

## Antimutagenic activity of coffee brew and spent coffee

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Coffee has proven to be an excellent source of bioactive compounds, mainly phenolic acids, such as chlorogenic acids (CGA). These compounds have been extensively associated with a risk decrease in several chronic and degenerative diseases. The by-product generated after brewing processes, named spent coffee, could have similar characteristics and also might contribute with health related properties. In a recent study of our research group, Bravo et al. (2012, 2013) found that spent coffee has antioxidant capacity measured by chemical based assays and in *in vitro* cell cultures, attributed to a high content of phenolic acids, as well as caffeine and Maillard reaction products. The aim of the present study was to evaluate the ability of coffee brew and spent coffee to protect against mutagens responsible of cell mutation. Spent coffee extracts from filter and espresso brewing process, as well as their respective coffee brews, were analyzed using the Salmonella mutagenicity test (Ames Test). Three non-toxic concentrations of the samples were tested with (S9) and without (-S9) metabolic activation. The data prove that both spent coffees extracts and coffee brews were able to reduce the action of direct (NPD) and indirect (2-AF) acting mutagens. The results showed that spent coffee extracts after no metabolic activation (-S9) had higher antimutagenic activity than their respective coffee brews. The protection percentage against direct mutagens (NPD) was up to 35%, showing no dose-dependent pattern. However, spent coffee extracts and coffee brews had a strong protection activity against indirect acting mutagens (2-AF), with a dose-dependent pattern, up to 92% in Arabica spent coffee after metabolic activation (S9). In conclusion, the high antimutagenic activity of spent coffee found in this work suggests that this by-product could be considered as a potential food ingredient to enhance healthy properties of functional foods. However, further experimental and clinical studies would be needed to claim their functional properties.

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