BOOK OF ABSTRACTS

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Ecological management of cumin common diseases in Iran; Planting date, intercropping and biofertilizer

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Cumin (*Cuminum cyminum*) production is seriously reduced by the Fusarium wilt and leaf scorch diseases in Iran [1]. To evaluate the effects of different planting dates, planting pattern and biological fertilizers on yield, yield components of cumin and fenugreek (*Trigonella foenum-graecum*) and also essential oil content and disease development in cumin, an experiment was conducted in a split-plot factorial arrangement in randomized complete block design with three replications in Ferdowsi university research farm of Mashhad in 2010 and repeated in 2011. The experimental treatments were planting date (5 November, 5 December and 5 March) assigned to main plots, planting pattern (sole cropping and intercropping of cumin and fenugreek) and biofertilizer (control, *Pseudomonas putida* and *Azotobacter chroococcum*) were randomized in subplot. Results showed that fall planting dates and intercropping system had positive effects on cumin disease control, whereas application of biofertilizers had no significantly effect in both years. The highest diseased plants percentage was achieved by spring planting date in sole cropping system. Higher yield component and yield of the crops was achieved when the crops were planted at fall season than spring planting. Increasing of yield component and yield of cumin in fall planting was related to reducing of diseases severity. It seems that the fenugreek cultivated between the cumin rows as physical barrier could led to avoid of transferring and spreading of disease agent from one row of cumin to other rows. As observed, the benefit of pseudomonas was demonstrated on two the crops. Among various treatments of planting dates, fall planting dates showed higher essential oil yield of cumin. The values of LER for all treatments of planting dates and biofertilizer were more than 1 indicating that the intercropping system had positive effect on diseases control and subsequently on yield for the 2010 and 2011 growing seasons. In essence, modifying planting date and using intercropping systems could be considered as effective management ways to control of diseases without chemical control.
Keywords: Azotobacter, Fenugreek, Fusarium wilt, Medicinal plant and Pseudomonas

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BACE1 inhibitory activity of alkaloids from *Corydalis cava* Schweigg. & Kort

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Alzheimer´s disease (AD) is one of the most common form of dementia among the elderly. The current approved therapy includes acetylcholinesterase (AChE) inhibitors and NMDA blockers. A reduction of β-amyloid peptides (Aβ) levels in brain by inhibition of β-secretase (BACE1) represents a promising strategy for AD therapy. Thus, BACE1 inhibition has become a key target in the development of new potential agents for the non-symptomatic AD treatment.
Several species of the genus *Corydalis* have been used in the treatment of memory dysfunction in folk medicine [1]. In previous studies, some of fifteen isolated alkaloids from *C. cava* demonstrated significant cholinesterase inhibitory and antioxidant activities [2,3]. In this study, the isolated alkaloids were evaluated for their BACE1 inhibitory activity by multi-well plate format assays using a fluorescent resonance energy transfer (FRET) principle [4].
The FRET assays were carried out in multi-well plates using peptidic substrates M-2420 and Panvera. Fluorescent signals were read at λ = 320/405 nm and 544/590 nm for excitation and emission, respectively. Panvera substrate was used for four compounds which were found to interfere with substrate M-2420 at λ = 405 nm.
Inhibition curves were obtained by plotting the % inhibition versus the logarithm of inhibitor concentration. The linear regression parameters were determined and the IC_{50} extrapolated. (-)-Corycavamine and (+)-corynoline inhibited BACE1 in a dose-dependent manner with IC_{50} values of 41.16 ± 2 μM and 33.59 ± 0.6 μM, respectively.

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