

BOOK OF ABSTRACTS

3rd International Conference on Plant Biology (22nd SPSS Meeting)



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Institute for Biological Research "Siniša Stanković", University of Belgrade

Faculty of Biology, University of Belgrade

**3rd International Conference
on Plant Biology
(22nd SPPS Meeting)**



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Towards pharmacological potential of edible lichen *Evernia prunastri* growing in the mountain region of southern Serbia

PP5-5

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Evernia prunastri (L.) Ach. (*Parmeliaceae*), edible lichen known as oak moss, is traditionally used for making breads by Egyptians. The lichen was tested *in vitro* in this study and linked with *diabetes mellitus* therapy (enzyme inhibition: anti-amylase and anti-glucosidase activities), Alzheimer's and Parkinson's disease treatment (enzyme inhibition: anti-cholinesterase and anti-tyrosinase activities), oxidative stress relief (antioxidant activity: free radical scavenging (DPPH and ABTS), reducing power (CUPRAC and FRAP), metal chelating and phosphomolybdenum assay) and bacterial infections treatment using *in vitro* antibacterial assay. We have determined total phenolic and flavonoid contents in ethyl-acetate (EtOAc) extract of *E. prunastri*. The effects were assessed for investigating biological profiles of *E. prunastri* EtOAc extract and describing the species as functional food. It was shown that *E. prunastri* possessed all biological activities investigated. The extract exhibited inhibitory effects on the activity of enzymes linked to *diabetes mellitus* and those linked to Alzheimer's disease; antioxidant activity and significant antibacterial activity against pathogenic and food contaminant bacterial species. The EtOAc extract of *E. prunastri* only failed in tyrosinase enzyme inhibition. This study showed that edible lichen *E. prunastri* might be classified as functional food with numerous health-beneficial effects in a dose dependent manner.

Keywords: *Evernia prunastri*, phenols, flavonoids, enzymes inhibition, antioxidant activity, antimicrobial activity

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Influence of bio- and magneto-priming on flax seedlings growth

PP5-6

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Flax (*Linum usitatissimum*) is an important food and fiber crop, due to its nutritional and nutraceutical qualities. Flax seeds have been consumed for at least 6,000 years, which makes it one of the world's first cultivated crops. Seed priming with living bacterial inoculum, termed biopriming, involves the application of plant growth-promoting rhizobacteria. The present study was con-

ducted to investigate the effect of growth-promoting rhizobacterium *Bacillus amyloliquefaciens* on the growth of flax seedlings under different strengths of magnetic field. Seedlings were soaked in bacterial suspension and bacteria were allowed to colonize. After ten minutes of soaking, the seedlings were exposed to magnetic field of 60 and 90 mT for 24 h, in dark under laboratory conditions. Untreated seedlings were used as controls. Shoot and root length, number and length of newly formed lateral roots and biomass production were measured after 1, 3, 5, 7 and 10 days. Results indicate that the combinations of magnetic field and plant growth-promoting bacteria gave half- to two-fold better results than bacteria or magnetic field alone. The best result was achieved in seedlings treated with *Bacillus amyloliquefaciens* and 90 mT magnetic field. This work showed a significant impact of bio- and magneto-priming on the improvement of flax seedling growth and biomass productivity.

Keywords: *Bacillus amyloliquefaciens*, *Linum usitatissimum*, static magnetic fields

This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Grant Nos. 173015, TR 31080 and III 45003).

Effect of seed magneto-priming on flax (*Linum usitatissimum*) seed germination and subsequent seedling growth

PP5-7

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In the context of seed technology, the use of magneto-priming, as a method for increasing plant production, offers advantages in comparison to conventional treatments with chemical substances. Magneto-priming is a cheap, non-invasive technique, based on the application of magnetic fields (MF) and described as eco-friendly, with proved beneficial effects on seed germination and subsequent plant biomass yield. In this study, seeds of flax (*Linum usitatissimum*), placed on moist filter-paper, were treated with 100 mT MF strength, with exposure time of 0, 24, 48, 72, 96 and 120 h and kept in dark under laboratory conditions. Seeds that were not exposed to magnetic field were used as controls. Efficacy of MF on seed germination and seedlings height, shoot and root length and biomass was evaluated. The MF promoted seed germination rate by 10%-40 %, depending of treatments, compared to control. The growth parameters were better in seedlings exposed to all magnetic treatments, with an increase of up to 60% over the control. MF treatment of 24 h had a 50% better effect than 120 h MF treatment. In addition, the best biomass yield of acclimated plants was achieved after the shortest magnetic exposure treatment. This study suggests a positive effect of stable MF on flax seed germination and subsequent growth of seedlings. Therefore, magnetic field may be useful in organic agriculture in replacing the usage of plant growth regulators.

Keywords: *Linum usitatissimum*, seed germination, static magnetic fields

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