

Ispitivanje uticaja fluorida na aktivnost amilaze iz pljuvačke

Amilaza je enzim koji hidrolizuje alfa 1,4 glikozidne veze koje postoje u skrobu, glikogenu, amilozi i amilopektinu i razgrađuje ih do maltoze i glukoze. Bioaktivator enzima amilaze je hloridni jon, a među ostalim aktivatorima spominju se bromidni i jodidni joni. Za fluor, koji se takođe nalazi u VIIa grupi, u literaturi se navodi da ima inhibitorno dejstvo na aktivnost enzima, ali su neki radovi ukazali na mogućnost njegovog aktivirajućeg dejstva na amilazu. Cilj ovog rada je bio da se ispita promena aktivnosti amilaze u zavisnosti od promene koncentracije fluorida. Kao izvor enzima korišćena je humana pljuvačka. Rezultati su pokazali da jon fluora može imati i aktivirajuće i inhibirajuće dejstvo na aktivnost enzima, u zavisnosti od koncentracije koja se dodaje. Pri koncentracijama od 20 do 320 mM fluoridi povećavaju aktivnost enzima amilaze, dok se sa daljim povećanjem njegove koncentracije aktivnost enzima inhibira.

Effect of Fluoride on the Activity of Human Salivary Amylase

Salivary amylase is an enzyme produced by the salivary glands that plays a central role in the digestion of polysaccharides by hydrolyzing the α -1,4 glycoside linkages of starch, glycogen and related polysaccharides. Chloride ions activate amylase, but several others ions, which include bromide and iodide ions, are also used. Fluoride is considered to inhibit the activity of amylase. However, several authors reported that fluoride not only had an inhibitory effect on human salivary amylase activity, but also stimulated its activity. Because the exposure to fluoride is widespread through drinking water, toothpaste and mouth rinses, and in the view of the conflicting results in literature, the influence of various concentrations of fluoride on human salivary amylase was investigated.

The effect of fluoride on the activity of amylase was examined *in vitro* and used concentrations of fluoride were from 20 up to 500 mM. Two groups were observed, each one with 25 samples with growing concentrations of fluoride. In the first group no activator was added, and in the second one the chloride ion was added to activate the enzyme.

Starch concentration is an opposite function of the enzyme activity: the more the enzyme is active, the less starch is detected. Degradation products of the polysaccharide hydrolysis are sugars such as maltose and glucose that are able to reduce iodine in potassium-iodine solution. The

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intensity of developed color was measured at 620 nm in a spectrophotometer. The standard curve was constructed using glucose solutions. Human salivary amylase was used. Before collecting the saliva, the mouth was rinsed with distilled water.

In the first group it was observed that lower concentrations of fluoride (20-320 mM) stimulate the activity of amylase, while concentrations higher than 320 mM inhibited the human salivary amylase. Similar results were detected in the second group, where chloride as an activator was added.