

Christina Bjerkvig

4th year English class

Szent Istvan University

Faculty of Veterinary medicine

THE NORWAY LEMMING (*Lemmus lemmus*)

I. INTRODUCTION

The Norway lemming (*Lemmus lemmus* Linnaeus, 1758) is a member of the subfamily *Arvicolinae*. It is the best known species of lemming and is found in northern Scandinavia.

Lemmus lemmus is about 7 to 15 centimeters long and weigh from 30 to 112 grams. They generally have long, soft fur and a short stumpy tail. Their incisors grow continuously, allowing them to exist on tough forage. They eat mainly grasses, shrubs, herbs, lichens and certain types of moss. The Norway lemming is active both during the day and night with breaks in between. The female gives birth to 5-8 young after a gestation period of 2.5 to 3 weeks. She gives birth in an underground hole and the young are breastfed for more than 2 weeks. The young develop quickly and often reach sexual maturity within 4 weeks. A Norway lemming can produce more than one nest per year, but this depends on the amount of food available.

The Norwegian lemming is well known because of a phenomenon that for a long time has been wrongly interpreted as mass suicide.

II. POPULATION CYCLE

Periodic population cycles in small rodents and other terrestrial vertebrates of the north have preoccupied ecologists since Elton (1924, 1942)

The Norway lemming has a dramatic 3-4 year population cycle. They spend their summer on the tundra and migrate to the mountains before winter sets in. Many lemmings die during the migration, particularly if their numbers have increased as a result of favorable conditions and sufficient food. This abrupt fluctuation, has given rise to the myth of lemming mass suicide. Biologists, however, have been able to determine that they do not commit mass suicide and that the large death rate is due to an unfortunate combination of circumstances.

When the seasons are particularly good (short winters and long summers) the Norway Lemming population can increase explosively. The mentioned early maturity and the high number of offspring under favorable conditions results in population build ups. This can lead to social friction, distress, and eventually a mass panic can follow, where they flee in all directions.

Gilg et al., 2003 disagreed in that food resources and the response of the lemmings own density is driving the 4 year cycle. They demonstrated another theory saying that predator-prey relations is responsible for the cycle. This theory is based on studies on lemming populations in Greenland where predation is so intense during the long summer days that lemming populations typically decline. It's only during the winter and under thick snow cover that lemmings have a chance to increase in numbers.



III. GLACIAL SURVIVAL OF THE NORWEGIAN LEMMING

Lemmus lemmus is the only vertebrate endemic to Scandinavia. Consequently, it has been suggested that this arctic rodent evolved by surviving the last glacial period or the last glacial maximum in some local Scandinavian refugia (Ekman 1922). This issue has been discussed for the past 100 years and the glacial survival hypothesis was initially based on biogeographical arguments for plants (Dahl 1987) and animals (Siivonen 1982). In order to evaluate the hypothesis of glacial survival Federov and Stenseth, 2001, examined mitochondrial DNA (mt DNA) diversity in the Norwegian lemming sampled across a range of species distributed in the Scandinavian mountains. They expected that if the Norwegian lemming had survived the last glacial maximum in some local Scandinavian refugia, the present pattern of mtDNA diversity would reflect expansion in its historical effective population size (Rogers and Jorde 1995). If the Norway lemming colonized Scandinavia after the last glacial period from south of the periglacial ice sheet, then no genetic signs of expansion in its historical effective size was expected. Previous findings about the phylogenetically similar Siberian lemming (*Lemmus sibericus*) supported the latter alternative saying that the Norwegian lemming rose from the ancestors of the Siberian lemming, moving in after glaciers receded.

Fedrov and Stenseth amplified the mitochondrial cytochrome b gene by PCR from lemmings collected from six places in Scandinavia. They found that there is a great phylogenetically divergence between the Siberian and Norwegian lemming which suggests that their separation predated the last glaciation. (Anderson and Borns, 1997)

Low mtDNA diversity in the Norwegian lemming provided evidence for a past reduction in its effective size followed by population growth (Slatkin and Hudson 1991). This implies that the Norway lemming went through a bottle neck and survived the last glacial maximum.

This fact together with fossil findings from periglacial areas supports the biogeographical hypothesis that the Norway lemming survived the last glacial maximum in a local Scandinavian refugium

V. CONCLUSION

The Norway lemming is a little creature surrounded by great myths and misconceptions. Whether the predator-prey theory based on lemming populations in Greenland can explain the “mass suicide” of the Norway lemming is unknown. The unfortunate combination of environmental circumstances is till now the best explanation for the abrupt fluctuation in the population.

Another myth that surrounds the Norway lemming is that when the animal is confronted by an obstacle it becomes so frustrated that it immediately suffers from severe heart-failure, or effectively, internally combusts. However, if feeling threatened, they will fiercely squeak and jump around, occasionally trying to bite the interloper.

In conclusion, the Norwegian lemming which probably survived the last glacial maximum is a very interesting animal which deserves more research attention in the future.

V.REFERENCES

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