21st National Rangeland Forum

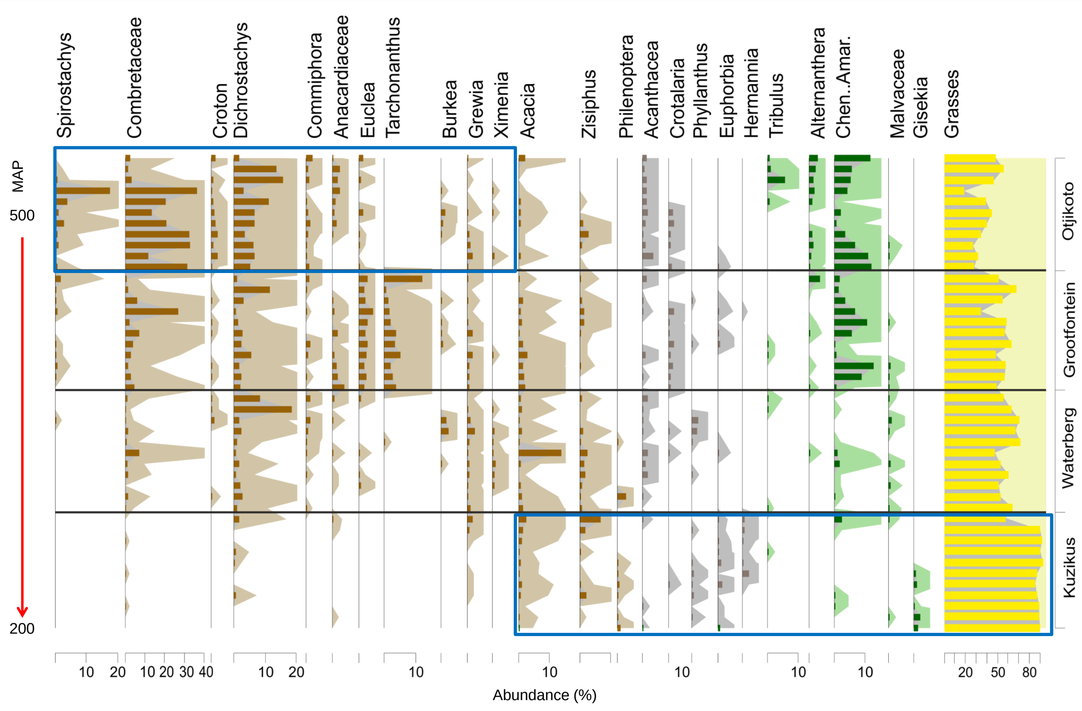
Otjiwarongo, Namibia,
17.-19. July 2017

OPTIMASS

Correspondence of modern-pollen and vegetation in Namibian savannahs

Objective: To check whether modern pollen reflect vegetation compositional change along precipitation and grazing intensity gradients.

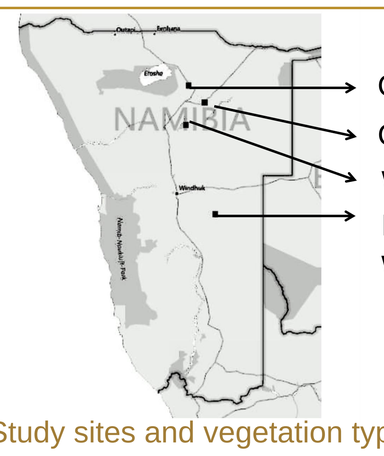
Methods: Modern pollen were extracted from soil surface samples collected at four localities (Otjikoto, Grootfontein, Waterberg and Kuzikus). At each locality a grazing gradient beginning at a watering point was defined and local vegetation was surveyed.



Modern pollen diagram of selected taxa. Shadow curves correspond to 10x exageration. MAP: Mean annual precipitation (Harris et al, 2014).

Correspondence of modern-pollen and vegetation along a precipitation gradient

- Modern pollen spectra reflect the **transition** from mixed woody savanna at Otjikoto to open savannah at Kuzikus.
- Modern pollen reflect **taxa turnover** according to mean annual precipitation: Dominance of broad-leaved-taxa (p.e. *Spirostachys*) at Otjikoto and increasing dominance of fine-leaved taxa (p.e. *Acacia*) and grasses at Kuzikus.
- Modern pollen reflect **disturbance** of local vegetation: Similar values in *Dichrostachys, Alternanthera* and *Crotalaria* pollen at Otjikoto point towards encroachment.

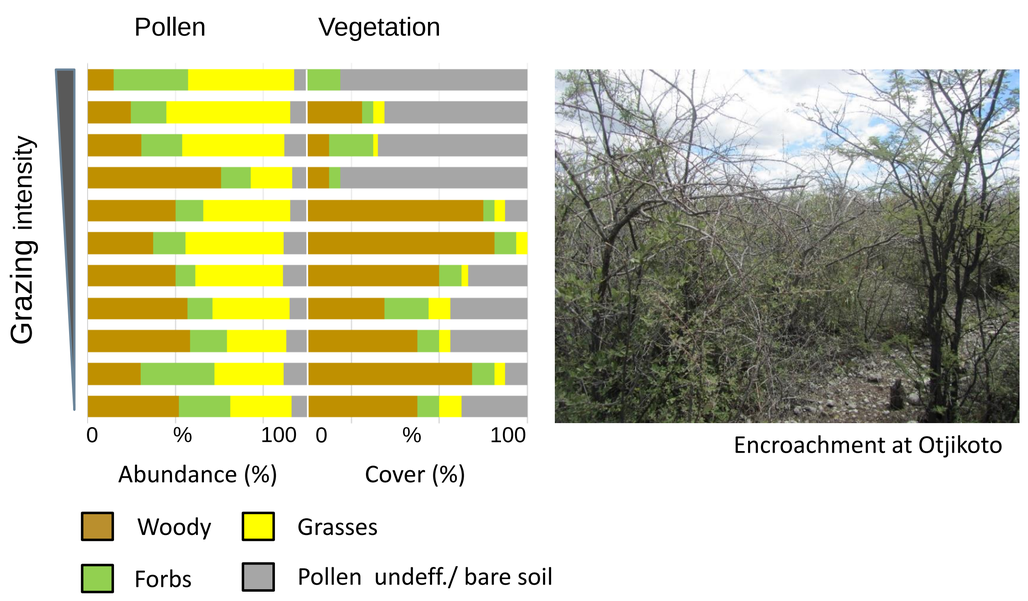


Otjikoto: Mixed woodland
Grootfoontein: Mixed woodland
Waterberg: Acacia shrubland
Kuzikus: Open Acacia woodland

Study sites and vegetation types according to Mendelsohn et al (2010).

Correspondence of modern-pollen and vegetation along grazing gradients

- There is a general **correspondence** between modern pollen and vegetation along grazing gradients.
- Woody vegetation increases at low grazing pressure.
- Forbs, particularly the unpalatable ones, are dominant at highest grazing pressure.
- **Insect pollinated taxa** (p.e. *Acacia*) are **underrepresented** in the pollen record.
- **Wind pollinated taxa** (p.e. grasses) are **overrepresented** in the pollen record.



Encroachment at Otjikoto

Modern pollen and vegetation types along a grazing gradient at Otjikoto. Highest grazing intensity at watering point.

Key messages

- **Modern pollen** reflect vegetation change according to mean annual **precipitation.**
- **Modern pollen** reflect **grazing impact** on vegetation well.
- Insect pollinated taxa are **underrepresented** in the pollen records, the contrary occurs with wind pollinated taxa.

Pollen is suitable to reconstruct vegetation composition and disturbance along precipitation and grazing gradients.

References

- Harris, I. et al., 2014. Updated high-resolution grids of monthly climatic observations - the CRU TS3.10 Dataset. International Journal of Climatology, 34(3), pp.623–642
- Mendelsohn, J. et al., 2010. Atlas of Namibia. A portrait of the land and its people 3rd ed., Cape Town: Sunbird Publishers.

ALFRED-WEGENER-INSTITUT
HELMHOLTZ-ZENTRUM FÜR POLAR- UND MEERESFORSCHUNG

Tabares, Ximena
University of Potsdam
tabares@uni-potsdam.de

DLR Project Management Agency

SPONSORED BY THE
Federal Ministry of Education and Research