

The relationship between Plants, Place, and People in the Klasies River area on the Tsitsikamma coast, South Africa

Objective

To provide a comparative database of plants at Klasies for identification of macro- and micro-botanical remains from the site.

To collect ethnobotanical data by engaging with local communities with links to a pre-colonial Khoe-San presence in the area.

This has been undertaken against the background of a larger study of vegetation at 75 archaeological site complexes in the southern and Eastern Cape

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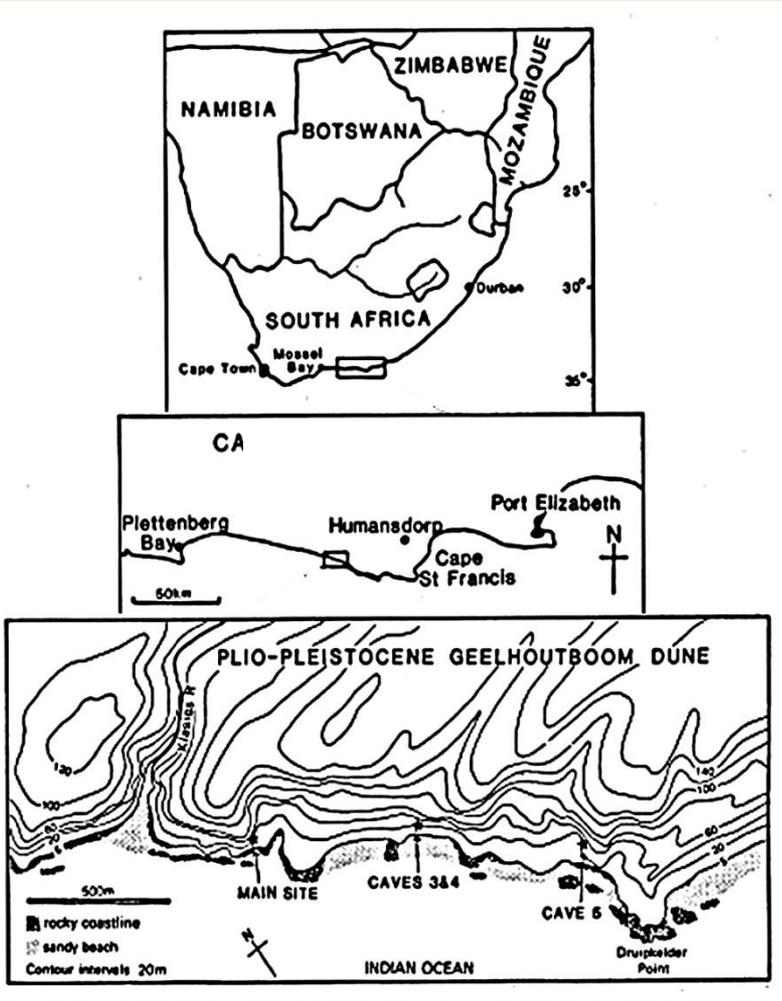


Locality of Klasies River Archaeological sites

Klasies River is a key site in early modern human origins research, but has not been closely studied regarding vegetation or ethnobotany.

Macro- and micro-botanical remains in the South African context have usually been used to infer climate change on the basis of vegetation change or vice versa. Seldom linked to human use.

The vegetation immediately surrounding the Klasies River sites is a complex mosaic of predominantly Subtropical and Kaffrarian Thicket, Southern Afrotemperate Forest, and Southern Cape Seashore vegetation, with elements of Fynbos. Grassy and Dune Fynbos interdigitates with Renosterbos on the inland dunefields and plateau - where agriculture and forestry allows.



Locality of Klasies river sites

Adapted from Deacon & Geleijnse (1988)

Questions

- What processes might have been responsible for the modern composition of these plant communities?
- **Anthropogenic? Ecological? Climatic? All of these?**
- Which of these plants are still used by modern Khoe-San descendants in the area today?
- **Ethnobotanical research is on-going – 89% are recorded as being of medicinal or other use today in other research into wider Cape Khoe-San descendant use.**
- Did these plants provide a source of food, medicine, insecticide, bedding, fuel, mastic, cordage, or tools?
- **If evidence of these taxa can be identified from the sediments in a context which tells a story - Traces of parenchyma on a stone tool or pottery or charcoal in a hearth.**
- How long have the plants been present that are growing today in close association with these archaeological sites?
- **Probably since the Late Pleistocene if not longer (Cowling pers.comm.).**



Methods

Modern presence and absence vegetation specimens were collected at Klasies River from accessible areas (see Map on next slide)

- 1 - 19 are relatively undisturbed areas between Klasies River Mouth in the West to Caves 3 & 4 in the East. These areas lie in a band from the shore to 100 - 120m above sea-level where the coastal cliffs level off onto the Tsitsikamma coastal plateau.
- 20 – 24 are 5 additional areas on the coastal plateau within 5 km of the sites – the plateau has been heavily impacted by agriculture and forestry leaving only relict fynbos, forest/thicket, and grassland patches.

Voucher specimens

- Madelon Tusenius collected woody spp. for charcoal research in 1984 / 85 & 2015
- Yvette van Wijk and Renee Rust collected all spp. each year from 2013 - 2016
- Richard Cowling partially sampled some areas 2015

Ethno botanical data

- Semi-structured and unstructured interviews & walks in the veld to collect information and plant specimens through interacting with elderly individuals who lived and grew up in an area close to the cave sites, now living in Clarkson. Khoesan / Fingo 'plantekenners' in the area have also been interviewed.

Panoramic view of Klasies main sites where most collecting took place



Aerial view – Core collecting areas numbered – Black, Yvw & Rust – White, Tusenius





Caves 3 and 4

Note high forest patch between and below the sites - protected by fore-dune stabilised mainly by thicket.

Salts-pray killed dead wood on hummock fore-dune provides tinder and fuel for fires.

Cave 3 is large and deep with stalagmites and stalactites and a passage running approx. 400m into the Fossil dune behind.

Cave 5

Note forest patch below cave - protected by hummock fore-dune stabilised mainly by coastal and littoral Vegetation.



Ecological and Anthropogenic Enrichment of soil



The topsoil below the thicket covering the fossil dune(s) is a dark brown, deep, fertile loam, which we also found above and below areas 12, 13 and 13a (Fig 2b).

This dark brown earth is the result of millennia of thicket growth, die back, perennial leaf shedding, and capture of wind blown sands and soil from the coast and inland (Tilney 1985, Y van Wijk pers. Com.).

The thickness of the dark humus soil bears testimony to the ancient origin of the dense thicket vegetation which has probably changed little since the Late Pleistocene (Cowling, Pers. com.).

A 1 square metre plot in area 8 is wind-and salt-sheared to a 10cm maximum height. It appears to be a grassy sward, but includes 21 different species of forest, thicket, succulent, grass, geophyte, and herb taxa. The soil is friable, dark, humus rich, loam (depth unknown).

Is this vegetation specific to Archaeological sites? If so Why?

- High diversity of vegetation within easy foraging range of the Klasies sites. 89% of the 268 species collected are reported as useful by local modern Khoe-San and in the literature.
- Similarity of taxa at Klasies, Nelson Bay, Pinnacle Point and Blombos, and at inland sites, points to a possible connection between humans and this vegetation through time.
- Soil enrichment during human occupation of sites over thousands of years would have had far-reaching and long-lasting effects.
- Potassium, Calcium and Phosphorus build up in the soil and salts accumulate from human waste and detritus, charcoal and ash.
- These chemicals have been shown to be long lasting in the soil - see Dark Earths of Amazonia (Balee 2010), West Africa (Fairhead & Leach in Williams & Texeira 2008), & S Africa (Blackmore et al 1990)

Plant collecting at Klasies is not for sissies!



Lycium ferocissimum forming an impenetrable wall of thorns, area 3



As high as we could get on the crumbling, densely vegetated cliffs in area 11

Plant use – the bigger picture

- Hunter-gatherers lived at Klasies from 125 000 bp with a few periods of apparent absence.
- Current research could give fascinating information about the past use of plants.
- They ate plants and possibly seaweed, as well as shellfish, marine mammals and land animals.
- There is a tendency to concentrate on only one or two obvious resources available at sites and extrapolate size of communities able to subsist in that landscape at any one time. But resources are multiple and diverse and could include such things as fungi, insects, honey, etc.
- Plants provide essential micronutrients not available elsewhere and essential to human diet and health.
- Humans and animals cannot live without plants.
- Seeds, buds, shoots, leaves, bark, cambium, fruit, pods, roots, tubers, bulbs, gum, nectar, galls – were / are all utilised by hunter-gatherers.
- The vast array of edible and useful plant parts, and the chemical chemotaxonomic resources they offer is far greater than we have yet realised.

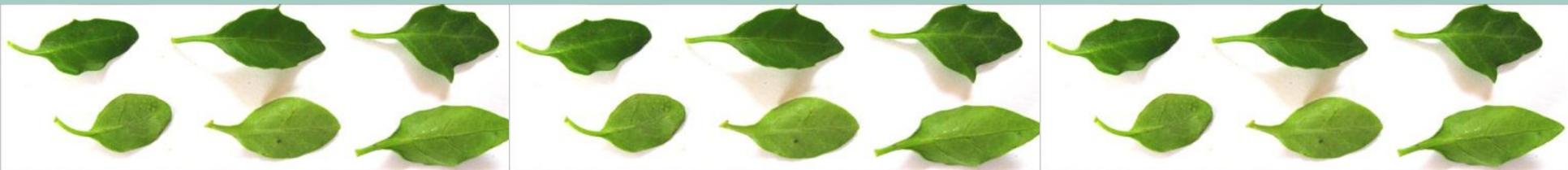
Results to date

- A total of 268 species, in 195 genera and 77 families have been collected.
- 56% spp. recorded as medicinal and 33% for food or fruit.
- Thicket and Fynbos form an intricate mosaic with 79 species falling into both categories

24 collecting areas within 5km	19 Core areas from seashore to cliff top
Thicket (155 spp.) = 32%	Thicket () = %
Forest (100 spp.) = 21%	Forest () = %
Coastal (105 spp) = 21%	Coastal () = %
Fynbos (73 spp) = 15%;	Fynbos () = %
Not categorised (56 spp.) = 11%	Not categorised

Vegetation references: *Cowling 1982; Geldenhuys 1992; Hanekom et al. 1989; Lubke & van Wijk Y, 1998a,b; Vlok & Euston-Brown 2002; Mucina & Rutherford 2012*

Useful spp. references: *Arnold 2002; Fox & Norwood-Young 1982; Hutchings et al. 1996; Pote et al 2006, Smith 1966; van Wijk Y (in prep), van Wijk Y & Rust (in prep); van Wyk B-E & Gericke 2000, van Wyk B-E et al 2009*



Ethnobotanical research



Freddie Williams explaining the use of “Stink Patat” by modern Fingo/Khoe-San at Klasies River.



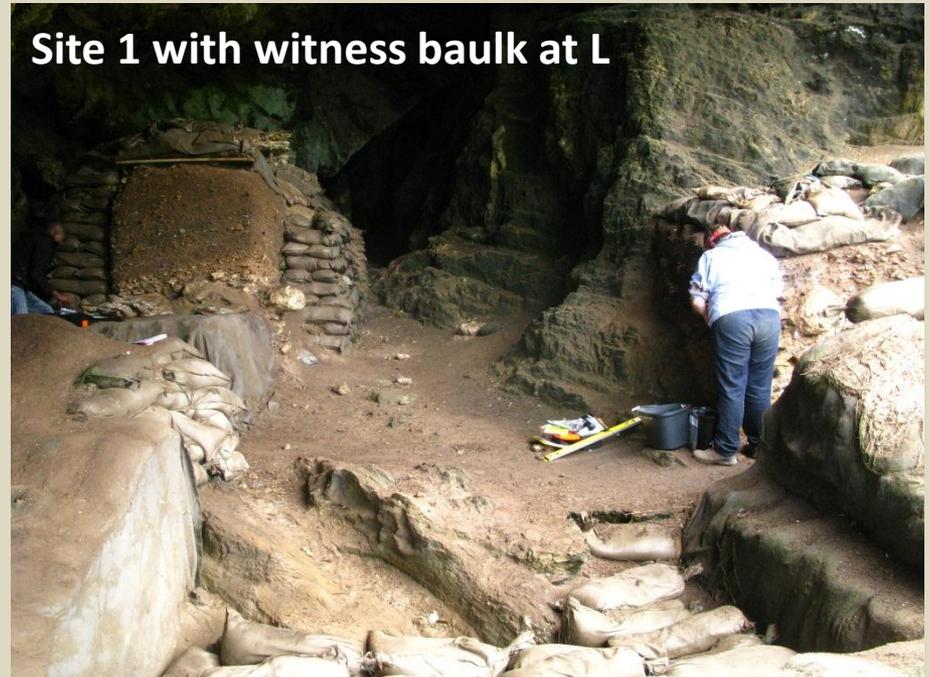
Irene Barnardo of Covie on R. provided valuable information



Yvette has held workshops and walked in the veld with southern Cape indigenous plantekenners for the past 20 years. An interesting overlap exists between plants still used today, those growing near sites, plus macro- and micro remains from excavations.

Research is on-going to record plants used now and in the remembered past by local people in the Klasies River area. A complex history of dispossession, politics and agriculture makes it hard to access information about descendants of pre-colonial inhabitants.

Collecting samples Nov/Dec 2013



Samples from labelled sediment layers were collected to provide the material from which seed, pollen, phytoliths and charcoal samples are being extracted.

Interesting results are emerging.

SEM photos and Gold covered stubs

Tarchonanthus littoralis



Sideroxylon inerme



SEM photos were taken of charred reference material collected by Madelon Tusenius in 1984/5.

MSA charcoal samples were too wet and crumbly for unambiguous identification, but some LSA samples (mounted on stubs) were identifiable and correspond well with the plants growing at the site at present.

Contrary to earlier impressions, adequate fuel-wood is present within foraging range of the sites.



Ongoing Collection and research

- Collection of modern plant specimens at different seasons of the year to provide as fully comprehensive a reference as possible.
- Photographing of plant specimens with details of seeds, fruit underground storage organs etc.

Research in progress

- Ethnobotany – Yvette van Wijk & Renee Rust
- Modern vegetation – Yvette van Wijk
- Cultural beliefs and myths – Renee Rust
- Parenchyma (starch) – Cynthia Larbey
- Charcoal – Madelon Tusenius and Bongekile Zwane
- Palaeobotany and combustion – Silje Bentsen
- Seeds – Chrissie Sievers and Bongekile Zwane
- Phytoliths – Alice Novello
- Stone Age technology - Sarah Wurz



Some Thoughts

- Name changes in Botanical taxonomy render families, genera and species invisible to non-botanical researchers. Need to refer to old publications to access past synonyms and keep up to date with constant new revisions.
- Botanists, Anthropologists, and Archaeologists need to co-operate and co-ordinate research, bringing the disciplines closer and supporting interdisciplinary. Research.
- Need for deconstructing colonial Westernised ways of doing science. Indigenous Knowledge is Indigenous Science. Indigenous taxonomy should be acknowledged as parallel to Linnaean.
- A pressing need for a South African (and African) centralised, open source, fully searchable database of modern vegetation, with accurately identified images and good descriptions. Not only for macro- and micro-botanical identification.
- Need to study Southern African data within a global context – to finally overcome past political isolation and make a bigger impact in global botanical and archaeo-botanical research.

Thanks & Credits

To

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- Sarah Wurz, head of the team, for inviting and welcoming us to work at Klasies.
- The people of Covie, Clarkson, and Humansdorp for enlightening and educational discussions, stories and walks, whilst we learnt about their useful plants.
- IZIKO for access to stored Klasies River botanical material
- Rhodes University for allowing me (Yvette) to undertake an *ad eundem gradum* PhD - which has opened up so many fascinating areas of research and introduced me to so many amazing plants, places and people