Ancient dairy, plant-food traces in Keeladi, Gottiprolu pottery

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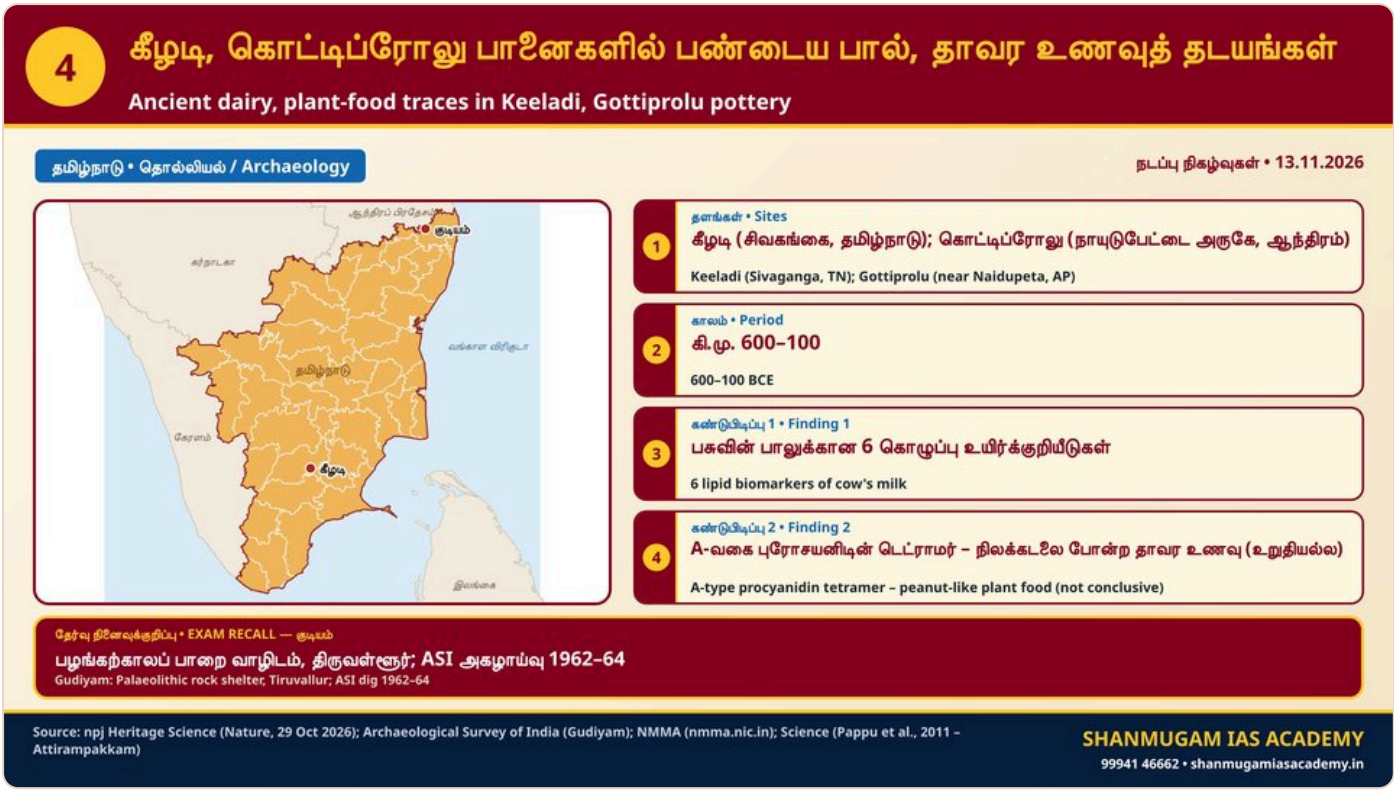

News

A paper analysing food residues absorbed into pottery from the archaeological sites of Keeladi in Tamil Nadu and Gottiprolu in Andhra Pradesh was published in 'npj Heritage Science' (Nature group) on 29 October 2026. Researchers from the Vellore Institute of Technology (VIT), the Archaeological Survey of India (ASI), PSGR Krishnammal College for Women and the Tamil Nadu Department of Archaeology took part. Four unglazed potsherds of 600–100 BCE (two from each site) were examined with UPLC-Q-ToF-MS/MS (liquid chromatography–mass spectrometry) and X-ray micro-CT scanning. Six lipid biomarkers consistent with cow's milk were found, taken as evidence of dairy processing. A plant molecule never before recovered from an archaeological context (an A-type procyanidin tetramer) was also found, which the researchers think points to peanuts or similar plant foods. They themselves note that with so few samples this is not conclusive. Tamil Nadu's other key windows into deep prehistory are the Palaeolithic sites of Gudiyam and Attirampakkam in Tiruvallur district.

Key facts for the exam

Point	Details
Journal, date	npj Heritage Science, 29 Oct 2026
Sites	Keeladi (Sivaganga, TN); Gottiprolu (near Naidupeta, AP)
Period	600–100 BCE

Point	Details
Samples	4 unglazed potsherds
Methods	UPLC-Q-ToF-MS/MS; X-ray micro-CT
Finding 1	6 lipid biomarkers of cow's milk
Finding 2	A-type procyanidin tetramer – peanut-like plant food (not conclusive)
Team	VIT, ASI, PSGR Krishnammal College, TN Archaeology Dept
Gudiyam	Palaeolithic rock shelter, Tiruvallur; ASI dig 1962–64

Background

- Scientific method: fats (lipids) from cooked food survive for thousands of years in the pores of unglazed pottery. Extracting and identifying them by chromatography–mass spectrometry reveals ancient diets. The age of once-living remains is found by carbon-14 (radiocarbon) dating, useful only up to about 50,000 years (Willard Libby, 1949).
- Agricultural history: the groundnut (peanut) is native to South America and is usually held to have reached India through the Portuguese in the 16th century. This study's suggestion that it may have been present earlier is debatable. Bones of humped Indian cattle (Bos indicus) found at both Keeladi and Gottiprolu fit the milk finding. The Mullai tinai of Sangam literature depicts herders' life of milk, curd and ghee.
- Prehistory – Gudiyam: the Gudiyam cave in the Allikuli hills of Tiruvallur district is one of South India's large natural rock shelters. K.D. Banerjee of the Archaeological Survey of India excavated it in 1962–63 and 1963–64 and found continuous layers of stone-tool cultures from the Palaeolithic onwards. It is listed by the National Mission on Monuments and Antiquities (NMMA).
- Attirampakkam: at this site in the Kortallaiyar (Kosasthalaiyar) valley, research by the Sharma Centre for Heritage Education (Chennai) dated Acheulian hand-axes to about 1.5 million years ago ('Science', 2011). Middle Palaeolithic tools about 385,000 years old were reported in 'Nature' in 2018. Gudiyam, Attirampakkam and Poondi lie in the same area west of Chennai.

Tamil Nadu link: Keeladi, the study's main site, is a Sangam-age urban settlement on the Vaigai in Sivaganga district; the Tamil Nadu Department of Archaeology was part of the study. Gudiyam and Attirampakkam are both in Tiruvallur district and put Tamil Nadu on the world map of prehistory. The Gudiyam caves trail is also part of the Tamil Nadu government's 'Trek Tamil Nadu' programme.

Frequently asked questions

What is this news about?

A paper analysing food residues absorbed into pottery from the archaeological sites of Keeladi in Tamil Nadu and Gottiprolu in Andhra Pradesh was published in 'npj Heritage Science' (Nature group) on 29 October 2026.

What are the key facts to remember for the exam?

Journal, date: npj Heritage Science, 29 Oct 2026; Sites: Keeladi (Sivaganga, TN); Gottiprolu (near Naidupeta, AP); Period: 600–100 BCE; Samples: 4 unglazed potsherds.

What is the background to this news?

Scientific method: fats (lipids) from cooked food survive for thousands of years in the pores of unglazed pottery. Extracting and identifying them by chromatography–mass spectrometry reveals ancient diets.

Practice questions (with answers)

1. Gottiprolu, studied along with Keeladi for food residues, is an archaeological site in which state?

A) Karnataka

B) Andhra Pradesh

C) Keralam

D) Telangana

Answer: B – Explanation: Andhra Pradesh – an early historic fortified settlement near Naidupeta, on a Swarnamukhi distributary. Keeladi is in Sivaganga district, TN.

2. The groundnut (peanut), hinted at by the study, is native to which region?

A) South America

B) Africa

C) Southeast Asia

D) Mediterranean

Answer: A – Explanation: South America; it is usually held to have reached India via the Portuguese in the 16th century. The study's earlier-presence idea is debated.

3. The Gudiyam cave, a Palaeolithic rock shelter, is in which district of Tamil Nadu?

A) Chengalpattu

B) Kancheepuram

C) Vellore

D) Tiruvallur

Answer: D – Explanation: Tiruvallur district, Allikuli hills; ASI's K.D. Banerjee excavated it in 1962–64 and found continuous stone-tool layers.

4. Attirampakkam, which yielded Acheulian tools about 1.5 million years old, lies in which river valley?

A) Palar

B) Cheyyar

C) Kortallaiyar

D) Araniyar

Answer: C – Explanation: The Kortallaiyar (Kosasthalaiyar), Tiruvallur district; the Sharma Centre team's dating appeared in 'Science' in 2011.

5. Which method dates once-living remains up to about 50,000 years old using the decay of an isotope?

A) Radiocarbon (C-14)

B) Potassium–argon

C) Dendrochronology

D) Thermoluminescence

Answer: A – Explanation: Radiocarbon (carbon-14, half-life about 5,730 years) – Willard Libby, 1949. Potassium–argon dates volcanic rock over far longer spans.

Sources: npj Heritage Science (Nature, 29 Oct 2026); Archaeological Survey of India (Gudiyam); NMMA (nmma.nic.in); Science (Pappu et al., 2011 – Attirampakkam); Nature (2018 – Middle Palaeolithic); Govt of Tamil Nadu 'Trek Tamil Nadu' (Gudiyam trail). © Shanmugam IAS Academy.