Applications of Multivariate Statistics on Ecological Surveys

Overview

Organization: Miguel Alvarez and Samuel Kiboi

Trainer: Miguel Alvarez

Date and time: 16th–23rd of November 2021
8:30–12:00 (classes)
13:30–16:30 (coaching)

Place: College of Biological and Physical Sciences
University of Nairobi

Mode: Presence

Description

Ecological systems are by nature complex, thus detecting relationships between environmental factors and abundance of species is challenging especially when working with observational studies rather than experiments. This course will do a brief introduction on the work with multivariate statistics and their applications on assessments of plant ecological observations.

We will handle the two major groups of methods, namely the ordination and the classification methods reviewing their fundamentals and applying in examples of vegetation data.

Requirements for the Workshop

This workshop is offered for Master and PhD students having basic knowledge on statistics. The limit of participants will be 20.

Every participant have to prepare his/her own computer. Data sets and installation files will be provided by the trainers.

It is also expected a previous knowledge about the programming language R and a quick Refresh course will be held before starting with statistics.

Intended Schedule

[R]efresh

16th November

- Refreshing R
- Syntax
- Objects
- Plot functions

Introduction to Multivariate Analysis

17th November

- Definition of Multivariate Statistics
- Classification vs. Ordination Analysis
- Similarity and dissimilarity
- Required transformations

Ordination Analysis

17th – 18th November

- Definition of Ordination
- Direct vs. Indirect Ordination in Ecology
- PCA, CA and DCA
- RA, CCA
- Dissimilarity and Distance Metrics
- nMDS

Classification Analysis

19th and 22nd November

- Hierarchical vs. Non-Hierarchical
- Agglomerative vs. Divisive
- Hierarchical Clustering
- TWINSPAN
- CART
- K-means
- Cocktail

Further Assessments

23nd November

- Procrustes
- MRPP
- Mantel Test
- Course closure