

## **Quality of herbal remedies from *Allium sativum*: differences between alliinase from garlic powder and fresh garlic.**

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Alliinase (EC 4.4.1.4) has been isolated from commercially available garlic (*Allium sativum* L., Alliaceae) powder and was investigated with respect to its use as ingredient of herbal remedies. The enzyme was purified to apparent homogeneity and results were compared with those obtained from a sample of fresh *A. sativum* var. *pekinense*. The purification of the enzyme involved a gel filtration step as well as affinity chromatography on concanavalin-A agarose.  $V_{max}$  using L-(+)-alliin as substrate ( $252 \mu\text{mol min}^{-1} \text{mg}^{-1}$ ) was at the lower range of data given in the literature ( $214\text{--}390 \mu\text{mol min}^{-1} \text{mg}^{-1}$ ). L-(-)-Alliin was also accepted as substrate ( $54 \mu\text{mol min}^{-1} \text{mg}^{-1}$ ).  $V_{max}$  for alliinase from *A. sativum* var. *pekinense* was at  $332 \mu\text{mol min}^{-1} \text{mg}^{-1}$  and  $90 \mu\text{mol min}^{-1} \text{mg}^{-1}$  for L-(+)- and L-(-)-alliin, respectively. The  $K_m$  values for alliinase from garlic powder were estimated to be 1.6 mM for L-(+)-alliin and 2.8 mM for L-(-)-alliin. In contrast to literature values, both temperature and pH optima were somewhat higher (36 degrees C and pH 7.0 versus 33 degrees C and pH 6.5, respectively). The enzyme was found to be active in a range from pH 5 to pH 10. Gel electrophoresis gave evidence that the alliinase obtained from garlic powder consisted of two slightly different subunits with molecular weights of 53 and 54 kDa whereas alliinase obtained from fresh garlic consists of two identical subunits. It is assumed that the alliinase gets significantly altered during the drying process of garlic powder but is still capable to convert alliin to allicin.

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