



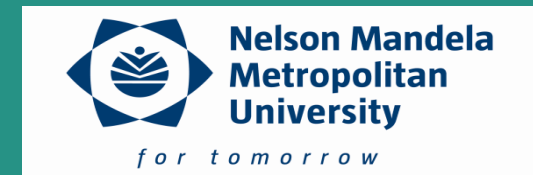
# *The foraging potential of edible plant foods in the southern Cape*

**by Susan Botha**

Botany Department, Nelson Mandela Metropolitan University

**Richard Cowling, Alastair Potts, Karen Esler, Jan de Vynck**

*Fynbos Forum, Port Elizabeth, 2016*



# Refugium Hypothesis

## SEASIDE SANCTUARY

Between 195,000 and 123,000 years ago, the planet was locked in an ice age known as Marine Isotope Stage 6, rendering much of the African continent cool and arid—unsuitable for the plants and animals that *Homo sapiens* ate. Only a few regions could have supported our species, namely, those with grassland or Mediterranean scrub vegetation. The southern coast would have been a particularly plentiful oasis, thanks to the edible fynbos plants that grow only here and the dense shellfish beds nurtured by the Agulhas current and the Benguela upwelling of nutrient-rich cold water from the sea bottom.



- 195 – 135 kya = World was predominantly in a glacial phase
- Africa became more dry and arid
- Archaeological records show that most of Africa had extended absences of hominin settlements
- southern Cape continuous occupation
- Modern day human went through a population bottleneck within the last ~200 000 years

Agulhas current

Fynbos vegetation

Marean, 2010

PP13B

PP13B



# Agulhas Oasis



- During minimum sea levels the landmass essentially doubled
- Proximity to the warm Agulhas current ameliorated the plain's climate
- Dense shellfish beds nurtured by the Agulhas current and Benguela current
- Large diversity and density of grazing fauna



# Agulhas Oasis - source of carbohydrates



- Cape Floral Kingdom
- 9 000 Plant species
- 17% of which are geophytes
- Diverse habitat types in close proximity to each other

Credit: Jan de Vynck

# Aim of my study.....

To better understand the importance of plant carbohydrates in sustaining past human populations

## Main Questions:

What are the foraging return rates for edible plants in the main vegetation types in the southern Cape?

Is foraging returns higher in burnt fynbos?

How sustainable are different plant species to harvesting?

How do we know people are utilising the same plant species today as in the past?



# What are the foraging return rates for edible plants in the main vegetation types in the southern Cape?









## How sustainable are different plant species to harvesting?



Set up 23, 10 by 10 m plots in August 2015 re-visit sites one year later to check re-generation



## Is edible food foraging returns higher in burnt fynbos?



Foraging bouts in limestone and sand fynbos at different ages after a fire



# How do we know people are utilising the same plant species today as in the past?

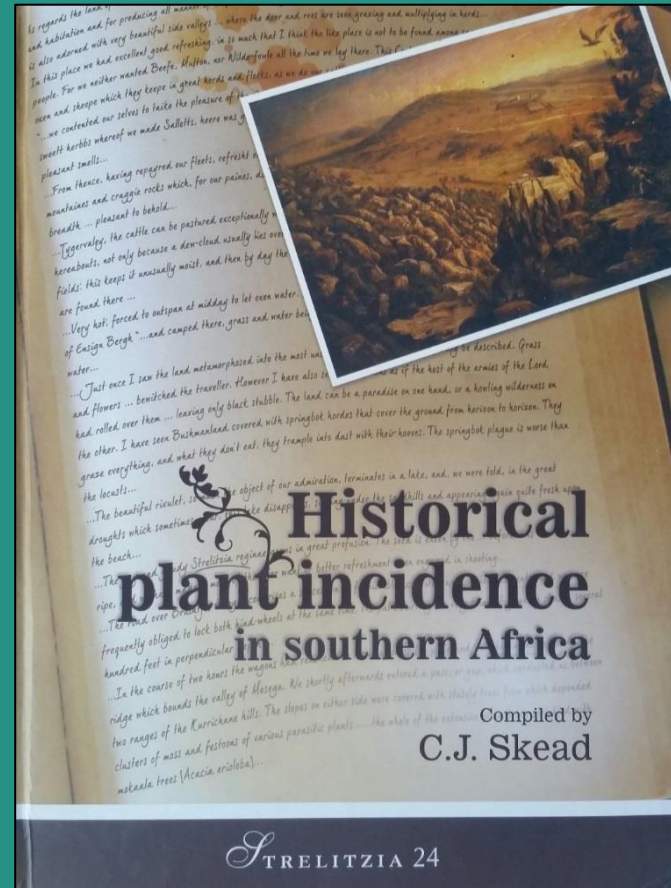


Lady with a digging stick  
(Liengme, 1987)

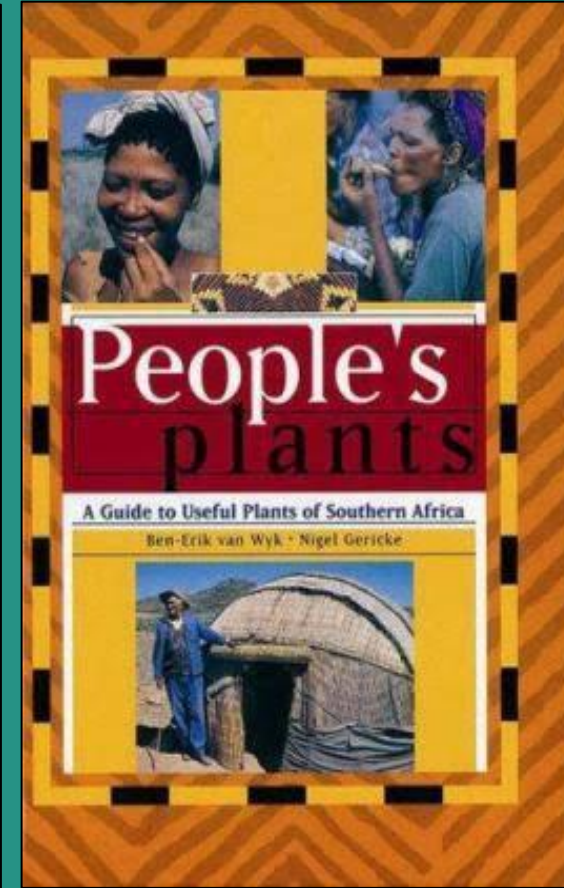


Botanical drawing of plant remnants from Scott's cave  
(Wells, 1965)

VS



Examples of contemporary books documenting plant use by humans in South Africa (Skead (2009) and van Wyk and Gericke (2000))





## Archaeological: Summarize all plant species found in archaeological sites within the GCFR

Archaeological sites:	# entries
Andriesgrond cave (Liengme, 1987)	14
Boomplaas (Deacon, 1979)	9
Buffelskloof rock shelter (Opperman, 1978)	14
De Hangen Cave (Liengme, 1987)	70
Diepkloof rock shelter (Cartwright, 2013, Liengme, 1987)	55
Elands Bay Cave (Liengme, 1987, Cowling et al, 1999)	69
Groot Kommandokloof Shelter (Binneman, 1999)	16
Kleinpoort shelter (Binneman, 1998)	21
Melkhoutboom (Deacon, 1976)	29
Nuwekloof shelter (Binneman, 2000)	6
Rautenbach's cave (Binneman, 2000)	29
Renbaan (Liengme, 1987)	14
Scott's cave (Wells, 1965, Deacon, 1967)	20
Springs rock shelter (Deacon, 1976)	11
Strathalen cave (Opperman and Hydenrych, 1990)	4
The Haven's cave (Binneman, 1997)	46

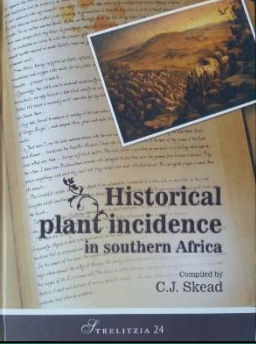


Map of archaeological sites





# Historical: Summarize all recorded plant uses in the GCFR

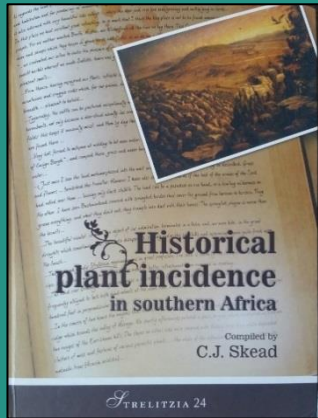


Author	No of entries
Archer (1982)	41
Botha (unpublished)	31
Coetzee and Miros (2010)	78
De Vynck (2014)	196
Moffet and Deacon (1977)	139
Rood (1994)	41
Skead (2009)	164
Thring and Weitz (2006)	26
Van Wyk and Gericke (2000)	300

Order	Species name in original text	SANBI new name CHECK	Genus	Family	GCFR	author	area	Use	Part	Method of preparation	Type	Page reference
101	Acacia karroo	Vacchelia karroo	Vacchelia	Fabaceae	yes	Skead	Eastern Cape	material	branches		tan, enclosing kraals, chewed as a thirst quencher	p. 234, 237, 110
189	Acacia karroo	Vacchelia karroo	Vacchelia	Fabaceae	yes	de Vynck (2014)	Overberg	edible	gum		snack	p. 104



# Summary of plant species found in archaeological and historical records



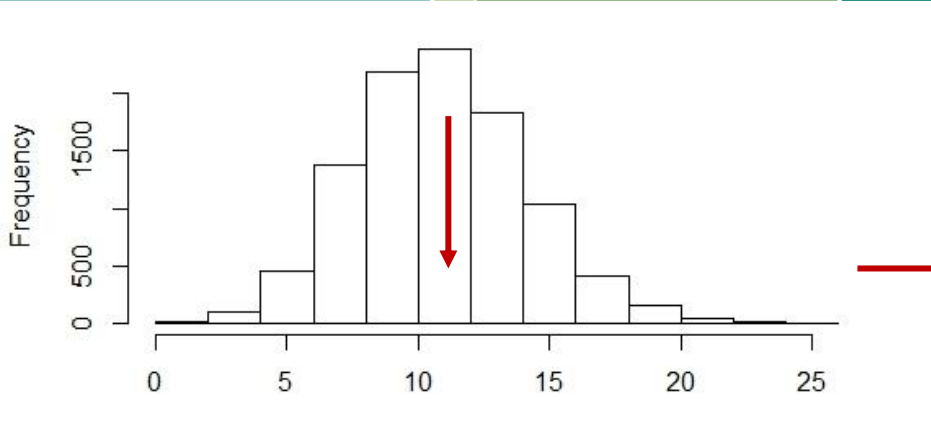
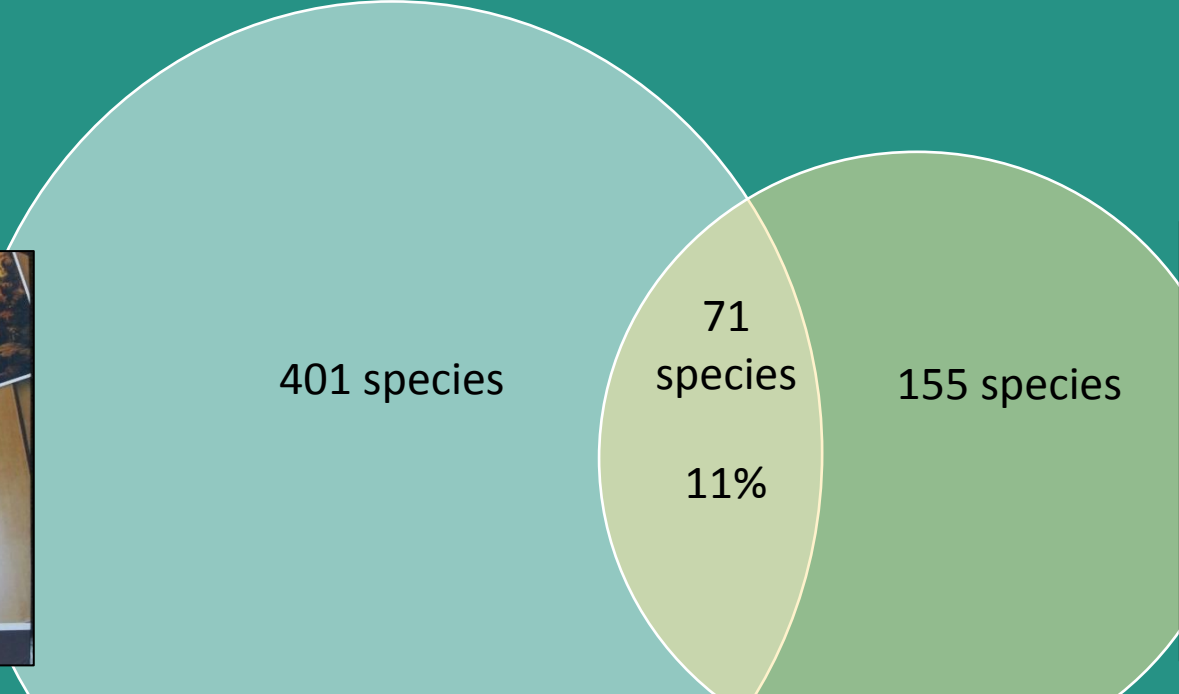
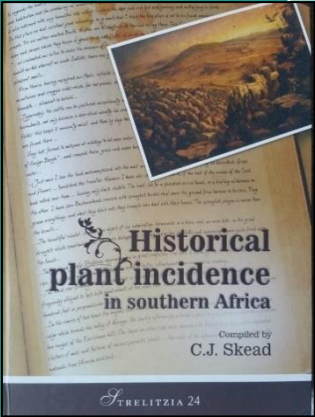
472 species  
267 genera  
103 families

226 species  
137 genera  
68 families





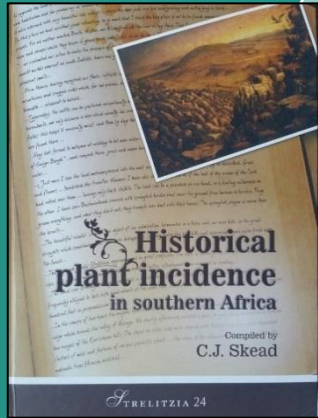
# Hypothesis: There is a significant overlap in indigenous plant species found in archaeological excavations and those historically recorded being used



No of species that overlap



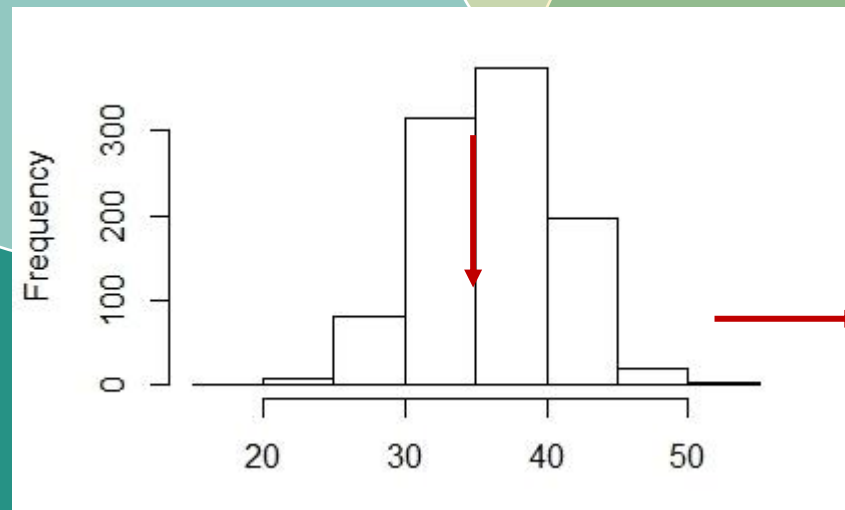
Hypothesis: There is a significant overlap in the number of genera.....



180 genera

87  
genera  
27%

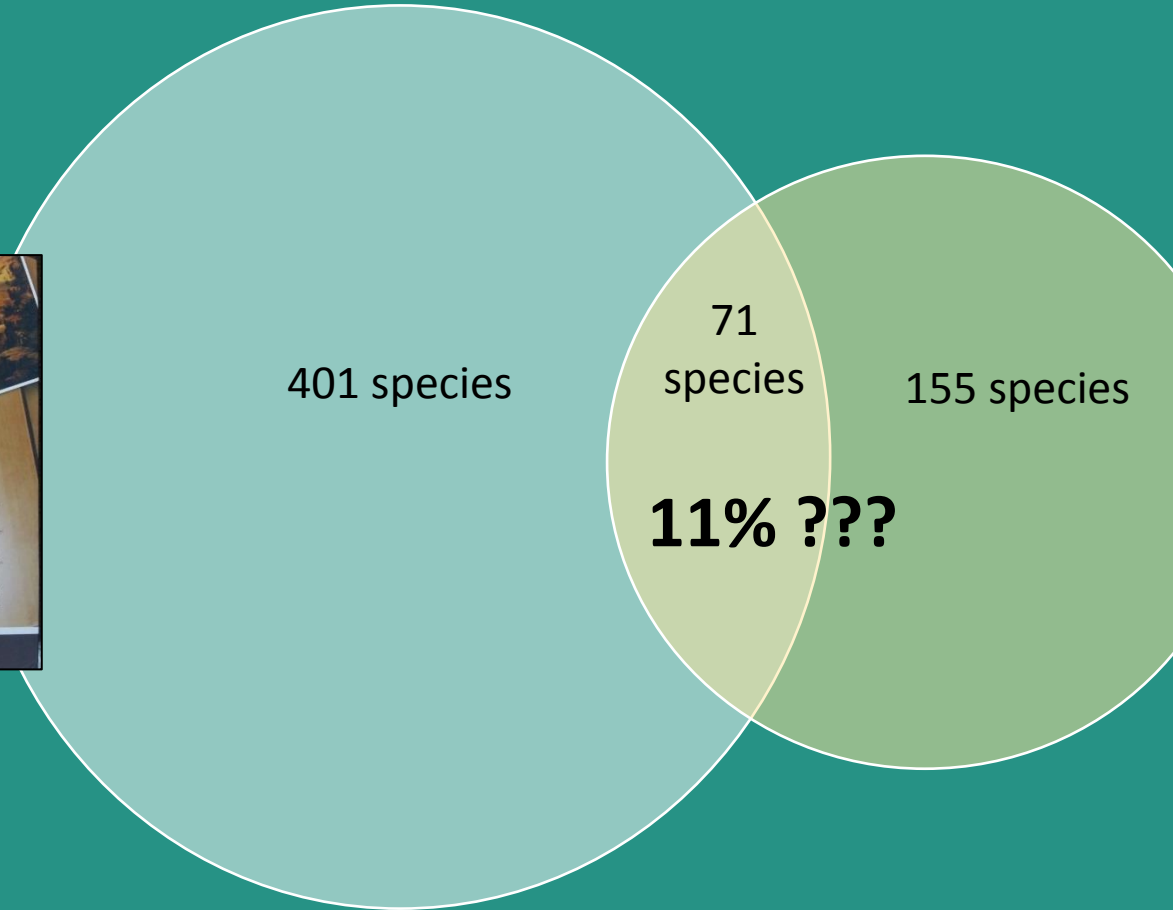
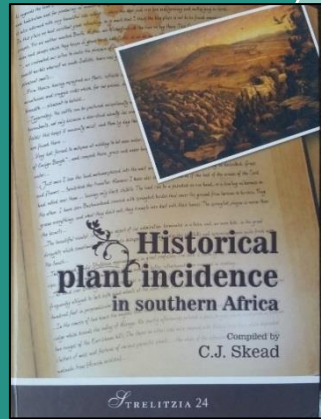
50 genera



No of genera that overlap

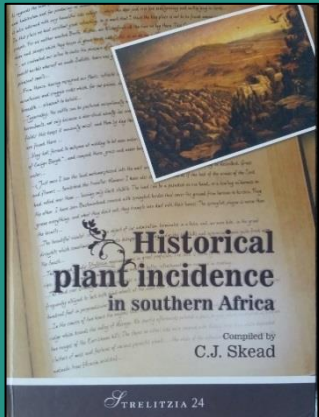


# Hypothesis: There is a significant overlap in indigenous plant species found in archaeological excavations and those historically recorded being used





# Breaking the mismatch down by looking at different plant use categories: medicinal, edible and firewood



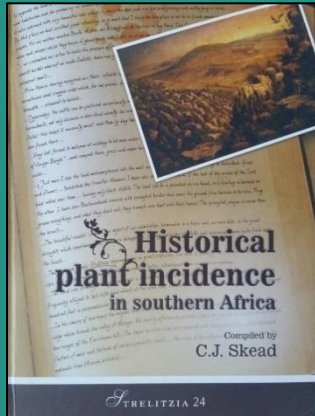
221 medicinal plant species  
226 edible plant species

38 medicinal  
plant species  
77 edible plant  
species





# Firewood use....

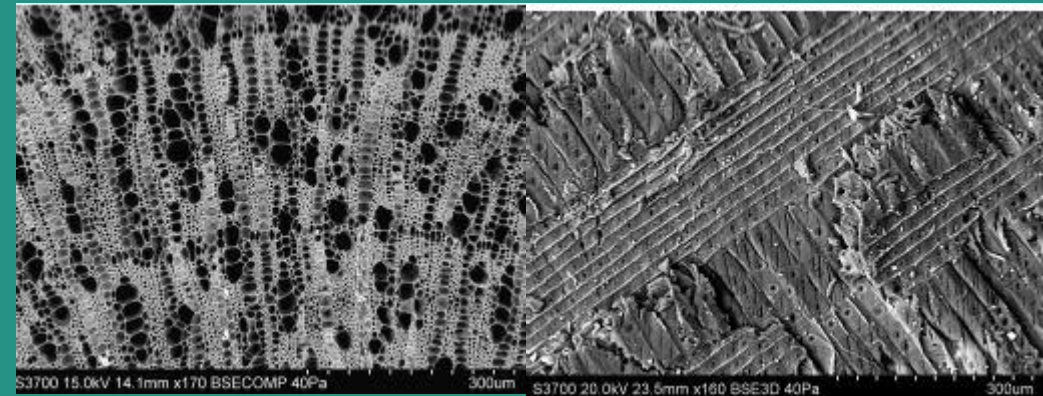


42 firewood species

89 firewood species

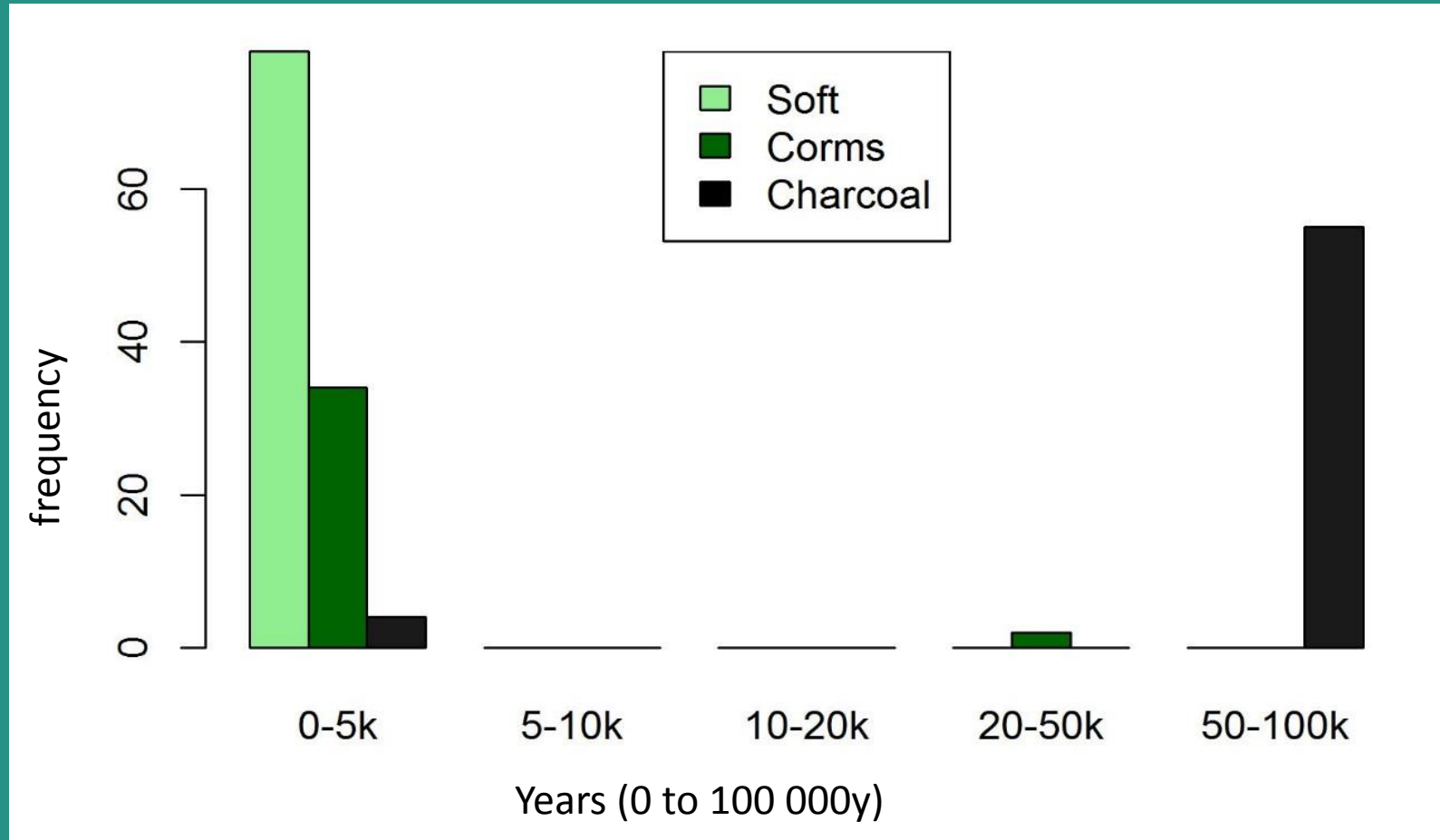


Heat treated silcrete



Elands Bay Cave: Cowling et al., 1999; Diepkloof rock shelter: Cartwright (2013)

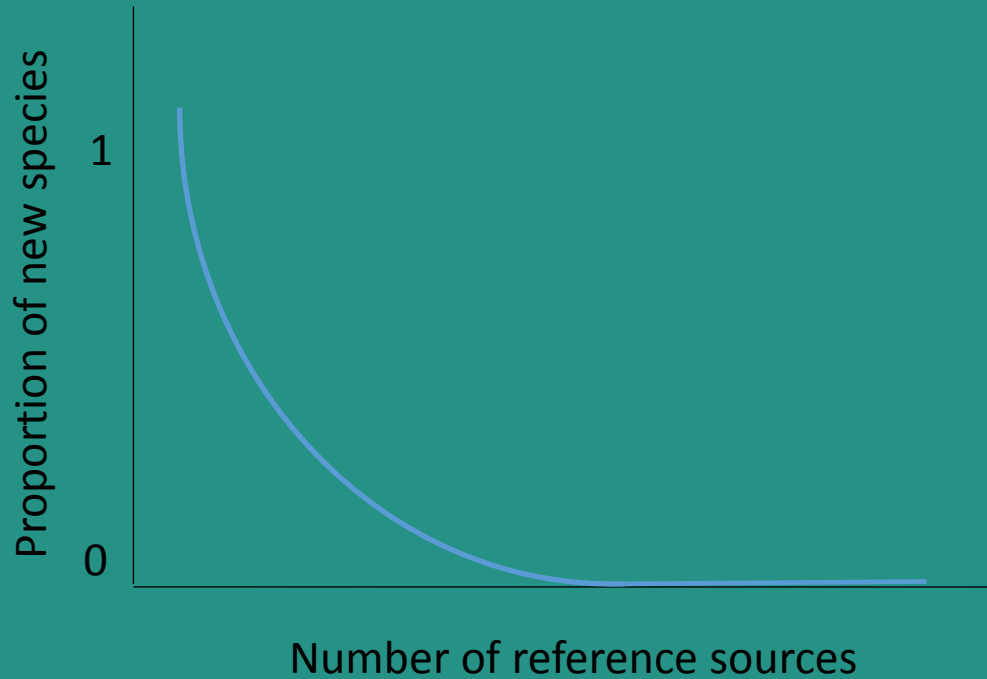
Fossilised charcoal preserve the longest in the archaeological records followed by corms, then soft plant material



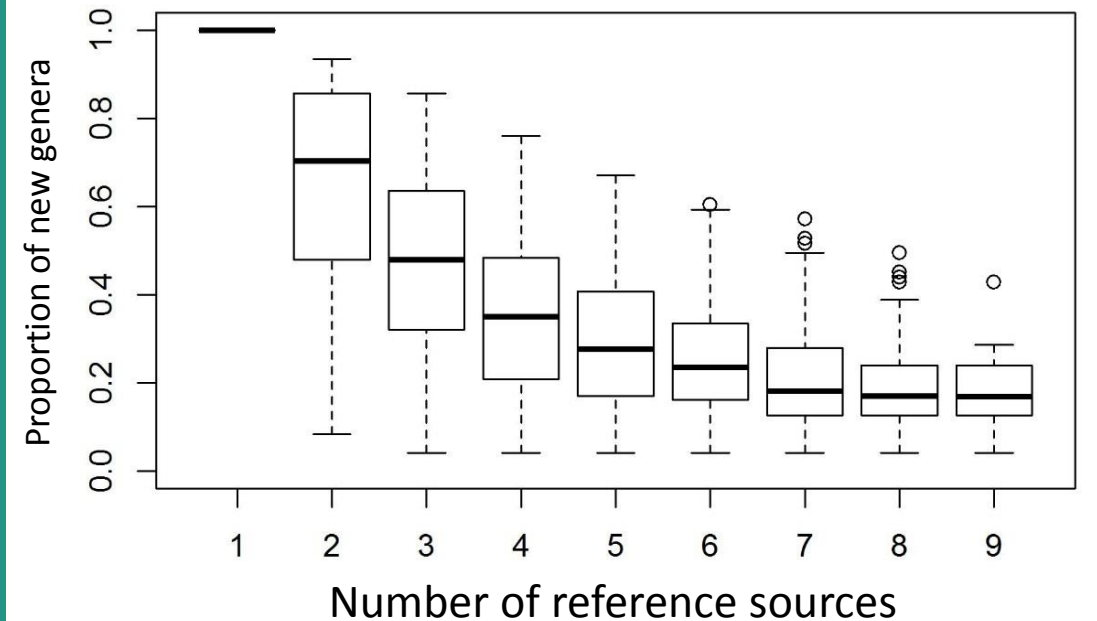
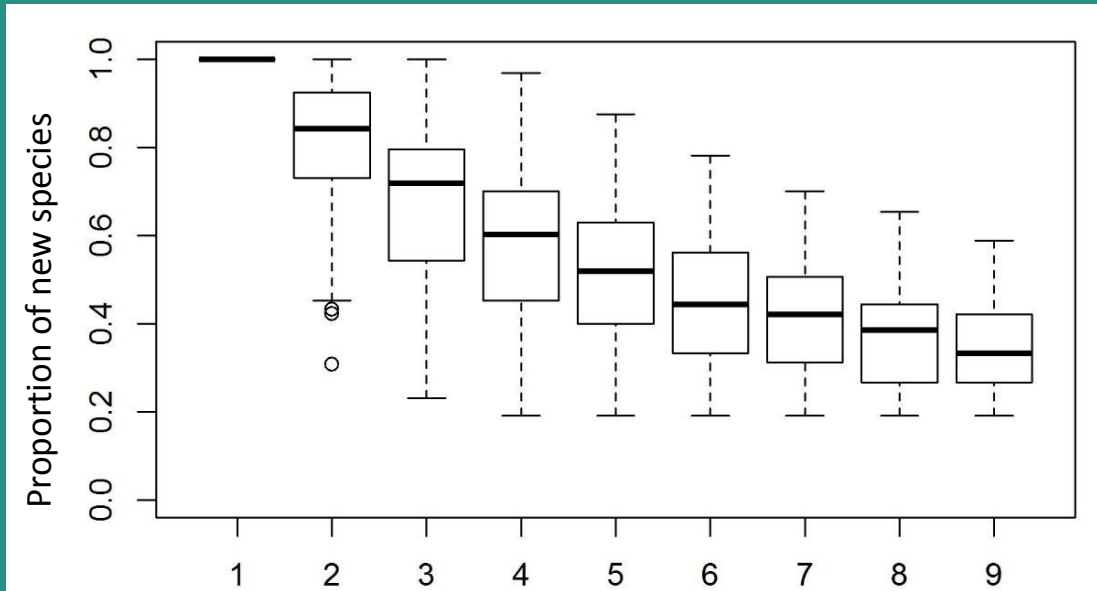
**Figure** The frequency of plant material divided into three categories depending on preservation ability: Soft (stems, leaves, fruits), corms and charcoal



# Hypothesis: There is a set # of plant species with uses useful to man



*“.....and that there is an urgent need to document this wealth of traditional knowledge in other parts of southern Africa, before it is lost forever.” (de Beer and van Wyk, 2011)*





## Acknowledgements

Jan de Vynck

Land owners of southern Cape

Participants from

Melkhoutfontein and Gouritz  
river communities

Supervisors:

Dr Alastair Potts

Prof Richard Cowling

Prof Karen Esler

NRF and Curtis Marean for  
funding