

Bioavailability and environmental safety of biopesticides

Duni Chand Sharma

Krishi Vishwavidyalaya Palampur, India

Biopesticides (Herbal) formulations have reached extensive acceptability as integrated pest management agents for several insect pests and diseases for organic crop production. The development of authentic analytical methods which can reliably profile the phytochemical composition, including quantitative analyses of marker/bioactive compounds and other major constituents, is a major challenge to scientists. Standardization is an important step for the establishment of a consistent biological activity, a consistent chemical profile, or simply a quality assurance program for production and manufacturing of botanical biopesticides. WHO specific guidelines for the assessment of the safety, efficacy and quality of botanical biopesticides. An overview covering various techniques employed in extraction and characterization of herbal biopesticides as well as herbal nano-pesticides standardization will be discussed. The extraction of high-valued botanical biopesticides bioactive compounds using supercritical phase extraction technology followed by the standardization utilizing various spectroscopic and chromatographic will be highlighted.

The secondary metabolites in plants have been used in the formulation of nanoparticles through increase the effectiveness of compounds used to reduce the spread of pest, while minimizing side effects for being: rich source of bioactive chemicals, biodegradable in nature and non-polluting (eco-friendly). Nature has devised various processes for the synthesis of nano- and micro- length scaled inorganic materials which have contributed to the development of relatively new and largely unexplored area of research based on the biosynthesis of nano-materials. Required information for regular method development/validation such as structure, solubility, chromatographic conditions, instrumentation information like HPLC, LCMSMS detection parameters, sample preparations, recovery details, limit of detection and limit of quantification are incorporated in the for discussion. In this paper effects of nanoparticles in biopesticides (bioactive compounds) extraction (Green Extraction Technology), formulation, characterization, effect of their characteristics on bioavailability and their applications in management of agriculture pest in relation to biosafety of environment will be highlighted.

Biography

Duni Chand Sharma has completed his Ph.D. at the age of 28 years from YS Parmar, University of Horticulture and Forest, Nauni, Solan, India and International Training on "Characterization of bioactive molecule from natural products and determination of food safety of these molecules in consumables" from Michigan State University, East Lansing, USA. He has attended International Symposium on "Prevention of residues in honey" at Celle, Germany and International Conference of Entomological Sciences, Workshop on cotton and International Conference of Agricultural Sciences at Agricultural University Faisalabad, Pakistan. Presently he is the Professor and Head Department of Entomology, of CSK Himachal Pradesh Krishi Vishwavidyalaya Palampur (HP), India a premier and lead hill agriculture university of India. He has guided 7 students for their master and 3 students for their doctoral degrees. He has successfully completed more than 15 research projects and presently is Consortium Principal Investigator of prestigious world bank sponsored NAIP (ICAR) Sub project on "A biopesticides mediated value chain for clean vegetables". He has published more than 123 research papers in reputed journals, proceedings of conferences and popular articles and serving as reviewers member for research papers many journals of repute.

sharmadc3@rediffmail.com