



GENERAL NEWS

Battling the imposter monster (Wiley, September 2014)

This essay was a runner up from the essay contest for our UK-based Wiley Advisors on “*The challenges and opportunities facing early career researchers (ECRs) in building an international reputation in the 21st Century*”. ... [Read more](#). For those of you wanting to know more about promoting your research through online forums such as blogs, here is another useful link entitled “*How to promote your research through blogging*”.... [Read more](#).

The cost of misconduct (Nature, August 2014)

This report details the supposedly meagre costs of scientific misconduct has set off an online discussion about the real toll of shoddy science. Academics are also talking about a study on a subject that many know all too well: the hardships of life off the tenure track. This paper attracted some traction on social media and is based on data from Altmetric.com. Altmetric is supported by Macmillan Science and Education, which owns Nature Publishing Group.... [Read more](#).

Ebola virus disease in West Africa – an unprecedented outbreak (SAMJ, August 2014)

This editorial piece outlines the current outbreak of the deadly Ebola virus affecting West Africa....[Read more](#). Here are other links to active research underway in identifying appropriate therapeutic interventions...[Link1](#), [Link 2](#), [Link 3](#).

How do you build trust with communities involved in your research? (SciDevNet, September 2014)

Are you are about to embark on a research project in a developing country? Perhaps you're conducting a clinical trial, figuring out the best way to set up a development project, or enlisting farmers to test improved seeds or other new technologies. How do you build trust with communities involved in your research? Obidimma Ezezika shares tips and experience”.... [Read more](#).

CONFERENCES

22 - 26 October 2014

[4th ASM Conference on Beneficial Microbes](#). Venue: San Antonio, Texas, USA

10 - 14 November 2014

[EMBL-EBI-Wellcome Trust workshop on Proteomics Bioinformatics](#). Venue: Cambridge, United Kingdom

1 - 3 December 2014

[2nd International Conference on Agricultural and Food Engineering](#). Venue: Kuala Lumpur, Malaysia

6 - 7 December 2014

[International Symposium on New Tools in Chemical Biology](#). Venue: Beijing, China

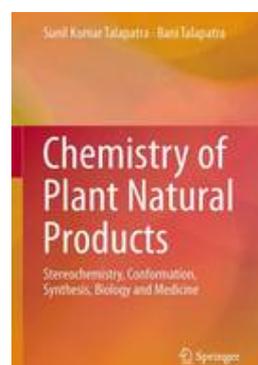
7 - 12 December 2014

[raci National Congress](#). Venue: Adelaide, Australia

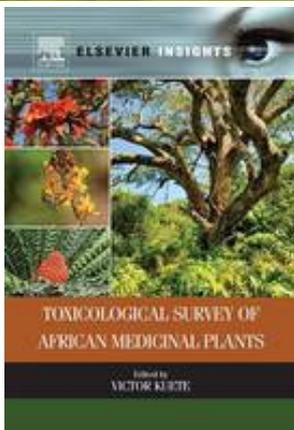
RECENTLY PUBLISHED BOOKS

Chemistry of Plant Natural Products: Stereochemistry, Conformation, Synthesis, Biology and Medicine

Published: August 2014



This book is aimed at advanced undergraduate and graduate students and researchers working with natural products, Professors Sunil and Bani Talapatra provide a highly accessible compilation describing all aspects of plant natural products. Beginning with a general introduction to set the context, the authors then go on to carefully detail nomenclature, occurrence, isolation, detection, structure elucidation (by both degradation and spectroscopic techniques) stereochemistry, conformation, synthesis, biosynthesis, biological activity and commercial applications of the most important natural products of plant origin. Each chapter also includes detailed references (with titles) and a list of recommended books for additional study making this outstanding treatise a useful resource for teachers of chemistry and researchers working in universities, research institutes and industry.



Toxicological Survey of African Medicinal Plants

Published: July 2014

This book written by Victor Kuete presents a compilation of data on a toxicological survey of medicinal African plants and a critical review of both the methods used and investigated parameters in that survey.

SABINA NEWS BITES

SABINA Annual meeting 2014



We are pleased to announce that the annual meeting will be held during the 27th-30th October 2014 at the White Sands Hotel in Dar es Salaam, Tanzania. Thank you to all of those who have responded. We will soon begin preparations and kindly request that you respond to communications regarding the meeting timeously. Further information regarding the event will be circulated shortly.

SABINA network members: Dr Benjamin Kumwenda , Prof Oleg Reva and Prof Derek Litthauer publish research findings on industrially important *Thermus* species



From left to right: Dr Benjamin Kumwenda, Prof Oleg Reva and Prof. Derek Litthauer.

Dr Benjamin Kumwenda, Prof Oleg Reva and Prof Derek Litthauer published an article entitled: Analysis of genomic rearrangements, horizontal gene transfer and role of plasmids in the evolution of industrial important *Thermus* species. The article was published in BMC Genomics in September 2014. A synopsis of the paper can be found below.

Background

Bacteria of genus *Thermus* inhabit both man-made and natural thermal environments. Several *Thermus* species have shown biotechnological potential such as reduction of heavy metals which is essential for eradication of heavy metal pollution; removing of organic contaminants in water; opening clogged pipes, controlling global warming among many others. Enzymes from thermophilic bacteria have exhibited higher activity and stability than synthetic or enzymes from mesophilic organisms.

Results

Using *Meiothermus silvanus* DSM 9946 as a reference genome, high levels of coordinated rearrangements has been observed in extremely thermophilic *Thermus* that may imply existence of yet unknown evolutionary forces controlling adaptive re-organization of whole genomes of thermo-extremophiles. However, no remarkable differences were observed across species on distribution of functionally related genes on the chromosome suggesting constraints imposed by metabolic networks. The metabolic network exhibit evolutionary pressures similar to levels of rearrangements as measured by the cross-clustering index. Using stratigraphic analysis of donor-recipient, intensive gene exchanges were observed from *Meiothermus* species and some unknown sources to *Thermus* species confirming a well established DNA uptake mechanism as previously proposed.

Conclusion

Global genome rearrangements were found to play an important role in the evolution of *Thermus* bacteria at both genomic and metabolic network levels. Relatively higher level of rearrangements was observed in extremely thermophilic *Thermus* strains in comparison to the thermo-tolerant *Thermus scotoductus*. Rearrangements did not significantly disrupt operons and functionally related genes. *Thermus* species appeared to have a developed capability for acquiring DNA through horizontal gene transfer as shown by the donor-recipient stratigraphic analysis.

[Link to full article](#)

Getting to know the new SABINA members

This month we start a new series of interviews focused on getting to know the new network members. Jessika Samuels was appointed as the Project Manager for SABINA phase III on the 1st of September 2014. Jessika is responsible for managing the SABINA project which includes project administration, compilation of the VRE newsletter and VRE administration and facilitation. Jessika can be reached at Jessika.Samuels@up.ac.za, +2712 420 6008.



Where are you from?

I was born and raised in Durban– KZN. Durban is located on the east coast of South Africa. It is warm and sunny all year round and has beautiful beaches. I moved to Pretoria approximately four years ago.

What did you study, and why?

I studied an undergrad degree in Molecular and Cellular Biology at the University of KwaZulu-Natal (UKZN). I loved the subject matter so much that I decided to register for an Honours degree and subsequently a Masters degree, both at UKZN. My postgraduate studies focused on identifying molecular makers of stress in abalone that are commercially farmed in Cape Town. The project drew on many biotechnology-based techniques which I used to evaluate cellular stress. Studying biology was a natural choice for me, I always wanted to know why and how everything worked, more especially biological processes. During my studies I became even more fascinated with newer technologies such as cloning, stem cells, gene editing and how these technologies can be used to develop therapeutics. While I am currently not actively engaged in research I stay up to date on trends and new findings by reading science news blogs and journals.

What interests you about working on the VRE & SABINA?

I am deeply interested in promoting and fostering collaboration and I am looking forward to interacting with all SABINA members and furthering the collaborative culture of the network. Furthermore I am excited about working with the SABINA staff and students on collaborative fundraising for future projects in the network.

There has been a global shift towards the use of research portals/VRE's for larger collaborative projects. Funders and network members alike have a safe a secure environment where project data can be stored, exchanged and reviewed. This makes working on larger data sets and projects possible in real time and across many different countries. I am looking forward to working on the VRE and ensuring that the necessary tools and functions are available to compliment the activities across the diverse projects within SABINA. In addition I believe that the VRE is an excellent platform for communication, co-operation, transparency and collaboration.

Blogging and social media are also changing the way in which science is communicated. The blogging and social functionalities on the VRE will make it possible for all SABINA members to experiment and adapt to these changing times. Overall, I see the VRE as an exciting, useful and nurturing environment where all SABINA members can freely interact, source information and manage their individual projects.

SIG-RISE visit to Pretoria and Johannesburg, September 2014

Sarah Rich (Programme Associate) and Alan Anderson (Editorial Consultant) recently visited SABINA staff and students at the University of Pretoria and the University of the Witwatersrand, to discuss their research projects and experiences. SABINA supervisors (Prof Charles de Koning, Dr Dalu Mancama, Dr Vinesh Maharaj and Prof Zeno Apostilides) and SABINA students (Ms Jean Dam, Mr Jimmy Sumani, Mr Kennedy Ngwira, Ms Liberata Mwita, Ms Pelly Malebe and Mr Tinotenda Shoko) participated in the visit. In addition they visited our sister networks SSAWRN (Sub-Saharan Africa Water Resources Network) and AMSEN (African Materials Science and Engineering Network).

Here are some of the pictures that Sarah Rich took of the SABINA members during the visit.



Above: Mr Kennedy Ngwira



Above: Mr Jimmy Sumani



Above: Ms Liberata Mwita



Above: Ms Jean Dam



Above: Prof Charles de Koning



Above: Ms Pelly Malebe

JOURNAL ARTICLES

Are plants used for skin care in South Africa fully explored?

N Lall, N Kishore, *Journal of Ethnopharmacology*, 153(1), 61-84, 2014

South Africa is an important focal point of botanical diversity, and although many plant species have been used since ancient times in ethnomedicine, only a few species have hitherto been fully investigated scientifically. A large proportion of the South African population use traditional medicines for their physical and psychological health needs. Many medicinal plants have recently gained popularity as ingredient in cosmetic formulations based on their ethnomedicinal values and many cosmetic products sold in stores are of natural origin. The present review discusses the ethnopharmacological values, pharmacological and toxicological evidence of 117 plant species grown in South Africa, which are used traditionally for skin care purposes. Special focus was on their traditional use for many skin disorders in order to identify their therapeutic potential, the state of ethnopharmacological knowledge and special emphasis has been on areas which require further research.

In vitro antibacterial activity of essential plant oils against biofilm forming methicillin resistant *Staphylococcus aureus*

T Punitha, K Moorthy, R Vinodhini, P Vijayalakshmi, S Saranya, M Bhuvaneshwari, C Kanimozhi, *Asian Journal of Pharmaceutical and Clinical Research* 7(1), 220-225, 2014

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An alarming increase in biofilm forming methicillin-resistant *Staphylococcus aureus* (MRSA) possesses a serious problem in hospital environment demands a renewed effort to seek agents from natural system that are effective against pathogenic bacteria resistant to current antimicrobials. In the study, the distribution of biofilm forming MRSA and the antibacterial activity of essential oils (Eucalyptus, Mint, Turpentine, Neem and Amla) was studied in 58 strains of *S. aureus* isolated from pus samples. Out of 58 clinical samples 22 *S. aureus* were found to be methicillin-resistant and showed a dry black crystalline morphology indicating strong biofilm production and they were screened for the antibacterial activity of five different essential oils by using agar well diffusion method. The results from the agar well diffusion method showed that 4 essential oils could inhibit the growth of biofilm forming *S. aureus* isolates. Among those turpentine oil had strong inhibitory effects with a zone of inhibition ranging from 16.8 ± 1.77 mm to 32.0 ± 2.12 mm. Eucalyptus oil shown moderate antibacterial activity against all tested isolates and followed by mint and neem with the average zones of inhibition. The oils at all concentrations showed potent inhibitory activity against the tested *S. aureus* with the exception of amla oil where there were no reports of inhibition. It is known that essential oils are composed of numerous different chemical compounds and their antimicrobial activity might be attributed to several different mechanisms, which could explain the variations in their mode of action. However, more studies are required to find the compounds of essential oils responsible for their antimicrobial activity, since little is known about essential oils and their medicinal property.

Intriguing properties of the angucycline antibiotic auricin and complex regulation of its biosynthesis

J Kormanec, R Novakova, E Mingyar, L Feckova, *Applied Microbiology and Biotechnology*, 98(1), 45-60, 2014

44.95 USD

Streptomyces bacteria are major producers of bioactive natural products, including many antibiotics. We identified a gene cluster, *aur1*, in a large linear plasmid of *Streptomyces aureofaciens* CCM3239. The cluster is responsible for the production of a new angucycline polyketide antibiotic auricin. Several tailoring biosynthetic genes were scattered in rather distant *aur1* flanking regions. Auricin was produced in a very narrow growth phase interval of several hours after entry into stationary phase, after which it was degraded to non-active metabolites because of its instability at the high pH values reached after the production stage. Strict transcriptional regulation of the auricin biosynthetic gene cluster has been demonstrated, including feed-forward and feedback control by auricin intermediates via several of the huge number of regulatory genes present in the *aur1* cluster. The complex mechanism may ensure strict confinement of auricin production to a specific growth stage.

Chemo- and bioinformatics resources for *in silico* drug discovery from medicinal plants beyond their traditional use: a critical review

AA Lagunin, RK Goel, DY Gawande, P Pahwa, TA Glorizova, AV Dmitriev, SM Ivanov, AV Rudik, VI Konova, PV Pogodin, DS Druzhilovsky, VV Poroikov, *Natural Product Reports*, Advance Article, 10.1039/C4NP00068D, 2014

36 GBP

In silico approaches have been widely recognised to be useful for drug discovery. Here, we consider the significance of available databases of medicinal plants and chemo- and bioinformatics tools for *in silico* drug discovery beyond the traditional use of folk medicines. This review contains a practical example of the application of combined chemo- and bioinformatics methods to study pleiotropic therapeutic effects (known and novel) of 50 medicinal plants from Traditional Indian Medicine.

High-level antimicrobial efficacy of representative mediterranean natural plant extracts against oral microorganisms

L Karygianni, M Cecere, A L Skaltsounis, A Argyropoulou, E Hellwig, N Aliannis, A Wittmer, A Al-Ahmad, *BioMed Research International*, Article ID 839019, 2014

Nature is an unexplored reservoir of novel phytopharmaceuticals. Since biofilm-related oral diseases often correlate with antibiotic resistance, plant-derived antimicrobial agents could enhance existing treatment options. Therefore, the rationale of the present report was to examine the antimicrobial impact of Mediterranean natural extracts on oral microorganisms. Five different extracts from *Olea europaea*, mastic gum, and *Inula viscosa* were tested against ten bacteria and one *Candida albicans* strain. The extraction protocols were conducted according to established experimental procedures. Two antimicrobial assays—the minimum inhibitory concentration (MIC) assay and the minimum bactericidal concentration (MBC) assay—were applied. The screened extracts were found to be active against each of the tested microorganisms. *O. europaea* presented MIC and MBC ranges of 0.07–10.00 mg mL⁻¹ and 0.60–10.00 mg mL⁻¹, respectively. The mean MBC values for mastic gum and *I. viscosa* were 0.07–10.00 mg mL⁻¹ and 0.15–10.00 mg mL⁻¹, respectively. Extracts were less effective against *C. albicans* and exerted bactericidal effects at a concentration range of 0.07–5.00 mg mL⁻¹ on strict anaerobic bacteria (*Porphyromonas gingivalis*, *Prevotella intermedia*, *Fusobacterium nucleatum*, and *Parvimonas micra*). Ethyl acetate *I. viscosa* extract and total mastic extract showed considerable antimicrobial activity against oral microorganisms and could therefore be considered as alternative natural anti-infectious agents.

Comparison of *Artemisia annua* bioactivities between traditional medicine and chemical extracts

A Nageeb, A Al-Tawashi, AHM Emwas, Z Talla, N Al-Rifai, *Current Bioactive Compounds*, 9 (4), 324-332, 2013

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The present work investigates the efficacy of using *Artemisia annua* in traditional medicine in comparison with chemical extracts of its bioactive molecules. In addition, the effects of location (Egypt and Jericho) on the bioactivities of the plant were investigated. The results showed that water extracts of *Artemisia annua* from Jericho have stronger antibacterial activities than organic solvent extracts. In contrast, water and organic solvent extracts of the *Artemisia annua* from Egypt do not have anti-bacterial activity. Furthermore, while the methanol extract of EA displayed high anticancer affects, the water extract of Egypt and the extracts of Jericho did not show significant anticancer activity. Finally, the results showed that the methanol and water extracts of Jericho had the highest antioxidant activity, while the extracts of Egypt had none. The current results validate the scientific bases for the use of *Artemisia annua* in traditional medicine. In addition, our results suggest that the collection location of the *Artemisia annua* has an effect on its chemical composition and bioactivities.

Synthesis and biological evaluation of imidazo[1,2-a]pyrimidines and imidazo[1,2-a]pyridines as new inhibitors of the Wnt/ β -catenin signaling

B Cosimelli, S Laneri, C Ostacolo, A Sacchi, E Severi, E Porcù, E Rampazzo, E Moro, G Basso, G Viola, *European Journal of Medicinal Chemistry*, 83, 45-56, 2014 35.95 USD

Wnt/ β -catenin signaling plays an important role in the regulation of embryonic development and tumorigenesis. Since its deregulation results in severe human diseases, especially cancer, the Wnt signaling pathway constitutes a promising platform for pharmacological targeting of cancer. In this study we synthesized a series of imidazo[1,2-a]pyrimidines and imidazo[1,2-a]pyridines and identified some derivatives that were able to inhibit the Wnt/ β -catenin signaling pathway in a luciferase reporter assay and cell proliferation in selected cancer cell lines, endowed with APC or β -catenin gene mutations. The most active compounds significantly down-regulate the expression of Wnt target genes such as c-myc and cyclin D1. Further studies indicated that these compounds function independently of GSK-3 β activity. More importantly, *in vivo* experiments, carried out on a Wnt-reporter zebra fish model indicate, in particular for compounds 4c and 4i as the most active compounds, an activity comparable to that of the reference compound IWR1, suggesting their potential use not only as small molecule inhibitors of the Wnt/ β -catenin signal in Wnt driven cancers, but also in other Wnt-related diseases.