

Herbals & Natural Remedies

October 26-27, 2015 Chicago, USA

Whole plant elicitation: A new approach toward enhanced production of plant secondary metabolites harvest index

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Plants are remarkable source for the discovery of new products with medicinal importance and plant secondary metabolites are rich sources of bioactive constituents used in pharmaceutical industry, food additives, flavors, and other industrial materials. Plants are generally very responsive to biotic and abiotic factors known as elicitors in altering their physiological, biochemical and morphological properties. Elicitation is a process of induced or enhanced synthesis of secondary metabolites by the plants to ensure their survival, persistence and competitiveness. Elicitors are usually capable to induce various modes of plant defense including the production of ROS (Reactive Oxygen Species), the hypersensitive response and the production of phyto-alexins, i.e., antimicrobial secondary compounds. The induction of phyto-alexin biosynthesis has gained special importance in biotechnological approaches as enhancers of plant-secondary-metabolite synthesis, and could play an important role in biosynthetic pathways of newly discovered enhanced bio-metabolites of commercial importance. Many of these compounds are of high value as therapeutics (anticancer) or otherwise biologically active agents. Although, increased production through elicitation of secondary metabolites from plant cell cultures has opened up a new area of research, the use has only had limited commercial success due to lack of understanding of how these metabolites are synthesized and high capital cost to set up the production. Whole plants elicitation grown in the field or raised under controlled environment, however, has demonstrated improved secondary metabolites production and enhanced plant growth and development. The paper discusses technique of elicitation and results on enhanced secondary metabolites harvest index of some tropical herbs that may spell future approach to production of quality herbal materials.

Biography

Hawa Z E Jaafar completed her PhD in 1995 from Nottingham University, United Kingdom in the area of Plant Environmental Physiology. She is very active both in environmental manipulation of herbal secondary metabolism research, and in community development of herbal materials and products. Currently, she is the Director of the University Community Transformation Centre (UCTC) UPM, and a Member of the National Herbal Implementation Committee. She has published about 150 papers mostly in high impact journals, more than 150 other articles in bulletin, monographs, books and chapters, and presented more than 130 papers nationally and abroad. She is very active in professional activities as a President, Vice President, Chief Editor and Editorial Member. She was also very involved in the development of Roadmap of the National Herbal Industry in Malaysia in 2010. She established the Controlled Environment System in Malaysia in 1991, and had assisted Sana'a University Yemen to establish the Protected Agriculture Centre (2006-2010).

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