

Causes and consequences of egg morphology in a long-lived seabird

Starting date: April 2019 (the exact date is flexible)

Duration: 5 months (also flexible)

The size, volume and shape of avian eggs are highly variable, both within and between species. Two recent studies found that inter-specific variation in egg shape can be explained by flight efficiency (Stoddard et al. 2017) and by selection during incubation (Birkhead et al. 2018). Factors explaining intra-specific variation are, however, less well understood. Egg colour ranges from white to green, blue and brown, and while some eggs are spotless, others are covered in spots. Several hypotheses, such as the sexual signalling or the structural hypothesis, have been proposed to explain this variability in egg colouration, but, despite a long history, studies have obtained mixed results.



Banter See colony

We study common terns (*Sterna hirundo*) at a long-term study population located in the Banter See at Wilhelmshaven on the German North Sea coast. Since 1992, all locally hatched birds have been marked with a transponder shortly prior to fledging. We use antennae at resting places and around nests to identify both breeding and non-breeding individuals. Combined with 3-times-weekly checks of nests to record reproductive parameters and to mark offspring, our methods enable the systematic and remote documentation of individual presence and reproductive performance at the colony. Once birds have established themselves as Banter See breeders, their re-sighting probability is almost 100% and their return rate is 90%, such that we can collect data over long individual life cycles.

Since 2017, all eggs from all clutches produced by known parents have been photographed and analysed to describe egg morphology (size, shape, colour and spottiness). At present, photos of 903 eggs are already available for further investigations.

For the proposed project, we are searching for (a) dedicated student(s) who can start in April 2019, is/are enthusiastic about spending lots of time in a large colony of seabirds to take egg pictures in a standardized way, as well as to participate in all other research



Common tern egg variability

projects and the general monitoring of the breeding population. The student(s) will also continue the image analysis and conduct statistical analyses. The aim of the project is to explore whether egg morphology relates to parental traits and whether there are consequences of morphology in terms of hatching success and post-hatching growth and development. Because the common terns in the breeding colony are habituated to research, fieldwork will involve a lot of close interaction with the birds. No prior experience with birds or fieldwork is required. Knowledge about statistics and R, however, would be useful. The student(s) need(s) to enjoy working in an international team, and happy to use English as the main working language.



Common tern nest

For more information, please contact **Dr. Coraline Bichet** (coraline.bichet@ifv-vogelwarte.de) or **Dr. Sandra Bouwhuis** (sandra.bouwhuis@ifv-vogelwarte.de), Institute of Avian Research, Wilhelmshaven, Germany.

Cited references:

Stoddard et al. (2017) Avian egg shape: Form, function, and evolution. *Science* 356, 1249–1254.

Birkhead et al. (2018) The evolution of egg shape in birds: selection during the incubation period. *Ibis*, DOI: 10.1111/ibi.12658