Research Article Open Access

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Abstract

A study was conducted to investigate the biochemical composition and diet type of Nile tilapia (Oreochromis niloticus) collected from Tekeze reservoir and Lake Hashenge, Ethiopia between December, 2014 and March, 2015. A WRWDO ¿VKHV ZHUH FROOHFWHG IURP WKH WZR ZDWHU ERGLHV IURP HDFK E size. The stomach contents were analyzed using frequency of occurrence and numerical methods. The food items in the stomach covered a wide variety, ranging from various types of phytoplankton to zooplankton and macrophytes. The food composition of O. niloticus VKRZHG WKDW WKHUH ZDV YDULDWLRQ ZLWKLQ WKH ¿VK VSHF major food items in terms of frequency of occurrence collected from the stomach of O. niloticus in Tekeze reservoir were Pediastrum (68.85%), Microcystis (60.45%), Peridinium (59.70%) and Staurastrum (41.56%) and from Lake Hashenge were Daphnia (63.12%), Copepods spp (56.90%), Nauplii (52.11%), and Macrophytes (45.56%).The contribution of zooplankton (Daphnia, copepods and Nauplii) was higher in case of Lake Hashenge but Pediastrum spp., Microcysts spp. and Peridinium VSS ZKLFK ZHUH SK\WRSODQNWRQ W\SH ZHUH WKH GRPLQDQW IRRG L

7KH ¿VK VSHFLHV IURP WKH ZDWHU ERGLHV ZHUH WUDQVSRUWHG WR WKH OD composition such as crude protein, crude fat, moisture, ash, carbohydrate and some minerals. The chemical analysis UHYHDOHG WKDW WKH FUXGH SURWHLQ FRQWHQW RI WKH ¿VK VSHFLHV FROOHF 15.31-16.32% of wet weight. The crude fat content and ash ranged between 1.20 and 2.45, 0.81 and 1.16% of the ZHW ZHLJKW FRUUHVSRQGLQJ\ 7KH FRQFHQWUDWLRQV RI VRPH HOHPHQWV ZH VH[HV DQG ORFDWLRQ ZHUH WKH ¿VK ZDV FROOHFWHG 7KH DQDO\]HG PLQHUDO K>Na>Ca>Mg>P>Fe>Zn>Cu>Mn. This investigation is an important measure towards the data needed to create information of the relationship between food type and biochemical composition. As the present study revealed that the ¿VK VSHFLHV DUH JRRG VRXUFHV SURWHLQV DQG IDWV WKHUH LV QHHG WR LQYH DFLGV RI WKH VDPSOHG ¿VKHV

Keywords: Daphnia; Food items; Lake Hashenge; Nile tilapia; proximate composition

Introduction

Nile tilapia (Oreochromis niloticus) [1] is widely distributed in tropical and subtropical Africa in the Volta, Gambia, Senegal, Niger Rivers and the Nile River basin and is native to Lakes Chad, Tanganyika, Albert, Edward, and Kivu [2,3].

Ethiopia has relatively large area of inland water bodies that contain diverse aquatic ecosystems giving great scienti c interest and economic importance. ere are di erent economically and ecologically

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reservoir were mostly phytoplankton and in case of Lake Hashenge zooplankton were the most abundance food items. e types of food items found in the stomachs of O. niloticus collected from Tekeze reservoir were di erence from the stomach content of sh collected from Lake Hashenge in type and abundance. In addition to zooplankton and phytoplankton, detritus and aquatic macrophytes were also considerable importance in the diet of O. niloticus due to some nutritional bene ts. Several authors have provided similar interpretations about the importance of detritus and macrophyte in di erent parts of Africa [2,29]. In the present study, proportion of phytoplankton was higher from the stomach of O. niloticus collected from Tekeze reservoir. e stomach content proportion of the sh collect from Lake Hashenge was higher in zooplankton than in phytoplankton. e composition di erences and relative contribution of food items may partly explained by di erence in habitat occupied of the sh.

Proximate composition of Nile tilapia

e proximate composition of the muscle of O. niloticus was estimated and presented in Table 3. Data on moisture, crude protein, crude fat, ash and carbohydrate content were expressed as percentag composition. e proximate composition of the llet of O.niloticus collected from the two water bodies showed signi cant di erence ($P<0.05$). is variation may be many possible factors such as size, sex, maturity of samples and sampling locations that can a ect the di erences in proximate composition of sh [30].

Sex has no signi cant ($P>0.05$) e ect in the proximate composition (moisture, ash, crude fat, crude protein and carbohydrate) of the sh species collected from the two water bodies. Moisture content among the sh species was observed between 77.55 and 79.83%. e results showed that there was signi cant di erence ($P<0.05$) in the moisture content of the sh species collected from the two water bodies. e moisture content of male shes was higher than the female shes within the species even though they were not statistically signi cant ($P>0.05$). is result was in line with the results of Edirisinghe, et al [30]. Results obtained from the moisture analysis of the sh species collected from the two water bodies showed that the sh samples, O. niloticus from Tekeze reservoir, which was locally harvested in large quantities had the highest percentage of moisture content (79.83 ± 0.34 for male and 79.11 ± 0.14% for female) than O. niloticus from Lake Hashenge had the lowest moisture content (77.55 ± 0.22% for female and 77.69 ± 0.39% for male). is shows that, O.niloticus from Hashenge have concentrated nutrients than O. niloticus from Tekeze Reservoir which agreed with the report of Egbal et al. [31] between O. lazera and O. niloticus. Zmijewski et al [32] found a reverse correlation between the fat and water content to be common among sh species, and it was in line with the present result in sor frl2r for(0Jobt al [[311]T

FAO [33] moisture and lipid contents in sh llets are inversely related. e percentage range of the moisture content of sh muscle was within the acceptable level (60%-80%) in all the samples which could be due to the stable water levels in the environmental location where the sh were collected [34]. In this study, the moisture content of male sh was higher than the female sh, and this may be due to the higher level of organic materials in females [35]. In connection with this work di erent researchers have reported that moisture content of male sh was higher than the female sh [36,37].

e content of crude protein of the sh species collected from the two water bodies ranged between 15.32 and 16.32%, which was in the range of permissible limit (15-28%) for sh and sheries products, and the protein content of female O. niloticus from Hashenge was higher (16.32 ± 0.30%) and male O.niloticus from Tekeze reservoir showed signi cantly lower ($p<0.05$) protein content (15.32 ± 0.28%) [38]. Alemu et al. [23] reported that the protein content of male and female O. niloticus collected from Zeway was 14.5 and 14.6% respectively which was lower than the result of present study. Higher crude fat and protein content in O. niloticus collected from Lake Hashenge may

that remains a er the organic matter has been burnt o . e highest ash content was recorded from O. niloticus collected from Tekeze reservoir (1.16% in male) and lowest value from female O. niloticus from Lake Hashenge (0.81%). Similar values of ash have also been reported by Alemu et al. [23] for O. niloticus Lake Ziway. Results of Job et al. [1] are in disagreement with the present results in the ash content of O. niloticus which was lower (0.57%).

e carbohydrate content ranged between 1.22% for female O.niloticus and 1.61% for male O. niloticus from Tekeze Reservoir.e results observed for carbohydrate showed no signi cant di erence ($p > 0.05$) within sh species collected from the two water bodies (Table 3).

e biochemical composition of tilapia varies considerably depending on growing conditions (temperature, dissolved oxygen, pH, salinity, turbidity, altitude, light or luminosity, among others factors)

53. Alli M, Salam A, Igbal F (2001) Effect of environmental variables on body