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An unusual, incised ground stone artefact from southwestern Victoria, Australia: its function and potential symbolic significance

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An unusual, incised ground stone artefact from southwestern Victoria, Australia: its function and potential symbolic significance

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Abstract

An unusual, incised sandstone artefact recovered during an archaeological salvage program in Bannockburn, southwestern Victoria, has been uniformly ground and contains sets of regularly spaced, shallow grooves on either side. Microscopic study indicates that the grooves were incised with stone and used to sharpen or shape the edges of wooden implements. The wear outside of the grooves indicates contact with soft wood or other plant material; possibly a soft plant bag. The regularity and distribution of the grooves suggest a symbolic meaning, perhaps tally marks or other form of communication.

Keywords

Microwear, usewear, residues, incised stone, southeastern Australia, Holocene, grinding stone

Introduction

Australian ground stone artefacts have been identified ethnographically and archaeologically, and have been found in Pleistocene and, much more commonly, late Holocene settings (e.g. Clarkson et al. 2017; Fullagar and Field 1997; Fullagar et al. 2015; Geneste et al. 2010; Gorecki et al. 1997; Hiscock et al. 2016; Smith 1985, 1988, 2013). Ground stone artefacts include a variety of formal tools (e.g. millstones, mullers, mortars, pestles and edge-ground axes), which are interpreted primarily as utilitarian implements (e.g. for grinding seeds, preparing plant fibres, honing axes, and removing wood or bark from trees).

Ground stone artefacts with incised lines or engravings are not common, and very few have been found in archaeological contexts. Some, such as *morah* grinding slabs (from far north Queensland), have deeply incised, parallel grooves, which possibly played a role in the processing of toxic nuts (Field et al. 2009; Woolston and Colliver 1973). Small, portable tablet stones with incised and/or pecked geometric or figurative motifs have been identified in the Western Desert; while their function is unknown, they may represent part of a continuum of symbolic behaviours (McDonald 2018). Other smaller incised stones from southeastern Australia have not yet been found in dated contexts, and are interpreted as tools used to abrade and sharpen bone points (D. Witter pers. comm. Nov. 2015; McCarthy 1976). Larger, elaborately incised stones (including *tjuringa,* cylcons and message stones), are documented ethnographically to convey symbolic meaning in rituals (McCarthy 1976:66–70; Mountford 1943).

Stones modified by grinding may not necessarily be utilitarian or symbolic implements. Akerman (1979) identified an unusual ground schist implement from an open sand dune site in Broome, Western Australia, but he argues that it probably had no utilitarian purpose. He proposes that it may represent a ceremonial or sacred object, perhaps an ancestral baler shell knife, a child's toy, or a stone worker's teaching tool. However, he thinks it was probably a "doodle"—an object produced almost unconsciously as a therapeutic pastime and not intended to be used or have symbolic significance.

Here we describe the study of a small ground stone artefact, with incised grooves, recovered from an archaeological excavation in southwestern Victoria (**Figure 1**). Our aim here is to assess its likely function.

Archaeological context

The ground stone artefact (GS491) was recovered during the Bannockburn archaeological salvage program in alluvial deposits on the eastern side of Bruce Creek (Light and Tuechler 2014). Bruce Creek forms an interface between sedimentary plains to the west and basalt plains to the east, exposing underlying Oligocene deposits and depositing alluvial silts (Robinson et al. 2003).

Artefact GS491 was part of an artefact scatter (registered as VAHR 7721-1241 on the Victorian Aboriginal Heritage Register), comprising flaked stone artefacts, and five pieces of ochre (**Table 1; Table 2**). Most of the flaked stone artefacts were made of quartz and silcrete, and less commonly quartzite, sandstone and crystal quartz. Quartz was brought in as unworked pebbles or cobbles, and was flaked, sometimes on an anvil, to create informal tools. Silcrete was transported in a relatively small or prepared form, and was reduced more intensively to create a range of tools that included notched artefacts, utilised flakes, backed artefacts and a variety of scrapers (Tuechler and Spry 2015:22–38).

The archaeological salvage program involved manual excavation of two 2x2 m pits, and mechanical stripping and monitoring of the remaining deposits at this Aboriginal place (Tuechler and Spry 2015). GS491 was recovered from Spit 2, Quadrant A of Salvage Excavation Pit 1 (SEP1) (**Figure 2**). While both spits have minor evidence for bioturbation from insects, and grass and tree roots, refitted flaked stone artefacts and artefact groups probably struck from the same core or tool indicate that these deposits are reasonably intact (Tuechler and Spry 2015:10–15, 25).

No direct age estimates are available for the excavated alluvial silts or the artefacts they encase. However, previous studies indicate that these deposits formed during the Holocene (Robinson et al. 2003). The artefact assemblage and stratigraphic context suggest a pre-European, late-Holocene age for artefact GS491.

Artefact GS491

Artefact GS491 was found in two pieces, which may be refitted to form a complete artefact with a uniformly smoothed surface and 14 incised grooves (**Figure 3**). The weathering evident around the broken edges of the pieces indicates that the break occurred prior to its discard. The sandstone itself is weakly cemented, relatively soft and easily shaped; it is typical of material suitable for abrading bone, wood or other stone (Hayes 2015).

Artefact GS491 has several distinctive macroscopic features: very rounded margins; an abrasively smoothed surface, with six incised grooves on Surface 1, and eight incised grooves on Surface 2. Four of the grooves on Surface 1 and five on Surface 2 are near-parallel, and similar in length, width and depth. However, the grooves are slightly deeper on Surface 1. The sets of parallel grooves on surfaces 1 and 2 are oriented differently. Two grooves on Surface 2 are shorter and oriented differently to the others on the same surface.

Usewear and Residue Analysis

Artefact GS491 displays distinctive macroscopic and microscopic wear. The entire tool surface has been smoothed and at least 14 incised, mostly parallel grooves are visible on the two main stone surfaces. At low magnification, individual grains appear minimally levelled and highly rounded **(Figure 4A–B).** The grooves on GS491 are similar to those made with stone flakes on experimental grinding stones (Hayes et al. in press).

At high magnifications (x100, x200 and x500), polish on GS491 can be distinguished on individual grains and likely attributed to use, and micro-scarring is common (**Figure 4B–C**).

In the grooves, we documented a bright, well-developed reticulated use-polish commonly associated with the processing of plant material with low silica content (Fullagar 1991). The use-polish documented on GS491 is similar to the wear on experimental tools (Hayes 2015) made of similar sandstone used to sharpen edges of dense mulga (*Acacia* spp.) wood for up to two hours (**Figure 4C**). It is likely that dense wood was used in the grooves on GS491 for durations exceeding two hours.

This use-polish is more extensively distributed on Surface 2, possibly indicating that this surface was used more intensively but for the same task. Overall, the use-polish observed outside the grooves on all sides is variable in morphology and texture, and probably indicates manufacturing (stone-on-stone grinding) stages and wear from use. A brightly reflective polish (cf. plant working) outside the grooves overlies patches of abrasive manufacture wear (**Figure 4D**), suggesting that GS491 was also used to rub objects made of wood or other plant tissue. It is also possible that the wear outside the grooves was sustained when the stone was wrapped with, or carried in, a bag made of soft plant fibres. The wear identified is not consistent with wear from post-depositional movement of sediments. GS491 was found in two pieces (one with grooves and one without) during excavation, and the broken surfaces are slightly rounded and weathered. If the GS491 had symbolic value, it makes sense to keep the pieces together, even though only one piece had the functional grooves. Consequently, it may have broken before it was discarded.

Organic residues were scarce on GS491 but included degraded plant fibres and distinctive plant structures (starch, cellulose and phytoliths). Although the plant residues cannot be confidently linked with use, their presence and the absence of animal tissue support the usewear interpretation indicating wood processing.

Conclusion

Incised stones are rare in Australian archaeological assemblages, and few have been studied microscopically to assess traces of use. Our usewear/residue study of artefact GS491 indicates that the grooves were probably made with a stone flake to create a guide for sharpening and shaping the edges of wooden artefacts.

Studies that have discerned a symbolic meaning for tools with more complex arrangements of incised lines—such as art, messages or tally marks (Cooper 1947; McCarthy 1976:66-70; Mountford 1943)—are not based on microscopic studies but are informed by ethnography and speculation. However, utilitarian stone tools, such as points and edge-ground axes, can also possess deeper symbolic or cultural meaning (Akerman et al. 2002; Brumm 2010; McBryde 1984).

Macroscopically, the physical features of artefact GS491 are most similar to those identified on incised stones from southeastern Australia, including the coast

(McCarthy 1976:Figures 49, 57–60; D. Witter pers. comm. Nov. 2015). While microscopic study of artefact GS491 from Bannockburn indicates that the incised grooves were probably made with stone initially and wood subsequently, the regularity and spacing of the of incised grooves may also indicate artistic expression, tally marks or other messages.

References

Akerman, K., 1979 An unusual stone implement from the West Kimberley, and its implications with regard to the philosophy of stone tool manufacture. *The Artefact* 4(3 & 4):73–78.

Akerman, K., R. Fullagar and A. van Gijn 2002 Weapons and wunan: production, function and exchange of Kimberley points. *Australian Aboriginal Studies* 1:13–42.

Brumm, A. 2010 'The falling sky': symbolic and cosmological associations of the Mt William greenstone axe quarry, central Victoria, Australia. *Cambridge Archaeological Journal* 20(2):179–196.

Clarkson, C., Z. Jacobs, B. Marwick, R. Fullagar, L. Wallis, M. Smith, R.G. Roberts, E. Hayes, K. Lowe, X. Carah, S.A. Florin, J. McNeil, D. Cox, L.J. Arnold, Q. Hua, J. Huntley, H.E.A. Brand, T. Manne, A. Fairbairn, J. Shulmeister, L. Lyle, M. Salinas, M. Page, K. Connell, G. Park, K. Norman, T. Murphy and C. Pardoe 2017 Human occupation of northern Australia by 65,000 years ago. *Nature* 547(7663):306–310.

Cooper, H.M. 1947 Incised stones of South Australia. *Mankind* 3(10):292–298.

Field, J., R. Cosgrove, R. Fullagar and B. Lance 2009 Starch residues on grinding stones in private collections: a study of morahs from the tropical rainforests of NE Queensland. In M. Haslam, G. Robertson, A. Crowther, S. Nugent and L. Kirkwood (eds), *Archaeological science under a microscope: studies in residue and ancient DNA analysis in honour of Thomas H. Loy*, pp.228–238. Terra Australis 30. Canberra: ANU E Press.

Fullagar, R. 1991 The role of silica in polish formation. *Journal of Archaeological Science* 18(1):1–24.

Fullagar, R. and J. Field 1997 Pleistocene seed-grinding implements from the Australian arid zone. *Antiquity* 71(272):300–307.

Fullagar, R., E. Hayes, B. Stephenson, J. Field, C. Matheson, N. Stern and K. Fitzsimmons 2015 Evidence for Pleistocene seed grinding at Lake Mungo, south-eastern Australia. *Archaeology in Oceania* 50(S1):3–19.

Geneste, J.-M., B. David, H. Plisson, C. Clarkson, J.-J. Delannoy, F. Petchey and R. Whear 2010 Earliest evidence for ground-edge axes: 35,400±410 cal BP from Jawoyn Country, Arnhem Land. *Australian Archaeology* 71:66–69.

Gorecki, P., M. Grant, S. O'Connor and P. Veth 1997 The morphology, function and antiquity of Australian grinding implements. *Archaeology in Oceania* 32(2):141–150.

Hayes, E. 2015 What was ground? A functional analysis of grinding stones from Madjedbebe and Lake Mungo, Australia. Unpublished PhD thesis, Centre for Archaeological Science, University of Wollongong, Wollongong.

Hayes, E., C. Spry, R. Fullagar, P. Schell, M. Goulding and A. Tuechler in press (accepted 17 January 2019) Tool-use experiments to determine the function of an incised ground stone artefact with potential symbolic significance. *Journal of Lithic Studies*.

Hiscock, P., S. O'Connor, J. Balme and T. Maloney 2016 World's earliest ground-edge axe production coincides with human colonisation of Australia. *Australian Archaeology* 82(1):2–11.

Light, A. and A. Tuechler 2014 Bio-retention Basin, Bannockburn: cultural heritage management plan no. 12604. Unpublished report prepared for Bannockburn Holdings P/L.

McBryde, I. 1984 Kulin greenstone quarries: the social contexts of production and distribution for the Mt William site. *World Archaeology* 16(2):267–285.

McCarthy, F.D. 1976 *Australian Aboriginal stone implements: including bone, shell and teeth implements*. Sydney: The Australian Museum Trust.

McDonald, J. 2018 Portable art in Australia's Western Desert. In M.C. Langley, M. Litster, D. Wright and S.K. May (eds), *The archaeology of portable art: Southeast Asian, Pacific, and Australian perspectives*, pp.274–298. Oxford and New York: Routledge.

Mountford, C.P. 1943 A stone tjurunga of unusual form from the Aranda tribe of Central Australia. *Mankind* 3(4):113–115.

Robinson, N., D. Rees, K. Reynard, R. MacEwan, P. Dahlhaus, M. Imhof, G. Boyle and N. Baxter 2003 *A land resource assessment of the Corangamite region*. Melbourne: Department of Primary Industries.

Smith, M.A. 1985 A morphological comparison of central Australian seedgrinding implements and Australian Pleistocene-age grindstones. *Beagle: Records of the Museums and Art Galleries of the Northern Territory* 2:23.

Smith, M.A. 1988 Central Australian seed grinding implements and Pleistocene grindstones. In B. Meehan and R. Jones (eds), *Archaeology and ethnography: an Australian perspective*, pp.94–108. Canberra: Australian National University.

Smith, M.A. 2013 *The archaeology of Australia's deserts*. Cambridge: Cambridge University Press.

Tuechler, A. and C. Spry 2015 Archaeological salvage program: bio-retention Basin, Bannockburn (Implementation of CHMP No. 12604). Unpublished report prepared for Bannockburn Holdings Pty Ltd.

Woolston, F.P. and F.S. Colliver 1973 Some stone artefacts from North Queensland rainforests. *Occasional Papers of the Queensland University Anthropology Museum* 1:104–125.

Figures

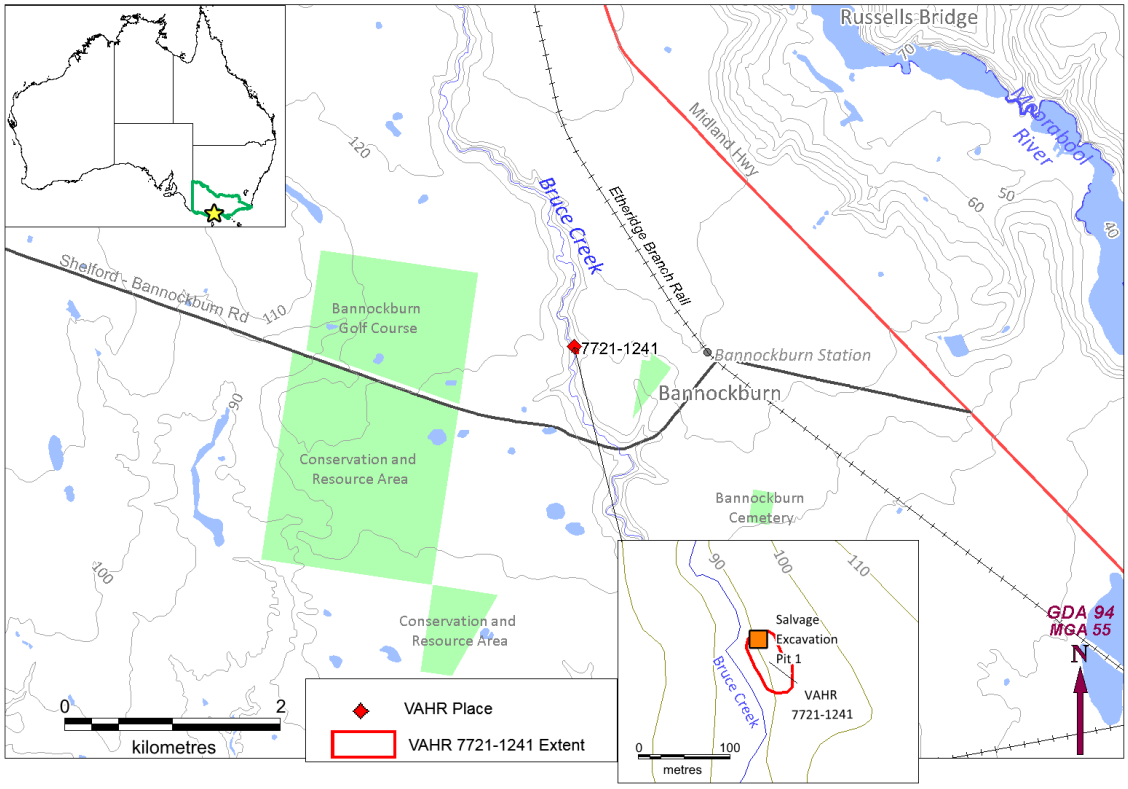

Figure 1: Map showing the location of the study area, registered Aboriginal place VAHR 7721-1241 and Salvage Excavation Pit 1 (SEP1)

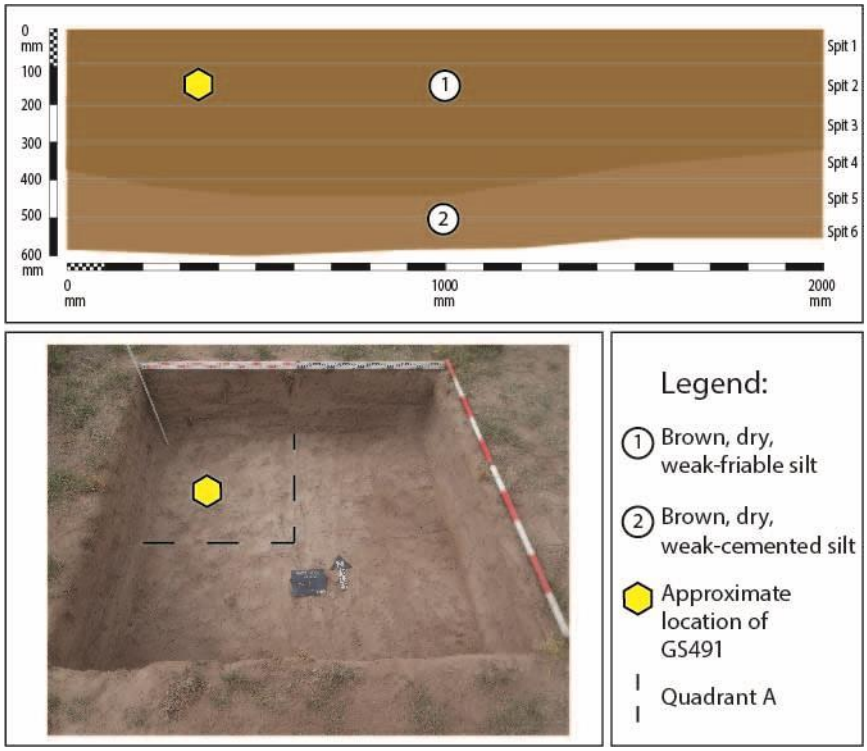

Figure 2: Upper, stratigraphic profile of Salvage Excavation Pit 1. Unit 1: brown, dry and weak to friable silt (0–440 mm); Unit 2: brown, dry and friable to cemented silt (440–580 mm). Lower: mottled black and orange clay (culturally sterile unit) at base of the excavation immediately below Unit 2.

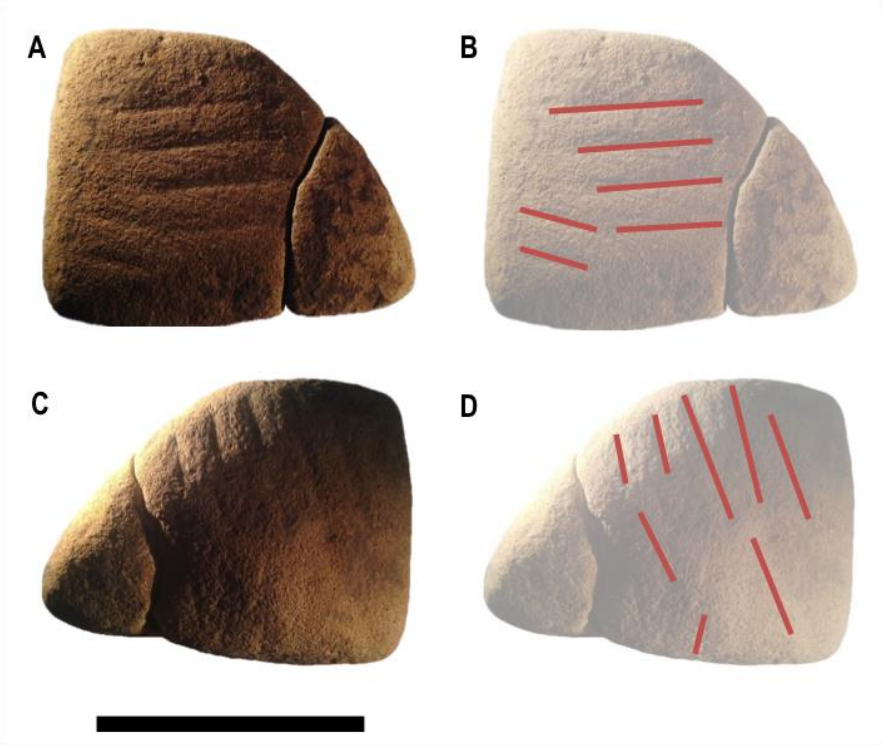

Figure 3: Ground stone artefact identified at Bannockburn (GS491), showing distinctive areas of abrasion and 14 incised grooves. Four parallel grooves run perpendicular to the fresh break on Surface 1 (A–B), compared to five on Surface 2 (C–D). Scale bar = 5 cm.

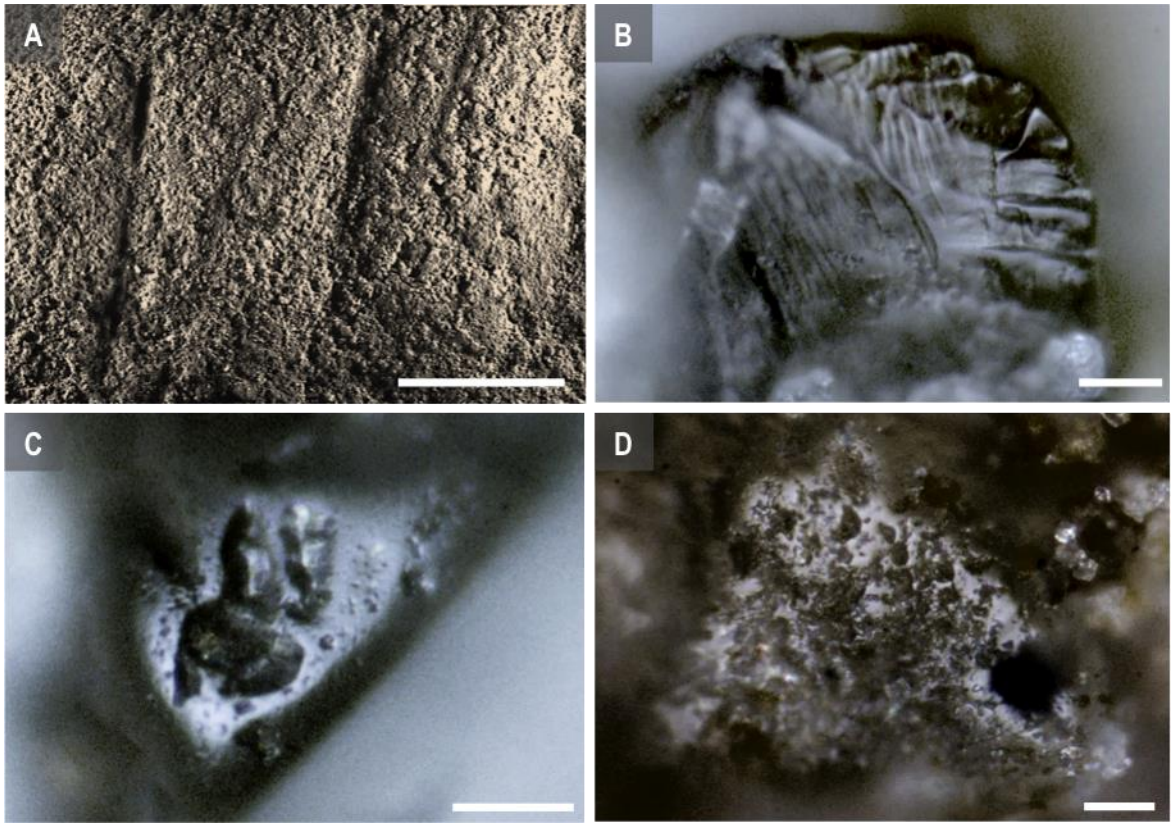

Figure 4: Usewear documented within and surrounding the grooves of GS491. A) Incised grooves on Surface 1; note the minimal levelling of grains under low magnification (scale bar is 5 mm); B) Quartz with polish and micro-scarring documented within the grooves on Surface 1; C) Use-polish on the highest points of the quartz grain with evident micro-pitting, documented within the grooves on Surface 1; D) Reticulated use-polish on individual grain, cf. siliceous plant processing, documented outside the grooves on Surface 2. Scale bars for micrographs are 20 µm.

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