

**BIOMEDICAL & VETERINARY SCIENCES  
GRADUATE PROGRAM**



**ANNOUNCES**

The Master of Science Seminar and Examination of

**Alphonse Assenga**

**“The potential health impact of ivermectin mass  
drug administration for malaria control on swine in  
Mozambique”**

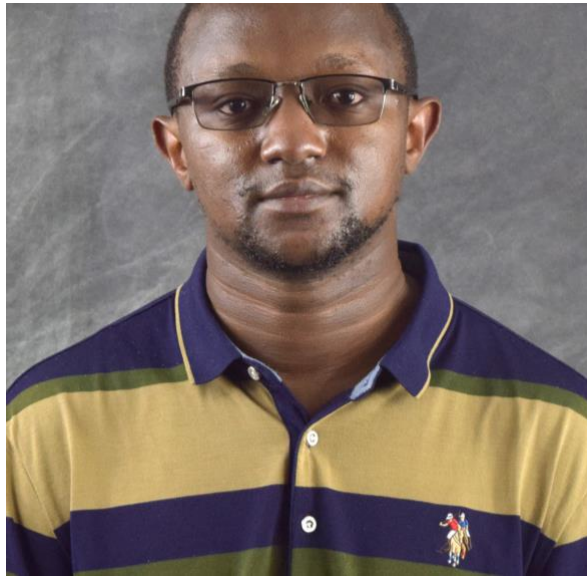
Monday, December 5th, 2022

9:00AM

VMIA Classroom 121B

Zoom: <https://virginiatech.zoom.us/j/81124090807?from=addon>





## **Bio**

Alphonse was born and raised in Kilimanjaro, Tanzania and received his bachelor's degree in zoology, wildlife science and conservation from the University of Dar es Salaam in 2014. He is now completing a master's degree in biomedical and veterinary sciences (BMVS). Prior to coming to Virginia Tech to continue his studies, Alphonse worked as a Research Officer at Ifakara Health Institute, in Dar es Salaam for over four years, where his research focused on mosquito vector control. The Two major projects he worked on was first on the control of *Aedes aegypti* mosquitoes using transfluthrin impregnated hessian emanators (2017-2019). The other was on evaluating Effectiveness of the innovative 1,7-malaria reactive community-based testing and response (1, 7-mRCTR) approach on malaria burden reduction in Southeastern Tanzania (2019-2020)

## **Funded by**

UNITAID, as part of the project titled, Broad One Health Endectocide-based Malaria Intervention in Africa (BOHEMIA).  
VMCVM Office of Research and Graduate Studies

## **Awards and Achievements**

Bachelor degree in zoology with wildlife science and conservation (2014)

## **Publications**

Nicodem J Govella, **Alphonse Assenga**, et al (2022), Assessment of low technology hessian fabric transfluthrin vapour emanator for protecting against outdoor-biting *Aedes aegypti* in coastal Tanzania.

## Presentations

- Rist C., **Assenga A.**, et al. Food safety and economic implications of ivermectin mass drug administration in swine – a One Health perspective on the future of malaria vector control. Presented at the annual meeting of the *American Society for Tropical Medicine and Hygiene*. Seattle, Washington; November 1, 2022
- “Control and eradication of Human African Trypanosomiasis by 2026”. **Alphonse Assenga**. Neglected & Emerging Infectious Diseases, Blacksburg VA, October 5, 2021. Oral presentation.
- “Using gene drive to suppress *Aedes aegypti* population and eliminate Dengue in Dar es salaam, Tanzania”. **Alphonse Assenga**, Neglected & Emerging Infectious Diseases, Blacksburg VA, December 07, 2021. Oral presentation
- “Human genome manipulation”. **Alphonse Assenga** , Josefa Garcia , Rita Makhoulf , Ehab Salama. Nov 30, 2021. Blacksburg VA.

### **Acknowledged in:**

Kevin Lhamers. The story of *Theileria orientalis*, a rapidly emerging pathogen of cattle, and *Haemaphysalis longicornis*, its tick vector. CeZAP Distinguished Speaker Series in Infectious Disease. Blacksburg, Virginia; November 10, 2022.

Kevin Lhamers. *Theileria orientalis* in cattle. Presented at the annual meeting of the American Association of Bovine Practitioners. Longbeach California; September 24, 2022.

## **Lay Language Abstract**

A clinical trial was conducted in rural Mozambique, in the Mopeia district, to assess the use of ivermectin mass drug administration in humans and pigs as a vector control tool for malaria. The results presented here are from a sub-study of the clinical trial, to determine the impact of ivermectin on pig health, when administered to pigs as part of the malaria intervention. The study began in March 2022, at the beginning of the rainy season, and ivermectin was given to pigs once a month for three months. Pigs were visited twice a month for the first three months, and then once a month for another three months. At various time points, fecal samples were collected, pigs were examined for evidence of ectoparasites (ticks, lice and scabies infestation), and young pigs were measured to determine their rate of growth. Fecal samples were analyzed for the presence of common internal parasites (endoparasites) affecting pigs in the area. The burden of endo and ectoparasites was estimated before any ivermectin was administered, and then compared in treated and untreated pigs over the course of the study. Similarly, the effect of ivermectin on growth rates in young animals was determined. The results of this study found that there was a high burden of common endoparasites in pigs in the Mopeia district, which was only minimally affected by the use of ivermectin delivered once a month. Among the treated pigs, a fecal egg count reduction test suggests that these parasites are potentially resistant to ivermectin, although other issues may be responsible for these results. The burden of ectoparasites was generally low (<10%), with ivermectin only significantly reducing the prevalence of ticks. Young animals that received ivermectin had a 15% increase in their growth rate, but this was not statistically significant. In conclusion, the use of ivermectin once a month for three months in pigs, as part of a malaria intervention, has some minimal positive health effects on treated pigs. Given the poor management practices, poor nutrition and lack of veterinary care in these pigs, it is likely that to have a greater impact on pig health, ivermectin will need to be delivered under a different dosing schedule and alongside owner education on pig management practices.

## Examination Graduate Committee

### **Major Advisor/Chair:**

Rist, Cassidy, DVM, MPH, Dip. ACVPM  
Associate Director, Center for Public and Corporate Veterinary Medicine  
Assistant Professor, Department of Population Health Sciences (0442)

### **Graduate Advising Committee Members:**

Roger A. Ramirez-Barrios, DVM, MS, PhD  
Clinical Associate Professor Veterinary Parasitology  
Department of Biomedical Sciences and Pathobiology  
VA-MD College of Veterinary Medicine

Patrick Pithua, DVM, MSc, PhD  
Associate Professor, Epidemiology  
Comparative and Analytical Epidemiology Laboratory  
Department of Population Health Sciences

Gillian Eastwood PHD  
Assistant Professor  
Department of entomology  
College of Agriculture & Life Sciences

Issa Lyimo, DVM, Ph.D  
Ecological and Behavioral Entomologist  
Environmental Health and Ecological Sciences Department  
Ifakara Health Institute, Tanzania



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