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Neolithic polished greenstone implements from Castello di Annone (Italy): mineropetrographic and archaeometric aspects

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High-pressure (H*P*) meta-ophiolites, so-called greenstones, were used in Neolithic to produce polished stone implements all over the Western Europe. Their accurate petrographic description may help in inferring the provenance of the raw materials, thus reconstructing the migratory routes of our ancestors. The lithic industry of Castello di Annone (Northwestern Italy) was investigated with a multi-disciplinary approach including density measurements, XRPD, optical microscopy, SEM-EDS and geothermometry. More than half of the studied tools (52%) are made of fine-grained eclogites, gathered in three different groups each with a peculiar metamorphic history. Na-pyroxene rocks represent a residual 26%, with mixed Na-pyroxenites being more abundant than jadeitites, while serpentinites and minor lithologies form the remaining fraction. In most greenstone implements, both pyroxenes and garnets show a complex compositional zoning. Such a heterogeneity is typical of these tools but almost unknown in geologic samples, due to the lack of petrologic data from the few known outcrops. Though these H*P* meta-ophiolites belong to the Piemonte Zone, their sharper provenance may only be inferred through a systematic field survey and comparative study on geologic samples. A recent prospection in the upper Carbonieri Valley brought to uncover small boudins of fine-grained eclogites and omphacitites, similar to those found in the Neolithic tools. The Castello di Annone eclogites, poorly manufactured and probably collected from fluvial pebbles, have to be considered low quality materials. This confirms the marginal role of this site in the production and distribution network of greenstone implements in Northern Italy during Neolithic.