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Incubating Common Iders (Somateria Mollissima) in Three Baltic Colonies were measured for Body Mass, Mercury Exposure

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Introduction

The common eider population in the Baltic/Wadden Sea Flyway has decreased over the last three decades. Multiple variables have been proposed to explain the drop, including pollutant exposure, global warming, hunting, white-tailed eagle predation, decreasing agricultural eutrophication, and infectious illnesses. To investigate incubating birds' metabolisms and energy balance, we gathered data on body mass, mercury (Hg) concentration, biochemistry, and untargeted metabolomics in two colonies in the Danish Straits [1].

In the Northern Hemisphere, the common eider is the largest and heaviest sea duck. Danish eiders are a biological subgroup of the Baltic/Wadden Sea Flyway population, which numbers over 900,000 birds. Breeding populations from Finland, Sweden, Denmark, southern Norway, and Germany make up the flyway. The second largest eider duck colony in Denmark is on the island of Christians, which is located in the southern portion of the Baltic Proper. The eiders on Christians travel from their wintering grounds in the western Baltic Sea to the Wadden Sea in the Netherlands. From late February to early April, they return to their summer mating habitats [2].

The Christians' colony, like the rest of the flyway, has seen population loss in recent decades. Long-term monitoring has showed that the population expanded from about 1,000 to about 3,000 breeding eiders but that the number has fallen by around 50% from 1990 to date for unexplained reasons. Despite the fact that the causes of these variations are unknown, a number of theories have been proposed. Changed access to food in winter areas and breeding locations, eutrophication of agriculture, infectious diseases such as fowl cholera, parasitic burdens, and blooming toxic algae, to name a few, as well as predation from the Baltic population of white-tailed eagles. Which has increased significantly in recent decades [3].

Starvation as a result of fishery activities, food web changes as a result of global warming, and rising winter temperatures affecting blue mussel stocks have also been proposed as potential causes of population decline, though these factors cannot fully account for the mortality of healthy birds. Furthermore, eider mortality has been linked to a high incidence of acanthocephalan parasites. Furthermore, candling of eggs revealed that at least 14% of eggs at Christians failed to fertilize.

Starvation and organ failure were the leading causes of death, with substantial endoparasite burdens of the acanthocephalan parasitic Polymorphous and Echinostoma spp. (intestinal flukes) causing severe damage to the intestinal mucosa. It's been suggested that Swedish eiders suffer from thiamine (Vitamin B1) deficiency, which lowers reproduction rates and increases chick mortality. Exposure to chronic organic pollutants has been linked to an increase in DNA lesions in the past. It's also unclear whether the Baltic Sea's high mercury concentration has an impact on eider reproduction. As previously stated, understanding of the physiology and metabolism of incubating fasting eiders in the Baltic/Wadden Sea region is sparse. To find out, we looked at body mass, plasma biochemistry, and untargeted metabolomics in three separate colonies spanning the Danish straits in the west to the Baltic Sea in the east [4].

We also looked at mercury, which has been shown to impact bird reproductive and is found in high concentrations in the eastern Baltic Sea food webs. We believe that fasting impacts body mass, blood biochemistry, metabolism, and the metabolome from early to late incubation, and that this may change among the three colonies due to differences in food availability. We also believe there is a difference in mercury exposure because mercury concentrations in the bottom food web are known to be high in the Baltic proper to the east, posing a risk to bird reproductive [5].

References

1. Alvarez AC, Velando A, Ferrer M, Veira JA (2002) Changes in Plasma Biochemistry and Body Mass During Incubation in the Yellow-legged Gull. Waterbirds 25: 253-58.
2. Balk L, Hägerroth PA, Akerman G, Hanson M, Tjärnlund U, et al. (2009) Wild birds of declining European species are dying from a thiamine deficiency syndrome. PNAS 106: 12001-06.
3. Boismenu C, Gauthier G, Larochelle J (1992) Physiology of prolonged fasting in greater snow geese (Chen caerulensis atlantica) The Auk 109: 511-521.
4. Fenstad AA, Bustnes JO, Lierhagen S, Gabrielsen KM, Jaatinen K, et al. (2017) Blood and feather concentrations of toxic elements in a Baltic and an Arctic seabird population Mar Pollut Bull 114: 1152-58.
5. Mallory ML, Braune BM (2012) Tracking contaminants in seabirds of Arctic Canada: Temporal and spatial insights. Mar Pollut Bull 64: 1475-84.

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