

**THE STUDY OF THE ECOLOGY AND PARASITES OF
HERPETOLOGICAL ANIMALS (AMPHIBIANS AND REPTILES) IN
OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE, OSUN STATE**

BY

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CERTIFICATION

This is to certify that this research study was carried out by John Femi OLAOSEBIKAN as part of the requirements for the award of Master of Science (M.Sc.) degree in Environmental Control and Management of the ObafemiAwolowo University, Ile-Ife, Nigeria.

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DEDICATION

This work is dedicated to God, the source of my knowledge and inspiration, who also provided for me through the highs and lows of this project. His name forever is praised.

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ABSTRACT

This study investigated the abundance and ecology of amphibians (Anura) and reptiles (Agamidae) in ObafemiAwolowo University, Ile-Ife, Osun State, Nigeria. It also assessed the prevalence and intensity of ectoparasites and endoparasites of the animals with a view to determining the patterns of parasitic infection among the herptiles in the study area.

Amphibians and reptiles were monitored in seven ecologically divergent locations purposively selected within the campus of ObafemiAwolowo University, Ile-Ife. Each location was monitored once every month for nine months (February – November, 2015) for presence and number of amphibians and reptiles. Each herptile encountered was captured, properly labelled and taken to the laboratory for identification and parasitological examination. In the laboratory, each animal was anesthetized with chloroform, weighed (using Scout pro Top loading balance Model Scout ProSPU202)) and the snout-vent length (SVL) measured using a meter rule. The animal was then identified using standard keys and photographed. The body was thoroughly examined for ectoparasites section by section. Each animal was then dissected longitudinally and the gastro-intestinal canal carefully removed and divided into sections. Each section,(oesophagus, stomach, small intestine and large intestine) was fixed separately in physiological saline for the recovery of parasites. Parasites recovered were fixed in alcohol-formal acetic acid (A.F.A) and preserved in 70% alcohol and 5% glycerol to prevent dehydration. The parasites recovered were then identified using standard keys and lucida photographs taken within 24 hours. Data were analyzed using the Chi square test, analysis of variance and correlation analyses.

Out of 231 herptiles collected, 111 were reptiles and 120 were amphibians. These comprised of one species of reptile (*Agama agama*) and five species of amphibians (*Buforegularis*, *Hoplobatrachusoccipitalis*, *Hylaranaalbolabris*, *Ptychadenaaequiplicata* and

Ptychadenaoxyrhynchus). The highest number of reptiles (46) was collected from Fajuyi Hall and the lowest (5) from Kajola Village. The corresponding values for the amphibians were 43 at the Agric Research Farm and 12 at Awolowo Hall, respectively. Ten parasite species were isolated. These included *Strongylurisbrevicaudata*, *Parapharyngodon* sp. I, *Parapharyngodon* sp. II, *Oochoristica truncata*, *Mesocoeliummonas* and an unidentified nematode were collected from the reptile and *Thelandros* sp. I, II, III, IV and *Mesocoeliummonas* were isolated from the amphibians. All the parasites were endoparasites and no ectoparasites were recorded. All the reptiles collected were infected with one parasite or the other, thus, prevalence of infection amongst them was 100%. Conversely, only 68.3% of the 120 amphibians were infected. The large intestine harbored most of the parasites (72.6%) while the stomach harbored the least number (1.9%). The infection rate among the sections was significantly different ($p < 0.05$). Prevalence of infection amongst the amphibians was highest at Agricultural Research Farm (60.9%) and least at the Library area (18.2%). These patterns were significantly different ($p < 0.05$). *Strongylurisbrevicaudata* was the most frequently observed helminth with a prevalence of 95.5% while *Thelandros* species IV was the least prevalent (2.7%). The herptiles harbored multiple infections of two to four helminth species. Double infection was the most common mixed infection (41.4% reptiles and 35.4% in amphibians).

The study concluded that the prevalence of parasitic infection among herptiles in the ObafemiAwolowo University which was high raised an important public health concern.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Herpetology is the study of amphibians and reptiles. It is the branch of Zoology concerned with the study of amphibians (including frogs, toads, salamanders, newts, and caecilians (gymnophiona)) and reptiles (including snakes, lizards, amphisbaenids, turtles, terrapins, tortoises, crocodilians, and the tuataras). Batrachology is a further subdiscipline of herpetology concerned with the study of amphibians alone. Herpetology offers benefits to humanity in the study of the role of amphibians and reptiles in global ecology especially because amphibians are often very sensitive to environmental changes, offering a visible warning to humans that significant changes are taking place. Living amphibians and reptiles are representatives of a small number of the many historical tetrapod radiations.

Herpetological animals (amphibians and reptiles) collectively called “herptiles” or “herpetofauna” are not each other’s closest relatives evolutionarily, yet they have traditionally been treated as though they are related. Nevertheless, many aspects of the lives and biology of amphibians and reptiles are complementary and allow zoologists to study them together using the same or similar techniques. Biological similarities between herpetological animals and the ease of field and laboratory manipulation of many species have made them model animals for the study of ecology. Amphibians and reptiles are important components of ecosystems. Efforts to collect baseline data about occurrence, distribution, and status of populations are relatively

well advanced for amphibians, but much less so for reptiles for which recent data suggest that turtles and crocodilians are as threatened as anurans (Gibbons *et al.*, 2000).

Amphibians were the first terrestrial vertebrates. Their ancestors were lobe-finned fishes (*Sarcopterygii*), a group of bony fishes (*Osteichthyes*). These fishes appeared in the Devonian Period (more than 380 million years) before present and radiated in fresh and salt water. Frogs are the earliest group of ancient amphibians that first appeared in the fossil record some 360 million years ago, during the Devonian period (Matson, 2002). The word Amphibian is derived from the Greek word *amphibious* which referred to an animal that lives alternately on land and in water (Bhamrah and Juneja, 1990; Matson, 2002).

Amphibians have successfully exploited most terrestrial environments while remaining closely tied to water or moist microhabitats for reproduction. Most amphibians experience rapid desiccation in dry environments, but some species have evolved spectacular adaptations that permit existence in extreme habitats.

During the past decades the ecology and ecotoxicology of amphibians started to get attention (Sparling *et al.*, 2000) because of global amphibian population declines (Houlahan *et al.*, 2000). Based on the lists of the International Union for the Conservation of Nature (IUCN) there are 787 rare or endangered amphibian species (Frost *et al.*, 2006) and about 1,900 species known to be threatened (Stuart *et al.*, 2008). Frogs and toads are about 90% of all amphibians (McDiarmid and Mitchell, 2000). Therefore, they are an important link between human and ecosystem health (Hayes *et al.*, 2002) and they are main components of aquatic and terrestrial ecosystems (Unrine *et al.*, 2007). Most adult frogs and toads feed on invertebrates, so they are important, energy-efficient trophic link between insects and other vertebrates (Sparling *et al.*, 2000). They are sensitive to environmental changes both in terrestrial and aquatic habitats

because they have highly semi-permeable skins and different life cycle stages (Alfred and Richards, 1999).

Studies (Matson, 2002; Ajibola, 2010) have revealed that frogs in general have a soft, moist skin lacking scales and they lay eggs that have no protective shells. They are found in freshwater lakes, rivers, ponds, ditches and on moist land. They live near water to maintain

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