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Data Article

Data on vegetation sampling in areas dominated *by Pteridium aquilinum* in Nyungwe forest, Western Province of Rwanda

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ABSTRACT

The data presented in this article describe plant traits (ecological strategy, plant succession, biological form, plant distribution and conservation status), cover-abundance scores of individualized communities after the application of Multivariate Statistical Package (MVSP) software and coverage percentage of species which compose the communities in areas sampled from Nyungwe forest. Taxonomic diversity indices (Shannon, Evenness and Richness) were also calculated and included in the dataset. The observed data can support the evaluation of *Pteridium* invasion in comparable forest types.

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Specifications Table

Subject	Plant ecology
Specific subject area	Plant biodiversity, Phytosociology and conservation
Type of data	Supplementary data
How data were acquired	Vegetation data were collected using consolidated field sampling methods. Several plaint traits were attributed to each sampled plant species by using well-established methods (e.g. Grime [1] for ecological strategy, Gibson et al. [2] for plant succession, Raunkiaer [3] for biological forms, White [4], Fischer and Killimann [5] for plant distribution and IUCN [6] for conservation status).Cover-abundance values were attributed to each classified plant species by using the Braun-Blanquet scale [7], and the percentage species coverage was then calculated from raw cover-abundance values. Taxonomic diversity indices were also calculated from the raw presence-absence values by using Multivariate Statistical Package (MVSP) software.
Data format	Raw Calculated Analysed
Parameters for data collection	Vegetation sampling was performed by a systematic sampling methodology where plant species were inventoried in plots of 10 × 10 m which were regularly and alternatively spaced at 10 m intervals. Four sites were selected for the sampling. Two of them were bracken- dominated areas, the third was a bracken-regenerated site after its removal and the fourth site was a non-invaded area sampled as the control site.
Description of data collection	In each of the 10 × 10 m plots, all plants were identified, their species name were recorded, and their absolute frequency was estimated. A total of 53 plots were sampled, and a total number of 141 plants were surveyed.
Data source location	Region: Nyungwe forest, Western Province Country: Rwanda Vegetation sampling was performed in Nyungwe forest located in Western Rwanda between latitudes 2°15–2°55 S, and longitudes 29°00–29°30 E, and at an altitude between 1600 m and 2950 m above sea level, with an area of approximately 1000 km^2.
Data accessibility	With the article Repository name: Mendeley data Data identification number: Reserved https://doi.org/10.17632/85cbmzvzd4.1
Related research article	J.M.V. Senyanzobe, Josephine M. Mulei, Elias Bizuru and Concorde Nsengumuremyi. Impact of *Pteridium aquilinum* on vegetation in Nyungwe Forest, Rwanda. Journal of Heliyon. https://doi.org/10.1016/j.heliyon.2020.e04806

Value of the Data

The ecological data obtained from fern vegetation are useful for plant ecologists: the data can be used to assess the vegetation structure after *Pteridium* invasion compared to the intact vegetation

Decision makers and phytosociologists can benefit from these data: for example, decision makers can use these data to justify their decision to remove the bracken fern from the forest.

Ecological data are dynamic within time and space context: thus, they can be used or reused to compare the vegetation change between the pre-existing and current vegetation.

Furthermore, ecological vegetation data constitute the database for researchers and resources managers.

1. Data Description

The ecological data presented in this article include field-observed, calculated and analysed data. Cover-abundance values observed in 53 plots were analysed, and four communities were

delineated; each community was then individualized according to plots and species. The four individualized communities were composed of 15, 13, 13 and 12 plots and 52, 42, 84 and 52 species respectively. The diversity indices presented in the supplementary file were also calculated from these data.

The presence/absence of species observed in the field was evaluated to calculate the number of individuals of each species and their relative frequency (RF) in all plots sampled (supplementary annex)

Supplementary file presents the details of the analysed data. Appendices 1, 2, 3 and 4 present data of all species, families, plot compositions, plant traits, cover-abundances and coverage percentage of species in community I, II, III and IV respectively. Appendices 5, 6, 7 and 8 show the diversity indices in the respective communities.

Supplementary annex presents raw data and calculated data in all 53 plots sampled in the selected areas of Nyungwe forest. The dataset consists of an excel spreadsheet containing species composition, presence/absence that allows to individualize communities and calculated data such as number of individuals and RF of each species surveyed.

RF is derived by taking the number of individuals of each species divided by the total number of plots sampled $\times$ 100.

2. Experimental Design, Materials and Methods

2.1. Study area

The study was performed in Nyungwe forest (Western Rwanda) between latitudes 2°15–2°55 S and longitudes 29°00–29°30 E. Floristically, Nyungwe is regarded as the richest forest remaining in Rwanda, with more than 240 plant species from at least 57 families which include dominant species such as *Syzygium parvifolium, Macaranga kilimandischarica, Hagenia abyssinica, Carapa grandiflora, Newtonia buchananii, Neoboutonia macrocalyx Prunus africana, Symphonia globulifera, Cyathea manniana, Polyscias fulva, Parinaria excelsa, Podocarpus latifolius, Erica johnstonii, Entandophragma excelsium* and *Maesa lanceolata. S. parvifolium, M. kilimandischarica* and *C. grandiflora* accounted for 35.7% of the large trees ($\geq$30 cm DBH [diameter at breast height]) (Plumptre et al.) [8].

Wildfires occurred in this forest between 1997 and 1998, which created large canopy gaps and clearings that allowed to establish light tolerant species such as

Pteridium aquilinum that rapidly colonized the burnt areas. Hence, fire was considered as a major threat to the conservation of plant biodiversity (Masozera) [9].

2.2. Experimental design and Materials

The study was conducted in three sites of the forest. The first site was the area affected by the fire and invaded by the fern vegetation. The second site was the natural forest regenerated after bracken fern clearing by Wildlife Conservation Society (WSC) [10]. The third site was the primary forest untouched by the 1997–1998 fires and was considered as the control site.

2.3. Analytical methods

Vegetation sampling was performed systematically according to Braun-Blanquet [11]. Plant species were inventoried in plots of 10 $\times$ 10 m which were regularly and alternatively spaced at 10 m intervals along a transect. Geographic coordinates of each plot were recorded using an estimated precision of positioning. A total of 53 plots were sampled, with 41 plots in fern bracken vegetation and 12 plots in primary forest.

For each plot, plants were recorded (1) and their species were identified. Data on vegetation were analysed using MVSP (Multivariate Statistical Package) software in which variables are plots and samples (cases) are species. Correspondence analysis was used to delineate communities in all the sampled areas, and plant diversity of communities was calculated using Shannon-Weiner formula.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships which have, or could be perceived to have, influenced the work reported in this article.

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Supplementary Materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.dib.2021.106772.

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