

ABSTRACT

Anacardic acid a major constituent of cashew nut shell liquid (CNSL) is a group of four compounds having similar core structure i.e. 6-alkyl-salicylic acid, differ only in the number of double bonds of the alkyl group. The anacardic acid is known as one of the sulfhydryl enzyme inhibitors; however the mechanism of the inhibition process is still in question.

It was therefore a three-step study has been conducted to investigate the role of each functional group of anacardic acid in this inhibition process which might explain the mode of interaction between anacardic acid and the enzyme in the inhibition process.

The first step of the study was the isolation and identification of anacardic acid from cashew nut shell liquid (CNSL), followed by functional groups transformation of anacardic acid through hydrogenation and methylation reactions; and four derivatives of anacardic acids were formed.

The second step was the investigation about the effect of anacardic acids against the proteolytic activity of papain, a sulfhydryl enzyme. From this study it was revealed that anacardic acid interacts with the sulfhydryl group at the catalytic site of papain through some kind of bond other than covalent bond. Anacardic acid inhibits papain competitively.

The third step was the the investigation about the effect of anacardic acids and its derivates against the activity of papain. The sequence of the inhibitory effects was : methyl ester > dimethyl derivate > anacardic acid > methyl ether > saturated anacardic acid.

Two pharmacophore groups possessed by anacardic acid; i.e. *ortho* hydroxy carboxylic acid moiety which contribute high acidity and unsaturated double bonds of the side chain which contribute high electron density to the molecule seems essential for this kind of sulfhydryl enzyme inhibition process.

Keywords : anacardic acids; papain; sulfhydryl enzyme inhibitor; high electron density and acid regions.