

IMPROVEMENT OF FUNCTIONAL PROPERTIES OF PLUM PROTEIN ISOLATE BY COMPLEXATION WITH CAFFEIC ACID

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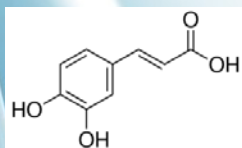
BACKGROUND

The oil industry generates large amounts of by-products which, besides use as animal feed and biofuels, can be used as sources of high-value compounds such as proteins. These proteins, in order to be attractive for various food formulations, should possess good functional properties, as well as significant bioactivity. In recent years, application of polyphenols for improving functional properties of proteins it is increasingly applied. Interaction between proteins and polyphenols, yielding „protein-polyphenol complexes”, have an impact on sensorial, functional and nutraceutical properties of protein products. In this article, mechanism of protein-polyphenol interactions as well as the functionalities and potential applications are investigated.

METHODS



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Shaking at room temperature,
exposed to air for 24 h



Control PI Conjugates C1, C2, C3

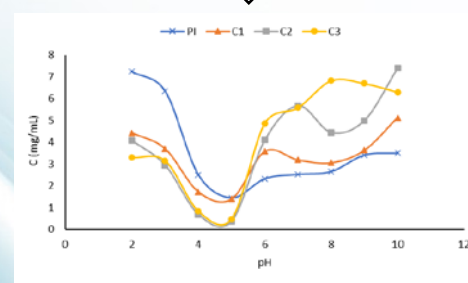
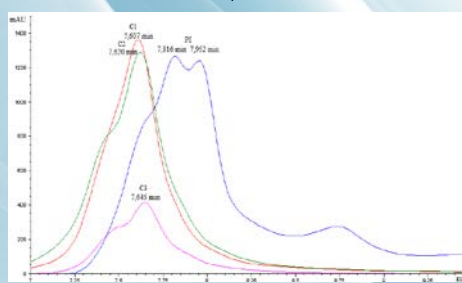
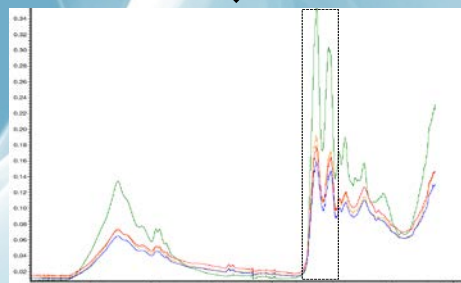
Plum protein isolate (PI)
< 90% protein content

Caffeic acid (CA)

The FTIR spectrum of complexes showed decreased in the absorption near amide I and I, because of the reaction between -NH₂ group of PI with CA.

The elution profile of samples shows that all three complexes eluted earlier than PI. What indicates that the conjugation of proteins with phenols results in complexes of higher molecular weights as results of cross-linking.

Solubility was increasing with the increase a concentration of CA in the complexes at alkaline pH.



CONCLUSIONS

Generally, binding of charged polyphenols changes the electrical properties of proteins, especially at the values of their isoelectric point, which significantly affects their solubility. Interaction of these components affects their functional properties and form the protein-phenol complexes that possess better functional properties and increase their potential application in different products. Obtained results showed that the complexation between plum protein isolate and caffeic acid made the conformational changes on the surface properties of protein that resulted in better solubility and emulsifying properties.