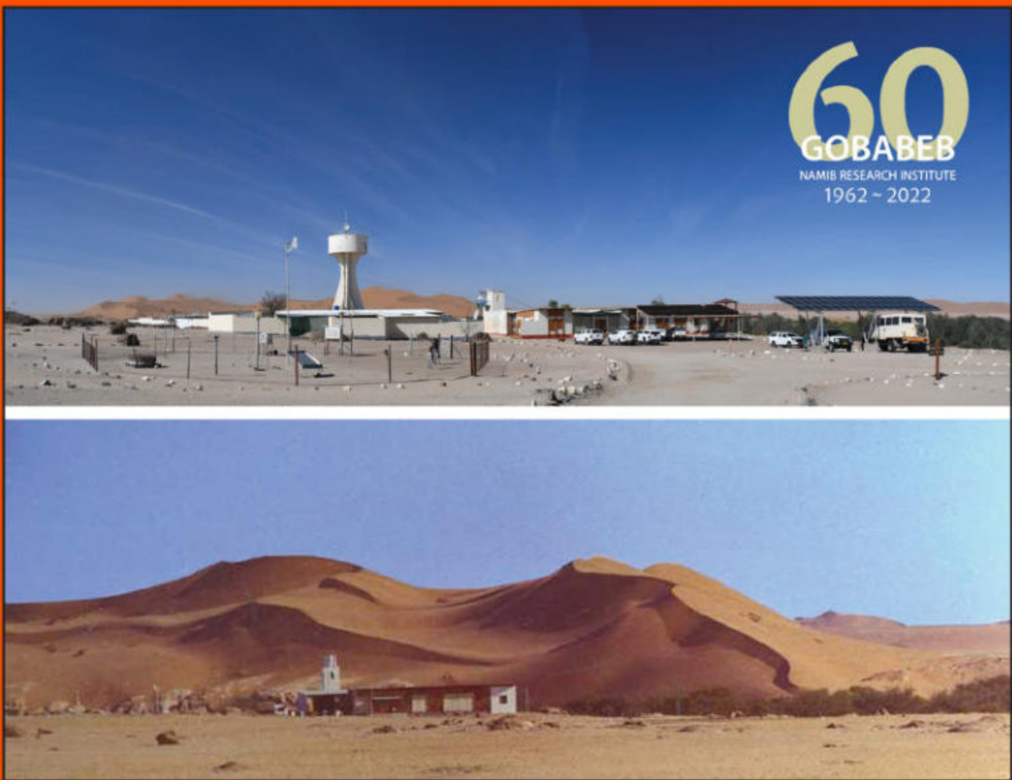
Namibia Wissenschaftliche Gesellschaft
Namibia Scientific Society

JOURNAL

Volume 69 - 2022



Journal	69	Windhoek	2022	ISBN: 978-99945-76-79-1	ISSN: 1018-7677

Namibia Scientific Society

J O U R N A L

Volume 69 - 2022

Journal 2022	Windhoek	ISBN: 978-99945-76-79-1	ISSN: 1018-7677

Author	Contents	Pages

Cover Photo	Gobabeb–Namib Research Institute
Publisher & Advertising	Namibia Scientific Society 110 Robert Mugabe Ave., Windhoek P.O. Box 67, Windhoek / Namibia Tel: 061-22 53 72, Fax: 061-22 68 46 E-mail: info@namscience.com
Website	www.namscience.com

Printing	John Meinert Printing, P.O. Box 56 Windhoek / Namibia, Tel: 061-22 54 11

Anibtanab: An Earlier and Middle Stone Age Site in the Namib Sand Sea

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Keywords: Earlier Stone Age, Middle Stone Age, Namib Desert, archaeology, Sand Sea, Anibtanab, arid landscapes, lithic technology.

Abstract

The archaeological site of Anibtanab is an interdunal pan locale on the northern margin of the Namib Sand Sea, situated roughly 1.5 km south of the !Khuiseb River and about 40 km east of Gobabeb. The site was first investigated by Shackley (1985) who reported earlier and middle stone age tools scattered across the approximately 1,500 m x 1,000 m pan. Shackley's brief mention provides typologies and total number of tools but no additional descriptions of the technology. In 2021, the site was revisited and a new sample of lithics was analyzed. This paper presents the preliminary results of this analysis, which provides a more detailed understanding of the Anibtanab site to inform future studies of the numerous archaeological pan sites in the Namib Sand Sea.

Introduction

The Namib Sand Sea holds a potential wealth of archaeological data that is only just beginning to be understood. Dozens of surface artifact scatters have been identified, but very few have been systematically studied. One such site on the northern edge of the Namib Sand Sea is Anibtanab. Located about 1.5 km south of the !Khuiseb River ravine and about

40 km to the east of Gobabeb, Anibtanab is a large interdunal pan, roughly 1,500 m by 1,000 m in size (Figures 1 and 2). The site is located favorably near seasonal water sources, raw materials for stone tools in the form of large quartzite cobbles, and vegetation, veld foods and longer lasting pools along the !Khuiseb.

The first archaeological report from the site was published by Myra Shackley in 1985, under the site name Zebravlei. She indicated that it was also called Mniszechi's Vlei by researchers from Gobabeb working in the area. We prefer to retain the historical local name "Anibtanab" for the area (Anon 1911, Stapff 1887), as Mniszechi's Vlei has no historical or contextual relevance. Shackley reports a Middle Stone Age (MSA) scatter with the highest density of artifacts in the central portion of the pan. Shackley recorded artifacts while walking five southwest to northeast transects of 500 m (Shackley 1985). One hundred and twenty seven artifacts were recorded, including points, blades and various flake types. No materials diagnostic of the Earlier Stone Age such as handaxes or cleavers were recorded. Total numbers and raw material types were not provided, nor were any size data, but the sample was 27% core types, 37.2% flake types, and 15.8% formal tools (Shackley 1985). The remaining portion was fragmented or debris types.

In 2013, Ted Marks, accompanied by the former director at Gobabeb, Mary Seely, revisited Anibtanab while undertaking an archaeological inventory of the northern Namib Sand Sea. Marks took X-ray fluorescence (XRF) measurements of minor and trace element concentrations in a sample of 16 quartzite artifacts from the site. These data were compared with a library of XRF measurements on unmodified quartzite cobbles from gravels throughout the central Namib. Using canonical discriminant analysis, he determined that the sampled quartzite artifacts at Anibtanab most likely originated from quartzite gravels derived from the Karpfenkliff conglomerate along the lower reaches of the !Khuiseb valley (Marks et al. 2014).

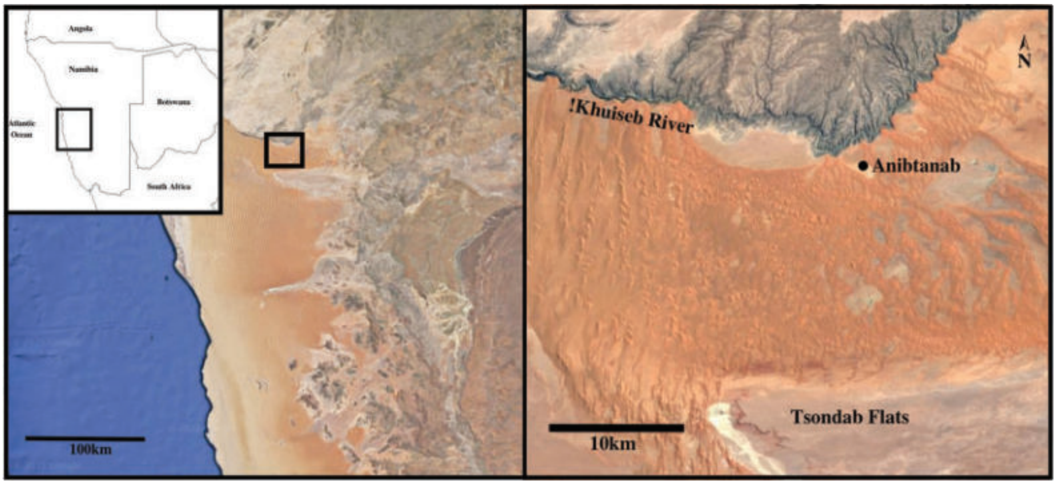

Figure 1: The site of Anibtanab in the Northern Sand Sea, 1.5 km south of the !Kuiseb River

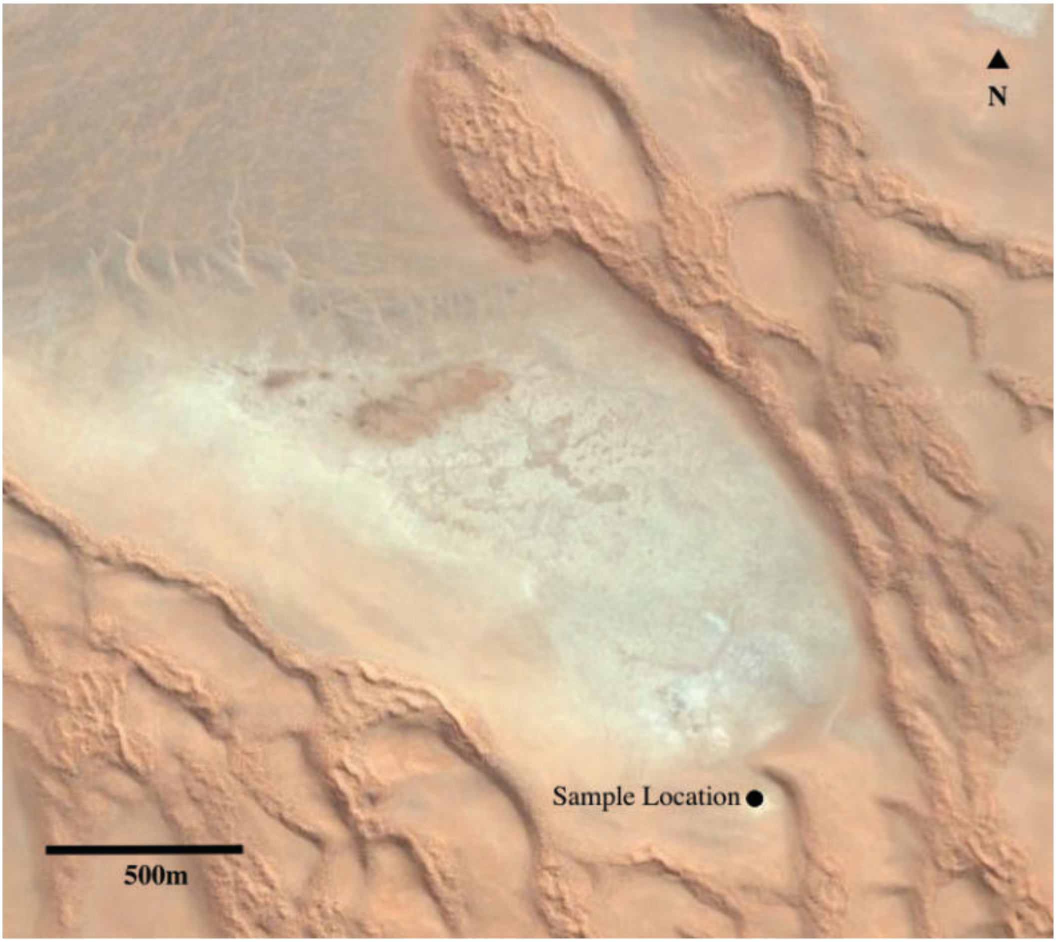

Figure 2: Anitanab interdunal pan

The limited data from previous studies offer clues to understanding prehistoric occupations of the Namib Sand Sea. However, numerous difficulties arise when studying surface archaeological sites, many of which involve localized taphonomic, depositional, and multiple occupation issues (Fanning et al. 2009). However, newly emerging methods and improving surface material dating technology have prompted a recent increase of interest in surface materials (Fanning et. al. 2009, Marks 2015, Gliganic et. al. 2021).

In recent decades, past fluvial episodes in the Namib Desert have been accurately dated (reviews in Stone et. al. 2010, Stone & Thomas 2012), though the full extent of wet conditions leading to substantial runoff and open water within dune areas is still unknown. Information from archaeological and geomorphological studies can supplement one another, where artifacts may provide broad chronologies of alluvially deposited gravels, cobbles, pebbles, or sediments. Modern dating methods for alluvial sediments may define likely wet periods conducive to hominin occupation. Establishing the relationships between climatic events and patterns of hominin occupation is therefore a key research goal for studies in the Namib Sand Sea.

Anibtanab is the first of many of these interdunal sites to be reinvestigated with the goal of gaining a better understanding of the movements of hominins in this challenging dune landscape. This paper provides preliminary technological data on an interdunal pan, which has never been fully described in previous studies (Shackley 1985). The site marks a northeastern locality from which a new project (Survey and Archaeology of the Namib Desert Surface) will continue mapping sites towards the southwest and along the ancient Tsondab River flats.

Methods

The site was revisited in July 2021. A preliminary artifact evaluation of the pan surface was first conducted for a general overview of the stone tool technology present and to assess the exposed geological deposits. The southern portion of the pan appears to have the highest density of artifacts. It was determined that a random sample of artifacts would be assessed within that portion of the pan.

A 10 m^2 area was measured off at a randomly generated location in the southern portion of the pan, near where the gravel plain meets the dunes. Stone artifacts were first flagged within the sample grid and data were collected (Figure 3). Standard measurements were taken on each artifact including maximum length (for flakes measured from the striking platform to the distal termination), maximum width (perpendicular to the maximum length at the midpoint of the length), and maximum thickness (at the midpoint of the maximum length). On flakes, the number of faces on the striking platform and the number of dorsal scars were recorded. Each artifact was assigned a typology (Leakey 1971, Kuman 2001, Marks et al. 2014). All flaking debris was classified as a single type, namely shatter. Measurements were not taken on fragmented pieces such as flake fragments (which include the blob of percussion) or incomplete flakes (medial or distal pieces of a flake).

All artifacts were returned to their original position after data collection. A low density of fossilized faunal remains was scattered throughout the sample area. The fossils were highly fragmented and were weathered to a white patination. No clearly identifiable fossils were observed. Fossil remains were flagged for a collective scatter photograph but not collected or assessed.

The Assemblage

The sample assemblage contained 209 total artifacts (Table 1). The majority were produced from quartz (n = 196, 93.7%) while only thirteen artifacts (6.2%) were produced

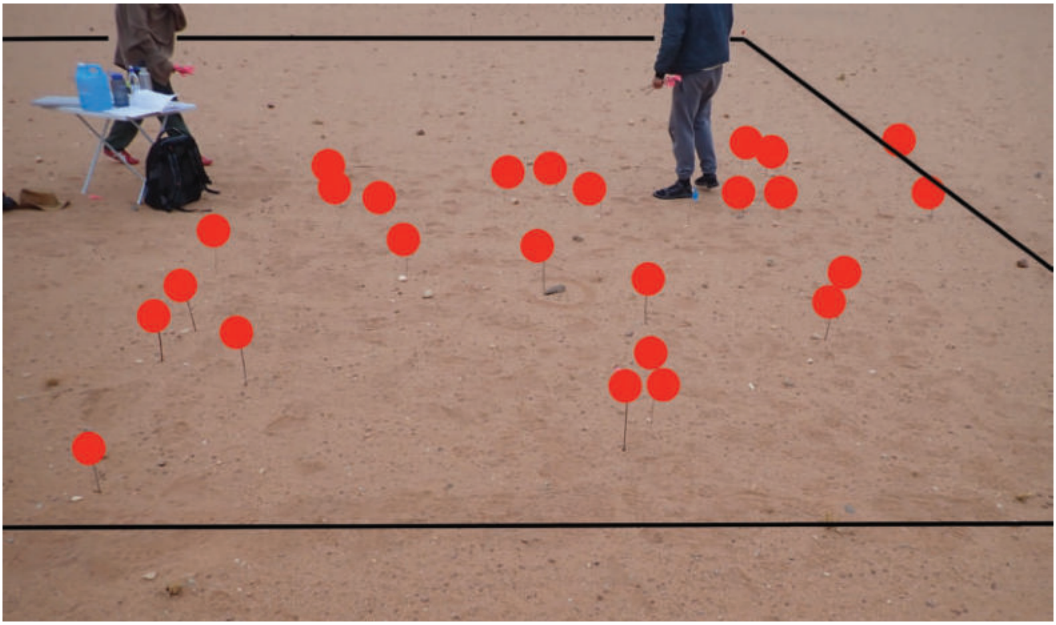

Figure 3: Flagging artifacts within the 10x10 m sample area. The tops of the flags are shown as red dots to enhance them.

from quartzite. The majority of the collection was flaking debris (n = 129, 61.7%) followed by various flake types (n = 58, 27.7%). Cores and formal tools each had eleven artifacts with each category representing 5.2% of the total. The assemblage was fairly well represented in the expected size distribution (Figure 4). The smallest fraction (< 9 mm) was not present, which was likely due to wind erosion that smooths and moves the smallest material, making it almost impossible to distinguish from natural lithic debris.

Flakes

Flakes were produced on quartz and quartzite with the majority on quartz (Table 2; Figure 5; 93%). The most frequent platform types on quartz were single (n = 19) and cortical platforms (n = 20). A fully cortical dorsal surface was the most frequent dorsal face type.

Quartz flakes represented the largest raw material category (average length 3.66 cm, width 2.79 cm, thickness 1.16 cm). The most significant difference between quartz and quartzite flakes was the width (Figure 6). Quartzite flakes comprised a very small sample (n = 4) and were on average much wider than long implying they were side struck. These subtle differences were more likely to reflect dissimilarities in the morphology of quartz vs. quartzite pebbles rather than any real differences in technological strategies in dealing with the two raw materials. This is, however, a question for future examination.

Table 1: Sample assemblage typology totals

	Quartz n (%)	Quartzite n (%)	Total n
Formal Tools			
Handaxe	0 (0)	1 (100)	1
Denticulate	6 (100)	0 (0)	6
Scraper	4 (100)	0 (0)	4
Total	10 (91)	1 (9)	11 (5.2)
Core Types			
Casual Core	6 (85.7)	1 (14.3)	7
Centripetal Core	2 (100)	0 (0)	2
Irregular Core	2 (100)	0 (0)	2
Total	10 (91)	1 (9)	11 (5.2)
Flakes			
Cortical Platform	19 (95)	1 (5)	20
Single face Platform	20 (91)	2 (9)	22
Two+ Faces Platform	3 (75)	1 (25)	4
Indeterminate	12 (100)	0 (0)	12
Total	54 (93)	4 (7)	58 (27.7)
Debris/Incomplete			
Core Fragment	5 (100)	0 (0)	5
Flake Fragment	33 (92)	3 (8)	36
Incomplete Flake	14 (88)	2 (12)	16
Shatter	64 (97)	2 (3)	66
Split Cobble	3 (100)	0 (0)	3
Split Pebble	3 (100)	0 (0)	3
Total	122 (95)	7 (5)	129 (61.7)
Total	**196 (93.7)**	**13 (6.2)**	**209 (100)**

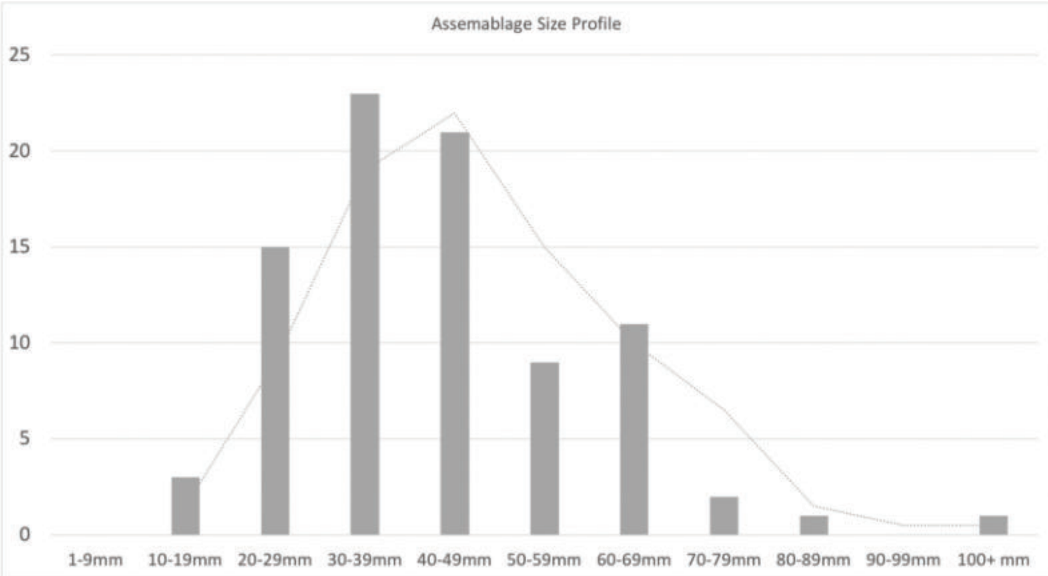

Figure 4: Assemblage size distribution with average trendline

Formal Tools

The only biface that was within the sample area was produced on a quartzite flake measuring 14 x 6.8 x 3.2 cm (Figure 7). Weighting 332 g, it had a total of twelve removals still visible on both faces. This is the only diagnostic of tools from the ESA, however its age cannot be determined.

The only other tool types present were denticulates (n=6) and scrapers (n=4). These are produced only on quartz. Denticulates are distinguished from the finer retouch of scrapers by a wider and deeper "notch-like" removal or removals on the flakes edge. These formal tools are more likely to represent an MSA occupation at the site.

Discussion

The northern region of the Namib Sand Sea, specifically south of the !Khuiseb and north of the former Tsondab course, is characterized by large pans on plains between the red, linear aeolian dunes. Some of these pans, like Anibtanab, may hold water during wet years and certainly did so in the distant past, though amount of rainfall needed and the duration of such seasonal ponding are unknown. The pans are also of interest as many of them contain surface scatters of artifacts from the ESA and MSA periods, indicating an ancient hominin association with more extreme parts of the Namib Desert. Almost no archaeological

Table 2: Flake types

Platform Type	**Quartz**	**Quartzite**	**Total n**
Cortical Platform	19 (95)	1 (5)	20
Single face Platform	20 (91)	2 (9)	22
Two+ Faces Platform	3 (75)	1 (25)	4
Indeterminable	12 (100)	0 (0)	12

Dorsal Ridges	**Quartz**	**Quartzite**	**Total n**
Cortical	16 (100)	0 (0)	16
One single ridge	4 (100)	0 (0)	4
Two ridges	11 (92)	1 (8)	12
Three+ ridges	6 (86)	1 (14)	7
Indeterminable	17 (89.5)	2 (10.5)	19

Quartz Flakes Average Sizes

	Max. (cm)	Avg. (cm)	Min. (cm)	S.D.
Length	7.5	3.66	1.1	1.22
Width	5.8	2.79	1.1	1.04
Thickness	3.7	1.16	0.4	0.6

Figure 5: Flakes made on quartz. Some minor edge damage is present and likely due to both natural weathering (i.e. animal trampling). (Scale in cm)

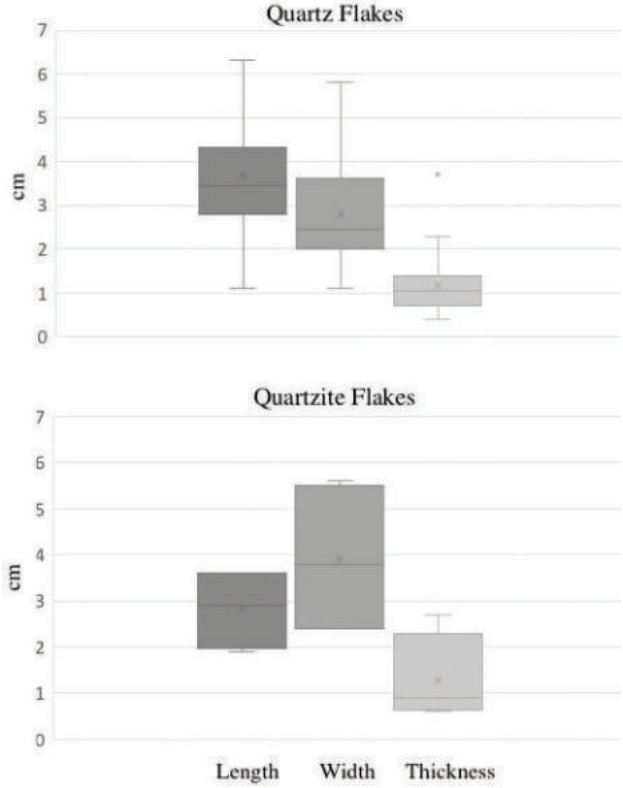

Figure 6: Flake size profiles

Figure 7: Handaxe produced on quartzite (scale in cm)

research has been conducted on these pan sites since the mid-1980s, largely due to the notion that only limited data can be extracted from surface sites, as well as the general challenges of accessing sites in a remote and demanding desert environment. However, interest in such sites is increasing as better methods and dating techniques continue to evolve (Knight and Stratford 2020). The archaeological record of the Namib Sand Sea may thus continue to yield important clues into human adaptations to this unique environment, as well as to broader questions of human evolution in Southern Africa.

Elsewhere, on the edge of the Namib Sand Sea, other surveys have been conducted. For example, Hardaker conducted extensive surveys of the ESA and MSA surface record along the Sand Sea's eastern margin (Hardaker 2011, Hardaker 2020), while others have recorded ESA along the coastal regions (Corvinus 1983). Though hundreds of lithic scatters were identified, detailed collection descriptions are not provided and the relative dating methods that were used are problematic (Knight & Stratford 2020).

One of the long-term goals of our current archaeological project is to understand hominin occupation within the Namib Sand Sea, particularly its northern part. It is of paramount importance that careful mapping of all the lithic scatters is conducted, whether multiple technologies are present on a single surface or not. A full description of sample surveys from various sites provides a starting point to build such a database.

The Middle Stone Age technology of Anibtanab is most comparable to an archaeological assemblage from the !Nara Valley site (23°33'S, 14°57'E). !Nara Valley is an MSA surface site located on the !Khuiseb 60 km downstream (northwest) of Anibtanab (Shackley 1985). Like Anibtanab, it is situated just south of the river.

The !Nara Valley assemblage resulted from a 100 m^2 sample grid selected in an area of the pan identified as having a dense artifact concentration. The sample area produced 202 stone artifacts including flakes, cores, and tools. The average flake size at !Nara Valley is only slightly larger than the Anibtanab flakes, but it is unclear if this is because Shackley incorporated all the raw material types into that average. Like Anibtanab, the !Nara Valley site is dominated by quartz. Shackley argued that 27% of these are flake types associated with a "Mossel Bay Industry" (Shackley 1985), though there are still many discussions as to what characterizes this industry (Thompson et al. 2010, Wurz 2013). Though an undated surface assemblage and likely visited on multiple occasions, if Shackley's comparison of the assemblage to the "Mossel Bay Industry" is confirmed, that might place the assemblage roughly in the Late Middle Pleistocene and could provide a possible clue to the age of the Anibtanab MSA component.

Similarities in the ecological setting exist between the two sites as well. !Nara Valley is situated along a through-route between dunes likely to be used by game to access the !Khuiseb River (Shackley 1985). The site also allows access to both raw materials, water, and other resources from the !Khuiseb. The same is true of Anibtanab where the site is located between the dunes and the plant and water resources of the !Khuiseb valley in an area extensively utilised by game. Shackley (1985) interprets the limited variation of formal tool types at !Nara Valley to be indicative of specificity of the site's usage, specifically for hunting game moving to and from the river. Together, these similarities may indicate patterns of MSA land use practices, where hominins positioned themselves at the boundaries between the comparatively lush riparian corridors and the dune and gravel plain environments farther afield, to access resources from both ecological zones. This pattern of intensive use of ecotones has been noted at other MSA sites in the wider Central Namib region (Marks 2015, Marks 2018).

Another much smaller surface scatter of comparable technology is Bubuses (23°22'S, 14°52'E), which lies 75 km northwest of Anibtanab and also only a short distance (600 m) south of the !Khuiseb. A long linear dune separates the site from the river. Bubuses' small assemblage consists of only 28 artifacts, mostly on quartz. Irregular core types (n = 3) and chopper cores (n = 6) dominate the core types totaling 32.1% of the artifacts (Shackley 1985). The technology is attributed to the MSA. However, the artifacts exhibit more abrasion (rolling), possibly indicating their association with the Gobabeb Gravels, which may place them closer to the Pleistocene-Holocene transition (Shackley 1985). Though Bubuses demonstrates another MSA locality in the Sand Sea, south of the !Kuiseb with an assemblage of artifacts largely produced on quartz, it is too small of a sample to make further comparison to Anibtanab.

Conclusion

Anibtanab is one of many hundreds (potentially thousands) of archaeological surface sites in the interdune pans of the Namib Sand Sea. Previous archaeological work in the 1970s identified a few of the sites, but further work is needed. These early site descriptions also lack full technological discussions, which complicates cross site comparisons based on those data.

The sample studied from Anibtanab is dominated by quartz flakes that are most likely associated with a Middle Stone Age chronology. The only definitive tool of the Earlier Stone Age found within the sample is a handaxe produced on quartzite. A lone handaxe is not comparable to other ESA sites. However, the quartzite flakes within the sample have a different size profile than the quartz flakes, being much wider than long, which may indicate that they are associated with a different occupation. Paired with evidence of quartzite being more frequently used during the ESA at other sites in the northern part of the Namib Sand Sea sites, they may be of ESA origin.

It therefore can be concluded that Anibtanab is a primarily a Middle Stone Age site, situated close to the modern !Khuiseb River, providing access to riparian resources and water. A smaller and Earlier Stone Age component exists but at low frequency.

There are still a great number of unresolved questions at Anibtanab and similar sites in the Namib Sand Sea. The primary unknowns center around chronology and paleoenvironmental conditions. We still have only a preliminary hypothesis for a mid to late Pleistocene hominin presence at sites in the Namib Sand Sea, during which it is quite likely that periods of human occupation were highly sensitive to fluctuations between wet and dry conditions. Broader environmental and demographic fluctuations outside the Namib Desert may also have influenced differences over time in the spatial distribution of MSA versus ESA sites in the region. It would go a long way towards helping us understand broader questions of the adaptations of early humans in this part of Africa if it was possible to associate patterns of site use, technological practices, and fine-scale environmental variability. As more sites are identified and studied, the data from the Anibtanab assemblage offer a strong starting point for future comparative studies of Namib Sand Sea surface collections, as well as of stratified assemblages.

Acknowledgements

The authors are honored to be a part of this special issue celebrating 60 years of research at Gobabeb Namib Research Institute. Research in the Namib Sand Sea, particularly the region between the Tsondab Flats and the !Khuiseb where our project is focused, would be impossible without the assistance of the Gobabeb–Namib Research Institute. This research was conducted under permit [12/2022] issued by the National Heritage Council of Namibia and the National Commission on Research, Science, and Technology [RPIV01042026].

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JOURNAL 69
Namibia Scientific Society / Namibia Wissenschaftliche Gesellschaft
Windhoek, Namibia 2022
ISSN: 1018-7677 ISBN: 978-99945-76-79-1