59th International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research

Date/Location: 4th–9th September 2011, Antalya, Turkey

President: Prof. Dr. K. Hüsnü Can Başer

Dear Colleagues,

It is my great pleasure and honour to hold the 59th International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research on September 4–9, 2011 in Antalya, Turkey. This congress series has been organized annually since 1953 and has become the most important and popular congress in Europe in its respected field. It is the first time the congress is organized in Turkey. Turkey is a large peninsula bridging the east and the west at the junction of two continents and has been a passage way between Europe and Asia and even Africa. Due to its geographic location Turkey has been a melting pot of civilizations, cultures and nations, and is full of history and home to diverse traditions. It is a land of many firsts since history starts here. Thanks to its climatically and phytogeographically unique position and its transect ranging from sea level (0 m) to the peak of the Ararat mountain (5137 m) the flora of Turkey is rich and diverse with over 12,000 flowering plant taxa recorded of which 33% are endemic. Anatolia is the land of Galenus of Pergamon and Dioscorides of Anavarza. Pedanius Dioscorides, a physician in the Roman Army had written his famous Materia Medica in the 1st century AD. His birthplace Anavarza is in Kozan, Adana in Southern Turkey not too far from Antalya.
The 59th Congress has attracted global attention and there are participants from all parts of the world. Its scientific level is high thanks to the efforts of the Scientific Committee. High rate of rejects were due to the meticulous work of the reviewers who gave it time and effort to keep the scientific level as high as possible.
Main topics of the Congress are as follows:

- New Trends in Pharmacognosy
- Traditional and Natural Medicines
- Leead Finding from Nature
- Antimicrobials – What's next?
- Endophytes – Importance in Pharmacognosy
- Natural Immune Enhancers
- Nutraceuticals, Cosmeceuticals, Functional Foods – Prevention of Metabolic Diseases
- Essential Oils – Analysis, Bioactivities, Uses, Therapeutical Potential
- Biotechnology and Nanobiotechnology
- Advances in the Analysis of Natural Products

Ten plenary and two keynote lectures will be presented by distinguished scientists. 73 short lectures will be presented in three paralel sessions. Numerous researchers will be able to report their research findings in 900 poster presentations. In addition, young researchers will be able to present their papers at two paralel Young Researchers Workshops. There will also be three more Permanent Committee Workshops of the GA on regulatory affairs, pharmacology, agriculture and quality of natural products. An additional workshop will be held on Traditional Chinese Medicine (TCM). 31 lectures will be presented in the workshops. All in all over 1100 scientific presentation will be made at the congress.

I would like to thank the Executive and the Advisory Board members of the GA for their help and encouragement during the preparatory stages of the Congress. I wish to extend my grateful thanks to Georg Thieme Verlag KG for processing such a huge number of abstracts in a short time. My special thanks go to the members of the Organizing Committee and to the Congress Organizing Company FTS who have done their utmost to offer you a successful, satisfying and enjoyable congress.

I wish you all a fruitful congress which I hope will strengten old friendships and develop new ones in a friendly, scientific and cultural atmosphere. I hope everybody enjoys their stay in sunny Antalya, gets the opportunity to discover hidden beauties of the region and Turkey, and takes home new scientific knowledge and unforgettable memories.

Prof. Dr. K. Hüsnü Can Başer
President of the 59th International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research

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which is characterized by the absence of alkaloids [3]. This extract was tested for estrogenic activity in a panel of suitable test models. Besides a significant competitive binding to estrogen receptors alpha (ER alpha) and ER beta, induction of alkaline phosphatase in Ishikawa endometrial adenocarcinoma cell was observed. Unfortunately, the extract did not display any estrogen receptor selectivity and promoted uterine growth in ovariectomized rats. Hence, it was considered inappropriate for the treatment of climacteric complaints and precluded from further product development. Keywords: Sophora flavescens, antiestrogenic activity References: 1. Kuang L, Zhang K (2005) Pharmacopoeia of the Peoples Republic of China, Vol.I, People's Medical Publishing House, Beijing. 2. Hillerns PI, Wink M (2005) Planta Med 71: 1065. 3. Dr. Willmar Schwabe GmbH & Co., European Patent EP 1294388 B1 (granted 2004)

PM130 Antibacterial activity of plant extracts highly depends on extraction solvent

Sperl C, Mader E, Henikl S, Teichmann K, Schatzmayr G
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As an alternative to antibiotic growth promoters in animal nutrition, that have been banned in the EU in 2006, the demand for plant derived substances (phytogenics) is emerging to counteract bacterial infections in swine and poultry. In contrast to antibiotics, phytogenics are expected to refrain from causing transmissible bacterial resistances and leaving critical residues in animal tissue. Looking for potential phytogenics, five different plant raw materials (*Berberis aristata* DC. root, *Sophora flavescens* Aiton root, *Holarrhena antidysenterica* (L.) Wall. bark, *Bridelia ferruginea* Benth. bark and leaves) were selected. Dry extracts were produced of each material using different extraction solvents (ethanol abs., water and 50/50 (v/v) ethanol/water). The antibacterial activity of the extracts on two pathogenic bacteria, *Salmonella typhimurium* and *Clostridium perfringens* Type C, was examined with a turbidimetric microdilution method. The bacterial cultures with defined microbial count were incubated together with different concentrations of the extracts. The change in optical density of the bacterial culture led to a quantitative result, indicated as the MIC_{50} value. The lowest MIC_{50} values were reached by the ethanol extracts of *B. aristata* (78 mg/l) and *S. flavescens* (156 mg/l) against *C. perfringens*. The ethanol and ethanol/water extract of *H. antidysenterica* showed higher activity against *S. typhimurium*. In fact, the ethanol extracts of all plant materials were most effective, except for the extracts of *B. ferruginea* bark, whereof the water extract was most effective against *C. perfringens* (MIC_{50} value 156 – 625 mg/l). Based on these findings about extraction solvent-dependent activity, further investigations towards active substance identification will be accomplished.

PM131 Phytochemistry and biological activities of the ethanolic extract of *Onosma aucherianum*

Maškovic P[1], Niciforovic N[2], Solujic S[2], Manojlovic N[3], Cvijovic M[1], Mladenovic J[1], Acamovic Djokovic G[1], Radojkovic M[4]
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This study was aimed at evaluating the antioxidant activity and efficacy of the ethanolic extract of the endemic plant species *Onosma aucherianum* DC. in inhibiting the development of selected fungi and bacteria. The highest susceptibility to the ethanolic extract of *O. aucherianum* among the bacteria tested was exhibited by B. subtilis and S. aureus (MIC = 15.62 µg/ml). Among the fungi, *A. niger* (MIC = 15.62 µg/ml) showed the highest susceptibility. Total phenolic, flavonoid, condensed tannin and gallotannin contents were 90.26 ± 0.69 mg GA/g, 35.24 ± 0.55 mg RU/g, 74.65 ± 0.75 mg GA/g and 31.74 ± 1.05 mg GA/g, respectively. Total antioxidant capacity was 78.45 ± 0.98 µg AA/g. IC_{50} values were determined for each measurement: 21.45 ± 1.55 µg/ml for DPPH free radical scavenging activity, 36.46 ± 1.68 µg/ml for inhibitory activity against lipid peroxidation, 99.11 ± 0.23 µg/ml for hydroxyl radical scavenging activity and 45.91 ± 0.88 µg/ml for chelating ability. The rosmarinic acid was found to be the dominant phenolic compound of the extract. Keywords: antimicrobial activity, antioxidant activity, Onosma aucherianum, HPLC analysis, phenolic compounds Acknowledgement: Serbian Ministry of Agriculture, Forestry and Water Management, SIAR Project No. 401 – 001972/2010 – 03.

PM132 Topical anti-inflammatory activity of *Plantago lanceolata* L. leaves: the relevance of triterpenic acids

Sosa S[1], Faudale M[1], Zacchigna M[2], Cateni F[2], Del Favero G[1], Tubaro A[1], Della Loggia R[1]
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The leaves of *Plantago lanceolata* L. (Plantaginaceae) are used in traditional medicine for the topical treatment of skin inflammatory affections [1]. Although *P. lanceolata* leaf extracts and some of their constituents have been shown to inhibit *in vitro* enzymes involved in inflammation [1, 2], the *in vivo* topical anti-inflammatory properties of the leaves have not been investigated. Therefore, *P. lanceolata* leaves have been studied for their topical anti-inflammatory activity by the Croton oil-induced ear dermatitis assay in mice [3]. *P. lanceolata* leaves were sequentially extracted with *n*-hexane, chloroform and methanol and the relevant extracts were evaluated for their ability to inhibit the mouse ear edema induced by Croton oil. Each extract (300 µg/cm²) provoked a significant edema reduction, the chloroform one being the most active. Its potency was only two fold lower than that of the reference non steroidal anti-inflammatory drug indomethacin: their ID_{50} (dose inducing 50% edema inhibition) values were 186 and 97 µg/cm², respectively. By column chromatography, the chloroform extract was separated in five fractions (A-E), concentrating its activity into fraction C, which was constituted mainly by ursolic acid (44%) and oleanolic acid (27%). These compounds induced a dose-dependent edema inhibition, and ursolic acid (ID_{50} = 56 µg/cm²) was more active than oleanolic acid (ID_{50} = 132 µg/cm²) and indomethacin. The two triterpenes, which give a significant contribution to the anti-inflammatory activity of the parent extract, can be proposed as parameters in the quality control of *P. lanceolata* leaf preparations for the topical use against skin inflammations. References: 1. Beara IN et al. (2010) J Pharm Biomed Anal 52: 701 – 706. 2. Vigo E et al. (2005) J Pharm Pharmacol 57: 383 – 391. 3. Tubaro A et al. (1985) Agents Actions 17: 347 – 349.

PM133 *Cyathula prostrata* inhibits *in vitro* cancer cell growth via multiple targets

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The *in vitro* anticancer activity of an 80% ethanol extract of *Cyathula prostrata* (L.) Blume, an annual branching shrub used by traditional healers in Nigeria to treat cancer was investigated. IC_{50} values were 100.8 µg/ml and 64.4 µg/ml for HeLa (cervical cancer) and U937 (myelo-monocytic) cell lines, respectively. Further experiments were performed using 125 µg/ml *C. prostrata* extract and 50 µM cisplatin as positive control. More than 80% of the cells were arrested in the G1 phase after 48 hours of *C. prostrata* treatment. The annexin V-FITC/PI assay revealed an increase in percentage apoptotic cells from 4.9% to 53.1% at 24 h. Cell cycle arrest was not accompanied by increased levels of the cyclin-CDK inhibitor p21. Increase in caspase-8 activation was observed in response to treatment with the extract with no cyt-c release from the mitochondria. The lack of cyt-c release was due to no change in mitochondrial membrane potential, which was investigated with the aid of fluorescent mitochondrial dyes and flow cytometric techniques. The results therefore show that *C. prostrata* extract induces apoptosis via the extrinsic pathway and this activation is independent of the mitochondria. Levels of hTERT, the catalytic subunit of telomerase, were also shown to decrease upon *C. prostrata* treatment. The findings from this study suggest that the extract acts through multiple targets, by inducing: cell cycle arrest in the G1 phase through an unknown mechanism; apoptosis through an extrinsic death receptor pathway and replicative senescence through inhibition of telomerase. Keywords: *Cyathula prostrata* apoptosis, caspase 8, telomerase, cell cycle arrest Acknowledge-

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Phytochemistry and biological activities of the ethanolic extract of Onosma aucherianum

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This study was aimed at evaluating the antioxidant activity and efficacy of the ethanolic extract of the endemic plant species *Onosma aucherianum* DC. in inhibiting the development of selected fungi and bacteria. The highest susceptibility to the ethanolic extract of *O. aucherianum* among the bacteria tested was exhibited by B. subtilis and S. aureus (MIC=15.62μg/ml). Among the fungi, *A. niger* (MIC=15.62μg/ml) showed the highest susceptibility. Total phenolic, flavonoid, condensed tannin and gallotannin contents were 90.26±0.69mg GA/g, 35.24±0.55mg RU/g, 74.65±0.75mg GA/g and 31.74±1.05mg GA/g, respectively. Total antioxidant capacity was 78.45±0.98μg AA/g. IC_{50} values were determined for each measurement: 21.45±1.55μg/ml for DPPH free radical scavenging activity, 36.46±1.68μg/ml for inhibitory activity against lipid peroxidation, 99.11±0.23μg/ml for hydroxyl radical scavenging activity and 45.91±0.88μg/ml for chelating ability. The rosmarinic acid was found to be the dominant phenolic compound of the extract.

Keywords: antimicrobial activity, antioxidant activity, Onosma aucherianum, HPLC analysis, phenolic compounds

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