

BIRD BIODIVERSITY VARIES BY LATITUDE, BEING IN EXTREME LATITUDES WHERE THIS VARIATION IS MOST EVIDENT

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INTRODUCTION

Bird biodiversity is a well-studied topic. However, very little research focuses on its linkage with latitude. In addition, the few studies that exist linked to our research question: how does latitude affect bird biodiversity?, are limited to a quantitative analysis of bird biodiversity based on latitude. On the other hand, there are both qualitative and quantitative studies that analyze biodiversity thoroughly based on latitude, but generally, without focusing on birds. In short, there is not much research on our particular subject. The main objective of this research is to analyze whether there is any link between latitude and bird characteristics.

Our starting hypothesis is: Some characteristics of birds vary depending on the latitude.

RESULTS

Analysis:

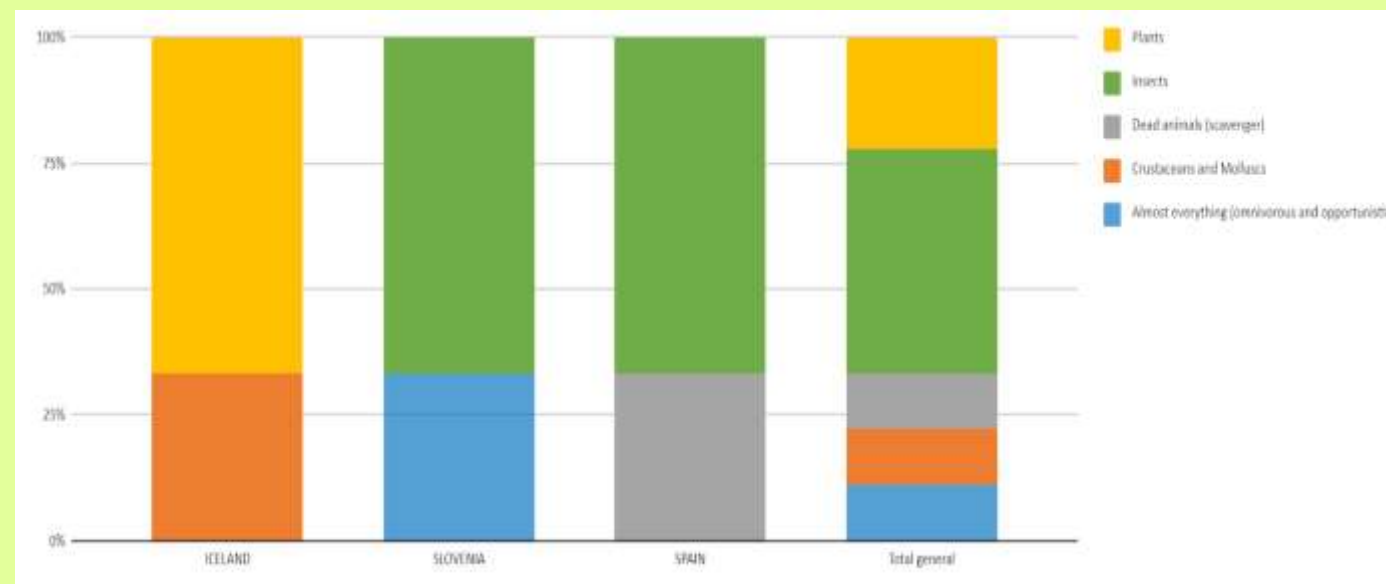
Those living in Iceland:

- They only live in northern areas.
- They feed mainly on crustaceans, molluscs and plants.
- They're migratory.
- They present adaptations for the cold.

Those living in Spain and Slovenia:

- They're more widespread across the country.
- They feed mainly on insects.
- They are not migratory.
- They have no adaptations.

It is necessary to take into account that this is a small-scale study. It would take many more data to get really reliable results



COUNTRY	SPECIES	DISTRIBUTION	DIET	COLOR	MIGRATION	ADAPTATION
ICELAND	Somateria Mollissima	Only in northern areas	Crustaceans and Molluscs	Black, white and brown	Yes	Yes (feather adaptation to its harsh environment)
	Anser Anser	Only in northern areas	Plants	White and grey	Yes	No
	Plectrophenax Nivalis	Only in northern areas	Plants	White and black	Yes	Yes (feather adaptation to its harsh environment)
SLOVENIA	Corvus Cornix	Widely distributed 1	Almost everything (omnivorous and opportunistic)	Grey and black	No	No
	Dendrocytes Medius	Widely distributed 1	Insects	Black, white and red	No	No
	Certhia Familiaris	Widely distributed 1	Insects	Brown and white	No	No
SPAIN	Gyps Fulvus	Widely distributed	Dead animals (scavenger)	Brown and white	No	No
	Pyrrhocorax Pyrrhocorax	Widely distributed	Insects	Black	No	No
	Athene Noctua	Widely distributed	Insects	Brown, grey and white	No	No

MATERIALS AND METHODS

To carry out this research, we have counted on the collaboration of one university in Iceland and another in Slovenia, maintaining contact with both countries thanks to the etwinning platform.

In this way, it has been possible to obtain data on bird biodiversity in the 3 countries: Spain, Iceland and Slovenia.

The data, all obtained in March, had to be collected in a table indicating the scientific name of all birds located in each of the countries.

Initially, the three countries had to collect the data in 3 different urban parks, indicating the characteristics of that park and the weather at the time of data collection. However, due to the situation we are experiencing, the students of Spain have had to search for the information on the Internet, specifically in the website: <https://www.inaturalist.org/observations>, and therefore, in this research, we will only take into account localized birds and not the characteristics of the park or the weather.

In short, due to the divergences of our sources of information, the variables that we are going to take into account are the following:

- Independent variable: latitude (Country)
- Control variable: the month of data collection (March) and the number of birds analyzed by country (3).
- Dependent variable: characteristics of birds, specifically their distribution, their main source of food, their color, whether it is a migratory bird or not and if it has any specific adaptation.

CONCLUSIONS

After analyzing the results, we can conclude that there is a link between latitude and biodiversity of birds.

Some features such as distribution, its main source of sustenance, whether it is a migratory bird or not, or if it has any specific adaptation vary depending on the latitude.

With the data analyzed, we cannot conclude that the color is affected. However, in a larger-scale study, including tropical countries, variations in color would probably be significant.

Most of the characteristics studied are linked to temperature. Examples include:

- Iceland's birds are likely to be forced to migrate due to the extremely low temperatures of the territories in which they live.
- In cold areas the number of insects is lower (MacMillan, H, Andersen, J, Davies, S & Overgaard, J, 2015), which explains the plant-based feeding of birds in Iceland.
- The only adaptations found are related to the cold.

For this reason we can conclude that bird biodiversity varies depending on latitude, but that this is mainly due to the temperature differences associated with it.

In addition, we can say that these variations are particularly noticeable in extreme latitudes, such as that of Iceland, since the characteristics of birds observed in Spain (43°N) and Slovenia (46°N) are very similar to each other, but have significant differences with those present in Iceland (66°N).

On the other hand, with the data obtained, it can also be concluded that the biodiversity of birds in extreme latitudes, as is the case in Iceland, is lower than that of average latitudes as is the case in Spain and Slovenia since in Iceland only 6 different species of birds were observed, while the number of birds located in Spain and Slovenia was significantly higher, surpassing 17 species in both countries.

Finally, and related to this research, we consider it could be interesting to investigate how global warming affects bird biodiversity.

REFERENCES

MacMillan, H, Andersen, J, Davies, S & Overgaard, J. (2015). The capacity to maintain ion and water homeostasis underlies interspecific variation in *Drosophila* cold tolerance. *Scientific Reports*, 5, (18607). doi: 10.1038/srep18607. Retrieved from <https://www.nature.com/articles/srep18607>

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