

Brewing up a gentler java: Dark-roasted coffee contains stomach-friendly ingredient

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Dark-roasted coffee contains substances that reduce stomach acid. The finding could lead to a new generation of brews that are gentler on the tummy. Credit: The American Chemical Society

With stomach irritation preventing almost 2 out of every 10 people from enjoying coffee, scientists today reported discovery of several substances that may be among the culprits responsible for brewing up heartburn and stomach pain in every cup.

Their report, presented here at the 239th National Meeting of the American Chemical Society, included the counter-intuitive finding that espresso, French roast, and other dark-roasted coffee may be easier on the tummy because these roasts contain a substance that tells the stomach to reduce production of acid.

The research could lead to a new generation of stomach-friendly brews with the rich taste and aroma of regular coffee, the scientists said.

"This discovery is going to help a lot of people who suffer from coffee sensitivity," say Veronika Somoza, Ph.D. from the University of Vienna in Austria, and Thomas Hofmann, Ph.D. from the Technische Universität München in Germany, who conducted the study. "As coffee-lovers, we're very excited about this research."

Estimates suggest that up to 40 million people in the United States alone either avoid coffee, or cannot drink as much as they like, due to stomach irritation. Doctors think that chemicals in coffee cause the stomach to overproduce acid. Some coffee drinkers take antacids or drink decaffeinated coffee in an effort to reduce this effect. Others turn to a small but growing number of specialty coffee brews marketed as stomach friendly.

"The problem is that studies have not verified the stomach irritating potential of coffee or its components, until now," Somoza said.

"Manufacturers currently make 'stomach friendly' coffees by processing raw [coffee beans](#) with steam or solvents intended to reduce levels of the irritants. But their effectiveness is unclear."

The processes used to produce stomach-friendly coffee also can reduce the amount of healthful substances in the coffee, including some that scientists have linked to benefits such as protection against diabetes and heart disease, Somoza said. In addition, the processing can affect the robust taste and smell of coffee.

To study the irritants in coffee, the scientists exposed cultures of human [stomach cells](#) to a variety of different coffee preparations, including regular, dark-roast, mild, decaffeinated, and stomach-friendly. They identified several substances that appeared to trigger chemical changes

associated with increased acid production. These substances include caffeine, catechols, and other ingredients.

"Our data show, for the first time, that caffeine, catechols and N-alkanoly-5-hydroxytryptamides are those coffee components that stimulate molecular mechanisms of stomach acid secretion in human stomach cells," Somoza said. Most of them are indeed removed by steam or solvent treatment of the raw coffee bean. We found out there's no single, key irritant. It is a mixture of compounds that seem to cause the irritant effect of coffee."

The scientists unexpectedly found that one of the coffee components, N-methylpyridium (NMP), seems to block the ability of the stomach cells to produce hydrochloric acid and could provide a way to reduce or avoid stomach irritation. Since NMP is generated only upon roasting and not found in raw coffee beans, darker-roasted coffees contain higher amounts of this stomach-friendly coffee ingredient. Dark-roasted coffee can potentially contain up to twice as much of the ingredient as light-roasted coffees, but its levels can vary widely depending on the variety of coffee bean and the roasting method, Somoza noted.

"Since NMP is generated upon roasting, dark-roast coffees contain high amounts of this stomach friendly coffee ingredient," Hofmann and Somoza said. "Now, there is hope for a good morning start with a freshly brewed cup of optimized stomach friendly coffee."

The scientists are testing different varieties of raw coffee beans and different roasting methods in an effort to boost NMP levels to make a better stomach-friendly [coffee](#). They hope to test the new brew in human volunteers later in 2010.

Provided by American Chemical Society

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