

## The Antarctic Epimeria species flock: a systematic Pandora box revealed by DNA analysis and illustrated by stacking photography.

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Analyses of DNA sequences of *Epimeria* from the Antarctic Peninsula, East Weddell Sea and Terre Adélie revealed an unexpected genetic diversity within this species flock. Many formerly recognized species were composed of several clades, identified as putative species by DNA-based delimitation methods (bPTP, GMYC, BPP). Careful examination of the specimens revealed previously overlooked morphological differences between the putative species. Moreover, some of them are found in sympatry. Assuming a strict COI molecular clock of 0.018 substitutions/site/My (previously estimated for other amphipods), the divergences between *Epimeria* species within the complexes were roughly dated between 10.28 and 1.11 Mya. Hence, as these speciation events likely occurred after the mid-Miocene climatic transition, the presence of many closely related (pseudo-)cryptic *Epimeria* species on the Antarctic shelf could be explained by a scenario of continental shelf refugia. Isolation of populations in refugia during glacial maxima and resulting divergences could have led to allopatric speciations. Following the morphological examinations of all the *Epimeria* material available, a total of 29 species were described as new, which increases twofold the number of Antarctic *Epimeria* species known to date. The latter species were used as case study for testing stacking photography as an alternative to line drawings in amphipod taxonomy. It appeared that these large and often very geometric amphipods can be adequately and quickly illustrated by this new technique. As large areas of the Antarctic shelf remain undersampled, the latter taxonomic revision of Antarctic *Epimeria* is likely non exhaustive.