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Project Gallery

Long-term prehistoric human occupation in Western Tibet: excavations and surveys at the Xiada Co site

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The complexity of the settlement pattern of hunter-gatherers is an underexplored issue in Tibetan archaeology; the multi-year survey and excavations at the Xiada Co site aim to address this situation. The project has provided evidence of long-term human occupation since the Early Holocene and has revealed the earliest human residential structures in Tibet.

Keywords: Tibet, Early Holocene, hunter-gatherers, multi-year surveys

Introduction

Archaeological research in recent decades has significantly increased our knowledge of early human occupation of the eastern, southern and northern parts of the Tibetan Plateau (e.g. Hudson *et al.* 2014; Madsen *et al.* 2017; Meyer *et al.* 2017; Zhang *et al.* 2018; Zhang *et al.* 2020).

However, the settlement pattern and residential mobility of hunter-gatherers in Tibet during the Early Holocene remains underexplored. In Tibetan archaeology, the presumption is that early hunter-gatherers in extreme environments were socially simple; this, combined with the fact that their residential remains are ephemeral, has prevented further academic efforts to investigate the complexity of their settlement patterns and social behaviours. Here, we provide results from our research project that took place between 2019 and 2023 at the Xiada Co site in Western Tibet. This site yielded evidence for long-term occupation by hunter-gatherers, with several residential structures, and sheds new light on the lifeways of ancient high-elevation foragers (Figure 1).

Excavations and surveys at the Xiada Co site

With an elevation of 4360m above sea level, the Xiada Co site (33°23′34.17″N, 79°23′22.91″E) lies on the northern terrace of a freshwater lake, Lake Xiada Co, in Rutog County in the Tibet Autonomous Region, between the Gangtise range and the Karakoram range in Western Tibet. The Asian Westerly and Indian Summer Monsoon led to pronounced seasonal differences in this region, featuring a long, cold and dry winter and a

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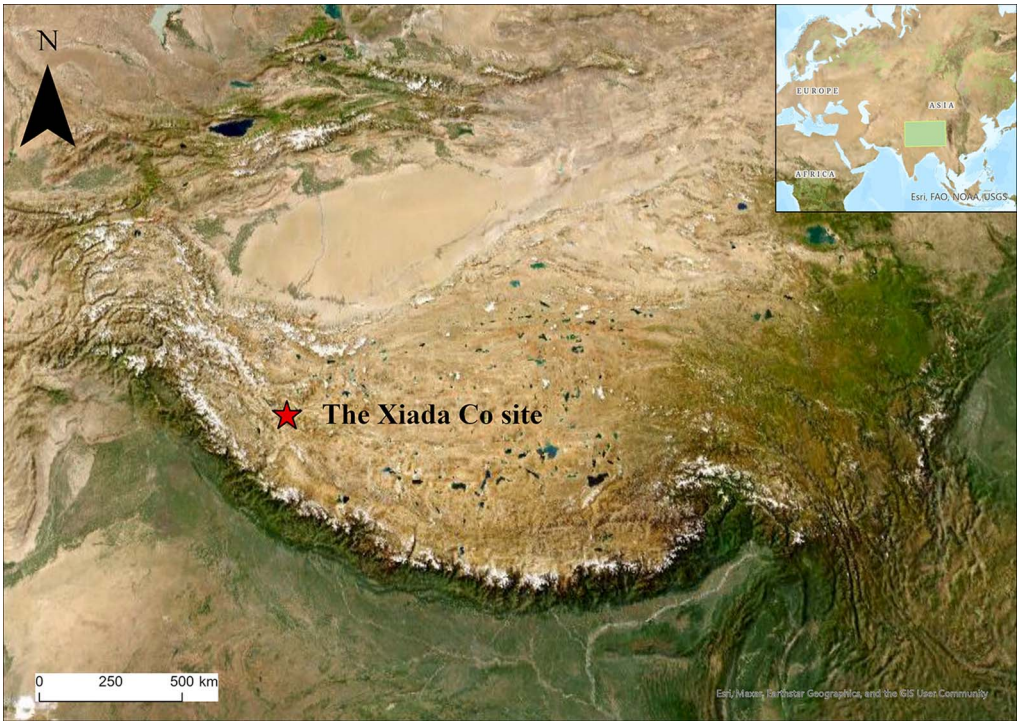

Figure 1. Location of the Xiada Co site (figure by X. Chen).

rainy summer. The mountainous landscape in this region is now dominated by grassland and shrubs.

An archaeological survey in 1992 led by archaeologists from Sichuan University discovered several stone tools by Lake Xiada Co (Li *et al.* 1993). Further research on this stone assemblage drew attention to the possible existence of Acheulian handaxes in Western Tibet (Lü 2011). In 2019, a joint archaeological team of Sichuan University and Institute of Cultural Relic Preservation of Tibet Autonomous Region discovered prehistoric cultural deposits at Xiada Co and conducted three excavations and surveys in 2020, 2022 and 2023 (Figure 2).

After the initial pedestrian survey and test excavation in 2019, the first archaeological excavation started in 2020 and we excavated a total area of 49m^2. The most important finding in 2020 was a square sandy feature with a concentration of charcoal, stone artefacts, animal bones and burned stones (Figure 3a). We also discovered several ash piles and stone piles within and near this feature, which is approximately 4m × 4m. According to the spatial distribution of stone artefacts and animal bones, this feature is likely to be the campsite of ancient hunter-gatherers.

In the 2022 and 2023 field seasons, we moved the excavation area to the west of the site and launched a comprehensive archaeological survey of the lake terrace. With a total excavation area of 200m^2, we discovered a profile consisting of three layers of black sand with stone artefacts (F2, F3 and L7; see Figure 4), indicating both long-term and discontinuous human

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Figure 2. Locations of archaeological excavations and surveys at Xiada Co (figure by X. Chen).

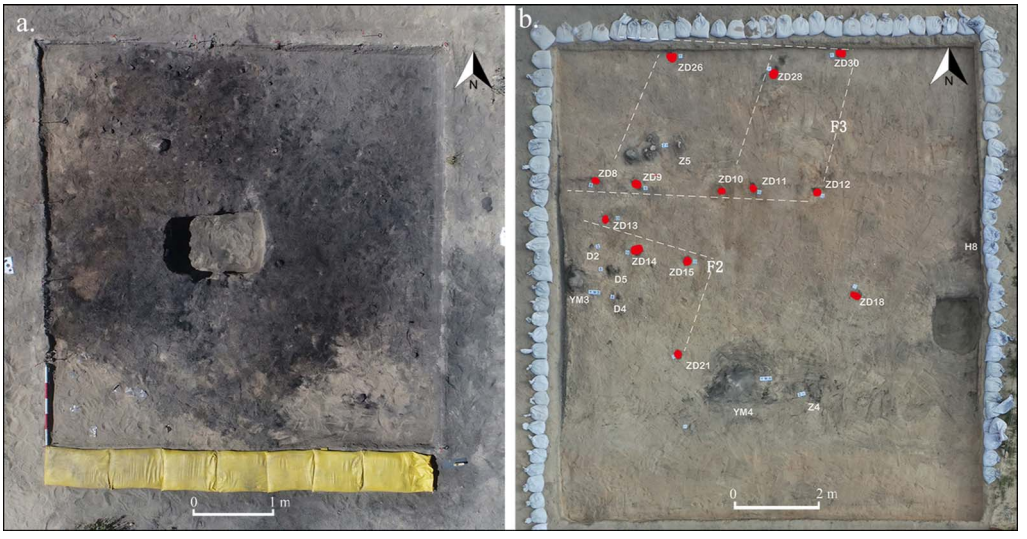

Figure 3. Aerial photos of the residential structures: a) the excavation in 2020; b) the excavation in 2023. Solid red circles indicate the location of postholes. White dashed lines indicate the postulated extent of residential structures F2 and F3 (figure by X. Chen & Z. Li).

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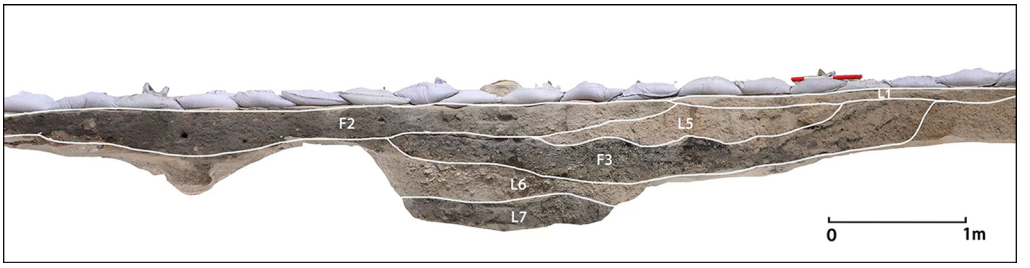

Figure 4. Stratigraphy of the Xiada Co site; east wall of the excavation trench in 2023 (figure by Z. Li).

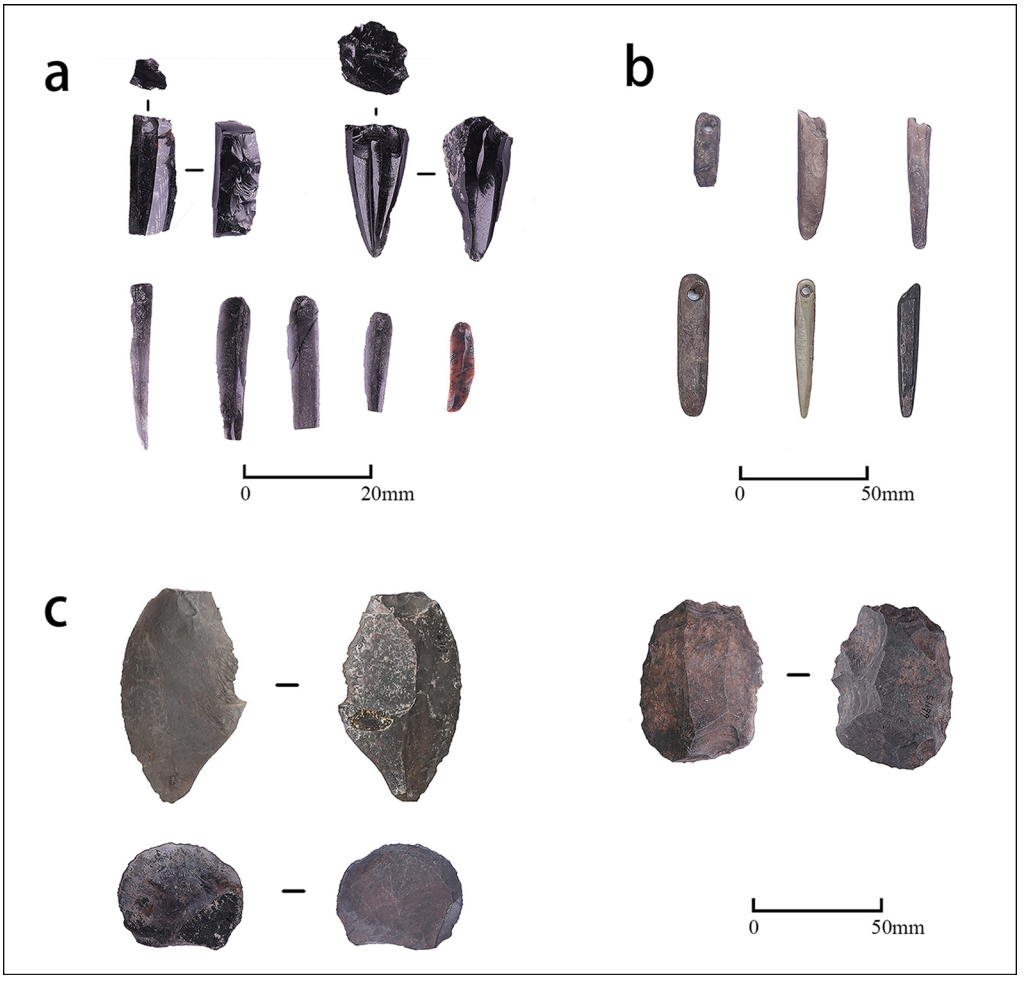

Figure 5. Stone artefacts from Xiada Co: a) obsidian microblades and microblade cores; b) ground stone needles; c) flakes and tools made on flake blanks (figure by Z. Li).

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Table 1. Details of radiocarbon dates for the Xiada Co site.

Lab no.	Sample context	Sample type	Conventional age (BP)	Calibrated age (BC; 95.4%)
Beta-660756	2023RX-F3	Animal bone	5310 ± 30	4246–4046
Beta-674198	2023RXF2	Animal bone	5350 ± 30	4324–4053
Beta-674202	2023RX-L7	Charcoal	5690 ± 30	4609–4450
Beta-605216	2020RX-L2A-B	Animal bone	7800 ± 30	6691–6516
Beta-605219	2020RX-L2A-C	Charcoal	7870 ± 30	7023–6641
Beta-605215	2020RX-L2B-B	Charcoal	7900 ± 30	7028–6647
Beta-605220	2020RX-L2B-C	Animal bone	7880 ± 30	7028–6647
Beta-605218	2020RX-L2C	Charcoal	7900 ± 30	6816–6597
Beta-605217	2020RX-L4-C	Charcoal	7850 ± 30	6816–6597
Beta-605214	2020RX-L4-B	Animal bone	7990 ± 30	7049–6706

occupation of this location. Those excavations revealed four similar features of black sandy patches containing rich deposits of ashes, several stone hearths, animal bones and stone artefacts. Two of the black sandy features, F2 and F3, were surrounded by several postholes

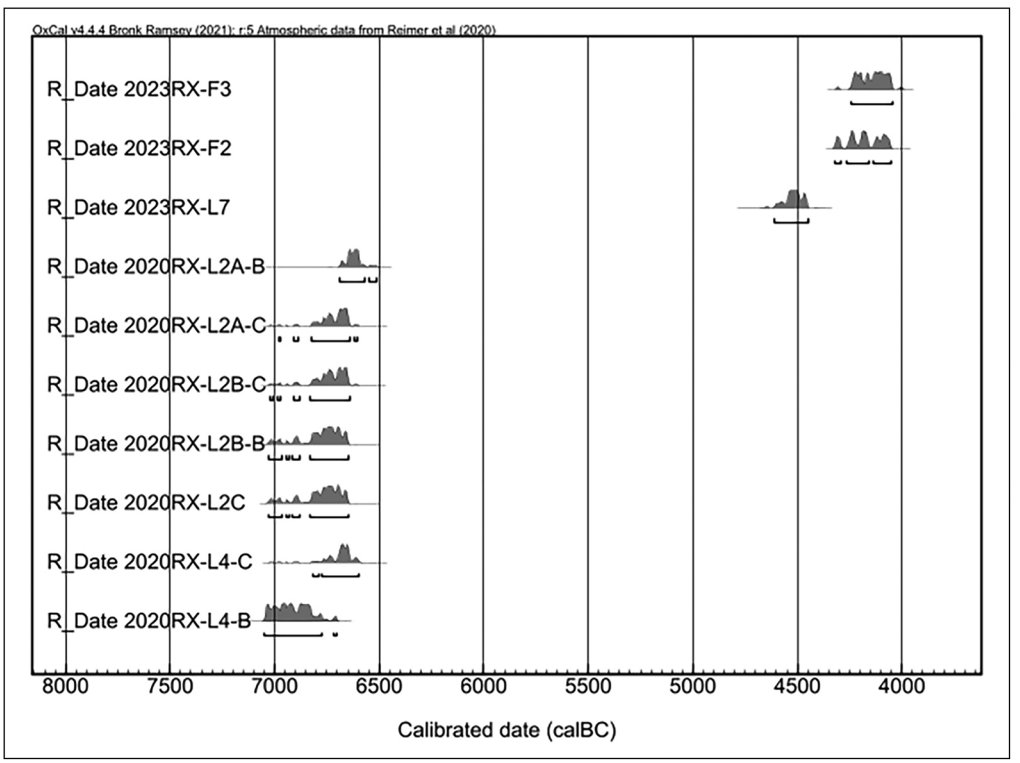

Figure 6. Calibrated radiocarbon dates for the Xiada Co site (using OxCal 4.4 and IntCal20 calibration curve, Reimer et al. *2020). Dates starting with '2023RX' are from the 2023 excavation trench while the rest of the dates are from the 2020 excavation trench; F-residential structures; L-layers (figure by X. Chen).*

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(labelled with ZD; see Figure 3b). The postholes all have a depth of approximately 100–200mm and are superimposed by the black sandy cultural deposits. Two compacted living surfaces of greyish-white sand were found. One compacted surface (YM3) possibly served as an indoor facility or trampled floor and the other one (YM4) was outside the residential structures.

Thousands of stone artefacts were found on the ground surface of the entire northern terrace of Lake Xiada Co, indicating that this site might have been intensively occupied by ancient people. Our systematic survey in 2023 on the lake terrace employed shovel-test sampling and discovered six locations of cultural deposits on the lake terrace. Those locations are patchy and small, usually with an area of less than 100m^2 each. We discovered one location on the north-eastern terrace with ceramics and bronzes, suggesting long-term human occupation of this site throughout the Holocene.

Artefacts and chronology

Excavations during three field seasons yielded over 20 000 stone artefacts and animal bones, which are still being documented and analysed. The assemblage of stone artefacts is dominated by core-flake items and microblades, some of which are made of obsidian. Of note, we discovered six ground stone needles, which represent the earliest ground stone tools found in Tibet (Figure 5).

Based on radiocarbon dates on charcoal and animal bone from layers L4 and L2 in the 2020 excavation trench, the earliest occupation of this site is dated to *c.* 9000–8500 BP. New radiocarbon dating results retrieved from the western part of the site date the residential structures to around 6000 BP (Table 1 & Figure 6).

Conclusion

The Xiada Co site presents a rare archaeological example of long-term, high-altitude occupation by early hunter-gatherers. Although our excavation grids during the project in 2022 and 2023 did not fully reveal the extent of the residential structures, the evidence indicates that at least two of them were constructed with postholes. This is the earliest evidence, to date, of human-built residential structures discovered in Tibet. We will investigate the spatial structure of this site in our future excavations. The systematic survey of the lake terrace and our results from the excavations suggest that this area was occupied from the early Holocene to Bronze Age. Long-term human settlement at Xiada Co suggests the continuity of human adaptative strategies and social behaviours in extreme environments, which possibly led to human aggregation on this lake terrace. Future work will focus on the excavations of the Bronze Age settlement at Xiada Co to explore the transition from hunting and gathering to food production in Western Tibet.

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