

Protein Precipitation by Tannins

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Although the ability to precipitate protein is the defining characteristic of tannins, the detailed chemistry of the interaction is still only partly understood. It is now clear that both the type of interaction and the strength of interaction are dictated by both the chemistry of the tannin and the chemistry of the protein. In addition, the interaction is influenced by reaction conditions including temperature, pH, solvent composition, and tannin:protein ratio. Review articles which summarize the current knowledge of tannin-protein interactions have been published by Hagerman; Haslam; and Butler. Recent comparisons of condensed to hydrolyzable tannins are useful (Hagerman, A.E.; Rice, M.E.; Ritchard, N.T. *J. Agric. Food Chem.* 1998, in press).

Numerous methods for determining tannins which take advantage of the interaction between tannin and protein have been devised. The radial diffusion method is convenient; the protein-precipitable phenolics method is robust and gives excellent results with many types of tannins; the radiochemical method is very sensitive but requires specialized equipment; a similar but less sensitive method can be done with blue dye-labeled protein. Qualitative assessments of binding can be made with electrophoretic methods. A method for assessing phlorotannin-protein interactions has also been described.