



Newsletter of the WDA AME

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WDA AME BOARD NEWS

Happy 2021 to all members. We hope you will enjoy the stories and short research updates in this edition. Please keep sending your relevant news articles to us at wdaamenews@gmail.com during the year for inclusion in the next issue.

Please remember to renew your membership for benefits such as a waiver for publishing in the Journal of Wildlife Diseases! <https://wildlifedisease.org/wda/MEMBERAREA/JoinRenew.aspx>

We have a new committee serving you for the next two years who want to hear from members and work together to understand how WDA can support you better. Meet the team at our website <https://www.wda-ame.org/>

All the best and a prosperous 2021 to everyone in wildlife disease and health, remember the "WDA is all wildlife diseases, all conservation, all one health, all the time!"

UPDATE ON *MYCOBACTERIUM BOVIS* DIAGNOSIS IN RHINOCEROS

Josephine Chileshe
PhD student

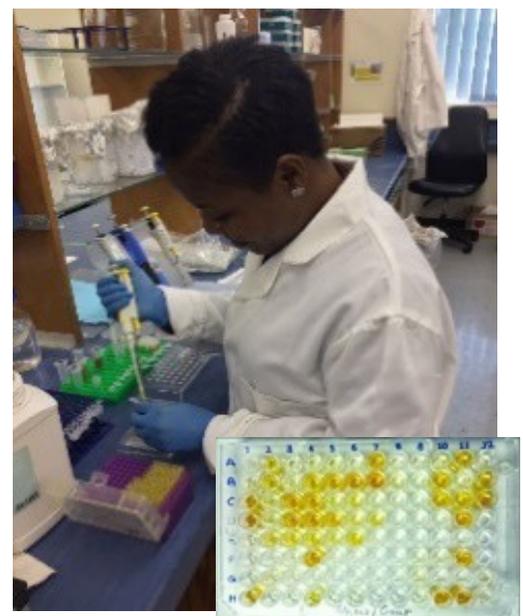
White rhinoceros

(*Ceratotherium simum*) are classified as “Near Threatened” by the International Union for Conservation of Nature. They are an important species with a great impact on conservation and economy in an African country such as South Africa. The Kruger National Park, in South Africa, is home to the largest population of white rhinoceros in the world but unfortunately rhinoceros have been found to be infected with animal tuberculosis caused by *Mycobacterium bovis*.

As a regulated disease, animal tuberculosis results in

quarantine and impacts conservation programs by restricting movement between parks. Hence, development of reliable tests for detection of infected animals is important to enable movement and minimize the risk of disease spread to other species. Research shows that the combination of using the QuantiFERON®-TB Gold (QFT) blood collection tubes, after which the plasma is harvested following centrifugation and Mabtech equine IFN- γ ELISA is a promising diagnostic test to distinguish between of *M. bovis*-infected and uninfected white rhinoceros.

Based on the research of the Animal TB group and researchers from the University of Pretoria, South African National Parks developed a TB management plan that has been accepted by the Department of Agriculture, Forestry and Fisheries. Under this plan, rhinoceros may be moved if they pass quarantine in a bio-secure facility with three negative tests over a three month period, using the blood-based interferon-gamma release assay. This demonstrates the contribution that wildlife TB research can have on policy development.



Josephine performing a diagnostic ELISA in the laboratory.

WHAT'S NEW WITH THE SOUTHERN AFRICA WDA STUDENT CHAPTER

The Southern Africa WDA Student Chapter (SAWDASC) is the first student chapter in the Africa and Middle East section of the WDA. It follows the objectives and aims of the WDA for student chapters:

- (1) educate students interested in wildlife health and disease about career options, job qualifications, education, internships, volunteer, and research opportunities;
- (2) enhance the skills of students interested in wildlife health and disease through lectures, workshops, conferences, or field trips; and
- (3) connect students interested in wildlife health and disease with mentors in WDA and the profession through the faculty advisor and guest lecturers.

The idea of founding the SAWDASC started when we, a group of students with different professional backgrounds, met at a wildlife congress in Southern Africa in 2017.

Since then, we have been organizing different activities, one of which is the (free) monthly online journal club together

with the zoo- and wildlife medicine study group.

In February 2018, we held our first bi-annual wildlife disease student workshop at the Wildlife Group of the South African Veterinary Association (SAVA) annual congress at the University of Pretoria. Thank you very much for your sponsorship!

We started the day with lectures in the morning:

Dr. Katja Koeppel led an interactive discussion on ONE HEALTH, Prof. Emily Mitchell empathized the importance of performing wildlife pathology, and our student chapter faculty advisor Prof. Michele Miller gave valuable insight in the role of PATHOLOGY in wildlife research.

After a quick lunch with pizza & juice, Prof. Emily Mitchell together with Dr. Alfredo Guiot from Mexico, demonstrated comparative post mortem examinations in reptiles, birds and fish.

In the evening, we held out first-ever mentor mixer providing students with the opportunity to meet and talk to wildlife professionals and ask them about their career.

We were very touched by the motivation and passion of our mentors: Michele Miller, Emily Mitchel, Katja Koeppel, Michael Kock, Richard Burroughs, Leith Meyer, Gareth Zeiler, Angela Bruns, Greg Simpson and Silke Pfitzer. Thank you for inspiring us!



HOPE FOR NIGERIA'S WILDLIFE CONSERVATION: ELEPHANT HERD ON THE INCREASE

Ogunde, O.W & Adetunji, V.E

A herd of some 250 elephants was spotted in Nigeria's far northeast, close to the borders with Cameroon and Chad. This is the first reported sighting of elephants in the region since the Boko Haram jihadist insurgency began a decade ago.

Yankari National Park in north-east Nigeria is home to most of the country's population of African Elephants. This majestic creature is the largest land mammal in the world, the image of which has become synonymous with Sub-Saharan Africa. Sociable and loyal, elephants here roam in herds, only the females separate from their peers to give birth and raise young calves. Sadly, ivory hunters and farmers have greatly reduced the number of elephants in Nigeria, and they are now endangered, but this area is one of the best places to view them in the wild.

The Omo-Shasah-Oluwa Reserve in the same region houses an elephant sanctuary, dedicated to the protection of the species, allowing visitors to view the elephants under their care.

Therefore, due to concerted efforts by the state government of Bauchi in collaboration with



Herds of elephants seen moving across the savannah close to Rann in Borno State, Nigeria on 19 December, 2019. UNHAS

non-government organisations, there has been an increase in the number of elephants in the country.

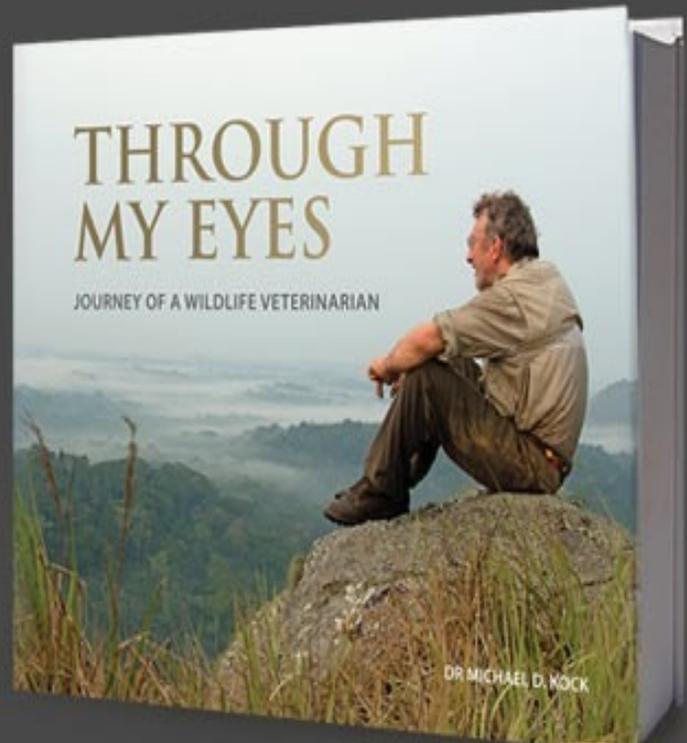
This effort has resulted in a massive reduction in the illegal hunting of this species to feed the ivory trade which has been an enormous threat in the region and has thus resulted in having an estimated 100 – 150 surviving elephants. Additionally, according to a report by Rosie Coyller, a new herd of elephants was spotted a few kilometres from Rann during a humanitarian mission carried out by helicopter. This is in line with a statement made by Tunde Morakinyo, a co-founder of Africa Nature Investors who said: "the sighting of this herd means Nigeria's elephant population has effectively doubled."

It was also noted that hundreds of elephants used to migrate through the region up until a decade ago at

around the time Boko Haram began fighting to establish an Islamic state. In 2014, Abubakar Shekau's faction of Boko Haram set up camp in the Sambisa Forest that was formerly a game reserve the size of Belgium and The Netherlands. With the appearance of this herd, it indicates that peace is slowly re-emerging, according to Kabiru Wanori, Borno State's environment commissioner.

Borno state which in the 1960's was nicknamed "home of peace" has no doubt experienced some gruelling change in circumstance, leading to the displacement of thousands of people and driving away of wild animals through the use of artillery fire. It is however a thing of joy to see the re-appearance of the big game back to that region and hopefully, with the decrease in violence in that region, more of these animals will be attracted to 'come back home'.

THROUGH MY EYES JOURNEY OF A WILDLIFE VETERINARIAN



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SHORT RESEARCH UPDATES

PREVALENCE AND ANTIBIOTIC SENSITIVITY PATTERNS OF BACTERIA ISOLATED FROM NON-HUMAN PRIMATES IN SELECTED ZOOLOGICAL GARDENS IN NIGERIA

Omonona, A.O., Ogunleye, A.O., Yusuf, B., Okunlade, A.O. and Adetuga, A.T

The rectal swabs of non-human primates were collected from five randomly selected zoological gardens in Nigeria to investigate the bacteria profile and antibiotic susceptibility. The zoological gardens include U.I Zoo, UNILORIN Zoo, OAU Zoo, FUNAAB Zoo Park, and Qbrat Zoo. The study examined 67 primates cutting across eight species. Bacteria isolated were subjected to antibiotic susceptibility test using the disc diffusion method and the diameter of zone of inhibition were also measured. *Escherichia coli* (78%), *Hafnia alvei* (11%), *Acinetobacter haemolyticus* (7%) and *Citrobacter amalonaticus* (4%) were isolated from all the rectal swabs. Ciprofloxacin and Ofloxacin had the highest number of sensitive organisms (74.1%) while Amoxycillin had the highest number of resistant organisms (74.1%). The presence of the pathogenic bacteria isolated in this study has public health significance because of the nature and use of their location and its proximity to human dwellings.

DRIVERS OF BUSHMEAT HUNTING AND PERCEPTION OF ZONOSSES AMONG WILDLIFE HUNTERS AND TRADERS AROUND OBA HILL FOREST RESERVE, SOUTHWEST, NIGERIA

Omonona, A.O., Adetuga, A.T. and Adetunji, S.A.

The study determined the drivers of bushmeat hunting and perception of zoonoses among wildlife hunters and traders around Oba Hill Forest Reserve (OHFR). Snowball, random and convenience sampling techniques were used to select wildlife hunters (199) and wildlife traders (30) from four randomly-selected communities around the reserve. Data collection was through administration of semi-structured questionnaires, subjected to descriptive and inferential (regression) statistics at $\alpha_{0.05}$. Hunting pressure was highest for duikers (48.2%) while market demands were higher (80.0%) for both duiker and Roan antelope. The majority of the wildlife hunters (54.8%) were unaware of zoonotic diseases while most of the wildlife traders (56.7%) were aware. Most wildlife hunters (68.3%) strongly agreed that it is easy to contract zoonoses via butchering and roasting while 53.3% of the wildlife traders disagreed. There is need for the management of Oba Hill Forest Reserve to intensify efforts in conservation education in communities around the reserve.

THREAT OF TUBERCULOSIS IN UNDER-RECOGNIZED SPECIES – TB IN AFRICAN RHINOCEROS

Prof. Michele Miller, NRF South African Research Chair in Animal TB

Animal TB Research Group – Dr. Leanie Kleynhans, Dr. Wynand Goosen, Dr. Tanya Kerr, Netanya Bernitz, Josephine Chileshe, Christina Meiring, Candice de Waal, Katrin Smith, Samantha Goldswain, Pamela Ncube

Tuberculosis, caused by one of the members of the *Mycobacterium tuberculosis* complex (MTBC), is the world's most deadly infectious disease, according to the World Health Organization. Although extensive resources and research have been committed to this disease in humans, the same is not true for animal tuberculosis, particularly in wildlife. This is especially true in developing countries where national control programs may not exist or be effectively implemented. In addition, many of these same countries also hold important wildlife populations that are threatened by habitat loss, poaching, and potentially disease. Due to the difficulty of detecting and monitoring diseases in wildlife populations, often the risk and threat of disease are under-recognized. Tuberculosis in rhinoceros has been reported in captive animals going back almost 200 years (Miller et al., 2015). However, due to the lack of clinical signs until disease is advanced and limited diagnostic techniques, cases are often missed until detection after death. Both *M. bovis* and *M. tuberculosis* can infect African rhinoceros species. Although an incidental case of *M. bovis* infection in a captive black rhinoceros that had been wild caught was reported in South Africa (Espie et al., 2009), the first documented case of fatal bovine tuberculosis was discovered in a black rhinoceros in Kruger National Park (KNP) in 2016 (Miller et al., 2017). Since that time, additional cases of incidental *M. bovis* infection have been found in white rhinoceros in KNP (Miller et al., 2018).

The presence of tuberculosis in a population results in quarantine, restricting animal movement, including conservation programs. With the increasing need to move rhinoceros to safe locations due to poaching as well as reintroductions, quarantine is a significant complication for these populations. As with other species, understanding the risk of transmission and availability of accurate diagnostic tests are crucial to developing an effective management plan and screen animals for translocation. The Animal TB Research Group at Stellenbosch University has been conducting research on multiple aspects of TB in rhinoceros. In vitro interferon gamma production assays have been studied to detect rhinoceros immune responses to detect infection (Parsons et al., Chileshe et al., 2019).



THREAT OF TUBERCULOSIS IN UNDER-RECOGNIZED SPECIES – TB IN AFRICAN RHINOCEROS

These blood-based tests provide a feasible method for screening rhinoceros for TB. In addition, other biomarkers are currently being investigated to improve detection. In order to determine risk of transmission, studies are also underway to improve detection of mycobacteria in secretions that can be collected by nasal or oral swabs, tracheobronchial lavage, or faeces. In pilot studies, rapid accurate detection of even low levels of *M. bovis* bacilli can be detected in secretions using a widely available human TB PCR method, GeneXpert MTB/RIF



Ultra (Cepheid). Substantial knowledge gaps remain with regards to TB in African rhinoceros. However, research to improve understanding transmission, susceptibility and pathogenesis in different rhinoceros species, and diagnostic techniques will facilitate our assessment of the impact of TB on rhinoceros and conservation programs.

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TUBERCULOSIS CONTROL IN EURASIAN WILD BOAR (*SUS SCROFA*) BY PARENTERAL VACCINATION WITH HEAT-INACTIVATED *MYCOBACTERIUM BOVIS*

Mariana Boadella. Sabioteec. Camino de Moledores s/n. Ciudad Real. Spain, Christian Gortázar. SaBio – IREC.

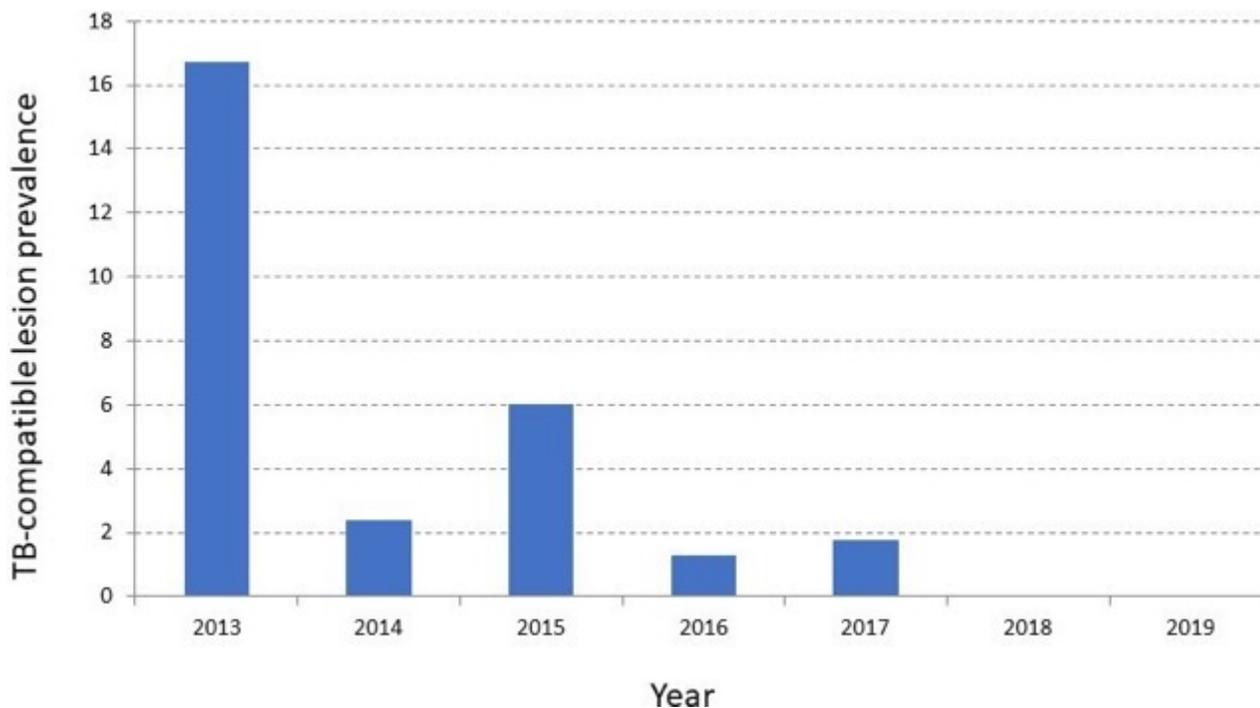
Ronda de Toledo, 12. Ciudad Real. Spain, Oscar Rodriguez. Rabat, Morocco,

Iker A. Sevilla Neiker. Parque Tecnológico de Bizkaia, Derio Spain, Jacob Mwanzia. Abu Dhabi, United Arab Emirates

Tuberculosis (TB) caused by members of the *Mycobacterium tuberculosis* complex (MTC) is a major public and animal health challenge in Africa. However, test and cull schemes are usually not viable due to economic constraints. Hence, vaccination emerges as an alternative for the control of zoonotic TB in Africa.

Heat-inactivated vaccines are a well-established tool for the control of bacterial infections in livestock, including mycobacterial infections (Bastida and Juste 2011). Domestic ruminants are often vaccinated against *Mycobacterium avium paratuberculosis* (MAP) - the causal agent of Johne's disease (Ott et al. 1999). Heat-inactivated MAP vaccinated goats and cattle showed cross-protection against MTC as compared to unvaccinated controls (Pérez-de-Val et al. 2012; Juste et al. 2014).

Heat-inactivated *M. bovis* (inactivated vaccine, IV) protects Eurasian wild boar and pigs (*Sus scrofa*) from generalized TB, both orally and parenterally, and both in the laboratory (Beltrán-Beck et al. 2014a) and in the field (Díez-Delgado et al. 2017, 2018). Being inactivated, this vaccine has the advantage of having no safety limitations as compared to live vaccines (Beltrán-Beck et al. 2014b).



TUBERCULOSIS CONTROL IN EURASIAN WILD BOAR (*SUS SCROFA*) BY PARENTERAL VACCINATION WITH HEAT-INACTIVATED *MYCOBACTERIUM BOVIS*

In 2013, we started an ambitious wild boar TB control program in a wild boar farm by means of parenteral vaccination with IV. Postmortem inspection and sampling were performed on hunter-harvested wild boar (n=1771). The study site is dedicated to recreational wild boar hunting and has a breeding facility for restocking the hunting area. In the first three years (2013-2015), only part of the stock (two thirds) was vaccinated in order to maintain unvaccinated controls for study purposes. Since then (2016-2019) all new stock was vaccinated. Figure 1 shows the effects of vaccination on apparent TB prevalence as assessed by the presence of TB-compatible lesions. Since 2018, six years after starting the vaccination program, the farm remains TB-free.

We are interested in exploring similar approaches in other settings and even in other host species, since preliminary results in ruminants also suggest some protection conferred by heat-inactivated vaccines (e.g. in goats and in red deer, *Cervus elaphus*; (Thomas et al. 2017, Roy et al. 2018).

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RESEARCH UPDATES

EVALUATION OF CAUSES OF MORTALITY AND MORBIDITY IN CAPTIVE WILD ANIMALS AND PROFFERING SYSTEM OF AMERLIORATION IN IBADAN, NIGERIA

Adetunji E. Veronica, Department of Veterinary Public Health and Preventive Medicine, Aquatic and Wildlife Medicine Unit, University of Ibadan, Nigeria

The reports of high mortalities in captives and free-living wild animals have become major concerns among conservationists, and zoological facilities are expected to play a major role in conservation (Russel, 2006). According to Fox's report, necropsies performed in more than 6,000 captive mammals and birds at the Philadelphia Zoo was said to be the first publication on causes of mortalities in zoo animals (Fox, 1923; Aguirre, 2009). Smith, 2009, identified and described 110 diseases of the zoo and exotic animals. Mathision and Huw (1998) observed that mortalities in wild animals could be due to infectious agents like parasitic, bacterial, fungal, viral and rickettsial or non-infectious causes like injuries, poisoning, congenital abnormalities, neoplasm and malnutrition.

Study 1

A retrospective study conducted between 2007 and 2012, on the causes of mortalities in wild animal species kept at University of Ibadan zoological garden, Agodi zoological garden, Ibadan and some wild animals kept in private homes in Ibadan, Oyo State, Nigeria. The study was carried out by collecting data of post mortem examination of wild animals at Mokola Veterinary Hospital, Ibadan and the University of Ibadan Veterinary Teaching Hospital. An overall total of 127 deaths was reported during the study period. Annual increases in mortalities were reported while the majority of the deaths occurred during the rainy season. There was a significant positive correlation between monthly mortalities and average monthly rainfall for Ibadan ($r=0.62$, $P<0.05$). The highest mortalities were reported in avians (29.13%), followed by reptiles (27.56%), primates (16.53%), carnivores (13.39%), rodents and ruminants (each with 6.30%) and porcine (0.79%). Causes of mortalities were unknown in more than 17% of the cases. The known major causes include, injuries (23.62%), gastroenteritis/helminthosis (14.96%), invasion by soldier ants (9.45%), transportation stress (8.66%), old age (7.87%), malnutrition (6.30%), paralysis (3.15%), drowning (2.36%) and others (6.32%). It was therefore concluded that to achieve a significant reduction in mortalities of captive wild animals, managers of zoological gardens should adopt proper housing and feeding, routine vaccination, deworming, hygiene and sanitation and seek prompt veterinary attention when animals are sick or they sustained injuries

Study 2

A study of wild animal's demography in zoological gardens in the southwestern, Nigeria using structured questionnaires and zoo records was conducted. This study reported the avians, reptiles and primates constituted 35%, 26% and 21%, respectively. The study also reported a total of 108 mortalities (annual mean of 36) during a three year period. Causes of mortalities include: transport stress (18%), selinity (12%), drowning (10%) and unknown causes (35%). The sex skewed demographic profile showed that there were more male (25%) than female (21%) animals in these zoos. It was advocated that to promote wild animal conservation, routine screening of animals, good nutrition, post-mortem examination of dead animals to ascertain causes of death and also strategies aimed at improving the reproductive capacity of wild animals like artificial insemination should be considered to balance zoo animal demography and reduce mortalities.

EVALUATION OF CAUSES OF MORTALITY AND MORBIDITY IN CAPTIVE WILD ANIMALS AND PROFFERING SYSTEM OF AMELIORATION IN IBADAN, NIGERIA

Study 3

Studies conducted in 2018, on the use of a drug to manage Capture or exertion myopathy (CM) in two ostriches (*Struthio camelus*), was evaluated. This work was carried out to restrain and immobilize two ostriches in a bid to facilitate their clinical examination and transportation from one location to another, without subjecting the birds to capture myopathy that arises from the stress and exertion associated with physical restraint and capture. Two ostriches, male and female, weighing 120kg and 105kg respectively, were requested to be immobilized for relocation over a distance of 15 kilometres in Oyo State, Nigeria. The birds have fasted for 16 hours overnight and at the initial stage fed little amounts of feed mixed with diazepam at 3mg/kg which accomplished mild sedation after one hour followed by intramuscular injection of ketamine. There was complete recovery 3 hours post administration of ketamine. We, therefore, conclude that the diazepam and ketamine combination is safe for use in the restraint and transportation of ratites and can also prevent the risk of capture myopathy. We suggest that the current dose of diazepam might be increased if the oral route is to be employed in order to shorten the onset of sedation and increase the depth of sedation.

Study 4

A study was conducted to determine the levels of infestation of gastrointestinal parasites in 36 non-human primates (NHP) and 19 zookeepers at the University of Ibadan Zoological Garden (UIZG) and Agodi Zoological Garden (AZG) in Ibadan, Nigeria. Freshly passed faecal samples were collected from NHP, zookeepers, and apparently healthy individuals (control). The faecal samples were processed using standard parasitological techniques. Twenty-two (61.1%) out of 36 NHP at UIZG and AZG were infested with gastrointestinal parasites. Infestations at UIZG and AZG were 61.3% and 60%, respectively. All the red patas, mangabey and mandrill monkeys and 90.9% (10/11) of the green monkeys were infested. There were higher infestation rates in young NHP than in adults ($P < 0.05$). The infestation rates in males and females were the same (61.1%). The most prevalent gastrointestinal parasites were *Trichuris trichiura*, (47.2%), *Strongyle spp* (13.9%), *Entamoeba spp* (13.9%) and *Strongyloides spp* (5.6%). Six (27.3%) of the infested NHP had mixed infestations. Only one of the 19 zookeepers screened was infested with *Ascaris lumbricoides* and two (15.4%) of the 13 members of the control group (garden workers) were infested with *Ancylostoma duodenale*. There was no evidence of cross-transmission of gastrointestinal helminths between the NHP and the zookeepers.

System of amelioration of morbidity and mortality in captive wild animals in Ibadan, Nigeria

Proper housing and adequate feed and adoption of effective biosecurity measures are very germane. In addition routine tests, deworming and prompt treatment of injured and sick inmates. Dead animals should be subjected to post-mortem examination to determine the causes of death which will enable the institutionalization of diseases preventive mechanisms. The amendments of relevant local laws in Nigeria to further protect wild animals from overexploitation was recommended. To ameliorate the risk of capture myopathy in ratites oral administration of diazepam accompanied by intramuscular administration of ketamine can provide excellent restraint mechanisms and also reduce injury.