



**FEDERAL UNIVERSITY OF TECHNOLOGY
MINNA**

AFRICAN CATFISH:
A NATURAL PROTEINOUS CHOICE

By

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INAUGURAL LECTURE SERIES 73

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AFRICAN CATFISH (*CLARIAS GARIEPINUS*): A NATURAL SELECTION TO SOLVE AFRICA'S FOOD PROTEIN DEFICIENCY PROBLEM

1.0 INTRODUCTION

1.1 WHAT IS FISH?

Fish is an aquatic vertebrate possessing some unique features such as gills for breathing and fins for locomotion in water which is its medium of life. The word "fish" is loosely used in fisheries and aquaculture to include both fin fish and other aquatic animals. Thus in a non literary definition, fish is all aquatic organisms exploited by man for any of their beneficial uses. This includes all aquatic vertebrate and invertebrate, shell and non-shell fishes such as Octopus, Oysters, Starfishes, Shrimps, Mollusks etc. (Lagler *et al.* 1977; Balogun 2015). Fish exist in various sizes from the smallest such as Philippine Goby (*Eviota*) whose maximum size is just about 12 mm (1.2 cm) to the largest animal on earth, the Whale shark or Berlin whale (*Rhincodon typus*) which can reach a length of 12.65 m (41.5 ft) and weight of 21.5 MT or more. Fishes are the most numerous vertebrate having between 20000 – 40000 species (Lagler *et al.* 1977).

1.2 ORIGIN OF FISH

Evolution is a gradual process of transformation of lines of descent from a common ancestor to a different more advanced stage. Evolution is a continuous process that is still in operation in life and hereditary modifications provide the bases for evolution (Lagler *et al.*, 1977).

From evolutionary point of view and phylogenetic relationship between different animal groups based on evidence from comparative anatomy, embryology and fossil records, fishes evolved from invertebrate chordates called Protochordates which are the beginning of the Phylum Chordata. They comprise of the Subphylum Hemichordata: the Acornworm (*Balanoglossus*) with notochord restricted to the proboscis; Subphylum Urochordata: the Sea Squirts (*Tunicata*) having notochord during its larval stage only; Subphylum Cephalochordata: the fishlike *Amphioxus* with notochord extending the whole length of the body. Protochordates evolved from Mollusks (*Molluscs*) and mollusks evolved from *Annelids*. (see phylogenetic tree).

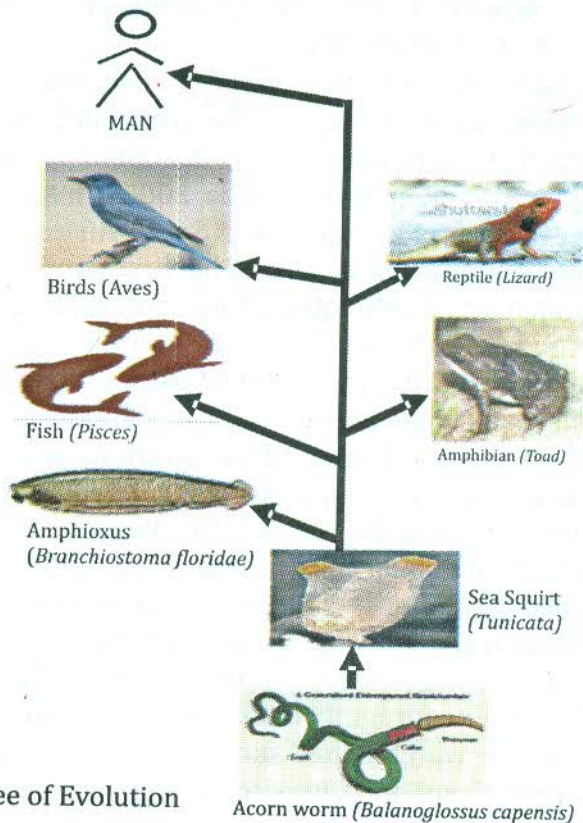


Fig 1: Phylogenetic Tree of Evolution

The appearance of fish on earth predates man's ape-like ancestors for about 500 million years. Many life features and body structure of man already existed for many years in ancestral fishes. These include the ground plan of animal body and the ten organ systems. Thus fish have a distant place in the ancestry of man (Lagler *et al.*1977). According to Ernst Haeckel (1834 - 1919) during embryological development, an organism repeats its ancestral history, "Ontogeny recapitulates phylogeny". The presence of branchial grooves and segmental myotomes in human embryo similar to that of fish indicates fish ancestry since fish predates man on earth.

1.1 AQUACULTURE DEVELOPMENT IN AFRICA, PROGRESS AND PROSPECTS

Aquaculture is the husbandry of fish and other valuable aquatic organisms in an artificially controlled water enclosure. The practice started as early as 2500 B.C in China and 6000B.C in Australia (Ekelemu and Ogba, 2005). In Africa, Trout culture and breeding was introduced in South Africa in 1859 and in Kenya and Madagascar in 1920. The first production of *Oreochromis niloticus* through aquaculture took place in D R Congo in 1946 (Vincke, 1995). By 1950s, fish farming was introduced to many African countries by Colonial masters and it developed rapidly. There was high interest in the new innovation but by early 1960s when many colonial administrations were coming to an end aquaculture development slowed down and many ponds and farms became abandoned (like Panyam fish farm near Jos). The history of fish farming in Nigeria therefore dates back to 1950's when the colonial masters established experimental fish farms. These were Panyam freshwater fish farm in Jos Plateau and Brackish water fish farm in Buguma, Delta State (Bardach *et al* 1972). Encouraging result was obtained from Buguma with brackish water fishes such as *Tillapia melanopleura*, *Cyprinus carpio* (Carp) and *Chrysichthys nigrodigitatus*. Panyam farm was

established mainly to culture *Tillapia* but this became non-viable due to prolific breeding and overpopulation of *Tillapia*. Emphasis was therefore placed on culture of Carp but as *Tillapia* could not be eradicated and became enemies of Carp, introduction of piscivorous species *Lates niloticus* and *Gymnarchus niloticus* became necessary. Both did well but *Lates niloticus* proved more suitable for pond culture. The development slowed down by the end of colonial era but pick up again by late 1960s through increased technical assistance and finance from international donors (Machena Moehl, 2001; Vincke, 1995). Rapid aquaculture development took place in Africa between 1970s and 1980s and by the year 2000 it has become well established in many countries including Nigeria (Machena and Moehl, 2001). Nigeria, Uganda, Cote d-Ivoire, Zimbabwe, Kenya, Ghana and South Africa are the major producers. Catfish was the highest produced, 64% while Tilapia and others was 36%.

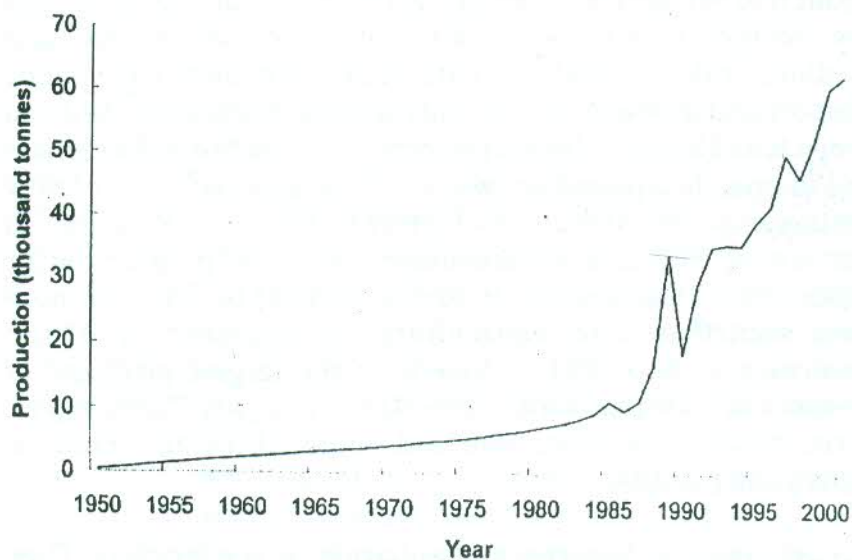


Fig 2. Evolution of Aquaculture in Sub-Sahara Africa 1950 – 2000.

FAO committee for Inland Fisheries of Africa (CIFA/R1, 1973) identified aquaculture as a priority area for development of Africa. Following this, FAO in 1975 organized the First Africa Regional Workshop on Aquaculture recognizing the importance attached to it by Government. It was observed that failure of some poorly planned aquaculture in the past was the constraints to further development as farmers were hardly convinced of its economic viability, coupled with lack of basic requirements for aquaculture and inadequate Government support. The workshop renewed interest in aquaculture and most African countries launched donor-supported aquaculture programmes. The production results however still remained below expectation.

The contribution of Africa to global aquaculture production is still not significant though it is increasing (Ben Satia, 2010). From 1998 to 2018, production has increased from about 43000 MT to about 8 M MT, with an average yearly growth of 14.45% due to the emergence and intensification of private sector small and medium scale aquaculture enterprises, stimulated by public support and inflow of foreign aids such as World Bank Assisted projects and loans, FADAMA projects and some NGOs. Awareness and interest in aquaculture was also raised by the effort of New Partnership for Africa Development (NEPAD) "Fish for all Summit" in 2005 and implementation of Special programme for Aquaculture Development in Africa (SPADA) by FAO. All these have contributed to aquaculture development in Africa. According to FAO (2013), Nigeria is the largest producer of African catfish in the World. Netherlands, Hungary, Kenya, Egypt, Syria, Brazil, Cameroon, Mali and South Africa also produce significant quantity.

Opportunities in fisheries and aquaculture are limitless. They exist for everyone whether or not they are professional

