

Vegetation Assessment Under the Influence of Environmental Variables; A Case Study from the Yakhtangay Hill of Himalayan Range, Pakistan

Authors : Hameed Ullah, Shujaul Mulk Khan, Zahid Ullah, Zeeshan Ahmad Sadia Jahangir, Abdullah, Amin Ur Rahman, Muhammad Suliman, Dost Muhammad

Abstract : The interrelationship between vegetation and abiotic variables inside an ecosystem is one of the main jobs of plant scientists. This study was designed to investigate the vegetation structure and species diversity along with the environmental variables in the Yakhtangay hill district Shangla of the Himalayan Mountain series Pakistan by using multivariate statistical analysis. Quadrat's method was used and a total of 171 Quadrats were laid down 57 for Tree, Shrubs and Herbs, respectively, to analyze the phytosociological attributes of the vegetation. The vegetation of the selected area was classified into different Life and leaf-forms according to Raunkiaer classification, while PCORD software version 5 was used to classify the vegetation into different plants communities by Two-way indicator species Analysis (TWINSpan). The CANOCO version 4.5 was used for DCA and CCA analysis to find out variation directories of vegetation with different environmental variables. A total of 114 plants species belonging to 45 different families was investigated inside the area. The Rosaceae (12 species) was the dominant family followed by Poaceae (10 species) and then Asteraceae (7 species). Monocots were more dominant than Dicots and Angiosperms were more dominant than Gymnosperms. Among the life forms the Hemicryptophytes and Nanophanerophytes were dominant, followed by Therophytes, while among the leaf forms Microphylls were dominant, followed by Leptophylls. It is concluded that among the edaphic factors such as soil pH, the concentration of soil organic matter, Calcium Carbonates concentration in soil, soil EC, soil TDS, and physiographic factors such as Altitude and slope are affecting the structure of vegetation, species composition and species diversity at the significant level with p-value ≤ 0.05 . The Vegetation of the selected area was classified into four major plants communities and the indicator species for each community was recorded. Classification of plants into 4 different communities based upon edaphic gradients favors the individualistic hypothesis. Indicator Species Analysis (ISA) shows the indicators of the study area are mostly indicators to the Himalayan or moist temperate ecosystem, furthermore, these indicators could be considered for micro-habitat conservation and respective ecosystem management plans.

Keywords : species richness, edaphic gradients, canonical correspondence analysis (CCA), TWCA

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