BUSITEMA UNIVERSITY
Pursuing Excellence

AN INVESTIGATION INTO ECOLOGICAL IMPACTS OF WATER HYACINTH AND PAPYRUS ON FISH IN RIVER NILE AT NAMASAGALI, KAMULI DISTRICT

BY

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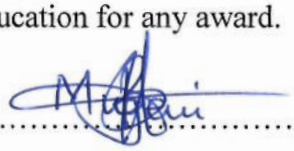
DECLARATION

This research report is my original work and has not been presented to any institute of higher education for any award.



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DEDICATION

My efforts presented in this prudently prepared piece of work are dedicated to my family and relatives, Busitema University (Namasagali Campus in particular), classmates and friends.

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ABSTRACT

A study was undertaken in the upper Victoria Nile at Namasagali, in Kamuli district with the aim of determining the impacts of water hyacinth and papyrus on fish ecology between March and April, 2019. In total 13 sites dominated by water hyacinth and papyrus were identified but eight were randomly selected for this study. Fish samples were collected using a panel of gillnets (1-5 inches) set at 17:00 hrs and retrieved at 8:00hrs. Identification and classification of fishes was done basing on the morphological features with the aid of identification kits.

A total of 13 fish species were encountered in the vegetated habitats in comparison to nine in the open water habitats. Haplochromine fishes dominated native fish species in all sampled habitats. Four of the invasive species i.e. *Lates niloticus, Oreochromis niloticus, Tilapia zillii,* and *Oreochromis leucostictus* were encountered in this study. Water hyacinth revealed the highest species composition and diversity, and abundance (in terms of numbers) while papyrus exhibited the highest relative abundance in terms of weight (g±SE).

Haplochromines, *O. niloticus* and *L. niloticus* in open water and papyrus habitats exhibited a negative allometric growth pattern as compared to the isometric growth exhibited by fish in water hyacinth habitats except for *O. niloticus*. The fish in all sampled habitats showed a good condition. The differences in the species composition amongst the habitats could be attributed to factors such as depth differences, vegetation and substrate types, and varying influence of season and diurnal patterns. Water hyacinth seems to act as a sheltering and nursing area of small size fishes while papyrus may act as a breeding area. Thus fishing in these areas should be prohibited and clearing of papyrus plants for agriculture should be punishable.

INTRODUCTION

Aquatic plants are plants that are able to achieve their generative cycle when all vegetative parts are submerged or are supported by water, or which occur normally submerged but are induced to reproduce sexually when their vegetative parts are exposed (Den & Segal., 1964). Examples of aquatic plants include *Phragmites spp*, *Typha spp*, *Vossia*, *Cyperus papyrus*, *Salvinia mollesta*, *Eichhornia crassipes*, and *Hydrilla verticillata*.

Aquatic plants transform into weeds if they proliferate to socio-economically undesirable levels and cause direct or indirect effects to aquatic environment. Directly, aquatic plants hinder navigation, increase sedimentation and affect recreation activities. Indirectly they reduce of dissolved oxygen (Yongoet al., 2017), cause water losses through evapotranspiration and hinder photosynthesis which may ecologically affect the aquatic biota.

Therefore in absence of control measures, aquatic weeds may become a threat to aquatic ecosystems especially shallow waters as they may lead to transformation of aquatic ecosystems to terrestrial ones (Arnold & Kevin., 2011).

Aquatic plants are widely spread all over the whole world. However the distribution and abundance of aquatic plants differs from region to region due to the differences in the environmental factors that favour there growth. In Uganda, the exotic aquatic weed water hyacinth (*Eichhornia crassipes*) occurs together with other indigenous aquatic plants such as papyrus (*Cyperus papyrus*) and these were the focus of the study.

Literature review

Origin and distribution of papyrus and water hyacinth

C. papyrus (papyrus) is native to Africa and is distributed all over the whole of Africa though it is well developed and widely distributed in the Nile River Valley of northern Africa, Madagascar and the Mediterranean countries(Nehru & Botanic., 2014) and is dominate in wetland areas or lake shores with shallow water depth especially around lake Victoria basin (Carter., 1955, Beadle., 1981).

Water hyacinth (*E. crassipes)*, is a free floating macrophyte native to South America and is firmly established throughout the River Nile Basin. The weed was reported on the northern part of River Nile in Egypt between 1872 and 1892, and central Sudan in early 1950s (Makhanu & Victoria., 1997). In Uganda, the weed was first observed on Lake Kyoga in

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