Medical Sciences
42. Maitra, S. and Nath, P. (1996). Isolation of three forms of vitellogenin from the plasma of estradiol-17β-treated Indian major carp, *Cirrhinus mrigala.* Proc. Symp. Emerg. Front. Horm. Res. Pp. 28-29. Banaras Hindu University, Varanasi.
43. Bhakta, M. , Mitra, K. , Maitra, S. and Nath, P. (1996). A common procedure for purification of fish vitellogenin. Proc. Symp. Emerg. Front.

Horm.Res. Pp. 29-30. Banaras Hindu University, Varanasi.

44. Nath, P., Bhakta, M. and Maitra, S. (1996). Induction of ovarian growth by fish vitellogenin in the catfish, *Clarias batrachus*. Proc. Symp. Emerg Front. Horm. Res. Pp. 41-42. Banaras Hindu University, Varanasi.
45. Nath, P. (1996). Circadian meal timing influences body weight gain in the catfish, *Heteropneustes fossilis*. Proc. Nat. Symp. Behav. P. 9. Pandit Ravisankar Shukla University, Raipur.
46. Nath,P. , Bhakta, M. and Maitra, S. (1997) . Fish vitellogenin and its role on vitellogenesis. Proc. Nat. Comp. Physiol. Endocrinol. P.1. Department of Zoology, Govt. D.B. Girls P.G. College, Raipur.
47. Nath, P. and Maitra, S. (1997). Mechanism of vitellogenesis in Indian teleost. Proc. Satellite Symp. Neural cont. Endo. Syst. P. 26. Dept. of Zoology, Nagpur University, Nagpur (Nov.26-28, 1997).
48. Nath, P. , Bhakta, M. Maitra, S. and Sarkar. S (1997). Vitellogenin induces vitellogenesis in the catfish, *Clarias batrachus*. In: Advances in Comparative Endocrinology (S. Kawashima and S.Kikuyama, eds.).pp. 1475-1479, MonduzziEditore S.P.A.Bologna (Italy).
49. Nath,P. and Maitra, S.(1998). Role of vitelloginin in Indian teleost. Proc. Nat. Symp. Endo. Res. Biotech. pp. 37-39.Dept. of Zoology, Utkal University, Bhubaneswar (April.16-18, 1998).
50. Nath, P. and Maitra, S.(1998).Some aspects of teleost vitellogenesis. Proc. Nat. Workshop Rec.Adv. Horm. Physiol. Fish shellfish Reprod. pp.40-CIFA Bhubaneswar (April 16-18, 1998).
51. Nath, P.(1999). Some aspects of teleost vitellogenesis.In: Icthyology: Recent Research Advances(ed. D.N. Saksena.), pp. 249-259, Oxford and IBH publishing Co. Pvt.Ltd. New Delhi.

52. Maitra, S. and Nath, P. (1999). Effect of Mrigal (*Cirrhinus mrigala*) Vitellogenins on the synthesis and uptake of vitellogenin in the catfish, *Clarias batrachus*. Proc.Nat. Sem. Environ. Biol. Fish. Biol.p.22.Dept. of Zoology, Visva-Bharati, Santiniketan (April 6-7.1999)

53. Nath, P. and Maitra, S. (2000). Annual changes in DNA, RNA and protein content in the liver and ovary and serum vitellogenin levels of the catfish, *Clarias batrachus*.Proc. Ind. Fish. Sci.Cong.P.98, Chandigarh (Sept. 21-23, 2000)

54. Nath P. and Maitra S. (2001). Role of two plasma vitellogenins from Indian major carp (*Cirrhinus mrigala*) in catfish (*Clarias batrachus*) vitellogenesis. Gen. and Comp. Endocrinol. 124,30-44 (2001).

55. Sahu, R. and Nath, P. (2002). Bulk preparation and separation of subunits of mrigal (*Cirrhinus mrigala)* vitellogenin. Proc. Nat. Sem. On Environ. Biol. Fish Biol. Pp 81-82, Dept of Zoology, Visva-Bharati, (Feb. 1-3,2002).

56. Mohapatra, S. and Nath, P. (2002). Demonstration of vitellogenesis –stimulating and –inhibiting actions of catfish (*Clarias batrachus*) vitellogenin. Proc. Nat. Sem. On Environ. Biol. Fish Biol. Pp 81, Dept of Zoology, Visva-Bharati, (Feb. 1-3,2002).

57. Ghosh Juthika and Nath P. (2002). Seasonal effects of melatonin on ovarian recrudescence in female catfish, *Clarias batrachus*. Proc. Nat. Sem. On Environ. Biol. Fish Biol. Pp 82-83, Dept of Zoology, Visva-Bharati, (Feb. 1-3,2002).

58. Nath, P. and Ghosh, J. (2002). Sexual difference in the action of melatonin in the catfish, *Clarias batrachus*.Annual symposium of Indian society for Chronobiology, P.1,. Bangalore (Sept. 3-4, 2002)

59. Ghosh, J. and Nath, P.(2002).Seasonal variation in the effects of melatonin on testicular growth of the male catfish, *Clarias batrachus,* Annual symposium of Indian society for Chronobiology, P.7, Bangalore (Sept. 3-4, 2002).

60. Nath, P. and Mohapatra, S. (2002). Vitellogenin: A modulator for fish reproduction. Nat. Col. Catfish physiol. Pp.47-48, Dept.of Zoology. Banaras Hindu University, (Nov. 19-20,2002).

61. Sahu, R. and Nath, P. (2002). Isolation and identification of mrigal, *Cirrhinus mrigala*, vitellogenin (HA-I) subunits. Nat. Col. Catfish physiol. Pp, 45-46, Dept. of Zoology, Banaras Hindu University, (Nov. 19-20,2002).

62. Mohapatra, S. and Nath, P. (2002). Induction of spermatogenesis by catfish vitellogenin in male catfish, *Clarias batrachus*. Nat. Col. Catfish physiol. Pp.47-48, Dept.of Zoology. Banaras Hindu University, (Nov. 19-20,2002).

63.Ghosh Juthika and P.Nath (2002). Effects of melatonin on gonadal growth in intact and pinealectomized catfish, *Clarias batrachus* maintained under short and long photoperiod. Nat. Col. Catfish physiol. Pp.48-49, Dept.of Zoology. Banaras Hindu University, (Nov. 19-20,2002).

64. Ghosh Juthika and P.Nath (2002). Effects of melatonin on gonadal growth and plasma vitellogenin levels in the annually breeding catfish, *Clarias batrachus* Nat. Con. On Innovation and Prospects in Lifesciences, pp.41, School of Lifesciences, Pt. Ravishankar Shukla University, Raipur (Chhattishgarh).

65. Mohapatra, S. and Nath, P. (2002).Catfish vitellogenin contents stimulatory and inhibitory factor for vitellogenesis. Nat. Con. On Innovation and Prospects in Lifesciences, pp.41, School of Lifesciences, Pt. Ravishankar Shukla University, Raipur (Chhattishgarh).

66. Mohapatra, S. and Nath, P. (2002). Recent advances in fish vitellogenesis. Nat. Con. On Innovation and Prospects in Lifesciences, pp.9, School of Lifesciences, Pt. Ravishankar Shukla University, Raipur (Chhattishgarh).

67. Ghosh J. and Nath P.(2003) Effects of pinealectomy and melatonin-treatment on ovarian growth and plasma vitellogenin levels in female catfish, *Clarias batrachus*, under different photoperiodic regimes during prespawning period. XV Nat Symp on choronobiology.Pp.18, School of Lifesciences, Pt. Ravishankar Shukla University, Raipur (Chhattishgarh).

68. Nath P. and Ghosh Juthika(2003),Fish pineal and reproduction: Role of photoperiod. XV Nat Symp on choronobiology.Pp.8, School of Lifesciences, Pt. Ravishankar Shukla University, Raipur (Chhattishgarh).

69. Nath, P. and Mohapatra, S. (2003). Vitellogenin and catfish reproduction. Nat. Symp. On Current Trends in Comp. Endocrinol. Impact of molecular Biology and Biotechnology. Pp. 62, Dept. of Zoology, Nagpur University, Nagpur.

70. Sahu, R. and Maitra, S. Gupta, S.D., Rath, S.C. and Mondal, B. (2003). Induction of quality fertilizable eggs by implanting mrigal vitellogenin in Indian major carp, *Catla catla*, in pond culture system. Nat. Symp. On Current Trends in Comp. Endocrinol. Impact of molecular Biology and Biotechnology. Pp.85, Dept. of Zoology, Nagpur University, Nagpur.

71. Ghosh Juthika, P.Nath, R.E. Peter and H.Kawauchi (2003). Development of enzyme linked immunosorbent assay (ELISA) for fish GtH II and its application to estimate the plasma GtH levels during annual breeding cycle and after pinealectomy in the catfish, *Clarias batrachus*. Nat. Symp. On Current Trends in Comp. Endocrinol. Impact of molecular Biology and Biotechnology. Pp.35, Dept. of Zoology, Nagpur University, Nagpur.

72. Halberg F.; Cornelissen G.; Wang Z.; Wan C.; Ulmer W.; Katinas G.; Singh R.; Singh RK; Singh RK; Gupta BD; Singh RB; Kumar A; Kanabrocki E.; Sothern RB; Rao G; Bhatt ML; Srivastava M; Rai G; Singh S; Pati AK; Nath P; Halberg F; Halberg J; Schwartzkopff O; Bakken E; Gov. Shri Vishnu Kant Shastri. (2003). Chronomics: circadian and circaseptan timing of radiotherapy, drugs, calories, perhaps nutriceuticals and beyond. J Exp. Ther. Oncol. 2003, 3: 223-60.

73. Nath P. and Ghosh Juthika(2004), Effects of pinealectomy and melatonin treatment on ovary and plasma GtH and Vg levels in the catfish, *Clarias batrachus*. XVI National Symposium on Chronobiology, pp 8, Dept. of Biochemistry, Faculty of Science, Annamali University, Annamali Nagar-608002, Tamil Nadu, India.

74. Ghosh Juthika. and Nath P.(2005) Sasonal effects of melatonin on ovary and plasma gonadotropin and vitellogenin levels in intact and pinealectomized catfish,*Clarias batrachus* (Linn.).Indian J. Exp. Biol. 43: 224-232.

75. Nath, P., Maitra, S., Sahu, R., Mahapatra, S., Bhattacharya, D., Sarkar, S. and Kabita SK. (2005) Multifacet functions of fish vitellogenin. National Symposium on Comparative Endocrinology and Reproductive Physiology: Retrospect and Prospect,Department Of Zoology, University of Delhi,(November 17-19, 2005).

76. Sahu, R., Maitra, S. and Nath, P. (2005) An approach to identify an alternate regulator for piscine vitellogenesis", National Symposium on Comparative Endocrinology and Reproductive Physiology: Retrospect and Prospect, Department Of Zoology, University of Delhi, (November 17-19, 2005).

77. Bhattacharya, D. and Nath, P. (2005) *In Vitro* effects of Catfish (*Clarias batrachus)* Vitellogenin –I on oocyte maturation", National Symposium on Comparative Endocrinology and Reproductive Physiology: Retrospect and Prospect, Department Of Zoology, University of Delhi, (November 17-19, 2005).

78. Sk Kabita, S.Mahapatra, and P.Nath,(2005) Switch on and off role of vitellogenesis on the regulation of vitellogenesis in the Catfish *Clarias batrachus*, National Symposium on Comparative Endocrinology and Reproductive Physiology: Retrospect and Prospect, Department Of Zoology, University of Delhi,

(November 17-19, 2005).

79. Maitra S, Sahu R, Trehan N, Garg S.K, and Nath P.(2007).Circannual variation in plasma vitellogenin and gonadotropin II levels in relation to annual ovarian cycle in female mrigal, *Cirrhinus mrigala* .
Aquaculture 265:370-384.

80. Nath P, SK. Kabita, Bhattacharya D. Sarkar S. (2007). Environmental and hormonal control of fish reproduction with special emphasis on vitellogenesis: In: Natural and Anthropogenic Hazards on Fish & Fisheries (ed Umesh C. Goswami) Narendra Publishing House. Delhi. India.

81. Sk Kabita and P. Nath Purification of three forms of vitellogenin in the catfish, *Clarias batrachus*. National Symposium on an Update of Reproductive Endocrinology: Novel and Applied Strategies, Department of Zoology, Banaras Hindu University, Varanasi (Feb. 26-28, 2007)

82. P. Nath, S. Sarkar, D. Bhattacharya and Sk. Kabita . Autoregulation of fish vitellogenesis:evidence from the work on catfish, *Clarias batrachus*. National Symposium on anUpdate of Reproductive Endocrinology:Novel and Applied Strategies, Department of Zoology, Banaras Hindu University, Varanasi (Feb. 26-28, 2007)

83. P. Nath . Generation of fertilizable eggs before season in the female catfish, (*Clarias batrachus*) by vitellogenin. National Symposium On Advances In Zoology : Faunal Diversity And Ecophysiology Department of Zoology, North- Eastern Hill University, Shillong. (March 13-14, 2008).

. 84. Sarkar S, and Nath P "Annual profile of plasma level of estradiol 17β and vitellogenin in relation to ovarian growth in the catfish***,Clarias batrachus*** **"** National Symposium on Comparative Endocrinology & Reproductive Physiology: Insights And Challenges Department of Zoology, Visva-Bharati University., Santiniketan. November 26-28,2007**.**

85. Sarkar S, and Nath P "**Inhibition of gonadal (testis/Ovary) growth by catfish *(Clarias batrachus)* gonadotropin antiserum"** 6th Congress of the Asia and Oceania Society for Comparative Endocrinology (AOSCE), University of North Bengal, Silliguri 734013, Dist- Darjeeling, West Bengal, India. (December 10-14, 2007).

86. Sarkar S, and Nath P **"Ovarian maintenance by conspecific gonadotropin in the hypophysectomized female catfish (*Clarias batrachus)* during pre-spawning period".** National Symposium on Advances In Zoology: Faunal Diversity And Ecophysiology .Department of Zoology, North Eastern Hill University, Shillong(March 13-14, 2008)

87. Nath, P (2009) Invited Lecture on "Evidences for the duality of gonadotropin in walking catfish, Clarias batrachus" In: International Conference on Integrative Physiology: Modern perspective & Platinum Jubilee Celebration of th Physiological Society of India, p107, Science City Convention Centre, Kolkata (November 12-14, 2009).

88. Sarkar S, and Nath P (2009) Biological neutralization of LH activity by using its antiserum in catfish, *Clarias batrachus* In: National Symposium on Comparative Endocrinology and Reproductive Physiology: Current Advances, p174, Department of Zoology, The Institute of Science, Mumbai.

89. Bhattacharya, D. and Nath P (2009) *In vitro* induction of oocyte maturation by catfish vitellogenin 2, In: National Symposium on Comparative Endocrinology and Reproductive Physiology: Current Advances, p175, Department of Zoology, The Institute of Science, Mumbai.

90. Nath P, Maitra, S, Sahu, R, Mohapatra S and Ghosh, J (2009) Some aspects of teleost vitellogenesis: Role of fish vitellogenin. In: Recent Advances in Hormonal Physiology of Fish and Shellfish Reproduction, pp.43-49 (ed. B. N. Singh and A. K. Pandey), Narendra Publishing House. Delhi. India

91. Sarkar, S. and Nath, P. (2012) Purification and partial characterization of GtHs (cfLH and cfFSH) from Indian walking catfish (*Clarias batrachus*) (L.) and development of a homologous ELISA for cfLH. Aquaculture Resarch. 43:879-896.

92. Nath, P. (2011) Endocrine regulation of vitellogenesis in catfish, Clarias batrachus. In: Brain Storming Meeting on Advances in Neuroendocrinology held at Department of Zoology, Banaras Hindu University, Varanasi (February 14-15, 2011)

93. Nath, P. and Sarkar, S. (2011) Duality of gonadotrupins in Indian catfish, Clarias batrachus. In: International Symposium on Comparative Endocrinology and Stress Physiology, Department of Zoology, University of Kerala, Thiruvananthpuram (February 16-18, 2012)

94. Juin, Subir K. and Nath, P. (2012) Viteloogenin influences catfish (Clarias gariepinus) body weight gain. n: International Symposium on Comparative Endocrinology and Stress Physiology, Department of Zoology, University of Kerala, Thiruvananthpuram (February 16-18, 2012)

95. Sarkar, S., Bhattacharya, D., Juin, S.K. and Nath, P (2014). Biological properties of Indian walking catfish (*Clarias batrachus*) (L.) Gonadotropins in female reproduction. Fish Physiology and Biochemistry 40:1849-1861.