

Iceland, Slovenia and Pamplona; Betulaceae family in Europe



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Introduction

It is known, since many years ago, plants are not equally distributed in different areas. Each plant has different necessities and conditions.


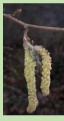


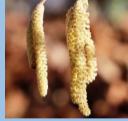

Therefore, depending on the places they live, they have different structures, although they are capable to adapt to the environment they are located. Sometimes, more than live, they have to survive.

Related to the climate, we can find different species; for example, deciduous trees or perennial. Other plants, do not need huge amounts of water because they can live in dry areas. The acidity of the place is another point to be consider. Also, the light is one of the most important item.

Our research goal is to discover if the latitude influence in the plants' growth, comparing species from Slovenia, Iceland and Navarre. Besides, we are going to focus on the characteristics of each trees, studying their ideal conditions which affect to their growth.

Results

To verify the reason for the growth of these species in some areas or others, we carried out the analysis of the climate of the different areas and studied the characteristics of the different specimens.

Place	Species	Image	Latitud
Pamplona	Alnus Glutinosa		42.8168716
	Corylus Avellana		
Iceland	Betula Pubescens		64.931300
Slovenia	Alnus Glutinosa		46.1333
	Corylus Avellana		46.36917
	Ostrya Carpinifolia		46.095560

Place	Type of climate	Average temperatures	Average precipitations
Pamplona	Transition	12.4°C	1042 mm
Iceland	Tundra	3.2°C	816 mm
Slovenia	Sub-mediterranean	10.0°C	1074 mm

Materials and methods

To carry out the research, we analyzed the different specimens of the Betulaceae family in Pamplona, Slovenia and Iceland, as well as the typical climate of each area. We have also analyzed the species that are common in some countries and those that are only found in one of them.

The platforms we used to carry out the research were the following:

- iNaturalist
<https://www.inaturalist.org/observations>
- GeoEnciclopedia
<https://www.geoenciclopedia.com/tipos-de-clima/>
- Latitud. Maps (mobile app)

The transition climate, we can observe more extreme temperatures in winter and summer. Winters can be sunny, but are usually cold with regular rainfall and light snowfall. Summers are hot and dry and nights cool.

Tundra is found in high latitudes and polar regions. It is characterized by presenting an icy soil with little vegetation of natural trees. It has a cold climate, very strong winds, but rainfall is very low, although it is not considered a dry climate.

Alnus Glutinosa can be found in Navarra and Slovenia. It is fairly cold hardy and can tolerate fairly wet or dry climates. Its optimal temperature range is between 8 and 14 degrees, which explains why we find it mainly in Pamplona and Slovenia, but not in Iceland. Corylus Avellana is very sensitive to drought, prefers not to be exposed to the sun (although it requires light) and is able to withstand frost. For flowering and fruit set, medium temperatures (between 12 and 20°) are necessary.

Betula Pubescens needs large amounts of water and that cannot withstand dry summers. It is prepared to withstand large amounts of snow on its branches. The branches of this species are flexible and resistant and its crown is very irregular.

Ostrya Carpinifolia can be found commonly in Slovenia. It knows how to adapt very well to weather conditions, although preferably in humid and cool climates, as its resistance to drought is medium.

Conclusions

Regarding the central question of this study, we can see how latitude does influence the growth of birch trees in the studied areas. This is due to the different temperatures and the climate present in the different areas. We can see how Alnus Glutinosa and Corylus Avellana are common in areas where temperatures are more stable, while others like Betula Pubescens are characteristic in Iceland, as they are more resistant to low temperatures. This is determined by the typical characteristics of each tree, as well as by their needs. Our results also indicate that despite having a similar climate there are species such as Ostrya Carpinifolia, which is only found in Slovenia and not in Spain. So we can see that more factors can influence than those studied. So this aspect is not clear to us and in future research we would carry out activities to understand it. Unexpectedly we also discovered the adaptation of the leaves according to the climate, since depending on whether they are in one climate or another, they are very different.

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