The effect of solvent and pH on trypsin – polyphenolic compounds interaction

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Protease inhibitors are one of the most promising and investigated subjects for their role in pharmacological studies, biological functions, medical benefits and drug design. The digestive enzymes–polyphenolic compounds interactions can be discussed as inhibition of these enzymes. It is known that green tea is the source of antioxidants, particularly polyphenolic compounds. The inhibition of trypsin by polyphenolic compounds derived from green tea is extensively studied [1,2], whereas the inhibition of digestive enzymes, in particular trypsin by antioxidants derived from alpine herbal tea remains unexamined. Various physiological effects of herbal tea are well-reported such as germicidal, anti-inflammatory, sedative, analgesic effects etc.

In present work the complex formation between trypsin and polyphenolic compounds derived from thyme (*Serpylli herba*) extract is studied. The effects of solvents such as ethanol and acetonitrile, as well as pH of the media from acidic to basic on complex formation are revealed.

The obtained results show that the binding constant increases with the decrease of pH due to the increased activity of trypsin in acidic solution. On the other hand, in basic media conformational changes cause the decrease of availability of binding site for ligand. As a result, complex formation does not occur properly. In organic media trypsin deviates more from the crystal structure in the free state

or in the complexed form than in aqueous solution. This departure is greater in ethanol than in more polar acetonitrile media resulting in the higher binding strength in less polar ethanol compared with water and acetonitrile.

References

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