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Fava beans as a medicinal plant for Parkinson's

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L-Dopa has been shown to be an effective drug for the treatment of Parkinson's disease. Synthetic L-Dopa is relatively expensive and some side-effects have been reported associated with artificial products. Fava beans are known as rich natural sources of L-Dopa and clinical studies have shown that its anti-Parkinson's characteristics have no or minimal side-effects compared with synthetic forms. Concentration of L-Dopa is often measured in seeds while other parts of plants may accumulate significant amounts of this chemical. The accumulation of L-Dopa in different plant organs of fava beans was studied in the field and controlled environment. In field condition, Windsor which is currently the common fava beans variety used in New England was planted on April 2013. Fava beans were harvested at six-leaf stage and when pods were fully grown. Plant parts were digested separately and analyzed for L-Dopa concentration using HPLC. The contents of L-Dopa in plant parts were in the following order: seedlings> leaves>terminal buds>seeds>roots>stems with 13.3, 10.5, 9.5, 7.2, 6.5, 3.5 $mg.g^{-1}$, respectively. Accumulation of L-Dopa from germination until 10-leaf stage in eight varieties of fava beans was studied in greenhouse. All varieties had their peak concentration of L-Dopa between 2-4 leaf stages followed by a declining trend. Delle Cascineand Bell bean varieties had the most and the least concentrations of L-Dopa by 10.89 and 7.56 $mg.g^{-1}$, respectively. Also, accumulation of L-Dopa after applying drought stress on Windsor variety was studied. The results indicated that drought stress did not influence L-Dopa concentration at various stages of growth. L-Dopa concentration in 6-leaf stage was higher than other stages of growth (20.1 mg/g) when affected by severe drought stress.

Biography

Fatemeh Etemadi is a PhD student at UMass Amherst in Crop Physiology. As part of her experiment, she is working on "Fava beans as Medicinal plant".

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