Reducing Peanut Allergens by High Pressure Combined with Polyphenol Oxidase.

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High pressure (HP) and polyphenol oxidase (PPO) have been shown to increase enzyme activity and reduce major peanut allergens (Ara h 1 and Ara h 2), respectively. We postulated that further reduction of peanut allergens can be achieved through HP combined with PPO. Peanut extracts were treated with each of the followings: (1) HP; (2) HP + PPO; (3) PPO; and (4) none. The conditions for HP treatment were: 300 and 500 MPa, each for 3 and 10 min. All treatments contained caffeic acid, a phenol compound for cross-linking the allergens through PPO. After treatment, SDS-PAGE was performed and allergenic capacity (IgE binding) of the treated extracts was determined colorimetrically in ELISA and Western blots. SDS-PAGE data showed that HP alone had no effect on major peanut allergens. However, HP (500 MPa) combined with PPO induced a reduction of major peanut allergens and IgE binding, which was found to be higher than the reduction by PPO itself. No difference in the degree of reduction was observed between treatment times (i.e., 3 and 10 min). We concluded that HP (at 500 MPa) combined with PPO enhanced the reduction of major peanut allergens and IgE binding, as compared to PPO alone. Three min appeared to be sufficient for the treatment. In the absence of PPO, HP had no effect on major peanut allergens under the conditions tested.