The crustaceans *Scylla serrata* and *Penaeus monodon* provide an important source of income, food, and essential nutrients to coastal communities in east Africa. Although they spawn offshore, juveniles inhabit muddy and sheltered areas among sea grass beds and mangroves. Apart from that, the rapidly growing coastal population in east Africa is threatening the sustainability of mangrove resources due to increased exploitation. Due to limited facilities and financial capability for treatment of wastes, levels of trace metals above background concentration are reported in several mangrove forests in the region. This study was conducted to assess the genetic diversity and connectivity in the East African mangrove crustaceans *S. serrata* and *P. monodon* in relation to trace metal pollution. Sediments cores, giant mud crabs (*S. serrata*) and tiger prawns (*P. monodon*) were collected from nine mangrove forests at the Tanzanian coast and analysed for trace metals (TMs) with a Sector Field Inductively Coupled Plasma Mass Spectrometer (ICP-MS). High levels of TMs were measured in sediments and tissues samples collected during the wet season. Mangroves associated with estuaries of big rivers and forests near large urban centres showed high levels of TMs. It was also revealed that the measured TMs present low to considerable risks to mangrove fauna. Due to their burrowing and feeding habits, mud crabs were more contaminated compared to tiger prawns sampled from the same site. However, the concentration of Cd, Cr, and Pb in edible tissues of both mud crabs and tiger prawns did not exceed the recommended levels for human consumption. It was also revealed that, with the exception of As, the measured elements are not expected to cause adverse health risks to an average local consumer.

Tissue samples of mud crabs were also collected in mangrove forests from Kenya, Mozambique, Madagascar, and South Africa. DNA extraction was performed on these tissues, together with the tissues of crabs and prawns collected from Tanzania. Eight microsatellite loci and a partial fragment (535 bp) of the cytochrome oxidase subunit I gene were amplified from the DNA extracts of mud crabs. Seven microsatellite loci and a partial fragment (582 bp) of the mitochondria control region were also amplified from the DNA extracts of tiger prawns. Populations of mud crabs on the east coast of Madagascar showed significant genetic divergence from the populations on the west coast of Madagascar, mainland east Africa, and Seychelles. The mud crabs showed extensive gene flow among mangroves in mainland east Africa, irrespective of the measured levels of pollution. Apart from that, significant negative associations were observed between the measured TMs and the genetic diversity of tiger prawns at the Tanzanian coast. Microsatellite differentiation was observed among tiger prawns in Tanzanian mangroves. Regression analysis showed that the observed microsatellite differentiation is associated with TMs pollution. Since no geographical barriers to gene flow were detected among Tanzanian mangroves, it is hypothesised that TMs affects connectivity by interfering with olfactory settlement cues. This suggests that if pollution control measures are strengthened, relatively pristine sites can act as source of larvae for recruitment and colonisation of moderately contaminated areas. Since, East African countries are committed to increase protection of their marine ecoregions to 10% by 2020, the observed pattern of connectivity provide useful information for establishment of a network of marine protected areas.

The defence will take place on Monday August 28 2017 at 9.30h in Auditorium D.2.01 at the Campus Humanities, Sciences and Engineering of the Vrije Universiteit Brussel, Pleinlaan 2 - 1050 Elsene, and will be followed by a reception.

Cyrus Rumisha was born in Dar es Salaam, Tanzania in November 1982. He obtained his first degree (BSc. Aquaculture) from the Sokoine University of Agriculture in 2008. In 2011, he completed postgraduate studies at the VUB and was awarded a master of science in ecological marine management (ecomama). Rumisha started PhD studies at the VUB in October 2013. His PhD research involved assessment of trace metal contaminants in mangrove sediments and the associated fauna, and analysis of the genetic population structure of the East African crustaceans using mitochondria and microsatellite markers. In the course of his PhD studies, Rumisha published two papers in peer-reviewed journals and submitted three manuscripts for publication consideration.