

Biodata

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Area of Specialisation : Fisheries & Aquaculture

Research Interest : Aquatic ecology (Pond and Riverine)

Fish nutrition Fish Conservation

Selected Publications (2009 onwards) :

Ashim Kumar Nath*, Anindita Patra, Babita Sen, Debalina Dey, Ipsita Das, Ipsita Mukherjee, Nabanita Ghosh, Soumi Paul. 'Fatty acid compositions of four edible fishes of Hooghly estuary, West Bengal, India' in International J. of Current Microbiology and Applied Sciences, 3(6): 208-218, 2014. (ISSN NO. 2319-7706) (Global Impact Factor: 1.594)

A. K. Nath and Bidita Banerjee 'Studies on the fatty acid profile in Hilsa and plankton in Hooghly-estuarine system of West Bengal' in International Journal of Advanced Research in Biological Sciences, 1(3): 94-98, 2014. (ISSN No. 2348-8069) (Impact Factor: 0.653)

A. K. Nath and Bidita Banerjee. 'Studies on the status of Hilsa catches in Hooghly-estuarine system of W.B.' in Fishing Chimes, Dec, 33(9): 46-51, 2013. (ISSN No. 0971-4529)

A. K. Nath and B. Banerjee. In situ accumulation of Heavy metals in Hilsa fish from the Hooghly River of W.B., India, India' in the journal 'Ecology, Environment and Conservation' 19(3): 813-818, 2013. (ISSN No. 0971-765X) (Scopus H Index 8, NAAS-5.02).

A. K. Nath, V. K. Gupta, M. A. Khan and P. Panda. 'Comparative study zooplankton in Makhana — perennial Fish pond in Darbhanga, North Bihar, India' in 'Journal of the Inland Fisheries Society of India' 44(2): 94-98, 2012. (ISSN No. 0379-3435, NAAS-4.15).

A. K. Nath 'Microbial load at two different sites of Hooghly River of West Bengal, India' in the journal 'Ecology, Environment and Conservation' 18(4): 927-929, 2012 (ISSN No. 0971-765X) (Scopus H Index 8, NAAS-5.02)

A. K. Nath and B. Banerjee. 'Comparative evaluation of body composition of hilsa , Tenualosa ilisha (Hamilton, 1822) in different size groups with special reference to fatty acid, in Hooghly estuarine system of West Bengal, India' in the journal 'Indian J of Fisheries' 59(2), 141-146, 2012. (ISSN 0970-6011 NAAS 6.20)

A. K. Nath, M. Chattopadhyay, A. Patra, S. Das, D. Chakraborty, A. Paul and T. Sen. 'Chank Fishery with Special Reference to Bangle Industries in West Bengal, India' in Fishing Chimes , 32 (9): 36-39, 2012 (ISSN No. 0971-4529)



A. K. Nath and B. Banerjee. 'Reproductive Development of Hilsa (*Tenualosa ilisha*) study of gonadosomatic, hepatosomatic and Dobriyal index in Hooghly estuarine system of West Bengal, India in *Fishing Chimes* 32(5): 57-61, 2012. (ISSN No. 0971-4529)

A. K. Nath. 'Indigenous fish faunal diversity of North Bihar, India' in *Fishing Chimes* 32(3): 28-29, 2012. (ISSN No. 0971-4529)

A. Nath, A. Mukhopadhyay, A. Nayak, A. Majumder, S. Sarkar, T. Chowdhury. 'Studies on some aspects of Khebli Beel, Panihati (Sodepur) West Bengal' in *Fishing Chimes*, 30(9): 60-63, 2011. (ISSN No. 0971-4529)

A. K. Nath. 'Naihati fish seed market, West Bengal – National centre of Fish seed sales of hybrid carps and exotic fishes' in the journal 'Fishing Chimes' July, 2010. (ISSN No. 0971-4529)

A. K. Nath, V. K. Gupta, M.A.Khan and P. Panda. 'Diversity of macro benthic fauna in Makhana pond and unmanaged perennial fishery pond in Darbhanga, North Bihar, India' in 'Ecology, Environment and Conservation' 16(4): 651-657, 2010. (ISSN No. 0971-765X) (Scopus H Index 8, NAAS-5.02)

A. K. Nath, S.Roy and A. Paul. 'Ornamental fish trade –with focus on Howrah market, West Bengal, India' 'Fishing Chimes' 30(7): 24-28, 2010. (ISSN No. 0971-4529)

A. K. Nath and S. Banerjee. Studies on the bottom faunal diversity of Ganga River system in relation to water quality adjacent to Serampore area, West Bengal' in the journal 'Asian Fisheries Science', Philippines 22: 21 – 26, 2009. (ISSN 0116-6514)

S. Quasin, K. Ganguly, S. Roy and A. Nath. 'Diversity of macro benthic fauna of two freshwater pisciculture ponds of West Bengal' in the journal 'Environment and Ecology' 27(3): 1017 – 1021, 2009. (ISSN 0970 – 0420) (NAAS – 4.09)

>Books Published

'Hilsa Fisheries in Hooghly-estuarine system of West Bengal, India'. Publ. LAP LAMBERT Academic Publishing (Germany). 2013. Total Pages 175. (ISSN Code No. 978-3-659-45014-3).

Ongoing Research Project:

'Documentation of diversity of freshwater fishes in Hooghly District of West Bengal' sponsored by West Bengal Biodiversity Board, Dept. of Environment, Government of West Bengal. (Memo No.390/3K (Bio)-2/2013 dated 24.06.13.

Completed Project Work :

1. Completed one UGC sponsored Major Research Project (F.No. 38-198/2009(SR) entitled as 'Studies on Hilsa fisheries in Hooghly estuarine system of West Bengal' as Principal Investigator (from 01.02.10 to 31.01.13). The final report was submitted in the month of July, 2013.

Achievements of the project / contribution to the society

The hilsa catch data in both marine and inland sectors of Hooghly-estuarine system was recorded for two years i.e. from March, 2010 to Feb, 2012 in Hooghly-estuarine system of West Bengal.

In inland sectors the total catch in three centers was declined from 0.884 ton (2010-11) to 0.585 ton in the year 2011-12. On the other hand, in marine region catch statistics were higher (4800 – 6800 ton) as hilsa is a marine fish and fishermen use technology to catch fish.

Comparison of monthly rainfall with CPUE does not show any significant relationship but the total annual rainfall played an important role in controlling total hilsa yield in both upstream and downstream. In the upstream rainfall had a significant relationship ($p = 0.034$, $p < 0.05$) with CPUE.

The statistical relationship between length and weight of the fish was derived by parabolic equation suggested by Le Cren (1951), i.e. $W = aL^b$. 'b' exponent describes the rate of change of weight with length. 'b' value was found to be higher in male (3.2278) than female (2.8474). The mean condition factor (CF) value was found to be 1.784492 and 1.113384 in female and male hilsa respectively. High values of CF in female fish due to heavy weight during maturation. The mean value of relative condition (Kn) was 1.0496801 and 1.010145 in female and male fish respectively. High values of the CF and Kn in different length groups indicate a general well being and adaptability of the fishes.

Poly Acrylamide Gel Electrophoresis on glucose 6 phosphate dehydrogenase, one important enzyme of the liver of Hilsa, suggests they have not formed any sub populations. Up and downstream hilsa have similarities at the genetic level.

Different sizes of hilsa fish were collected from different studied stations in Hooghly-estuarine system and analyzed. Proximate body composition showed variations in different size groups. Protein content varied from 10.65 to 59.9 %, lipid content varied from 1.32% to 13.71% and carbohydrate content varied from 0.76% to 7.18% in different weight groups of fishes. Saturated fatty acid content varied from 49.9% to 55.8% and unsaturated fatty acid content varied from 43.75 to 49.45 % during pre monsoon period in different weight groups of upstream fishes. Values were compared with monsoon and post monsoon period in the upstream and downstream fishes. $\omega 3 / \omega 6$ ratio varied from 2.5 to 7.0 in different weight groups, $\omega 6 / \omega 3$ varied from 0.14 to 0.38.

Amylase activity was found to be highest in the alimentary tract. Protease activity is a little higher in midgut, hindgut and hepatic caeca. Low gastric protease activity was noticed in hilsa. Lipase activity was found to be moderate. The mainly available foods found during this study period in hilsa gut are phytoplankton. Perhaps this is cause of higher amylase activity in hilsa fish.

Present study is to describe the reproductive pattern of anadromous fish Hilsa (*Tenualosa ilisha*) in Hooghly-estuarine system of West Bengal, India based on gastro somatic index (GSI), hepato somatic index (HSI) and Dordriyal index (DI) of male and female gonads. The sex ratio was found to be 1:1 in monsoon period. Increase in GSI values in monsoonal time is indicative of the ovarian maturation. A strong positive correlation of GSI with body weight during monsoon period suggests the ovary is increasing whereas HIS value in monsoon time is found to be less indicates the liver function to build up mature ovarian tissue. Increase of GSI values in monsoonal male fishes is also indicative of the testicular maturation.

Present study reveals that cadmium and lead concentration are increasing in Hilsa gills, gonads and body muscles but well below the permissible levels suggested by WHO. Cadmium and lead levels in Hilsa fish have been reported in this paper which is believed to be a great help for fish trade as well as health and safety of the people.

The fishers are the backbone of this large fishing oriented business and only they can play the most important role for the conservation and development of Fishery. In most cases it was found that the Government rules are violated. Mesh size is found below 90 mm range. The juveniles are randomly caught. For the analysis of these high rates of exploitation level when a glance is thrown to their social structure the wretched condition is expressed.

Present study reveals most of the fishermen have kaccha houses. In most of the cases they have either illegal connections or no electricity. Education and health aspects are neglected. From upper to lower stretch the social structure takes a little change as fishermen at least get some alternative job options.

But only a small percentage has such constructive alternative livelihood options. In most of the cases they have to depend private money lenders for livelihood.

2. Completed UGC Minor Research Project – Sanction No. F.PSW-55/06-07 (ERO). Dated 06-Nov-06. The final report was submitted in the month of Nov, 2008.

Title:

Toxicological response and sensitivity of Ganga River biota exposed to industrial effluents with special reference to water quality assessment in some parts adjacent to Hooghly industrial area

Achievements of the project / contribution to the society

Serampore side (station I) of Ganga River in the studied area is more polluted than Barrack pore side (station II) because less no. of tubificid was recorded in station II than station I and chironomid larvae found maximum in station I.

Present study also revealed that toxicants containing heavy metals from industrial effluents along river Ganga might cause large scale mortality to different organisms of the food chain and will hamper the ecological balance of the aquatic ecosystem.

We as members of a civilized society should protect and preserve rather than destroy the delicate balance of our ecosystems by our inadvertent activities.

Study revealed that coli form bacteria exceeds the prescribed limit at both the studied stations. Human excreta caused contamination. So we must be aware of taking bath at both the stations.

In the river Ganga *Thiara lineata* – a gastropod mollusk showed metal accumulation in different size group and they can be used as biofilters / scavengers as well as bioindicators of high levels of metal pollution in aquatic ecosystems.

3. Completed UGC sponsored project (UGC MRP (No.F.PSW-023/00-01 (ERO) entitled as ‘Survey on the Ganga River System adjacent to Serampore College area to assess the possible effect of industries on the aquatic environment and biota’ and submitted in the month May 2002.

Abstract of the completed project

Physico-chemical and biological characteristics of river Ganga have been studied in the area of Serampore (a stretch of about 5 kms.), W.B., from January, 2001 to December, 2001 with a view to assess the resource potentiality of the river Ganga. Water samples and available plankton, nekton and benthic fauna were collected from four stations. Collected samples record a number of faunal composition including different species of fish and a number of plank tonic and benthic organism.

Present observation reveals that two stations are mostly polluting zone than other two stations, which is clear by the abundance of two biomarker gastropod species – *Thiara lineata* and *Thiara scabra*. Concentration of some heavy metals such as viz. Cu, Pb, Cd and Zn were assessed in water, soil, mollusk and fish to trace out the bioaccumulation those heavy metals the zone of pollution. Pb and Cd were found in high amount in the studied area.

The fishes found in the study area were mostly hardy fishes and recorded species show a decline trend in contrast to the previous survey result. Zooplankton abundance were studied throughout the study period and found in minimum nos. /litre of water. Physico-chemical parameters of the river water were also studied to portrait the present status of Ganga river system.