Obsidian Sourcing at Körtik Tepe (Turkey)

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(1) Introduction

Located on the Upper Tigris (**Fig. 1**), Körtik Tepe is one of the earliest Pre Pottery-Neolithic A [PPNA] sedentary settlements in the Anatolian part of the Fertile Crescent, dated to the early 10th millennium BC.

The site contributes to the definition of an Upper Tigris regional tradition, with parallels drawn between the architecture, material culture and iconography of Körtik Tepe and the nearby Epi-Palaeolithic sites of Hallan Çemi and Demirköy and PPNA Çayönü .

Recent faunal and archaeobotanical studies indicate "a mosaic of exploitation strategies" amongst the earliest Neolithic communities of the Fertile Crescent (Arbuckle and Özkaya 2006: 114; see also Asouti 2010).

Do obsidian procurement and technical choices also reflect such local contingencies, or is there evidence for common modes of consumption over wide areas?

It is this theme of defining local and supra-regional cultural practices in the context of 'Neolithisation' that forms this study's point of departure.

We aimed to source these artefacts' raw materials via elemental characterization, part of a larger study on obsidian consumption by prehistoric communities in the Eastern Mediterranean.

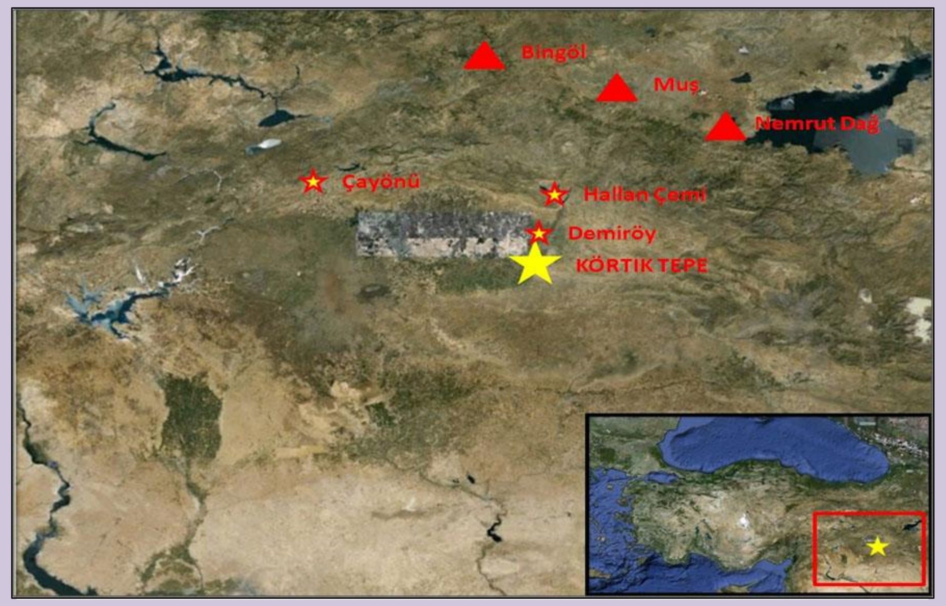

Figure 1: Upper Tigris region, Turkey (with sites and obsidian sources).

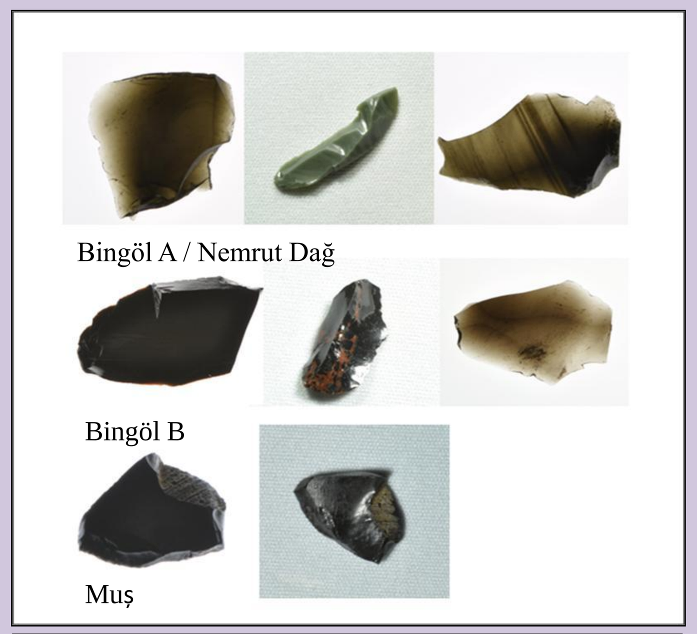

Figure 2: Visual distinctions by source.

(2) The Körtik Tepe obsidian

Preliminary reports by Kartal suggest that the Körtik Tepe obsidian has more in common with the local Epi-Palaeolithic traditions, as best evidenced at nearby Hallan Çemi (late 11th / early 10th mill. BC [Özkaya 2009: 6]).

It is dominated by blade and microblade production, with geometric microliths, thumbnail scrapers, backed blades and various points (Özkaya 2009: 6; Özkaya *et al* 2008: 90-95).

Our study involved the analysis of 120 artefacts; the material was selected by Kartal and Özkaya to examine initially: 1) the relation between visual distinctions in raw materials and sources (**Figs. 2-3**), 2) the potential variance of raw material consumption within the community (**Fig. 4**)

With the selection process biased towards non museum-quality finds, the bulk of the artefacts comprise relatively undiagnostic flake debris.

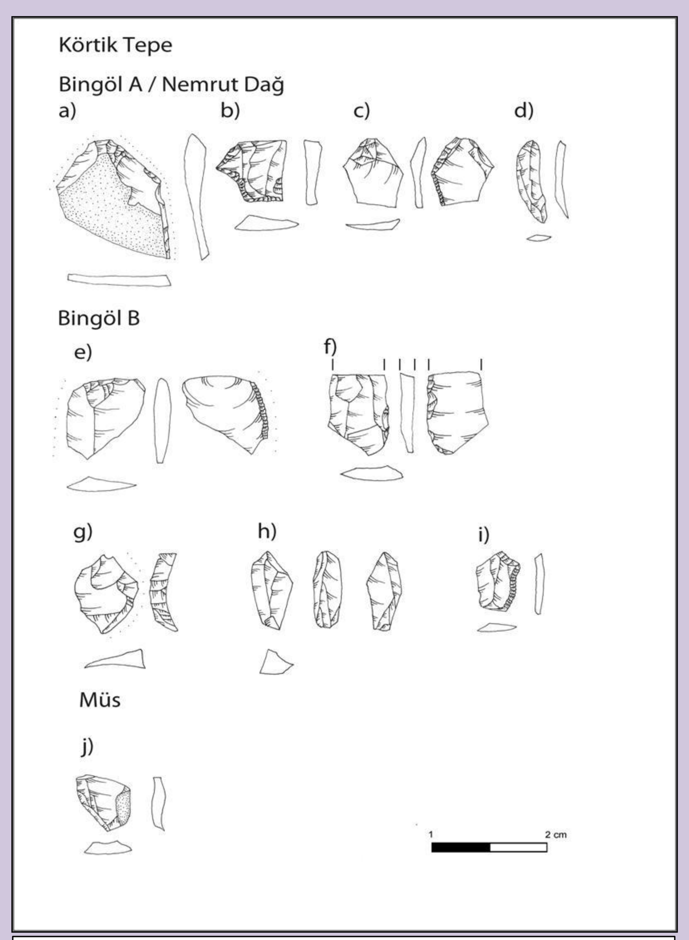

Figure 3: Selection of artefacts by source (D. Mihailović).

3) The Elemental Characterization

120 artefacts were analyzed whole and *non-destructively* at the MAX Lab by a Thermo *Quant'X* energy-dispersive x-ray fluorescence spectrometer [EDXRF], recording Ti, Mn, Fe, Ni, Cu, Zn, Ga, Rb, Sr, Y, Zr, Nb, Ba, Pb and Th.

Trace element intensities were converted to concentration estimates through reference to various standards, including those certified by NIST and USGS.

In a Zr *vs.* Sr contents plot, the 120 artefacts are clearly discriminated into two groups, plus a single outlier (**Fig. 5**).

Source assignment was achieved through comparing the artefact chemical signatures with those of source samples run by the lab and/or published elsewhere (Poidevin 1998).

The dominant group (n=67) is a brown/black colour with a chemical signature of low Zr and high Sr content that matches the calk-alkaline outcrops of the **Bingöl B** source, 135-150 km due north.

The artefacts with the high Zr is a highly distinctive green peralkaline obsidian (n=52), whose signature matches those of products from **Bingöl A** and/or **Nemrut Dağ.**

The final artefact we tentatively assign to the **Muş / Merçimakkale** source **(Fig. 6).** All the sources are approximately the same distances from the site.

(4) Discussion

The **Bingöl A** and/or **Nemrut Dağ** artefacts include blanks from an entire reduction sequence relate to unipolar percussion blades and microblades (**Fig 3**).

Conversely, the **Bingöl B** sample does not include cortical debris, tentatively suggesting a subtly different form of procurement; the material is otherwise very similar.

The community's reliance upon these raw materials mirrors that of Epi-Palaeolithic Hallan Çemi and PPNA Çayönü, evidence for an Upper Tigris cultural tradition.

This is distinct to the Urfa region and Middle Euphrates, where people also accessed Cappadocian obsidian (Chataigner 1998).

This is the first evidence for the use of the **Muş / Merçimakkale** source.

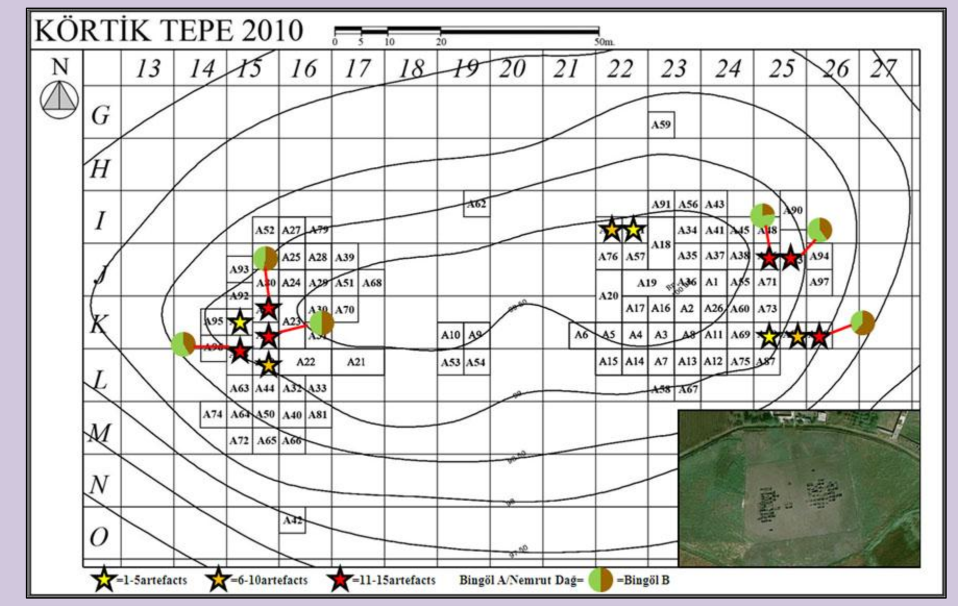

Figure 4: Site plan with distribution of analyzed artefacts by amount / source / trench.

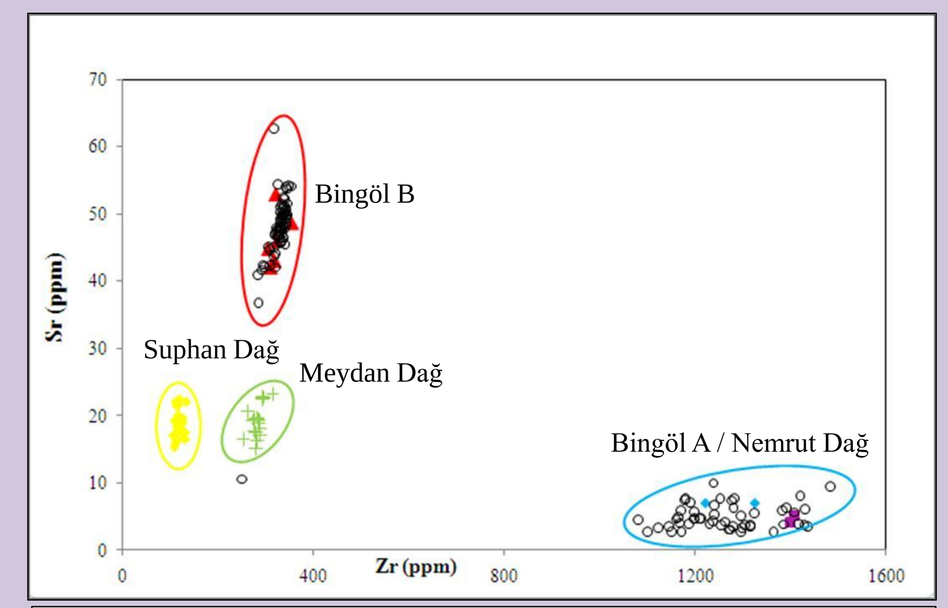

Figure 5: Bivariate contents plot of Zr vs. Sr (solid symbols - source samples).

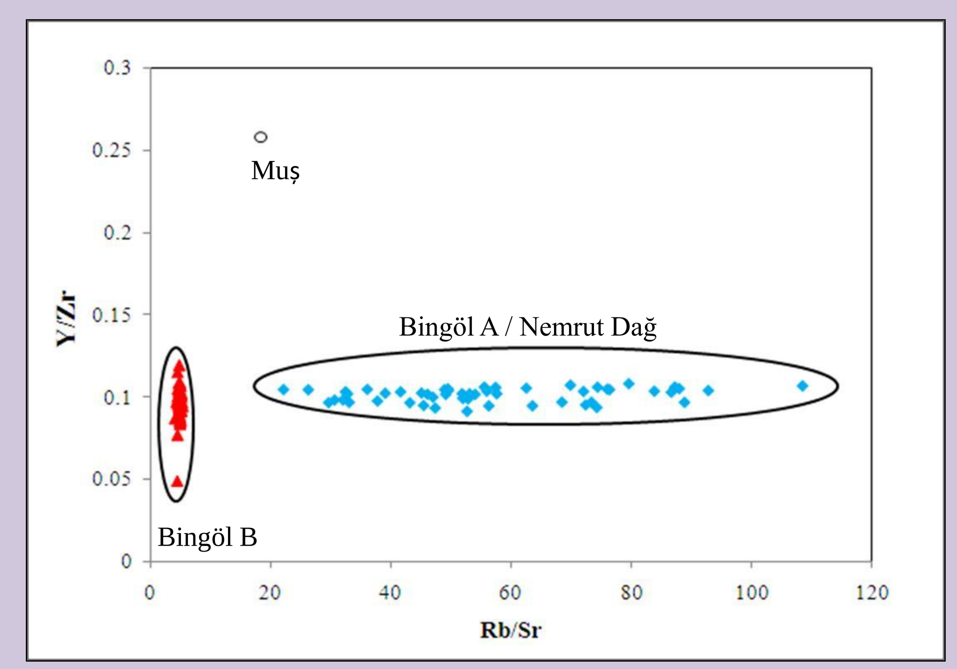

Figure 6: Rb/Sr vs. Y/Zr ratio plot.

(5) Conclusion and future directions

Our next analyses will aim to a) more fully integrate our sourcing data with Kartal's techno-typological studies to gain a detailed insight into the community's traditions, b) to examine these practices phase-by-phase, c) to compare two or more contemporary household assemblages **(Fig. 4).**

Finally we need to make detailed comparisons with assemblages from other sites who also used these eastern Anatolian obsidians; shared raw materials do not necessarily mean common traditions.

References

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For further information about the project and the MAX Lab, contact Dr. T. Carter at **stringy@mcmaster.ca.**