

Title Enzymatic browning reactions: a threat to post-harvest quality, or a blessing
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Abstract

For a variety of reasons, it often happens that, after harvest, vegetables and fruits show brown-black discoloration. This phenomenon is the result of the action of enzymes, such as polyphenol oxidases and/or peroxidases, on endogenously present substrates, such as phenolic compounds. The brown discoloration makes the produce visually less attractive, and much effort is being placed on options to prevent this from occurring. Although browning of fresh products may be undesirable for visual quality, there are other viewpoints too, however, that should nuance our wish to inhibit browning, and rather change it into a desire to control browning reactions. For instance, in some processed products, such as chocolate or tea, a certain degree of browning is desirable and contributes to flavor and attractiveness. Also, in specific cases, the reaction sequence that leads to browning can decrease the allergenicity of products, making foods safer for consumption. And last but not least, the enzymes that cause browning can crosslink polysaccharides and proteins, which may give lead to the formation of products with positive impact on functioning of the immune system, thus contributing to the nutritional quality of foods. An overview of options to acquire better control of browning reactions is presented against the background of the molecular mechanisms that underlie these browning reactions, in particular with white button mushrooms, which show a high tendency to turn brown, as an example.