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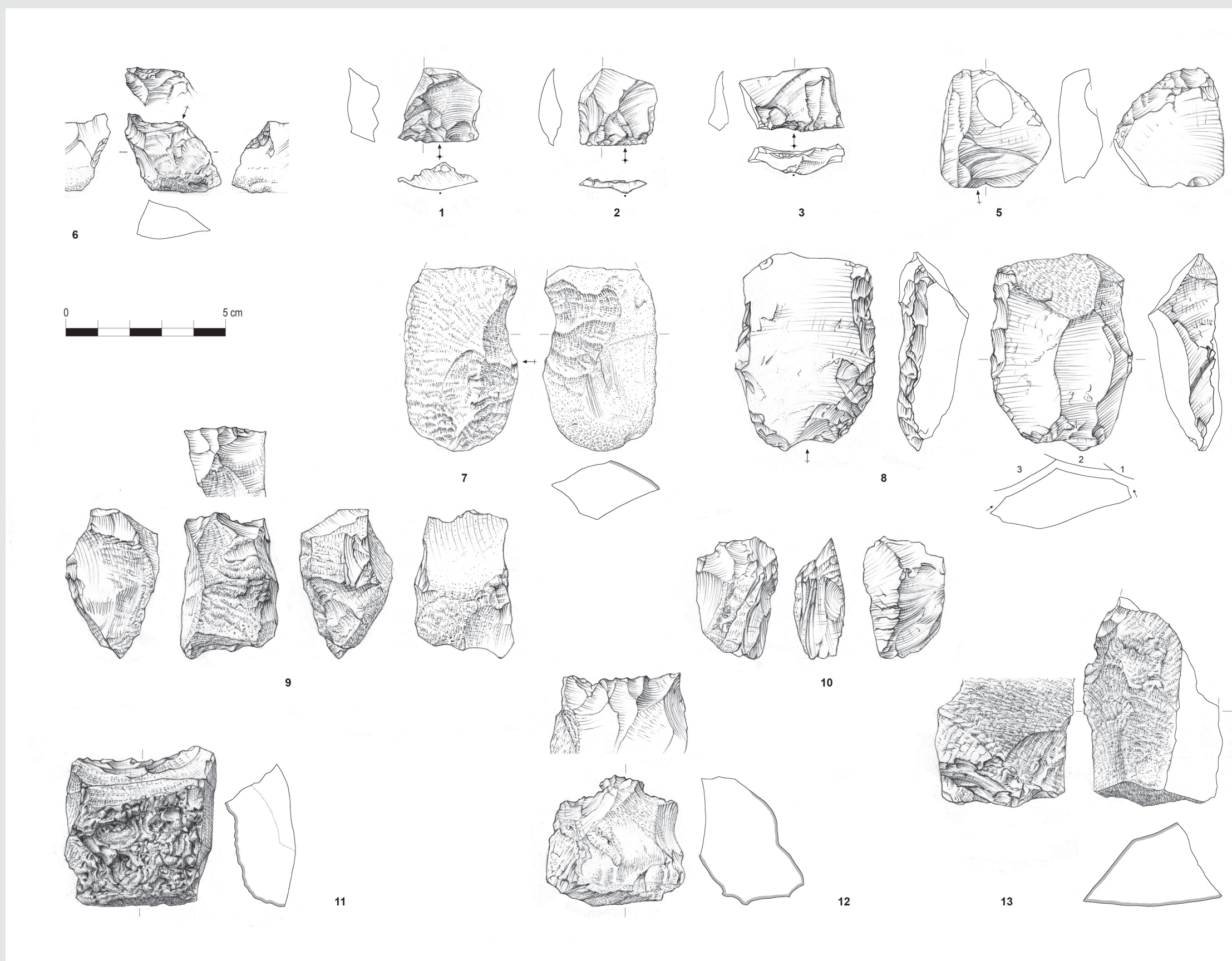
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# NEW INSIGHTS ON LATE PLEISTOCENE-HOLOCENE LITHIC INDUSTRY FROM EAST KALIMANTAN (BORNEO)

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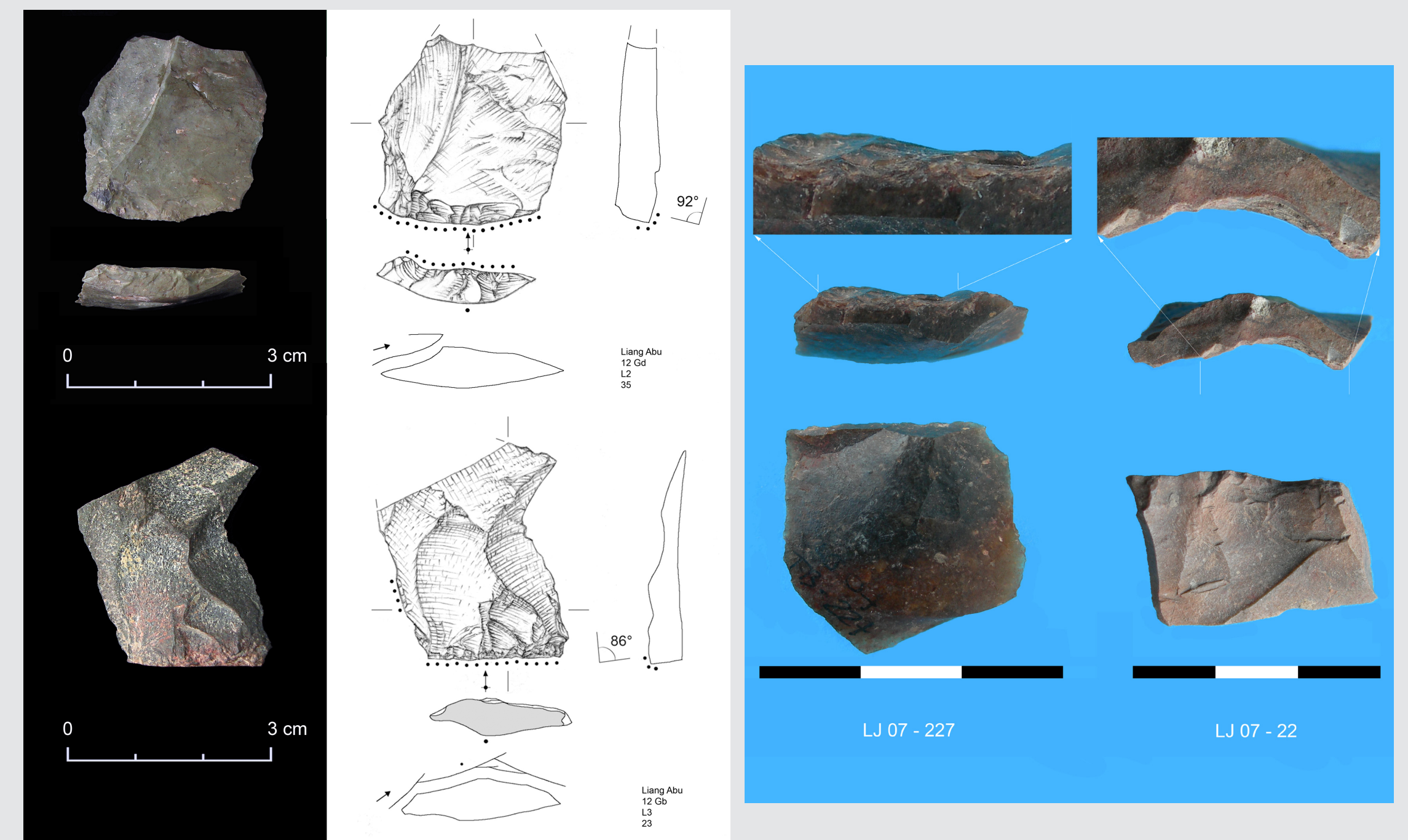
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Current collaborative research by a French-Indonesian team attempts to answer the lack of data from Borneo by conducting field research and a multidisciplinary scientific project in the karstic region of Mangkalihat (East Kalimantan, Indonesia). The comparative study of the lithic artefacts coming from three different sites (Liang Jon, Liang Abu, Liang Pemalawan) has brought new data and significant results for a better understanding of the prehistory of Kalimantan in the regional context.



Sebagai contoh artefak dari Liang Jon. Industri litik pada dasarnya terdiri dari serpih serta artefak yang berasal dari pecahan-pecahan krakal dan "alat batu-inti". Teknik penyerpihan yang umum ditemukan yaitu secara langsung menggunakan "batu pukul" yang keras. 1-3 : Serpih yang digunakan langsung sebagai alat, 5, 7 : alat dari serpih yang dimodifikasi; 6 : alat dari serpih yang masih menunjukkan kulit batunya, 8, 9, 11 : alat batu-inti, 10, 12 : alat dari pecahan krakal.

The example of Liang Jon. The lithic industries are essentially composed of flakes, tools on raw chunks or pebbles and «core-tools». The technique of debitage is mainly hard stone hammer percussion. 1 to 3 : rough flakes used as tools; 5, 7 : tools shaped on flake; 6 : tool on a cortical flake from a pebble; 8, 9, 11 : core-tools; 10, 12 : tools on raw material chunks.



Beberapa alat serpih menunjukkan jejak-jejak pemakaian pada bagian-bagian pangkal. Jejak tersebut kemungkinan berhubungan dengan aktivitas pengerjaan benda organik yang cukup keras seperti kayu, tulang.

Some flakes show uses scars on their proximal parts (dihedral butt/upper face). The choice of this functional part is related to the treatment of hard organic material (hard wood, bone).

## SEBUAH INDUSTRI YANG EFISIEN DAN TERDIRI ATAS ALAT SERPIH DIRETUS DAN PECAHAN BATU YANG DIMODIFIKASI AN EXPEDIENT LITHIC INDUSTRY COMPOSED OF RAW OR RETOUCHE FLAKES AND SHAPED CHUNKS

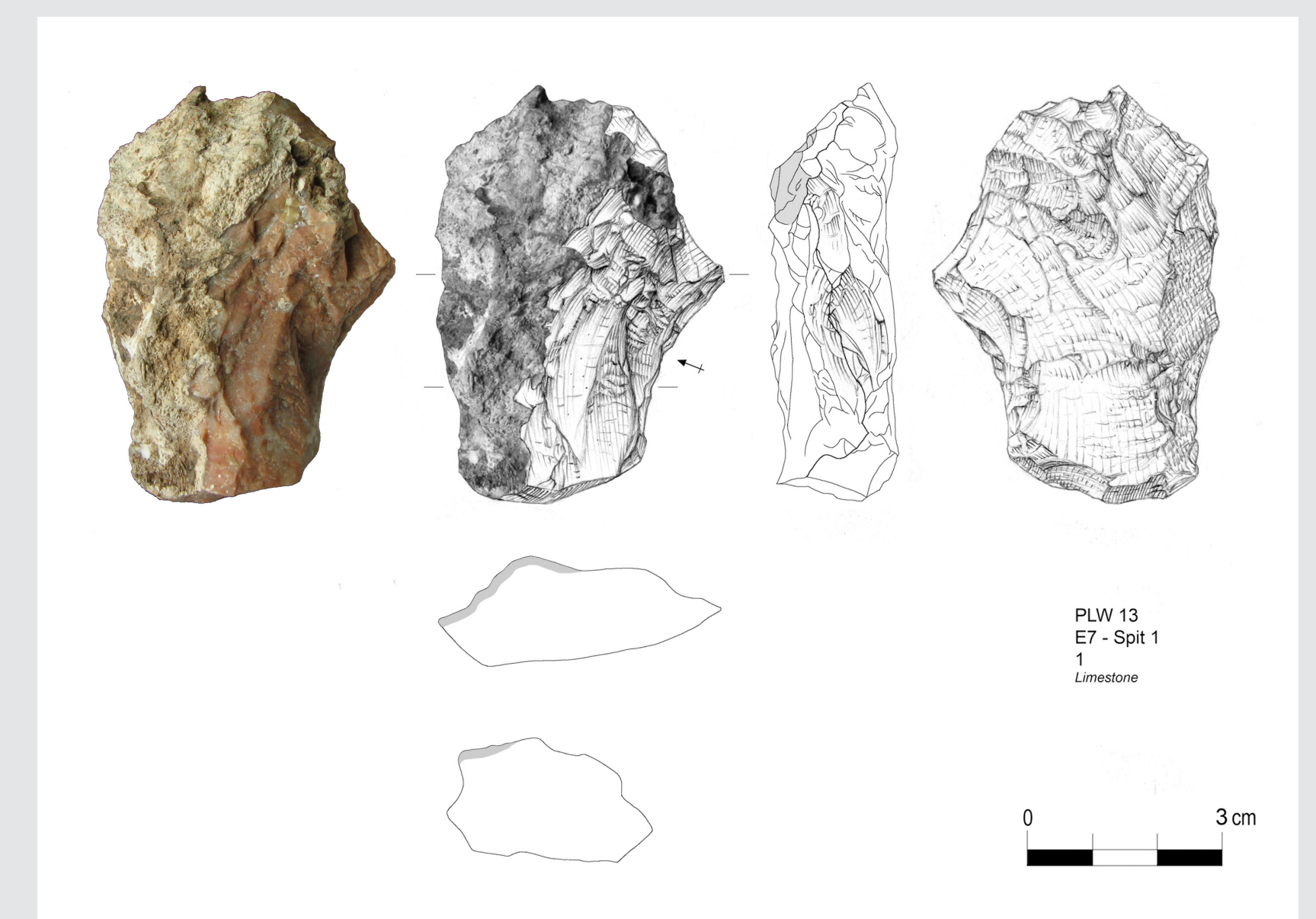


Liang Pemalawan. Alat tipe "serut-gerigi" pada serpih yang berasal dari krakal yang banyak ditemukan di sungai Lesan di dekat situs.

Liang Pemalawan. A denticulate shape on a cortical flake from a pebble coming from the nearby Lesan river.

Pemerolehan bahan baku amat berhubungan dengan karakter lingkungan geografis dan geologi. Asal-usul bahan baku tersebut berbeda di masing-masing situs. Sebagian besar bahan baku nampaknya dikumpulkan di sekitar situs. Selain itu, sejumlah kecil bahan baku eksotik yang jelas berasal dari daerah lain, dapat memberikan gambaran luas area aktivitas penduduk masa lalu di daerah karst. Penyerpihan di ceruk dan gua alami. Kanan: batu gamping-kersikan yang banyak tersedia dari area sekitar gua/ceruk hunian, digunakan sebagai bahan baku pada tiga lokasi yang diteliti (sekitar 15% sampai 20%).

The acquisition of raw material is related to both geographical and geological environments. The origin of the knappable material differs in each site. Most of it is collected in the site surrounding area. The distant importations, little represented, give an idea of displacements of the rain forest inhabitants in the karstic area. Knapping the rock shelter. On the right : the silicified limestone coming directly from occupied rock shelters and used as an easily available material well represented in the lithic assemblages from the three studied sites (15 to 20 %).



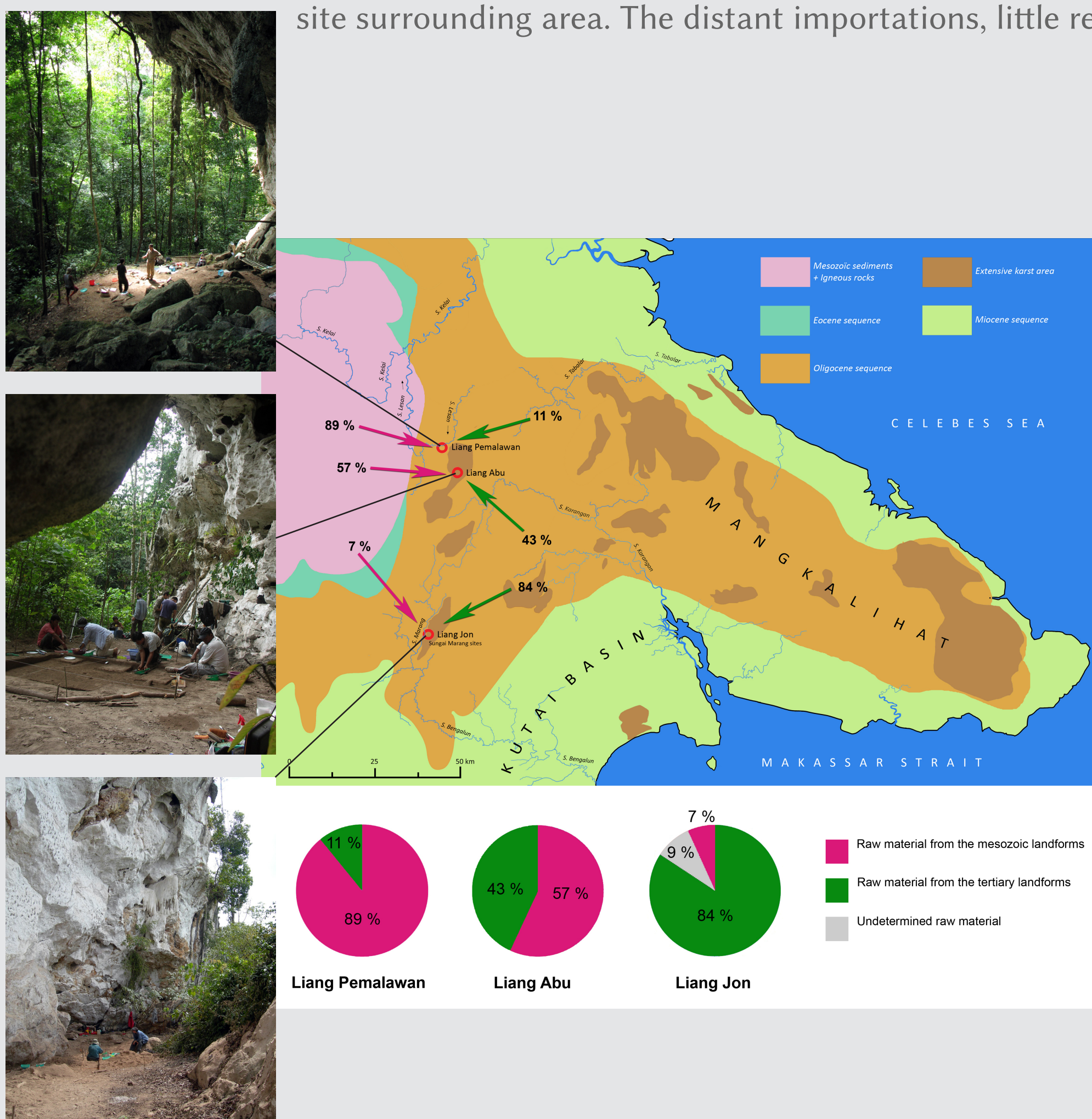
Liang Pemalawan. Alat tipe "cekung kecil" pada serpih yang masih memperlihatkan kulit batunya.

Liang Pemalawan. Notch on a limestone cortical flake.

## PEMEROLEHAN BAHAN BAKU: TIGA LOKASI PENGUMPULAN, TIGA WILAYAH YANG BERBEDA RAW MATERIAL ACQUISITION : THREE DIFFERENT CATCHMENTS, THREE DIFFERENT TERRITORIES

Aktivitas pengumpulan bahan baku amat berhubungan dengan lingkungan geografis dan geologi. Asal usul bahan baku alat batu agaknya berbeda di setiap situs. Umumnya bahan baku dikumpulkan di daerah sekitar situs. Adapun jenis batuan yang berasal dari luar wilayah formasi geologinya, dapat memberikan gambaran tentang luas cakupan area aktivitas penduduk pada masa prasejarah.

The acquisition of raw material is related to both geographical and geological environments. The origin of the knappable material differs in each site. Most of it is collected in the site surrounding area. The distant importations, little represented, give an idea of displacements of the rain forest inhabitants in the karstic area.



Karakter sebaran penggunaan bahan baku nampaknya berhubungan dengan ketersediaannya di setiap area dalam konteks geologi. Artefak dari Liang Pemalawan umumnya dibuat dari kerakal yang dapat diperoleh di sungai Lesan (batuan malihan dan batuan beku). Sedangkan bahan baku industri alat batu di Liang Abu kemungkinan berasal dari Sungai Lesan dan Sungai Karangan (jenis rijang). Khusus di Liang Jon, jauh dari endapan formasi berumur Mesozoikum, bahan baku yang diperoleh kebanyakan berasal dari formasi batuan berumur Tersier (umumnya rijang).

The distribution of the raw material is related to their availabilities in each catchment within its geological context. Liang Pemalawan mainly contained pebbles from the Lesan river (metamorphic and igneous rocks), Liang Abu is supplied by both the Lesan and the Karangan river catchments (more flints). Liang Jon, away from the mesozoic landforms, outsources mostly flints from the tertiary landforms.



Sungai Lesan memberikan bahan baku yang berkualitas baik untuk industri serpih. 1, 3: artefak dari batuan jenis chert; 2: batuan beku (jenis andesit)

The Lesan river provides good quality knappable raw material. 1, 3 : cherts; 2 : igneous rock (andesite).

Krakal dari Sungai Lesan yang berasal dari formasi batuan berumur Mesozoikum.  
Lesan river pebbles from the mesozoic landforms.

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