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Keeladi: Evidence, Chronology and Significance

A stratigraphic and historical assessment of the Vaigai-valley settlement

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Overall assessment: strong evidence for a major early-historic habitation; contested boundaries for chronology, literacy and urbanism

This paper separates excavated observation, laboratory result, contextual inference and wider historical interpretation. It is intended as a reproducible evidence review, not as a claim of cultural ownership or political priority.

Abstract

Keeladi (Keezhadi), near the Vaigai River southeast of Madurai, has become central to debates about early settlement, production, writing and urbanism in South India. This paper evaluates the site through stratigraphy, radiocarbon dating, architecture, ceramics, craft evidence and inscribed material. The strongest conclusion is that Keeladi preserves a substantial, organised habitation whose occupational sequence extends at least into the sixth century BCE and continues into the early centuries CE. Radiocarbon measurements date organic samples and their archaeological contexts; they do not automatically date every associated sherd or inscription. Brick features, water-management elements, dense domestic assemblages and specialised production support an interpretation of complex settlement, but the label "urban" remains scale- and definition-dependent. Tamil-Brahmi/Tamili-inscribed sherds directly attest writing, while population-wide literacy and a sixth-century date for particular inscriptions require closer contextual demonstration. Graffiti marks cannot be equated with script or linked directly to the Indus script by visual resemblance alone. Keeladi decisively expands the evidence base for early Tamilakam while leaving the political form, settlement hierarchy and detailed history open to further publication and testing.

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1 Research question and method

The question is not whether Keeladi is "important" in the abstract, but what its excavated record establishes, which inferences are probable, and which public claims exceed the evidence. The review gives greatest weight to excavation reports, laboratory results and peer-reviewed materials studies. Government summaries are used as primary evidence for what agencies report, not as substitutes for complete context records. Journalism is used for attributed institutional disagreement.

Four evidential levels are distinguished:

1. **Observation**: a wall, sherd, bead, feature or sample recorded in an excavated context.
2. **Measurement**: a radiocarbon determination, mineralogical signature or microscopic structure.
3. **Contextual inference**: the date, function or relationship assigned through stratigraphy and association.
4. **Historical interpretation**: claims about urbanism, literacy, polity, trade or civilisational continuity.

Confidence normally decreases as an argument moves from observation to broad interpretation unless several independent evidence classes converge.

2 Site and history of investigation

Keeladi lies approximately 12 km southeast of Madurai and about 2 km north of the Vaigai River. Its importance is regional: habitation at Keeladi should be read with nearby burial and settlement evidence at Konthagai, Agaram and other sites across the Vaigai basin. A single mound is a sample of a lived landscape, not the landscape itself.

The Archaeological Survey of India (ASI) excavated the site during 2014–15, 2015–16 and 2016–17. The Tamil Nadu State Department of Archaeology (TNSDA) continued work from 2017–18 onward. This succession produced different season reports, sampling programmes and interpretive emphases. TNSDA's 2019 synthesis presented the fourth-season material as an urban settlement of the Sangam age. A later state overview reported 35 accelerator mass spectrometry (AMS) dates and cumulative inventories including 172 Tamili-inscribed and 2,128 graffiti-bearing sherds. These are important counts, but they must be tied to season, trench, layer and classification rule before being used comparatively.

The Ministry of Culture announced in July 2025 that an official ASI report for the first two seasons had been released after review. Debate continued about the report's periodisation and review process. That dispute is relevant to access and confidence, but institutional motive cannot decide archaeological chronology. The remedy is publication of observations, matrices, sample provenience, laboratory outputs and interpretive revisions.

3 Chronology: what the dates mean

3.1 The sixth-century BCE horizon

TNSDA reports that analysis of carbon samples produced a sixth-century BCE result, commonly summarised as 580 BCE. The 2025 state synthesis presents a broader set of AMS determinations, with calibrated central values extending approximately from 610 BCE to 220 CE. Together they support occupation during the later first millennium BCE and into the early centuries CE. They do not demonstrate one uniform settlement phase across that entire interval.

Radiocarbon laboratories measure the remaining carbon-14 in organic material. A conventional radiocarbon age is converted to calendar probability through a calibration curve; the result is a distribution, not an exact birthday. Archaeological meaning then depends on the sample's relationship to the deposit. Charcoal may predate the event in which it was deposited (the "old wood" problem); small material may move through pits, roots or later disturbance; residual objects may persist in younger layers.

Evidence	What it can establish	What it cannot establish alone
AMS date on charcoal	Calendar probability for the sampled organism's death; a chronological constraint on a secure context	Exact date of a wall, pot or inscription without a demonstrated depositional relationship
Stratigraphic sequence	Relative order of deposits and features	Absolute calendar date without external dating evidence
Ceramic typology	Comparison with independently dated assemblages	Exact date where types have long use-lives or circular chronologies
Inscribed sherd	Presence of writing or marking in a material context	Rate of literacy, language of every mark, or date earlier than its secure layer

The defensible formulation is therefore: *some excavated contexts at Keeladi date to the sixth century BCE*. A stronger statement—that every feature or all writing at the site dates to 580 BCE—requires object-by-object provenience and stratigraphic demonstration.

3.2 Periodisation remains revisable

Period boundaries are analytical tools. Changes in ceramic frequency, architecture, artefacts and dated samples may define phases, but occupation rarely changes everywhere at once. Competing chronologies for the site's earliest phase should be compared through the same trench matrices and calibrated probability ranges rather than through isolated headline dates. A Bayesian chronological model could combine stratigraphic order with AMS likelihoods, provided complete sample data are released.

4 Built environment and the question of urbanism

Excavation publications describe brick-built features, floors, channels or drains, ring-well components and dense habitation debris. These establish investment in durable construction, water management and repeated occupation. They also imply labour coordination and craft knowledge. They do not by themselves reveal a complete street plan, total population or named political authority.

Archaeologists use “urban” in several ways: population concentration; functional diversity; administrative centrality; specialised production; monumental or infrastructural investment; and position in a settlement hierarchy. Keeladi clearly satisfies some functional indicators, especially dense habitation, infrastructure and craft activity. The scale and regional-centrality tests require systematic survey, mound-boundary work and comparison with neighbouring settlements.

The phrase “urban civilisation” can communicate complexity but risks implying a bounded, homogeneous culture or state. “Substantial early-historic habitation and production centre” is more precise until settlement size, zoning, hierarchy and political organisation are reconstructed. This precision does not diminish Keeladi. It locates its significance in evidence that can be tested.

5 Households, craft and economy

The assemblage includes abundant pottery, spindle whorls, beads, iron and copper objects, ornaments, gaming pieces and production debris. In combination, these illuminate food storage and consumption, textile work, personal display, recreation and specialised manufacture. An artefact’s presence indicates use or deposition; only spatial patterning, residues, unfinished pieces, wasters and tools can identify a workshop with confidence.

A peer-reviewed study by Odelli and colleagues examined 29 sherds from Alagankulam and Keeladi, including 17 from Keeladi, using petrography, X-ray diffraction, X-ray fluorescence and Raman spectroscopy. Common black-and-red and coarse red wares were compatible with local geology. Their technological routine appeared stable through the examined sequence. Variation in red polished ware suggested local imitation and exchange within Tamil Nadu. This supports skilled local production and regional circulation, while cautioning against automatic identification of fine ware as Roman import.

Black-and-red ware was produced through controlled oxidising and reducing firing conditions. Materials science makes that achievement measurable without projecting modern scientific concepts onto ancient craftspeople. A separate microscopy study identified carbon nanostructures in black pottery coatings. It demonstrates the physical result of a production process; it does not show that potters possessed a theoretical concept of nanotubes or engineered them at the nanoscale.

6 Writing, names and the limits of literacy claims

Tamil-Brahmi (also called Tamili in TNSDA publications) adapts Brahmi to represent Tamil phonology. Inscribed potsherds at Keeladi are direct archaeological evidence that writing occurred in the site’s material world. Short inscriptions may record personal names, ownership, production or circulation, although each reading depends on preservation and palaeography.

Three cautions matter. First, a carbon date belongs to the organic sample; an inscription shares its date only if the stratigraphic association is secure and the objects are not residual or intrusive. Second, a set of names in different hands demonstrates multiple writing acts, not a population literacy rate. Third, graffiti marks include non-alphabetic symbols. Their classification, function and chronology must be established before they are counted with inscriptions.

Claims connecting south Indian graffiti directly to the Indus script face a large chronologi-

cal and evidential gap. Similar simple shapes can arise independently, and resemblance does not specify language, sound or transmission. A credible continuity argument would require defined sign inventories, positional rules, frequencies, chronological chains and results that outperform chance and alternative explanations. Keeladi currently supplies material for that research question, not its solution.

7 Keeladi, Sangam literature and early Tamilakam

The archaeology and early Tamil texts illuminate different evidence domains. Literature describes social roles, exchange, warfare, landscapes and settlements, but texts have composition, transmission and genre histories. Excavated houses or crafts cannot be assigned to a named poem or ruler without a direct bridge. Conversely, lack of a royal inscription does not make household archaeology historically marginal.

Keeladi's major contribution is to shift analysis from dynastic lists toward ordinary material life: how vessels were made, water managed, textiles produced, names marked and objects discarded. It gives physical depth to the study of early Tamilakam while checking the temptation to make literature a literal site report.

8 Competing interpretations and institutional trust

The public dispute has combined legitimate technical questions with regional and national identity politics. Four propositions should be kept separate:

- an early radiocarbon result can be valid even if some wider historical claims are overstated;
- a report can be imperfect without the excavation being unimportant;
- institutional review is normal, but opaque review weakens reproducibility;
- political interest does not automatically falsify a measurement, just as official publication does not make every inference final.

The most productive standard is symmetrical transparency. Excavators should publish field records and uncertainty; reviewers should identify requested corrections and their empirical basis; laboratories should report identifiers, pretreatment, material and calibrated ranges; repositories should preserve versions. This enables critics and supporters to test the same record.

9 Evidence assessment

Claim	Assessment	Reason
Major habitation existed in the Vaigai valley in the early historic period	Strong	Convergence of stratigraphy, architecture and dense material assemblages
Some Keeladi contexts reach the sixth century BCE	Strong	Multiple reported AMS dates; contextual interpretation remains sample-specific

Keeladi had specialised craft production and regional exchange	Strong to probable	Artefact assemblages and peer-reviewed ceramic characterisation
Writing was present at Keeladi	Strong	Inscribed ceramic corpus
Tamil-Brahmi at the site is securely dated to exactly 580 BCE	Contested	Requires direct provenience and association for each sherd; carbon dates are not inscription dates
Keeladi was a city	Probable under functional definitions	Infrastructure and specialisation support complexity; total scale and hierarchy remain incomplete
The settlement proves mass literacy	Unsupported	Inscription counts do not supply a population denominator or reading ability
Graffiti demonstrate direct Indus-script continuity	Unsupported at present	Morphological resemblance is insufficient without a transmission chain and formal testing

10 Research priorities

Future work would most improve confidence by publishing: (1) georeferenced trench and feature plans; (2) Harris matrices and context registers; (3) all radiocarbon laboratory reports and calibration code; (4) high-resolution inscription images, readings and find contexts; (5) ceramic quantification by fabric, form and layer; (6) archaeobotanical, zooarchaeological and residue datasets; (7) regional survey and settlement-size estimates; and (8) versioned reports recording disagreements. Open data would allow Bayesian chronology, spatial analysis and independent epigraphic review.

11 Conclusion

Keeladi is neither a single date nor a slogan. Its strongest significance lies in a converging record of habitation, construction, production, exchange and writing in the Vaigai valley. Scientific dates make a sixth-century BCE occupational horizon credible. They do not remove the need to prove the association of individual inscriptions or to define urbanism explicitly. The evidence expands the history of early South India without requiring claims of uniqueness, direct Indus continuity or universal literacy.

The correct scholarly posture is confident about what excavation establishes and candid about what remains inferential. On that basis, Keeladi deserves a central place in the archaeology of early historic South Asia and a publication programme equal to its importance.

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Editorial note. Terminology follows sources where necessary. “Keeladi” and “Keezhadi” refer to the same site. All dates are BCE/CE. This research synthesis may be revised when new context records, laboratory reports or excavation volumes become available.