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. Vmax using L-(+)-alliin as substrate (252 mumol min-1 mg-1) was at the lower range of data given in the literature (214-390 mumol min-1 mg-1). L-(-)-Alliin was also accepted as substrate (54 mumol min-1 mg-1). Vmax for alliinase from A. sativum var. pekinense was at 332 mumol min-1 mg-1 and 90 mumol min-1 mg-1 for L-(+)- and L-(-)-alliin, respectively. The Km 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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