Trail of 'stone breadcrumbs' reveals the identity of one of the first human groups to leave Africa

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A series of new archaeological discoveries in the Sultanate of Oman, nestled in the southeastern corner of the Arabian Peninsula, reveals the timing and identity of one of the first modern human groups to migrate out of Africa, according to a research article published in the open-access journal *PLoS ONE*.

An international team of archaeologists and geologists working in the Dhofar Mountains of southern Oman, led by Dr. Jeffrey Rose of the University of Birmingham, report finding over 100 new sites classified as "Nubian Middle Stone Age (MSA)." Distinctive Nubian MSA stone tools are well known throughout the Nile Valley; however, this is the first time such sites have ever been found outside of Africa.

According to the authors, the evidence from Oman provides a "trail of stone breadcrumbs" left by early humans migrating across the Red Sea on their journey out of Africa. "After a decade of searching in southern Arabia for some clue that might help us understand early human expansion, at long last we've found the smoking gun of their exit from Africa," says Rose. "What makes this so exciting," he adds, "is that the answer is a scenario almost never considered."

These new findings challenge long-held assumptions about the timing and route of early human expansion out of Africa. Using a technique called Optically Stimulated Luminescence (OSL) to date one of the sites

in Oman, researchers have determined that Nubian MSA toolmakers had entered Arabia by 106,000 years ago, if not earlier. This date is considerably older than geneticists have put forth for the modern human exodus from Africa, who estimate the dispersal of our species occurred between 70,000 and 40,000 years ago.

Even more surprising, all of the Nubian MSA sites were found far inland, contrary to the currently accepted theory that envisions early human groups moving along the coast of southern Arabia. "Here we have an example of the disconnect between theoretical models versus real evidence on the ground," says co-author Professor Emeritus Anthony Marks of Southern Methodist University. "The coastal expansion hypothesis looks reasonable on paper, but there is simply no archaeological evidence to back it up. Genetics predict an expansion out of Africa after 70,000 thousand years ago, yet we've seen three separate discoveries published this year with evidence for humans in Arabia thousands, if not tens of thousands of years prior to this date."

The presence of Nubian MSA sites in Oman corresponds to a wet period in Arabia's climatic history, when copious rains fell across the peninsula and transformed its barren deserts to sprawling grasslands. "For a while," remarks Rose, "South Arabia became a verdant paradise rich in resources – large game, plentiful freshwater, and high-quality flint with which to make stone tools." Far from innovative fishermen, it seems that early humans spreading from Africa into Arabia were opportunistic hunters traveling along river networks like highways. Whether or not these pioneers were able to survive in Arabia during the hyperarid conditions of the Last Ice Age is another matter – a mystery that will require archaeologists to continue combing the deserts of southern Arabia, hot on the trail of stone breadcrumbs.

More information: Rose JI, Usik VI, Marks AE, Hilbert YH, Galletti CS, et al. (2011) The Nubian Complex of Dhofar, Oman: An African

Middle Stone Age Industry in Southern Arabia. PLoS ONE 6(11): e28239.doi:10.1371/journal.pone.0028239