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Deodorization of Garlic Breath by Foods, and the Role of Polyphenol Oxidase and Phenolic Compounds

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Abstract

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Garlic causes a strong garlic breath that may persist for almost a day. Therefore, it is important to study deodorization techniques for garlic breath. The volatiles responsible for garlic breath include diallyl disulfide, allyl mercaptan, allyl methyl disulfide, and allyl methyl sulfide. After eating garlic, water (control), raw, juiced or heated apple, raw or heated lettuce, raw or juiced mint leaves, or green tea were consumed immediately. The levels of the garlic volatiles on the breath were analyzed from 1 to 60 min by selected ion flow tube mass spectrometry (SIFT-MS). Garlic was also blended with water (control), polyphenol oxidase (PPO), rosmarinic acid, quercetin or catechin, and the volatiles in the headspace analyzed from 3 to 40 min by SIFT-MS. Raw apple, raw lettuce, and mint leaves significantly decreased all of the garlic breath volatiles *in vivo*. The proposed mechanism is enzymatic deodorization where volatiles react with phenolic compounds. Apple juice and mint juice also had a deodorizing effect on most of the garlic volatiles but were generally not as effective as the raw food, probably because the juice had enzymatic activity but the phenolic compounds had already polymerized. Both heated apple and heated lettuce produced a significant reduction of diallyl disulfide and allyl mercaptan. The presence of phenolic compounds that react with the volatile compounds even in the absence of enzymes is the most likely mechanism. Green tea had no deodorizing effect on the garlic volatile compounds. Rosmarinic acid, catechin, quercetin, and PPO significantly decreased all garlic breath volatiles *in vitro*. Rosmarinic acid was the most effective at deodorization.

Number of times cited according to CrossRef: 9

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