The demise of the Shimuwini baobab in the context of baobab adaptation and climate change

Stephan Woodborne & Sarah Venter

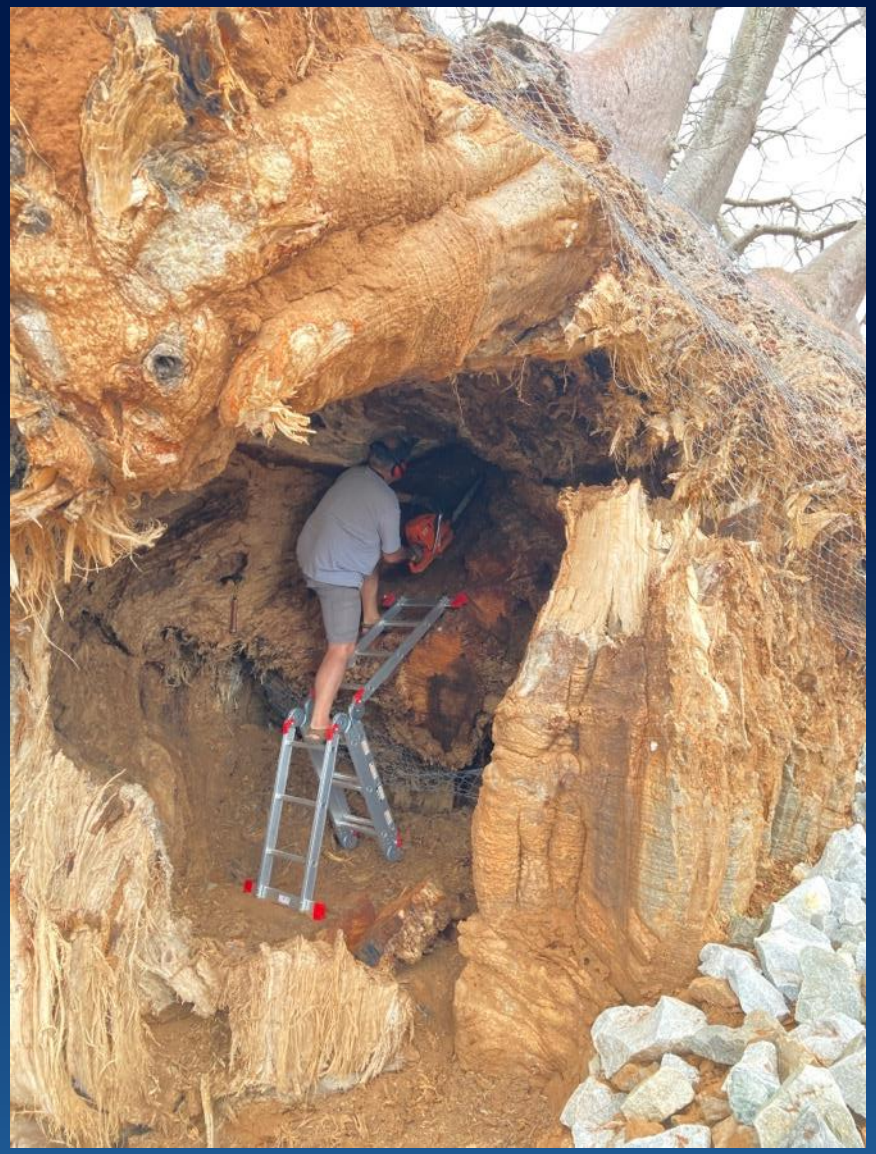
The tragedy

https://tracks4africa.net/listings/item/w165186/sh

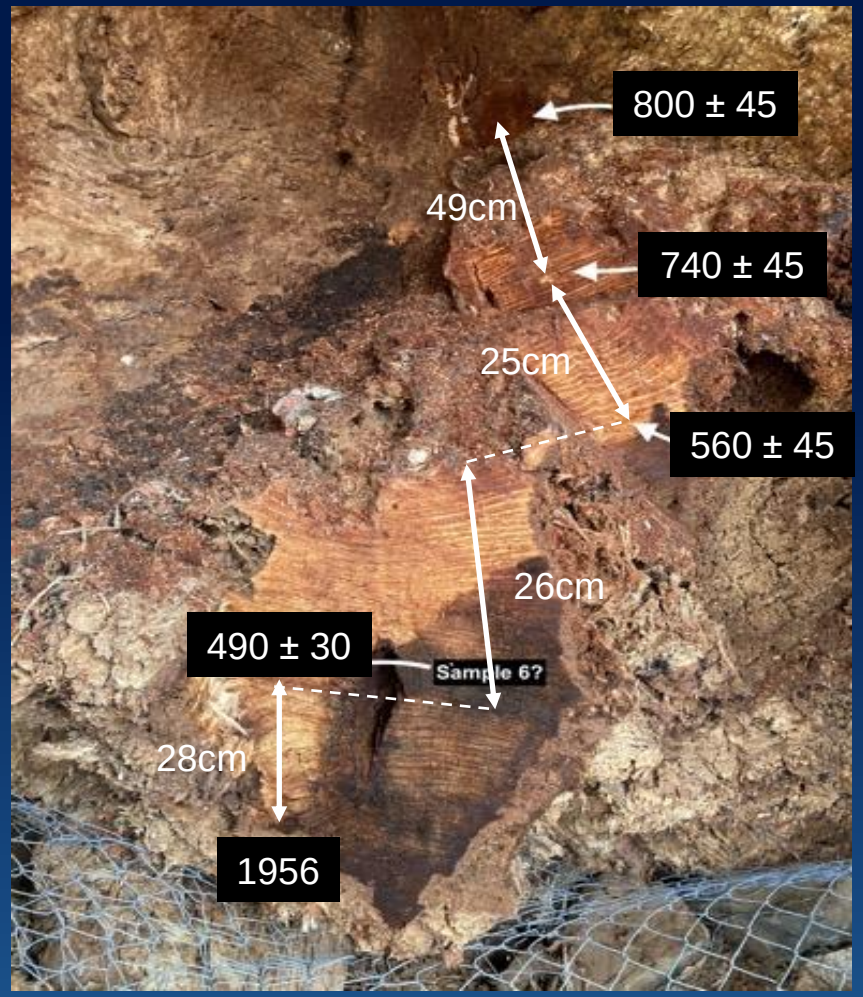
https://africawild-forum.com/viewtopic.php?t=10941

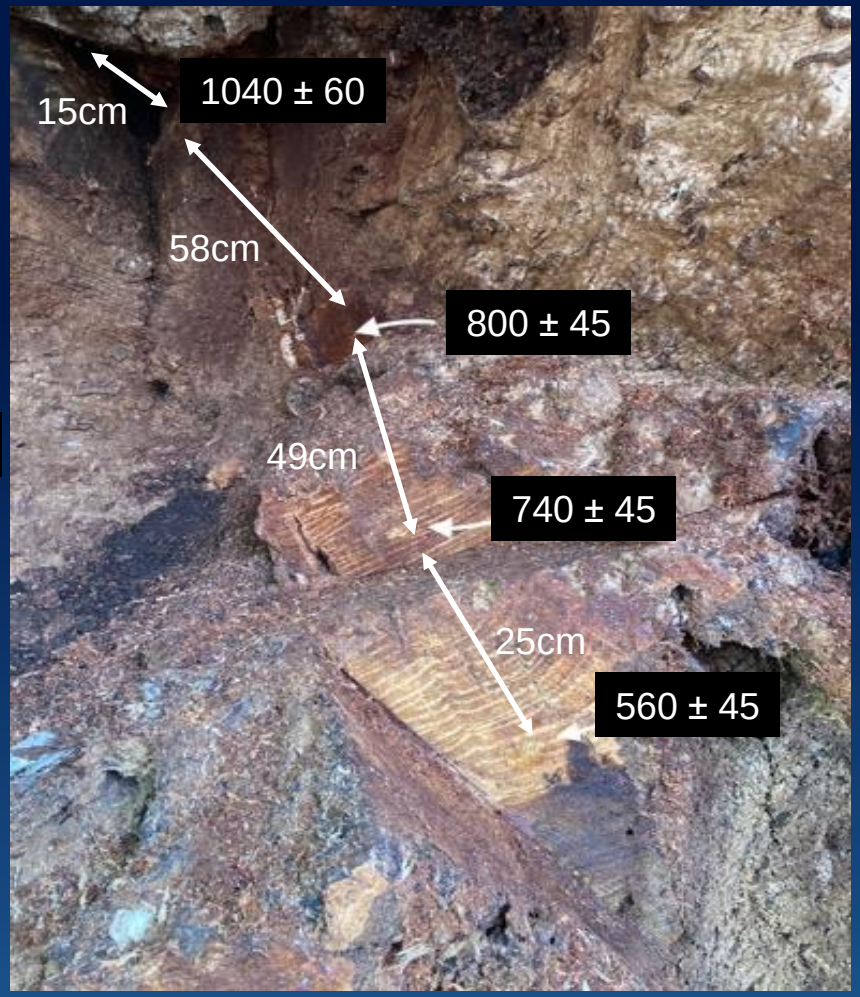
https://outandabout.africa/kruger-rivers-sunsets-and-baobabs/ Kingsley Biddington

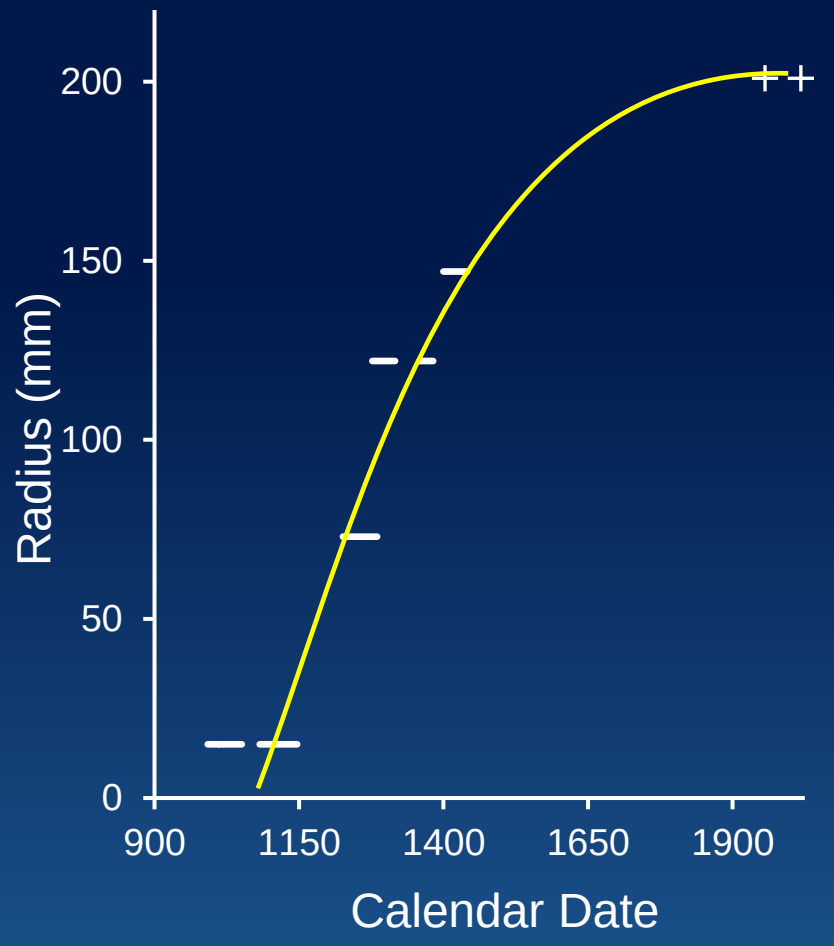
How old was the Shimuwini Baobab?



How old was the Shimuwini Baobab?







Is there a problem?

nature plants

BRIEF COMMUNICATION

https://doi.org/10.1038/s41477-018-0170-5

The demise of the largest and oldest African baobabs

Adrian Patrut[1*], Stephan Woodborne[2], Roxana T. Patrut[3], Laszlo Rakosy[3], Daniel A. Lowy[4], Grant Hall[5] and Karl F. von Reden[6]

Editors pushed for a “reason”
Phenomenon noted at the southern edge of the distribution range and we speculated it may be climate change
≠ Baobabs are going extinct!

nature plants

Matters arising

https://doi.org/10.1038/s41477-024-01681-4

Baobabs as symbols of resilience

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Check for updates

Sarah M. Venter[1] & Ed T. F. Witkowski[2]

ARISING FROM A. Patrut *Nature Plants* https://doi.org/10.1038/s41477-018-0170-5 (2018)

Core-rot

Core-rot

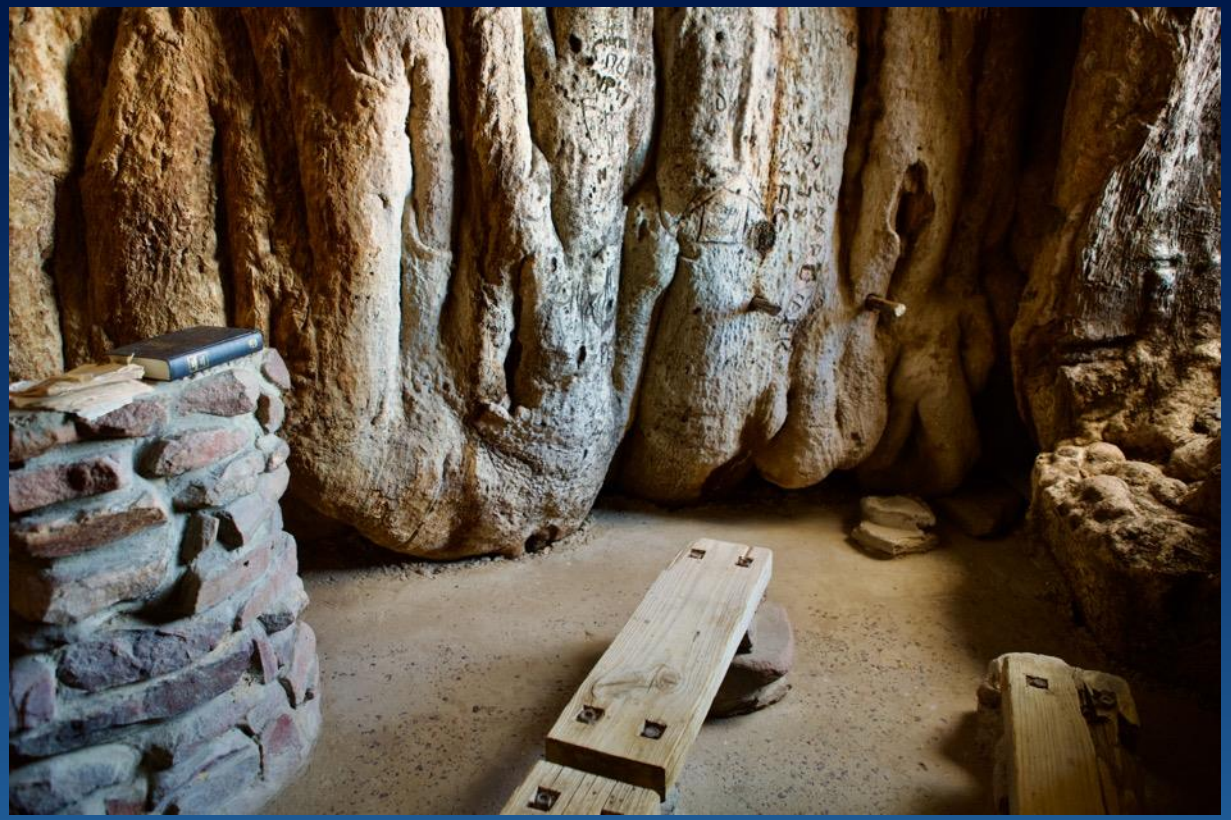
The “false cavity” phenomenon

PLOS ONE

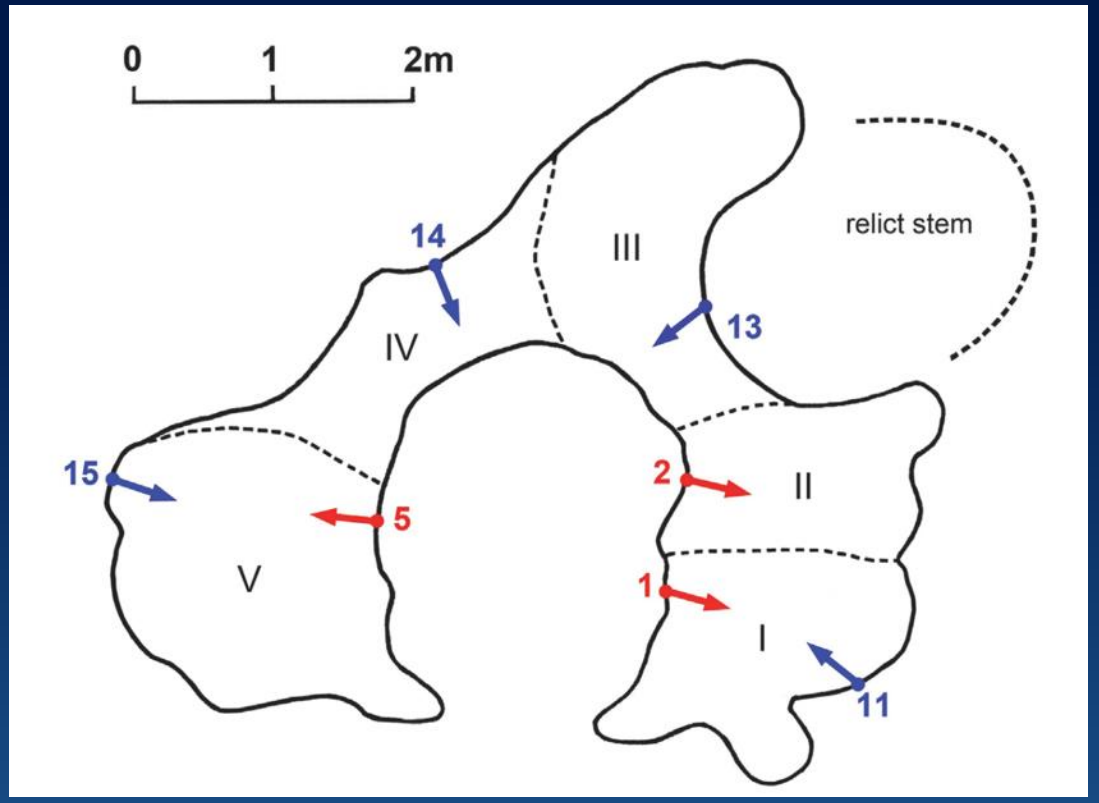
RESEARCH ARTICLE

African Baobabs with False Inner Cavities: The Radiocarbon Investigation of the Lebombo Eco Trail Baobab

Adrian Patrut[1]*, Stephan Woodborne[2], Karl F. von Reden[3], Grant Hall[4], Michele Hofmeyr[5], Daniel A. Lowy[6], Roxana T. Patrut[7]



The “false cavity” phenomenon



The “ring shaped structure” phenomenon

forests

MDPI

Article

Radiocarbon Investigation of the Historic African Baobabs of Omusati, Namibia

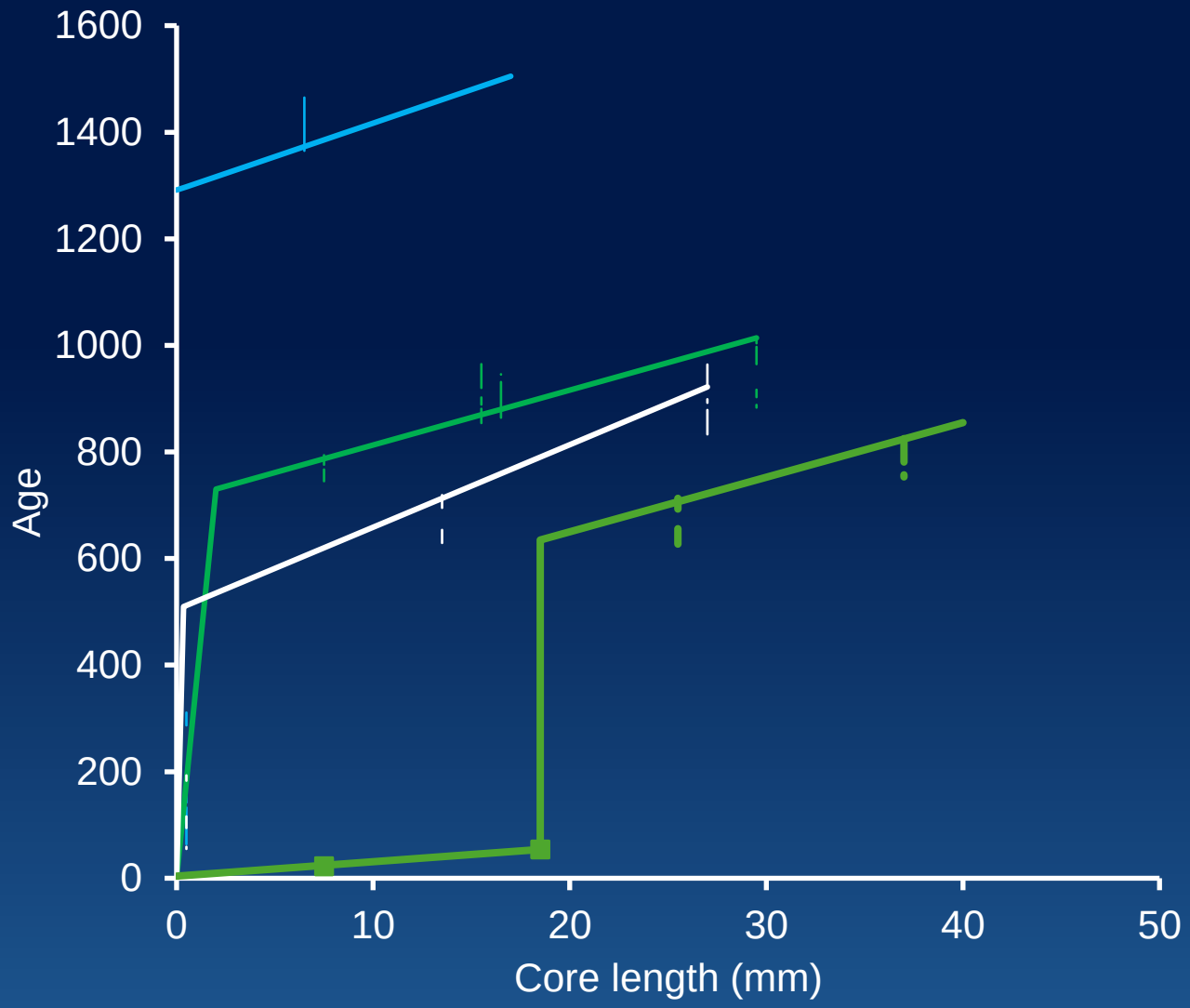
Adrian Patrut [1,2,*], Roxana T. Patrut [1], Laszlo Rakosy [3], Demetra Rakosy [4,5], Willie Oliver [6], Ileana Andreea Ratiu [1,2], Daniel A. Lowy [7,8], Gebhardt Shiimbi [9], Stephan Woodborne [10] and Karl F. von Reden [11]

The “growth-stop” phenomenon

Radiocarbon, Vol 59, Nr 2, 2017, p 435–448 DOI:10.1017/RDC.2016.92
Selected Papers from the 2015 Radiocarbon Conference, Dakar, Senegal, 16–20 November 2015

THE GROWTH STOP PHENOMENON OF BAOBABS (*ADANSONIA* SPP.) IDENTIFIED BY RADIOCARBON DATING

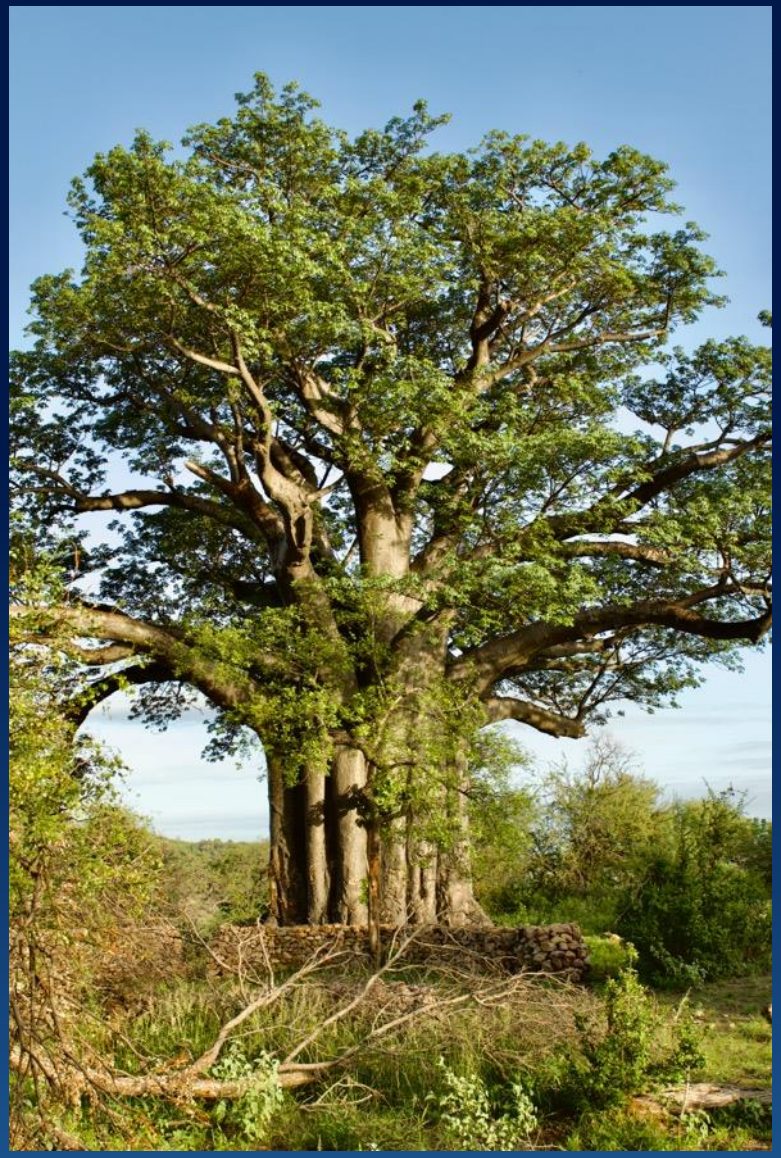
Adrian Patrut[1*] • Stephan Woodborne[2] • Karl F von Reden[3] • Grant Hall[4] • Roxana T Patrut[5] • Laszlo Rakosy[5] • Pascal Danthu[6,7] • Jean-Michel Leong Pock-Tsy[7] • Daniel A Lowy[8] • Dragos Margineanu[1]



Reconciling the observations:
A growth model for superlative baobabs

Stage 1: Concentric ring formation

A growth model for superlative baobabs



Stage 2: Buttressing

A growth model for superlative baobabs

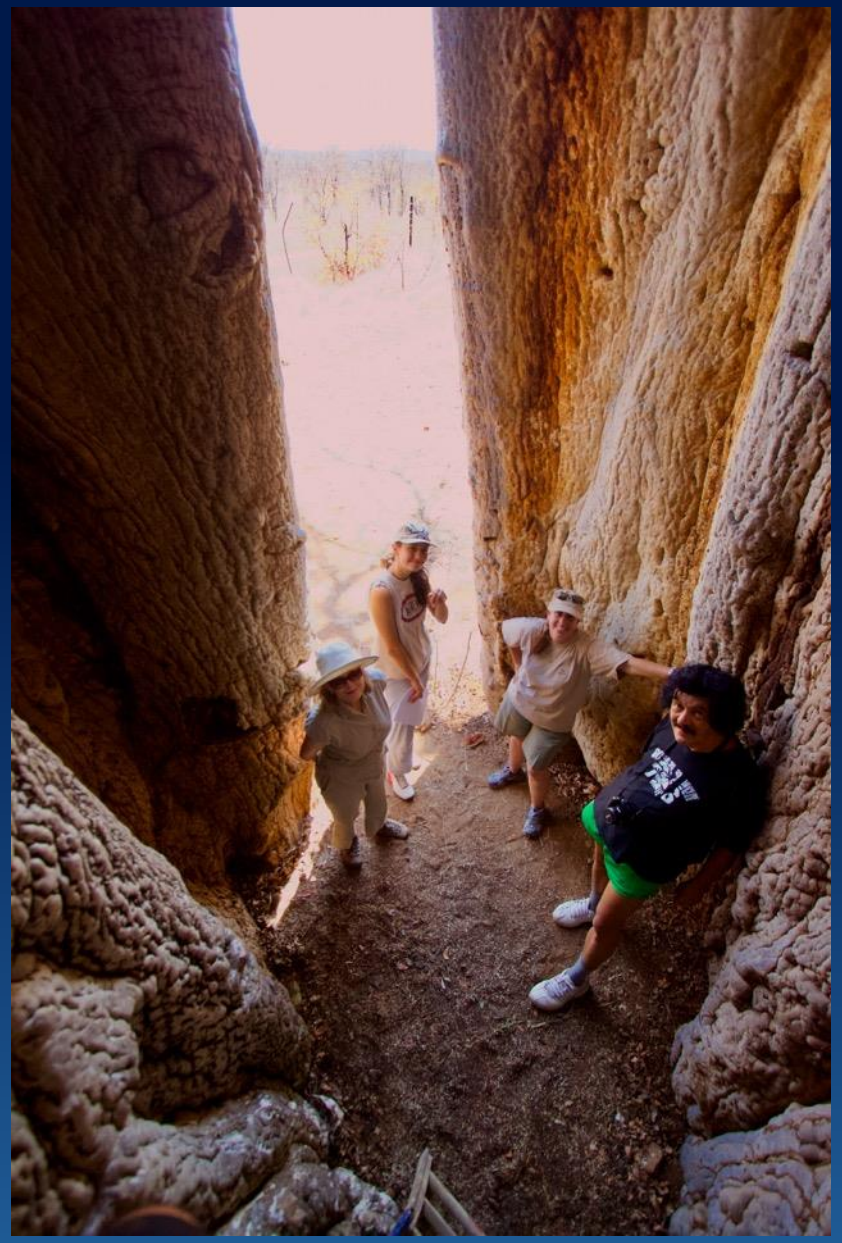
Stage 3: Core-rot

- May be initiated by relict roots becoming dysfunctional and dying
- Spreads upwards through the center of the stem
- Rot may spread outwards to the inner structures of the buttresses
- **Most baobabs will structurally fail & die**
- Core-rot may to be attractive to elephants & trauma improves the chances of collapse

A growth model for superlative baobabs

Stage 4: Healing & Regrowth

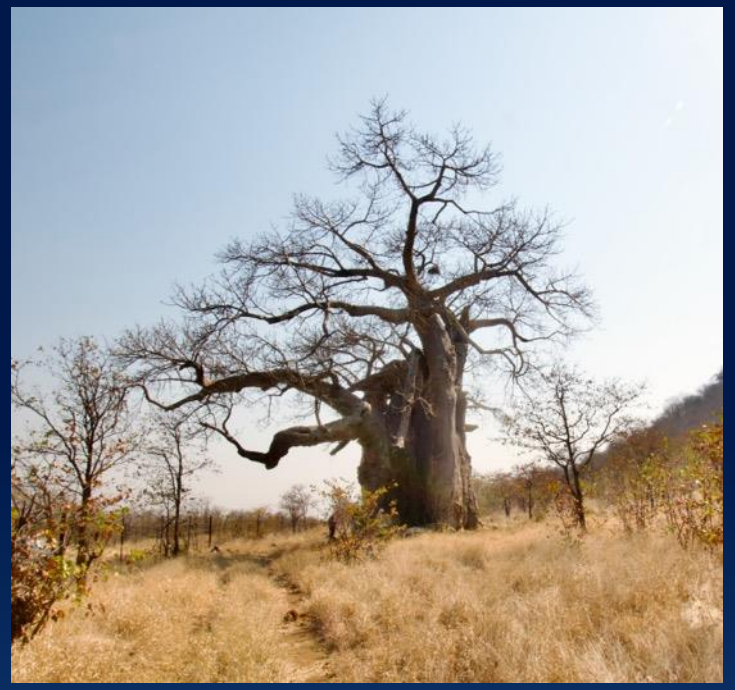
- New bark forms inside “false cavity”
- Where core-rot reached the inner part of the buttress structures, each buttress becomes a separate stem
- Creates ring shaped structures
- Ring shaped structures are resilient to elephant damage, and may be why the superlative baobabs in southern Africa reach extreme ages

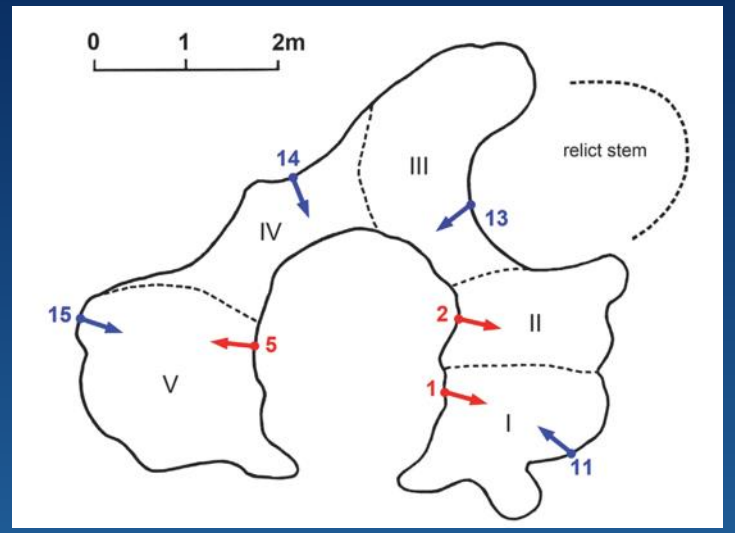


A growth model for superlative baobabs

Stage 5: Separate stems experience core rot leading to differential stem loss

- Occlusions between stems inhibit growth
- Release events when one stem dies
- Creates growth stop features





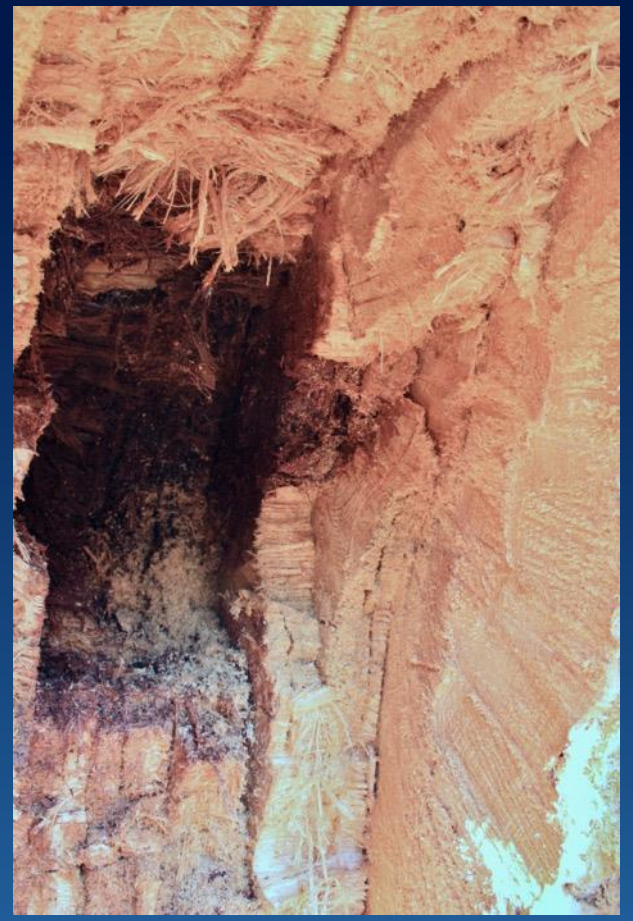
A growth model for superlative baobabs

Stage 6: Repeat

- Some superlative baobabs appear to have evidence for several rot/recovery cycles

Conclusions

- Core rot is widespread and is a threat to baobabs
- The problem may exacerbate the impact of elephants
- The demise of the Shimuwini and other superlative baobabs is likely a natural process
- The ring shaped structures obscure the true age of these baobabs, and they could be many 1000s of years old



New Research Questions:

Does core rot initiate as a function of environment or age?

Justice?

Thank you

Swoodborne@tlabs.ac.za