

### Espresso coffee residues in horticultural improvement

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Spent coffee grounds are usually disposed as common garbage, without specific reuse strategies. Due to its recognized richness in bioactive compounds,<sup>[1]</sup> the effect of espresso spent coffee grounds on lettuce's macro- and micro-elements, as well as on its antioxidant and bioactive compounds, was assessed in order to ascertain its potential applicability in agroindustry, minimizing environmental issues and increasing vegetables nutritional features. Therefore, a greenhouse pot experiment with fresh and composted spent coffee (2.5 to 30% v/v) was conducted, using lettuce plants.

The plants antioxidant capacity, assessed by radical scavenging effect and reducing power, was enhanced by fresh spent coffee. Total reducing capacity was also improved, particularly for low spent coffee percentages. Additionally, very significant positive correlations were observed for all carotenoids in fresh spent coffee treatments. The results were not so significant with composted coffee residues, neither for vitamin E on both cases, but chlorophyll *a* was a good discriminating factor between control group and both treated samples. In opposition, a progressive decrease on all mineral elements (magnesium, calcium, phosphorous, sodium, iron, manganese, zinc and copper) was verified with the increase of fresh spent coffee, except for potassium, while with low amounts of composted spent coffee (5%, v/v) a significant increase in the potassium content (by 40%), manganese (by 30%) and magnesium (by 20%) was observed.

A sustainable bioconversion approach for coffee by-products was achieved, which might be extendable to other crops, and favourably contributes to the potentiation of vegetables nutritional quality.

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#### References

- [1] Cruz, R.; Cardoso, M.M.; Fernandes, L.; Oliveira, M.; Mendes, E.; Baptista, P.; Morais, S.; Casal, S. J. *Agric. Food Chem.* **2012**, *60*, 7777.