Elucidating woody vegetation patterns in relation to soil and topography in tropical Africa: the case of Nech Sar National Park in Ethiopia.

Shetie, Gatew M[1,2].; Dondeyne, Stefaan[2]; Nyssen, Jan[3]; Vancampenhout, Karen[2,4]; Deckers, Jozef[2]

[1]Faculty of Natural Sciences, Department of Biology, Arba Minch University, Ethiopia
[2]Department of Earth and Environmental Sciences, KU Leuven, Celestijnenlaan 200E, B-3001 Leuven, Belgium
[3]Department of Geography, Ghent University, Krijgslaan 281 (S8), B-9000 Ghent, Belgium
[4]Cluster for Bio-engineering Technology, Department Microbial and Molecular Systems, KU Leuven Campus Geel, Kleinhoefstraat 4, B-2440 Geel, Belgium

Key words: : Andosols; Bushland; Cambisols; Digital Elevation Model; Fluvisols; Riverine Forest; Soil Characteristics; Topographic Characteristics

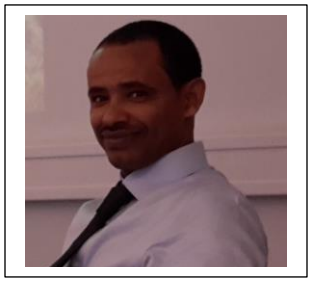
Abstract

Although soils and topography are reported to be key factors determining vegetation patterns, there are very few studies on this topic in tropical Africa. Given the relatively young age of the soils of Nech Sar National park, we hypothesised that the woody vegetation would be related to both topsoil and subsoil characteristics. As topography also determines soil characteristics, we investigated whether soil and topography could be considered independently. The abundance of woody plant species was measured in 19 stratified randomly selected plots of 20 m × 20 m. At the centre of each plot a soil profile pit was dug and samples were taken from each horizon. Topographic characteristics were derived from a 30 m × 30 m digital elevation model. Forest vegetation was found on Fluvisols and Gleyic Cambisols while bushland was found on Andosols and Vertic Cambisols. The vegetation gradient from forest to bushland (DCA-1) was correlated with both topsoil and subsoil characteristics reflecting parent material and alkalinity; these could however not be dissociated from topography. In contrast, variation both within the forest and the bushland (DCA-2) was not correlated with environmental characteristics. We attribute this variation to disturbances such as collection of firewood or logging or to the absence of large browsers or scarcity of wildfires. This study calls for giving equal attention to topsoil and subsoil for elucidating woody vegetation patterns. Though vegetation patterns vary with topography, a comprehensive understanding requires insights into soils.

Biography:

Shetie Gatew Mitiku has completed his MSc degree from Addis Ababa University, Ethiopia and PhD Studies from Faculty of Bio-Science engineering, Catholic University of Leuven, Belgium. He is a researcher in the field of Soil Science. He is a young researcher who finished his PhD recently and has published 3 papers in reputed journals.

Presenting author details



Full Name: Shetie Gatew Mitiku
Contact number: +251904852420
Twitter account: shetieg@yahoo.com
Linked In account:
Session name/ number:
Category: (Oral presentation/ Poster presentation): oral presentation
Passport Number: EP3424072