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Nutritional, phytochemical and anti-diabetic profiling of organically and conventionally cultivated vegetables

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Until now this perception that, organically grown food is 'better for you' appears to have been largely based on intuition rather than conclusive evidence. Therefore, the study was designed to validate perception in terms of growth pattern, nutritional, phytochemical and anti-diabetic activity of Momordica charantia (MC) and Trigonella foenum graecum (TF) using organic and non-organic cultivation technologies. Vegetables with organic treatment showed early initiation of flowers followed by early fruiting (OMC) and legumes (OTF).

The harvested plant materials were authenticated, studied for microscopy, nutritional, anti-nutritional and physico-chemical parameters of whole fruits and aerial parts of MC and TF respectively. OMC and OTF were confirmed the higher content of primary metabolites, crude fibers, ascorbic acid, total bitters and the caloric values. While the non-organic plants shown the higher amount of ash, extractives and anti-nutritional contents.

Heavy metals (HM), Mycotoxines, Non-organic pesticide (Monocrotophos) and fungicide (Indofil) were examined by ICP- AES, UFLC, GC and LC/MS-MS respectively. Both vegetables were devoid of mycotoxines but non-organic showed the presence of higher amount of HM and insecticides.

Several biomarkers including diosgenin for methi and charantin for karela were utilized. The OMC contained 0.79 g/100 g greater amount of charantin than NMC. Whereas, diosgenin was 0.04 g/100 g in OTF>NTF. Both were reconfirmed by UFLC using RP C18 (G5µm 250 X 4.6 nm) column.

Though, no significant differences in the acute anti-diabetic activity and effect on body weight of animals were noted between both treatments. Organic crops revealed better profile for nutritional, phytochemical, long term pharmacologic evaluations, including sub-chronic anti-diabetic activity, normalizing the disturbed levels of biochemical, regeneration potential of β-islets as well as antioxidant activity.

It is therefore evident that an organically grown produce will be an asset and fruitful in the management of sub-chronic and chronic diseases due to its lower toxicity profile.

Biography

Dr. Mohammad Tauqeer Sheikh has completed his M. Pharm and Ph.D. in Pharmacognosy and Phytochemistry, from the Department of Pharmaceutical Sciences Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur (MS) India. He has also gained postgraduate degree in Management (MBA) from Yashwantrao Chawan Open University, Nasik (MS) India. He has total 12 years of teaching and research experience in various colleges and industries. Currently, working as the Principal, Dr. Arun Motghare College of Pharmacy, Kosra-Kondha, and Bhandara (MS) India. He has 15 National / International publications in reputed publication houses. He has delivered so many guest lectures in different colleges. He was the active member in the organization of five National and one International conference. He is recipient of four best poster presentation awards in different National conferences. His research areas of interest are Organic cultivation & post-harvest processing of medicinal plants. Herbal drug standardization, isolation, analytical, toxicity & preclinical studies of herbal extracts.

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