Available online at www.scholarsresearchlibrary.com

Scholars Research Library

Annals of Biological Research, 2022, 13 (7):205-206
(http://scholarsresearchlibrary.com/archive.html)

ISSN 0976-1233
CODEN (USA): ABRNBW

Impact and Applications of Functional Ecology in Ecosystems

Storm Russell*

Department of Biological Sciences, University of Calgary, Alberta, Canada

***Corresponding Author:** Storm Russell, Department of Biological Sciences, University of Calgary, Alberta, Canada, E-mail: russell@gmail.com*

***Received:** 01-Dec-2022, Manuscript No. ABR-22-83188; **Editor assigned:** 06-Dec-2022, PreQC No. ABR-22-83188; **Reviewed:** 21-Dec-2022, QC No. ABR-22-83188; **Revised:** 28-Dec-2022, Manuscript No. ABR-22-83188; **Published:** 04-Jan-2023, DOI: 10.4172/0976-1233.002*

DESCRIPTION

A subcategory of ecology known as "functional ecology" is concerned with the functions that species perform within the communities and ecosystems in which they are found. The physiological, anatomical and life history traits of the species are highlighted in this method. The word "function" is used to explain an organisms function in a trophic system, highlight specific physiological processes over specific features or show how natural selection affects an organism. The intersection between ecological patterns and the underlying processes and mechanisms is represented by this branch of ecology. It focuses on features that are present in a number of various species which can be evaluated in two different ways screening which mainly contains a trait across a wide range of species and empiricism which offers quantitative relationships for the screening measured traits.

Functional diversity

According to common perception functional diversity refers to "the significance and complexity of those species and organismal features that influence ecosystem function." Function might refer to a person, a population, a community, a trophic level, or an evolutionary process. Functional diversity was developed as an alternative classification to approaches that measure a species ecological importance in an environment by looking at its genetic or physiological diversity. It also aims to help us understand how biodiversity affects particular ecosystem functions.

Impact on ecosystem health

The influence of functional diversity on ecosystem health is a major focus of contemporary study in functional ecology. Biodiversity has a beneficial effect on an ecosystem's productivity. The capability of the ecosystem to control the flow of energy and matter through the environment (Ecosystem Functions) and the ecosystem's capacity to produce resources helpful to humans such as air, water and wood both grow with more functional diversity. As the diversity of genes, species and functional groups within an ecosystem declines the ecosystems functions. In fact regardless of functional group, trophic level, or species, decreases in functional diversity have a significant negative impact on the ability of organisms to survive in their environment. This suggests that how communities in an ecosystem are organized and interact with one another has a significant influence on the ecosystem's capacity to function and self-sustain. Additionally, diversity enhances the stability of the environment. An ecosystem is more resilient to changes in species composition (such as extinction events or invading species) and unintentional changes to environmental circumstances the more diverse it is (e.g. logging, farming, and pollution). Additionally, the advantages variety brings to an area don't increase linearly with diversity levels. Ecosystems are negatively impacted by the non-linear loss of diversity this effect is particularly harmful when the loss occurs across trophic levels.

Applications of functional ecology

The concepts of functional ecology have positive effects on the identification and classification of species. Ecologically significant traits, such as plant height, affect the likelihood of a species being found during field surveys. When analyzing an environment holistically, the systematic error of imperfect species detection can result in incorrect conclusions about how traits and environments have evolved, as well as inaccurate estimates of the functional trait diversity and the role of the environment. For instance, if small species of insects are less likely to be found researchers may draw the conclusion that they are considerably rarer than larger species of insects. The functional packaging and the defining functional groups in an ecosystem are significantly impacted by this detection filtering.

Even species classification can benefit from a functional perspective on identifying features. The frequency and types of traits to be considered are heavily contested yet trait-focused taxonomy schemes have long been employed to categorize organisms. More features will help classify species into more narrow functional categories, but they may also cause the total functional variety of the environment to be overestimated. Too few features however run the risk of labelling species as redundant when they are actually essential to the ecosystems health. So, the definition of trait needs to be established before organisms may categorized based on their qualities. Modern ecologists support a more comprehensive definition of features, also referred to as functional traits, as opposed to Darwin's concept of traits as proxies for organism performance. According to this paradigm, functional features are morpho-physiophenological traits that affect growth, reproduction, and survival and have an indirect impact on fitness.

Genomic science and functional ecology are similar. Knowing the functional niches that different species fill in an ecosystem might help identify genetic variations among genus members. On the other hand understanding the characteristics or capabilities that genes encode for provides information on the functions that organisms carry out in their environments. Genetic ecology or ecogenomics are terms used to describe this type of genomic research. A more accurate categorization system can be created by using genomic ecology to categories features at the cellular and physiological levels. Additionally predictions about the functional variety and composition of an ecosystem can be formed from the genetic data of a few species through a technique known as reverse ecology, after genetic markers for functional features in individuals are identified. Better taxonomy of organisms is another benefit of reverse ecology.

The study and discussions surrounding de-extinction or the resuscitation of extinct species, also benefit greatly from functional ecology. Ecology can be used to evaluate the resuscitation of extinct species selectively to maximize its environmental impact. A functional study of the world's ecosystems can be carried out to assess which habitats would profit most from the enhanced functional diversity of the reintroduced species in order to prevent reintroducing a species that has been functionally redundant by one of its descendants. These factors are crucial because, despite the fact that many species currently under consideration for de-extinction are terrestrial, they are also redundant in their original environments.