

Current Trend of Vertebrate studies in Nigeria

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Abstract

This study was conducted to evaluate the most studied class among Fish, Amphibians, Reptiles, Birds and Mammals in Nigeria. Data were obtained from the Web of Science core collection from 1970-2020 with the inclusion of each class ("Fish", "Amphibians", "Reptiles", "Birds" and "Mammals") and country ("Nigeria") as the search terms. The most studied class, fields within each class (Web of Science subject categories), most cited article and author, and affiliation with most publication were identified and used to reveal the most studied class in Nigeria. The results show that the class Fish with a total 536 publications, is the leading research focuses, most studied and had the highest number of publications, followed by Birds (214), then Mammals (52), Amphibians (30) and Reptiles (25) which is the least studied and with the least number of publications. It can be concluded that research on Fish remained the hotspot, whereas there is a paucity of data and research on Reptiles. Attention should be given to the least studied classes i.e. Amphibians and Reptiles so as to achieve a balance across the vertebrate classes.

Keywords: Amphibians, Birds, Fish, Mammals, Reptiles, Web of Science

INTRODUCTION

Globally, growing evidence from long-term research suggested decline in vertebrate populations which are attributed to factors such as habitat loss, disease, climate change, over-exploitation, pollution e.t.c. (Ayodeji & Kilishi, 2019; Reading *et al.*, 2010). In Nigeria several vertebrate studies e.g. Fish (Abalaka *et al.*, 2020; Adeogun *et al.*; Ibor *et al.*, 2020; Ude *et al.*; Usese *et al.*, 2020), Amphibians (Asiyanbi, Arhin, & Isyaku, 2017; Nneji *et al.*; Suleiman *et al.*, 2017), Reptiles (Eniang *et al.*, 2020; Nneji *et al.*, 2019; Rabi, 2019; Sowunmi *et al.*, 2017), Birds (Agaldo, 2020; Bada & Omotoriogun, 2019; Kret *et al.*, 2018; Muhammad, Ramli, & Then, 2018; Muhammad, Then, & Ramli, 2018; Nwaogu *et al.*, 2020), and Mammals (Kamani *et al.*, 2018; Omotoriogun *et al.*, 2019; Suleiman *et al.*, 2020) have been conducted. But no attempt has been made to investigate the current state of vertebrate studies in Nigeria. This is particularly important and will help in identifying which class or areas/subject within class, that needs attention or exploration because of data scarcity. Likewise, to determine the availability of useful data when conserving vertebrates (Luiselli *et al.*, 2019).

Web of Science is an online subscription-based scientific global citation database for many different academic disciplines. It is also one of the largest and most reputable global citation databases. This study was conducted to determine how much vertebrate studies are available in Nigeria through surveying published literature in the Web of Science database (Clarivate Analytics, Philadelphia, PA, USA; <http://wok.mimas.ac.uk>) over the last five decades. The goal is to find out which of these classes (Fish, Amphibians, Reptiles, Birds and Mammals) is the most studied and had the highest number of publications in Nigeria. Secondly, within each class, which field of study is given the most attention and had the highest number of

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published papers in Nigeria. Similarly, which author and affiliation in Nigeria are the most cited and has the most publication respectively. And lastly to provide suggestions and recommendations that will at the end balance research focuses across vertebrates in Nigeria.

MATERIALS AND METHOD

Articles from 1970 to 2020 were searched from the Web of Science Core Collection using the search term “Fish”. Articles referring to Fish were assessed by the trend of publication output. The search results were then refined using the keyword “Nigeria”. Inclusion of the country’s name as a search term will sort out papers publish in Nigeria or where Nigeria is mentioned. Therefore, the output was then refined, analysed, and sorted by countries. The most studied class, fields within class (Web of Science subject categories), most cited articles and proceedings, most cited author and affiliation with highest number of publications were identified. These same procedures were repeated for each class i.e. “Amphibians”, “Reptiles”, “Birds” and “Mammals”. The records were exported to Microsoft office Excel.

RESULTS

Of the 397, 767 global research on Fish, 536(0.14%) were conducted in Nigeria. Whereas 214(0.15%) of 140, 946, 52(0.04%) of 128, 732, 30(0.16%) of 18, 751 and 25(0.16%) of 15, 275 were conducted on Birds, Mammals, Amphibians and Reptiles respectively. In Nigeria, class fish is the most studied and had the highest number of publications, followed by Birds, then Mammals, Amphibians and Reptiles which is the least studied and had the least number of publications. On the other hand, Amphibians (16%) and Reptiles (16%) had higher percentages on a global scale, follow by Birds (15%), Fish (14%) and the least being Mammals (0.04%). Within each class, these publications were spread across various Web of Science subject categories (Appendix 1). However, the three most studied Web of Science subject categories and with the highest number of publications for each class is presented in figure 1. The top 10 most productive Web of Science subject categories for each of the class is presented in Table 1. Similarly, the most cited authors and affiliation with most number of published articles across the various classes are shown in figures 2 and 3 respectively. Appendix 2 shows the three most productive and cited papers for each class.

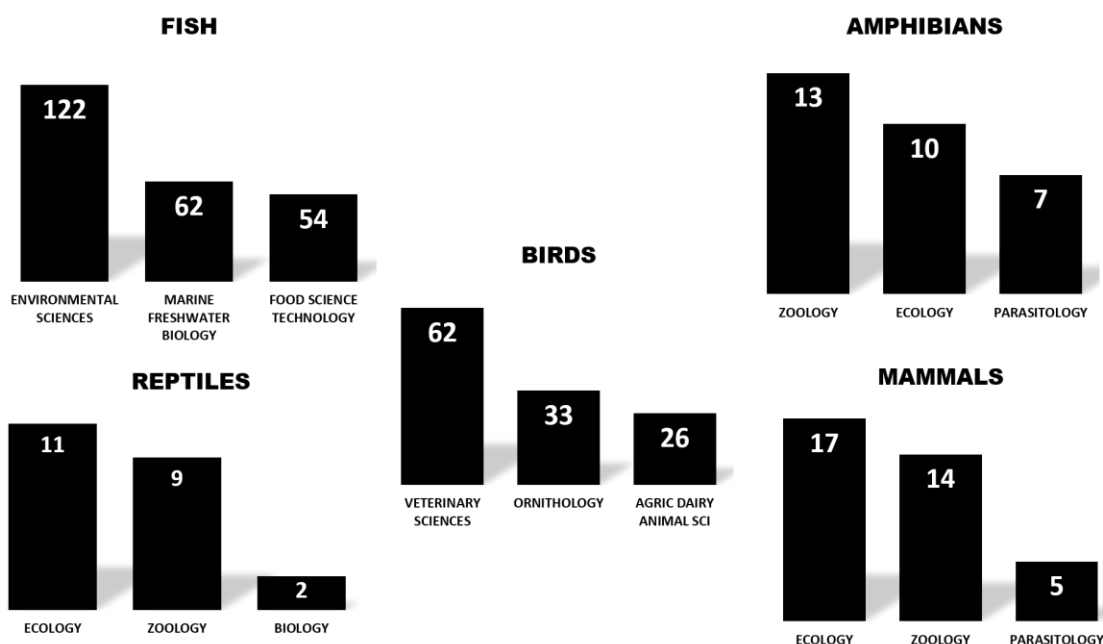


Figure 1: The three most studied fields (Web of Science Subject categories) and had the highest number of publications across classes in Nigeria

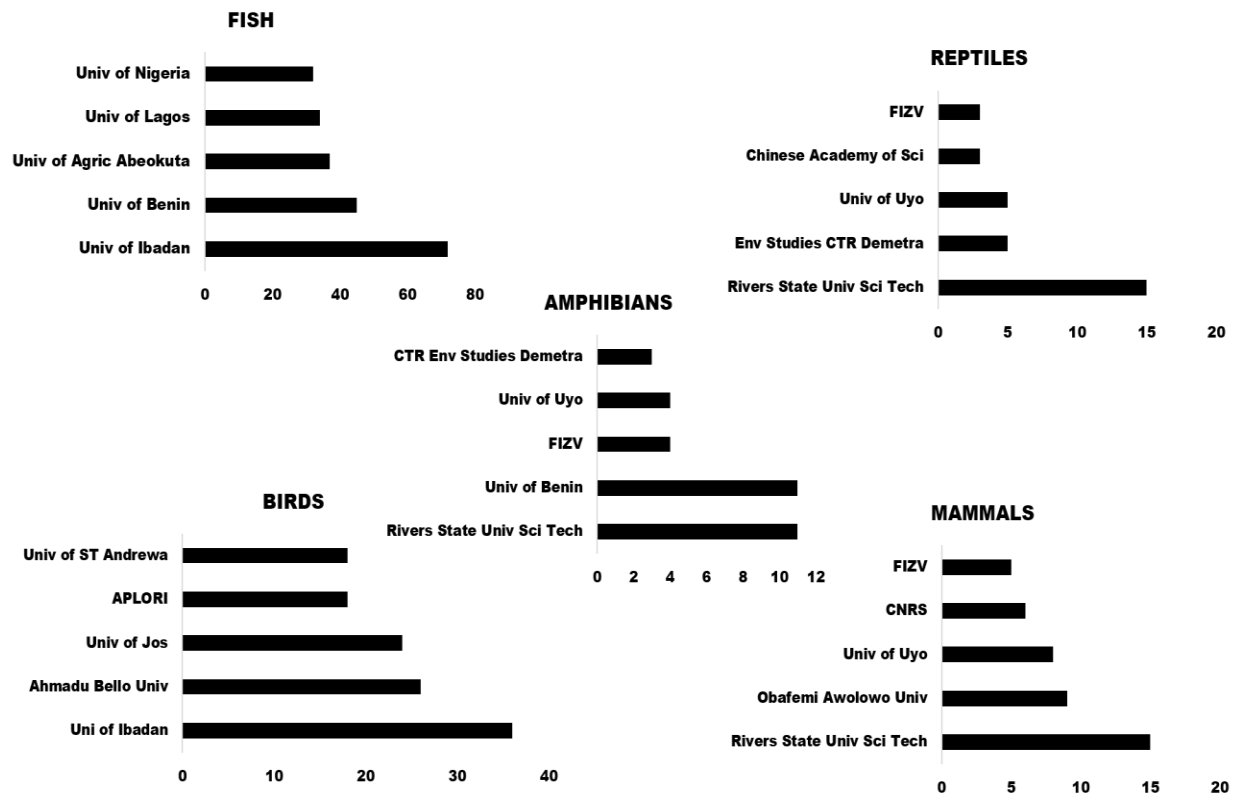


Figure 2: Affiliation with the highest number of published articles for each class in Nigeria

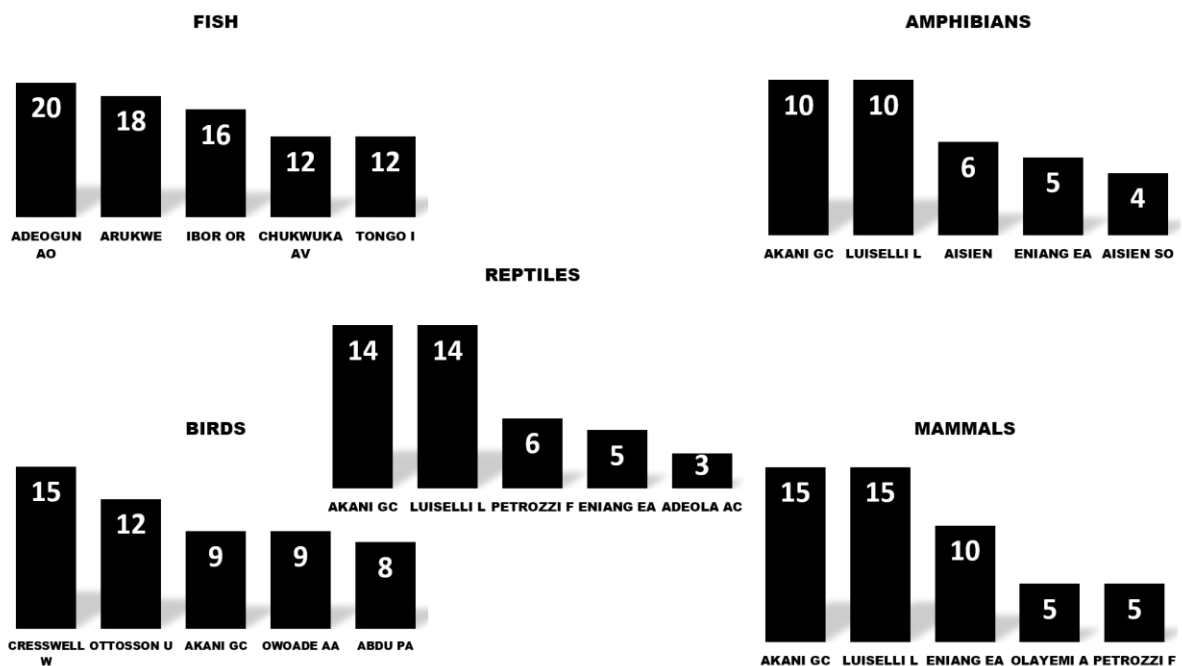


Figure 3: Five most cited authors for each studied class in Nigeria

studied, with lower number of publications in Nigeria. The scantiness of studies and publication in the least studied classes could be linked to low expertise and local research capacity. Although, there is paucity of study for the classes Amphibians (16%) and Reptiles (16%) in Nigeria, but on a global scale, they had the highest percentages with Mammals (0.04%) being the least, revealing the fact that Amphibians and Reptiles are least studied globally.

Within the Web of Science subject categories, Environmental Sciences (122, 22.8%) had the highest number of publications in the class Fish, whereas Veterinary Sciences (62, 29.1%), Ecology (17, 32.7%), Zoology (13, 43.3%) and Ecology (11, 44%) are the top most leading Web of Science subject categories in terms of number of publications for the class Birds, Amphibians, Reptiles and Mammals respectively. On the other hand, Veterinary Sciences (1, 3.3%) was the least studied field in the class Amphibians. Within the Web of Science Subject categories, Biology, Ecology and Zoology appeared across all the classes. More interestingly, Ecology and Zoology appeared both in class Mammals, Amphibians and Reptiles as the top leading fields while Parasitology appearing in Mammals and Amphibians. Other fields of study such as Agriculture Dairy and Animal Science was the third leading field with high number of published journals in Birds (26, 11.7%), but having the least number of publications in the classes Fish (5, 0.9%) and Mammals (1, 1.9%). Similarly, Marine Freshwater Biology becoming second top field with high number of publications in Fish (62, 11.6%) but appearing the least in class Mammals (1, 1.9%), Amphibians (1, 3.3%) and Reptiles (1, 4%).

The number of citations for a publication is an important indicator in assessing the impact of a published article. In this study, older publications correlated with higher number of citations (Appendix 2). Similarly, older affiliations/Universities are the ones with higher number of publications. For example, University of Ibadan is one of the oldest University in Nigeria, the University was among the top leading institutions or affiliations (figure 3). It had the highest number of publications for the class Fish (72) and Birds (36). Both classes had relatively balanced number of published articles across the classes, whereas class Amphibians, Reptiles and Mammals had one sided distribution. Rivers State University of Science and Technology was the top leading institution for the class Amphibians (11), Reptiles (15), and Mammals (15). FIZV (4, 3, 5) and University of Uyo (4, 5, 8) appeared in the class Amphibians, Reptiles and Mammals respectively. Other Affiliations such as APLORI, CNRS and University of St Andrews appeared once, though with high number of publications.

Adeogun AO (20), and Cresswell W (15) are the topmost cited authors for the class Fish and Birds respectively. Akani GC (10, 14, 15) and Luiselli L. (10, 14, 15) are the topmost cited for the class Amphibians, Reptiles and Mammals respectively and had a corresponding number of citations across the three classes. Similarly, the Author Eniang EA appeared in multiple classes i.e Amphibians, Reptiles, Mammals and had the following number of citations 5, 5, 10 respectively. Other authors such as Abdu PA, Tongo I, Aisien SO, Adeola AC and Petrozzi F appeared in only one class each. During the search, few authors that have worked and published a paper with multiple classes were found to be appearing multiples times in different search results. For example, Reading *et al.* (2010) worked on Snakes (Reptiles) but it appeared in all search results in the five classes (i.e. Fish, Birds, Amphibians and Mammals) simply because class names were mentioned in the article. This was taken care of by removing the article in the various search results. Therefore, cases like this do not wrongly add to publication number.

The findings of this work do not provide the exact number of publications across classes but rather an index. This is because the study is limited to vertebrate studies published and

available only on the Web of Science database. There are many more vertebrate studies and publications that are not included on the Web of Science database, possibly due to non-indexing, low impact or non-established sources (grey literature). More so, majority of the studies conducted in Nigeria are many at times published in local and traditional journals that are rarely online and non-indexed. This may downplay the strength and impact of many studies conducted in Nigeria as compare to other develop countries. There could be a correlation between most cited Authors and Affiliation with higher number of publications although this was not tested in the study. Conclusively, despite the great the number of studies and publications on vertebrate, a lots needs to be done especially on Reptiles and Amphibians in Nigeria

RECOMMENDATION

There is a need for increased study of Amphibians and Reptiles in Nigeria as well as globally. Therefore, Nigerian academics and researchers should pay attention to vertebrate studies especially the class Amphibians and Reptiles. Likewise, while focusing on good quality vertebrate studies, they should also target peer reviewed journals for their publications. There is also a need for continued training of Nigerian academics/researchers after their PhD study to better improve their research capacity. Research institutes and Universities should also be fully equipped with research tools and equipment that will enhance vertebrate research and other Taxa. More research should be encouraged and carried out especially for the least studied class.

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