Ain Shams University
Faculty of Science
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Environmental Studies on Invertebrates of Lake Qaroun (Fayoum, Egypt) for Proper Management of its Natural Resources

A Thesis Submitted in Partial Fulfillment for the award of the Degree of Doctor Philosophy in Zoology (Aquatic Ecology)

BY

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2017

Abstract

The present study was carried out on Lake Qaroun during the period from May 2014 to February 2015 to assess water quality of the lake and 2 trophic levels (zooplankton and macro benthos) to set up a proper management plan for enhancing the lake's productivity.

The results revealed that the areas in front of El-Bats and El-Wadi drains exhibited somewhat of organic pollution; lowest transparency, DO and salinity values. In addition, the water in front of El-Wadi drain recorded the highest values of iron (Fe), copper (cu) and nitrates (NO_3). On the other hand, zooplankton community was represented by five groups; Rotifera, Protozoa, Arthropoda, Annelida and Nematoda. Rotifera was the most dominant group representing 75.68% of total zooplankton, which is an indicator of eutrophication of the lake. Furthermore, the study revealed that most of freshwater zooplankton species disappeared due to increasing of salinity with few freshwater species that could tolerate high salinity ranges. The community of macrobenthic invertebrates was represented by four groups; Arthropoda (68.55%), Annelida (18.55%), Mollusca (11.84%) and Coelentrata (1.06%). *Corophium acherosicum* was the most dominant species (34.91%) and it is considered a bioindicator of organic pollution. In addition, Morphoedaphic Index (MEI) was calculated to assess the existing yield and derive estimates of the future potential yield. The result revealed that the lake production has been decreased than the expected yield. Furthermore, the relationship between zooplankton, macrobenthos and fish production reflects instability of fish production as a result of implementation of irrational and unevaluated composition from period to another due to variation in species composition of transplanted fry. Analysis of DPSIR framework components enabled us to get proposed policies and responses to mitigate the effect of pressures and their impacts. In the management plan, it was recommended to monitor water quality and salinity; to treat waste water before discharging into the lake, as well as examining the newly transmitted fish fry to avoid invasive and parasitic species that destroyed the productivity of the lake during the last 3 years.

Key words: Lake Qaroun, invertebrates, management plan

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Acknowledgements

First of all, I would like to thank God who enabled me to fulfill this work and overcome the difficulties I have faced.

I am greatly indebted to Dr. Magdy T. Khalil, Professor of Aquatic Ecology, Faculty of Science, Ain Shams University, not only for his keen interest and fruitful suggestions, but also for his continuous encouragement.

This work could not have been completed without the keen interest and support provided by Dr. Mohamed Reda Fishar, Professor of Aquatic Invertebrates, National Institute of Oceanography and Fisheries (NIOF).

I would like to thank Dr. Safwat Shakir Hanna, Professor of Chemical Engineering, Texas A & M University, for his supervision and cooperation during this work.

Special thanks are given to Dr. Amany S. Amer, Associate Professor of Invertebrates, Central Lab. for Environmental Quality Monitoring (CLEQM), who participated actively and most effectively during analyzing the samples and revising the manuscript.

Also I'd like to thank Dr. Madlen M. Habashy, Professor of Aquatic Invertebrates, National Institute of Oceanography and Fisheries (NIOF), for her cooperation during laboratory work.

Finally, there are no words could express my thanks to my beloved husband for his support and encouragement and I would like to dedicate this work to my lovely son.

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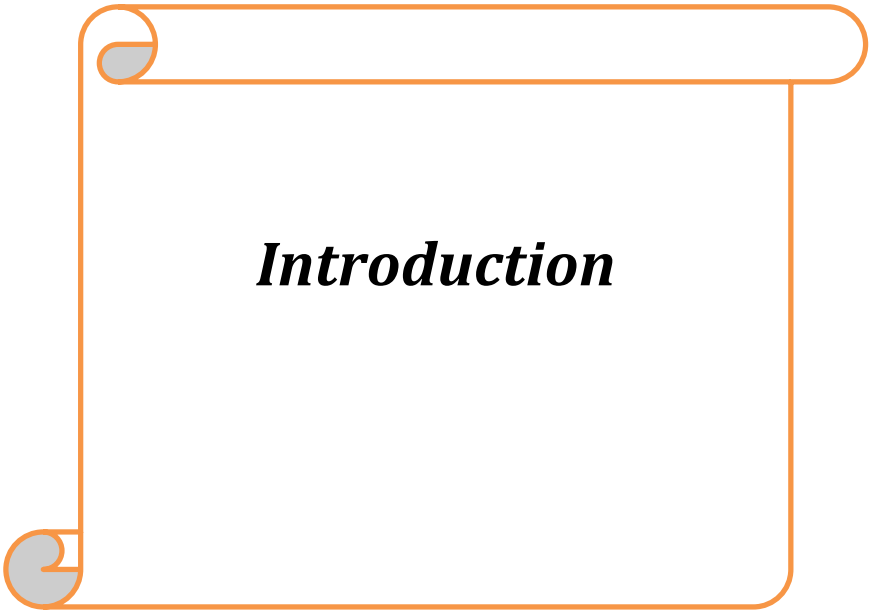
Introduction