



# Gesture variation in the use of Palaeolithic bulb-retouchers. Application to the late Acheulean site of Jaljulia (Israel)

Cyrielle Mathias, Cristina Lemorini, Flavia Marinelli, Sol Sanchez-Dehesa Galan, Ran Barkai

## ► To cite this version:

Cyrielle Mathias, Cristina Lemorini, Flavia Marinelli, Sol Sanchez-Dehesa Galan, Ran Barkai. Gesture variation in the use of Palaeolithic bulb-retouchers. Application to the late Acheulean site of Jaljulia (Israel). 6th International Congress of Experimental Archaeology, Oct 2022, Pézenas, France. . hal-03840602

**HAL Id: hal-03840602**

**<https://hal.science/hal-03840602>**

Submitted on 10 Jan 2023

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License



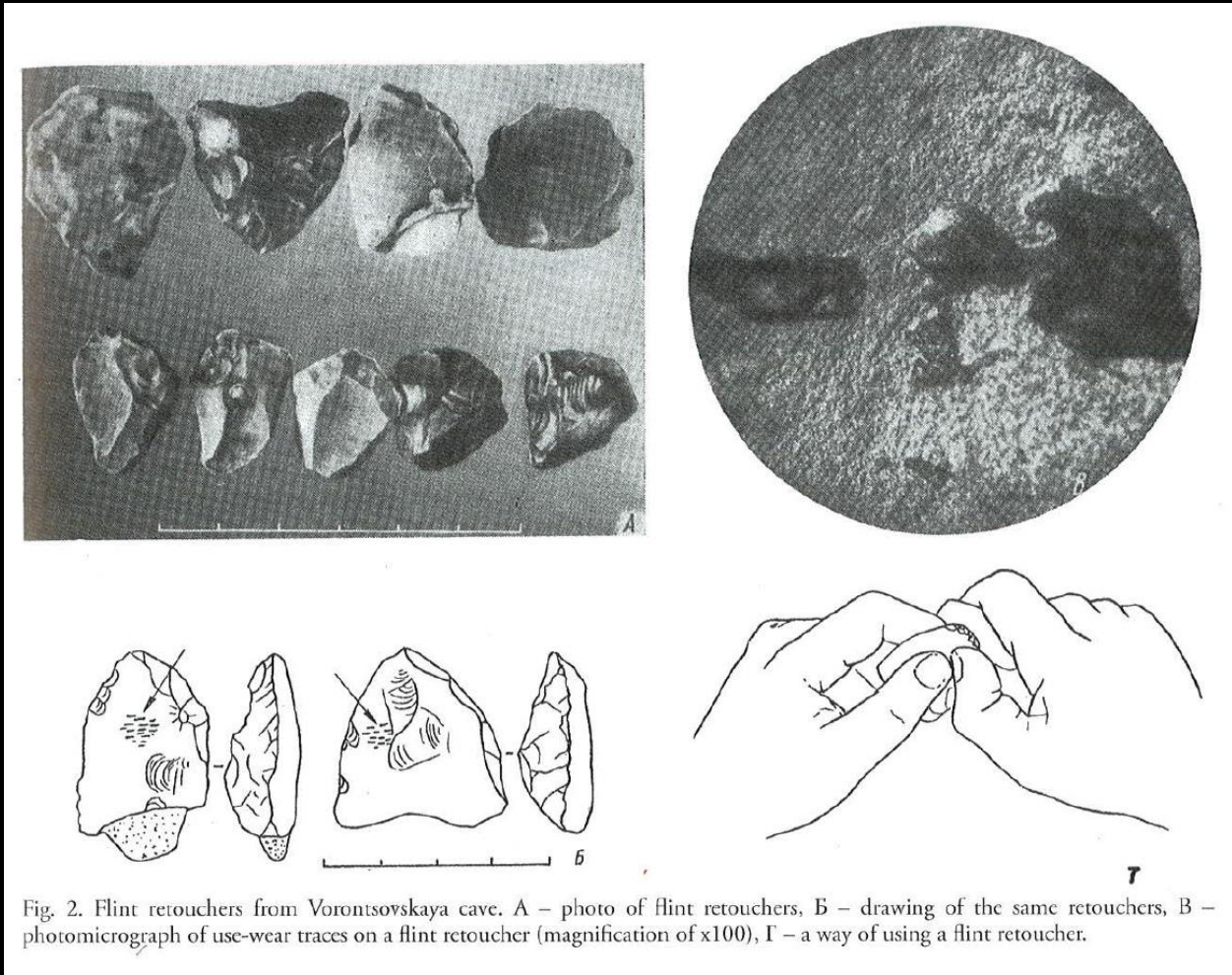
# GESTURE VARIATION IN THE USE OF PALAEOLITHIC BULB RETOUCHERS. APPLICATION TO THE LATE ACHEULEAN SITE OF JALJULIA (ISRAEL).

Mathias C.\*, Lemorini C., Marinelli F., Sánchez-Dehesa Galán S., Shemer M., Barkai R.

cyrielle.mathias@gmail.com



- ◆ Bulb retouchers (« éclats à bulbes piquetés ») were identified by Semenov and Praslov within Middle Palaeolithic assemblages in the 1950's.
- ◆ These pieces present percussion marks (pits) on the ventral surface of flakes (directly on the bulb but not only), similar to those found on bone retouchers.
- ◆ Bulb retouchers were since then recognised in numerous contexts, almost only dated to Middle Palaeolithic in Eastern and Western Europe, North Africa. They were recently identified in the Levant, where their use seems very systematic, especially in Nesher Ramla (Centi et al., 2019).
- ◆ Most of the bulb-retouchers blanks are retouched flakes, such as side-scrapers or convergent tools (Adler, 2002; Centi et al., 2019).
- ◆ The first use hypothesis of A. Semenov was the use in pression/flexion of retouchers. Since then, several experiment have shown their use in direct percussion (Adler, 2002; Mathias & Viallet, 2018; Centi et al., 2019).



Semenov, 1970, 1972

◆ **Objective:** Test the impact of various gestures in the use of bulb-retouchers and on the traces produced.

## EXPERIMENT

- ◆ Test of 2 motions (tangential, perpendicular), by mid-experienced knappers, following a number of strokes ; 1 without count to produce side-scrapers ; 1 by "pressure"
- ◆ 4 pieces for each stroke number (100, 200, 400, 800).

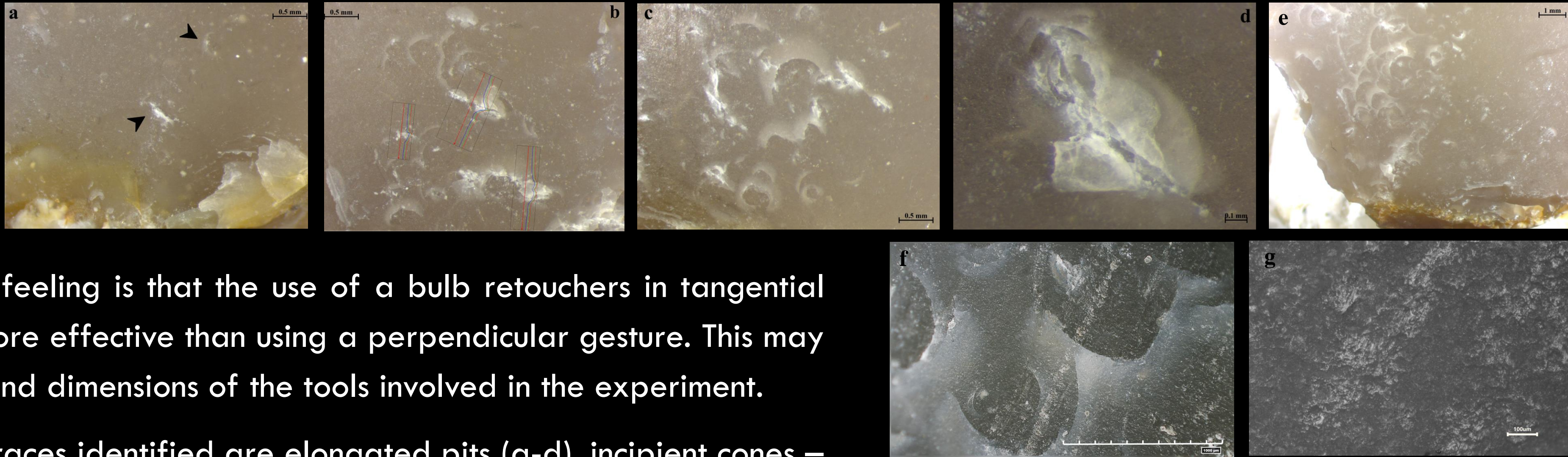
N	Length (mm)	Width (mm)	Thick. (mm)	Thick. bulb (mm)	Weight (g)	Angle bulb/butt	Angle ventral surface/butt	Raw material	Retouch gesture	N strokes	Observation
1	77,8	45	17,7	17,7	62	122	110	Mishash	Tangential	200	-
2	52,4	31	9,5	6,1	18	126	123	Mishash	Perpendicular	100	-
3	54,9	48,3	17,5	15,5	64	126	112	Mishash	Tangential	200	-
4	57,5	48,2	17,2	17,2	43	128	128	Mishash	Perpendicular	600	Bad gripping
5	54	42,9	12,1	12,1	27	124	124	Mishash	Tangential	600	-
6	53,5	36,6	14,9	10	34	114	114	Mishash	Perpendicular	450	Initially for 600 strikes, but fracture
7	46,3	59	18,5	18,5	43	128	130	Mishash	Flexion/pressure	-	For two flakes. Difficult and not efficient
8	34,6	37,4	15,4	15,4	30	120	114	Mishash	Perpendicular	200	-
9	43,7	28,5	12,7	12,7	19	109	92	Mishash	Tangential	100	-
10	34,3	48,9	9,1	9,1	15	113	95	Mishash	Perpendicular	200	-
11	50,8	36,1	9,6	7,8	19	122	117	Mishash	Tangential	400	-
12	60,4	50,2	14,4	14,1	54	122	113	Mishash	Perpendicular	400	Lateral fracture (notch-like) of the bulb-retoucher
13	32,7	36	10,2	9,8	11	110	107	Mishash	Tangential	400	Difficult to handle
14	66	42	19,9	14,3	74	120	120	Mishash	Tangential	> 400	Retouch of several tools during a long period
15	31,5	31,3	12,2	12,2	12	124	124	Turonian	Perpendicular	100	-
16	35	30	16,8	16,8	11	128	128	Turonian	Perpendicular	400	-
17	76,4	47,2	12,2	11,9	55	122	110	Mishash	Tangential	600	-
18	47,6	26	8,1	8,1	10	131	114	Mishash	Perpendicular	100	Difficult to handle



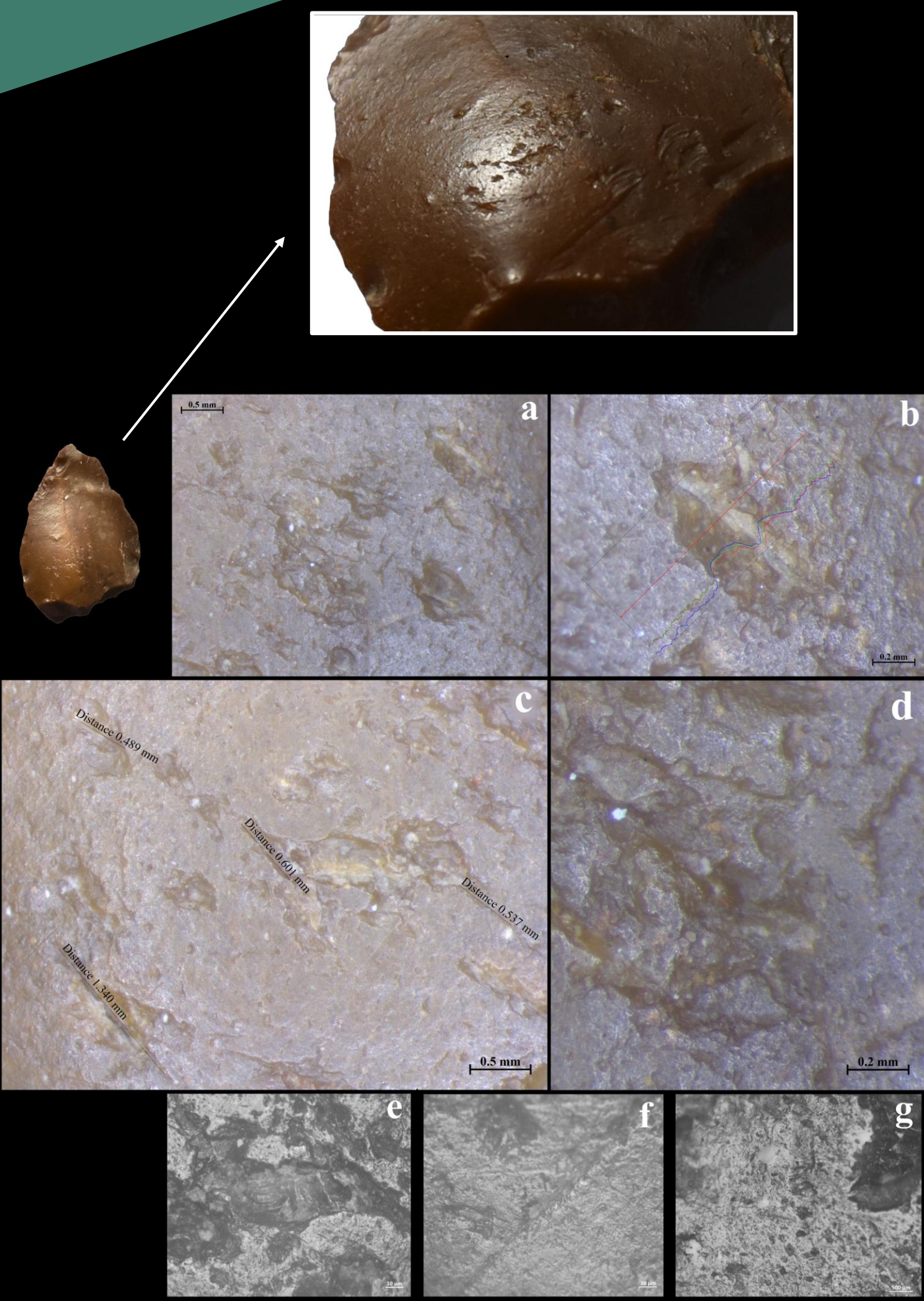
◆ Observation with stereomicroscope (Zeiss Axio Scope A1, Nikon SMZ-U), metallographic microscope (Nikon Eclipse ME 600).

## RESULTS

- ◆ The experimental feeling is that the use of a bulb retouchers in tangential percussion is much more effective than using a perpendicular gesture. This may be due to the mass and dimensions of the tools involved in the experiment.
- ◆ Main traces identified are elongated pits (a-d), incipient cones – half, whole (b, c, e) and striae (f, g).



## ARCHAEOLOGY



JALJULIA  
LATE ACHEULEAN



QESSEM CAVE  
ACHEULEO-YABROUDIAN

- **Perpendicular gesture:** more incipient cones in general, and more circular (full) incipient cone;
- **Tangential:** more pits, and more linear pits. Still sometimes numerous incipient cones.

◆ The intensity of traces in not always correlated with the number of strikes. Other factors may have an impact, such as the energy transmitted, the convexity of the ventral surface or the flint quality.

- ◆ Similar elongated pits and incipient cones (mainly semi-circular), and sometimes striae, can be identified on the lithic material.
- ◆ But, more incipient cones produced during the experiment (contrary to what was published before): caused by the skills of the knappers (here, knappers not familiar to the use of retouchers) or a gesture?
- ◆ At Jajulia, at least 2 of the 5 pieces with percussive marks on the ventral surface can be descibed as a classic bulb-retoucher, with an intensive use. It constitutes so far the oldest evidence of such pieces, ca. 500 ka in the Levant.
- ◆ A first examination of the lithic material from Qesem cave show their use during the Acheuleo-Yabroudian, with a much better preservation of lithic material and thus a potential to study the microwears and tool functions (cutting-edges).

◆ **Aknowledgements:** We are grateful to the Sonia and Marco Nadler Institute of Archaeology, Tel-Aviv University, for the research funding with a postdoctoral fellowship. We also thank colleagues who share information about their experimental or archaeological material: D. Adler, O. Jöris, M. Massoulié, M. Prévost, C. Viallet.

◆ **References:** Adler, D.S., 2002. *Late Middle Palaeolithic Patterns of Lithic Reduction. Mobility and Land-Use in the Southern Caucasus*. Harvard University, Cambridge. / Centi, L., Groman-Yaroslavski, I., Friedman, N., Oron, M., Prévost, M., Zaidner, Y., 2019. The bulb retouchers in the Levant: New insights into Middle Palaeolithic retouching techniques and mobile tool-kit composition. *PLoS ONE*, 14, e0218859. / Mathias, C., Viallet, C., 2018. On the possible use of flake-bulbs for retouch during the Early Middle Palaeolithic in Southeastern France: First results of an experimental approach. *Butlletí Arqueològic V*, 323–328. / Semenov, S.A., 1970. Production and functions of stone tools. *Kamennyyi vek na territorii SSSR. Materialy i issledovaniya po arkhologii* 166, 7–18. / Semenov, S.A., 1972. Concerning the traces of use on moustérien artifacts from Vorontsov cave. *Materialy i issledovaniya po arkhologii SSSR*. 185, 20–24. / Tixier, J., 2000. Outils Moustériens a bulbe "piqueté" (Retaimia, Algérie). In: Otte M, editor. *À la recherche de L'Homme préhistorique*. ERAUL 95. Liège; 2000. p. 125–30.