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# Optically stimulated luminescence dating of hearths from the Fazzan Basin, Libya: A tool for determining the timing and pattern of Holocene occupation of the Sahara.

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Circular concentrations of burned stone fragments, generally interpreted as ancient hearths, are widespread in the Sahara. These hearths provide a rich resource for reconstructing the pattern and timing of Holocene human occupation of North African drylands. However, since less than 5% of hearths contain dateable carbon and collection of this carbon frequently results in the destruction of the hearth, the potential of this resource has not been fully explored. Since anthropogenic firing should empty the optically stimulated luminescence (OSL) source traps of quartz grains within hearth rocks, the quartz OSL signal should provide a means for determining the time elapsed since last firing of the hearths. To test the applicability of this approach to Saharan hearths, samples were collected from a site in the Fazzan Basin, and analysed using single-grain OSL. Equivalent dose-depth profiles through hearth rocks demonstrate that they are sufficiently opaque to preserve a record of ancient firing. Comparison with unfired parent material indicates that anthropogenic firing of hearth rocks was sufficient to empty the OSL source traps. Sensitivity analysis indicates that hearth OSL ages are relatively insensitive to uncertainties in the burial/deflation histories of hearth The OSL ages for hearth rocks are internally consistent and suggest use around 8 ka. Our study demonstrates that OSL dating is a viable tool for determining the timing and pattern of Holocene occupation of the Sahara.