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# The Discovery of a 500 Year Old Shark, Somniosus Microcephalus, and Its Implications for Marine Biology and Conservation

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**ABSTRACT**
*The recent discovery of Somniosus microcephalus, also known as the Greenland shark, has huge implications for marine biology and conservation. This paper will touch on the methodology used in its discovery, as well as, the impact of climate change on its habitat. This paper highlights the need for targeted conservation strategies, which is important to preserve marine ecosystems.*

**KEYWORDS:** *Marine Ecology, Greenland, Eye Lens, Isotopes, Arctic, Apex Predators, Life Cycle, Climate Change, Ancient*

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## INTRODUCTION

The premise of evolutionary biology and marine ecology rests on the discovery of new water species. Sharks are among some of the oldest water-living species (Singh, 2018). Recently, a new Greenland shark was discovered, prompting scientist to re-evaluate the roles that sharks play in their ecological niches. Furthermore, this find challenges the present notions on shark longevity. In addition, the current threats to marine life, viz. climate change and water pollution, needs to be addressed so that marine life is protected.

The Greenland shark is a unique species, particularly because it is found in the cold, deep waters of the North Atlantic and Arctic Oceans, as well as, it's very slow growth rate. The growth rate of this shark is about 1 cm per year, thereby indicating that it can live for centuries. Although it has been reported that these sharks can survive for up to 400 years, recent times suggest a lifespan that's longer than this. Their diet consists of fish and marine mammals mostly, and their habitat includes living under Arctic ice (Arctic Council, 2022; McGowan, 2023).

## MATERIALS AND METHODS

The methods employed to discover this new shark species included radiocarbon dating techniques. Eye lens tissues were collected from the sharks. These lens tissues contain proteins that accumulate carbon isotopes over time. The age of the specimen was analysed by measuring the levels of carbon-14. Scientists have also used this technique on other long-lived marine species, such as the bowhead whale, thereby highlighting its reliability (for further information, please read, Smith & Johnson, 2021).

## RESULTS

*In this section, I will discuss the longevity and growth rate, ecosystem dynamics, and climate change implications.*

The longevity of this shark species prompts questions on the biological mechanisms underlying its age, particularly since it's the longest-living vertebrate. It has been found that its slow metabolism, low reproductive rate, and cold water adaptation have contributed toward its prolonged lifespan. Additionally, Greenland sharks play a crucial role as apex predators in their ecosystem. They are referred to as apex predators because they maintain ecological balance through their diets. They achieve this by regulating the population of fish and other marine species. Therefore, by understanding their longevity, one may understand the stability and health of Arctic marine environments. Also, the Arctic environment of the Greenland shark is vulnerable to climate changes. This climate change has been found to have a profound impact on sea temperature, ice coverage, and prey availability, thereby having an influence on the life cycle of the shark, as well as, other species within the ecosystem. This has emphasised the need for climate action and conservation measure.

## DISCUSSION

It can be said that this discovery extends beyond the realms of science. The reason for this is because this finding emphasises the need for effective conservation strategies to protect ancient marine species and their habitats. The discovery of the Greenland shark shows the delicate balance within the Arctic ecosystem that's vulnerable to environmental changes (Singh, 2018; NOAA Fisheries, 2023).

I will now discuss 4 conservation strategies, i.e. *habitat protection, climate change mitigation, research and monitoring, and public awareness and education:*

In order to conserve marine life, the establishment of protected areas in marine water might help in preserving essential habitats for the Greenland shark and other marine species. Currently, efforts put into reducing greenhouse gas emissions may aid in reducing the effect of climate change on marine environments. Furthermore, there's a need to monitor the health and population dynamics of the Greenland shark, because this monitoring would dictate conservation efforts and policy decisions. Lastly, by raising awareness about the importance of ancient marine species, and the threats they face, may assist in obtaining public support for conservation initiatives.

## CONCLUSION

In conclusion, the discovery of the Greenland shark shows the connection between longevity, ecosystem dynamics, and environmental health. It also emphasises the need to have conservation efforts in place to protect marine creatures and other organisms. It is only through the collaboration of scientists, policy makers, and conservationists that the future of marine biodiversity can be secured.

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