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 Anazarba. Pedanius Dioscorides, a physician in the Roman Army had written his famous Materia Medica in the 1st century AD. His birthplace Anazarba 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 reject 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
- Lead 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 parallel 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 parallel 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 presentations 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 strength 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
Planta Medica
Journal of Medicinal Plant and Natural Product Research

Editor-in-Chief
Luc Pieters, Antwerp, Belgium

Senior Editor
Adolf Nahrstedt, Münster, Germany

Review Editor
Matthias Hamburger, Basel, Switzerland

Editors
Wolfgang Barz, Münster, Germany
Rudolf Bauer, Graz, Austria
Veronica Butterweck, Gainesville FL, USA
João Batista Calixto, Florianopolis, Brazil
Thomas Effert, Mainz, Germany
Jerzy W. Jaroszewski, Copenhagen, Denmark
Ikhalas Khan, Oxford MS, USA
Wolfgang Kreis, Erlangen, Germany
Imgard Merfort, Freiburg, Germany
Kurt Schmidt, Graz, Austria
Thomas Simnet, Ulm, Germany
Hermann Stuppner, Innsbruck, Austria
Yang-Chang Wu, Taichung, Taiwan
Yang Ye, Shanghai, China

Advisory Board
Giovanni Appendino, Novara, Italy
John T. Amason, Ottawa, Canada
Yoshinori Asakawa, Tokushima, Japan
Lars Bolin, Uppsala, Sweden
Gerhard Bringmann, Würzburg, Germany
Reto Brun, Basel, Switzerland
Mark S. Butler, S. Lucia, Australia
Ihsan Calis, Ankara, Turkey
Salvador Canigueral, Barcelona, Spain
Hartmut Derendorf, Gainesville, USA
Verena Dirsch, Vienna, Austria
Jürgen Drewe, Basel, Switzerland
Roberto Maffei Facino, Milan, Italy
Alfonso Garcia-Piñeres, Frederick MD, USA
Rolf Gebhardt, Leipzig, Germany
Clarissa Gerhäuser, Heidelberg, Germany
Jürg Gertsch, Zürich, Switzerland
Simon Gibbons, London, UK
De-An Guo, Shanghai, China
Leslie Gunatilaka, Tucson, USA
Solomon Habtemariam, London, UK
Andreas Hensel, Münster, Germany
Werner Herz, Tallahassee, USA
Kurt Hostettmann, Geneva, Switzerland
Peter J. Houghton, London, UK
Jinwoong Kim, Seoul, Korea
Gabriele M. König, Bonn, Germany
Ulrich Matern, Marburg, Germany
Matthias Melzig, Berlin, Germany
Dulcie Mulholland, Guildford, UK
Eduardo Munoz, Cordoba, Spain
Kirst-Maria Oksman-Caldentey, Espoo, Finland
Ana Maria de Oliveira, São Paulo, Brazil
Nigel B. Perry, Dunedin, New Zealand
Joseph Pfeilschifter, Frankfurt, Germany
Peter Proksch, Düsseldorf, Germany
Thomas Schmidt, Münster, Germany
Volkert Schulz, Berlin, Germany
Hans-Uwe Simon, Bern, Switzerland
Leandros Skaltsounis, Athens, Greece
Han-Dong Sun, Kunming, China
Benny K. H. Tan, Singapore, R. of Singapore
Ren Xiang Tan, Nanjing, China
Deniz Tasdemir, London, UK
Nunziatina de Tommasi, Salerno, Italy
Arnold Vlietinck, Antwerp, Belgium
Angelika M. Vollmar, München, Germany
Heliki Vuorela, Helsinki, Finland
Jean-Luc Wolfender, Geneva, Switzerland
De-Quan Yu, Beijing, China

Publishers
Georg Thieme Verlag KG
Stuttgart · New York
Rüdigerstraße 14
D-70469 Stuttgart
Postfach 30 11 20
D-70451 Stuttgart

Thieme Publishers
333 Seventh Avenue
New York, NY 10001, USA
www.thieme.com
Masthead
Planta Medica
Volume 77

Editor-in-Chief
Prof. Dr. Luc Pieters
Department of Pharmaceutical Sciences
University of Antwerp
Universiteitsplein 1
BE-2610 Antwerp, Belgium
email: luc.pieters@ua.ac.be
phone: +32 3 265 27 15
fax: +32 3 265 27 09

Editorial Offices
Dr. Claudia Schärer
Department of Pharmaceutical Sciences
Institute of Pharmaceutical Biology
University of Basel
Klingelbergstrasse 50
CH-4053 Basel, Switzerland
e-mail: claudia.schaerer@unibas.ch

Dr. Tess DeBruyne
Department of Pharmaceutical Sciences
University of Antwerp
Universiteitsplein 1
BE-2610 Antwerp, Belgium
e-mail: tess.debruyne@ua.ac.be

Publishers
Georg Thieme Verlag KG
Rüdigerstraße 14, 70469 Stuttgart or
P.O. Box 30 11 20, 70451 Stuttgart
phone +49-711-893-1-0
fax +49-711-893-1-288
www.thieme.com
www.thieme.de/tz/plantamedica
http://www.thieme-connect.de/ejournals

Copyright
This journal, including all individual contributions and illustrations published therein, is legally protected by copyright for the duration of the copyright period. Any use, exploitation or commercialization outside the narrow limits set by copyright legislation, without the publisher’s consent, is illegal and liable to criminal prosecution. This applies in particular to photocopy reproduction, copyright, clipping, distribution, microfilming or duplication of any kind, translating, preparing of microfilms, and electronic data processing and storage.

Advertising responsibility
Thieme, media
Pharma Anzeigen- und Verlagsservice GmbH
Ullrike Brüderl
Rüdigerstraße 14, 70469 Stuttgart and
P.O. Box 30 08 80, 70448 Stuttgart
phone +49-711-893-1-466
fax +49-711-893-1-392
e-mail: Ullrike.Brüderl@thieme.de

Printed in Germany
AZ Druck und Datentechnik GmbH, 87437 Kempten

Typesetting
Hübner EP GmbH, Eltville

Production manager
phone +49-711-893-1-452
fax +49-711-893-1-392
e-mail: Daniel.Bauer@thieme.de

Subscription Information
Planta Medica is available as an institutional subscription only. For information about institutional rates, please contact eproducts@thieme.de

General Information
Planta Medica, ISSN 0032-0943, is published in 18 issues per year. Subscribers are asked to inform the publisher immediately in case of address changes in order to ensure correct delivery of the journal. All subscription orders are entered for the calendar year. The rate of subscription is invoiced in advance at the end of the year for the following year and becomes due for payment for the full calendar year. Subscriptions can be started anytime. Subscriptions are automatically extended each year unless notice of cancellation is received from the subscriber prior to September 30 of each year (applies to Germany, Switzerland, Austria only).

Subscriptions for Europe, Africa, Asia and Australia (excluding South Asia)
Order from Georg Thieme Verlag KG, Rüdigerstr. 14, 70469 Stuttgart, Germany; P.O. Box 30 11 20, 70451 Stuttgart, Germany; phone +49-711-893-1-421; e-mail: customerservice@thieme.de.

Subscriptions for South Asia (Bangladesh, Bhutan, India, Nepal, Pakistan & Sri Lanka)
Contact Thieme Medical and Scientific Publishers Private Limited, N-26, II-Floor, Sector 18, NOIDA-201301, India. phone +91 120 247 44 61 to 64; fax +91 120 247 44 65; e-mail: customerservice@thieme.in. Please contact customer service for information on 2011 subscription rate in INR.

Subscriptions for the American Continent
Order from Thieme New York, 333 Seventh Avenue, New York, NY 10001, USA. Order toll free +1-800-782-3488 (US only) or +1-212-760-0888, fax +1-212-947-0108; e-mail: customerservice@thieme.com.

For information on special society agreements, please contact Fiona Henderson, Thieme Publishers, phone +49-711-893-1-458, fax +49-711-893-1-410; e-mail: Fiona.Henderson@thieme.de

For Users in the USA
Authorization of photocopying items for internal or personal use, or the internal or personal use of specific clients, is granted by Georg Thieme Verlag Stuttgart - New York for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service; www.copyright.com.
For reprint information in the US, please contact: International Reprint Corporation, 287 East “H” St., Benicia, CA 94510, USA; phone: +1-707-746-8740, fax: +1-707-746-1643; e-mail: irc@intereprints.com

Product names
Product names which are registered trademarks may not have been specifically designated as such in every case. In case that a product has been referred to by its registered trademark it cannot be concluded that the name used is in the public domain. The same applies to labels, names or other signs.

Manuscripts
Manuscript submission exclusively via: http://mc.manuscriptcentral.com/plamed

For details regarding manuscript submission please refer to “Guidelines for Authors” and the “Sample Manuscript”. Download PDF files from http://mc.manuscriptcentral.com/plamed (follow link “Instructions and Forms”) or http://www.thieme.de/tz/plantamedica (follow link “For Authors”), in principle only papers will be accepted which have not been published previously, domestically or abroad. Furthermore, manuscripts may not be offered to other publishers at the same time as they are under consideration for this journal.

Important note
Medicine is an ever-changing science undergoing continual development. Research and clinical experience are continually expanding our knowledge, in particular our knowledge of proper treatment and drug therapy. Insofar as this journal mentions any dosage or application, readers may rest assured that the authors, editors and publishers have made reasonable effort to ensure that such references are in accordance with the state of knowledge at the time of production of the journal.
Nevertheless this does not involve, imply, or express any guarantee or responsibility on the part of the publishers in respect of any dosage instructions and forms of application stated in the journal. Every user is required to examine carefully the manufacturers' leaflets accompanying each drug and to check, if necessary in consultation with a physician or specialist, whether the dosage schedules mentioned therein or the contraindications stated by the manufacturers differ from the statements made in the present journal. Such examination is particularly important with drugs that are either rarely used or have been newly released on the market. Every dosage schedule or every form of application used is entirely at the users own risk and responsibility. The authors and publishers request every user to report to the publishers any discrepancies or inaccuracies noticed.

The corresponding author will receive a PDF-file for private use.

Online
The scientific text of this journal is available online through Thieme-connect, http://www.thieme-connect.de/ejournals. Access to Thieme-connect is free of charge for personal subscribers. For information concerning licenses and prices for institutional access, please contact Carmen Krenz, e-mail: sales@thieme-connect.de.

Customers from North, Central and South America and Canada please contact Alexandra Williams, e-mail: awilliams@thieme.com
Authors may choose to allow, for a fee, free general access to their papers online. For details, please contact plantamedica@thieme.de

© Georg Thieme Verlag KG Stuttgart · New York 2011
Inter-population variation in phenolic content of Teucrium chamaedrys L. from the localities in the Balkan Peninsula
Sankovic MS, Vassilev K, Stankovic MN, Milosevic T*, Topuzovic M, Markovic A, Soljac S. 1Department of Biology and Ecology, Faculty of Science, University of Krakovac, Rodaja Domanovica 12, 34000 Krakovac, Serbia; 2Institute of Botany, Bulgarian Academy of Sciences, Acad. G. Bonchev St, bl.23, Sofia 1113, Bulgaria; 3Special Nature Reserve - Zasavica, Svetog Siv, 22000 Sremska Mitrovica, Serbia; 4Department of Pharmacognosy, Faculty of Pharmacy, University of Athens, Panepistimiou, Zografou, 157,71 Athens, Greece; 5Department of Chemistry, Faculty of Science, University of Krakovac, Rodaja Domanovica 12, 34000 Krakovac, Serbia

Total phenolic content and flavonoid concentrations in methanolic extracts obtained from Teucrium chamaedrys L. in five natural populations of the Balkan Peninsula and a garden population were investigated and compared. The above-ground parts of plants were collected during the flowering phase and the methanolic extracts were prepared. The total phenolic content of the extracts was determined using Folin-Ciocalteu reagent and expressed as gallic acid equivalent. The obtained values varied between 142.04 mg GAE and 282.91 mg GAE. The concentration of flavonoids was determined using AlCl₃ and expressed as rutin equivalent. The obtained values ranged between 55.66 mg RuE and 90.48 mg RuE. The highest phenolic content was found in the plants collected from the mountain areas (Bulgaria, Serbia, Bosnia and Herzegovina) and somewhat lower content was found in plants from Mediterranean localities (Montenegro, Croatia). The lowest level was found in the extracts obtained from the cultivated plant (Greece). The highest concentration of flavonoids was found in the plants from Mediterranean localities (Croatia, Montenegro), while the levels were lower in the other samples and ranged between 50 and 70 mg Ru/mL. On the basis of comparative analysis, the plant collected at High Athens, Panepistimiou Site, was found to be richer in total phenolics, while higher concentration of flavonoids was found in T. chamaedrys from Mediterranean localities. A cultivar of T. chamaedrys had lower concentration of phenolics in comparison with natural populations. The results obtained in the analysis point out that the concentration of phenolics depend on the ecological properties of the plant habitats. Acknowledgement: Ministry of Science and Education, Republic of Serbia (II410110)

Phytochemical and pharmacological studies of Ficus auriculata Lour. (Family Moraceae) cultivated in Egypt
Ali Fathy, A*, Zayed R, Affif S. 1Department of Pharmacognosy, Faculty of Pharmacy, Cairo University, Cairo, Egypt; 2Department of Pharmacognosy, Faculty of Pharmacy, Sinai University, 55441 North Sinai, Egypt

This study scientifically examined the phytochemistry, antibacterial and anti-inflammatory potencies of two extracts of Ficus auriculata Lour. Eight known compounds, including: betulinic acid, lupeol, stigmastanol, bergapten, scopoletin, β-sitosterol-3-O-D-glucopyranoside, myricetin and quercetin-3-O-D-glucopyranoside were isolated from the petroleum ether, chloroform and ethyl acetate fractions of alcoholic extracts of the leaves and fruits of Ficus auriculata. The structures of these compounds were elucidated on the basis of various spectroscopic methods. This is the first report on compounds separation from Ficus auriculata (Moraceae). Concerning the biological studies, the results revealed that both extracts were effective against gram + ve bacteria (Staphylococcus aureus) and gram – ve bacteria (Escherichia coli) by agar well diffusion method. However, ethanolic extract of leaves exhibited greater antibacterial activity than the ethanolic extract of fruits. Meanwhile, the ethanolic extract of leaves at dose of 500 mg/kg exhibited significant anti-inflammatory effect using carrageenan-induced rat hind paw oedema model. Keywords: Ficus auriculata, Moraceae, antibacterial activity, anti-inflammatory.

Moringa oleifera-treated dry season-turbid Well-water in Enugu Metropolis, Nigeria: A comparative evaluation
Nnamani OP, Onufo CF, Attam AA, Inya Agha SP, Ibehet CE. 1Drug Delivery Research Unit, Environmental Research Unit, Department of Pharmacology, Faculty of Pharmaceutical Sciences, University of Nigeria, Nsukka 410001, Enugu State, Nigeria; 2Department of Pharmacognosy and Environmental Medicine, University of Nigeria, Nsukka 410001, Enugu State, Nigeria.

Water and sanitation services provide a cost-effective solution for alleviating the impact of water-borne diseases. Polluted water is gateway to infectious pathogens leading to both acute and chronic-diseases worldwide. With the ultimate objective of contributing to the improvement of the quality control of drinking water, we report here, the main application of Moringa oleifera Lam. seed extract in the treatment of 25 natural underground well-water samples randomly collected from the three most populous cities in Enugu Metropolis, in southeastern Nigeria. The assessed parameters were salinity, pH, conductivity, total dissolved solid (TDS), total solids (TS), total suspended solids (TSS), turbidity and microbial load before and post-treatment with both alum (as a standard agent) and M. oleifera aqueous and ethanolic extracts at equal concentrations of 60 mg/L. The result of the finding showed the ability of M. oleifera seed extract to remove organic matter (natural humic substances and micropollutants) thereby avoiding water degradation (mainly bad odours and taste, formation of disinfection by-products such as trihalomethanes) and in addition to having a potent antimicrobial activity which alum naturally lacked. The ethanolic extract of M. oleifera had broader spectrum of antibacterial activity than aqueous extract. The alum-treated water samples showed increased salinity and pH in addition to other by-products. From the foregoing, the use of M. oleifera aqueous and ethanolic seed extracts as alternative biocompatible flocculants in water treatment in Enugu Metropolis could be recommended. Acknowledgement: This work is a product of research for a Fellowship award of Nigerian Institute of Science Laboratory Technology (NISLET).

The effect of Salvia virgata on GSH-Px Activities of HepG2 cells.
Yerer Ayhan M*, Seker Karatoprak C, Aslan C, Inanir M, Kösar M. 1Department of Pharmacology, Faculty of Pharmacy, University of Erciyes, Kayseri, Turkey; 2Department of Pharmacognosy, Faculty of Pharmacy, Erciyes University, Kayseri, Turkey; 3Department of Biochemistry, Faculty of Pharmacy, University of Erciyes, Kayseri, Turkey.

Turkey is an important country for Salvia species. The flora of Turkey includes 88 species of the genus Salvia. Salvia virgata Jacq, which has shown to be extremely rich with the phenolic compounds that allows this species to be an important member of antioxidant plants. This study was performed to investigate the effect of different Salvia extracts on GSH-Px activities of HepG2 hepatocarcinoma cells. The 70% methanol and water extracts were prepared from the aerial parts of S. virgata collected from Bursa, Turkey. Gallic acid and rosmarinic acid were used as positive controls. The cells at a number of 2 x 10⁶ cells per well were incubated for 24 h with the extracts and the positive controls under 5% CO₂ at 37°C. The GSH-Px activities of the cells were then analysed spectrophotometrically via a multifunctional microplate reader. Phenolics rich extract of s. gallic acid and rosmarinic acid activity more than water extract and control, the extract where the effect was just in between the rosmarinic acid and gallic acid positive controls. These results reveal that both extracts mostly the phenolics rich extract of s. gallic acid supports the antioxidant activity in the hepatocarcinoma cell line and these results confirm that it can further effect the glutathione reserves of these cells. This preliminary results needs to be further investigated over the GSSG, GSH and total glutathione and selenium levels. Keywords: Salvia Virgata, HepG2, GSH-Px antioxidant References: 1. Kösar M, Göker F, Baser KHC (2008) J Agric Food Chem 56(7):2369 – 74 2. Tösün M, Erçilsi S, Sengül M, Özener H, Polat T, Oztürk E (2009) Biol Res 42(2):175 – 81 3. Tepe B (2008) Biosens Bioelectron Technol 99(6):1584 – 8