

## 65<sup>th</sup> International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research (GA 2017)

Date/Venue:  
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Chair:  
Prof. Dr. Matthias Hamburger  
Prof. Dr. Veronika Butterweck, Basel

### Editorial

#### Abstracts of the 65<sup>th</sup> Annual Meeting of the Society for Medicinal Plant and Natural Product Research (GA)

From September 3rd to 6th 2017 over 600 participants from more than 30 countries gathered in Basel, Switzerland, for the 65<sup>th</sup> Annual Meeting of the Society for Medicinal Plant and Natural Product Research.

The main scientific topics of the conference were

- Bioactive Natural Products
- Dermatology and Dermatocosmetics
- Functional Foods
- Biosynthesis and Biotechnology
- Sustainable Use of Natural Products
- Natural Product Formulation and Nanotechnology
- Analytical Studies, Natural Product Chemistry & Computational Approaches
- Quality control methods for herbal extracts, starting materials and natural products
- Phytopharmacology/Extract Pharmacology
- Animal health care and Veterinary phytotherapy

The scientific programme of the Main Conference included 5 plenary lectures by invited speakers, 4 award lectures, 96 contributed short lectures and 545 posters. The short lectures were held in three parallel sessions, and the two poster sessions on Monday and Tuesday provided a forum for lively scientific discussions.

On Sunday, 3<sup>rd</sup> September, three pre-congress events took place. The Young Researchers Workshop offered a platform for young scientists to present their latest findings, and the Regulatory Affairs Workshop served as a forum for industry to update on the latest trends in regulation of phytotherapeutics and related areas. A Pre-congress Symposium on Veterinary Phytotherapy was organized by the Swiss Medical Society for Phytotherapy (SMGP), in cooperation with the GA Networking Group on Animal Healthcare and Veterinary Medicine. On Tuesday, 5<sup>th</sup> September, the session 'Herbals for health world-wide – WHO strategy and Herbal Regulation for Meeting People's Need' provided an excellent forum for all participants to discuss the needs for international educational, regulatory and research activities.

We would like to take the opportunity to express our sincere thanks and appreciation to all participants of the conference, and to the sponsors and exhibitors. They all contributed significantly to make this meeting a success. We also would like to thank the members of the organizing committee for all the efforts during the preparation phase of the congress, and to our staff members and students who volunteered to assist us in various organizational tasks during the conference.

Last, but not least, we would like to thank Thieme Publishers for their generous support, and for publishing the conference abstracts in *Planta Medica International Open*.

Prof. Dr. Matthias Hamburger & Prof. Dr. Veronika Butterweck

On behalf of the Organizing Committee

#### Tu-Poster Session 2-PO-130 *In vitro* Protective Effect of Chemically-Characterized Flower Extracts of *Clitoria ternatea* L. Against Hydrogen Peroxide Induced Cytotoxicity in Human Keratinocytes (HaCaT)

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*Clitoria ternatea* (Leguminosae), commonly known as the butterfly pea, is easily recognizable by its deep blue flowers. The leaves and roots of the plants are well researched. However, very little is known about the flower parts of the plant. In Malaysia and Thailand, the flower part was used as a food colorant in the traditional dish, drink as herbal tea and consumed as vegetable salad for health benefits, particularly as defence against skin aging. This study was conducted to investigate the protective effect of *C. ternatea* extracts against hydrogen-peroxide induced cytotoxicity in HaCaT cells (human keratinocytes) as skin cells model. Two extracts (aqueous and 70% ethanol) were prepared to mimic the traditional methods of preparation. The antioxidant potential of the extracts was determined using diphenyl-picryl hydrazine (DPPH) and 2, 2'-azino-bis (3-ethylthiothiazoline-6-sulphonic acid (ABTS) assays, expressed as Trolox equivalent (TE)mg extract. The protective effect against hydrogen-peroxide induced cytotoxicity was determined by 3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulphophenyl)-2H-tetrazolium (MTS) assay. The antioxidant assays showed the TE/mg extract for *C. ternatea* ethanol extract (CTE) were significantly higher than *C. ternatea* water extract (CTW) ( $p < 0.05$ ). HaCaT treated with CTW extract showed to have higher percentage viability compared to untreated HaCaT after exposure to 200µM hydrogen peroxide ( $p < 0.05$ ). No protective effect was observed from CTE extract. High resolution liquid chromatography-mass spectrometry (LC-MS) revealed the detection of compounds assigned as flavonol glycosides (derived from quercetin and myricetin), anthocyanins (derived from delphinidin) and coumaric acid derivatives (coumaroylsucrose and coumaroylglucose) in CTE and CTW. The higher antioxidant potential in CTE, observed by higher antioxidant potential to inhibit free radicals but antagonistically prevented the protective effect against hydrogen peroxide-induced cytotoxicity as opposed to HaCaT treated with CTW may be due to variation in the relative levels of phytochemicals in the CTE and CTW extracts.

#### Tu-Poster Session 2-PO-131 Effect of herbal syrup "Limoniidin" at the functional non ulcer dyspepsia

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The syndrome of the functional non ulcer dyspepsia (FNUD) can be met independently as well as in association with a number of widespread diseases of the digestive system. Main reasons for its emergence are the violations of the motor function of the stomach and duodenum, and also a hypersensitivity of stomach wall receptors to stretching. Abundance of complaints, linked to stomach pathology, is very high and occurs in industrialized countries at 30–40% rate of the population, and a half of all cases are the share of non ulcer dyspepsia.

Clinical trials of domestic herbal syrup "Limoniidin" on a syndrome of FNUD are conducted on the basis of scientific and clinical diagnostic center of SRCID on 30 patients (63.3% of which are women), middle age of 41.55 ± 11.82. Patients were included in a research only from their informed consent. Observa-

tion was conducted for 21 days. At all patients included in a research the endoscopic study of proximal departments of digestive tract and ultrasound examination of abdominal organs was conducted. In the presence of organic pathology patients were excluded from a research. From the results of the experiment it might be concluded that the studied herbal medicine possesses along with anti-inflammatory and antiseptic properties spasmolytic influence on a smooth emulsionation of a stomach. Physiological activity of syrup might be defined by presence of epigallocatechin-3,3,5,7,3',4',6'-hexahydroxyflavan, (-)-epigallocatechin-(4R)-8)-2R,3R(-)-epigallocatechin-3,(-)-epigallocatechin-(4R)-8)-3,5,7,3',4',6'-hexahydroxyflavan, myricetin and a number of its glycosides.

#### Tu-Poster Session 2-PO-132 The antioxidant intervention in colon cancer initiation by Detarium microcarpum and its fractions

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Pathophysiological situations have shown that oxidative stress and inflammation are closely related. Evidences show the simultaneous existence of chronic inflammation and oxidative stress in cardiovascular, neurodegenerative, diabetic, and chronic kidney diseases, do exist [1]. Whenever chronic inflammation takes place, pro-inflammatory molecules, are all upregulated. Thus, providing an enabling environment, for the exponential growth of malignant cells [2]. The uses of anti-inflammatory agents have been found to reduce the incidence and management of cancer. Three folkloric plants used in the treatment of inflammation and cancer were studied; *Bowlesia dolabifolia*, *Detarium microcarpum*, and *Daniellia oliveri*. Identification, authentication and voucher numbers were carried out at the Federal College of Forestry, Jos, Nigeria. For the selection phase, after the preliminary screening and antioxidant assays, DMI had the highest inhibitory ability to prevent the formation of malondialdehyde in the liver, brain and colon; going by its low IC<sub>50</sub>. The *in vitro* antioxidant capacity was carried out among the Methanolic extract (DMI), Butanol fraction of DMI (BDMI) and Ethyl acetate fraction of DMI (EDMI). The result showed that EDM had the highest antioxidant capacity, followed by DMI, and the least was BDMI. The EDM was chosen and the acute toxicity was carried out as to determine the LD<sub>50</sub>. The test was carried out following the method described by the Organisation for Economic Co-operation and Development, OECD [3]. From the clinical observations, there was no sign of morbidity, but the results from the haematological, serum biochemistry and histopathological studies, indicated the LD<sub>50</sub> for EDM extract to be 5 1000 mg/kg.

[1] Gülcin I, Bursal E, Sehitoglu MH, Bilgel M, Gören AC. Food Chem Toxicol 2010; 48: 2227 – 2238.

[2] Hofbeth J, Ying L. Biochim Biophys Acta. 2006; 1765:74 – 84.

[3] OECD (2001) OECD guideline for the testing of Chemicals: Acute Oral Toxicity - Acute Toxic Class Method [Guideline 423 adopted 17th December 2001].

ments to ensure products with homogeneous characteristics and also suggest that the selection of optimal roots would increase the yield in secoiridoid glycosides.

Tab. 1: Secoiridoid glycosides (mg g of root dry weight) in the cortex/vascular tissues in the roots of wild collected *C. lutea* L. subsp. *aurantiorum*. Different letters for every bitter compound are significantly different ( $p < 0.05$ ) according to Student's T test.

	Cortex mg/g	Vascular tissues mg/g	Variation %
Geniposide	7.187 a	5.381 b	33.6
Araucagone	0.088 a	0.024 b	261.5
Saverone	0.174 a	0.108 b	61.7
Sweetaninon	0.370 a	0.309 b	19.8

[1] Gonzalez-Lopez O, Polanco C, Gyrozy Z, Pedryc A, Casquero PA. Journal of Molecular Sciences 2014; 10052 – 10066

[2] Gonzalez-Lopez O, Carro G, Aiello N, Scartezzini F, Casquero PA. Planta Medica 2014; 80: 1489 – 1490

#### Tu-Poster Session 2-PO-188 Phytochemical study of the *Limonium leptophyllum* plants and isolated substance

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From *Limonium obtusifolium* a number of highly efficient medicinal preparations have been obtained possessing anti-inflammatory, antiviral and wound-healing activities with no allergic reactions and cumulative properties. Currently endemic plant *Limonium leptophyllum* was studied. Preparation of plant material collected in September, 2016 in Almaty region consisted in its drying and refinement to 3 mm. In accordance with the requirements of the State Pharmacopoeia of the Republic of Kazakhstan, the authenticity for the studied type of medicinal plant material was established by the methods of macroscopy and microscopy. Quality indices were esteemed. Identification of various groups of biologically active compounds for substance standardization and assessment of active compounds for their comparative biological screening was carried out. The results obtained: humidity – 9.59%; total ash – 10.84%; ash, insoluble in 10% HCl – 0.02%; sulphated ash – 10.79%. "Microbiological purity", "Heavy metals" and "Radionuclides" were established according to the norms for the medicinal plant materials. Pesticides and mycotoxins are not found. Varying the extraction conditions, a rational technological scheme was developed for obtaining a substance from the above-ground part of the plant species under study in the form of a dry extract. Extraction of the studied plant material was carried out twice with 50% ethanol at its ratio with the raw material of 1:6 for 6 hours at room temperature. The substance is a biologically active complex with a high hydrophilicity containing the main classes of biologically active natural compounds in the form of phenolic acids (gallic and ellagic), flavonols (quercetin and myricetin) both in free form and in the form of glycosides, hydrolyzed and condensed tannins, which are dimeric and oligomeric forms of flavan-3-ol. It also includes eight essential α-amino acids, mono- and oligosaccharides, vitamins, microelements and other compounds. For the first time, ajlugin apigenin is isolated from this genus.

#### Tu-Poster Session 2-PO-190 Evaluation of transdermal drug-delivery system of capsacin

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Capsacin has been employed topically to treat many diseases such as rheumatoid arthritis and nerve pain in diabetes. The short half-life of capsacin by intravenous administration made topical application of capsacin advantageous.

In this study, we have evaluated differences in the dissolution characteristics of capsacin patch purchased from market, at different dissolution rotation speed.

The dissolution study was conducted using USP apparatus 5 (n = 6), ERWEKA DT800 dissolution tester and 500 mL of pH 7.4 phosphate buffer as dissolution media. All dissolution studies were carried out at 32 ± 0.5°C and different rotation speed (50 ± 5; 100 ± 5 and 150 ± 5 rpm). 5 mL aliquots of samples were withdrawn at various time intervals (1, 4, 8 and 12 hours). Withdrawn were appropriate diluted and analyzed by HPLC.

The HPLC method proposed by Al Othman et al. (2011) has been optimized and validated for the separation and quantitation of capsacin in a transdermal patch [1].

HPLC analysis was performed using ProntoSIL 120 – 3-C18AQ 125 × 4.0 mm (3µm) column maintained at 60°C. The mobile phase consisted of acetonitrile: water (50:50v/v), the flow rate of 0.9 mL/min, the injection volume 10 µL and the detection wavelength 222 nm.

The used HPLC method can be applied for fast (total run time was 4.0 minutes) and simultaneous analysis of capsacin and dihydrocapsaicin in a transdermal patch.

We can conclude that the relative difference of dissolution rate of capsacin after 12 hours was elevated by increase of dissolution rotation speed (100 rpm vs. 50 rpm: 87.1 ± 12.1% and 150 rpm vs. 100 rpm: 39.6 ± 8.7%).

USP Apparatus 5 could be considered as a discriminatory test that would be able to point out the differences in the dissolution rate of capsacin at different rotation speed.

[1] Al Othman ZA et al. Molecules 2011; 16:8919 – 8929.

#### Tu-Poster Session 2-PO-191 Metabolite profiles of *Labisia pumila* and the discriminative analysis of the varieties using 1 H NMR-based metabolomics approach.

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Medicinal plants and herbs have natural variation. The metabolite profile, and hence the biological properties of plant samples of different species, varieties, geographical origin localities or agronomic conditions, may vary quite significantly. Thus, the identification of crude herbs is crucial in order to ensure authenticity, quality, safety and efficacy of the raw material before it is converted to the final products. The chemical analysis techniques which should be unbiased, rapid, and reproducible, while requiring only simple sample preparation. Metabolomics is a comprehensive analysis of metabolites in biological samples using a combination of spectral platforms (e.g. NMR and mass spectroscopy) and multivariate statistical analysis. The approach has received a lot of attention due to its holistic nature and the information-rich results that can be obtained from it. In this paper, an NMR-based metabolomics approach was used to differentiate between three varieties of the medicinal plant *Labisia pumila* L. *L. pumila* var. *alata* L., *L. pumila* var. *pumila* L. and *L. pumila* var. *lancofolata* L. The medicinal herb is one of five herbs which have been prioritized as and Entry Point Project under the Agriculture NKEA (New Key Economic Area) program for Malaysia. The medicine plant is traditionally used to induce or facilitate labour and treat flatulence, dysentery, dysmenorrhoea, gonorrhoea, and bone sickness. *L. pumila* exerts an uterotropic effect and regulates body