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# Direct pyrolysis-compound-specific carbon isotope analysis (PY-CSIA) of Excalyptus spp. bark

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Changes in climatic and environmental conditions can affect both, plant chemical and isotope composition. Therefore, biomass carbon isotope composition is frequently used to gain information about the environmental conditions at the time a plant was growing [1]. In this field, the majority of studies use isotope values obtained from bulk samples. However, these values are a weighed mean average of the different plant compounds. The Isotopic characterization of individual biogeochemical compounds represents a relevant analytical advance able to differentiate the isotopic composition of the main plant components i.e. polysaccharides, lignin, polypeptides, lipids and waxes, etc.
Here, we investigate the link between molecular and isotope composition of bark from three Eucalyptus species (E. grandis, E. dunni and a hybrid E. grandis x E. dunni) using Py-CSIA. Bulk samples and lignin extracted were analysed by Py-CSIA; this technique, although not widely used, has been previously developed and applied, with different variants [2-7], to characterize plant products including lignin [8], sugars [9] and terpenes [10].
Our results support the idea that the pyrolysis compound specific isotope analysis (Py-CSIA) can provide valuable and accurate isotopic fingerprinting of biomass. Despite that wood/bark from different origins provide very similar pyrolysis pattern, isotopic composition of relevant specific compounds can make the difference giving additional valuable information.

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