Variability in yield and phytochemicals content in mandukapanri (Centella asiatica) as influenced by nutrient management

A two years field experiment was conducted to study the influence of nutrient management on herbage yield, triterpenes content and their correlation with NPK, triterpenes yield, and NPK content and their use efficiencies in Centella asiatica (L.) Urban. Results indicated that application of FYM 15 tonnes/ha and NPK 60:50:60 at planting and NK 60:60 kg/ha at 5th harvest as basal along with N 20 kg/ha as split application at each harvest recorded highest dry herbage yield. The asiaticoside (AS) and madecassoside (MS) content increased with FYM application, whereas, decreased with NPK, however, asiatic acid (AA) and madecassic acid (MA) content markedly increased with FYM and NPK both. Highly strong relationships were exhibited between plant NPK content with AA and MA content. Triterpenes yield was recorded highest with the application of FYM 15 tonnes/ha and NPK 60:50:60 at planting and NK 60:60 kg/ha at 5th harvest as basal along with N 20 kg/ha as split application at each harvest. Application of FYM and NPK significantly influenced N and K content and their agronomic and use efficiencies, whereas, P content and it’s agronomic and use efficiency were significant with FYM. Thus, application of FYM 15 tonnes/ha and NPK 60:50:60 at planting and NK 60:60 kg/ha at 5th harvest as basal along with N 20 kg/ha as split application at each harvest found optimum to harvest maximum herbage and triterpenes yield and to produce quality raw drugs of C. asiatica [R. S. Jat*, N. A. Gajbhiye (ICAR Directorate Med & Aromat Plants Res, Anand 387310, Gujarat, India) Indian Journal of Agricultural Sciences, 2016, 86(8), 1004-1009].

Functional properties of spinach (Spinacia oleracea L.) phytochemicals and bioactives

Overwhelming evidence indicates that diets rich in fruits and vegetables are protective against common chronic diseases, such as cancer, obesity and cardiovascular disease. Leafy green vegetables, in particular, are recognized as having substantial health-promoting activities that are attributed to the functional properties of their nutrients and non-essential chemical compounds. Spinach (Spinacia oleracea L.) is widely regarded as a functional food due to its diverse nutritional composition, which includes vitamins and minerals, and to its phytochemicals and bioactives that promote health beyond basic nutrition. Spinach-derived phytochemicals and bioactives are able to (i) scavenge reactive oxygen species and prevent macromolecular oxidative damage, (ii) modulate expression and activity of genes involved in metabolism, proliferation, inflammation, and antioxidant defence, and (iii) curb food intake by inducing secretion of satiety hormones. These biological activities contribute to the anti-cancer, anti-obesity, hypoglycemic, and hypolipidemic properties of spinach. Despite these valuable attributes, spinach consumption remains low in comparison to other leafy green vegetables. This review examines the functional properties of spinach in cell culture, animals and humans with a focus on the molecular mechanisms by which spinach-derived non-essential phytochemicals and bioactives, such as glycolipids and thylakoids, impart their health benefits [J. L. Roberts*, R. Moreaua (Univ Nebraska, Dept Nutr & Hlth Sci, Lincoln, NE 68583 USA) Food & Function, 2016, 7(8), 3337-3353].

Isolation of sesquiterpenes lactone from Curcuma aeruginosa rhizome and the cytotoxic activity against human cancer cell lines

The objectives of this research were to isolate bioactive compounds from Curcuma
aeruginosa Roxb. and to study the cytotoxic activity against human cancer cell lines. The in vitro cytotoxicity test was done on human cancer cell lines such as Breast carcinoma MCF-7 and T-47D; Cervical carcinoma Ca Ski and Hela S3 by MTT ([3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide] assay. Cytotoxicity test was also conducted on Vero cells (normal cells). The isolation of bioactive compounds from this extract of C. aeruginosa rhizome was carried out by chromatographic method and the structure elucidation was performed by interpretation of spectroscopic data, including UV, IR, 1H and 13C NMR 1D and 2D. The study showed that n-hexane and chloroform fraction from C aeroginosa had low cytotoxic activity against MCF-7 and Ca-ski (IC50 <100µg/mL), but not toxic against Hela S3, T-47D, and Vero cell lines (IC50 >500µg/mL). From the chloroform fraction of C. aeroginose we isolated a new sesquiterpene lacton aeruginon (1) and a known compound curcumenon (2). It can be concluded that according to the present study, C. aeruginosa can be used as a potent source of natural bioactive compounds that is rich in sesquiterpene compounds [S. Atun*, R. Arianingrum, N. Aznam, S. N. Ab Malek (Department Chemistry education, Yogyakarta State University, Jl. Colombo No. 1, Depok, Sleman, Yogyakarta, Indonesia) International Journal of Pharmacognosy and Phytochemical Research, 2016, 8(7), 1168-1172].

NPARR, 7(4), 2016-385 Phytochemicals as future drugs for Parkinson's disease: A comprehensive review

Parkinson's disease (PD) is the second most common chronic neurodegenerative disease that affects motor skills and cognitive performance. The conventional therapeutic approaches for the management of PD are just able to alleviate symptoms. Exploring for achieving novel substances with therapeutic benefits in PD patients is the focus of a wide range of current investigations. The aim of the present study is to comprehensively review phytochemicals with protective or therapeutic activities in PD and focus on their neuropsychopharmacological mechanisms. Various subgroups of polyphenols (flavonoids, phenolic acids, stilbenes, and lignanes) and terpenes are the most abundant groups of phytochemicals with well-established antiparkinsonian effects. Other phytochemical categories, such as alkaloids, cinnamates, carbohydrates, amino acids, and fatty acid amides, also have some representatives with positive effects in PD. Phytochemicals perform their antiparkinsonian effect through several mechanisms of action, including suppressing apoptosis (via the reduction of Bax/Bcl-2, caspase-3, -8, and -9, and alpha-synuclein accumulation), decreasing dopaminergic neuronal loss and dopamine depletion, reducing the expression of proinflammatory cytokines (such as prostaglandin E-2, interleukin-6, interleukin-1 beta, and nuclear factor-kappa B), and modulating nuclear and cellular inflammatory signaling, elevation of neurotrophic factors, and improvement of antioxidant status. Plant-derived natural products can be considered as future pharmaceutical drugs or adjuvant treatment with conventional therapeutic approaches to improve their efficacy and alleviate their psychological adverse effects in the management of PD. Well-designed clinical trials are mandatory to evaluate the protective and healing benefits of phytochemicals as promising future drugs in the management of neurodegenerative diseases [Z. Shahpiri, R. Bahramsoltani, M. H. Farzaei, F. Farzaei, R. Rahimi* (Univ Tehran Med Sci, Sch Tradit Med, Dept Tradit Pharm, Tehran 141763761, Iran) Reviews in the Neurosciences, 2016, 27(6), 651-668].

NPARR, 7(4), 2016-386 Phytochemicals and potential health effects of Sambucus williamsii Hance (Jiegumu)

Sambucus williamsii Hance (Jiegumu) is traditionally used in Chinese medicine to treat bone and joint diseases. The major phytochemicals in S. williamsii are lignans,
terpenoids, and phenolic acids, together with trace amounts of essential oils, minerals, amino acids, and natural pigments. In this review, a database search for studies published from 1990 to November 2015 was conducted using PubMed, the China Academic Journals Full-Text Database, and Google Scholar with the keywords "Sambucus williamsii Hance", "Sambucus williamsii", "Sambucus williamsii + clinic", "Sambucus williamsii + biology", "Sambucus williamsii + chemicals", and "Jiegumu", which covered chemical studies, cell culture studies, animal experiments, and clinical studies. This article reviewed the compounds isolated from S. williamsii that may reduce the risk of cancer, and exert antifungal, antioxidant, anti-inflammatory, bone fracture healing, and anti-osteoporotic effects [H. H. Xiao, Y. Zhang, R. Cooper, X. S. Yao, M. S. Wong* (Hong Kong Polytech Univ, State Key Lab Chinese Med & Mol Pharmacol Incubat, Shenzhen Res Inst, Shenzhen 518057, Peoples R China) Chinese Medicine, 2016, 11, DOI: 10.1186/s13020-016-0106-9].