

Centre for Archaeological Science

Dr Richard Fullagar



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Professional Profile

- Qualifications: BA, MA(Prelim), PhD, MAACAI
- Awards/Fellowships: The Bruce Veitch Award for Excellence in Indigenous Engagement (2007); ARC Australian Research Fellowship (1993–1997); ARC Postdoctoral Fellowship (1989–1991)
- Director: Scarp Archaeology
- President: Australian Association of Consulting Archaeologists Inc. (2010-11)
- Editor: Australian Association of Consulting Archaeologists Inc. Monograph Series
- Editorial Board: Australian Archaeology

Key Research Interests

- Use-wear and residue analysis
- History of plant food processing
- Modern human evolution and dispersal into Australia
- Australian and Pacific archaeology

Use-wear and residue analysis

I have contributed to understanding the function of stones tools, particularly by enhancing and developing methods of microscopic use-wear and residue analysis. After my doctoral research at the La Trobe University, I established use-wear/residue laboratories at the Australian Museum and at the University of Sydney. I have focussed on the identification of plant processing tools by integrating studies of plant residues (notably starch grains and phytoliths) with studies of worn and polished stone tool surfaces. I have also made contributions in the understanding of particular artefact types (e.g. backed artefacts and grinding stones) and archaeological assemblages.

Representative publications

- Fullagar, R., McDonald, J., Field, J. & Donlon, D. (2009). Deadly weapons: backed microliths from Narrabeen. In *Archaeological science under a microscope: studies in residue and ancient DNA analysis in honour of Thomas H. Loy*. Edited by M. Haslam, G. Robertson, A. Crowther, S. Nugent & L. Kirkwood. *Terra Australis* 30, 248-260.
- Fullagar, R. (2006). Starch on artifacts. Chapter 9. In R. Torrence and H. Barton (eds.) *Ancient Starch Research*. California: Left Coast Press. pp. 177-204.
- Fullagar, R. (2006). Residues and usewear. In Balme, Jane and Paterson, Alistair (eds) *Archaeology in Practice: A Student Guide to Archaeological Analysis*. Malden: Blackwell Publishing. Chapter 7. pp. 207-234.

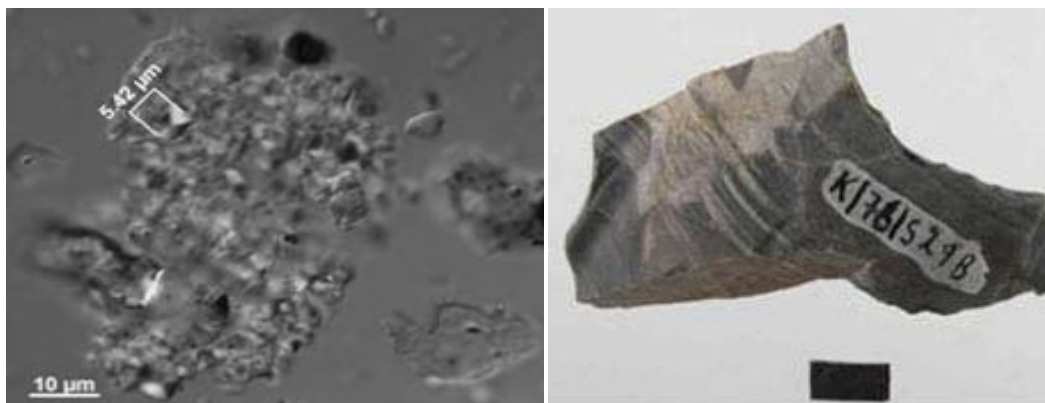
- Kealhofer, L., Torrence, R. & Fullagar, R. (1999). Integrating phytoliths within use-wear/residue studies of stone tools. *Journal of Archaeological Science* 26, 527-546.
- Fullagar, R. (ed.) (1998). *A Closer Look: Recent Studies of Australian Stone Tools*. Sydney: Archaeological Computing Laboratory, School of Archaeology, University of Sydney. Sydney University Archaeological Methods Series 6.
- Fullagar, R. (1993). Taphonomy and tool-use: a role for phytoliths in use-wear and residue analysis. In B. Fankhauser and R. Bird (eds) *Archaeometry: Current Australasian Research*. Canberra: Department of Prehistory, Research School of Pacific Studies, Australian National University. *Occasional Papers in Prehistory* 22, 21-27.
- Fullagar, R. (1991). The role of silica in polish formation. *Journal of Archaeological Science* 18, 1-25.

History of plant food processing

Stone tools were used for in plant food extraction and processing by several hominin classes and some other primates (like Chimpanzees) and span all human history. My particular interest has been to explore how plant processing, notably starchy plant foods, may have changed over long time periods e.g. since Australia was first colonised about 50,000 years ago. I have also been interested in food production before and after the Neolithic and particularly among hunter-gatherers.

Representative publications

- Summerhayes, G.R., Leavesley, M., Fairbairn, A., Mandui, H., Field, J., Ford, A. & Fullagar, R. (2010). Human adaptation and plant use in highland New Guinea from 49,000 to 44,000 years ago. *Science* 330, 78-81.
- Liu, L., Field, J., Fullagar, R., Bestel, S., Chen, X. & Ma, X. (2010). What did grinding stones grind? New light on Early Neolithic subsistence economy in the Middle Yellow River Valley, China. *Antiquity* 84, 816-833.
- Liu, L., Field, J., Fullagar, R., Zhao, C., Chen, X. & Yu, J. (2010). A functional analysis of grinding stones from an early Holocene site at Donghulin, North China. *Journal of Archaeological Science* 37, 2630-2639.
- Fullagar, R., Field, J., Denham, T. & Lentfer, C. (2006). Early and mid Holocene processing of taro (*Colocasia esculenta*), yam (*Dioscorea* sp.) and other plants at Kuk Swamp in the Highlands of Papua New Guinea. *Journal of Archaeological Science* 33, 595-614.
- Denham, T.P., Haberle, S.G., Lentfer, C., Fullagar, R., Field, J., Therin, M., Porch, N. & Winsborough, B. (2003). Origins of Agriculture at Kuk Swamp in the Highlands of New Guinea. *Science* 301, 189-19.
- Van Peer P., Fullagar, R., Stokes, S., Bailey, R., Moeyersons, J., Steenhoudt, F., Geerts, A., Vanderbeken, T., De Dapper, M. & Geus, F. (2003). The Early to Middle Stone Age Transition and the Emergence of Modern Human Behaviour at site 8-B-11, Sai Island, Sudan. *Journal of Human Evolution* 45, 187-193.



Starch grains (left) of *Colocasia esculenta* taro from the c.10,000 year old artefact (right) from Kuk Swamp in the Papua New Guinea Highlands.

Modern human evolution and dispersal into Australia

Aspects of my research include how lithic technology can inform us about the modern human evolution and colonisation of Australia. Studies have included archaeological excavations, studies of stone technology and more theoretical discussion of the kinds of new data required to answer key questions. Much of my current research has emerged from consulting projects.

Representative publications

- Denham, T., Fullagar, R. & Head, L. (2009). Plant exploitation on Sahul: from colonization to the emergence of regional specialization during the Holocene. *Quaternary International* 202, 29-40.
- Fullagar, R. (2006). Starch grains, stone tools and modern hominin behaviour. In S. Ulm and I. Lilley (Eds) *An Archaeological Life: Papers in Honour of Jay Hall (Aboriginal and Torres Strait Islander Studies Unit Research Report Series 7)*. pp. 191-202.
- Brumm, A., Aziz, F., van den Bergh, G. D., Moore, M., Morwood, M., Hobbs, D., Kurniawan, I. & Fullagar, R. (2006). Early stone technology on Flores and its implications for *Homo floresiensis*. *Nature* 441, 624-626.



Left: Use-polish on a flint grinding slab from the middle Stone Age, Sai Island, Sudan; right: Water lily seed grinding stones used by Aboriginal people at Marralam, NT.

Australia and Pacific Archaeology

I have initiated and collaborated in extensive archaeological research projects within the Australia- Pacific region, with publication of important data sets and review papers on the prehistory of this region.

Representative publications

- Head, L., Allen, H., Denham, T. & Fullagar, R. (2009). In *Australasia. The Oxford Handbook of Archaeology*. Edited by B. Cunliffe, C. Gosden, and R.A. Joyce. Oxford: Oxford University Press. Chapter 28 pp. 866-897.
- Attenbrow, A. & Fullagar, R. (eds) (2004). *A Pacific Odyssey: Archaeology and anthropology in the western Pacific: papers in honour of Jim Specht*. Records of the Australian Museum Supplement 29. Sydney: Australian Museum.
- Wroe, S., Field, J., Fullagar, R. & Jermin, L.S. (2004). Megafaunal extinction in the late Quaternary and the global overkill hypothesis. *Alcheringa* 28, 291-332.
- Slack, M., Fullagar, R., Field, J. & Border, A. (2004). New Pleistocene ages for backed artefact technology in Australia. *Archaeology in Oceania* 39, 131-137.
- Fullagar, R., Price, D. & Head, L. (1996). Early human occupation of northern Australia: stratigraphy and dating of the Jinmium rockshelter, Northern Territory. *Antiquity* 70, 751-73.
- Dodson, J., Fullagar, R. & Head, L. (1992). Dynamics of environment and people in the forested crescents of temperate Australia. In J. Dodson (ed) *The Naive Lands: Prehistory and Environmental Change in the Southwest Pacific*. Longman Cheshire, Melbourne. pp. 115-159.



Left to right: Refitted stone flakes from a quarry in the East Kimberley; excavations at the Jinnium site, East Kimberley, NT; The Terrace Site, with megafaunal bones, in the Riversleigh region, western QLD.

[Searchable Publication List](#): from 2006

Research Projects

My research is mostly collaborative in nature and is currently linked with providing specialist services for analysis of stone artefacts from diverse locations but generally linked with my research interests.

Current major projects

- Analysis of stone artefacts from Kuk Swamp, PNG (with Jack Golson and Tim Denham)
- Analysis of grinding stones from China (with Li Liu and others)
- Analysis of artefacts from Cuddie Springs, NSW (with Judith Field)
- Analysis of stone artefacts from Liang Bua, Indonesia (with Carol Lentfer and others)

Potential Honours and PhD topics

- Function of stone tool assemblages from key sites under study by CAS
- McCauleys Beach (Thirroul, NSW) midden: analysis of excavated material
- Identification, description and potential sourcing of tool stone from the Pilbara
- Use-wear/residue studies: experimental databases for specific tool materials (e.g. stone, bone, shell) and specific tasks (e.g. woodworking, harvesting, butchering).
- Optical profiling and imaging of surfaces



Recent excavations at Warkworth, Hunter Valley, New South Wales.