

Standing on the shoulders of giants: the contribution of Cláudia Sousa for the foundation of primate archaeology

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Cláudia Sousa was a founding member of the newly emerging and interdisciplinary field of primate archaeology. This discipline employs an archaeological approach to the study of nonhuman primates through the observation of their material culture – i.e. objects produced during tool use and manipulation – and has significant implications in the study of human evolution.

KEYWORDS: primate archaeology, primate behaviour, human evolution, tool use, material cultures.

Aos ombros de gigantes: o contributo de Cláudia Sousa para a fundação da arqueologia dos primatas ♦ Cláudia Sousa foi uma das fundadoras da área emergente e interdisciplinar da arqueologia dos primatas. Esta disciplina emprega uma abordagem arqueológica no estudo dos primatas não humanos através da observação da sua cultura material – i.e. objetos produzidos durante a utilização e manipulação de ferramentas – e tem implicações significativas no estudo da evolução humana.

PALAVRAS-CHAVE: arqueologia dos primatas, comportamento, evolução, ferramentas, cultura material.

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THE 80'S MARKED A STIMULATING PERIOD FOR THE USE OF REFERENTIAL and conceptual (either cladistic or strategic) modelling to unveil our behavioural past (Potts 1987; Foley and Lee 1989; Tooby and DeVore 1987; Wynn and McGrew 1989, but see Stanford 2012 for a review). The next decade saw this research grow and was much focused on using primates as models (human and nonhuman) to shed light in the evolution of key hominin traits (e.g., social organization, nesting/shelter use, intelligence, tool making). During this phase, an archaeologist developed interest in the stone tools used by wild

chimpanzees in Ivory Coast and described features of these tools in relation to the hominin record (Joulien 1996). This study marks the dawning of the archaeology of primates – which differs from primate archaeology, as we will see. The trend continued with the pioneering excavation of a nonhuman primate archaeological site in Taï forest and the first publication of a nonhuman stone tool assemblage (Mercader, Panger and Boesch 2002, Mercader *et al.* 2007). These studies were crucial in opening the field of archaeology to primate material culture, albeit limited by a traditional archaeological approach to tools used by nonhumans: analysing objects after being used or recovering discarded assemblages. McGrew (e.g., 1992, 2004) had argued frequently about the need of inbreeding archaeology and primatology thoroughly, and inspired the first primate archaeologists. By 2004, Cláudia Sousa was the only international primatologist in Portugal, and was teaching primatology in the Masters programme in Human Evolution at Coimbra, Portugal. Her charisma and scientific mentoring would prove crucial during the next decade to internationalize Portuguese primatology and Portuguese primatologists. I had been trained as an archaeologist but decided to pursue my passion in primatology by studying wild chimpanzee stone tool use, while investigating some of the human earliest stone tool assemblages at Koobi Fora, Lake Turkana, Kenya. Mentored by McGrew and J. W.K. Harris, the idea was to do “living archaeology” while studying our closest living relatives. Cláudia Sousa, who was very pragmatic and scientific, was initially apprehensive about supervising such a risky topic that varied from primatology. However, Cláudia did not dismiss the proposed study or the possibility of taking an archaeologist to study wild chimpanzees in Africa. From this, in 2007 the pioneering field of primate archaeology emerged (Carvalho, Sousa e Matsuzawa 2007). The first results were published soon after, a fusion of ethology and archaeology with an evolutionary framework (Carvalho *et al.* 2008, 2009). The research was recognized internationally and, by 2009, as a result of the “Primate meeting paleoanthropology” conference organized with colleagues in 2008 (Ling *et al.* 2009), the new field of primate archaeology was formally announced in the journal *Nature* (Haslam *et al.* 2009). Primate archaeology (unlike the archaeology of primates) requests scientists equally trained in both areas. It focuses on modelling the evolution of technological behaviour through applying a combination of methods to tools while they are being used and after use. It also addresses processes of site formation *in vivo* and focuses on strategies of exploitation of resources in the tool using areas (Carvalho 2007; Carvalho *et al.* 2007, 2008, 2012).

Where are we ten years later? Cláudia Sousa would acknowledge that we have not yet answered some of our main questions (e.g., who were the first tool users, when and how did technology emerge, etc.), but the approach has proven valid for testing some important predictions in human evolution

that would not have been possible otherwise (e.g., testing one of the main hypotheses for the origins of bipedalism, Carvalho *et al.* 2012). Furthermore, the field has flourished and is becoming a burgeoning area of research in its own right (Stewart, Piel and McGrew 2011; Haslam *et al.* 2013; Pascual-Garrido *et al.* 2013; Luncz, Wittig and Boesch 2015). On the other hand, in East Africa, where I regularly examine geological deposits older than the Oldowan (+2.6 Ma), new assemblages have been found due to surveying areas that had never been the focus of archaeologists, as they were considered “too old” to have tools (see Harmand *et al.* 2015, and the novel discovery of the Lomekwian industry in Kenya). There have also been recent cutting-edge developments concerning novel methods for analysing some of the most difficult-to-recognize tools in the archaeological record: pounding tools (tools not modified prior to use but by use). Two studies were developed in parallel, one describing a new GIS method for recognizing intentional versus accidental or natural modifications (Caruana *et al.* 2014), and another reporting the first GIS analysis of a chimpanzee stone tool assemblage, allowing for future comparisons across human and nonhuman assemblages (Benito-Calvo *et al.* 2015). The novel discipline that Cláudia Sousa helped to establish has provided the foundations and the empirical data that then allowed for the official establishment of the discipline (Haslam *et al.* 2009). The field is thriving with multiple studies focusing on other nonhuman primates using stone tools – capuchin monkeys (*Sapajus sp.*) and macaques (*Macaca fascicularis aurea*) – (Visalberghi *et al.* 2013; Haslam *et al.* 2013), or those focusing on communities of chimpanzees using tools made of perishable raw materials (Pascual-Garrido *et al.* 2013).

Cláudia Sousa gave important support to the birth of primate archaeology, which led to several innovative approaches: (1) ethology and archaeology combined in the same study; (2) recording modern primate site formation; (3) linking behaviours to tool assemblage types; (4) developing analytical methods to recognize percussive technologies; and (5) surveying rocks older than 2.6 Ma, initiating the study of Pliocene archaeology. Cláudia’s research and mentoring extended across many areas of primatological research, spanning from great ape cognition to primate conservation and human evolution, and her legacy in Portugal and internationally will long be remembered.

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