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PROXIMATE ANALYSES OF SOME SELECTED FISH SPECIES IN LAKE GERIYO, YOLA, ADAMAWA STATE, NIGERIA

JA'AFARU ALI AND TANGWA GODFREY

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ABSTRACT

Crude protein, crude lipid and moisture content were determined from five fish species (Oreochromis niloticus, Clarias lazera, Lates niloticus, Citharinus citherus and Synodontis clarias) in both wet and corresponding dry samples. Standard analytical methods were used. Oreochromis niloticus had the least crude protein content (11.21% and 13.26%) in the wet and dry samples respectively. Lates niloticus had the highest crude protein content of 12.9% and 16.11% in the wet and dry samples respectively. There was no significant difference at P>0.05 between dry and wet sample and between the five species of fish sampled. Similarly, crude lipid content for O. niloticus was the lowest (3.0% and 3.4%) for wet and dry samples respectively. While Synodontis clarias showed the highest lipid content 5.6% and 13.1% for wet and dry samples respectively. Percentage moisture content was measured and O. niloticus showed the highest value of 82.08% while Synodontis clarias showed the lowest value of 65.78%. There was no significant difference at P > 0.05 between moisture content and all the five species of fish sampled.

KEY WORDS: Proximate analysis, Oreochromis niloticus, Clarias lazera, Lates niloticus, Citharinus citherus

INTRODUCTION

The role of fish in the diet of African people cannot be over emphasized due to the fact that it is the cheapest and available source of animal protein. There is vast literature on the proximate analysis of fish. This includes, Mumba and Jose, 2005, Onasanya 2002, Hetzel, 1994, Effiong and Mohammed 2008, Oyedapo et al 2005.

In Yola and its environs, most of the consumed fish here are Oreochromis niloticus, Claria lazera, Lates niloticus, Citharinus citherus, and Synodontis clarias. This work therefore looks at the proximate analysis of these fishes to ascertain its usefulness in the diet of people in this locality.

MATERIALS AND METHODS

10 specimens each of Adult Oreochromis niloticus, Clarias lazera, Lates niloticus, Citharinus citherus and Synodontis clarias were collected live from Lake Geriyo Yola – Nigeria with the assistance of local fishermen. The size range of the fish sampled were as follows; O niloticus 8.21-16.10cm, Clarias lazera 15.34-23.40cm, Lates niloticus 12.32- 18.60cm Citharinus citherus 7.11-13.50cm and Cynodontis clarias 5.80-12.60cm. These specimens were immediately conveyed in a cool box to the laboratory of the Department of Biological Sciences, Federal University of Technology, Yola Nigeria for analysis. The weight and length of fish were measured in gram (g) and centimeter (cm) using weighing balance (Sartorrus 1219MP) standard and a meter rule respectively. Fish samples were gutted, washed, filleted and finely crushed into a uniform paste (for wet sample) and powder form for dry sample using an electric oven at a temperature of 120^{o}C for 30 minutes. After drying the sample was homogenized using kitchen blender. The moisture content crude protein and lipid content were then determined using standard procedures of AOAC, 2005.

RESULTS

Oreochromis niloticus, Clarias lazera, Lates niloticus, Citharinus citherus and Synodontis clarias were studied for proximate analysis. Percentage crude protein content varied amongst different fish species. High values were observed in dry than in wet samples. In wet samples, the value ranged between 11.21% and 12.9% (Table 1). Clarias lazera, Lates nitoticus and Synodontis clarias recorded the highest percentage (12.96%) and O. niloticus recorded the least value of crude protein (11.21%). In corresponding dry samples, the percentage crude protein content ranges from 3.26% to 16.11%. The highest percentage value was recorded for Lates niloticus, O. niloticus still had the least value (13.26%).

Percentage crude lipid content varies amongst different fish species (Table 1). In the wet sample O. niloticus recorded the lowest value of percentage crude lipid (3.0%) while Synodontis clarias recorded the highest value of 5.6%. In the dry sample, Synodontis clarias showed the highest value (13.1%) while O. niloticus showed the lowest values of 3.4%. (Table 1). The mean percentage crude lipid content was low (4.0%) in wet samples and high (9.0%) in the dry samples. Percentage moisture content ranged from 65.78% to 82.08% with Synodontis clarias recording the least value. Oreochromis niloticus recorded 82.08%. The mean percentage moisture content for all the fish species was 72.25 % (Table 1).

DISCUSSION

Most of the fish species sampled from lake

Ja'afaru Ali, Department of Biological Sciences, Federal University of Technology, Yola
Tangwa Godfrey, Department of Biological Sciences, Federal University of Technology, Yola

Geriyo had high percentage crude protein content in both wet and dry samples. High values of crude protein were observed in dry than in wet samples. This result agrees with Ogbonnaya and Ibrahim, 2009 who work on proximate composition of cat fish Clarias lazera. There was no significant difference at (P > 0.05) between the wet and dry samples.

Clarias lazera, Lates niloticus and Synodontis clarias recorded high values of crude protein in both wet and dry samples. Earlier reports of a range of 12 – 20% protein content in fish muscles were made [Zelibe 1989) Henderson and Tocher (1987), Andrade et al (1995) Osibona et al (2006) Ogbonnaya, (2009)], Oyedapo et al (2005) however obtained values between the range of 66.66 and 9.30%. High crude protein value may be due to season of the year, effect of spawning, migration and food availability (Abdullahi 2001). Crude protein content in fish could be affected by age, nutrition, physiological condition and genetic factors. Different fish species also have different capacities to store food (Lagler 1952). It could be that lower percentage crude protein content found in

O. niloticus has a genetic origin and as such the observed value may be peculiar to it.

Percentage Crude lipid content was low in both wet and dry samples of most fish species. Lates niloticus, Oreochromis niloticus and Clarias lazera showed low crude lipid values suggesting that the sample species may be lean fish. This is in conformity with the range (< 1-20%) reported earlier by Beckett and Usua 1985, Stansby 1982, Ackman, 1989, Mendez, et al 1996 and Osibona et al 2006. Very low lipid value exhibited by O. niloticus explains why problem of rancidity does not occur during sun-drying of this species. The low lipid value in the sampled species could be due to poor storage mechanism and the use of fat reserves during spawning activities (Osibona et al 2006).

The % moisture content of all the fish species sampled was within the range earlier reported by Gallagher et al 1991, Osibona et al 2006, Effiong and Mohammed, 2008, Abdullahi 2001, Abdullahi 1999, Effiong and Tafa, 2005. The relationship between moisture and lipid is well established in this work. The moisture content is inversely proportional to the lipid content. This result agrees with FAO (1999), and Robert (1986). However, Osibona et al 2006 did not observe this pattern in his study on Clarias gariepinus and attributed this to the fact that this species is a non-fatty fish.

CONCLUSION

This study determined protein, lipid and moisture content in five (5) fish species Oreochromis niloticus, Clarias lazera, Lates niloticus, Citharinus citherus and Synodontis clarias. Nutrient contents varied among the different fish species. Higher protein and lipid contents were observed in dry samples than their corresponding wet samples. This was however not significant at (P > 0.05). Although Lates niloticus had the highest crude protein content as well as low crude lipid content, O. niloticus and C. lazera could be recommended as a possible effective ways to solve protein malnutrition. Both species, O. niloticus and C. lazera are abundant, easily captured, low priced and highly preferred by the local people.

Table 1 – Moisture, Protein and Lipid content of some species of fish from Lake Geriyo

Fish Species	Moisture (%)	Protein (%)		Lipid (%)	
		Wet	Dry	Wet	Dry
O. niloticus	82.08 ± 18.23	11.21 ± 1.26	13.26±1.96	3.0±0.29	3.4 ±0.26
		12.96 ± 1.63	15.76±2.34	3.6±0.24	6.8 ±0.49
Clarias lazera	70,81 ± 0.08	12.96 ± 1.72	16.11±2.98	2.8±0.19	9.6 ±1.90
		12.96 ± 1.64	14.01± 2.20	5.0±0.62	12.3 ±1.60
Lates niloticus	70.85 ± 0.08	12.96 ± 1.66	13.66±1.96	5.6±0.80	13.1 ±1.82
Citharinus citherus	71.72 ± 0.06				
Synodontis clarias	65.78 ± 0.17				
Mean	72.25 ± 16.20	12.47±1.68	14.66±2.37	4.0±0.53	9 .0±1.83

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