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Elusive wild foods in South East Asian subsistence: Modern ethnography and archaeological phytoliths

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ABSTRACT

A common predicament in archaeobotany is the relatively low proportion of the plant material exploited by humans that survives into the archaeobotanical record. Ethnobotanical survey can provide insights on how people utilized and disposed of their local plant resources and this can feed back into interpretations of archaeological evidence. Here ethnobotanic data from different regions of Thailand are employed to better understand the exploitation of gathered and garden economic plants in the context of traditional village systems where there is often a blurred line between the wild and the domestic and no clear division between the garden and the forest. This information is used in turn, to understand archaeobotanical results from Rach Nui, a Neolithic settled non-agricultural site in Vietnam, and Non Ban Jak, an Iron Age site with a rice farming economy in Northeast Thailand.

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1. Introduction

1.1. Background and aims

While there is a continuing debate on the nature of the transition from foraging to farming, particularly rice farming, in mainland South East Asia, (Higham, 1995; White, 1989; Bellwood, 2005; Harris and Hillman, 2014; Higham and Rispoli, 2014), it is almost certain that gathered plants were utilised before, during and after the introduction of agriculture, and are still used today. In China there is archaeobotanical evidence for the exploitation of wild foods long after people started cultivating and then domesticating rice, for example at Tianluoshan in the Lower Yangtze (Fuller et al., 2009; Fuller et al., 2011) and in the Ying Valley (Fuller and Zhang, 2007). However, even more than other branches of archaeology, archaeobotany is limited by preservation (Miksciek, 1987; Fairbairn, 2005; Fuller, 2007). The vast majority of archaeological floral macro-remains come from charring, which favours robust items like small seeds, chaff or nutshell, while large fruit and edible leaves, for example, are unlikely to survive (Fairbairn, 2005). More mesic environments or those with a wet and dry cycle, such as those frequently found in the humid tropics, often produce low quantities of charred remains due to soil formation processes and poor preservation (Miksciek, 1987; Hather, 1994). One approach is to explore archaeobotanical datasets from materials that preserve differently such as starches (Barton and Paz, 2007; Piperno, 2012; Barton, 2012) or phytoliths (Kealhofer and Piperno, 1994, 1998; Piperno, 2009). Silica bodies are inorganic so are not subject to the same patterns of deterioration as organic material. Distinct phytolith morphotypes are produced in different plant parts, including leaves, so can provide additional information to charred botanical remains (Piperno, 1989; Prychid et al., 2004).

Two major questions are posed in this paper:

i. What proportion of gathered and garden cultivated plant remains could survive into the archaeobotanical record?
ii. Is this reflected in the archaeobotanical remains from the different sites?

To answer the first question information was derived from ethnobotanic surveys of gathered plants including wild, feral, field weeds, and those cultivated in gardens in four villages in Thailand. Which plant part was gathered, how it was prepared, consumed and any remains were disposed of, was recorded. Plants were recorded to species, genera or family where possible and the way the plant was exploited was categorised (Table 1).

For the second question phytolith assemblages were analysed

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Table 1
Plant use record, after Anderson, 1993.

Location:		Date:	
Name/s	Family	Use	Notes
Binomial/common/local name/description		code	Where found, wild/cultivated processing and disposal

Key:
1 = food, 2 = fibre, 3 = ceremony, 4 = medicine, 5 = construction, 6 = dye/paint, 7 = pleasure/masticorary, 8 = tinder/firewood, 9 = decoration, 10 = cash, 11 = other

from two South East Asian archaeological sites, Rach Nui (3390–3850 cal BP) in southern Vietnam and Non Ban Jak, (AD 220–700) an Iron Age site in Northeast Thailand. These sites were selected as case studies because they represent different subsistence economies; settled non agriculturalists at Rach Nui and fully developed rice farmers at Non Ban Jak. The phytoliths from these two sites have been analysed as a whole rather than separating the samples into discrete phases because, in this case, the focus is evidence for the remains of gathered or garden cultivated plants and broad distinctions between farming and non-agricultural sites. While ethnographic studies have been applied to archaeobotany (see Antolin et al. (2016) for review), few studies have been published combining phytolith data and ethnography. Tsartsidou et al. (2008, 2009) used modern phytolith assemblages collected from different activity areas in and around an agro-pastoral community in Northern Greece to analyse archaeological phytolith assemblages from a Pottery Neolithic village. Harvey and Fuller (2005) used Thompson's (1996) and Reddy's (1997) ethnographic work on traditional rice and millet crop processing to propose a model using phytoliths for understanding ancient crop processing practices at the site of Mahagara. However, this study is the first time ethnographic work on the use of garden and gathered feral and wild plants has been combined with phytolith analysis to consider food pathways.

2. Methodology

2.1. Methods for ethnobotanical survey

I interviewed households and individuals in each village to identify what was being cultivated in the village gardens and collected from in and around the villages, how it arrived there and how it was used. There was an even distribution of male to female interviewees and both male and females gardened, gathered and prepared food, although most food was prepared and the waste disposed of by women. Many plants in the surveyed gardens had been collected from the forest and replanted so are cultivated wild species. Some were gifts from friends and others brought from another region. Some plants were not cultivated but gathered from the wild or from community forests when needed, others were collected from pathways and ditches around the villages. Plant use was classified into 11 categories; food, fibre, ceremony, construction, colouring, pleasure, fire, decoration, medicine, cash or other, based on Anderson (1993) (Table 1).

What happens to any waste material, including disposal is significant to what might survive so I questioned the villagers about their plant food waste, and observed then recorded how it was discarded. Many plants that are used every day will be invisible archaeobotanically. I considered what would be expected to survive in the archaeobotanical record from these different uses and in which contexts they might be found, particularly focussing on food in this instance.

2.2. Phytolith methodology

Phytoliths can provide a robust archaeobotanical dataset. They are inorganic so preserve well in the humid tropics, often better than charred seeds. However, silica bodies have the disadvantage of rarely being identifiable to genera, species or sub species. For this reason I have emphasised plant families and the broader picture presented by the archaeobotanical phytolith assemblages (Table 2).

Phytoliths were extracted from 29 sediment samples which had

Table 2
Phytolith samples.

Non Ban Jak				
No.	Square	Layer/spit	Context	excavator's notes
113	b2	3:l4		White floor; 25.11.11
165	b2	4:l6	Δ2	Stove
166	b2	4:l6	Δ2	
168	a1	4: 8		
172	b1	4: 8	Δ2	Ash
179	b2	5:l1		Contains rice grains
181	a2	4:l8	Δ2	Clay floor
191	a1	5:l1	Δ1	Structure room 1
192	a1	5:l1	Δ2	From burnt area in room 1
194	a1/a2	5:l1	Δ2	Room 2
224	a2/b2	5:l2a	Δ11	Burnt area
240	b1	5:l2	Δ1	Daub & charcoal underneath the large pot
286	a2	6:l2	Δ1	
312	b1	5:l6	Δ1	Soil in pot found in kiln
	b2	5:l2	Δ2	Hearth ash contents

Rach Nui		
Sample	Trench	Context
12 RN H1 1027	1	External surface and foundation deposit similar to 1024 – associated with F.2j or F.2k: Phase 5 or 6.
12 RN H1 F135	1	The make-up of Platform F.135 at the south end of the trench: Phase 2
12 RN H1 F92	1	Similar to F.72 and F.84: associated with F.2i: Phase 7
12 RN H1 F54	1	F.2f: Phase 10: Extending from the western baulk 1.8m into squares B3 – B4 was a hard compacted layer (F.54) with an upper creamy white/pinkish grey (7.5 yr 7/2) loose loamy sand, with smooth surfaces a few centimetres thick. The north and west edges of this surface were extremely straight and formed a 90° angle in B3. This layer appeared to be made of a very fine-grained material that contained a considerable amount of charcoal within its matrix. When this upper surface was removed there was an abundance of charcoal evenly spread between it and the 0.25m thick deposit of reddish brown (2.5 yr 6/6)
12RN H1 F61	1	Platform surface with underlying charcoal layer – associated with F.2g: Phase 9
12 RN H1 1019	1	Broken up surface and underlying soft sediments similar to 1018 etc. associated with F.2e: Phase 11
12 RN H1 F74	1	Platform surface with underlying charcoal layer – associated with F.2h: Phase 8
12 RN H1 F134	1	Upper surface and charcoal of F.2m: Phase 3
12 RN H1 1009	1	Similar to 1015, 1016: F.2b or F.2c – Phase 13 or 14
12 RN H1 C1010a	1	Similar to 1015, 1016: F.2b or F.2c – Phase 13 or 14
12 RN H1 C1011a	1	Similar to 1015, 1016: F.2c – Phase 13
12 RN H1 C 1013a	1	Similar to 1015, 1016: F.2c – Phase 13

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