

# ***S U M M A R Y***

## SUMMARY

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Isolation and characterization of an antithiamine compound from a kind of bean (*Phaseolus radiatus*) and its biochemical and nutritional studies were described.

1. The procedure for isolation of antithiamine factor from *Phaseolus radiatus* consisted of solvent extraction, acid hydrolysis, column chromatography using different adsorbents, repeated crystallisation etc. The isolated antithiamine factor was a light yellow amorphous substance and proved to be a single compound on thin layer chromatography using three different solvent systems.

a) acetone : methanol (1:1, v/v)

$$R_f = 0.70$$

b) n-butanol : acetic acid : water (upper phase 8:1:1, v/v/v)

$$R_f = 0.73$$

c) chloroform : methanol : water (3:1:1, v/v/v)

$$R_f = 0.91$$

2. A simple method to measure the antithiamine activity was developed in which the residual thiamine was estimated by the modified thiochrome method. The antithiamine activity of the isolated factor was measured by this method and it was found that 1 mg of this compound inactivated 135.0 $\mu$ g of thiamine hydrochloride.

3. From different chromatographic studies, spectral (IR) and micro-analytical data

as well as from the standpoint of biological activity, the antithiamine factor was characterized as 3, 4 dihydroxy cinnamic acid.

4. Effect of the antithiamine factor (3, 4 dihydroxy cinnamic acid) was studied on the growth of rats (nutritional). 3, 4 dihydroxy cinnamic acid when administered to rats under *in vivo* condition, animals developed symptoms of thiamine deficiency which completely disappeared by further administration of thiamine.

5. Estimation of free plasma cholesterol of antithiamine factor (3, 4 dihydroxy cinnamic acid) treated rats showed about half value in comparison with that of normal rats.

6. The blood pyruvate level of the antithiamine factor (3, 4 dihydroxy cinnamic acid) treated rats was found to be increased about 4 times its normal value.

7. Effect of the antithiamine factor (3, 4 dihydroxy cinnamic acid) on transketolase activity in blood, brain and small intestine of rats, *in vivo*, was studied in terms of TPP effect (%). While in case of 3, 4 dihydroxy cinnamic acid treated rats, the TPP effect was found to have increased in blood and intestine but not significantly in brain and this increased TPP effect became normal with further administration of thiamine hydrochloride.

8. In a broth containing thiamine the growth of *S. aureus*, a thiamine requiring strain, was inhibited in presence of the antithiamine factor (3, 4 dihydroxy cinnamic acid). After administration of excess thiamine into the broth, this retarded growth of *S. aureus* was found to have reached normal level.

