

## Quantitative Analysis of Alliin and Alliinase Activity in Various Garlic Cultivars.

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### Objectives

The garlic has been used as medicinals or spices, from ancient times. Garlic is known as the most effective medicinal plant and disease-preventive food against cancer and Cardiovascular disorders. The effect is caused by Alliin and sulphur compounds. So we need to find garlic race which has high content of Alliin and high activities of Alliinase. In this study we carried out quantitative analysis various races of garlics. Because It is more useful high content of alliin and allinase for functional foods.

### Materials and Methods

41 samples of garlics from Russia(R), Thailand(T), Netherland(N), Italy(I), Peru(P), Bolivia(B), China(C) and Korea(K) were cultivated and harvested.

Alliin extraction - 1g of frozen dried garlic powder, added methanol and formic acid and shaking 150rpm for 60mins. Filtering that solution, Removed for lipids and impurities added Ether. Centrifuge the supernatant and evaporate it. Added cold ethanol and 50°C of acetone, get white deposit. And in the sulphuric acid desiccator dried the deposit. Resoluted the deposit with water. Repeat 3times crystalization.

Alliinase extraction - 5g of frozen dried garlic powder, added pH 7.5 sodium -potassium phosphate buffer(0.02M)containing 10% of glycerol. Mixing 2mins and centrifused on 2100G for 30mins. Added 1% of protamine sulfate 15mL, the supernatant and fixed 10mins. Removed deposit after centrifusing. Added 35% of ammonium sulfate, saturate the solution. Centrifused and got deposit. And resoluted 2ml of water. Dialysis in sodium -potassium phosphate buffer(0.02M) for 24hours.

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## Results and Discussion

The average of 41 samples of alliin was 2.85mg. If the high content of alliin means, high activity of alliinase and more useful for functional foods. The most useful sample was P4. By the way R6, R15, K1, K2, P1, P5, P6, I2 and K3 contained a quantity of alliin also. They showed high content of alliin over than the average. But R2, R3, R10, R17, T1, T5, B1, I1 were a quarter of alliin than the average (Fig. 1.) The activity of alliinase R6, R9, R15, P1, P4, P5, P6, K1, K2 exceed the average. Particularly P4 showed very high activity more than any other samples.(Fig. 2.)

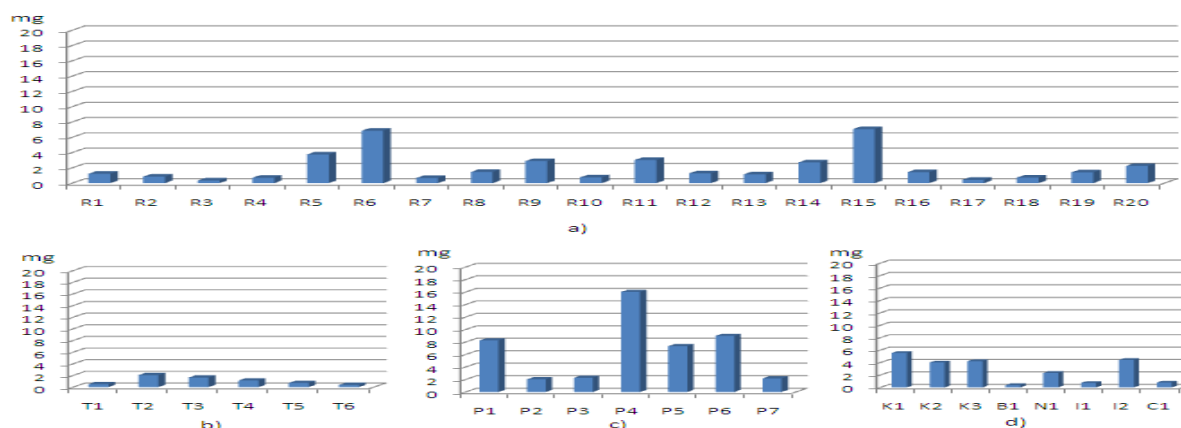


Fig 1. The content of alliin in 41 cultivars of garlic.

a) cultivars of Russia b) cultivars of Thailand c) cultivars of Peru d)cultivars of Korea, Netherland, Italy and China

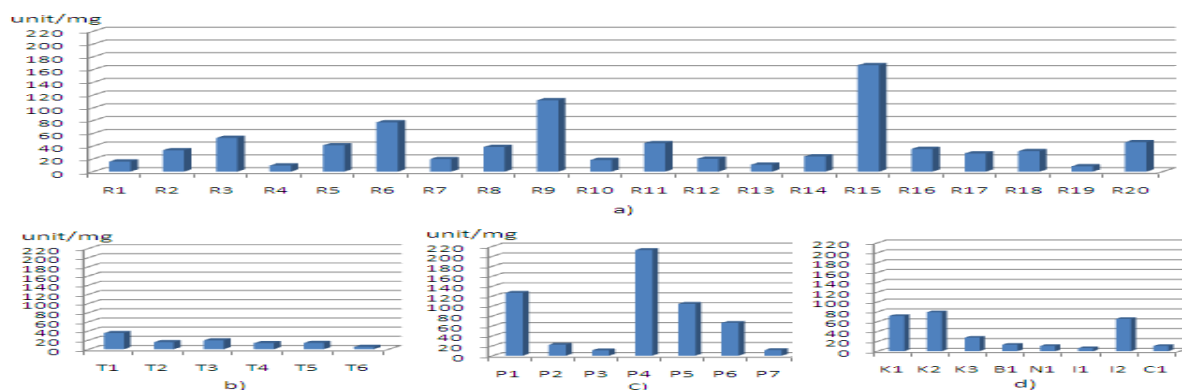


Fig 2. The activities of Alliinase in 41 cultivars of garlic at 37°C

unit/mg : alliinase activity of pyruvate 1 $\mu$ M product per 1 minute/ protein mg

a) cultivars of Russia b) cultivars of Thailand c) cultivars of Peru d)cultivars of Korea, Netherland, Italy and China

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