Hydrobiological Assessment Of Zoshk River, Mashhad City

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Abstract

Zoshk River is one of the major rivers of Mashhad city always filled with water .the present study is devoted to hydrobiological study of Zoshk River in a one –year period , from October 2006 to September 2007 , in four sites the origin or the river to the end of Shandiz region . In this study physical factors such as water temperature , air temperature as well as chemical factors such as NO_3 , PO_4 , BOD_5 and PH were measured . During the study period concentration of soluble Oxygen was always in saturated conditions with an average of 9.6 mg/L and the concentration of BOD_5 was always ignorable with an average of 3.7 mg/L . Based on the results , Zoshk River is a good place aquaculture and raising Oncorhynchus mykiss.

Keywords-*:* Zoshk River; aqua culture; BOD_5; PH.

I. INTRODUCTION

Rivers are lotic or running water environment that are usually habitats to an amazing diversity of species with abundant specialized niches. They are also sources of water for drinking, cleaning, bathing, washing clothes, preparing and cooking food, gardening and even for irrigating farmlands. Moreover, they serve as source of livelihood like fishing and in some areas, quarrying [1] .

Zoshk River is one of the branches of the Kashafrud. It flows from the northern slopes of the Binalud mountains towards the Northeast, Length of the river is 540 km . the purpose of this present paper is investigating of quality of water in 4 various stations.

II. MODEL DETAILS

Four stations were established by using of various factors such as maps with Scale 1:150000 ,taking into account water flow rate and substrate gene of river and amount of Baetis population changes (finge 1). the Zoshk River were sampled between October 2006 and September 2007. Different Physico-Chemical parameters were measured like pH, temperature, dissolved oxygen (DO) , phosphates and nitrates. To sample Benthic Macro of flow waters , we had used a customary device named Sorbey . Then Obtained samples that fixed with 4% formalin were investigated.

Determination of Dissolved Oxygen (DO), pH and Temperature.

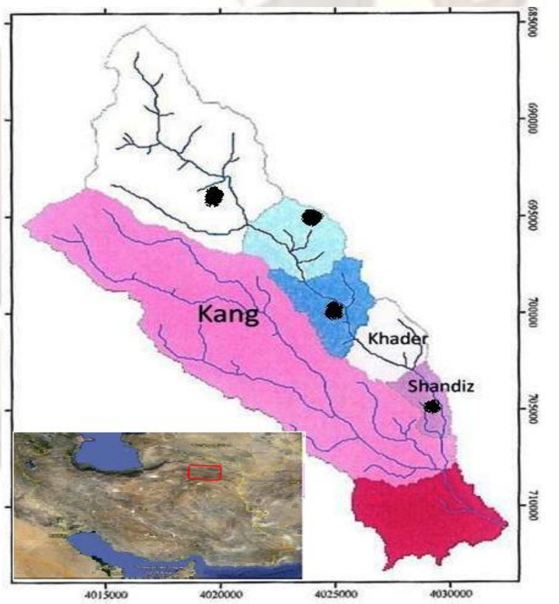
In situ measurements of dissolved oxygen, pH and temperature were conducted a portable DO meter, pH meter and thermometer , respectively in three replications.

Nitrate Analysis

To measure nitrate , we used identifiers of sodium chloride , concentrated sulfuric acid and sulfate acid Berosin . After the steps relevant, The final solution absorbed was read at wavelength of 41 nm . in comparison with the standard absorbed curve of device, the nitrate concentration of water samples was calculated [2] .

Phosphates Analysis

`We've added 0.5 ml of compound solution included ammonium molybdate, sulfuric acid, ascorbic acid potassium molybdate to 100 ml of water sample by using of scaled Cylinder . and immediately Blend and We were to evaluate the light fading coefficient in wavelength 885 nm after 10 minutes . in comparison with the standard absorbed curve of device, the Phosphate concentration of water samples was calculated [3] .



finge 1:The map of zoshk river ●shows the sampling sites

III. RESULTS

According to our results, the amount of oxygen in all year levels is desirable The amount maximum of dissolved oxygen was measured

Station 3 in August 12(mgr/Li) , amount least of dissolved oxygen was measured 8.5 (mgr/Li) at station 1 in September and average dissolved oxygen is 9.6(mgr/Li) . zoshk River PH sampled during one year, amount maximum 8.3 from Station 2 in December and amount least 7 from Station 1 in June was measured. We've measured amount maximum of BoD_5 sampled 7.83 (mgr/Li) from Station 4 in January and amount least 1.71(mgr/Li) of Station in April and it's average is 3.71(mgr/Li) .amount maximum and amount minimum Nitrate sampled respectively is 7.13 (mgr/Li) from Station 3 in January and 0.01 (mgr/Li) from Station 1 in April.

worm) , Arthropoda and also of orders such as Trichoptera , Ephemeroptera, Diptera .

During the review year, 22 families were identified and the annual average total number of species identified is 1665. genes Baetis sp and Simulium sp, respectively, with 696 and 466 numbers have the highest abundance also geness Stratiomys sp and Piscicola sp with 1 number have The least abundance Benthic Macro comparison abundance shows the highest abundance in the months of November and December with a lot of 489 and 236 numbers and in the months of April and May, there wasn't no inventory at different stations (Table2) .

2006 _ 2007												
	October	November	December	January	February	March	April	May	June	July	August	***September***
NO_3 (mg/L)	8.03 ±4.86	3.09 ±0.73	2 ±0.35	7.13 ±2.37	4.63 ±1.23	0.88 ±0.59	0.7 ±0.49	1.71 ±0.81	1.97 ±1.21	3.21 ±1.09	2.4 ±1.05	2.15 ±0.73
PO_4	0.31 ±0.11	0.22 ±0.05	0.39 ±0.08	0.52 ±0.1	0.49 ±0.14	0.02 ±0.01	0.14 ±0.02	0.35 ±0.61	0.83 ±0.32	0.08 ±0.03	0.08 ±0.03	0.11 ±0.11
PH	7.2 ±0	8.1 ±0	8.1 ±0.16	7.9 ±0.31	7.93 ±0.35	8.08 ±0.08	7.82 ±0.04	7.35 ±0.29	7.59 ±0.28	7.66 ±0.17	7.66 ±0.27	7.49 ±0.23
DO (mg/L)	8.5 ±0	9.8 ±0	10 ±0	10 ±2.31	9 ±0	9.4 ±1.52	11.3 ±0	9.25 ±0	9 ±0	10.2 ±2.19	8.5 ±0	9.13 ±0.39
BOD_5				7.83 ±1.91		4.18 ±1.98	1.71 ±0.57	2 ±0.71	2.88 ±0.64	5.28 ±1.51	2.67 ±0.75	3.13 ±0.99
water temperature	11±0	9±0	7±0	7±0	7±0	12±0	12.8 ±0.27	12.3 ±1.36	14.5 ±2.81	13.9 ±2.81	14 ±0.87	10 ±0.74
air temperature	16±0	4.5±0	3±0	3±2	10±0	21.5 ±1.64	19 ±4.38	21.5 ±0	24.3 ±2.7	22.8 ±1.59	23 ±1.73	10 ±3.69

Table1: Results of physical factors - chemical sampling stations in Zoshk River

The results show that Identified Benthic Macro-Invertebrate in Zoshk River for example branch Annelidae(Segmented worm),Platyhelminthes (Flat

	October	November	December	January	February	March	April	May	June	July	August	***September***
Baetis sp	126±195	98±79	58±38	95±100	84±78	0±0	0±0	0±0	13±17	75±34	94±81	56±63
Simulium sp	278±699	63±70	27±23	41±74	12±18	0±0	0±0	0±0	1±2	7±7	23±37	14±12
Tipulasp	1±1	1±0	1±0	1±1	0±0	0±0	0±0	0±0	0±0	2±3	1±1	0±0
Empididae	1±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0
Lumbriculidae	5±4	15±11	11±10	4±4	3±2	0±0	0±0	0±0	1±1	10±31	1±1	3±2
Lumbricidae	2±1	4±7	16±7	6±6	2±2	0±0	0±0	1±1	0±0	0±0	3±6	1±1
Elmis sp	23±32	13±19	9±9	9±6	4±3	0±0	0±0	2±3	23±20	21±15	3±3	9±9
Chironomus sp	33±48	23±12	18±15	11±7	6±5	0±0	0±0	4±5	41±28	35±28	6±6	19±17
Hydropsyche Sp	3±3	3±2	1±2	3±4	1±0	0±0	0±0	1±0	0±0	0±0	5±8	0±0
Psycodidae Sp	9±2	6±7	17±24	12±22	1±0	0±0	0±0	1±0	0±0	0±0	0±0	0±0
Chironomus Sp	2±4	4±4	1±1	1±1	0±0	0±0	0±0	1±1	2±2	1±0	1±0	3±2
Glossiphonidae Sp	0±0	0±0	1±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0
Asellus sp	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	1±0	0±0
Polycelis	0±0	0±0	0±0	1±0	1±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0
Dicranota sp	1±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0
Tabanus sp	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0
Piscicola sp	0±0	0±0	0±0	0±0	1±1	0±0	0±0	0±0	0±0	0±0	0±0	0±0
Culex sp	1±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	1±1	0±0	0±0
Psychoda sp	1±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	1±0	0±0	0±0	0±0
Eristalis sp	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	1±0	0±0	0±0	0±0
Stratiomys sp	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0	1±0	0±0	0±0	0±0
sum	489	236	162	186	115	0±0	0±0	9	83	144	138	103

Table2 :Distribution Benthic Macro-Invertebrate in zoshk rivers in years 2006-2007

Table 3 shows that the concentration genes Baetis sp and Simulium sp at stations 1 and 2 is more than 3 or 4 stations . it is represents average water quality at this station .the concentration genes Chironomus Sp and Elmis at stations 3 and 3 is more than 1 or 2 stations. it can indicate pollution of these stations

	St1	St2	St3	St4
Baetis sp	74.25	77	43	13
Simulium sp	101	28	12	3
Tipula sp	0	1	2	0
Limoniidae sp	0	1	0	0
Lumbriculidae sp	3	5	3	7
Lumbricidae sp	1	3	2	1
Elmis	6	9	11	13
Chironomus sp (L)	9	13	16	22
Hydropsyche sp	1	2	1	1
Psycididae sp	1	3	7	4
Chironomus Sp (P)	1	2	2	2
Glossiphonidae Sp	0	0	1	0
Asellus	0	1	0	0
Polycelis	1	0	0	0
Dicranota sp	1	0	0	0
Tabanus sp	0	0	0	0
Piscicola sp	1	0	0	0
Culex sp	0	0	1	0
Psychoda sp	0	0	1	0
Eristalis sp	0	0	1	0
Stratiomys sp	0	0	1	0

Table 3: The average Benthics at 4 stations sampled in 2006-2007

Discussion

Population structure and high density of Baetis is indication of favorable ecological conditions in this part of the river .

The results show physical stresss such as environmental stress as due to constrution and development , destruction of river canals and finally destructions caused by floods rather than stress due to organic pulloutions.

References

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