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The term "ground stone" refers to non-flaked industry, and includes a multitude of different instruments that have not undergone an intensive stone shaping. This natural and non-modified appearance of the stones lends to them the high potentiality of being utilised in the most varied uses as the processing of different materials such as bone, mineral and plant [1]. Among them we are here referring to the elaboration of vegetal resources that leave evanescent traces and perishable residues on the stone surfaces, which call for a tailored approach. Of great support for the comprehension of these stone tools' function(s) is the use of analytical techniques that allow a 3dimensional characterisation of the item and of wear affecting the surfaces as well as of morphotextural properties within the sample volume [2]. Our approach is based on multimodal and multidimensional morphological approach, by applying imaging techniques ranging from macro to sub-micro scales aiming at elaborate a digital model of the tools and at performing a wide range of analysis. In particular, the procedure exploits the advantage of (i) photogrammetric acquisition of the ground stones and 3D model elaborations to inspect their geometry and macroscale investigation of their surface, (ii) profilometry measurements of selected areas of the stone surface to characterise the microtopography and highlight the presence of use-wear traces, (iii) high-resolution synchrotron X-ray tomographic imaging to investigate the volumetric microstructure by a non-destructive approach and to verify the presence of crevices that served as putative traps for biogenic residues deriving from the plants grinding and pounding.
We present the pipeline developed for the analysis of the artefacts from several Marine Isotopic Stage 3 (MIS 3, 60-25 ka) sites, and in particular, tailored for the ground stones retrieved in the Aurignacian cultural level III of the Brînzeni I cave (north-west Moldova) [3]. The proposed analysis is tested on experimental replicas used to treat plants starch-rich organs compatible with the biome of the Pontic steppe during the MIS 3 [4].

References

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