

CSI Tromso—where forensics meets Vikings

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Viking Burial Stones in Aalborg, Denmark. Credit: Eric Gross under CC BY 2.0 from [Flickr](#)

Insect remains have their own tale to tell in the mystery that surrounds the Øsknes Viking burial boat, as Eva Pangiotakopulu and colleagues investigate in their recent *PLOS ONE* study.

Over the years many Viking burial boats have been unearthed throughout Scandinavia providing us with valuable insights into the past. However, one boat unearthed in 1934 in north-eastern Norway has perhaps provided more questions than answers as no evidence of a body was ever found. For almost a century, researchers have wondered whether the boat ever housed a body or whether it was simply buried as an empty grave. To try to unravel the mystery Eva Pangiotakopulu from the University of Edinburgh, UK, teamed up with Stephen Wickler from University of Tromsø and independent researcher Paul Buckland, in the hopes of finding forensic evidence that might provide some more clues.

To begin their search, the team revisited the excavation results published by the lead archaeologist at the time, Gutorm Gjessing. The notes describe how the boat was originally found during road construction in Øksnes in the remote Vesterålen Islands. Like many burials, the boat was found under a small mound of earth within a small stone circle or kerbing. Placed within the boat, Gjessing found several items including a small iron axe, some hair from fragments of animal hide and a mass of feathers with fragments of woollen textile which the archaeologist thought could have been pillow or duvet. All the clues and graves goods suggested that the site was indeed a burial ground, but the lack of a body was puzzling. At the time, Gjessing wondered whether the acidity of peat bog conditions found in Øksnes had destroyed the body, but as the team today points out, bogs are notoriously good at preserving bodies – just look at the "bog body" of the Man of Rendswühren found in Germany.

Luckily for Pangiotakopulu and the team, the feathers from the Øksnes site had been well preserved at Tromsø University Museum and in two visits to the museum, the team were able to meticulously sift through a portion of the feather matter to look for insect remains. By comparing the insect fragments to the Osborne Collection of Coleoptera beetles housed at the University of Edinburgh and other published classification keys used to identify insect species, the researchers painstakingly set out to identify all the little bug fragments.

In total they found 16 different types of insects, including several species of beetle that are typically found in hay which may have been used in the ship to keep cargo in place. Intriguingly, they also found evidence of the raspberry beetle *Byturus tormentosus* which, as its common name suggests, feeds on the flowers of raspberry plants and lays eggs in the developing fruit. Pangiotakopulu and her colleagues speculate that raspberry flowers may have been used at the grave and indeed other burials have found evidence of flowers being used as part of the Viking

funerary process. Knowing that the flowering season for raspberry plants in Norway tends to be towards late June or July the team suspect that the burial may have taken place in late summer.

Flea fragments

The first clue of human presence was the discovery of 35 fragments of the human flea, *Pulex irritans*, within the feathers. This was somewhat perplexing as human fleas, with their taste for blood, aren't known for their ability to survive away from the hosts for long periods of time. It's possible that the pillow used in the burial ground may have been present in the death bed of the deceased and the fleas fled their host upon death into the feathers with no escape route after the burial had taken place. However, the most interesting clues came from the presence (and absence) of some insects known to be associated with decaying bodies. In carefully sifting through all the fragments the three researchers found 12 remnants belonging to *Protophormia terraenovae* pupae. More commonly known as blow flies, *P. terraenovae* larvae enjoy feasting on dead flesh and adult flies can suss out animal and human corpses within minutes. As such, blow fly remnants are good forensic indicators of early decay and the fragments found are one of the strongest clues that a body was present in the burial grounds. Interestingly, the team didn't find evidence of insects usually associated with later stages of decay which suggests that the body was probably removed soon after burial.

Without a body, we may never know conclusively whether the site was a [burial ground](#), but the forensic clues provide the first strong evidence that a body was buried towards the end of summer but very quickly removed for unknown reasons. So, whilst one mystery has been laid to rest, it seems that another unanswered question emerges from the Øksnes boat burial.

More information: Eva Panagiotakopulu et al. Is there anybody in

there? Entomological evidence from a boat burial at Øksnes in Vesterålen, northern Norway, *PLOS ONE* (2018). DOI: [10.1371/journal.pone.0200545](https://doi.org/10.1371/journal.pone.0200545)

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