

Contents

<i>Subject</i>	<i>Page</i>
INTRODUCTION -----	1
THE AIM OF WORK -----	4
REVIEW OF LITERATURE -----	5
Water Quality -----	5
Hemoglobin content and Respiratory functions of blood---	19
MATERIALS AND METHODS -----	30
Study Locations -----	30
Water Sampling -----	31
Water Analysis -----	32
1- Determination of water temperature -----	32
2- Determination of water pH -----	32
3- Determination of water total alkalinity -----	32
4- Determination of water electric conductivity -----	32
5- Determination of water total dissolved solids -----	32
6- Determination of ammonia in water -----	33
7- Determination of water turbidity -----	33
8- Determination of water dissolved oxygen -----	33
9- Determination of water biological oxygen demand -----	33
10- Determination of water chemical oxygen demand -----	33
11- Determination of water major anions -----	33
12- Determination of major water cations and heavy Metals --	34
Fish Sampling -----	34
Blood Analysis-----	35
1- Determination of blood hemoglobin content-----	35

Contents

Subject	Page
2- Determination of respiratory functions of the blood-----	35
a- Blood gases and acid–base status-----	35
b-Oxygen equilibrium curve (OEC) -----	35
Statistical Analysis -----	35
RESULTS -----	37
I-Water physico-chemical characteristics -----	37
1- Temperature -----	37
2- The pH value -----	37
3- Total alkalinity (carbonate and bicarbonate) -----	37
4- Electric conductivity (EC) and total dissolved solids (TDS)-	37
5- Ammonia -----	42
6- Turbidity -----	42
7- Dissolved oxygen -----	42
8- Biological oxygen demand -----	42
9- Chemical oxygen demand -----	42
10- Major cations -----	47
a- Sodium -----	47
b- Potassium -----	47
c- Calcium -----	47
d- Magnesium -----	47
11- Major anions -----	51
a- Chloride -----	51
b- Sulphate -----	51

Contents

Subject	Page
c- Phosphate -----	51
d- Nitrate -----	51
12- Heavy metals -----	55
a- Iron -----	55
b- Manganese -----	55
c- Zinc -----	55
d- Copper -----	55
e- Lead -----	56
f- Cadmium -----	56
II-Blood Analysis -----	61
Blood hemoglobin content-----	61
Respiratory functions of the blood-----	61
1- Blood Gases-----	61
a- Blood oxygen partial pressure (PO ₂) -----	61
b- Blood oxygen saturation (%O ₂ Sat.)-----	61
c- Blood carbon dioxide partial pressure (PCO ₂)-----	62
2- Blood acid-base status -----	62
a- Blood pH -----	62
b- Blood bicarbonate concentration (HCO ₃ ⁻) -----	62
c- Blood total carbon dioxide concentration (TCO ₂)-----	63
d- Blood base excess concentration (BE)-----	63
3- Oxygen equilibrium curve (OEC) -----	63
DISCUSSION -----	77

Contents

<i>Subject</i>	<i>Page</i>
ENGLISH SUMMARY-----	89
REFRANCE -----	92
ARABIC SUMMARY-----	