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TOWARDS A CHRONOLOGY OF BORNEO'S POTTERY: NEW DATA FROM EAST KALIMANTAN

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1. THE MAFBO PROJECT

The "Mission archéologique franco-indonésienne à Bornéo" (MAFBO) is a collaborative and interdisciplinary French-Indonesian archaeological research project in the karstic rainforest region of East Kalimantan (Mangkaliat Peninsula, Indonesia), supported by the French Ministry of Foreign Affairs (France), the *Jurusan Arkeologi* at Gadjah Mada University (Yogyakarta) and the Research Center for Archaeology (*Puslit Arkenas*, Indonesia). This research project, entitled "Karst archaeology, technologies and settlement History in East Kalimantan (Indonesia)" aims to better understand human prehistory in this understudied region. There are three phases to the project:

- 2005–2010: Research that led to the discovery of the first and most ancient prehistoric rock art in Borneo.
- 2011–2014: Research that aimed to determine the chronology of human occupation and its technological development in this part of Kalimantan since Late Pleistocene/early Holocene.
- 2015–2017: Further surveys and an excavation at Liang Jon are planned for this period.

Archaeological surveys and excavations, ethno-linguistic investigations and anthropobiological analyses are combined in a diachronic perspective, within an area defined by three river catchments:

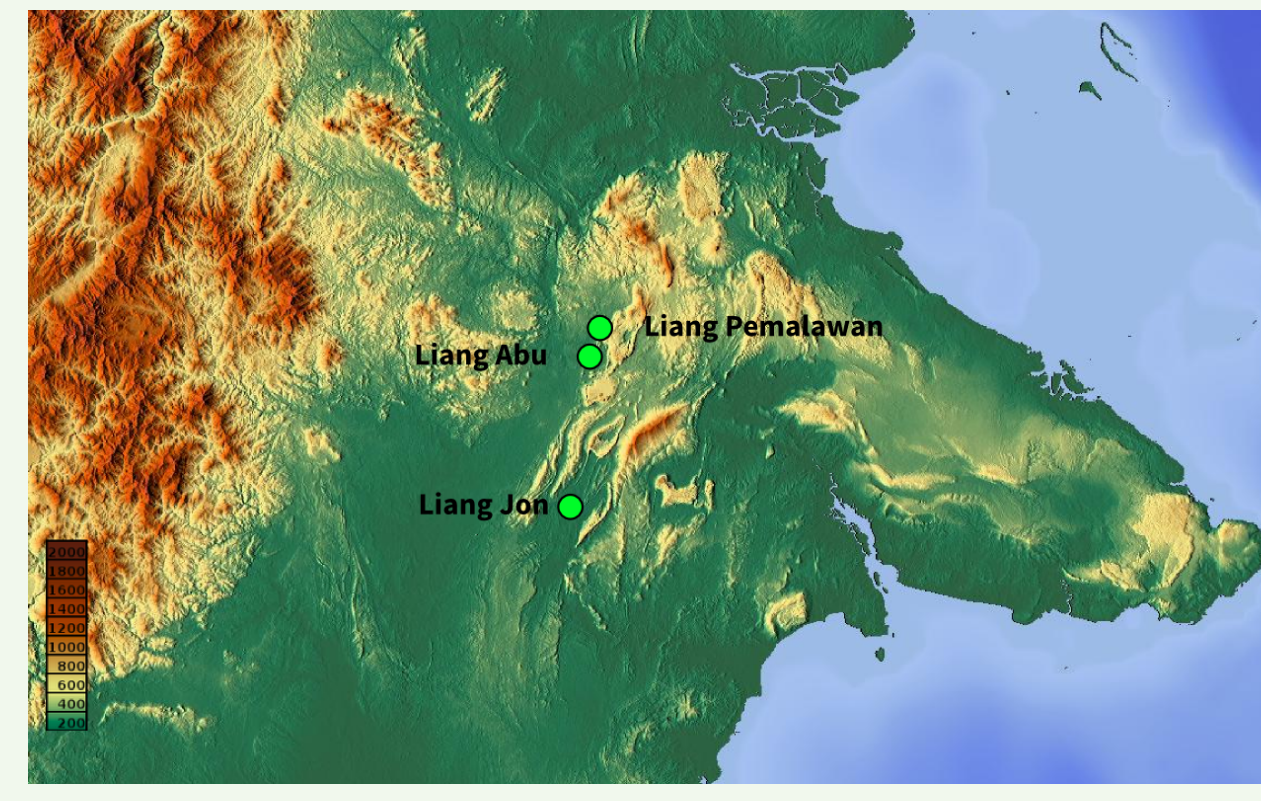
- Bengalon river catchment: surveyed sites along the Marang river and an excavated site in the Liang Jon rock-shelter (East Kutai district).
- Karangan river catchment: excavated site in the Liang Abu rock-shelter (Berau district).
- Kelai river catchment: excavated site in the Liang Pemalawan rock-shelter (Berau district).

This region contains the karstic mountains nearest to the coast of the Celebes Sea. It is of high interest in the investigation of the population dynamics between the coast and the inland karstic forest over a broad time range.

Borneo



Main ceramic sites in Borneo



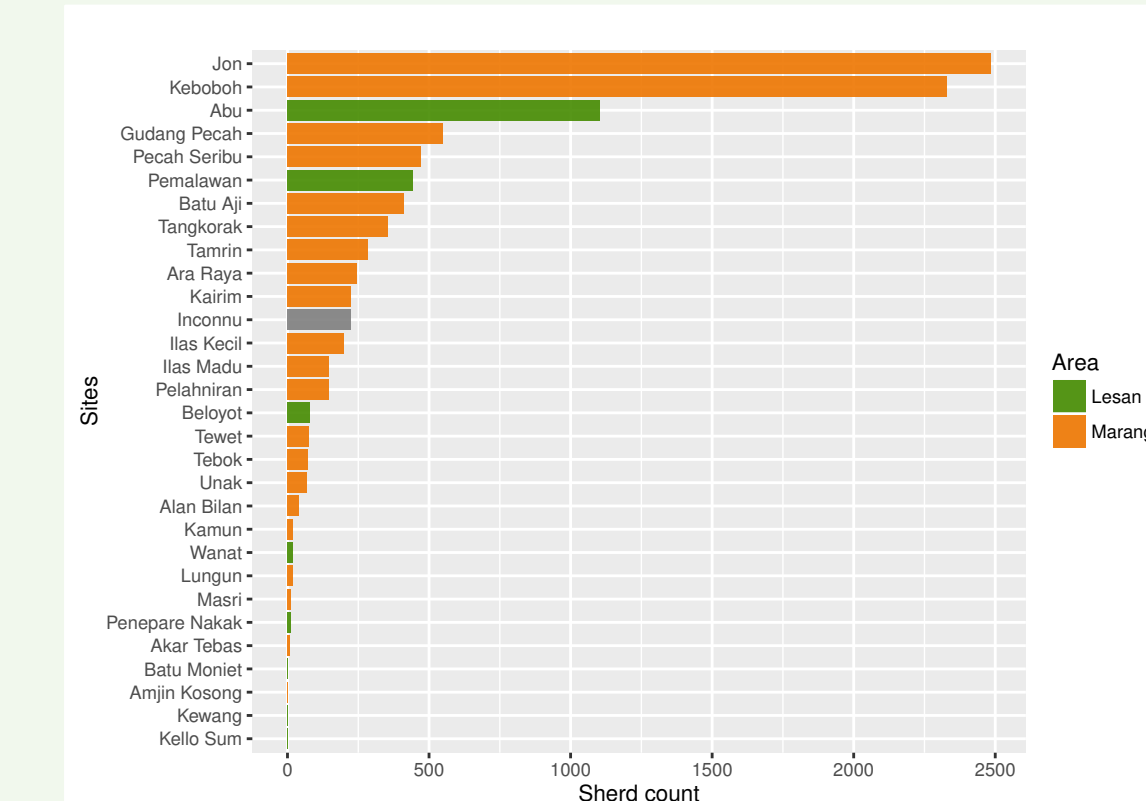
Sites locations in the Mankaliat Peninsula

2. POTTERY COLLECTION

The pottery materials collected since 2005 are currently stored at the *Dinas Pemuda Olahraga dan Pariwisata* (Sport and Tourism office) in Sangatta, East Kutai district, East Kalimantan. This collection contains 8960 sherds, from 28 sites in total. Three sites were (partially) excavated (**Liang Abu**, **Liang Pemalawan** and **Liang Jon**) and only 25 have been surveyed. In addition to its archaeological interest this collection is displayed in the local museum in Sangatta, thus contributing to the development of the museum.



Potteries displayed in the Sangatta Museum



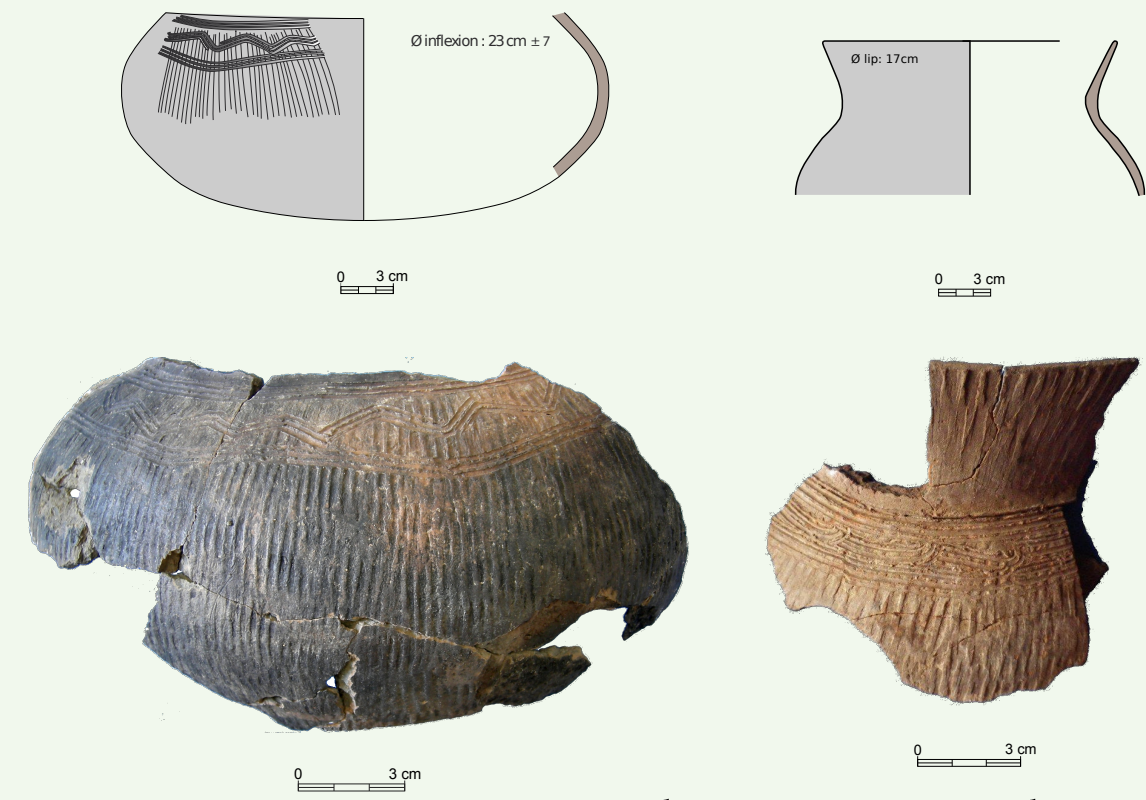
Sherd count by site include in our corpus

3. POTTERY TYPES AND STYLES

Vessel shapes

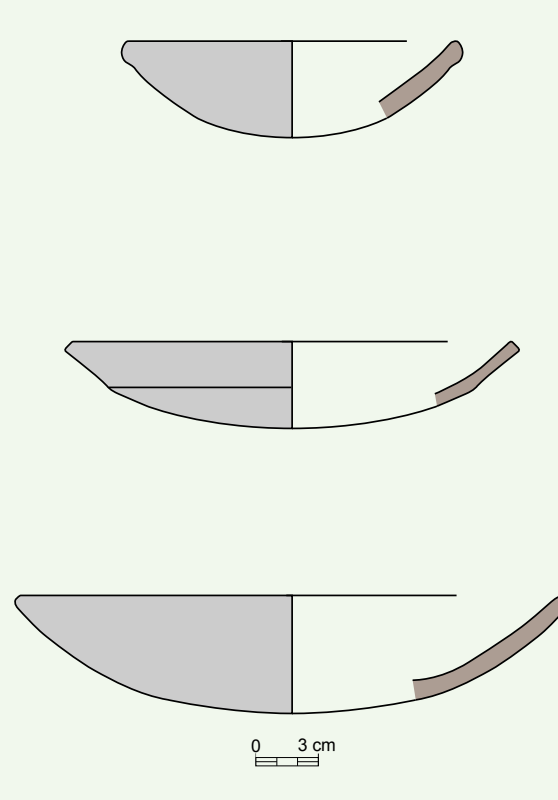
As regards the material from the excavations, identification of vessel shapes was difficult because of the high degree of fragmentation. For instance, in Liang Abu two types of vessels have been identified: plates and restricted vessels. All the rims which allowed a determination have been related to open shape vessels.

Restricted vessels



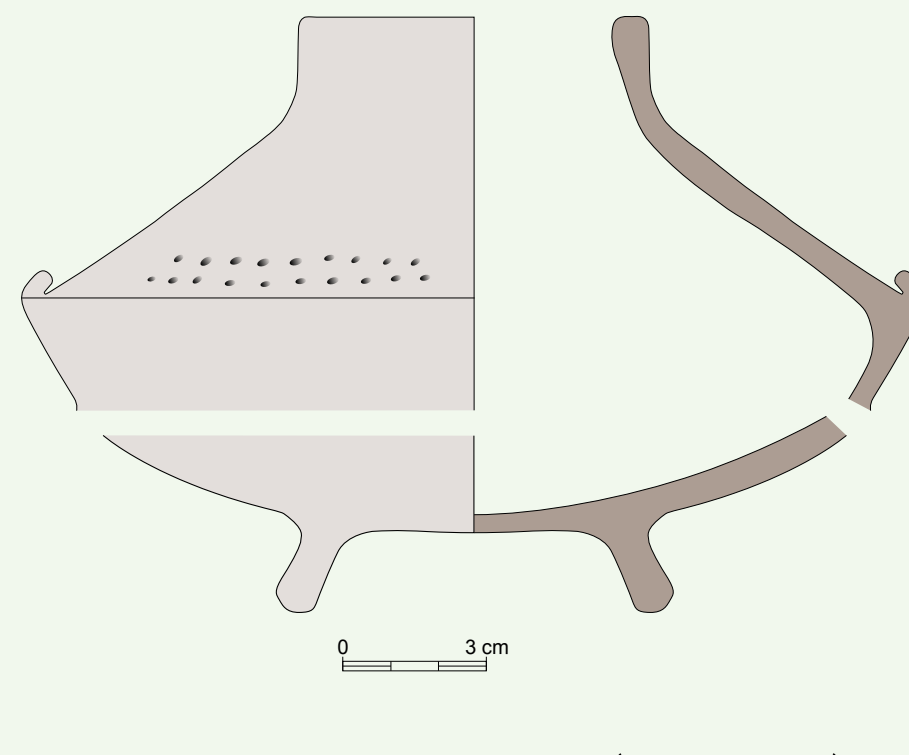
Pottery shapes in Liang Abu

Plates



Red-slipped vessel

Rare evidence of red-slipped vessels have been found in Liang Abu and Liang Pemalawan and they are undoubtedly present in Liang Jon. Chemical analyses of the clay are in progress in order to get an approximation of the distance between our sites and the origins of the raw materials.



(Liang Jon)

Motifs

Both potteries from the surface and from the excavations are generally decorated. In Liang Abu, 48% (in count) of the assemblage present a motif. Impressed patterns (cord-marked, squared, vertical lines) and complex incised motifs are the most common. In Liang Pemalawan only 18% of the sherds are decorated. No three-colour wares have been found in the excavations, but some sherd of this type have been recorded on surface in the Marang sites. Liang Jon gave an uncommon fine-incised motif comparable to the Lapita motifs from the eastern regions (Chazine & Ferrié 2008).

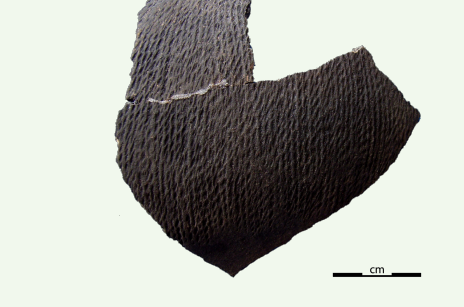
Impressed (Liang Pemalawan)



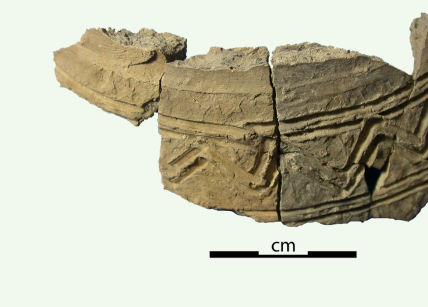
Squared (Liang Abu)



Cord-marked (Liang Jon)



Incised (Liang Jon)

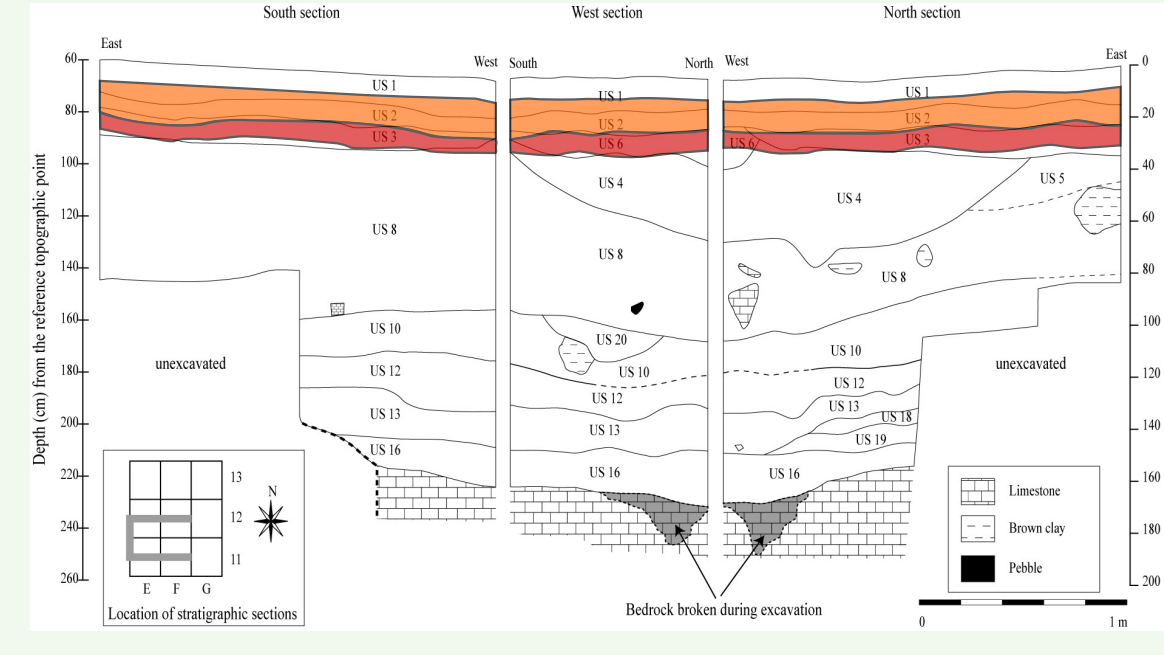


4. A FOCUS ON LIANG ABU

In Liang Abu, ceramic sherds have been found both on the surface and in the two first stratigraphic layers. The first of these layers is immediately located under the surface and is probably highly disturbed. The second layer is a well-cohesive stone line made of fine gravels. These two layers show very distinctive features, which could be explained by environmental changes in the rock-shelter. However, our ceramic analyses showed that there is no significant differences between 1), the material from the various archaeological layers, 2) the materials from the surface, 3) the materials from the little caves in the rock-shelter's wall.

Environmental & technological changes

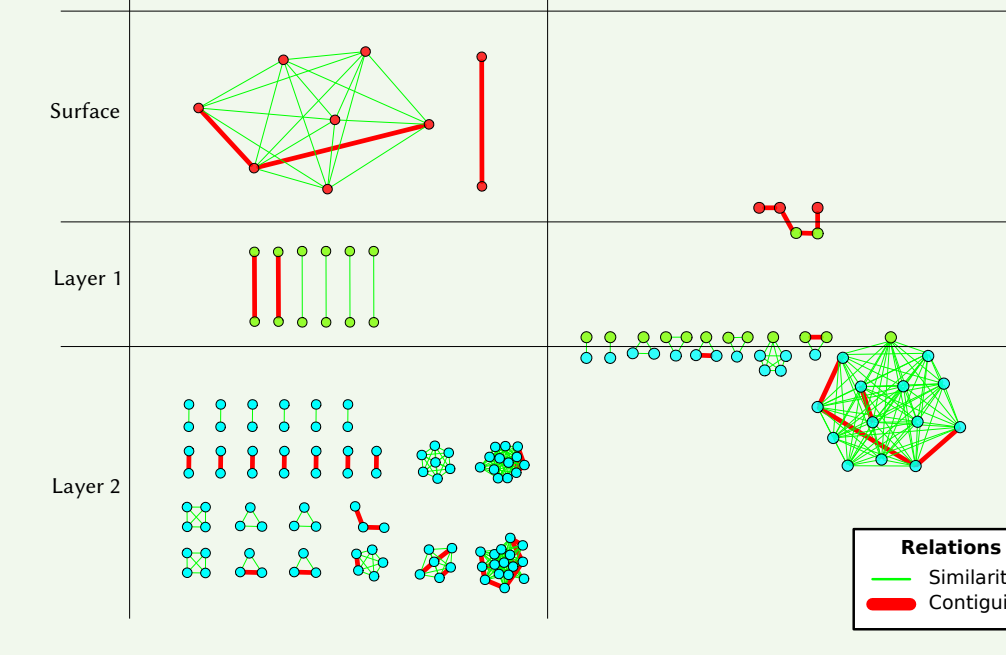
1) This situation offers us an interesting case where an environmental change does not correlate with a technological and stylistic change. Geoarchaeological analyses are still in progress and will provide more insights about the former.



In Liang Abu, ceramic has been found on surface and in the two first layers

Refitting analysis

2) It also raises issues related to the formation processes of the sites: we aim to address them by an analysis of the refitting links between sherds. The structural properties of the refitting network help to determine the degree of admixture (or of self-consistency) of the two stratigraphic levels. These methodological improvements of refitting analysis are also in development.



Refitting networks from Liang Abu

5. REGIONAL FRAMEWORK

We obtained reliable radiocarbon datings associated with pottery layers, as presented in the following table.

Site	BP	Code	AMS δ13C	Cal. BP 2σ	Cal. BC/AD 2σ	ceramic
Liang Abu, lv2	1672±21	UBA-20839	-32,5	1687–1527	AD 264–423	presence
Liang Abu, lv2	1524±22	UBA-20840	-41,2	1515–1349	AD 435–602	presence
Liang Abu, lv3	5966±33	UBA-26297		6694-6694	BC 4944-4745	TPQ ceramic
Liang Jon	2665±35	SacA-19317	-29,1	2845–2744	BC 897–796	Red-slipped

Radiocarbon dates for ceramic layers from our excavations

These results are of particular interest for the determination of a regional chronological ceramic framework. Our data can be compared with the results from others published sites in Kalimantan (Kimanis, Jambu Hilir) or in the northern part of Borneo (notably the recent reassessment of Niah's Caves).

Site	Cal BC/AD 2σ	Cord-marked	Red-slipped
Kimanis	322/1228	no	no
Liang Abu	344/601	yes	yes
Liang Jon	-897/-796	no	yes
Jambu Hilir	-1291/-981	no	yes

A comparison of two decorative features

Prior to state for one or another audacious model of human settlement in ISEA, a reassessment of the relevant pottery data in Borneo has to be done and shall lead to a robust pottery typochronology.

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