Dr Heike Lutermann (hlutermann@zoology.up.ac.za)

Level: MSc or PhD

Topic: Improved forecasting of blood feeding midges associated with the transmission of veterinary diseases

Summary: Predicting the dynamics of insect vectors of animal disease remains challenging. This project will determine the relationship between weather variables and the distribution and abundance of biting midges (Culicoides) as vectors of bluetongue virus (BTV) using an established nationwide suction trap network in South Africa. For a PhD the project will be expanded to include the development of forecasting models involving climate variables and atmospheric systems.

Level: MSc

Topic: Bergmann's rule in African mammals: geographic variation in body size across a continent

Summary: Variation in body size along latitudinal gradients is common in mammals. The energetic challenges of colder climates (i.e. Bergmann's rule) or rainfall patterns that affect plant productivity and seasonality (i.e. primary productivity hypothesis) have been proposed to explain this pattern. However, to date it is not clear whether these hypotheses hold for African mammals. This MSc project will assess variation in morphology of two sympatric small mammals species, the eastern rock sengi (Elephantulus myurus) and the Namaqua rock mouse (Micaelamys namaquensis), that are widely distributed across sub-Saharan Africa. This project aligns with UN sustainable development goal 15 (life on land).

Topic: The role of endemic rodents as reservoirs of tick-borne zoonotic diseases in Africa

Summary: Africa suffers from the highest burden of infectious diseases of humans and animals in the world while having the least capacity for disease detection and treatment. For vector-borne pathogens, ticks are the most important arthropod vectors and they frequently feed on commensal rodents. While many studies have implicated invasive rodents as reservoirs for tick-borne zoonotic pathogens, the role of endemic African rodents is rarely explored. This project will carry out a thorough review of the ticks and tick-borne pathogens reported for African rodents to date and use network analyses to identify the most likely sources for such zoonotic pathogens. It aligns with UN sustainable development goals 1(no poverty), 2 (zero hunger) and 3 (good health and well-being).