

PhD thesis on the little-known Arctic comb jelly found in the Baltic Sea and the Arctic

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Researcher Sanna Majaneva also travelled to Spitsbergen to dive in the sea so as to collect samples of comb jellyfish. Credit: Peter Leopold.

One of the world's oldest animal species, the comb jellies – which have inhabited the seas for millions of years – have kept their secrets up to the present day. In her PhD thesis, which she is due to defend on 11 April, researcher Sanna Majaneva has studied the life of the Arctic ctenophore *Mertensia ovum*, or the Arctic comb jelly, which is found in the Baltic Sea and the Arctic.

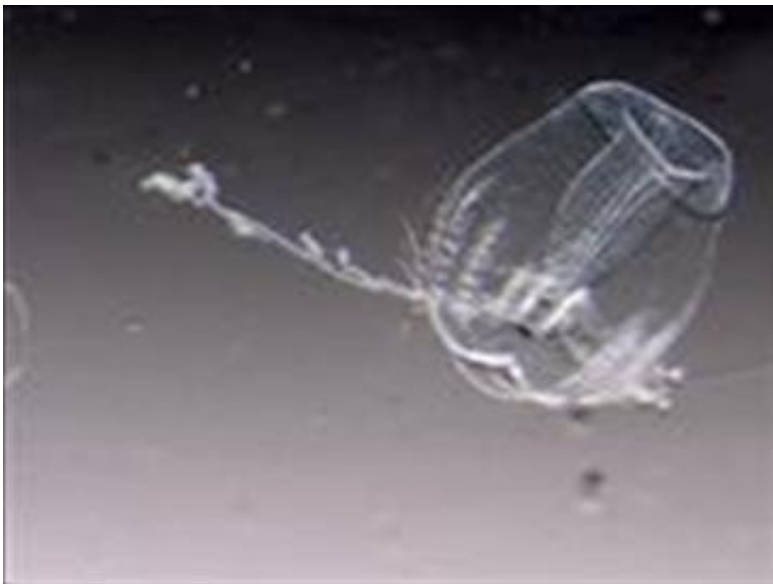
"We know far too little of the ctenophore and other animals of the gelatinous zooplankton, such as medusae. Even the species identification methods are deficient, regardless of the fact that gelatinous zooplankton

can be abundant in the ecosystem and have a major effect on both the upper and lower levels of the food web," says Majaneva.

Majaneva says that the title of her dissertation might be: Why do we know so little of the [comb jellies](#)? However, its official title is "Understanding the biodiversity and ecological importance of ctenophores – Lessons from Arctic and Baltic *Mertensia ovum*".

Prior to Majaneva's study, only limited information has been available about the comb jelly, and even that has often been distorted. In the Baltic Sea, this species was first identified in 2008 by using DNA methods.

"Earlier research considered the [sea](#) gooseberry (*Pleurobrachia pileus*) as the only member of the Ctenophora in the northern Baltic Sea. However, my study showed no signs of it in that area. This finding supports the idea that the earlier identification of comb jellies in this area was wrong, and that the Arctic comb jelly is found in the Baltic Sea as an Ice Age relic, not as an alien species. However, this result is not yet fully confirmed, so research continues," says Sanna Majaneva.



Researcher Sanna Majaneva also travelled to Spitsbergen to dive in the sea so as to collect samples of comb jellyfish. Credit: Peter Leopold

There are many reasons why these species are so difficult to identify. The individual specimens are fragile and often inadequately described. Furthermore, the small number of published gene sequences limits the accuracy of the identification methods. One of the conclusions of Majaneva's dissertation is that the most reliable method for identifying ctenophores is to combine photos of individual specimens with morphological and molecular identification methods.

Should gelatinous zooplankton be included in regional monitoring programmes?

In its Arctic home waters, the Arctic ctenophore reaches a size of nearly 10 centimetres. It is a voracious predator, which mainly feeds on copepods (such as the *Calanus* species).

The Arctic ctenophore is rather common from the southern Baltic Sea to the Gulf of Finland and the Sea of Bothnia. Thus, this species can cope in waters whose salinity is lower than in the oceans, but remains much smaller in size. The largest specimens found in the northern Baltic Sea were less than one centimetre in size. Therefore, they eat microscopically small plankton organisms

The role of the Arctic ctenophore in the Arctic and Baltic ecosystems has not been fully understood due to the limited availability of precise frequency and research data. However, it is clear that the importance of *M. ovum* in the [arctic](#) plankton community is larger than was previously thought, especially considering the patchy occurrence of the species and

its prey. Therefore, gelatinous zooplankton should be permanently included in regional monitoring programmes."

Future environmental changes will have different effects on gelatinous zooplankton populations in different areas. In the Baltic Sea, climate change is expected to reduce its distribution, whereas in the Arctic its distribution is expected to remain virtually unchanged.

In the Baltic Sea, the occurrence of the warty comb jelly, *Mnemiopsis leidyi*, which is considered to be an ecologically damaging alien [species](#), is limited to south of the Bornholm Basin, and it has not been found in Finnish territorial waters.

In recent years, there has been a lot of discussion about the global increase in the abundance of gelatinous zooplankton populations. However, researchers are not unanimous on this topic, since, for the time being, there are no reliable methods for determining the size of medusa and comb jellyfish populations, and there is no long-term research data.

Provided by Finnish Environment Institute (SYKE)

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