Effects of climate change on hibernation period of small mammals

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Introduction

In last half of the twentieth century, climate change caused the warming of environmental temperature, decline of snow and ice levels and rising sea levels due to the increasing concentration of greenhouse gases, mainly CO_2, at in the atmosphere.

In this context, small hibernating mammals in the temperate zones of the northern hemisphere have shortened their hibernation period and in most cases, their metabolism has been altered.

Hypothesis

My working hypothesis is that climate change has benefited small hibernating mammals.

Aim

The aim of this work is to analyze the real and possible impact of climate change in different species of marmots, squirrels and bats.

Materials & Methods

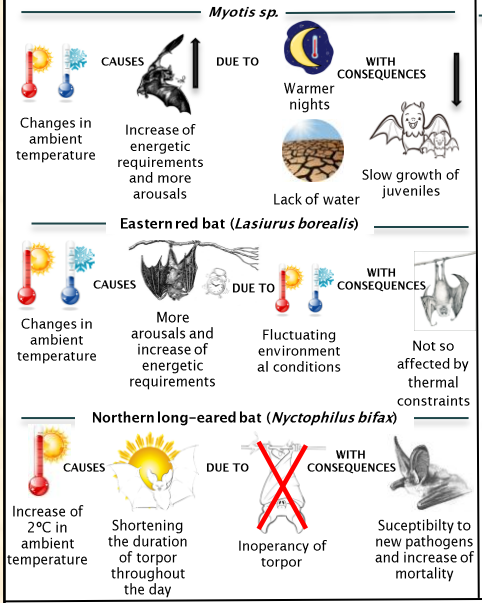
This work is a review conducted using *Web of Science*, *Scopus* and *Google Scholar* search engines. The combinations of key words used on search were *hibernation climate change, bats climate change*, *marmots climate change* and *squirrels climate change.*

I analyzed a total of 31 publications between 2000 and 2014. 13 of them were used to create a comparative. From these 13 papers, 6 of them are studies of bats, 4 of them studied marmots and 3 of them studied squirrels.

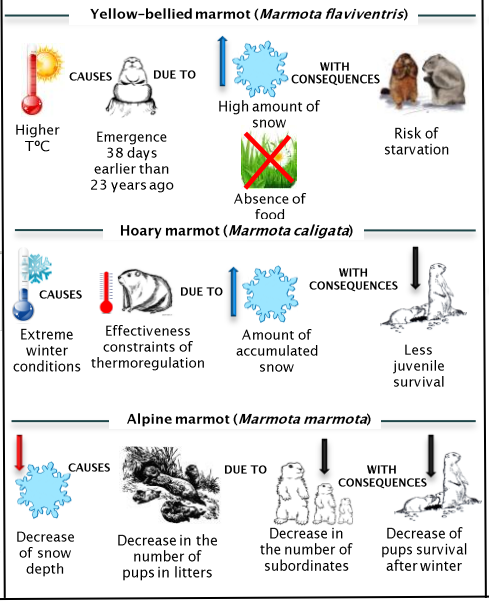
I chose these animals because they are the most studied true hibernating mammals.

Results

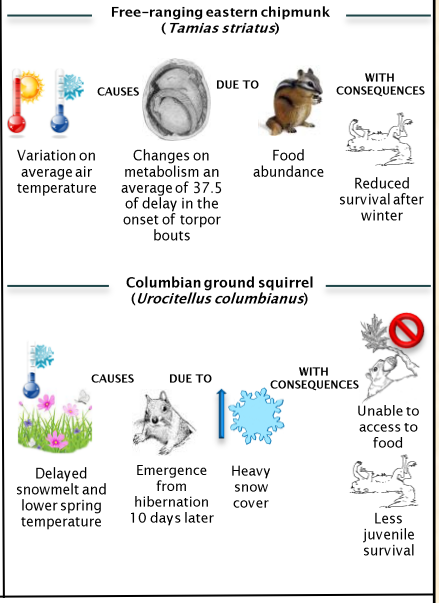
Bats



Marmots



Squirrels



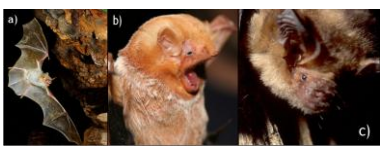


Figure 1. a) *Myotis myotis*, b) *Lasiurus borealis*, c) *Nyctophilus bifax*.

Figure 2. a) *Marmota flaviventris*, b) *Marmota caligata*, c) *Marmota marmota*.

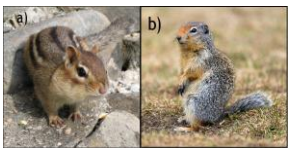


Figure 3. a) *Tamias striatus*, b) *Urocitellus columbianus*.

Discussion

Currently, researchers have not reached a consensus on the fact that changes in the life events of these animals are due to climate change. There are still very few studies related to the effects of climate change causes in small hibernating mammals. These studies have some limitations such that the samples studied have few individuals and study periods are short.

Long-term studies conclude that the observed changes are due to phenotypic plasticity.

Conclusions

1. Increase in temperature will cause an increase in energy costs of individuals and these animals will reduce the time spent in torpor.

2. If there is no synchronization between the different trophic levels, communities will have unpredictable effects that alter the structure and functioning of ecosystems.

3. More studies are needed to develop action plans to mitigate potential effects of climate change on these species.

References

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