OTHERS (incl. Cultivation, Distribution, New species, Post harvest Technologies, Packaging Technology, New technologies/Know How Developed, Book reviews, Forthcoming events)

CULTIVATION

NPARR 3(2), 2012-0210, Growth and centelloside production in hydroponically established medicinal plant- Centella asiatica (L.)

Conditions to cultivate medicinally important herb Centella asiatica in hydroponic system are reported here for the first time. Growth kinetics of hydroponically grown plants was monitored over a period of 70 days. The maximum growth and dry matter accumulation (156.3% increment over the initial inoculum weight) in the cultured plants occurred around 42nd day. High Performance Liquid Chromatography (HPLC) analysis of the bioactive centellosides in the crude triterpenoids extract of the harvested leaves showed the presence of 11mg, 1.7mg, 36.6mg and 6.3mg of madecassoside, asiaticoside, madecassic acid and asiatic acid on per gram dry weight basis, respectively. The results of this study suggest that the cultivation of C. asiatica in hydroponic systems can be an effective platform for the production of clean and good quality C. asiatica herb for the pharmaceutical companies [Archana Prasad, V.S. Pragadheesh, Archana Mathur*, N.K. Srivastava, Manju Singh and A.K. Mathur (Division of Plant Biotechnology, Central Institute of Medicinal & Aromatic Plants, Council of Scientific & Industrial Research, PO CIMAP, Lucknow, Uttar Pradesh 226015, India) Industrial Crops and Products, 2012, 35(1), 309-312].

NPARR 3(2), 2012-0211, NaCl plays a key role for in vitro micropropagation of Salicornia brachiata, an extreme halophyte

A simple and rapid method for micropropagation of succulent, salt accumulator and extreme halophyte Salicornia brachiata has been established for the first time using shoot tips and nodes. Individually, BA showed significant response compared to Kn and in combinations, improved shoot proliferation was observed with BA+NAA than BA+2,4-D, however no significant response was observed with BA+IAA. Percentage of shoot response significantly increased with NaCl treatment in the combination of BA+NAA while BA+2,4-D+NaCl combination showed reduced shoot proliferation followed by demises of most of cultures. Efficient shoot proliferation was observed with combinations BA (8.9μM)+NAA (5.37μM)+NaCl (500mM) and BA (13.3μM)+NAA (5.37μM)+NaCl (250mM) indicating that NaCl is required for the micropropagation. The developed method will facilitate functional analysis of novel salt responsive gene(s) isolated from S. brachiata and propagation of industrially important elite accessions [Mukul Joshi, Avinash Mishra and Bhavanath Jha (Discipline of Marine Biotechnology and Ecology, Central Salt and Marine Chemicals Research Institute, Council of Scientific and Industrial Research (CSIR), G. B. Marg, Bhavnagar 364021, Gujarat, India), Industrial Crops and Products, 2012, 35(1), 313-316].

NPARR 3(2), 2012-0212, Sensory quality, bioactive constituents and microbiological quality of green and red fresh-cut lettuces (Lactuca sativa L.) are influenced by soil and soilless agricultural production systems

Quality characteristics and shelf-life of fresh-cut lettuce cultivated in soil, as the traditional production system, and soilless, as an innovative production system, were investigated. Three lettuce genotypes, lollo rosso and red oak leaf as red-leafed genotypes, and butterhead as a green-leafed genotype, were studied. Lettuces from both production systems were grown in the same open field and at the same time in the winter season. A longer growing period was
needed, to obtain the same maturity stage, in the soil than in the soilless (102 and 63 d after planting, respectively). After harvest, the visual quality of the fresh-cut produce from red-leafed lettuce cultivated in soilless was better than those in soil. In the case of green-leafed genotype, the soilless system gave a lower visual quality of the fresh-cut product. Lollo rosso cultivated in the soilless system had a higher content of phytochemicals, including vitamin C and individual and total phenolics, than that cultivated in soil. At the end of storage, fresh-cut lollo rosso and red oak leaf grown in the soilless system showed significantly higher content of vitamin C than those in soil. This high content of antioxidants was linked to a better maintenance of visual quality and the control of browning when compared with the fresh-cut product from lettuces cultivated in soil. The soilless system was more effective in controlling microbial contamination as lettuce cultivated in the soilless system had a lower initial microbial load and slower microbial growth during storage. At the end of shelf-life, differences in microbial counts between soil and soilless lettuce were 3 and 1.5 log units higher for lactic acid bacteria and total coliforms, respectively, in soil. This study shows that higher quality and microbiologically safer raw product can be provided by the soilless system as a new growing system although it depends on the genotype and the season [María V. Selma, María C. Luna, Ascensión Martínez-Sánchez, Juan A. Tudela, David Beltrán, Carlos Baixauli and María I. Gil* (Research Group on Quality, Safety and Bioactivity of Plant Foods, Food Science and Technology Department, CEBAS-CSIC, P.O. Box 164, E-30100 Espinardo, Murcia, Spain), Postharvest Biology and Technology, 2012, 63(1), 16-24].

NPARR 3(2), 2012-0213, Effect of salinity on seed oil content and fatty acid composition of safflower (Carthamus tinctorius L.) genotypes

Safflower (Carthamus tinctorius L.) is a species moderately tolerant to salt stress and is cultivated in dry areas where salinity can be a serious threat. We examined effects of salinity stress on seed oil content and fatty acid composition in 64 safflower genotypes grown under saline and non-saline (control) field experiments in two growing seasons. The results showed significant effects of genotype, salinity and their interactions on most of the characteristics examined. Salt tolerant genotypes were less affected by salinity than salt-sensitive ones for oil quantity and quality. The overall reductions of 7.7% oil content and 29% oil yield were observed due to salinity stress. Salinity stress caused a significant increase in oleic acid (C18:1) and significant decreases in linoleic (C18:2) and linolenic (C18:3) acids. These results suggest inhibition of oleic acid desaturase and differential responses of salt-tolerant and salt-sensitive genotypes under salinity stress [Hadi Yeilaghi, Ahmad Arzani*, Mostafa Ghaderian, Reza Fotovat, Mohammad Feizi and Sayyed Saied Pourdad (Department of Agronomy and Plant Breeding, College of Agriculture, Isfahan University of Technology, Isfahan 84156-83111, Iran), Food Chemistry, 2012, 130(3), 618-625].