



People of the ancient rainforest: Late Pleistocene foragers at the Batadomba-lena rockshelter, Sri Lanka

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ABSTRACT

Batadomba-lena, a rockshelter in the rainforest of southwestern Sri Lanka, has yielded some of the earliest evidence of *Homo sapiens* in South Asia. *H. sapiens* foragers were present at Batadomba-lena from ca. 36,000 cal BP to the terminal Pleistocene and Holocene. Human occupation was sporadic before the global Last Glacial Maximum (LGM). Batadomba-lena's Late Pleistocene inhabitants foraged for a broad spectrum of plant and mainly arboreal animal resources (monkeys, squirrels and abundant rainforest snails), derived from a landscape that retained equatorial rainforest cover through periods of pronounced regional aridity during the LGM. Juxtaposed hearths, palaeofloors with habitation debris, postholes, excavated pits, and animal and plant remains, including abundant *Canarium* nutshells, reflect intensive habitation of the rockshelter in times of monsoon intensification and biome reorganisation after ca. 16,000 cal BP. This period corresponds with further broadening of the economic spectrum, evidenced though increased contribution of squirrels, freshwater snails and *Canarium* nuts in the diet of the rockshelter occupants. Microliths are more abundant and morphologically diverse in the earliest, pre-LGM layer and decline markedly during intensified rockshelter use on the wane of the LGM. We propose that changing toolkits and subsistence base reflect changing foraging practices, from shorter-lived visits of highly mobile foraging bands in the period before the LGM, to intensified use of Batadomba-lena and intense foraging for diverse resources around the site during and, especially, following the LGM. Traces of ochre, marine shell beads and other objects from an 80 km-distant shore, and, possibly burials reflect symbolic practices from the outset of human presence at the rockshelter. Evidence for differentiated use of space (individual hearths, possible habitation structures) is present in LGM and terminal Pleistocene layers. The record of Batadomba-lena demonstrates that Late Pleistocene pathways to (aspects of) behavioural 'modernity' (composite tools, practice of symbolism and ritual, broad spectrum economy) were diverse and ecologically contingent.

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Introduction

The Late Pleistocene, from the warm Last Interglacial (OIS 5e: ca. 125,000 BP) to the end of the Pleistocene epoch, was a period critical

for the evolution of our species. During this period, *Homo sapiens*, which emerged in Africa between 200,000 and 150,000 years ago (Stringer, 2002), expanded its range and became a cosmopolitan species. Towards the end of the Pleistocene, by ca. 35–30,000 BP, people of a recognisably modern anatomy were present across the Old World, from the unglaciated parts of Atlantic Europe in the northwest to Sahul, then the joined Australia and New Guinea continent, in the southeast (Bulbeck et al., 2003; Trinkaus, 2005).

In the course of their dispersal, *H. sapiens* foragers entered and adapted to novel habitats, from the deserts, tropical rainforests,

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estuaries and islands of equatorial Asia, to the periglacial tundra of Europe and Tasmania (Oppenheimer, 2003, 2009; Bulbeck, 2007; Gilligan, 2007; Pope and Terrell, 2008; Petraglia et al., 2010). Many of these landscapes were already parts of a Late Pleistocene ecumene, whose hominin diversity is only hinted at by recent discoveries. These include bones and tools of *Homo floresiensis*, a late member of a clade rooted in early *Homo* (Morwood et al., 2004; Argue et al., 2009), and *Homo erectus* (Swisher et al., 1996), which may have overlapped with *H. sapiens* in Island Southeast Asia for tens of thousands of years. Outside Africa, *H. sapiens* populations, probably diverse at the infraspecific level (c.f. Lahr and Foley, 1998; Gunz et al., 2009), may have interacted with these hominins in ways possibly more intricate and nuanced than earlier models of total population replacement (e.g., Stringer and Andrews, 1988) allowed. The presence of Neanderthal DNA in the genotypes of living non-Africans (Green et al., 2010) is a testimony to some level of interbreeding at the western end of the *H. sapiens* dispersal arc (Hodgson et al., 2010). The dispersal of *H. sapiens* out of Africa, with its ecological, demographic and cultural corollaries, is a central theme of research in human evolution and Pleistocene archaeology. Matters of contention include the number and timing of Late Pleistocene dispersal events, the routes followed by dispersing groups, the interactions of *H. sapiens* newcomers with other hominins, the degree to which non-*sapiens* populations were assimilated into the modern human gene pool, and the behavioural and technological traits that accompanied and, perhaps, facilitated *H. sapiens* dispersal and settlement in novel and changing Late Pleistocene habitats (e.g., Stringer, 2002; Oppenheimer, 2003, 2009; Cameron and Groves, 2004; Macauley et al., 2005; Trinkaus, 2005; Mellars, 2006a,b; Bulbeck, 2007; Endicott et al., 2007; Atkinson et al., 2008; Pope and Terrell, 2008; Petraglia et al., 2010).

Homo sapiens in Late Pleistocene South Asia

Evidence from South Asia should be of critical bearing to these discussions, owing to South Asia's location half way between Africa and Sahul (Fig. 1), its inferred high population densities in the later

part of the Late Pleistocene (Atkinson et al., 2008), and its diverse Late Pleistocene cultures that differed markedly from their better known European and Levantine Upper Palaeolithic contemporaries (James and Petraglia, 2005; James, 2007; Petraglia et al., 2009a, 2010).

This critical region, however, has yielded only a scanty and patchy skeletal record for the Late Pleistocene. With the possible exception of sporadic finds in its northern periphery (a robust *H. sapiens* cranial fragment at Darra-i-Kur, Afghanistan, associated with a Mousterian industry and dated tentatively to ca. 30,000 BP (Angel, 1972; Dupree and Davis, 1972) (Fig. 1), the earliest reliably dated *H. sapiens* skeletal remains in South Asia come from its southernmost tip: Late Pleistocene rockshelters in Sri Lanka, where fragmentary remains may date back to ca. 38,000 cal BP (Beta 3394: $33,070 \pm 410$ BP uncalibrated at Fahien-lena: Kennedy et al., 1987; Kennedy and Deraniyagala, 1989; Deraniyagala, 1992; Wijeyapala, 1997; Kennedy, 1999, 2000; Perera, 2010) (Fig. 1). These finds are among the handful of Late Pleistocene skeletal remains in the vast swath of territory between Arabia and Australia (Kennedy, 2000; Bulbeck et al., 2003). Reconstructions of human dispersal in Late Pleistocene South Asia, therefore, draw on the regional archaeological record and genetic evidence from living populations (see Misra, 2001; James, 2007; Oppenheimer, 2009; and Petraglia et al., 2010 for reviews).

The archaeological record suggests that diverse Middle Palaeolithic industries were present across South Asia during most of the Late Pleistocene. The few available absolute dates indicate a temporal range extending from the Last Interglacial (Achyutan et al., 2007) to ca. 38,000 BP or beyond (Petraglia et al., 2007, 2009b). Diverse assemblages with a substantial blade and microblade component, microliths (small flake- and blade-based stone tools with bipolar blunting along one margin) and bone points, locally accompanied with beads, engraved ostrich shells and other evidence for symbolic practice, made their appearance from ca. 45–40,000 BP onwards (James and Petraglia, 2005; James, 2007; Petraglia et al., 2009a). These industries, variously termed as 'Upper Palaeolithic' and, when microliths are present, 'Microlithic'

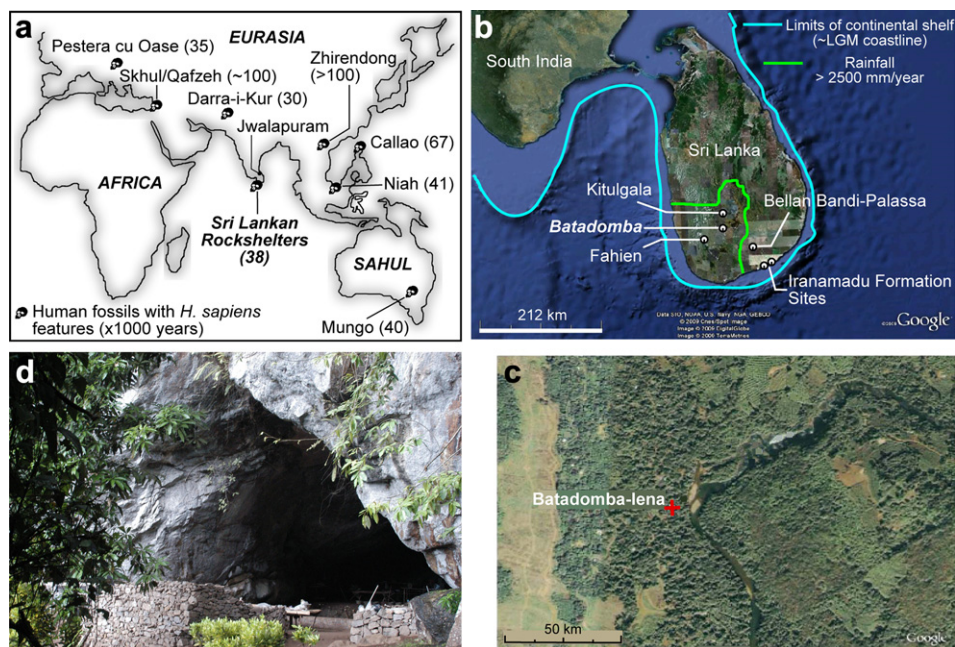


Figure 1. a) Sri Lankan rockshelters in the Late Pleistocene world (emphasis on early pre-30,000 BP *Homo sapiens* sites east of Africa). (Pester cu Oase: Trinkaus et al., 2003; Skhul/Qafzeh: Shea, 2001; Darra-i-Kur: Angel, 1972; Sri Lankan rockshelters: Perera, 2010; Zhirendong: Liu et al., 2010; Niah: Barker et al., 2007; Callao: Mijares et al., 2010; Mungo: Bowler et al., 2003). b) Location of archaeological sites mentioned in the text. c) Setting of Batadomba-lena rockshelter. d) Rockshelter entrance, at the base of a steep gneiss cliff.

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