



# Ethnobotanical research at Klasies River linking past, present, and future

Yvette van Wijk, Renee Rust, Eldrid M. Uithaler, Sarah Wurz

## Research

### Abstract

**Background:** Klasies River is a prominent archaeological site on the South African southern Cape coast, with a unique and continuous occupation spanning the Middle and Late Pleistocene into the Holocene. Ethnobotanical research was undertaken with the objective of enabling a deeper understanding and contextualisation of the palaeo-ethnobotanical finds retrieved during ongoing excavation.

**Methods:** Research into ethnobotanical usage enables extrapolation of the uses to which archaeobotanicals may have been put. Semi-structured interviews and walks in the veld with six local participants, selected for their knowledge of the local plants, were conducted. An interdisciplinary focus, with a pragmatic and abductive grounded theory approach was used.

**Results:** Of the Klasies taxa reported in use today by participants 84% are confirmed by other published research into Khoi and San indigenous plant knowledge in the three Cape Provinces and 42% of these useful taxa are reported as finds in published archaeological research in the Cape Provinces, indicating ongoing usage from past to present.

**Conclusions:** Our research indicates the need for thorough and systematic collection of ethnobotanical data (particularly from Khoi and San descendants), which is under-studied in the South African context. We consider that environment and behaviour of the past, present and future is not only shaped by climate, but by adaptive human-plant interactions through intergenerational and inter-cultural learning.

**Keywords:** Useful plants; medicinal plants; archaeobotany; Khoi and San; indigenous knowledge;

### Abstrak

**Agtergrond:** "Klasies Rivier main site", 'n beduidende argeologiese terrein geleë op die Suid Afrikaanse suidkaap kus, bewaar unieke bewyse van kontinue bewoning vanaf die Middel tot die Laat Pleistoseen, en ook in die Holoseen. Die doelstelling van hierdie etnobotaniese navorsing is om dieper insig en kontekstualisering te bevorder van die paleo-etnobotaniese vondse van die argeologiese opgrawings.

### Correspondence

Yvette van Wijk<sup>1\*</sup>, Renee Rust<sup>2</sup>, Eldrid M. Uithaler<sup>3</sup>, & Sarah Wurz<sup>2,4</sup>

<sup>1</sup>Anthropology Department, Rhodes University, Grahamstown, South Africa

<sup>2</sup>School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand, South Africa

<sup>3</sup>Executive Manager: Development Facilitation, Buffalo City Metropolitan Development Agency, East London, South Africa

<sup>4</sup>SFF Centre for Early Sapiens Behaviour (SapienCE), AHKR Institute, University of Bergen, Norway

\*Corresponding author: [vanwijkyvette41@gmail.com](mailto:vanwijkyvette41@gmail.com)

**Ethnobotany Research & Applications**  
18:34 (2019)

**Metodes:** Die etnografiese gebruike hier opgeteken kan gebruik word om hipoteses op te stel van argeobotaniese plant gebruike in die Steentydperk. Semi-gestruktureerde onderhoude and staptogte met die ses plaaslike deelnemers, gekies vanweë hulle kennis van die plaaslike plantegroei, is onderneem. 'n Interdissiplinêre fokus, met 'n pragmatiese en abduktiewe teoretiese grondslag is gevolg.

**Resultate:** Van die taxa wat deur die deelnemers geïdentifiseer is 84% plante wat steeds in gebruik is, kom ook voor in gepubliseerde navorsing van Khoi

*en San inheemse plantgebruik en kennis van die Kaap provinsies. Van hierdie gebruikte taxa kom 42% ook voor in gepubliseerde argeologiese navorsing van die provinsies, en dui op kontinuïteit in gebruik van die verlede tot die hede.*

*Gevolgtrekkings: Ons navorsing dui die behoefte vir intensiewe en sistematiese versameling van etnobotaniese data, van Khoi en San afstammeling. Daar is 'n gebrek aan hierdie kennis in die Suid-Afrikaanse konteks. Die omgewing en gedrag van die verlede, hede en toekoms is, en word nie slegs deur klimaat gevorm nie, maar ook deur aanpasbare mens-plant interaksies moontlik gemaak deur die inter-generasie en inter-kulturele oordra van kennis.*

*Sleutelwoorde: Nuttige plante; Medisinale plante; Argeobotaniese; Khoi en San; Tradisionele kennis;*

## Background

Ethnobotanical research was carried out in the vicinity of the Klasies River archaeological sites from 2013 to 2016, forming part of the ongoing archaeological project investigating Klasies River main site led by Sarah Wurz (see Klasies River project on Researchgate, Wurz *et al.* 2018). Klasies River is one of the most significant archaeological sites in relation to modern human origins along the southern Cape coast (Bentsen & Wurz 2019, Deacon 1995, Singer & Wymer 1982, Wurz *et al.* 2018). One of the aims of the Klasies River project is to obtain archaeobotanical data for the LSA (Later Stone Age) and MSA (Middle Stone Age) and to expand the ethnographic and local knowledge on plant use of the area as one way to construct hypotheses for the archaeological evidence. Plant materials in the form of parenchyma have been identified in the layers to ca. 120 000 and 65 000 years ago (Larbey *et al.* 2019), and seeds occur in layers throughout the sequence (Sievers 2016, Zwane 2015). Further archaeobotanical results from Klasies River include the presence of charcoal (Tusenius 1984, Zwane *et al.* 2017).

Ethnobotany and archaeobotany together act as important windows into the past, and aid in recognising the wider environment in which archaeological studies are conducted, linking to the cultural and ecological present, and providing lessons for the future. A detailed vegetation survey of the area within five kilometres of the sites was conducted (van Wijk *et al.* 2017) which has provided comparative material for identification of archaeobotanical specimens excavated, and a phytolith reference collection of modern plants and soils occurring in the area today has been created

(Novello 2018). The systematic documentation of botanical, cultural, and traditional knowledge of plants and their uses, both qualitatively and quantitatively, provides a promising route to a better understanding regarding the utilization and subsistence possibilities of an environment through time (Berkes *et al.* 2000, van Wijk 2019). A strong case can be made for the presence and use of the rich resources around the Klasies River sites in the past (van Wijk *et al.* 2017). Extrapolating from past to present, and vice versa, allows for a wider focus, a deeper understanding, and builds on the research done by Hilary Deacon (1989, 1992, 1993, 2004), suggesting that a long history of ethnographically known plant exploitation is evident at Klasies River since the Late Pleistocene.

Most of the traditional knowledge of the Khoi and San descendants of the region is contained in an oral traditional system. Some consider that much authentic indigenous knowledge might already have been lost (Mukuka 2010, Van Wyk 2012), however, our research indicates that enough has survived to extrapolate to the past (Ouzman 2005, van Wijk 2019). The knowledge is transferred intergenerationally and cross-culturally (Lewis & Laland 2012, Shea 2009, 2012, Whiten & Erdal 2012). The same suite of useful plants (Table 2) are present today at hundreds of sites across the southern and Eastern Cape (van Wijk 2019), and compare closely to the uses and naming by Khoi and San descendants elsewhere in the Cape (De Vynck 2014, De Vynck *et al.* 2016, Hulley & Van Wyk 2018, van Wijk 2019, van Wyk *et al.* 1997; van Wyk & Gericke 2000, van Wyk 2008, van Wyk *et al.* 2008,).

Throughout the world over the last 200 to 300 years, as industrial, urban, and agricultural development took place on an economic and social level, traditional communities have been increasingly marginalized and denied access to traditional collecting grounds and their resources, especially plants, with the resultant threat to local knowledge (de Wet 2006).

*. . . the cultural self-awareness we inherit from our parents and pass on to our children is squarely and solidly built on a Great Forgetting that occurred in our culture worldwide during the formative millennia of our civilization . . . Historians wouldn't touch this . . . because it wasn't history . . . it was just prehistory. A huge, long period of nothing happening. (Quinn 2010)*

This “forgetting” has contributed to today's environmental degradation, and plant-blindness (Balding & Williams 2016, Pany 2014), particularly in

the younger generation. Apparent acculturation has, to an extent, led to the abandonment of traditional ecological knowledge, which is losing its relevance to modern communities living in these areas (Zylstra *et al.* 2014). We attempt to record the extant, sometimes fragmentary, but surprisingly robust, primary plant knowledge and beliefs that have survived this degradation and history of attrition in the Klasies River area (Table 1).

### Aims

The aim of this ethnobotanical research is to document the present use and knowledge of local plants by participants of Khoi and/or San descent who had lived in the vicinity of the sites. Genetic DNA testing further to the west has shown that modern Hessequa or "coloured folk" of the southern Cape in the vicinity of Stilbaai and Riversdale are closely linked genetically to the original San/Bushman and Khoekhoen (De Jongh 2016, Schramm 2016); however, no DNA testing as yet includes the Klasies River area. In the recent past, modern Khoi and San descendants in South Africa have made a determined effort at amalgamation of many groups self-identifying as First Indigenous Peoples. The heterogenous modern communities living around Klasies River who comprise both close and distant descendants of the pre-colonial inhabitants

(Schramm 2016) were therefore included in our research. Many groups and individuals moved into and settled in the area over time (Table 1), including European explorers, traders, and farmers who interacted closely with local indigenous peoples (Table 1). We work from the premise that modern populations moving into and out of the area over time have assimilated, adopted, and adapted local plant knowledge, and have confirmed and cemented local traditional plant knowledge over time -- Sven Ouzman's "embedded knowledge" (2005). This was the motivation for including the data from the Stulting Primary School projects (Table 2).

### Historical background

Published research is lacking on the history of the original San (Bushman) and later Khoekhoen (Khoi) of the Tsitsikamma and Eastern Cape -- the Forgotten People (De Jongh 2016) lost in the Great Forgetting (Quinn 2010). It was not easy to accommodate the tangled colonial history, while acknowledging and demonstrating how it impacts on and relates to the ethnobotanical data we gathered. The turbulent and complex history of the Klasies area had a large bearing on the difficulties experienced in identifying key participants, and in assessing their links with earlier pre-colonial inhabitants.

Table 1. Time-line of complex multicultural interactions in the Klasies River area from 200 000 years before present to 2019.

>200000 120000 ybp	to	Acheulian stone tool scatters in the dunes. Evidence of <i>Homo sapiens</i> from 120,000 years before present (Deacon 1995).
22 000 2000 ybp	to	San / Bushman hunter-gatherers inhabited the area on a permanent or seasonal basis. (Deacon 1995)
<2000 ybp		Khoekhoen herders entered the area with cattle - displaced, killed, and possibly integrated with the San (Sadr 2015, Suzman 2017)
1700's		European adventurers and travellers passed through, and the European farming frontier reached this region in the 1780s (Skead 2009)
1836		Adam Kok camped in a spot subsequently called Koksbosch, 14 km inland from Klasies River (Uithaler W. 1994, Personal information William and Olive Uithaler 2013).
183?		Queen Victoria gave land south of Koksbosch held in trust by the state to (Mfengu) Fingo families, with the right to bequeath their land-use to descendants for help in the Frontier Wars (Melunsky no date).
1838		Thomas Clarkson, friend of William Wilberforce (antislavery campaigner), donated £200 to restore & outfit Koksbosch settlement on condition it be named Clarkson (South African History Online 2011, Uithaler E. 2001).
1839		Five founder families - Wilms (Williams), Jantjies, Potbergh, Louis (Lewis) & Goliad (Goliath) moved from Enon Mission near Port Elizabeth as the first inhabitants of Clarkson (Uithaler W. 1994).

1970's	Apartheid government expropriated communal grazing and farming land at Covie and evicted inhabitants (Delius 2002, Kleinbooi & Lahiff 2007).
1977	The Apartheid government removed the Mfengu and sent them to Keiskammahoek in the Ciskei. 19 European farmers were settled on the land and supported by government subsidies (Jannecke 2005, Melunsky no date).
1983	Mfengu land was transformed from subsistence cultivation to forestry and dairy farming (Jannecke 2005, Melunsky no date).
1995	6000 ha of agricultural land returned to the Tsitsikamma Mfengu community (hailed as a victory, although in fact farmers sold to the state, then rehired their land from the impoverished Mfengu) (Jannecke 2005).
1995	Mfengu with no access to farming land instituted a land claim against Clarkson Moravian Mission for township land-rights (Jannecke 2005, Melunsky no date).
1996	Clarkson and Mfengu residents formed a joint management committee. The Mission village became the rural town of Clarkson (Jannecke 2005, Melunsky no date).
2007	The Covie parcel of land was officially returned to the original community (Staff writer IOL News 2009, Kleinbooi & Lahiff 2007).
2017	Nothing as yet addresses the invisibility and increasing demands of the Khoi and San descendants for First People's rights, which have been ignored due to being earlier than the 1913 Land Act. Mfengu - Fingo land-claims were approved because alienation was post-1913 (de Jongh 2016, Human rights commission 2018, Quinn 2010, 2013).
Present	The formerly resident "coloured" farm workers were gradually moved into Clarkson and so lost contact with their ancestral spaces and plants. Farms and the coast are "toegesluit" (behind locked gates) and off bounds without special permission. There is little possibility today for locals to gather traditional wild plants along the remaining coastal areas (Personal information William and Olive Uithaler 2013).

**Locality, topography, and vegetation:** A number of cave sites have been excavated along the southern and southwestern Cape coasts of South Africa that inform on the development of early modern humans in South Africa. Klasies River main site is a National Heritage site and a prominent and significant Middle Stone Age (MSA) site (Deacon 2001, Deacon & Wurz 2005, Singer & Wymer 1982, Wurz et al. 2018) with evidence for the presence of the earliest cognitively modern humans (*Homo sapiens*) from about 120,000 years before present (ybp). The Klasies River caves are situated on the coast 40 km southwest of Humansdorp, 50 km west of Cape St Francis and 24 km southwest of Clarkson. For primary data collection we considered that Covie, just a few kilometres east of Nature's Valley and 70 km from Plettenberg Bay, formed a logical western boundary both culturally and vegetatively, while Humansdorp was the eastern boundary.

A comprehensive and taxonomically precise botanical database of the current vegetation of the Klasies River landscape was created between 2013 and 2015 (van Wijk *et al.* 2017). Thicket, forest, and grassland dominate at the coast, forming

interdigitated vegetation mosaics with some fynbos patches on the coastal plateau and inland (van Wijk *et al.* 2017). Archaeobotanicals reflect past selection and possible use which to a large extent is evident in the modern vegetation (Table 2). If a particular plant proved good for a certain purpose in the past, it apparently continued being used in that way because it was effective, and these useful plants persist over time (van Wijk 2019). Both the thicket vegetation and the forest have roots deep in the past (Cowling *et al.* 2005, Geldenhuys 1993, Vlok *et al.* 2003). That at least 75% of the plants present today at Klasies River have traditional uses assigned to them today by Khoi and San descendants in the Cape provinces (van Wijk *et al.* 2017) indicates how rich in resources the Klasies environment was and remains today.

## Materials and Methods

Participants were identified through purposive selection (Tongco 2007). A condition for their participation was that they should have empirical and practical knowledge of using plants growing in the vicinity of the Klasies sites. The language spoken during interactions was almost always vernacular

and idiomatic Afrikaans, and only occasionally English. Our ability to understand the local vernacular Afrikaans with its subtleties of dialect and idiom, enabled us to capture nuances that are often lost in translation.

Permission to collect information and plant specimens was given by the farmers owning the land, and by Toetie Douw, who is a representative of the Cape Khoi and San descendants. Initial discussions with the participants in order to convey our aims and ideas and ask for their opinions and suggestions were held. The aims and objectives for the research were fully disclosed and discussed with all participants and permission was granted to use real names and images. This project was partially undertaken under the umbrella of Yvette van Wijk's Doctoral research (2019), where the ethics procedures are further described.

Linda Smith, in her book "Decolonizing Methodologies" (2013), describes the colonizing role of Western research methodologies (as do Hewson *et al.* 2009, Kovach 2010, Todd 2016). Decolonizing advocates for the use of an indigenous focus in research methodology, so that research practices can help to assert the legitimacy of indigenous science and acknowledge indigenous people's rights and sovereignty (Andah 1995, Ouzman 2005, Smith 2013) These are aspects of our research that we discussed with the participants. The disjuncture between the accepted Western academic paradigm and the need to decolonise is very pertinent to South Africa at the moment (Bentsen & Wurz 2019).

The semi-structured, informal and open-ended conversational method we used, combined with walks-in-the-veld allowed for important stories and extraneous information to be offered and shared (Kovach 2010). To avoid using a westernised top-down approach, we did not use structured and formal interviews and a rigid numerical matrix system. Because our research formed part of the larger archaeological project where yearly visits of one to two weeks from 2013 to 2016 were organised, we were able to conduct repeat interviews at different times of the year. During walks-in-the-veld a process of engagement was initiated with each informant as they showed us their familiar plants and described their uses, methods of preparation, and dosage. Stories around the plants as cultural entities were encouraged and noted. Most plant names were Afrikaans, with a few original Khoi and San names, and occasionally English (Table 2). Interviews were sometimes recorded and written notes were always taken. This method is time consuming, but repeat interviews and walks afforded more time for in-depth

general discussion where additional names could be offered and noted, and different uses and preparations described. These interactions allowed for a self-correcting feedback loop, which has the advantage of highlighting and eliminating dubious or incorrect information.

### Identification of Plant Specimens

Yvette van Wijk identified the majority of the ethnobotanical plant specimens, and where necessary specialist help for identification was sought from Richard Cowling of Nelson Mandela University (NMU); The International Plant Names Index (IPNI); and iSpot (now iNaturalist). Classification follows Manning and Goldblatt's "Cape Core Plants" (2012), APGIII & IV, and The Red Data list updates by South African National Biodiversity Institute (SANBI). Recent synonyms appear in brackets, although very recent name changes may not have been incorporated. Most specimens were photographed either in situ, before pressing, or both, and are stored as digital images in the process of being uploaded to iNaturalist. Plant specimens constituting the primary data were collected and pressed according to accepted herbarium practice (Forman & Bridson 1992, Victor *et al.* 2004). A set of voucher specimens and images will be lodged at the Selmar Schonland Herbarium, Grahamstown, with duplicates going to the Ria Olivier Herbarium at Nelson Mandela University (NMU), Port Elizabeth.

Genus was used as the terminal taxon for quantification in Table 2. However, all specimens were identified to species level. Indigenous/traditional taxonomy shows that generic classification is more common than specific allocation (Berlin 2014). It is common to find substitution of morphologically and chemically related species or sister genera, with similar properties (Bonzani 1997, Hather 1992). Chemotaxonomy and phylogenetic research support the scientific validity of the substitution of species (Cogne 2002, Yessoufou *et al.* 2015). Insistence on identification to the species level while ignoring species and genera substitution by traditional/indigenous users in ecological, ethnobotanical, and archaeobotanical research can lead to incorrect identification and failure to highlight similarities in use of important genera across a broader geographical context.

### The Participants

In order to identify participants, we made extensive enquiries from landowners and workers encountered in the Klasies area, and at the Humansdorp Museum, Library, and Clinic. Partly because of time constraints, and the difficulty in arriving at a suitable

sampling strategy for the Klasies River area with its fractured and complex social history of displacement and manipulation, the number of primary informants and participants we interacted with was just six in total. Details of the six participants and their contributions are provided below.

In 2004, Irene Barnardo, a well-respected and knowledgeable herbal “*kruiekenner*” (herb specialist) from Covie shared ethnobotanical information with Yvette. Covie is small rural village on the coast just

east of Nature’s Valley, about 50 km west of Klasies River (Fig 1). Inhabitants were scattered after expropriation by the apartheid government in 1970s. Irene was a leader in the land claims in Covie, and the land was officially returned to the previous inhabitants in 2007 (Kleinbooi & Lahiff 2007). A revisit in 2014 revealed that Irene had died a few months earlier, and it appeared that no one else had the knowledge of useful plants that she had. The knowledge gained from these interviews is incorporated in Table 2.

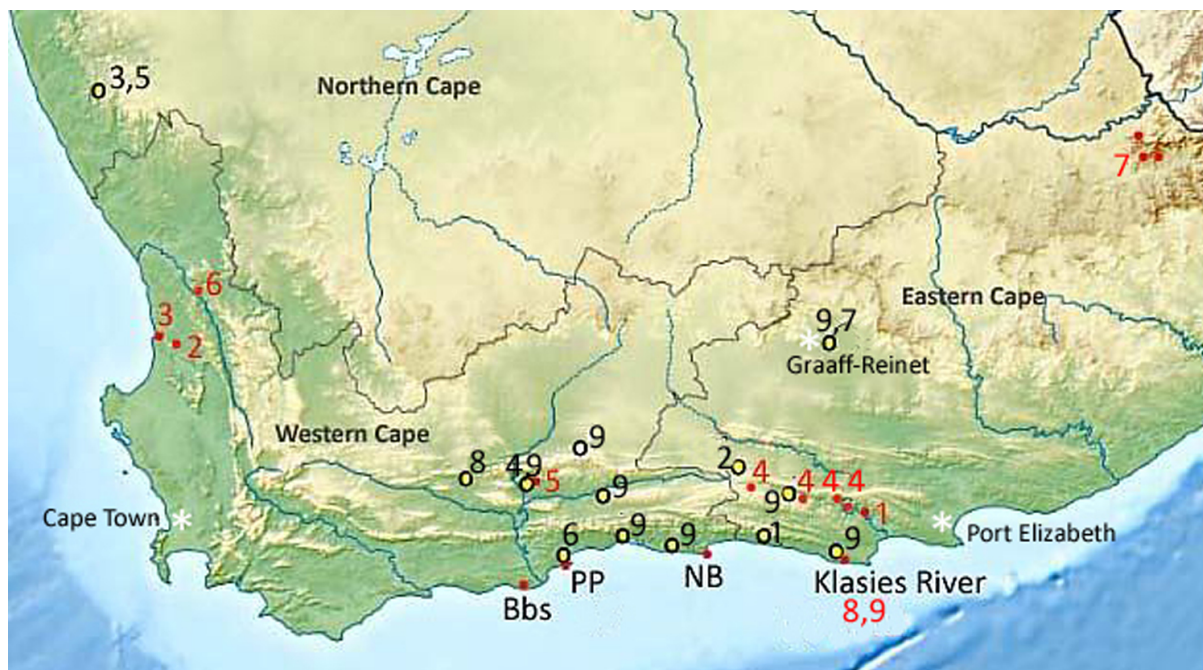


Fig. 1. Geographical locality of Klasies River and other significant coastal archaeological sites situated within the Cape Provinces, South Africa. **Bbs** = Blombos; **PP** = Pinnacle Point; **NB** = Nelson Bay. ● = Ethnobotanical survey areas, numbers in black (references in Column B, Table 2). ● = Archaeological sites reporting archaeobotanicals, numbers in red (references in Column C, Table 2).

In 2014, Yvette and Renee met and interviewed husband and wife, Freddie and Marta Williams, who lived and worked on Geelhoutboom dairy farm in the near vicinity of the Klasies River sites. They claim to be of mixed Khoi, San, and Fingo descent, and are the sixth generation on the farm, were reported to be knowledgeable about local plant usage, and showed us a number of plants they used and knew well. Marta's stories about the ‘water people’ living under the Kamsedrif (a low-level bridge) over the Tsitsikamma River were strikingly similar to stories collected by Renee Rust & Jan van der Poll (2011) from Khoi and San descendants. Marta explained that female half-human/half-fish water spirits act as keepers of water and plant resources and transform at times into water snakes. These beliefs are shared throughout southern Africa (Rust & Van der Poll 2011).

In 2015 we met William Uithaler and his wife Olive, who lived in Clarkson. William had been mentioned frequently as being knowledgeable about Clarkson, had researched and written about the history and culture of the area (Uithaler W. 1994), and was passionate about sharing history and knowledge with younger generations and with us. Olive Uithaler supplied much valuable information about the plants she knows and uses, and introduced us to other “plantekenners,” which was a tremendous help. Olive is a descendant of one of the first families of Clarkson, Lewis (now Louis). Their son, Eldrid, had completed a Master’s thesis on the ethnobotany of the Clarkson area (Uithaler E. 2001) and as a co-author on this paper his data validates and adds valuable information about the plants used in the area (Table 2).

Olive introduced us to Soekie Kees in 2015. Soekie had lived very close to the Klasies River main site as a child. She watched Singer and Wymer excavate the site in the late 1970s (Singer & Wymer 1982), and when the “*twee Duitsers*” played their guitars at night she and her siblings danced to the music, out of sight behind the bushes. Soekie's demonstration of the “Riel dans” left little doubt of her Khoekhoe descent. As a child Soekie played with human bones in the dune/midden in front of the caves, and realised the skulls did not belong to people like herself. One wonders if excavators thought to ask for stories or information from Soekie's family?

Due to heavy rains and cold weather in 2015, and the advanced age of the Uithalers and Soekie Kees, we conducted preliminary semi-structured interviews indoors. We discussed a selection of plants collected while driving along the road into Klasies with Olive and William, while they pointed out those they knew. We also visited their home in Clarkson when Soekie Kees was present and discussed plants picked previously, as well as others that Soekie remembered and described to us that day. To avoid providing subjective information and asking leading questions, names and uses were not proffered by us until participants had given their information. There was no hesitation on their part in providing names and information about plants that they knew, nor in admitting they did not know or use some of the plants we saw or picked.

During a visit to the Humansdorp Museum, the curator, “Oom” Carel Ferreira unearthed some handwritten ethnobotanical projects by children at the Stulting Primary School in Humansdorp (Stulting Primary School 2006). Each page included named and identifiable pressed plant specimens, and it was clear that much of the information had been provided by their family members and farm or house workers. This is an example of indigenous knowledge filtering through heterogenous communities due to propinquity between overlapping cultures. The school projects provided an illuminating glimpse into the ability of traditional knowledge to survive the complexities and vicissitudes of social and cultural upheavals, as well as genetic mixing, which has played out over the nearly 2000 years since the Khoekhoen first arrived in the area (Ouzman 2005).

In 2016, it was with great sadness that we learnt of the death of both William Uithaler and Soekie Kees. We were privileged to hear William's passion for gathering and sharing the history of the area, strengthening pride in local culture and preventing it from being lost. It was particularly sad that Soekie did not get to visit the childhood haunts she remembered

so fondly, to find and show us the plants she still remembered clearly but had not seen for years. We salute her indomitable spirit, deep knowledge, and attachment to the plants she knew and used. We will not forget her spirited “Riel dance” at over 80 years old.

Janee Windvogel accompanied Olive when we at last were able to walk-in-the-veld near the sites in 2016. Janee exhibited a deeply felt topophilia that many have lost due to their removal and exclusion from the areas where they lived for generations. “*My hart is seer dat ek van so 'n mooi plek moes weggaan*” (*my heart is sore to have left such a beautiful place*) was a poignant remark by Janee. In the heart-breaking stories of dispossession it was not really the ownership of land that is the issue, so much as the love of the land, the lifeways, and loss of access to traditional plant resources which came across so clearly. Janee was overjoyed to be back ‘*in die bos*’ (in the bush) and on the beach. Olive and Janee regaled us with stories about ‘*watermeide*’ (mermaids), culminating in a hair-raising drive, with the farmer's permission, to a deep and mysterious pool in the Klasies River where Janee's brother had once nearly been ‘taken’ by the ‘water people’. Myths survive through time and retain importance in the present (Rust 2008). However, this paper presents traditionally useful plants as day-to-day resources, and we cannot explore spiritual or mythical issues fully here; this is the subject of a paper in preparation by Rust and van Wijk.

## Results

In their vegetation survey within 5 km of the sites, van Wijk et al. (2017) found that 57% of the total of 268 species collected near the archaeological sites at Klasies are medicinal plants, indicating the high proportion of medicinal species in that area. The 43% of species that are edible or have other uses is also impressive (Hutchings *et al.* 1996, van Wyk 2000, Zhu 2011). Plants, prey-animals, and in the case of coastal sites like Klasies River, seafood, would have been the main sources of food and utilitarian resources for hunter-gatherer-pastoralists. Unfortunately, seaweeds, grass seed, and insects have not been seriously researched, although it is likely they would have been used. The proportions of each class of food are debatable, and they were most likely seasonal and weather dependent. But it is generally agreed that plant foods (Deacon 1993, Singels 2013) would have made up a substantial proportion of the available edible landscape.



Fig. 2. **A** - Discussions about plants and history. L–R, William Uithaler, Yvette van Wijk, Olive Uithaler, Renee Rust. **B** - Janee Windvogel and Olive Uithaler looking for plants they know and use in the dense vegetation growing in the vicinity of the Klasies River sites. **C** – Tant Soekie showing Yvette some plants. **D** – Freddie Williams demonstrating the use of a *Kedrostis nana* (*bospatat* or bush potato) root. **E** – Renee Rust and William Uithaler in Clarkson. **F** - Janee Windvogel revelling in being in the bush. **G** – Janee walking toward Klasies main sites.

Other ethnobotanical research in the three Cape Provinces was compared with data recorded at Klasies (Table 2) and show that the knowledge of useful plants remains comprehensive among local Khoi and San descendant communities living near the Klasies River sites at present. Correspondence between plants still used by the six local participants and those listed by Neil Edwin Uithaler in his thesis (2004) indicates no loss of knowledge in the 15 years since he carried out his research (Table 2). Incorporating the ethnobotanical data collected by mainly 'white' pupils from Stulting Primary school in 2006 (Table 2) aimed to indicate cross-dissemination of knowledge across historical, political, and social barriers.

Archaeobotanicals listed by archaeologists in the Cape Provinces were also noted (Table 2). Modern ethnobotanical studies with Khoi and San descendants can help archaeologists to identify taxa retrieved from the sediments, and also indicate the probability that these taxa were used in some way in the past by pre-colonial inhabitants of archaeological sites. Dating the finds can show for how long these plants were used or at least how long they have grown in the vicinity of the sites. It is acknowledged that the presence of the plants might only indicate that they grew near the sites or within collecting distance at a particular time; in which case the information remains valuable in determining the vegetation composition and climate occurring at the sites at that time in the past.



Table 2. Species reported as used by communities in the vicinity of the Klasies River area. **Column A, Par** - Participants **IB**, Irene Barnardo; **MW**, Marta Williams; **FW**, Freddie Williams; **OU**, Olive Uithaler; **SK**, Soekee Kees; **JW**, Janee Windvogel; **EU**, Eldrid Uithaler; **SP**, Stulting Primary School; **Column B, Eth** - Selected references from the Cape Provinces on Khoi and San plant usage **1**. Diogo & Dold 2014. **2**. Dold *et al.* 2006. **3**. De Beer & Van Wyk 2011. **4**. De Jager 2009. **5**. Nortje 2011. **6**. De Vynck 2014. De Vynck *et al.* 2016; **7**. Van Wyk *et al.* 2008; **8**. Hulley & Van Wyk 2018; **9**. van Wijk 2019. **Column C, Arc** - Selected archaeobotanical references from the Cape Provinces **1**. Deacon 1972. **2**. Cartwright 2013. **3**. Cowling *et al.* 1999, Parkington *et al.* 2000. **4**. Binneman 1997, 1998, 1999, 2000. **5**. Scholtz 1986. **6**. Parkington & Poggenpoel 1968. **7**. Tusenius 1984. **8**. Tusenius 1989. **9**. Zwane 2015, 2017. Square brackets [ ] indicate the same genus but different species; Synonyms are listed in brackets.

Family / Species (synonyms)	Common Name	Ailment or Use	Method of preparation and dosage	A Par	B Eth	C Arc
<b>Aizoaceae</b> (Mesembryanthemaceae)						
<i>Carpobrotus deliciosus</i> (L.) Bolus	Ghokum, Ghoena,	Thrush (Sproei), Fruit	Squeeze a sip or rub it in mouth and on	OU SP	1,2,3,4,5	4,6
<i>Carpobrotus edulis</i> (L.) N.E.Br.	Hottentotsveye	edible, Sore throat, Bleeding	gums for children and adults. Eat ripe fruit.	SK	,[6],7,8,9	
<b>Amaranthaceae</b> (Chenopodiaceae)						
<i>Exomis microphylla</i> (Thunb.) Aellen	Rambossie, Oorbossie, Hondepisbossie, Slangbos	Fever, Worms, Earache, Sick dogs, Diarrhoea	Boil this with Brandnetel ( <i>Urtica doica</i> ), Bakbossies ( <i>Nidorella ivifolia</i> ) and a little sugar. Crush leaves into a poultice for earache. Cook for dogs to drink.	IB MW JW SP	1,2,6,7, 8	
<b>Anacardiaceae</b>						
<i>Searsia dentata</i> (Thunb.) F.A. Barkley	Bessieboom	Fruit	Children eat berries.	JW	1,2,3, [4],5,6,7, [8],9	2,[3][4] [5][6][7] [8][9]
<i>Searsia glauca</i> (Thunb.) Moffett						
<b>Apiaceae</b>						
<i>Apium decumbens</i> Eckl. & Zeyh. ( <i>Apium graveolens</i> L.)	Wilde Seldery, Wild Celery	Water retention, High blood pressure.	Boil in water and wash legs and feet with it before going to bed, also drink a little. Can be used in food.	IB	3,9	
<i>Arctopus echinatus</i> (L.)	Dawidjiedoring	Jaundice	Boil only the root and drink the liquid cold. Or give to baby in a bottle with "Behoedmiddel" ie. sweet-oil and /or "visolie" (vegetable oil).	JW	4,7,8	
<i>Notobubon ferulaceum</i> (Thunb.) Magee ( <i>Peucedanum ferulaceum</i> (Thunb.) Eckl. & Zeyh.)	Seldery, Wild Celery	Stomachache, Menstrual cramps	Boiled with Bels ( <i>Podalyria spp.</i> ), drink as tea.	EU	6,7,[8],9	4

<b>Apocynaceae</b>						
<i>Carissa bispinosa</i> (L.) Desf. ex Brenan	Noem-noem	Fruit	Eat fruit.	JW	1,6,9	
<i>Cynanchum obtusifolium</i> L.f.	Opklim	Head sores	Wash head with tea for white spots and dry skin on scalp.	JW	[1],[5]6,[8],9	
<b>Asparagaceae</b>						
<i>Asparagus densiflorus</i> (Kunth) Jessop <i>Asparagus aethiopicus</i> L.	Katdoring	Asthma, Liver, Bronchitis, Chronic coughs	Chop leaves and roots and boil, drink fluid as tea. Flowering stems used for decoration (Mooigheid). Boil the root to make tea for abortion in early pregnancy.	SK OU EU	[4][6][7], 8,9	[3][6]
<b>Asphodelaceae</b>						
<i>Aloe ferox</i> Mill.	Aloe, Aalwyn	Burns, Minor wounds, Cleanse blood, Digestion, Stomach	Leaf gel for burns etc. Soak dried leaves in water for at least 3 days, drink juice. Mix sap with mealie meal (corn) or wheat flour, form pills and dry.	EU SP	1,2,3,4,5,6,7,8,9	[4]
<i>Bulbine latifolia</i> (L.f.) Spreng.	Rooiwortel	Kidneys, Back pain	Chop in pieces, mix with gin and water, drink as a tea.	EU	1,2,[4] [5][6]7,8,9	[1]
<b>Asteraceae</b>						
<i>Arctotheca prostrata</i> (Salisb.) Britten	Gousblom Skaapoor	Infections, Sores	Boil and use liquid.	OU	8,9	
<i>Artemisia afra</i> Jacq. ex Willd.	umHlonyana, Wildeals	Eyewash, Wounds, Arthritis, Worms, Fever, Headache, Colds, Cough, Toothache, Appetite loss, Influenza	Put leafy twigs up nostrils. Soak twigs in bath for itch. Smoke leaves for sore throat. Inhale steam from leaves boiled in water. Drink tea with honey to improve appetite. Make cough syrup with honey and sugar. Wet leafy twig with vinegar and castor oil to bind over wounds. Warm leaves on a cloth around stomach. Tea mixed with Oondbossie ( <i>Nidorella ivifolia</i> ) for fever.	MW OU EU SP	2,3,4,67,9	
<i>Chrysocoma ciliata</i> L.	Bitterbossie, Bitter Karoo	Stomachache	Chew leaves and swallow sap to relieve pain.	EU	1,2,3,4,8	

<i>Eriocephalus africanus</i> L. <i>Eriocephalus punctulatus</i> DC.	Rosemary, Roosmaryn	Diarrhoea, Blood loss, Bleeding	Boil and drink tea.	EU	1,2,4, [5][6][7]8 ,9	[3]
<i>Helichrysum cymosum</i> (L.) D. Don	Hotnotskooigoed	Rheumatism, Kidneys, Heart problems	Pour boiling water over and drink tea.	SP	2,4, [6],8,9	[4][6] [8]
<i>Helichrysum petiolare</i> Hilliard & B.L. Burt	Geita, Kye, Langbeenghyta	Woman's ailments, Insecticide, Bedding	Used as bedding for pigs, it is soft and keeps fleas away. Drink tea as medicine.	OU, SK, JW, EU	1,[5], [8],9	[5]
<i>Nidorella ivifolia</i> (L.) JC. Manning & Goldblatt ( <i>Conyza scabrida</i> DC.)	Bakbossies, Klaaslou, Koorsbossie, Oondbossie	Colds, Influenza, Stomach problems, Worms,	Warm tea is good for colds and flu with lemon juice and a disprin when you go to sleep. Next day flu is better. Make tea and add Brandbossie ( <i>Urtica doica</i> ) and some sugar. Mixed with Wildeals ( <i>Artemisia afra</i> ) drink tea. Make tea for worms.	IB MW JW EU	1,2,3,4,5 ,6,7,8,9	
<i>Osteospermum moniliferum</i> L. ( <i>Chrysanthemoides monilifera</i> (L.) Norl.)	Bitou	Fruit edible	Cook for dogs. Baboons and monkeys eat the berries.	JW	6,8,9	3,4,5,9
<i>Stoebe plumosa</i> (L.) Thunb. ( <i>Seriphium plumosum</i> L.)	Vaalbossie, Veebossie	Stitch in the side, Brooms	My secret - if you must run a race, hold a piece in your mouth to prevent a stitch. You can't use it now because of strict rules about using drugs in races! "hulle sal jou squeal" (you will be reported).	SK JW OU	5,9	[5]
<i>Tarchonanthus littoralis</i> P.P.J. Herman ( <i>Tarchonanthus camphoratus</i> L.)	See Salie, Salieboom, Sea Sage	Diabetes	Mix with Kankerbossie from the garden ( <i>Centaurea cineraria</i> ). Put into cold water and heat until bitter and strong. Keep in the fridge and whenever feeling unwell with "hoog suiker" take a kelkie (brandy glass), every second morning.	OU	1,4,5,6,7 ,9	3,5,8,9
<b>Caryophyllaceae</b>						
<i>Prismatocarpus campanuloides</i> (L.) Sond.	Maagpynbossie	Stomach	Drink tea made with "takkies" (twigs).	SK		

<b>Convolvulaceae</b>						
<i>Cuscuta africana</i> Willd.	Opklim	Head sores, Pimples, Boils	Boil with Bloukeur ( <i>Psoralea</i> spp.), wash affected areas with the liquid, allow to dry.	EU		
<b>Crassulaceae</b>						
<i>Cotyledon orbiculata</i> L.	Kouterie, Vetplant	Pain in ear, Garden plant	Cook in olive oil or sweet oil. Use the sap and the oil in sore ears.	SK, JW	2,3,4,5, 6,7,8,9	[4]
<b>Cucurbitaceae</b>						
<i>Kedrostis nana</i> Cogn.	Bitterpatat, Bospatat, Stinkpatat	Stomach problems, Chest, Flatulence	Make tea mixed with Groen Amara ( <i>Artemisia absinthium</i> ), Cut slivers and grind up in water, drink. Soak piece of tuber in cold water for 8 to 10 days, drink this water every day. Cut round slices and dry them, tuber keeps on growing.	IB FW SK	2,3[4]8,9	
<b>Cyperaceae</b>						
<i>Cyperus rotundus</i> L.	Watergras	Heart	The whole plant is boiled with just the worst of the soil shaken off the roots. Hot or cold tea is good for palpitations. One small wine glass (wynkelkjie) a day until heart is better.	IB	[6]	[1][2] [4][6]
<b>Ebenaceae</b>						
<i>Diospyros dichrophylla</i> (Gand.) De Winter ( <i>Royena dichrophylla</i> Gand.)	Snotterbel	Wounds, Fruit edible.	Dig roots and scrape bark to make paste for wounds. Eat the jelly (snot), has nice taste.	IB JW SK	[1] [5],6, [7][8]9	[2][3] [4]5 [7][8]9
<b>Fabaceae</b>						
<i>Lessertia frutescens</i> (L.) Goldblatt & J.C. Manning ( <i>Sutherlandia frutescens</i> (L.) R. Br).	Gansies	Stomachache, Stomach cancer, Diabetes, Fever, Eyes, Cleanse blood, Wounds	Boil with water until bitter. Drink tea. Used for stomachache, Sores in stomach (ulcers), Many believe it helps with cancer, chew the pods. Powdered leaves and roots as a decoction are used to wash eyes. 2 to 4 leaves boiled in a cup of water for tea.	IB OU SP	3,4,5,6,7, 8,9	

<i>Podalyria burchellii</i> DC.	Bels	Stomachache, Menstrual cramps	Boil with Wild Celery ( <i>Notobubon spp.</i> ) and drink the tea.	EU		
<i>Psoralea pinnata</i> (L.)	Bloukeur	Weak and painful legs, Head sores & ulcers	Make a decoction with water, use liquid to bathe legs and wash the head, leave to dry.	EU		
<i>Tephrosia capensis</i> (Jacq.) Pers.	Rankbossie	Womb	Infuse like tea	SK		
<b>Flacourtiaceae</b>						
<i>Trimeria trinervis</i> Harv.	Appelblaar	Uterus problems, Kidneys,	Leaves boiled as a tea, it has a pleasant fresh taste.	SK	EU	SP
<b>Hyacinthaceae</b>						
<i>Albuca bracteata</i> (Thunb.) J.C. Manning & Goldblatt ( <i>Ornithogalum longibracteatum</i> Jacq.)	Jikui	Lice, Scabies	Boil sliced bulb in water then wash or soak affected area.	MW		1,6,9
<b>Lamiaceae</b>						
<i>Leonotis leonurus</i> (L.) R. Br. <i>Leonotis nepetifolia</i> (L.) R. Br	Wildedagga Klipdagga	Stomachache, Chest, Lung problems, High blood pressure, Diabetes	Throw leaves in a pot with water and boil till the liquid is green. Drink the liquid, but not too much.	IB	SP	[1],4,5,6, 7,8,9
<i>Salvia aurea</i> L. ( <i>Salvia africana-lutea</i> L.)	Strandsalie	Arthritis, Diabetes	Mix with Perdepis ( <i>Clausena anisata</i> ) and drink tea.	SK		1,[3],[5]6 ,7,9 3,4,[9]
<b>Malvaceae</b>						
<i>Grewia occidentalis</i> L.	Koekies	Fruit edible	Eat fruits.	JW		2[4]6,8,9 3,4,5,7,9
<b>Menispermaceae</b>						
<i>Cissampelos capensis</i> L.f.	Dawidjieswortel	Flatulence, General illness	Cut pieces of the stem and roots, dry them and store till needed. Use as decoction for wind in babies and adults. Drink when feeling sick. (As 'it werk, dan werk dit!'). "When it works it really works!"	SK		1,2,4,6,7 ,8,9 4
<b>Proteaceae</b>						
<i>Leucadendron salignum</i> R. Br.	Geelbos	Stomach problems, Constipation	Make tea and drink	FW		1 [2][3][6]

<b>Restionaceae</b>						
<i>Restio leptoclados</i> Mast. ( <i>Ischyrolepis leptoclados</i> (Mast.) H.P. Linder)	Besemgoed, Katstert	Brooms, Posies (Ruikers)	Made brooms in old days. For decoration, eg. childrens parties (kinderfees)	OU JW	[1], [6]	[4] [6]
<b>Rosaceae</b>						
<i>Cliffortia odorata</i> L.f.	Wildewingerd	Influenza, Womb	Boil and drink as tea.	EU	7,8	[2],8
<i>Cliffortia ilicifolia</i> L.	Kaggeltee	Kidney infection, Inflammation of bladder	Mixed with Buchu ( <i>Agathosma sp.</i> ), boil and drink as tea.	EU	1,7,9	3
<i>Rubus pinnatus</i> Willd.	Braam	Fruit	Eat fruits.	JW	[2],7,8	
<b>Rubiaceae</b>						
<i>Pentanisia prunelloides</i> (Klotzsch) Walp.	Kakbossie	Fever, Diarrhoea, Vomiting	Leaves put in cloth dampened with vinegar and wrapped around the stomach.	EU		
<b>Rutaceae</b>						
<i>Agathosma apiculata</i> E. Mey. ex Bartl. & H.L.Wendl. <i>Agathosma ovata</i> (Thunb.) Pillans	Steenbokboegoe	Sore legs, Sores, Red rash, Backache, Sore knees, Stomach problems	Put a bunch into vinegar and allow to draw. Use vinegar to wash legs. Can leave in a bottle of vinegar. Infuse with water like a tea and wash sores and rash. Boil with Ment ( <i>Mentha spicata</i> ) in a big pot. Good for everything.	SK SP OU JW	[2][3] [5][6] [7][8]9	[4]
<i>Clausena anisata</i> (Willd.) Hook.f. ex Benth.	Perdepis	Arthritis, diabetes, Colds, Influenza, Fever, Pain	Boil and mix with lemon and ginger, drunk as a tea. Plant near house and use mixed in a glass with lemon juice, for flu. Mix with Strandsalie ( <i>Salvia africana- lutea</i> ) drink as tea. People survived the great flu epidemic by using this.	SK EU SP	1,2,6,9	8
<i>Empleurum unicasulare</i> (L. f.) Skeels	Langblaarboegoe Boegoe, Buchu	Arthritis, Cold, Cough, Sprain Nausea Backache, Stomachache	Put in cold water bring to boil and leave to cool. Mix with vinegar and keep in closed bottle, dampen cloths in this liquid and apply to affected area.	OU EU	4,9	
<i>Zanthoxylum capense</i> (Thunb.) Harv.	Perdepram	Walking sticks	Cut off pramme (thorns) before making walking sticks.	SK	7	[9]

<b>Santalaceae</b>						
<i>Colpoon compressum</i> P.J. Bergius ( <i>Osyris compressa</i> (P.J. Bergius) DC.)	Notchou, Wildeganaat	Fruit edible	Eat the black fruit, the sap stains clothes	WU OU JW	6,9	3,4
<b>Sapotaceae</b>						
<i>Sideroxylon inerme</i> L.	Melkhout	Skin infection	Grate bark on a stone and smear face.	JW	6,9	9
<b>Scrophulariaceae</b>						
<i>Selago corymbosa</i> L.	Rankbossie	Woman's ailments	Boil and drink.	JW	9	
<b>Solanaceae</b>						
<i>Solanum africanum</i> Mill.	Snotblare	Wound, Burns	Crush and put sap on the wound or burn.	JW	6,[7]	
<i>Solanum linnaeanum</i> Hepper & P.- M.L.Jaeger	Gifappel	Tandpyn	Mix cut plant (fruit) in water and steam mouth with blanket over the head. Takes worm out of the tooth.	MW	1,[3][4] [5],7,[8], 9	
<i>Solanum retroflexum</i> Dunal ( <i>Solanum nigrum</i> L.)	Nasgal	Inflammation	Boiled and drunk as tea.	EU	4,5,6,8,9	
<i>Withania somnifera</i> (L.) Dunal	Geneesblaar	Wounds, Cuts	Use leaf as poultice - DO NOT drink at all.	SK	1,2,4,7,8	
<b>Vitaceae</b>						
<i>Rhoicissus digitata</i> (L. f.) Gilg & M. Brandt <i>Rhoicissus tomentosa</i> (Lam.) Wild & R.B. Drumm.	Bobbejaantou, Wildedruwe	Deodorant, Fruit	Grows high in trees and green bark from stems rubbed off to use as deodorant.	OU JW	2,6,9	
<b>Various Tree species</b>						
<i>Various woods</i>	As	Deodorant, Insecticide	Used wood-ash as deodorant as well as insecticide in old days	OU		

Non-Indigenous Plants						
<b>Amaranthaceae</b> (Chenopodiaceae)						
<i>Chenopodium murale</i> L. <i>Chenopodium album</i> L.	Hondepisbossie, Varklossie, Fat Hen	Spinach relish (Morogo), Soothing powder, Blocked nose	Seed used in bredies. Grey granular powder from underside leaf used to soothe sore feet by <i>skaapwagters</i> (herders). Powdered dried leaves used for skin irritations. Mash finely in cup, wet this, two drops in each nostril.	SP	6,[7],9	[1]
<b>Apiaceae</b>						
<i>Foeniculum vulgare</i> Mill.	Anys, Vynil, Vinkel, Fennel	Heart problems, Food, Flatus/severe wind and colic in babies	Make tea and drink when cold and use seed in cooking. Infuse ripe seed for palpitations, drink very cold. Seed is also good in buns and the leaves in green salads. Boiled in water, left to cool; babies bathed in it.	IB EU	4,6,7,8, 9	
<b>Asteraceae</b>						
<i>Artemisia absinthium</i> L.	Groen Amara	Stomach problems	Make tea mixed with Bospatat ( <i>Kedrostis sp</i> ) for stomach ailments.	IB	5,6,8,9	
<i>Anthemis arvensis</i> L.	Kamella	Stomachache, Pain	Boil leaves and drink the fluid.	EU		
<i>Calendula officinalis</i> L.	Gousblom / Marigold	Inflammation of bladder	Boiled and drunk as tea.	EU		
<i>Centaurea cineraria</i> L.	Kankerbossie	Cancer	Tea to drink	OU	[7],8,9	
<i>Chrysanthemum parthenium</i> (L.) Bernh. ( <i>Tanacetum parthenium</i> (L.) Sch.Bip.)	Kamille, Kamella	Woman's ailments, Fever Stomachache,	Drink the tea which is good for stomach ailments, for woman's problems, and for any illness. Can be mixed with other herbs.	IB	8,9	
<b>Boraginaceae</b>						
<i>Symphytum officinale</i> L.	Kamfie tee, (Comfrey)	High Blood pressure, Diabetes	Leaves dried in sun and thrown in water, drunk as a tea.	EU	2,9	
<b>Lamiaceae</b>						
<i>Mentha longifolia</i> (L.) L. <i>Mentha spicata</i> L.	Ment	Backache	Boil with Steenbokboegoe ( <i>Agathosma sp.</i> ).	OU	2,3,4,5,6 ,7,8,9	
<i>Salvia microphylla</i> Kunth	Rooiblommetjie	Colds, Influenza	Boiled and drunk as tea.	EU	9	
<b>Moraceae</b>						



<i>Ficus carica</i> L.	Vye	Warts (Vratte)	Pick (domestic) fig fruit and put white milk into a wart which has been cut to bleed. Throw the fruit away over left shoulder and do not look back!	OU	9	[2]
<b>Solanaceae</b>						
<i>Datura stramonium</i> L.	Olieblaar	Headache, Pain	Heat leaves in the oven and apply to affected area.	EU	4,5,6[7], 8,9	
<b>Urticaceae</b>						
<i>Urtica dioica</i> L. <i>Urtica urens</i> L.	Brandnetel	Worms, Fever	Make tea and add Rambossie ( <i>Exomis microphylla</i> ) and Bakbossies ( <i>Nidorella ivifolia</i> ) with some sugar.	IB	5,6,7,8,9	
					58	29
74 species		194 uses		100	84%	42%

Of the Klasies useful taxa 84% are confirmed by reports from other Khoi and San ethnobotanical research from the Cape Provinces indicating a good correlation with our research. Of the taxa in use today 42% are reported from archaeological excavations in the three Cape Provinces (Table 2), but this percentage is likely to increase as more

results become available in future during archaeobotanical research using the many new technologies and methods available to archaeobotanists. The scarcity of archaeobotanists is a draw-back world-wide, however, and needs to be addressed.

Table 3. A comparison and break-down of the number of indigenous and non-indigenous species reported as useful at Klasies River and the number of uses to which they are put.

	Individual species	Total reports	Number of uses	Medicinal species	Edible species	Household species	Mixed species
Indigenous	61	86	164	51	14	9	16
Non-indig.	13	14	30	13	2	0	2
Total taxa	<b>74</b>	<b>100</b>	<b>194</b>	<b>64</b>	<b>16</b>	<b>9</b>	<b>18</b>

We collected 100 individual reports that included 194 uses for the 74 individual species reported as used today. Medicinal taxa numbered 64 of the 74, accounting for 86.4% of the modern usage. The high percentage of medicinal taxa indicates the high value that these plants still hold for communities who cannot easily access or afford modern medicine, or who prefer to continue using traditional remedies as an expression of their culture. Of the 194 uses, only 18 comprise mixtures of more than one species. The

low 21% of edible taxa that are eaten does not reflect possible pre-colonial usage when edible plants would have played a far larger part before agricultural produce was readily available. Of the 74 taxa, 17.5% are non-indigenous, accounting for 15.4% of the number of uses reported, indicating a healthy and persistent reliance on wild-collected taxa over time, plus the ability to accommodate new knowledge and adapt it to modern needs and loss of freedom to collect from the wild.

Table 4. Klasies River useful taxa reported in Table 2, and listed as useful by more than five of the nine literature sources referenced, which have also been reported as archaeobotanicals in the selected references.

Species	Participant reports	Other research	Recorded uses Klasies	Archaeo remains	Present near Klasies sites
<i>Agathosma spp.</i>	4	7	6	1	yes
<i>Asparagus spp.</i>	3	5	5	2	yes
<i>Carpobrotus spp.</i>	3	9	4	2	yes
<i>Diospyros spp.</i>	3	7	7	7	yes
<i>Grewia occidentalis</i>	1	5	1	5	yes
<i>Helichrysum spp.</i>	5	8	6	4	yes
<i>Searsia (Rhus) spp.</i>	1	9	1	8	yes

These seven popular taxa generally have a high number of recorded uses as well as being present as macro- or micro-botanical plant remains in sediments of archaeological sites (Table 2). Taxa with edible fruits such as *Searsia (Rhus)* and *Grewia* are frequently listed in the literature and are also often reported as archaeobotanicals, but are infrequently reported today as useful plants except as a fond memory from childhood. Their reduction in use can be attributed to the fact that participants belonging to today's consumer society buy food at the local store or supermarket, while wild fruits are only eaten as snacks by rural children where they still provide essential vitamin- and metabolite-rich

resources (Bvenura 2017, Kucich 2016). The relatively high number of woody species found as archaeobotanicals in site excavations might not refer only to edible or medicinal uses, but could indicate usage for fuel, bows, arrows, and household tools and utensils. These same woody species very often form protective green walls (van Wijk 2019) that screen the sites, and would have provided valuable protection for the human inhabitants.

The difficulty in identifying the large amount of unidentified macro- and micro-plant remains retrieved from sites at present should improve as new technologies in archaeobotany become more

mainstream, and the research becomes a recognised and important facet of inter-disciplinary archaeological and botanical research. Links

between present indigenous knowledge and our understanding of past usage would similarly become clearer.

Table 5. Indigenous Taxa reported as useful at Klasies River with five or more literature reports, but with no archaeobotanical reports.

Species	Participant reports	Other research	Recorded uses Klasies	Archaeo remains	Present near Klasies sites
<i>Exomis microphylla</i>	5	6	6	-	yes
<i>Lessertia frutescens</i> (spp.)	3	7	7	-	No (over-collected)
<i>Nidorella ivifolia</i>	4	9	4	-	No
<i>Solanum</i> spp.	3	8	4	-	yes
<i>Withania somnifera</i>	1	5	2	-	yes

## Discussion and Conclusions

In order to identify macro- and micro-botanical plant remains retrieved from sediments of archaeological sites, it is essential to be able to access reliably identified comparative, physical, and photographic specimens of modern vegetation, including seed and pollen-bearing samples (van Wyk *et al.* 2017). We discuss uses for plants of the Klasies River landscape that were identified by six local informants, knowledge that is likely to disappear in the future. We also show the relationship between present ethnobotany in the Klasies area and other ethnobotanical research in the Cape provinces and we refer to the archaeobotanicals retrieved from sites. Ethnobotanical studies such as this, can and will enable a deeper understanding and contextualisation for future palaeoethnobotanical finds. Research into ethnobotanical usage for an area is essential to enable extrapolation of the uses to which archaeobotanicals may have been put.

Past plant usage and survival during environmental and vegetation changes can provide valuable lessons for our survival during climate change in the future. There is a need for cooperative and interdisciplinary projects to attract and encourage botanists, anthropologists, archaeologists, and citizen scientists to cooperate. Cooperation would result in additional data and information in order to make the results accessible and useful to those who today claim descendant status. It would also be valuable to broaden the conventional repertoire of plant usage to include other factors such as the likely use of seaweeds, and importance to health and cognitive functions of salt acquisition from halophytic plants and the coastal environment.

More research into the ethnobotany of local populations such as the Khoi and San descendants throughout southern Africa is long overdue and it is to be hoped that Khoi and San descendants will follow the example of William Uithaler and his son Eldrid. A group calling themselves "The Gamtkwa Khoisan Council," headed by traditional leader Chief Ronald Booyens who lives in Hankey, 35 km to the northeast of Humansdorp, claim descent from the earliest Khoi and San inhabitants of the Kouga area, and this group is attempting to reclaim land near the Klasies River sites. The leadership and narrative of this group is, however, contested and they were not willing to meet with us, but mentioned ethnobotanical surveys carried out on their behalf, which are referenced within Table 1, Column B (Cocks *et al.* 2006; Diogo & Dold 2014).

The results of our research into plant usage by local Klasies River participants (Table 2. Column A) are compared with ethnobotanical results reported by other researchers on plants used by Khoi and San descendants (Table 2. Column B), and with macro- and micro-botanical plant remains retrieved from archaeological sites (Table 2. Column C). All results refer only to research in the three Cape Provinces. The aim of employing this triangulated approach is to allow for (a) the validation of plant knowledge held by the local participants and (b) extrapolation from present to past as to the possible usage of the archaeobotanicals retrieved.

We admire and salute the ability of indigenous or traditional and *in-situ* community knowledge to survive and adapt without losing its validity and usefulness. Tracing ancestry through history is full of pitfalls but does not mean that the knowledge held by modern descendants is less valuable. Today's

Khoi and San do not need to wear skins and carry bows and digging sticks to identify and be recognised as Khoi and San descendants; it is in the genes and in the knowledge held, not in modern clothes and lifeways, that authenticity and belonging resides (Schramm 2016). We hope that this, and other similar research (such as De Wet 2006), will lead to the restoration of pride in inherited knowledge, cultural roots, and a sense of place amongst the youth in severely traumatized urban 'coloured' communities, who now represent the majority of the modern Khoi and San descendants of the Cape and southern Africa.

## Declarations

### List of abbreviations:

APG - Angiosperm Phylogeny Website  
 DNA - Deoxyribonucleic Acid  
 IPNI – The International Plant Names Index  
 NMU - Nelson Mandela University  
 SANBI - South African National Biodiversity Institute

**Ethics approved and consent to participate:** Prior informed consent was received from the participants for this research.

**Consent for publication:** Consent was obtained from all participants to publish data, information, stories, and personal names. Permission was also granted to use individual details and images.

**Availability of data and materials:** Voucher specimens of plants to be lodged in the Selmar Schonland Herbarium in Grahamstown, South Africa. Detailed data is available as a supplementary table to this paper.

**Authors' contributions:** YvW and RR carried out fieldwork and interviews, YvW identified and processed the plant specimens, carried out the data analysis, and drafted the manuscript. SW designed and led the overall Klasies River research project, and organised accommodation, food, and workspace on site. EU made his MSc thesis available for incorporation. All authors read, reviewed, improved, and approved the final version of the manuscript.

**Conflicts of interest:** None.

**Funding:** Sarah Wurz' research was supported by a National Research Foundation of South Africa, grant no 98826; any opinion, finding, conclusion or recommendation expressed in this article is that of

the authors and the NRF does not accept any liability in this regard.

### Acknowledgements

Irene Bernardo from Covie, William Uithaler, Olive Uithaler, Soekie Kees and Janee Windvogel of Clarkson, Freddie and Marta Williams (previously) of Geelhoutboom Farm all shared their knowledge so generously and consented to publication and the use of their names.

We thank Oom Carel Ferreira from the Humansdorp Museum (retired); Richard Cowling of Nelson Mandela University (NMU) for help with identification of plants; and Liz Abbott, and the reviewer of this manuscript, for proof-reading and corrections; The Struwig Germeshuysen Trust, owners of the land on which the Klasies sites graciously granted us permission to collect botanical specimens and carry out the research.

Finally we thank Sarah Wurz and the whole Klasies team who have made this research such fun and an enlightening exercise.

## Literature cited

- Andah BW. 1995. Studying African societies in cultural context. In *Making alternative histories: The practice of archaeology and history in non-western settings*, Schmidt PR, Patterson TX Eds. 149-181. ISBN 0933452926, 0933452934
- Angiosperm Phylogeny Website, APGIII & IV, 2007, Version 14, July 2017 [and more or less continuously updated since].  
<http://www.mobot.org/MOBOT/research/APweb/>  
 Last accessed on 15<sup>th</sup> June 2019
- Balding M, Williams KJ. 2016. Plant blindness and the implications for plant conservation. *Conservation Biology*,30(6):1192-1199.  
<https://www.jstor.org/stable/4450624>
- Bentsen SE, Wurz S. 2019. Color me heated? A comparison of potential methods to quantify color change in thermally altered rocks. *Journal of Field Archaeology* 44(4):1-19. doi: 10.1080/00934690.2019.1591092
- Berkes F, Colding J, Folke C. 2000. Rediscovery of traditional ecological knowledge as adaptive management. *Ecological Applications*,10(5):251-1262. <https://www.jstor.org/stable/2641280>
- Berlin B. 2014. *Ethnobiological classification: Principles of categorization of plants and animals in traditional societies* (Vol. 185), Princeton University Press, Princeton New Jersey. ISBN 1400862590, 9781400862597
- Binneman JNF. 1997. Results from a test excavation at the Havens Cave, Cambria Valley, South-eastern Cape. *Southern African Field Archaeology*,6(2):93-105.

- Binneman JNF. 1998. Results from a test excavation at Kleinpoort Shelter in the Baviaanskloof, Eastern Cape Province. *Southern African Field Archaeology* 7(1):90-97.
- Binneman JNF. 1999. Results from a test excavation at Groot Kommandokloof shelter in the Baviaanskloof/Kouga region, Eastern Cape Province. *Southern African Field Archaeology* 8(1):100-107.
- Binneman JNF. 2000. Results from two test excavations in the Baviaanskloof Mountains, Eastern Cape Province. *Southern African Field Archaeology* 9(1):81-92.
- Bonzani RM. 1997. Plant diversity in the archaeological record: A means toward defining hunter-gatherer mobility strategies. *Journal of Archaeological Science* 24(12):1129-1139. doi:10.1006/jasc.1997.0192
- Bvenura C, Sivakumar D. 2017. The role of wild fruits and vegetables in delivering a balanced and healthy diet. *Food Research International*,99(1):5-30. doi: 10.1016/j.foodres.2017.06.046
- Cartwright CR. 2013. Identifying the woody resources of Diepkloof Rock Shelter (South Africa) using scanning electron microscopy of the MSA wood charcoal assemblages. *Journal of Archaeological Science* 40(9):3463-3474. doi: 10.1016/j.jas.2012.12.031
- Cocks M, Dold T, Diko MM, Plaatjies MB. 2006, unpubl. res. Wild resources and their value at Coleskeplaas, Baviaanskloof. For: Baviaanskloof Mega-Reserve Project Management Unit (PMU).
- Cogne AL. 2002. Phytochemical investigation of plants used in African traditional medicine. Doctoral dissertation, Université de Lausanne, Faculté des sciences.
- Cowling RM, Cartwright CR, Parkington JE, Allsopp JC. 1999. Fossil wood charcoal assemblages from Elands Bay Cave, South Africa: Implications for Late Quaternary vegetation and climates in the winter-rainfall fynbos biome. *Journal of Biogeography* 26(2):367-378. doi: 10.1046/j.1365-2699.1999.00275.x
- Cowling RM, Procheş Ş, Vlok JH. 2005. On the origin of southern African subtropical thicket vegetation. *South African Journal of Botany* 71(1):1-23. doi:10.1016/S0254-6299(15)30144-7
- De Ber JJ, Van Wyk B-E. 2011. An ethnobotanical survey of the Agter-Hantam, Northern Cape province, South Africa. *South African Journal of Botany* 77(3):741-754. doi: 10.1016/j.sajb.2011.03.013
- De Jager S. 2009. Veld medicine from the Klein Karoo. Self published.
- De Jongh M. 2016. *Forgotten first people: The southern Cape Hessequa*. The Watermark Press, Plettenberg Bay, South Africa. ISBN 9780620693196. <https://searchworks.stanford.edu/view/11760743>
- De Wet PF. 2006. Make our children proud of the heritage. A case study of the Commission for the Promotion and Protection of the Rights of Cultural, Religious and Linguistic communities in SA with specific reference to the emerging Khoe and San indigenous peoples in the Republic of South Africa. Master's thesis, Indigenous Studies Faculty of Social Sciences, Universitetet i Tromsø, Denmark.
- De Vynck JC. 2014. Contemporary use and seasonal abundance of indigenous edible plants (with an emphasis on geophytes) available to human foragers on the Cape south coast, South Africa. Masters thesis, Nelson Mandela University, Port Elizabeth, South Africa. <http://hdl.handle.net/20.500.11892/161334>
- De Vynck JC, Van Wyk B-E, Cowling RM. 2016. Indigenous edible plant use by contemporary Khoe-San descendants of South Africa's Cape South Coast. *South African Journal of Botany* 102:60-69. doi: 10.1016/j.sajb.2015.09.002
- Deacon HJ. 1972. A review of the post-Pleistocene in South Africa. *Goodwin Series* 1:26-45. DOI: 10.2307/3858091, <https://www.jstor.org/stable/3858091>
- Deacon HJ. 1989. Late Pleistocene paleoecology and archaeology in the southern Cape. In *The Human Revolution: Behavioral and Biological Perspectives on the Origins of Modern Humans*. Edited by P. Mellars and C. B. Stringer. 547-564. Edinburgh University Press, UK. ISBN 0852246463, 9780852246467
- Deacon HJ. 1993. Planting an idea: An archaeology of Stone Age gatherers in South Africa. *The South African Archaeological Bulletin* 48(158):86-93. doi:10.2307/3888947
- Deacon HJ. 1995. Two late Pleistocene-Holocene archaeological depositories from the southern Cape, South Africa. *The South African Archaeological Bulletin* 50(162):121-131. <https://www.jstor.org/stable/3889061>
- Deacon HJ. 2001. Guide to Klasies River. <http://academic.sun.ac.za/archaeology/krguide2001.pdf>. Accessed on 11th May 2019
- Deacon HJ. 2004. Talking to the rocks. Before Farming 1(5):1-4. doi:10.3828/bfarm.2004.1.5
- Deacon HJ., and S. Wurz, 2005. A late Pleistocene archive of life at the coast, Klasies River. In *African Archaeology: A Critical Introduction*. Stahl AB Ed.

- Blackwell Publishing, Oxford, 130-149. ISBN-13: 978-1405101561
- Delius P., 2002. Caught in a Crossfire: A History of Covie, 1883–2002, *South African Historical Journal*, 47:1, 132-161, doi:10.1080/02582470208671438
- Diogo S, Dold T. 2014. Unpubl. Res. Medicinal and useful plants of Kouga region. Report for the Gamtkwa Indigenous Knowledge Project.
- February E. 1992. Archaeological charcoals as indicators of vegetation change and human fuel choice in the late Holocene Elands Bay, western Cape Province, South Africa. *Journal of Archaeological Science* 19(3):347-354. doi: 10.1016/0305-4403(92)90021-T
- Forman L, Bridson D. 1992. The herbarium handbook. Royal Botanic Gardens: Kew. ISBN 0 947643 45 1
- Geldenhuys CJ. 1993. Floristic Composition of the Southern Cape Forests with an Annotated Checklist. Division of Forest Science and Technology, CSIR, Pretoria. <http://hdl.handle.net/10204/2044>, accessed 16th June 2019
- Hather JG. 1992. The archaeobotany of subsistence in the Pacific. *World Archaeology* 24(1):70-81. doi:10.1080/00438243.1992.9980194
- Hewson MG, Javu MT, Holtman LB. 2009. The indigenous knowledge of African traditional health practitioners and the South African science curriculum. *African Journal of Research in Mathematics, Science and Technology Education*, 13(1):5-18. doi: 10.1080/10288457.2009.10740647
- Hulley IM, Van Wyk B-E. 2018. Quantitative medicinal ethnobotany of Kannaland (western Little Karoo, South Africa): Non-homogeneity amongst villages. *South African Journal of Botany* 122:225-265. doi: 10.1016/j.sajb.2018.03.014
- Human Rights Commission 2018. Report National Hearing Relating to the Human Rights Situation of the Khoi-San in South Africa. <https://www.sahrc.org.za/home/21/files/National%20Hearing> accessed 16<sup>th</sup> June 2019
- Hutchings A, Lewis G, Scott AH, Cunningham A. 1996. *Zulu Medicinal Plants: An Inventory*. University of Natal Press, Pietermaritzburg. ISBN 0-86980-893-1.
- iNaturalist. <https://www.inaturalist.org/> accessed 16<sup>th</sup> June 2019
- International Plant Names Index (IPNI). <http://www.ipni.org/index.html> accessed 16th June 2019
- Jannecke C. 2005. Communal identity and historical claims to land in South Africa: the cases of the Clarkson Moravian Mission and the Tsitsikamma Mfengu. Doctoral dissertation, University of Cape Town, Political Studies, South Africa.
- Kleinbooi K, Lahiff E. 2007. Covie community land claim. Programme for Land and Agrarian Studies, Research Report 35, University of the Western Cape, Cape Town, South Africa. <https://www.plaas.org.za/plaas-publication/rr-35> accessed 2019/04/26
- Kovach M. 2010. Conversational method in Indigenous research. *First Peoples Child & Family Review* 14(1):123-136. ISSN:1708-489X
- Kucich DA, Wicht MM. 2016. South African indigenous fruits – Underutilized resource for boosting daily antioxidant intake among local indigent populations? *South African Journal of Clinical Nutrition* 29(4):150-156. doi: 1080/16070658.2016.1219470
- Larbey CS, Mentzer S, Ligouis B, Wurz S, Jones M. 2019. Cooked starchy food in hearths ca. 120 kya and 65 kya (MIS 5e and MIS 4) from Klasies River Cave, South Africa. *Journal of Human Evolution* 131:210-227 <https://doi.org/10.17863/CAM.35919>; doi: 10.1016/j.jhevol.2019.03.015
- Lewis HM, Laland KN. 2012. Transmission fidelity is the key to the build-up of cumulative culture. *Philosophical Transactions of the Royal Society B: Biological Sciences* 367(1599):2171-2180. doi:10.1098/rstb.2012.0119
- Manning J, Goldblatt P. 2012. Plants of the greater cape floristic region. 1: The Core Cape flora. South African National Biodiversity Institute (SANBI), Pretoria. ISBN 1919976744, 9781919976747
- Melunsky P. Undated. Fingo tribe who lived on land allocated to the tribe by Queen Victoria, Digital Innovation South Africa (DISA). <https://www.sahistory.org.za/archive/fin-go-tribe-who-lived-on-land-allocated-to-the-tribe-by-queen-victoria> Accessed 25<sup>th</sup> October 2019
- Mukuka G. ed. 2010. *Reap what you have not sown: Indigenous knowledge systems and intellectual property laws in South Africa*. Pretoria University Law Press (PULP), Pretoria. ISBN 0986985740, 9780986985744; <http://www.pulp.up.ac.za/component/edocman/reap-what-you-have-not-sown> Accessed 25<sup>th</sup> October 2019
- Nortje JM. 2011. Medicinal ethnobotany of the Kamiesberg, Namaqualand, Northern Cape Province, South Africa. Doctoral dissertation, University of Johannesburg, South Africa.
- Novello A, Bamford MK, van Wijk Y, Wurz S, 2018. Phytoliths in modern plants and soils from Klasies River, cape region (South Africa). *Quaternary*

- International 464:440-459. doi: 10.1016/j.quaint.2017.10.009
- Ouzman S. 2005. Silencing and sharing southern African indigenous and embedded knowledge. Smith C, Wobst HM Eds. *Indigenous archaeologies: decolonising theory and practice*: 208-225. *One World Archaeology* 47. London: Routledge. ISBN 0-203-0089-4 e-book
- Pany P. 2014. Students' interest in useful plants: A potential key to counteract plant blindness. *Plant Science Bulletin* 60(1):18-27. doi:10.3732/psb.1300006
- Parkington J, Poggenpoel C. 1971. Excavations at de Hangen, 1968. *The South African Archaeological Bulletin*, 26(101/102), 3-36. <https://www.jstor.org/stable/3888526>
- Parkington J, Cartwright C, Cowling RM, Baxter A. 2000. Africa: Wood charcoal and pollen TS evidence from Elands Bay Cave. *South African Journal of Science* 96:543. doi: 10.1046/j.1365-2699.1999.00275.x
- Quinn D. 2010. *The story of B (Vol. 2)*. Random House, New York, ISBN 0307575233, 9780307575234
- Raimondo D. *Threatened Species Programme, South African National Biodiversity Institute (SANBI), (incorporating iSpot)*. <http://redlist.sanbi.org/> Accessed 25<sup>th</sup> October 2019
- Rust C. 2008. *Meta-tourism, sense of place and the rock art of the Little Karoo*. Doctoral dissertation. Stellenbosch University, Department of Archaeology, Stellenbosch, South Africa. <http://scholar.sun.ac.za/handle/10019.1/1187>
- Rust R, Van der Poll J. 2011. *Water, stone and legend: Rock art of the Klein Karoo*. Penguin Random House, Cape Town, South Africa. ISBN 1920545263, 9781920545260
- Sadr K. 2015. Livestock first reached southern Africa in two separate events. *PlosOne*, 10(8), e0134215. doi: 10.1371/journal.pone.0134215
- Singer R, Wymer J. 1982. *The Middle Stone Age at Klasies River Mouth in South Africa*. University of Chicago Press, Chicago. ISBN-10: 0226761118
- Scholtz, A. 1986. *Palynological and palaeobotanical studies in the southern Cape*. Doctoral dissertation. Faculty of Arts and Social Sciences, University of Stellenbosch, South Africa. <http://hdl.handle.net/10019.1/3071>
- Schramm K. 2016. *Casts, bones and DNA: Interrogating the relationship between science and postcolonial indigeneity in contemporary South Africa*, *Anthropology Southern Africa*, 39(2), 131-144, doi: 10.1080/23323256.2016.1168267
- Shea N. 2009. Imitation as an inheritance system. *Philosophical Transactions of the Royal Society B: Biological Sciences* 364(1528):2429-2443. doi: 10.1098/rstb.2009.0061
- Shea N. 2012. New thinking, innateness and inherited representation. *Philosophical Transactions of the Royal Society B: Biological Sciences* 367(1599):2234-2244. doi: 10.1098/rstb.2012.0125
- Sievers C, Zwane B, Tusenius M, Wurz S. 2016. Fire-starter or Food? Fruits of *Morella* in the Middle Stone Age at Klasies River. Paper presented at the 23<sup>rd</sup> Society of Africanist Archaeologists Conference. Toulouse, France.
- Singels E. 2013. *Underground storage organs of plants as a food source for Pleistocene hunter-gatherers in the Southern Cape*. Doctoral thesis, Stellenbosch University, Conservation Ecology and Entomology, South Africa. doi: 10019.1/95475
- Skead CJ. 2009. *Historical plant incidence in southern Africa: A collection of early travel records in southern Africa*. South African National Biodiversity Institute, Pretoria. ISBN 978-1-919976-53-2
- Smith LT. 2013. *Decolonizing methodologies: Research and indigenous peoples*. Zed Books, London. ISBN 1848139535, 9781848139534
- Stulung Primary, Humansdorp. 2006. Unpub. res. *Natural History projects by pupils*. Housed in Humansdorp Museum, Eastern Cape, South Africa.
- Suzman J. 2017. *Affluence Without Abundance: The Disappearing World of the Bushmen*. Bloomsbury Publishing, City. ISBN 9781632865748
- Staff Writer. 2009. *Covie land returned to families*. IOL News, Politics. <https://www.iol.co.za/news/politics/covie-land-returned-to-families-439889>. Accessed 25<sup>th</sup> October 2019
- Todd Z. 2015. *Decolonizing nature, the academy, and Europe: An interview conducted by Aaron Vansintjan*. <http://unevenearth.org/2015/09/decolonizing-nature-the-academy-and-europe/>
- Tongco MDC. 2007. Purposive sampling as a tool for informant selection. *Ethnobotany Research and Applications* 5:147-158.
- Tusenius ML. 1984. *Charcoal studies at Klasies River*. Unpub. res, housed in IZIKO Museum, Cape Town, South Africa.
- Tusenius ML. 1989. *Charcoal analytical studies in the north-eastern Cape, South Africa*. Goodwin Series 6:77-83. doi: 10.2307/3858135
- Uithaler WC. 1994. *Clarkson: Honderd en vyftig jaar op pad*, University of Port Elizabeth, Suid Afrika,

- Department Antropologie. ISBN. 0869885685, 9780869885680
- Uithaler EM. 2001. Community knowledge cohesion and environmental sustainability: An educational case study in Clarkson. Masters Thesis. Rhodes University, Department of Education, Grahamstown, South Africa. doi: 10962/d1003334
- van Wij Y, Tusenius ML, Rust R, Cowling RM, Wurz S. 2017. Modern vegetation at the Klasies River archaeological sites, Tsitsikamma coast, south-eastern Cape, South Africa: A reference collection. *Plant Ecology and Evolution* 150(1):13-34. doi: 10.5091/plecevo.2017.1286
- van Wijk Y. 2019. Plants, People, and Place: Complex, Mutualistic, and Co-evolving Global Patterns Through Time. Doctoral thesis, Rhodes University, Departments of Botany and Anthropology, Grahamstown, South Africa. <http://hdl.handle.net/10962/76575>
- van Wyk B-E. 2008. A review of Khoi-San and Cape Dutch medical ethnobotany. *Journal of Ethnopharmacology* 119(3):331-341. doi: 10.1016/j.jep.2008.07.021
- van Wyk B-E, van Oudtshoorn B, Gericke N. 1997. Medicinal plants of South Africa 184). Pretoria: Briza publications, South Africa. ISBN 187509309
- van Wyk B-E, Gericke N. 2000. People's plants: A guide to useful plants of Southern Africa. Briza Publications, Pretoria, South Africa. ISBN-10: 1875093192, ISBN-13: 978-1875093199
- Van Wyk B-E, de Wet H, Van Heerden FR. 2008. An ethnobotanical survey of medicinal plants in the southeastern Karoo, South Africa. *South African Journal of Botany* 74(4):696-704. doi: 10.1016/j.sajb.2008.05.001
- Van Wyk B-E, De Beer JJ. 2012. Sosiaalaanspreeklike etnobotaniese opnames in die Kaapse flora: Etiese beginsels, metodologie en kwantifisering van data, Suid-Afrikaanse Tydskrif vir Natuurwetenskap en Tegnologie 31(1) Art. #369. doi: 10.4102/satnt.v31i1.369
- Victor JE, Koekemoer M, Fish L, Smithies SJ, Mössmer M. 2004. Herbarium essentials: The southern African herbarium user manual. Southern African Botanical Diversity Network Report No. 25. The Southern African Botanical Diversity Network (SABONET). Pretoria. ISBN 1-919976-01-9
- Vlok JHJ, Euston-Brown DIW, Cowling RM, Hoffman MT. 2003. Acocks' Valley Bushveld 50 years on: New perspectives on the delimitation, characterisation and origin of subtropical thicket vegetation. *South African Journal of Botany* 69(1):27-51. doi: 10.1016/S0254-6299(15)30358-6
- Whiten A, Erdal D. 2012. The human socio-cognitive niche and its evolutionary origins. *Philosophical Transactions of the Royal Society B: Biological Sciences* 367(1599):2119-2129. doi: 10.1098/rstb.2012.0114
- Wurz S. 2008. Modern behaviour at Klasies river. *Goodwin Series* 10:50-156. <https://www.jstor.org/stable/40650026>
- Wurz S, Bentsen SE, Reynard J, Van Pletzen-Vos L, Brenner M, Mentzer S, Pickering R, Green H. 2018. Connections, culture and environments around 100 000 years ago at Klasies River main site. *Quaternary international*, 495, 102-115. doi: 10.1016/j.quaint.2018.03.039
- Yessoufou K, Daru BH, Muasya AM. 2015. Phylogenetic exploration of commonly used medicinal plants in South Africa. *Molecular Ecology rResources* 15(2):405-413. doi:10.1111/1755-0998.12310
- Zhu F, Qin C, Tao L, Liu X, Shi Z, Ma X, Jia J, Tan Y, Cui C, Lin J, Tan C. 2011. Clustered patterns of species origins of nature-derived drugs and clues for future bioprospecting. *Proceedings of the National Academy of Sciences* 108(31):2943-12948. doi:10.1073/pnas.1107336108
- Zwane B. 2015. Unpubl. res. Gathering an idea: a closer look at the seed remains from the Middle Stone Age layers at Klasies River mouth cave 1a. BSc Hon. Wits University, School of Geography, Archaeology and Environmental Studies, Johannesburg, South Africa.
- Zwane B, Bamford M, Sievers C, Wurz. 2017. Preliminary results for the analysis of charcoal from the Later Stone Age at Klasies River. *Palaeontologica Africana* 52:44-45. ISSN 2410-4418.
- Zylstra MJ, Knight AT, Esler KJ, Le Grange L. 2014. Connectedness as a core conservation concern: An interdisciplinary review of theory and a call for practice. *Springer Science Reviews* 2(1-2):19-143. doi: 10.1007/s40362-014-0021-3