

Biodiversity

New species in the North Sea

Researchers describe the newly discovered amphipod *Epimeria frankei* using extensive mitogenomic information

[02. May 2018] Experts from the Alfred Wegener Institute and the Universities of Oldenburg and Potsdam, Germany have confirmed the existence of a new cryptic amphipod species in the North Sea. For the first time for the description of a new species, they used a level of mitogenomic information, which was normally applied in other areas of genetics. The discovery of *Epimeria frankei* was now published in the journal *Scientific Reports*. In the future, this level of molecular information could revolutionise biodiversity research.



Reports of "new species" in the North Sea, usually relate to animals or algae that were newly introduced by human activities. The discovery of a new amphipod species is proof that there are still unknown organisms lurking in the German Bight. A team of scientists around Dr Jan Beermann from the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI) and Dr Michael J. Raupach from the University of Oldenburg, as well as colleagues from the University of Potsdam, now successfully discovered and described a previously overlooked species in the North Sea - a rare event, considering that the region is one of the best-studied seas in the world.

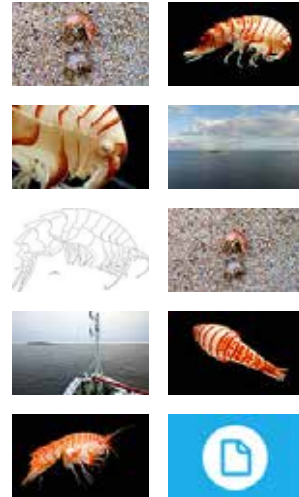


New amphipod and known related species (Photo: Alfred-Wegener-Institut / Hermann Neumann, Senckenberg am Meer)

In the first place, AWI ecologist Beermann and Michael Raupach from the University of Oldenburg analysed so-called "DNA barcodes" of North Sea crustaceans: small genetic sequences that are a common tool in modern biodiversity

research. Scientists create molecular libraries with these barcodes in order to simplify the identification of species. When Beermann and Raupach analysed their data, the researchers began to wonder whether they were dealing with only one, but two different species. "Once we had a closer look, we noticed

Downloads



Contact

Science

 Jan Beermann
 +49(471)4831-1341

Jan.Beermann@awi.de

Press Office

 Folke Mehrrens
 +49(471)4831-2007

Folke.Mehrrens@awi.de

Uni Oldenburg

Dr. Michael J. Raupach
 +49 441 798 3373
michael.raupach@ruhr-uni-bochum.de

that, for instance, some animals exhibited more pointed plates on their legs than others, but these subtle differences aren't always easy to detect," reports Beermann.

"The moment you realise that you've probably discovered a new species is fascinating and incredibly exciting. The North Sea isn't the first place you'd expect to stumble across an unknown species - especially in a genus, which is comparably large in the North Sea with a body length of up to three centimetres, and which eye-catching colourations have also attracted the attention of earlier generations of researchers," says Jan Beermann. The new *Epimeria* species was named *Epimeria frankei*, after Prof. Heinz-Dieter Franke, a renowned ecologist who worked for many years at the AWI marine station at Helgoland, and who was Jan Beermann's PhD mentor.

With the discovery and the availability of extensive information on the two species, both species had to be newly described. "In this regard we wanted to prepare species descriptions that weren't restricted to the physical appearance but also include detailed genomic information," explains Michael Raupach from the University of Oldenburg. "A few years ago, this would have been an extremely time-consuming. But nowadays, modern technologies make the analyses much faster and easier."



Epimeria cornigera (Photo: Alfred-Wegener-Institut / Jan Beermann)

For the descriptions, the scientists made use of the entire mitochondrial genome, using state-of-the-art decoding methodologies. In collaboration with the Genomics Team of Prof Michael Hofreiter from the University of Potsdam, they sequenced the genome with cutting-edge technologies. Classifying the importance of their work, Hofreiter and Raupach conclude: "We are the first team in the world to analyse the complete genetic material of the mitochondria, base pair by base pair, in the context of a species description."



Aerial Helgoland island (Photo: Alfred-Wegener-Institut / Marc Petrikowski)

its sister species. Until then, *Epimeria cornigera* was commonly assumed to occur from the Mediterranean Sea to Iceland - a quite broad but possible distribution. Nevertheless, reliable information on the species' biology was still scarce. As Jan Beermann explains, "We now know that the new species, *Epimeria frankei*, ranges

Photos

[Public media](#)
[Press media](#)

Abo/Share



Subscribe to AWI press
release RSS feed



**The
Institute**



The Alfred
Wegener

Institute pursues research in the polar regions and the oceans of mid and high latitudes. As one of the 19 centres of the Helmholtz Association it coordinates polar research in Germany and provides ships like the research icebreaker Polarstern and stations for the international scientific community.

from the Mediterranean to the North Sea, whereas the old species, *Epimeria cornigera*, is more restricted to the northern North Atlantic. There is a small area of overlap in the North Sea where both species can be found." With the addition of *E. frankei*, the number of known *Epimeria* species in the north-eastern Atlantic increased to a total of five species.

This new discovery underlines that, even today, marine biodiversity can still be underestimated and that molecular methods have become an indispensable tool for modern biodiversity research. For their publication, the researchers combined various molecular genetic and morphological methods to a so-called integrated taxonomic approach ("taxonomics"). The authors are convinced that: "The successful validation of this approach confirms that, for future biodiversity research, taxonomics could also prove to be extremely important for further considerations such as marine conservation."

Original publication

Jan Beermann, Michael V. Westbury, Michael Hofreiter, Leon Hilgers, Fabian Deister, Hermann Neumann, Michael J. Raupach: Cryptic species in a well-known habitat: applying taxonomics to the amphipod genus *Epimeria* (Crustacea, Peracarida). Scientific Reports. DOI: [10.1038/s41598-018-25225-x](https://doi.org/10.1038/s41598-018-25225-x)



HELMHOLTZ