



Implications of phytolith records from an Early Historic megalithic burial site at Porunthal in Southern India



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ABSTRACT

Collateral phytolith records from four megalithic burials uncovered at Porunthal on the foot hills of the Western Ghats, Tamil Nadu, are presented. This has contributed to the current knowledge of the landscape in association with the flora and megalith culture that prevailed in South India during the Early Historic time at 540–410 cal BCE. Evidence shows that Early Historic megalithic people engaged less in pastoral activities on the open landscape, dominated by herbs e.g., Cyperaceae and Poaceae, and also by *Palmae* species in semi-arid environment. The presence of strong mode of settled-paddy and millet farming cultures, cereal-processing activities and grazing in association with the burial practices were significant as early as 6th century BCE. Seeds, leaves and sheath from domesticated rice, millet and some materials from sedges and *Palmae* species were deliberately deposited indicating variable burial rituals in each grave. Burial tradition indicates that Iron Age and Early Historic megalithic people of southern India may have carried out burial rituals with more rice than millets. Evidence for the early appearance of Brahmi writing as part of the ‘complex’ megalithic social life marks the beginning of Early Historic Period, previously not reported in southern Asia. Phytolith evidence also provides new insight into the transformation of urban-fringe landscapes with possible irrigated agriculture in those broad ecological and cultural contexts.

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1. Introduction

Phytoliths - minute silicate bodies from the cellular environments of plants are known to scientists since the middle of the nineteenth century (Piperno, 2006). Phytolith analyses had a wide range of applications in fields e.g., archaeology and palaeoecology, mostly in Europe, USA, East, West and Southeast Asia after 1970s (Bryant, 2003; Pearsall, 2010). Research questions relevant to the origins and intensification of agriculture (Pearsall, 1978, 1982; Fijiwara, 1993; Kealhofer and Piperno, 1994; Chen and Jiang, 1997; Zhao and Pearsall, 2000; Davey et al., 2007; Piperno et al., 2008; Piperno and Stothert, 2003; Zhijun, 1998), reconstruction of past environment e.g., vegetation, climate, landscape (Rovner, 1971; Lewis, 1981; Piperno, 1993a,b; Donohue and Dinan, 1993; Fredlund, 1993; Dinan, 1993; Madella, 1997; Kealhofer and Penny, 1998; Runge, 1999; Barboni et al., 1999; Carter and Lian, 2000; Clarkson and Wallis, 2003), irrigation (Rosen and Weiner, 1994;

Rosen, 1999) and food habits (Renfrew, 1973; Middleton and Rovner, 1994) have widely been addressed using phytolith proxy evidence.

In South Asia too, phytolith records describe the late Quaternary vegetation and climate changes and anthropogenic impact on environment (Risberg et al., 2002; Saxena et al., 2002; Premathilake and Epitawatta, 2001; Kajale et al., 1997; Kajale and Eksambekar, 2001, 2007; Madella, 2003; Premathilake and Risberg, 2003; Premathilake, 2003, 2006, 2012; Weiskopf, 2005; Weiskopf et al., 2015a, 2015b; Singh et al., 2007; Prasad et al., 2007; Fuller and Madella, 2009; Premathilake and Gunatilaka, 2013; Ghosh et al., 2014; Premathilake and Seneviratne, 2015; Noguè et al., 2015). These works show that phytolith investigations in Southern Asia and particularly in the red soils of were very relevant given the poor preservation of organic walled microfossils (e.g., pollen), due to highly ferruginous materials and oxidizing conditions prevailing (Lewis, 1981; Runge, 1999; Piperno, 2006). However, phytolith analyses have so far not been used in understanding the context of material cultures and symbols largely accumulated in megalithic burials preserved in the areas dominated by red soils (Rajan and Yatheeskumar, 2014).

The transition from Iron Age to Early Historic is of great significance in Southern Asian archaeology and history (Possehl and Gullapalli, 1999; Gullapalli, 2009; Deraniyagala, 1992; Coningham et al., 1996; Deraniyagala and Abeyratne, 1997; Coningham, 2006; Rajan, 2012,

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