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Thema

Kommission IV: Bodenfruchtbarkeit und Pflanzenernährung

Biogeochemie gekoppelter Stoffkreisläufe (NPK) unter traditioneller Landnutzung

Autoren

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Titel

In vitro regeneration of parsley and coriander plants: uptake, translocation and accumulation of nicotine

Abstract

It is well known that, nicotine is a type of alkaloids found in some plants of family Solanaceae but some other plants can produce it under different stresses. Medicinal and spice plants cannot synthesize nicotine under normal growth conditions as well as the fate and behavior of nicotine in plant tissues are not understood totally. Many medicinal plants and plant derived products as spices may be contaminated by nicotine from different sources. This contamination could be considered the main problem facing the exportation of these plant products. On the other hand, determining of nicotine putative sources and detecting its uptake from nicotine contaminated soils and tobacco smoke using peppermint plants have been already studied under greenhouse conditions in Germany. These results from pot experiments demonstrated that, peppermint had the ability to uptake and metabolize nicotine endogenously. So, some plants including parsley and coriander were selected to investigate the nicotine uptake mechanism from culture media supplemented with different nicotine concentrations, which extracted from cigarette tobacco (Matosian Egyptian Spirit) comparing with nicotinic acid (as a pure chemical of nicotine) in Egypt. Moreover, this in vitro study aimed to focus on the translocation and accumulation of nicotine in plant tissues. Hence, in vitro research has been already begun using parsley and coriander plants. The preliminary results indicated that, regenerated plants of parsley and coriander were successfully obtained on MS medium supplemented with 1 mg L⁻¹ benzyl adenine + 0.01 mg L⁻¹ naphthalene acetic acid. Furthermore, callus cultures have been initiated on MS medium fortified with 1 mg L⁻¹ benzyl adenine + 1 mg L⁻¹ naphthalene acetic acid. Regenerated plants and obtained callus of these plants will be transferred onto MS media supplemented with different concentrations of nicotine and nicotinic acid as mentioned above. In parallel, some field experiments in Egypt have been conducted to get a holistic overview for the object under investigation. Therefore, different experiments including field, pots and in vitro experiments have been conducted in order to reduce the contamination of plants with nicotine.