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The use of stones for “confection” during the early Middle Palaeolithic in Southeastern France: first results of an experimental approach on lithic retouchers.

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Introduction

A stone retoucher is traditionally defined as a pebble or as a stone of globular shape, smaller than hammers, with crushing marks on an extremity, on one surface or on both. The use of bone retouchers begins during the Lower Palaeolithic (Moigne *et al.*, 2014) and increases during the Middle Palaeolithic. At Orgnac 3, bone retouchers were identified, as well as a flake that seems to show very similar stigmata on his ventral surface, and other pieces with crushing marks.

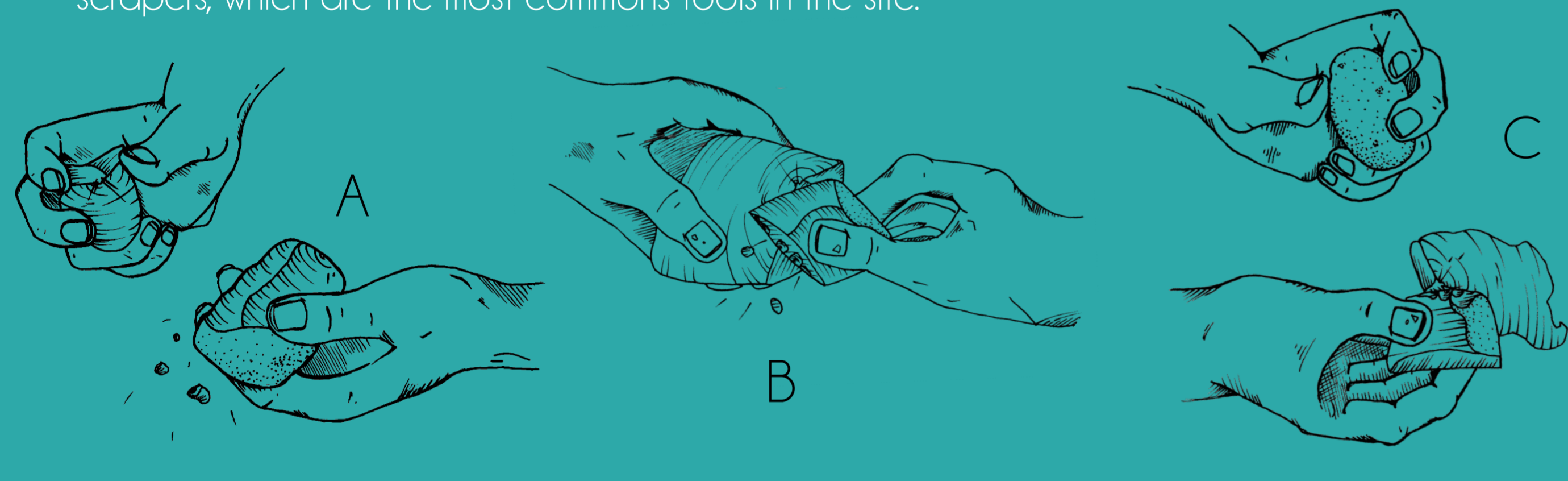
Protocol

- **Objects tested** : flakes obtained by S.S.D.A. methods with a large and open striking platform.
- **Raw materials** : flint slabs from the Barjac-Issirac riparian basin. Type O1 with microfossils and O2 with macrofossils (gastropods : *Striatella*, *Planorbis*).



N°	Motion	Raw material	Dimensions	Weight	Angle ventral surf/striking plat.	N Blows
RS01	Percussive	Flint O1	99x63x23	110g	123°	1200
RS02	Percussive	Flint O1	160x145x30	300g	127°	600
RS03	Percussive	Flint O2	93x85x21	160g	136°	2000
RF01	Flexion	Flint O1	75x50x14	64g	120°	400
RI01	Indirect/anvil	Flint O2	107x81x27	270g	128°	600

- **Activities performed**: retouching (confection) with a percussive motion (A) ; retouching with a motion of flexion (B) ; retouching with flake-anvil in an indirect way (C). The aim was to made side-scrapers, which are the most commons tools in the site.



Comparison with archaeological data

A flake interpreted as a stone retoucher was identified in the layer 6 of Orgnac 3 (Ardèche, France), attributed to the early Middle Palaeolithic or a final Acheulean (MIS 9 ; Moncel, 1999 ; Michel *et al.*, 2013).

Flake description : 49x27x19mm, semi-cortical flake from an unipolar flaking with a dihedral striking platform. The angle between the ventral surface and the striking platform is 120°.

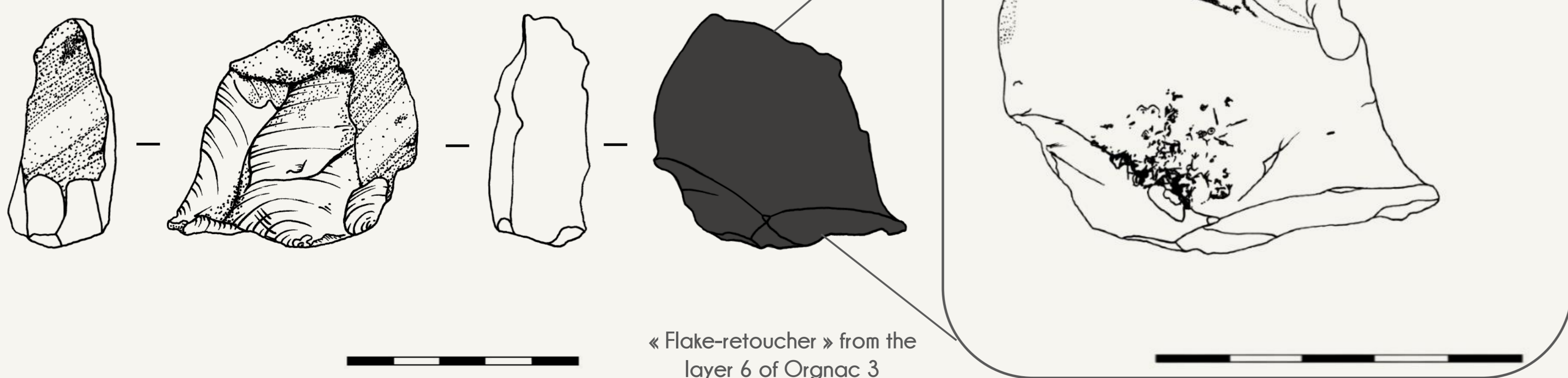
Marks : crushing marks are located on the ventral surface, on the bulb and on the junction-edge with the striking platform. We can notice a graduation in the deterioration of the surface by the incipient cones (Figure A and C) which are often outlined. A scar is present (B) at the intersection between the surfaces.

Correspondance with experimental data :

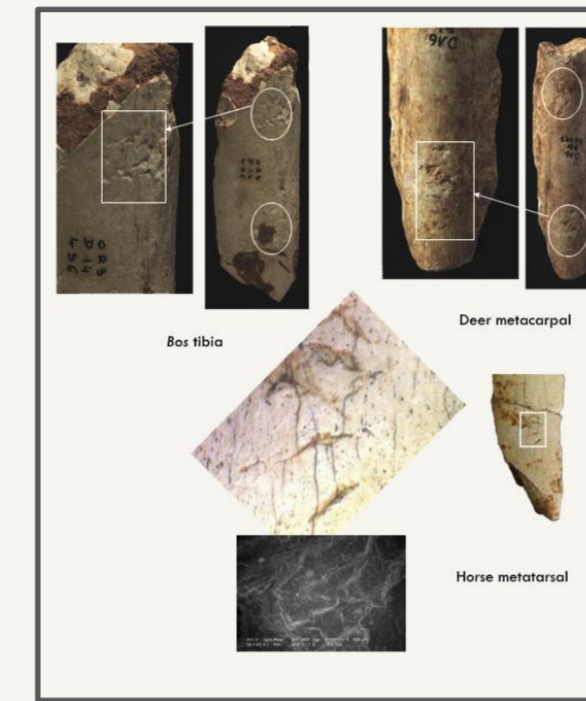
Crushing marks on this flake, by their type and development, correspond to those obtained during the experimental phase in direct percussion. The small dimensions of the piece induce a probable use as a flake-retoucher instead of a use for *débitage*.



Incipient cones (« coups d'angles ») General view of crushing marks (punctiforms, linears) Scar Outlined incipient cones

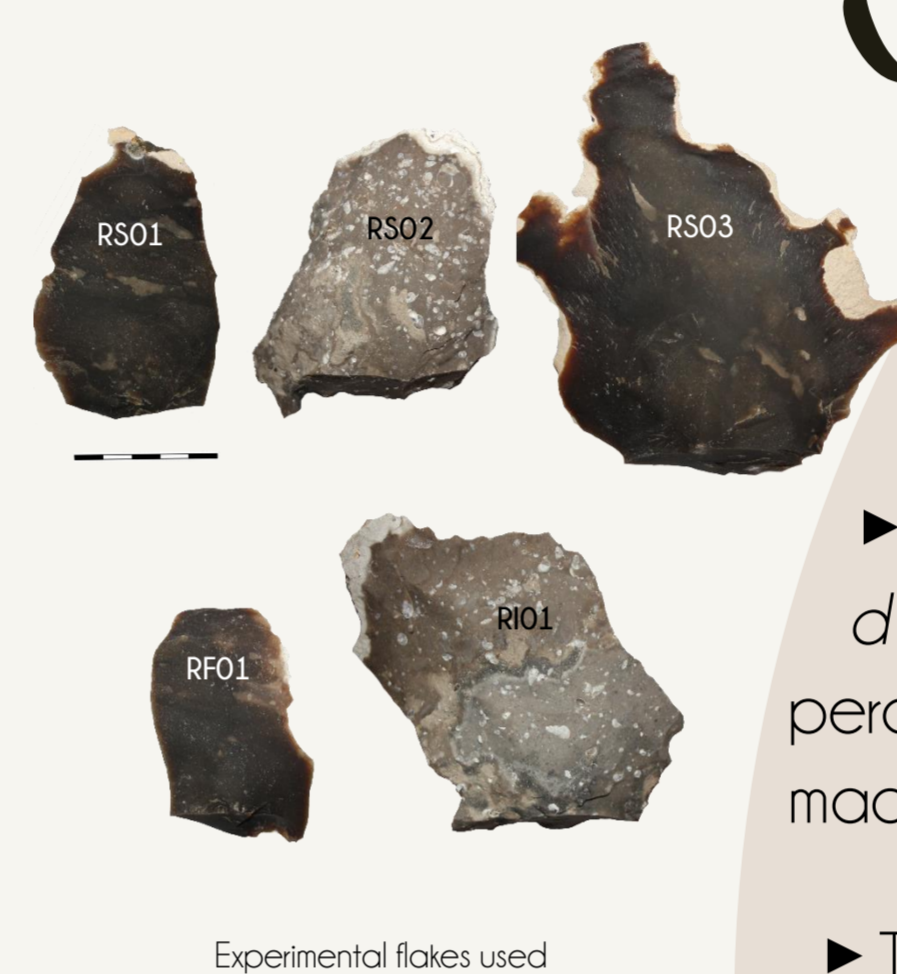


« Flake-retoucher » from the layer 6 of Orgnac 3



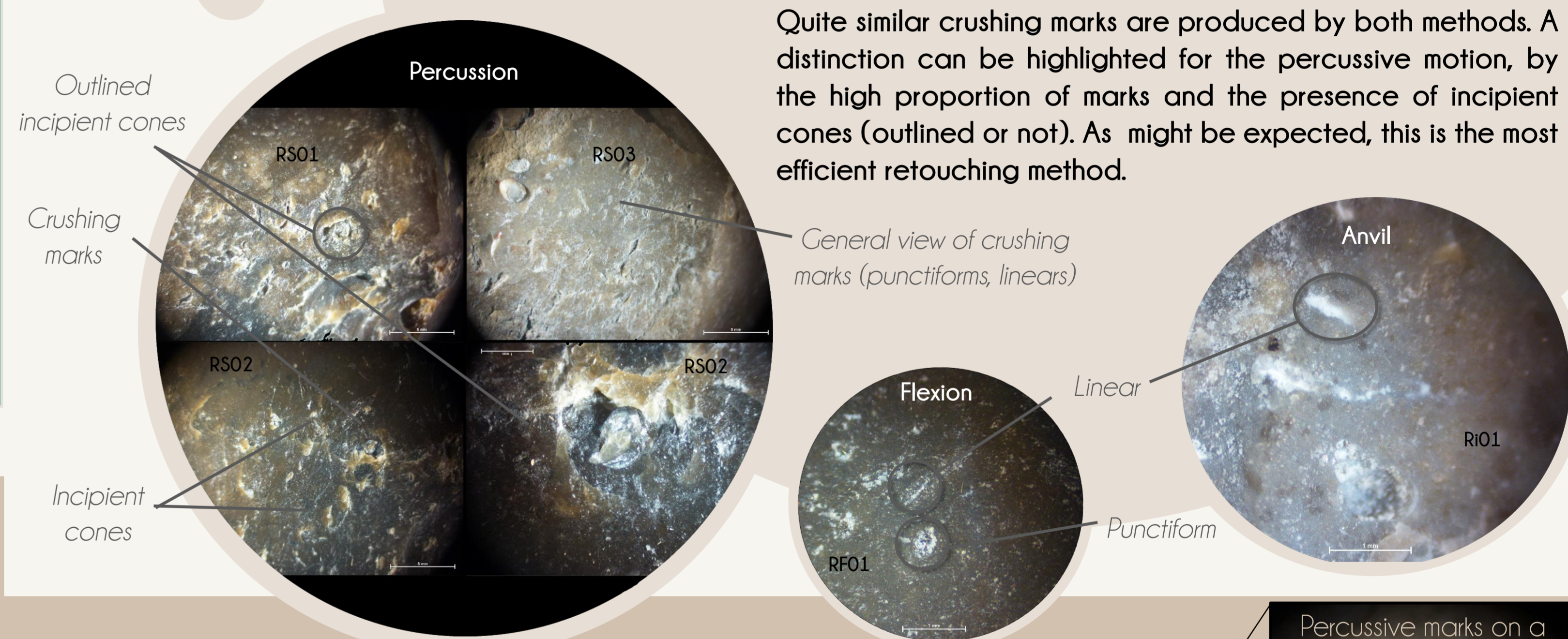
Bone retouchers from the layer 6 of Orgnac 3 (Moigne *et al.*, 2014)

Experimental results

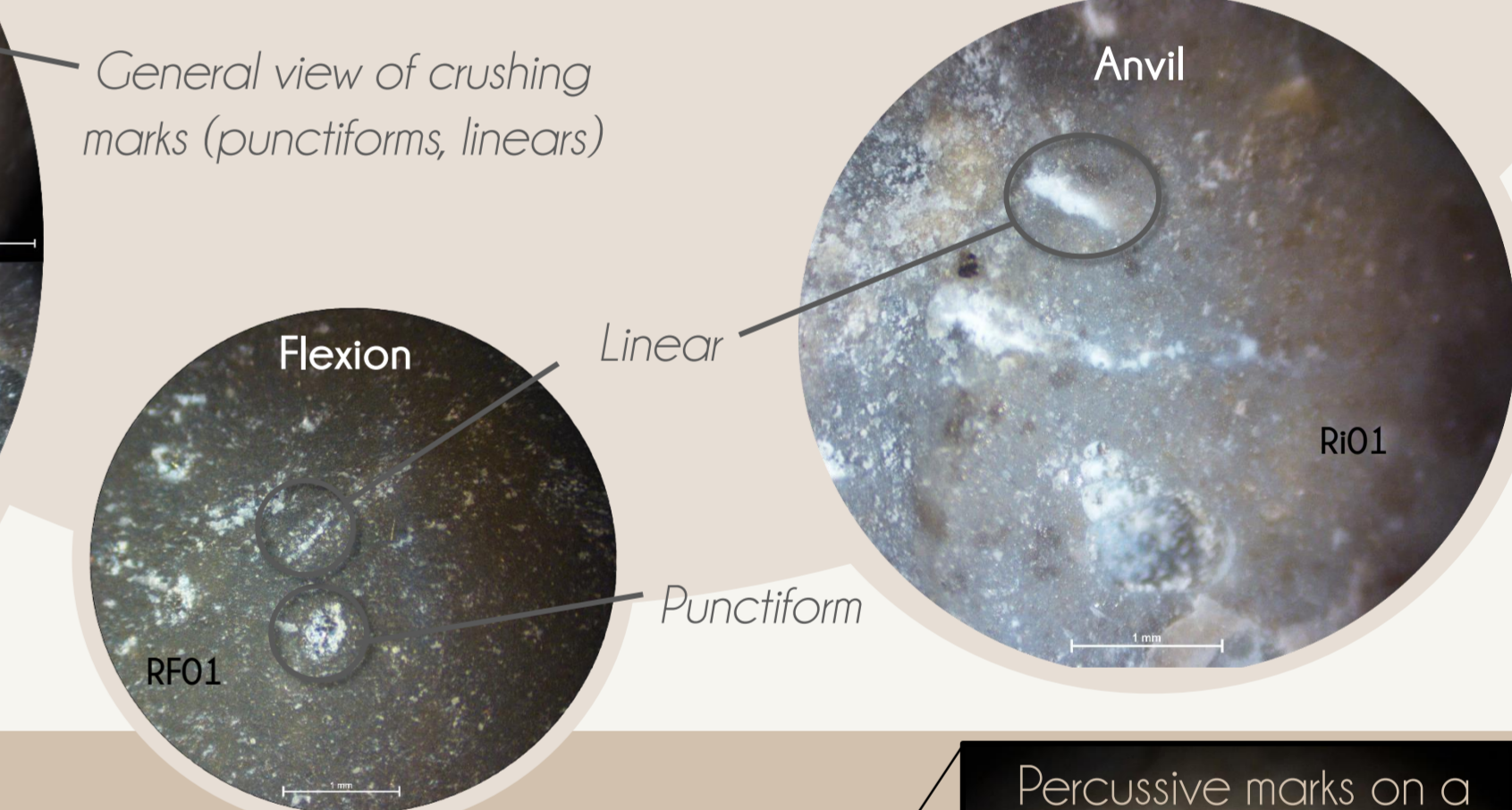


Experimental flakes used

- The use of a flake for retouching in a motion of flexion is ineffective. Nevertheless, small crushing marks, linears and punctiforms, can be observed on the used area (600 flexions).
- Flakes are highly effective for confection in a motion of direct percussion. According to their mass and weight, they could even been employed for flaking.
- Traces appear early (before 600 blows) and increase proportionally (1200 and 2000 blows). They are bigger than in the retouching motion of flexion.
- Marks related to this activity consist of incipient cones (traces « en coups d'angles ») and crushing marks (punctiforms, linears) resulting from the repetition of the percussion, forming small craters (outlined-incipient cones). The size of these macrowears is varying from 0,2 mm to 1 mm.
- The action of retouch is not efficient with a flake-anvil, probably due to the convexity of the bulb which hindered the holding. Moreover, traces are very rare and scarce (few marks for 600 blows).



Quite similar crushing marks are produced by both methods. A distinction can be highlighted for the percussive motion, by the high proportion of marks and the presence of incipient cones (outlined or not). As might be expected, this is the most efficient retouching method.



Some other pieces present marks attributed to a percussive motion, such as discoid cores, whose use has already been experimented (Thiébaud *et al.*, 2010).



Conclusions and Discussions

- There are few mentions of flakes with crushing marks on the bulb in literature (« à bulbes piquetés »), all during the Mousterian in Russia or Algeria (Plisson, 1988 ; Tixier, 2000). In all cases, it concerns only one or two tools by layer. Tixier put forward two options, regarding the work of Praslow (1984) : the use as retoucher in a percussive motion ; or an intentional percussion towards the bulb of the flake intending to facilitate its hafting. Here, hafting seems not to make sense due to the absence of a valuable edge.
- Due to the presence of only one flake and few cores with these stigmata in the layer 6 of Orgnac 3, we can argue that this trend is quite opportunistic and assimilable to a recycling phenomenon, common during MIS 8 to 3. Despite the presence of local flint on the plateau, pebble stones can only be found in the Ardèche and Ceze's alluviums, distant of 5 km. In that way the use of flint knapped material can be a response to a temporary need. Another hypothesis still needs to be tested and further analysis of the archaeological piece : the use in percussion for marking fire.

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