

Publication

Realised rather than fundamental thermal niches predict site occupancy: Implications for climate change forecasting

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 4612497

Author(s) Braschler, Brigitte; Duffy, Grant A.; Nortje, Erika; Kritzinger-Klopper, Suzaan; du Plessis, Dorette; Karenzi, Natasha; Leihy, Rachel I.; Chown, Steven L.

Author(s) at UniBasel [Braschler, Brigitte](#) ;

Year 2020

Title Realised rather than fundamental thermal niches predict site occupancy: Implications for climate change forecasting

Journal Journal of Animal Ecology

Volume 89

Number 12

Pages / Article-Number 2863-2875

Keywords abundance, behaviour, macrophysiology, microclimate, occupancy, thermal safety margins

Mesh terms Animals; Climate Change; Ecosystem; Hot Temperature; South Africa; Temperature

1. Thermal performance traits are regularly used to make forecasts of the responses of ectotherms to anthropogenic environmental change, but such forecasts do not always differentiate between fundamental and realised thermal niches. 2. Here we determine the relative extents to which variation in the fundamental and realised thermal niches accounts for current variation in species abundance and occupancy and assess the effects of niche-choice on future-climate response estimations. 3. We investigated microclimate and macroclimate temperatures alongside abundance, occupancy, critical thermal limits and foraging activity of 52 ant species (accounting for >95% individuals collected) from a regional assemblage from across the Western Cape Province, South Africa, between 2003 and 2014. 4. Capability of a species to occupy sites experiencing the most extreme temperatures, coupled with breadth of realised niche, explained most deviance in occupancy up to 75%), while foraging temperature range and body mass explained up to 50.5% of observed variation in mean species abundance. 5. When realised niches are used to forecast responses to climate change, large positive and negative effects among species are predicted under future conditions, in contrast to the forecasts of minimal impacts on all species that are indicated by fundamental niche predictions.

Publisher Blackwell Science

ISSN/ISBN 0021-8790 ; 1365-2656

edoc-URL <https://edoc.unibas.ch/80651/>

Full Text on edoc No;

Digital Object Identifier DOI 10.1111/1365-2656.13358

PubMed ID <http://www.ncbi.nlm.nih.gov/pubmed/32981063>

Document type (ISI) Journal Article