# Raw material choices in Amudian versus Yabrudian lithic assemblages at Qesem Cave: A preliminary evaluation

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## ABSTRACT

The lithic assemblages recovered from Qesem Cave can be divided into two distinct industries, the Amudian and the Yabrudian, based mostly on different proportions of blades and scrapers. The assemblages can also be divided chronologically and by area within the site, such as the shelf, and the hearth area. The goal of our study is to try to determine whether the assemblages vary in their use of the landscape and its resources. Were the same raw materials used in each case, or do the assemblages differ, either in proportions or in sources exploited? We have therefore undertaken an examination of a sample of approximately 6000 pieces, divided fairly equally between three assemblages: the Amudian and the Yabrudian from the shelf area, and the hearth area (which is Amudian). We begin by categorizing each distinct raw material as to rock type, and, since most of them are varieties of flint, distinguish individual types based on criteria such as colour, cortex characteristics, homogeneity, and any visible fossils. To date we have identified 51 raw material types, some of which are varieties of each other which will be grouped together later. Each lithic piece examined is recorded as to typological category, assigned a raw material type, and weighed. We are thus able to examine the differences in proportions of use of the raw material types in each assemblage, by typological category, and in terms of number of pieces and of weight of material used. This paper reports only on the data concerning numbers of pieces, and shows that some raw materials were selected for specific types of tools or technological requirements. In addition, we have started field work aimed at locating the sources of the flint varieties. We have located 15 potential sources, most within 5 km of the site, but also two located more than 15 km away. Comparison of samples from the geologic sources with samples from the site assemblages has allowed us to tentatively suggest the origins of 46 of the 51 raw material types. This gives us an idea of the extent of the territory exploited by the hominins at Qesem, how different raw materials were used for different purposes, and how use of these resources and territory differs between assemblages.

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## 1. Introduction

As part of the multidisciplinary effort to understand the lives of the prehistoric inhabitants of Qesem Cave, we have undertaken a study of the lithic raw materials used for the stone tool assemblages excavated there. The site has several layers and distinct areas of use, from which many thousands of lithics have been excavated, analyzed and published (e.g., Barkai et al., 2005, 2009; Assaf, 2014; Assaf et al., 2015; Parush, 2014; Parush et al., 2015). Generally, three different industries characterize the Acheulo-Yabrudian techno–complex: Amudian, which is dominated by

blade production; Yabrudian, dominated by production of scrapers; and Acheulo-Yabrudian, dominated by handaxe production. Two of these three industries, the Amudian and the Yabrudian, have been identified at Qesem Cave. The goals of this present study are to identify what raw materials were used, to determine whether use of raw materials varied between tool types, industries, or areas of the site, and to determine what the sources of the raw materials were in the surrounding area. As a preliminary approach to understanding the lithic assemblages, therefore, we chose to study a large sample of pieces from each industry in one area (known as 'under the shelf', hereinafter called the shelf, see Parush et al., 2015), and an equivalently-sized sample from another area (the hearth), which is attributed to the Amudian industry (Blasco et al., 2014; Shahack-Gross et al., 2014). The three are of approximately equivalent age: Falguères

et al. (2016) give ESR dates on teeth showing mean ages of 280 ka for the Amudian hearth, and 313 ka for the Yabrudian under the shelf, with overlapping ranges for the two areas. We wanted to examine whether there are differences between the Yabrudian and the Amudian, between the two different Amudian assemblages, or between the two assemblages from the shelf versus the one from the hearth. We recorded numbers of pieces and weights of pieces, by tool and raw material type, so that we could see whether the assemblages differ only in terms of technology and typology, with the same raw materials being used for both, or also in terms of raw materials used, either in proportions or in sources exploited. This will then allow us to determine whether the differences extend to different uses of the landscape and its resources, and to gain some perspective on the economic strategies adopted by the hominins at Qesem.

The preliminary report presented here forms part of a much larger, on-going project started in 2013, which will take several years to complete. Full analysis of the individual raw material proportions and distributions within the assemblages is beyond the scope, and the space allotted, for this paper, as is any detailed discussion of the geologic context of the site. To keep things manageable, therefore, we are reporting only on our data concerning numbers of pieces of each raw material, not the weights of material used. However, our results demonstrate the usefulness of this approach, and encourage us to continue with the analysis of the full dataset.
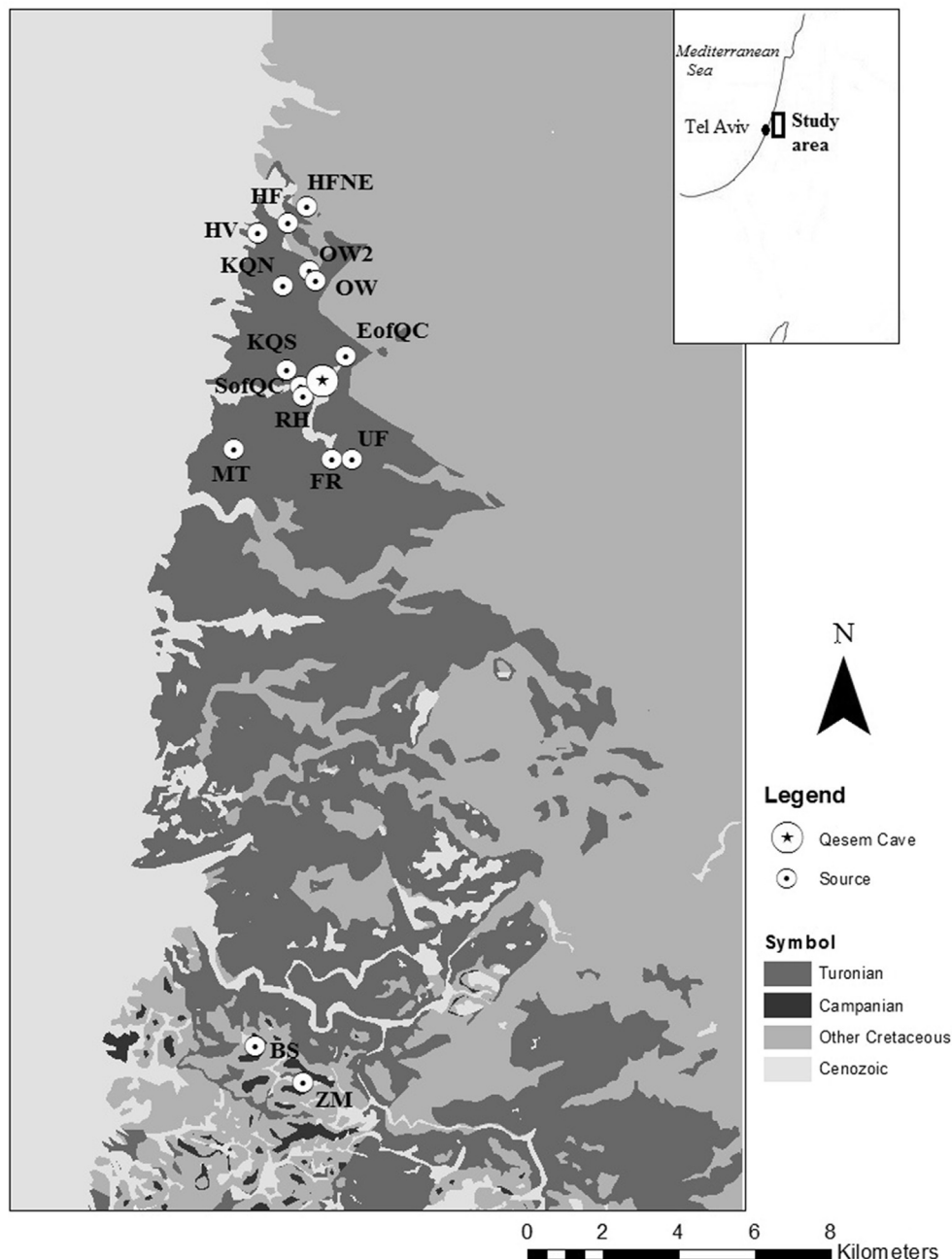


Fig. 1. The study area and potential raw material sources.