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High concentrations of environmentally persistent free radicals in fire derived pyrogenic organic matter

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Fire derived pyrogenic organic matter / charcoal is a source of environmentally persistent free radicals, which are precursors of potentially harmful reactive oxygen species. We analyzed charcoal samples from ten wildfires, including crown as well as surface fires in boreal, temperate, subtropical and tropical climate regions. Concentrations of environmentally persistent free radicals in these samples were orders of magnitude higher than those found in soils or other “background” matrices, as measured via electron spin resonance spectroscopy. The highest concentrations were measured in woody charcoals that were highly carbonized. We also found that environmentally persistent free radicals remained unexpectedly stable in the field for at least 5 years.

More details can be found in our recently published article: <https://www.nature.com/articles/s43247-021-00138-2>