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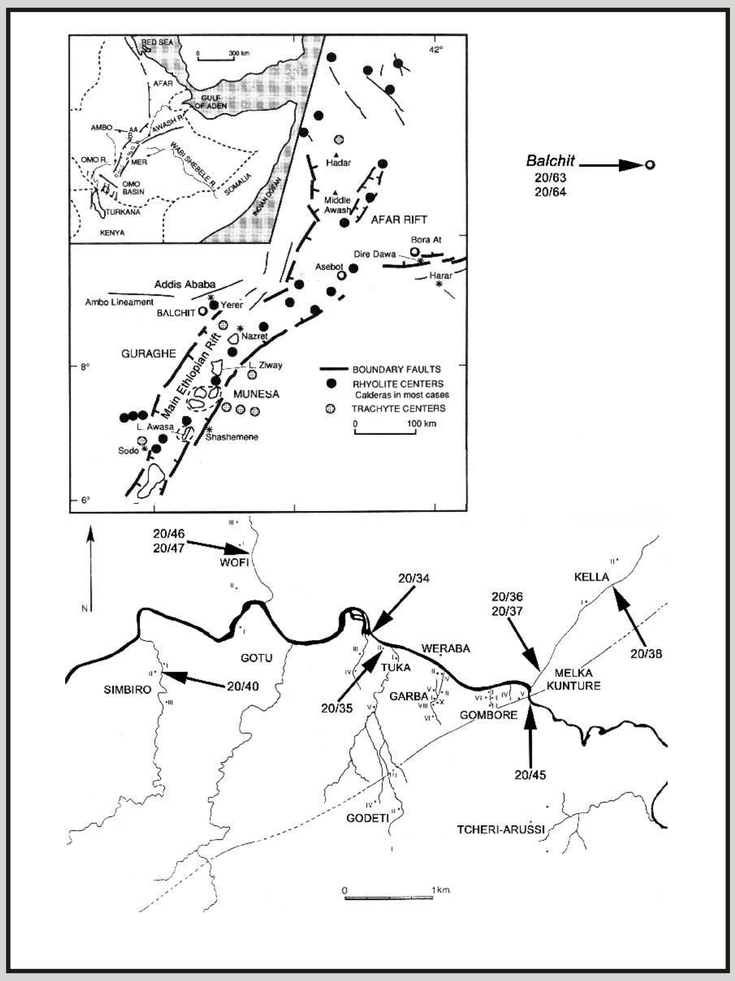
The small volcanic massif of Balchit is one of the Pliocene silicic centers of the Wechecha Formation (Addis Ababa Rift Embayment). It is located some 25 km SE of Addis Ababa and 7 km NE of Melka Kunture, on the left interfluve of the Awash river (see map). One Balchit obsidian was recently dated at 4.37±0.07 Ma by K-Ar (Chernet et al., 1998).

Accumulation of obsidian artefacts and debris.



Obsidian and man in the Melka Kunture area

In the vicinity of Melka Kunture, obsidian is a major component of lithic series since the Oldowayan. The nearby Balchit volcanic massif constitutes a major obsidian source-area **(**Berthelet *et al.,* 2001**)**. Since 1999, new investigations have been undertaken on the prehistory and volcano-sedimentary environments of Melka Kunture and a special attention was paid to obsidian artefacts and its primary and secondary sources. Analyses were performed on several obsidian samples from various locations, both *in situ* from a lava flow of Balchit and reworked debris or pebbles from different alluvial formations of the Awash river and its tributaries (Poupeau *et al*., 2004).

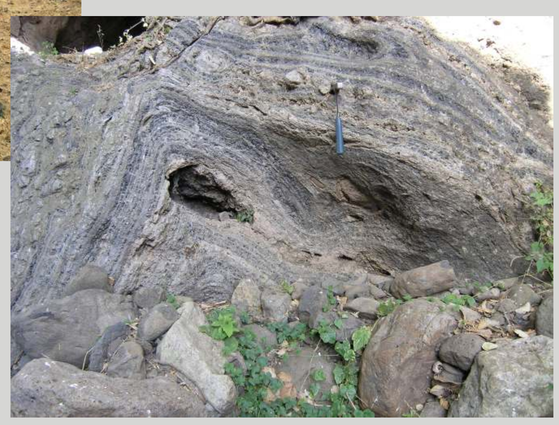
Close-up view of obsidian artefacts.

Balchit volcanic complex: view from top towards Balchit village with Wechecha volcano in background.

Obsidian occurences

The only recognized source of obsidian is the Balchit flat flow-dome, which offers a few kilometres square outcrop with a wide variety of eruptive facies (vertical and convolute fluidal structures, finely banded perlitic lava, spherulitic facies, massive obsidian, etc). Remarquable amygdals up to metric lenses of pure and massive obsidian are scattered among the various lava facies. The obsidian colour is dominantly black but locally blue, green, red and beige colours have been observed.

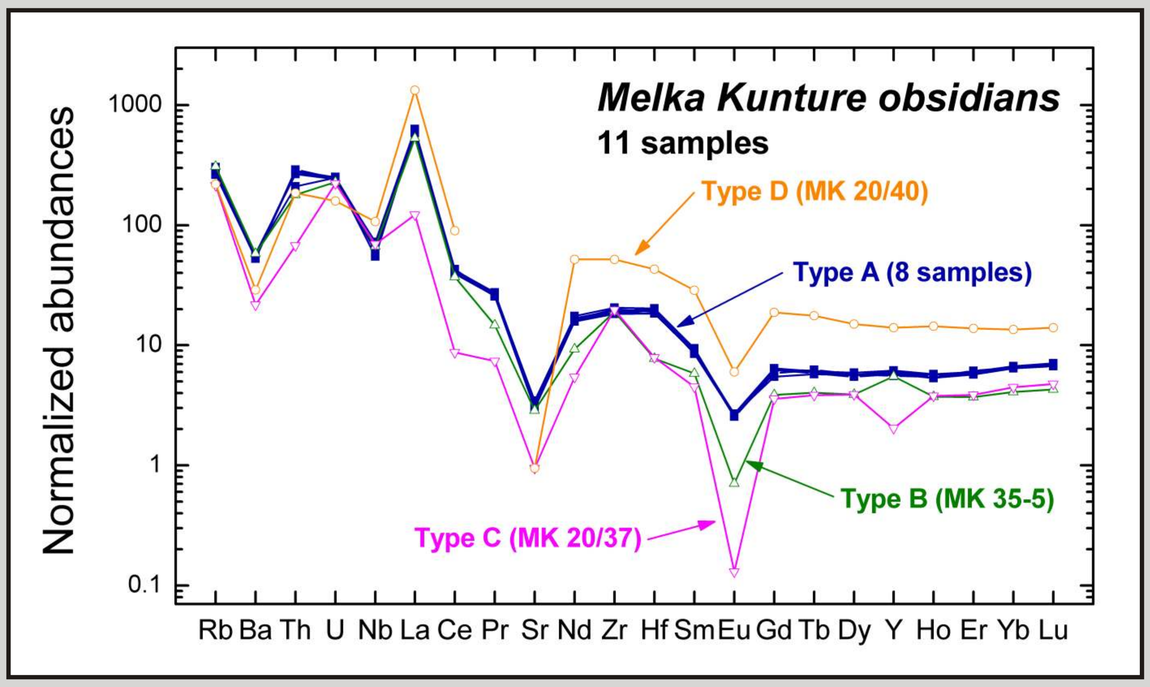
As products of erosion, blocks, cobbles, pebbles and gravels are found in quaternary alluviums and in minor river beds and form secondary sources which were available for prehistoric groups (Kieffer *et al.,* 2004).



Convolute facies.

Vertical facies.

Unweathered massive block of obsidian.



Normalized abundance of trace elements in Melka Kunture obsidians. The norm selected is the composition of the primitive earth mantle as given by Sun and McDonough (1989).

ICP-MS analysis and comments

The trace element contents of two Balchit samples from the main obsidian-bearing lava flow and of nine obsidian pebbles from alluvial deposits were determined by ICP-MS at LGCA (Grenoble) and at SOCFAC (Southampton), using the same experimental procedure (Barrat *et al.*, 2000).

Six obsidians pebbles were found to present the same (type A) elemental composition as the two Balchit obsidians and therefore might come from this mother-rock.
The three other obsidians present specific trace element systematics dubbed respectively as types B, C and D (diagram on left).

Conclusions

Field observations show that the large size of Simbiro Acheulian obsidian artefacts found in the area studied excludes a raw material procurement from the local alluvial deposits. This preliminary work shows that at least four geochemically different sources could have been exploited by Ancient Man. One of these sources could be the Balchit main lava flow or one of its proximal concentrations of erosion products.

Thus in order to deepen our understanding of the obsidian procurement strategies of Ancient Man, the next step (in progress) will be to draw a comprehensive map of the potential obsidian sources in the vicinity of the Melka Kunture area and to establish their geochemical fingerprinting.

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Acknowledgments

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