

# WHO WERE THE FIRST SETTLERS OF INDIA?

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When did our species, *Homo sapiens*, first set foot in India? There are two competing versions of the answer: let's call them the 'early version' and the 'late version'. The 'early version' says they arrived 74,000 to 120,000 years ago from Africa through the Arabian peninsula with Middle Stone Age tools such as scrapers and points that helped them hunt their prey, gather food, or make clothes. The 'late version' says they arrived much later, around 50,000 to 60,000 years ago, with upgraded technology such as microlithic (tiny stone) tools that might have been used to give sharp tips to arrows and spears.

A geological event separates the two versions: the supervolcanic eruption at Toba in Sumatra, Indonesia, about 74,000 years ago, dumped tonnes of ash all over South-east Asia and South Asia, causing much stress to all life in the region. The 'early version' says migrants reached India before Toba; the 'late version' says the opposite.

## Two new studies

Until two months ago it looked like the late version had all the momentum. But two new studies, published in July and August, may have changed that. The first study, led by Professor Chris Clarkson of the University of Queensland, established that modern humans were in Australia by between 59,300 and 70,700 years ago, or, if you take the midpoint, 65,000 years ago. That is about 15,000 years earlier than previous estimates. Prof. Clarkson and his colleagues used the latest techniques to date things left behind by humans at the Madjedbebe caves in Australia's Northern Territory: mortars and pestles, ground-edge axes, and painting material.

The second study, led by archaeologist Dr. Kira Westaway of the Macquarie University, palaeontologist Dr. Julien Louys of the Australian National University, and others had equally remarkable results. They reinvestigated two teeth that had been found in the Lida Ajer caves in Indonesia's Sumatra island more than a century ago, but whose dating and provenance were disputed. Using the latest multidisciplinary techniques, they have confirmed that the teeth belonged to modern humans who lived 63,000-73,000 years ago, thus pushing back the dates for modern human occupation of South-east Asia by about 20,000 years.

The Sumatra and the Madjedbebe findings point in the same direction, says Dr. Louys: that Out of Africa (OOA) migrants made it into South-east Asia before 60,000 years ago. In fact, he says, they could have been in the region for much longer because "it is incredibly likely we're not sampling the very first humans in Sumatra and Australia."

But if people were already in Australia and South-east Asia by 65,000 years ago, then they would have had to have left Africa and reached India much earlier (India having been a key corridor for the OOA migration). And that would put the 'late version' in jeopardy. Professor Ravi Korisettar of the Karnatak University, a well-known archaeologist who has worked extensively on early modern human migrations in South Asia, concurs. "These findings support our argument for an earlier migration," he says.

## Why should we care?

But wait a minute, why should anyone care? How does it matter when a group of hunter-gatherers first walked into India? The simple answer is that human history in the subcontinent begins with them. But there's also another reason. The first settlers of India are our direct

ancestors: about 50% to 60% of Indian genetic ancestry today comes from the first settlers, with the rest contributed by later migrants from West Asia, East Asia, and Central Asia. So, the deeply held belief that only tribals (about 8.6% of the population) carry the ancestry of the original settlers couldn't be more wrong. The first settlers of India are, indeed, the bedrock of our population and civilisation. Without getting their story right, we cannot get the rest of our history right.

### Jwalapuram and the early version

So, to get back to our story, there's a reason for Prof. Korisettar to feel vindicated. He was instrumental in discovering the Jwalapuram site in Andhra Pradesh, which posed the first big challenge to the 'late version'. Jwalapuram lies in the Jurreru river valley and its significance is in the fact that the river basin holds layers of volcanic ash left behind by the Toba eruption. The archaeologists who excavated Jwalapuram more than a decade ago, including Prof. Korisettar and Prof. Michael Petraglia, then of Cambridge University, found something remarkable at the bottommost layer: Middle Stone Age tools dated to around 77,000 years ago and were made by what they believe were modern humans. Those findings created a stir because they frontally challenged the 'late version'. Prof. Korisettar and Prof. Petraglia, in fact, went on to argue that modern humans could have been in India as early as 100,000-120,000 years ago. "Ever since our paper was published in *Science* magazine in July 2007, we have been suggesting pre-Toba expansion," says Prof. Korisettar.

The Jwalapuram findings did not go uncontested, though. Middle Stone Age tools were made by both modern humans and archaic hominins such as *Homo erectus* and are, therefore, difficult to assign to one or the other. And India has had archaic hominins at least from about 1.5 million years ago. But Prof. Korisettar argues that the Jwalapuram artefacts are remarkably similar to those made by Middle Stone Age modern humans in Africa. That argument now finds strong support from Dr. Louys who says "it makes sense" to think modern humans were in Asia before the Toba eruption.

### The late version

The problem is that this suggestion bumps up against genetics. All humans belong to haplogroups or lineages (Y-DNA haplogroups for males, and mitochondrial or mtDNA haplogroups for females), and by studying current populations using genetic markers and mutation rates, geneticists can create global family trees and estimate the age at which two haplogroups shared a common ancestor. These techniques have improved by leaps and bounds, so it's no surprise that there's now near-consensus about the history of human migrations. It goes something like this: *Homo sapiens* originated in Africa over 200,000 years ago, started range expansions into the Levant and West Asia between 120,000-100,000 years ago, and started on a colonising journey of the world around 70,000 years ago, reaching South Asia by 60,000 years, Australia by 50,000 years, and Europe by 45,000 years ago.

All non-African populations in the world, therefore, are descendants of a single, small group of migrating Africans (perhaps numbering no more than a thousand). Because of this bottleneck, the entire non-African world population belongs to just three mtDNA super-haplogroups M, N, and R (and C, D, and F in the case of non-African Y-DNA). The common ancestor of M, N, and R is a parent haplogroup called L3, which still has many lineages in Africa. Given this, it is reasonable to conclude that OOA migrations could not have happened earlier than the emergence of L3. And genetic studies say the earliest possible date for the emergence of L3 is 70,000 years ago. In other words, there is no way that an OOA migration could have happened before the Toba eruption of 74,000 years ago!

Those who argue this also put forward other reasons why the 'early version' cannot hold. One of them is that genetic records show that the first migrants had spread across South Asia, South-east Asia, and Australia within a brief period of time before too many mutations could accumulate. And that means it must have been quite a sprint, in historical terms. The only way this could have been accomplished is if they took a coastal route from West Asia to India to South-east Asia and then, finally, Australia. A coastal route meant two things: one, the beach-hopping migrants could use the same skill sets to survive on marine resources such as fish and crustaceans all along their journey. Two, their march got an unintended directionality, taking them inexorably towards Australia.

What lends support to this chronology is that at least from about 35,000 years ago, there is incontrovertible evidence of modern humans in South Asia, while evidence for earlier presence is circumstantial. The earliest modern human fossil in the region is from the Sri Lankan cave of Fa Hien, dated to 33,000-30,000 years ago. (Sri Lanka was then linked to the Indian landmass, as sea levels were lower). In India too, there is abundant evidence of microlithic tools from around the same time.

### Squaring the circle

There is an attractive parsimoniousness to the 'late version' and until now there hasn't been abundant, securely dated evidence against it. Moreover, every recent genetic study has further confirmed the late version, the latest being "A genetic history of aboriginal Australia", the lead author of which is Dr. Michael Westaway of Griffith University. "Our study added a lot more detail to the understanding of early migrations," says Dr. Westaway. Co-author Dr. Sankar Subramanian acknowledges the difference between the findings of their study and that of the Madjedbebe study. "The age of the common ancestor estimated in our study is younger, about 40,000 years (as against 65,000 years of the Madjedbebe study)," he says, adding that the difference could be either because some of the early lineages have gone extinct and therefore do not show up in the genetic studies, or simply because the genetic study did not include samples from the Northern Territory, the area where Madjedbebe caves are located.

So, how does one square this circle? The 'late version' cites genetics to say that OOA could not have happened before 70,000 years ago. But archaeological evidence says humans were already in Sumatra by around then. There are two ways of looking at this. The first is that the new findings do not really overturn the 'late version', but only stretch it to the maximum. The lower end of the Madjedbebe study puts the age of the artefacts at 59,300 years; that of the Sumatra study puts it at 63,000 years. Theoretically, both could fall within the extreme range of possibilities, with OOA migrants reaching Australia by 59,000 years ago, after having left Africa by 70,000 years ago. Another possibility is that the Madjedbebe and Sumatra people went extinct long ago, leaving behind artefacts and a couple of teeth, but without leaving a mark in the genetic pool as it exists today.

The new studies may have given new wind to the early version of OOA, but it will take new fossil finds with older dates for a new consensus to emerge.

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