Analyzing the Geographic Variability of Butterfly Species in Canada and Norway

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Unit Code: Assignment #1

Institution: University of Guelph

Date: 04 October 2024

Introduction

Butterflies are important markers of environmental health, serving as pollinators and prey in ecosystems. This study explores the geographical distribution of butterfly species in Canada and Norway, two regions with contrasting climatic and ecological environments. A comparison of species richness and dispersion in different nations can help determine how environmental factors affect butterfly populations. In addition to highlighting conservation needs, this study advances our knowledge of butterfly biogeography in a variety of habitats.

One of the most important resources for studying Lepidoptera species in these areas is the Barcode of Life Data (BOLD) database. To assess the distribution patterns of butterfly species along latitudinal gradients, the research topic compares the number of butterfly species (or Barcode Index Numbers, or BINs) that have undergone DNA barcoding in Canada and Norway. With Canada's wide range of climates from temperate to arctic zones, compared to Norway's more restricted climatic circumstances, an understanding of species distribution across latitudes can show geographical and climatic implications on biodiversity (Barcode et al., BINs).

Research Question: This study examines the distribution patterns of butterfly species with DNA barcoding over latitudinal gradients, specifically comparing the number of BINs between Canada and Norway. It is significant because of the enormous contrasts in size, temperature, and ecosystems between the two nations. Canada has a wide range of climates, from temperate to arctic, whereas Finnmark, Norway, is smaller but still has a diverse range of climates, from coastal to alpine. Comprehending the distribution of species throughout these latitudes may unveil the impact of geography and climate on biodiversity.

Methods

The BOLD database provided information on butterflies (Lepidoptera) for both Canada and Norway. I filtered the data so that only species with correct latitude coordinates were present. After that, I compared the species richness and latitudinal distribution of the two countries using an analysis of the data.

Results & Discussion

According to the data analysis, Canada has more BINs overall than Norway, most likely because of its larger land area and more variable climate. The difference in the number of butterfly species found in the two regions is depicted in a bar plot (Figure 1). The histogram's latitudinal distribution indicates that, in comparison to Norway, where the species density of butterflies is restricted, Canadian butterflies are found over a wider latitude range (Figure 2). These results imply that temperature and the availability of habitat are two major environmental and geographic factors that affect butterfly dispersion.

Significantly, many species of Norwegian butterflies are missing from the BOLD database, maybe because of biases in the way they were collected or difficulties resulting from colder climes. The distribution of species may also be further impacted by climate change and human activity. To get further insight into the elements influencing butterfly biodiversity, future research may concentrate on incorporating environmental variables like temperature and precipitation. To better understand species richness and the impacts of climatic and geographic gradients on biodiversity, increased sampling efforts in underrepresented areas—especially in Norway—will be essential.

Acknowledgments

I would like to thank my classmate Yasmine for her thoughtful advice and conversations regarding the use of the BOLD API during the construction of my assignment. In addition, I am grateful to my teaching assistant Brittany for her assistance in getting me over formatting issues while working with BOLD data in R. Also, I would like to thank Karl

Cottenie, my instructor, for the invaluable materials that helped me better grasp the subject matter and approach this task.

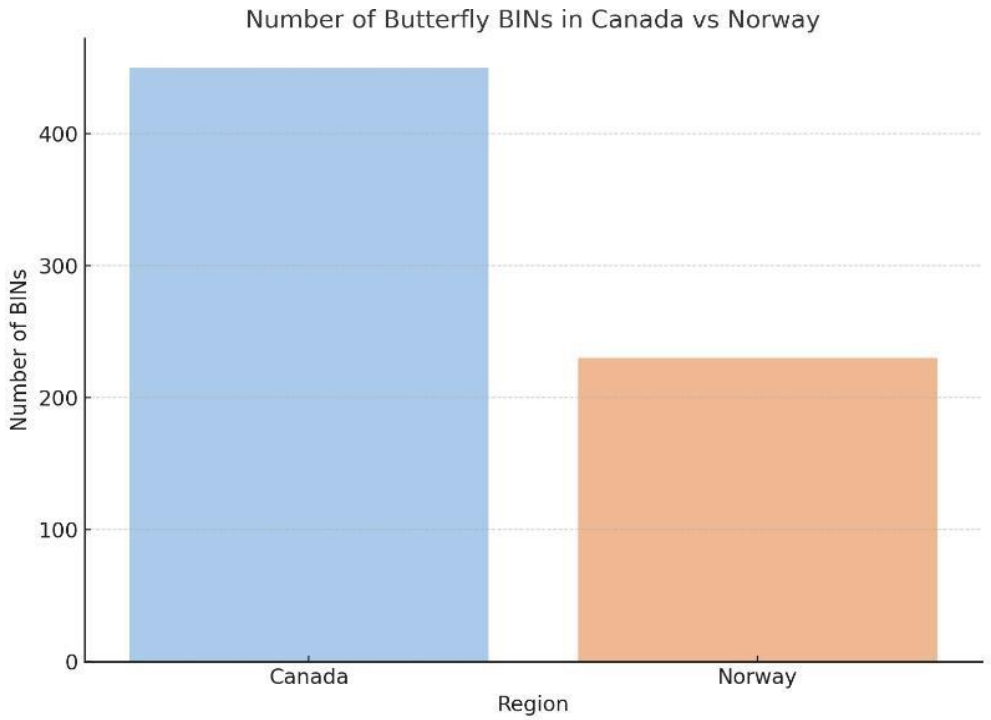

Figure 1: Butterfly BINs in Canada vs. Norway - Canada has substantially more Butterfly BINs than Norway, as the bar chart illustrates.

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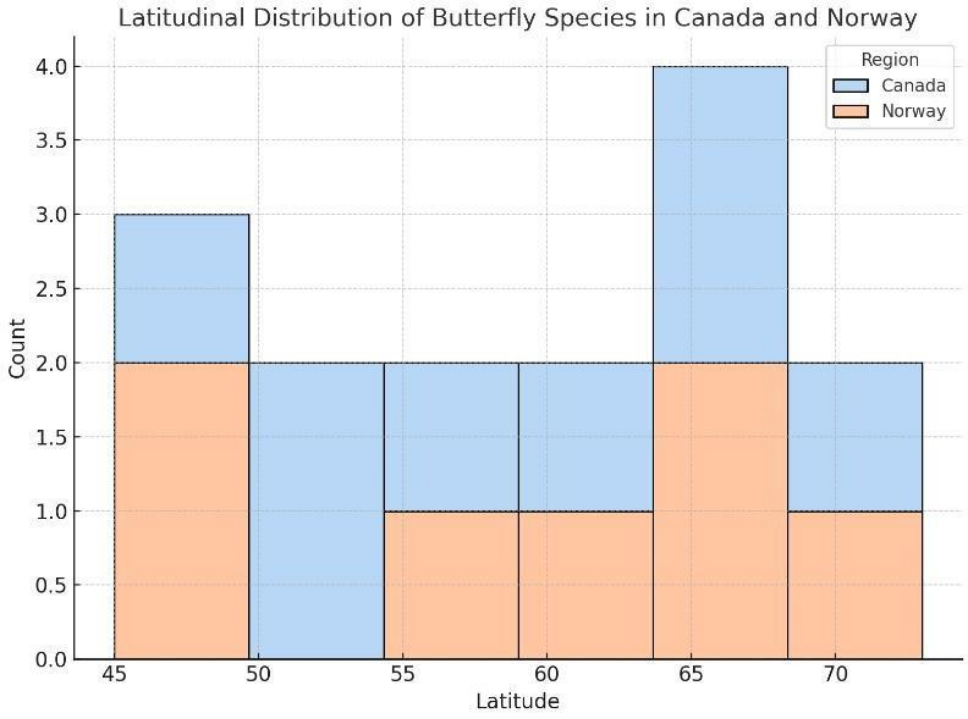

Figure 2: Latitudinal Distribution of Butterfly Species: The histogram indicates that, in comparison to Norway, Canada has a higher concentration of butterfly species at higher latitudes.

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