

Biodiversity and the ecological role of grasslands environment and territory

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Abstract: Biodiversity is all the living species that inhabit the planet: plants, animals, microorganisms, but also their genetic diversity and all the ecosystems in which they live. The preservation of biodiversity is vital, because the organisms that constitute it participate in the major ecological cycles of air, soil and water. It is today recognized for its intrinsic value and for the functions it provides in ecosystems. The grassland and the hedges that surround them play a key role in carbon storage, water purification, biodiversity and the typicality of landscapes. They partly provide the plants necessary for feeding herds of herbivores (cattle, goats, sheep, equines). Generally composed of a plant diversity and agroecological infrastructures (hedges, ponds), the meadows offer shelter (nesting) and cover to an infinity of species which enrich each other and form a community with multiple ecological assets. The relationship between plant diversity and the primary production of grassland ecosystems is still the subject of debate today. We most often observe a positive relationship between diversity and biomass production in reconstituted plant communities (results of experiments on artificial communities) and a negative relationship in natural communities (results of observations on permanent grasslands in place for several years).

Introduction

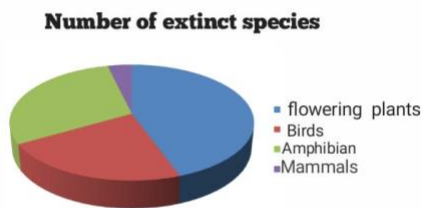
All over the world, biological communities that have been formed for millions of years are now being destroyed by man. The current threats to biodiversity are unprecedented: never in the history of life have so many species been threatened with extinction in such a short time. Threats to biodiversity are intensifying due to the increasing demands of a rapidly growing human population. The preservation of biodiversity is vital, because the organisms that constitute it participate in the major ecological cycles of air, soil and water. Today, it is recognized for its intrinsic value and for the functions it performs in ecosystems. The meadows and the hedges that surround them play a key role in carbon storage, water purification, biodiversity and the typicality of landscapes.

In our climates, permanent grasslands, which are never plowed, are the main reservoirs of biodiversity. When they graze the grass in the meadows, cows, sheep and horses only eat certain plants, according to their preferences. This promotes a plant diversity that offers varied food and habitats for many insects. Thus, there are many plant species that, associated with hedges, offer varied habitats where a great diversity of animals can take refuge, feed and reproduce: insects, birds, mammals.

The set of living beings in an ecosystem constitutes the biocenosis, in which the different communities are essentially distinguished by their position in the food web (autotrophic plants and microorganism's primary producers; animals: primary and secondary consumers; heterotrophic microorganisms decomposers). It is these communities, considered essential elements of the biodiversity of the prairies, that we will discuss in this chapter. The diversity of prairies landscapes and ecosystems, which is also an important component of biodiversity, will also be addressed.

Biodiversity:

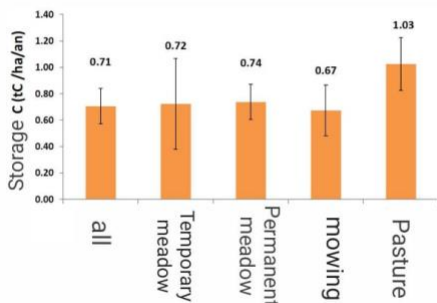
Biodiversity is the diversity of all life on Earth, from genes to ecosystems, including all types of animals, plants and microorganisms that inhabit all habitats on the planet. It penetrates each of the three main levels of organization of living matter, hence the three branches of biodiversity: genetic, species and ecological. Biological diversity at the species level covers the entire range of species on Earth, from bacteria and protozoa to the kingdom of multicellular plants, animals and fungi. On a smaller scale, biological diversity includes the genetic diversity of species, both geographically distant populations and individuals of the same population. Biological diversity also includes the diversity of biological communities, species, ecosystems formed by communities and the interactions between these levels. All levels of biological diversity are necessary for the continued survival of species and natural communities.



According to the famous biologist Edward Wilson, biodiversity is the very essence of life. The most reliable facts of the disappearance of species from the face of the Earth have been recorded for the period from 1984 to 2004. During this period, at least 27 species become extinct: 12 species of flowering plants, 6 species of birds, 8 species of amphibians and 1 species of mammals.

Ecological role of grasslands environment and territories

Carbon storage according to the type of meadow



source : klumpp k., 2015

Grasslands are carbon sinks

In temperate zones, a meadow captures 65 tons of CO₂ per hectare, which makes it a major asset in the fight against climate change. This absorbing power of the prairies thus largely compensates for the 5% of greenhouse gas emissions of ruminants the prairies and the grasslands are equally effective, and the risks of great losses following a fire are less. Hence the interest of maintaining the meadows threatened in particular by rampant urbanization.

Due to genetic progress and cultural practices, the production of plant biomass has increased in recent years. This made it possible to increase the restitution of straw in the soil and thus the carbon stock. Intermediate crops also capture carbon, produce biomass and protect soils from erosion. All the biomass they produce contributes to replenishing the soil's humus stock: this corresponds on average to 240 kg of carbon per hectare per year. The meadows feed the stock at a height of 700kg c / ha per year

Grasslands, a source of diversity

The meadows and the structures that are associated with them (field edges, hedges, embankments, ditches, ...), are also a source of biodiversity and provide habitats for wildlife and pollinating insects. Several studies carried out have demonstrated in this sense that grassland soils are richer in microbial biomass and biodiversity than crop soils.

The meadows filter the water and make it possible to fight against soil erosion

A meadow is a filter that captures pollutants from the air, cleans and purifies the soil, and protects the water resource "Meadow soils are 20 times less sensitive to erosion and filter water better



Finally, and this is perhaps one of the most important points, the disappearance of grasslands leads to desertification. Grazing makes it possible to combat desertification. Indeed, INRA specifies that "during the 19th century, a billion hectares of arable land disappeared in the world, that is to say the surface of the

United States. The main cause of this is the disappearance of livestock farming and its regulatory functions, which has led to a desertification of the land. The pastured soils contribute indeed by their texture and the grass cover to the limitation of water losses by runoff and to the recharge of the groundwater tables. In addition to these direct effects, grasslands have indirect effects via spatial and temporal interactions with annual crop areas within the framework of the cultivation and production systems where they are inserted.

Conclusion

Thus, the conservation of biodiversity is, among other things, a question of ethics. Nature in all its manifestations plays a very important role in the creation of our ideals and aspirations. Many of us feel despair and even shame when an animal species disappears or an element of the landscape is destroyed because of human activity in our region. And, on the contrary, we rejoice when we learn that we have managed, for example, to save this or that animal, to empty a tank of household garbage. It should be noted that the feeling of satisfaction in this case can also be indirect. Thus, a person who has never seen a whale is delighted with the simple awareness that this and other exotic species still live in the world. Concern for the conservation of biodiversity is increasingly becoming the basis of activity for an increasing number of people. It is this feeling that pushes them to give their time and energy, and sometimes to devote their lives to the conservation of animal, avian or plant species. This feeling supports those who, for years, go through bureaucratic bodies to create a reserve or a natural monument. Like the aesthetic value, the ethical value of biodiversity cannot be measured and expressed in monetary terms. The dedication of conservationists is solid proof that the resources of biodiversity are priceless - they are priceless.

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