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Heart-Healthy Compound in Chocolate Identified

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In a multifaceted study involving the Kuna Indians of Panama, an international team of scientists has pinpointed a chemical compound that is, in part, responsible, for the heart-healthy benefits of certain cocoas and some chocolate products.

The researchers, who are from the University of California, Davis; the Heinrich-Heine University of Duesseldorf, Germany; and Harvard Medical School, hope the findings will lead to new dietary or medicinal methods for improving and maintaining cardiovascular health.

The study showed that epicatechin, one of a group of chemicals known as flavanols, was directly linked to improved circulation and other hallmarks of cardiovascular health. Findings of the study are reported in the Jan. 16 online issue of the Proceedings of the National Academy of Sciences.

"Although previous studies strongly indicated that some flavanol-rich foods, such as wine, tea and cocoa can offer cardiovascular health benefits, we have been able to demonstrate a direct relationship between the intake of certain flavanols present in cocoa, their absorption into the circulation and their effects on cardiovascular function in humans," said UC Davis biochemist Hagen Schroeter, who co-authored the paper along with cardiologist Christian Heiss of the Heinrich-Heine University.

"The results of this study provide direct proof that epicatechin is, at least in part, responsible for the beneficial vascular effects that are observed after the consumption of certain flavanol-rich cocoas," Schroeter said.

Key to the study were volunteers from the Kuna Indians, who live on the San Blas islands off the coast of Panama. High blood pressure and other signs of cardiovascular disease are rare among the island-dwelling Kuna, who are also known to consume large amounts of flavanol-rich cocoa -- three to four cups per day. However, previous studies carried out by Norman Hollenberg's research team at Harvard Medical School have found that Kuna who have migrated to the suburbs of Panama City on the mainland consume only about four cups of cocoa per week and, interestingly, do not enjoy the same level of cardiovascular health.

Through analyses of urine samples from members of both the island-dwelling and mainland Kuna, the researchers found that, compared to their mainland counterparts, the urine of island dwellers had more than twice the levels of urinary nitric oxide -- a chemical compound already known to be associated with healthy flow of blood through the arteries.

The Kuna project was only one part of a five-pronged study approach that the research team conducted in order to determine whether epicatechin meets five previously established criteria for compounds that directly cause improved circulation. In the other four parts of the study the researchers demonstrated that:

- Levels of nitric oxide in the blood were higher in individuals who drank flavanol-rich cocoa, compared to those who drank cocoa beverages with low flavanol levels. This showed that flavanols contained in the cocoa were actually absorbed and subsequently present in the bloodstream.
- Higher levels of the flavanol epicatechin in the bloodstream were accompanied by improved blood flow.
- In the laboratory, flavanols administered to samples of vascular tissue caused the tissue to relax.
- Pure epicatechin consumed by humans had much the same effect as did consumption of flavanol-rich cocoa.

Considered together, these findings point to epicatechin as one of the compounds found in cocoa that has beneficial impacts on cardiovascular health.

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