Coffee's Antioxidant Capacity Put to the Test

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Melbourne, Australia—Coffee drinkers now have another reason to reach for their morning cup of Joe. Researchers recently found that coffee and its byproducts may even more antioxidant capacity than previously thought.

A group of Australian researchers conducted a detailed study to see what happens to coffee beans' antioxidants during brewing. The team arranged for 25-g groups of *Coffea arabica* beans to be roasted at 220 degrees Celsius for 2, 4, 6, 8, 10 or 12 minutes before packaging them in foil bags to be shipped. Once they arrived for research, the bags were opened and samples were either studied as-is, grinded with a marble mortar and pestle, or brewed. Samples were then inspected using an electron paramagnetic resonance (EPR) to search for any polyphenols with antioxidant properties.

When analyzing the in-tact samples, the EPR sent signals made from the release of Fe^{3+} and MN^{2+}, as well as three stables radicals produced from the roasting. Two of these stable radicals were previously known, while the third is yet to be studied. In the brewed samples, the compounds with a higher molecular weight (>3 kD) were found to contain melanoidin; whereas, the ones with a low molecular weight (<3 kD) did not have the highest antioxidant capacity, while using DPPH (2,2-diphenyl-1-picrylhydrazyl), a stable free molecule, as an oxidant.

This research was published on *PLOS ONE* and conducted by Dr. Gordon Troup, physicist at Monash University, and Dr. Luciano Navarini, chief chemist of Illycaffe.

Another recent study, conducted by Jose Angel Rufian Henares and the University of Granada, analyzed typically discarded coffee spent grounds, coffee silverskin and coffee melanoidins. The researchers concluded that these coffee by-products were high in antioxidants, and the grounds and silverskin also had prebiotic activity. These

materials could be recycled and used as an ingredient in a new food, giving the new food additional antioxidants, the study authors concluded.

This study was published in the April 2015 edition of the academic journal *Food Science and Technology*.

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