

5 March 2020

Dear Editor,

Please find uploaded our manuscript "Skull shape of a widely-distributed, endangered marsupial reveals little evidence of local adaptation between fragmented populations " (P. Viacava, S. P. Blomberg, G. Sansalone, M. J. Phillips, T. Guillerme, S. F. Cameron, R. S. Wilson, V. Weisbecker) for consideration for publication in *Ecology and Evolution*.

In our study we adapt 3D geometric morphometrics, a technique usually employed in evolutionary biology, to assess the contribution of biotic and abiotic factors thought to impact on the phenotypic diversity of the skull in potentially locally-adapted conservation units of the northern quoll. We find a lack of morphological distinction between these populations, suggesting functional uniformity and exceedingly limited local adaptation within the species. This has ecological implications, particularly in a conservation context because it suggests that outbreeding of populations will not result in cranially maladapted individuals. However, it also indicates that fast adaptation to change is not to be expected in this species. The latter find also has an evolutionary dimension, because it appears to support the much-maligned paradigm that marsupial mammals may be less adaptable than placental mammals.

Our study is fully replicable; the original 3D Data, landmark coordinate data, and all analyses used in this study are publically available on Github and can be run easily by others. We hope you will be able to share the link and/or the files with the reviewers.


We believe that our study would be ideally placed in *Ecology and Evolution* because it deals with the interaction between ecology and microevolution in a species of conservation concern. It also introduces a novel adaptation of geometric morphometrics to provide a statistical assessment of phenomic diversity within a species, capable of augmenting the wealth of molecular data on population genetics/genomics. While our study focuses on the northern quoll, it is easily applicable to other mammals and non-mammals. The study is therefore of interest to evolutionary ecologists, biogeographers, conservation ecologists and population geneticists alike.

All authors have read the manuscript and agree with its publication.

Sincerely,



**Pietro Viacava**



**Vera Weisbecker**