Happy New Year!

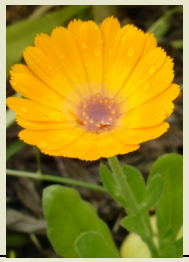
December 22nd, 2014

Herbal Analysis Reporter

HERBAL ANALYSIS SERVICES

SPECIAL THANK YOU:

- EPSRC UK NATIONAL MASS SPECTROMETRY FACILITY
- OUR COLLABORATORS
- OUR WORLD-WIDE FOLLOWERS



INSIDE THIS ISSUE:

SPECIAL THANK YOU

EPSRC Mass Spectrometry Facility: For natural products identification, a reliable mass spectrometry service is an absolute necessity. For the past few months, we have been exclusively reliant on external colleagues who kindly gave us unfettered access to their resources. We are particularly grateful to our access to the state-of-the-art equipment and services provided by the EPSRC UK National Mass Spectrometry Facility. The data were simply second to none.

Our Collaborators: It is a blessing to have colleagues far away form you and yet able to make your research and scientific contribution so meaningful. The list is so big but we wish to thank the very few who did support us most this year:

India— Professor George Varghese of Kerala.

Ghana— Professors T.C. Fletcher and Abraham Mensah & their groups, Kumasi.

Cameron— Professor David Tsala and his group, Maroua.

Iran— Professor Mohamed Nabavi and his group, Tehran.

Italy— Professor Giovanni Lentini of Bari.

Spain— Professor F. Parra and Dr Angel Alvarez, Oviedo.

UK— Professor Derek Tocher, UCL, London.

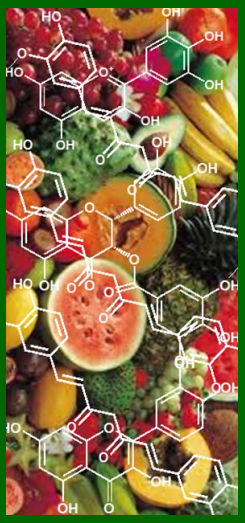
Our Followers: This year, our website was visited by 368,233 people and only a tiny fraction of these were from the United Kingdom. We are aware that most of our visitors are people involved in plant medicine research, professionals and the public who have passion for drugs coming from natural sources. We thank all who visited our resources and news and particularly grateful to those who gave us feedback.

EBOLA INSIGHT INTO ITS THERAPY

Ebola was discovered decades ago and yet the world seems to be totally unprepared for it. Even the realization of the disease as a global significance appears to be noted in the West very late. In the affected countries with limited resources and no vaccination/drug to treat the disease, the sheer panic and hopelessness is evident. But now the debate is heating up both on possible ways of vaccine development and drug discovery strategies. Our recent commentaries on repurposing old drugs for Ebola therapy is published in International Journal of Cardiology. The significance of plant medicines as a source of new drugs should not also be underestimated and our commentary on this will appear in Phytotherapy Research In the next few days.

The role of natural antioxidants in health and disease

In the past few years, We, among others, have shown the pivotal role of reactive oxygen species in the pathogenesis of various diseases such as diabetes and cardiovascular disorders. Thus, natural antioxidant undoubtedly have therapeutic potential for many diseases. Our publication in Current Pharmaceutical Biotechnology has provided a comprehensive assessment of the dietary polyphenols' potential for diabetes. The liver protective potential of a major dietary polyphenol, curcumin, under various disease states is also presented in the journal of Comprehensive Reviews in Food Science and Food safety. Another group of antioxidants, anthocyanins, were assessed for their potential role in treating diabetes retinopathy and our work published in Current Medicinal Chemistry. One other work of major significance this year was our data showing the human miR-17-3P as a potential target for our polyphenol prototype drugs (Molecular Nutrition & Food Research). We continue running a range of antioxidant assays with the hope that we will pick up a multifunctional biologically active drug candidate. This doesn't necessarily mean to discover large, complex, rare or even novel molecules.



"Diabetes with its associated diseases will be the major global epidemic of the 21st century . Sadly, we are not doing enough to control it."

Medicinal Plants and diabetes

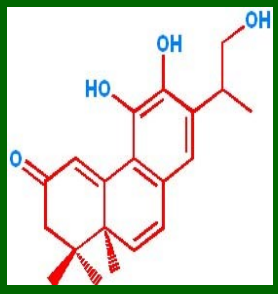
Our strategy has been to screen medicinal plants for various targets including digestive enzymes and identify multifunctional compounds that target multiple diseases. In the past few years, we have demonstrated this by isolating promising compounds from Asian antidiabetic herbal drugs.

One classical example from our studies this year is that on Maringa. Both the Indian and African *Moringa species* are extensively used for treating diabetes but relatively little work has been done on the African species.

Our comprehensive phytopharmacology study on this plant along with literature review will be published this week (more update to follow). The *African* Moringa trade for medicinal uses is now among the fastest growing in the continent and elsewhere. Such studies are therefore of significant importance both to the plant traders and the public at large. We have so many other examples both from *in vitro* and *in vivo* studies.....

Medicinal Plants and Cancer

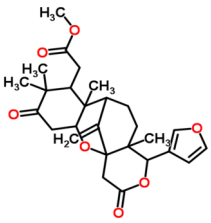
Our routine screening of medicinal plants for antiproliferative effects in cancer cells for the past 22 years have identified so many small molecular weight hits. One class of compounds that we found interesting are diterpenes extracted from African *Premna* species. Interestingly, *Premna* species of the Indian subcontinent are also rich sources of diterpenes and our journey in the search of these compounds recently brought us face-to-face with the unique flora of Kerala, India. Our effort in this area was rewarded this year when we identified a novel compound based on a totally new class of diterpenes (right). The finding of this novel compound with *in vitro* anticancer and antioxidant effects demonstrates the merit of continued search for unusual multifunctional drugs of natural origin. Our published work is available in >>>> Phytotherapy Research



MEDICINAL PLANTS & INFLAMMATION

Apart from chronic inflammatory diseases, such as arthritis, almost every disease has an inflammatory component and the search for novel therapeutic agent in this field is just as significant as it has ever been. We have various approaches and targets and, for many years, we employed *in vitro* assays as primary screening tools and only use *in vivo* models for promising hits.

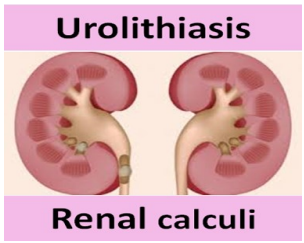
One of the plants that we looked at this year however defies this principled approach as the popular West African anti-inflammatory herbal drug was already assessed *in vivo* by our Ghanaian collaborators. The Group utilizes a rare animal model in chicks which is shown to be similar with the commonly used rodents model. We have isolated the active principle (right) which was characterized by a range of spectroscopic methods including X-Ray crystallography. The published article is available in Phytotherapy Research. In this example, we are moving from *in vivo* to *in vitro* assays to establish mechanism of actions.



We do also have several other examples and an iconic €10 million FP7 European-wide project on micro algae. Here, we are searching for novel anti-inflammatory and other pharmacologically active agents from several algae species grown at an industrial scale.

OTHER THERAPEUTIC TARGETS

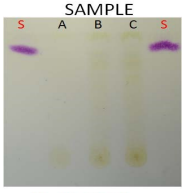
We have had numerous other projects undertaken during the year. Among these were our continued interest in kidney diseases and renal protection studies. Our published work (Link) on urolithiasis illustrates how traditional medicines could be used as a therapy for this disease. In addition to *in vitro* models of wound healing, our animal studies have also shown promising effect for a number of medicinal plants. In a classical example, the wound healing effect of the African medicinal plant (right) is demonstrated (Link). We have also completed several projects on ant-herpes activity studies; scrutinized various papers published in the literature (Link), etc.....



"There are still lots of molecular secrets of plant medicines that we ought to reveal"

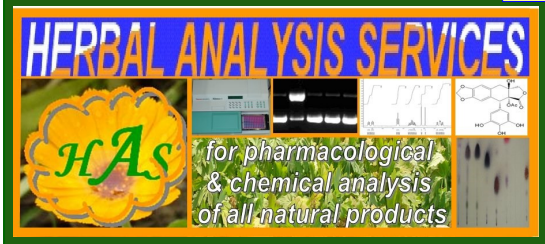
OUR CONSULTANCY ON HERBAL MEDICINES STANDARDIZATION

We are employing our knowledge, expertise and instrument to assist people in establishing the quality, safety and efficacy of their herbal drugs. Our greatest strength has been on standardizing plant products through finger-print analysis and determination of active ingredients. **Of the various services that we provided to external customers were quality control assays of numerous plant-based antidiabetic drugs, active ingredient analysis of banana leaves, forskolin plant, sunflower heads, Artemisia, essential oils, etc.** In each case, we advise clients whether their products are worthy as drugs or matches their claimed specifications. We are looking forward to receive requests for more of this work either as research collaborations or constancy service provision. The picture on the right shows three products (A-C) which were claimed to contain the reference drug (S). Can you imagine people taking these drugs as medicines? We validate our results with a range of assays including HPLC (right).



S = Standard

www.herbalanalysis.co.uk



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...for establishing the quality, safety, efficacy and active ingredients of natural medicines...

Herbal Analysis Services is founded & exclusively owned by Dr. Solomon Habtemariam. Its mission is three-fold: to discover novel drugs from natural sources; employ phytochemical and pharmacological assays to standardize plant medicines; and provide expert advice and services on the subject area. The website also provides resources and news on our progress both on modernization of herbal medicines and the discovery of novel pharmacologically active compounds. Dr Habtemariam has published over hundred papers in peer review journals and regularly hosts experts from all over the world who come for research visits and trainings.

We welcome all requests on natural medicine researches and businesses.

GROWING MEDICINAL PLANTS

If we travel thousands of miles to get them, why not grow them as well? The phytochemical contents of plants vary depending on hosts of environmental conditions, and having them analyzed by growing them in a controlled environment makes sense.

Our collections range from medicinal plants of India and Africa to common European herbs, spices and culinary plants. The picture below is a photograph taken last week of the *Ensete ventricosum* growing in our greenhouse.

With one year old Ensete

Above is a Picture of Aloe vera

We have been using these plants as standards for quality control analysis of *Aloe vera* gels, juices and other products in the market.

The picture above is an African Moringa growing in a greenhouse and below is the common Rue.

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