SCIENCES & BIOENGINEERING SCIENCES

The Research Group

Ecology and Biodiversity

has the honor to invite you to the public defense of the PhD thesis of

Addisie Yalew GEREMEW

to obtain the degree of Doctor of Sciences

Title of the PhD thesis:

Clonal and genotypic diversity, structure and connectivity of Cyperus papyrus populations: isotropic and anisotropic drivers

Promotor:

Prof. Ludwig Triest

The defence will take place on

Friday August 31 2018 at 15.00h

in Auditorium E.0.07 at the Campus Humanities, Sciences and Engineering of the Vrije Universiteit Brussel, Pleinlaan 2 - 1050 Elsene, and will be followed by a reception.

Members of the jury:

Prof. Nico Koedam (chairman)
Prof. Harry olde Venterink (secretary)
Prof. Dominique Maes
Prof. Olivier Hardy (ULB)
Dr. Taita Terer (National Museums of Kenya)

Curriculum vitae

Addisie Yalew Geremew (born in Ambo Meda, Ethiopia, 1983) obtained a Master of Science degree in Botanical Sciences from Addis Ababa University (Ethiopia) and Master of Science in Biology, following a scholarship he received from the VUB-IRMO, in 2013. In the same year, he was awarded a PhD scholarship by the same sponsor and went on to pursue his doctoral studies, under the supervision of Prof. Dr. Ludwig Triest, in the Ecology and Biodiversity Lab of the VUB.
He has participated in several international conferences and authored 3 peer-reviewed papers, in which he has shared his scientific work.

Abstract of the PhD research

The paper reed, *Cyperus papyrus* L., is a biologically productive keystone tropical macrophyte that provide several socio-ecological services. Knowledge about factors driving clonal and genetic diversity, structure and connectivity of *C. papyrus* populations is central for proper conservation measures and to understand the adaptive potential of the species. **The aim** of this project was to investigate isotropic and anisotropic drivers influencing clonal and genetic diversity, structure and connectivity of *C. papyrus* populations across different spatial scales (fine, local and regional-scales). Genotypic data combined with clonal growth data indicate that *C. papyrus* ameliorates the effect of sedimentation by shifting clonal growth strategy from guerrilla (in low sediment level, LSR) to phalanx (in high sediment level, HSR) and enhances clonal richness (under HSR). Hydrological connectivity and vegetative dispersal shape local scale clonal and genetic diversity, structure, and connectivity of C. *papyrus* populations in Lake Tana. Isotropic pattern of fine-scale genetic structure (FSGS) along physical distance between individuals differed between adults and juveniles. An imprint of significant anisotropic pattern of FSGS indicated directionally biased gene dispersal along the prevailing wind directions. At regional scale, multiple gene flow barriers limiting dispersal and increasing isolation-by-distance, and environmental factors (isolation-by-environment) favouring local selection contributed to the genetic differentiation between Rift and non-rift valley populations *C. papyrus* populations. In sum, these findings provide insights about isotropic and anisotropic drivers on clonal and genetic diversity, structure and connectivity of C. *papyrus* populations from fine-to regional spatial scales and the need of their considerations prior to restoration and conservation actions.