Natural Products Chemistry & Research

Kerwin Sean, Nat Prod Chem Res 2017, 5:2
DOI: 10.4172/2329-6836.1000e120

Editor's Note OMICS International

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Received: March 15, 2017; **Accepted:** March 17, 2017; **Published**: March 21, 2017

Editor's note

From the ancient past of human history, plant products were known to provide the first line of defense for all physical and mental anomalies. With advancement of scientific understanding, researchers have highlighted the chemical nature of various plant natural products and also established some of these compounds to be therapeutic against a variety of diseases. From this beginning, new avenues in the research of natural products have opened up, leading to a renewed interest in detailed chemical investigations of natural products with as-yet unknown functional benefits. Natural Products Chemistry & Research is an interdisciplinary scholarly journal that publishes research developments related to the identification, structural and functional characterization of natural products. The journal specifically emphasizes the publication of scientific manuscripts that highlight the possible application of natural products in all aspects of the biomedical sciences.

The current issue of the journal presents an array of research articles that demonstrate this broad scope. The work presented ranges from pharmacological activities of isolated plant compounds as well as root extracts, antimicrobial properties of endophytic fungi and plants, the preparative separation of an alkaloid from a medicinal plant, as well as a review article on the application of plant derived flavonoids in drug development.

Cyclooxygenase (COX) has been identified as the prime target for the functioning of most pain killer and anti-inflammatory drugs. Researchers are still screening for hitherto unidentified natural compounds that possess higher COX inhibitory activities. Identification and pharmaceutical application of such drugs will help in the development of novel and more efficient drugs. The article published by Beer et al. [1], presented the results of a similar study. The authors studied the anti-inflammatory effects of 1,8cineole (eucalyptol) by elucidating its effects on cyclooxygenase and its isoforms (COX1 and COX2). Furthermore, they also compared the effects of 1,8cineole (eucalyptol) with that of indomethacin and celecoxib. As per the results shown in the published article, 1,8cineole is 10 times more efficient than indomethacin in blocking cyclooxygenase and its isoforms (COX1 and COX2). The information presented in the article may help in the furtherance of research and pharmaceutical application of 1,8cineole (eucalyptol).

Ethnobotanical application of many plant based products in the treatment of pain and other inflammatory diseases has been known since the earliest recorded history. While some of those plant species have been extensively studied and their therapeutic role substantiated on the basis of scientific evidences, many others are yet to be elucidated. The article published by Koech et al. [2], presented the analysis of one such ethnobotanical plant, namely, Clutia abyssinica. The plant has been used as a herbal medicine by the Kallenjin community since ages, but the scientific basis of its healing and pain relieving properties are yet to be elucidated. The authors of the said article made a commendable effort towards studying the medicinal use of the dichloromethanolic root extract of *C. abyssinica* as an analgesic on animal models (Swiss albino mice). The results obtained from the physiological analyses of the experimental mice models as well as biochemical analyses of the plant extract indicated that the *C. abyssinica* extract possess analgesic activities at par with Diclofenac, a commonly used analgesic. On the one hand, the present study substantiated the traditional usage of *C. abyssinica* as an herbal medicine; on the other hand, it opened up the opportunities for the development of herbal analgesic formulation for commercial applications.

Another article that surveyed the existence of novel natural products with antimicrobial properties was published by Sreekanth et al. [3]. The authors implemented the de-replication strategy to discover thirteen strains of endophytic fungal strains with antimicrobial properties. The endophytic fungal strains identified belonged to the orders Pleosporales, Botryosphaeriales and Capnodiales (class Dothideomycetes). To further elucidate the antimicrobial potential of the fungal strains on a molecular level, the authors performed polyketide synthase (PKS) biosynthesis gene targeted degenerate PCR-based screening. The results obtained from this screening helped in the detection of 12 PKS gene fragments. The authors proposed that, the diversified existence of these PKS genes is an indication towards the possible application of these fungal strains in the development of novel biopharmaceutical compounds in future.

Multi-drug resistance development is one of the most crucial concerns in the biomedical and pharmaceutical industry. It not only reduces the therapeutic efficacy of the conventionally used antibiotic drugs, but also necessitates the identification and development newer and more effective ones. The article published by Ololade et al. [4], presented a study that investigated the antimicrobial potential of *E. maculata* leaf essential oil isolated from the eucalyptus trees in Nigeria, against multi-drug resistant gram-positive and gram-negative bacteria. The authors also analyzed the biochemical composition of the oil with the help of GC-MS. The results of these tests revealed that the oil is rich in ß-citronellol (18.5%), ß-pinene (9.4%), 2,6-dimethyl-2,6-octadiene (8.3%), alpha-pinene (7.1%), 2,6-dimethyl-1,3,5,7- octatetraene (6.7%), and citronellyl acetate and is highly efficient against most of the multi-drug resistant bacterial strains. The authors propose that the oil can be used as an alternative or supplemented antibiotic treatment against resistant strains that do not seem to respond to conventionally administered antibiotics.

Lappaconitine has already been identified as a potential analgesic. However, the research and development of standardized methods of its production is yet to be achieved. The issue published an article by Amatjan et al. that proposed the application of High speed counter-

current chromatography (HSCCC) method as a standardized method of lappaconitine production from Aconitum leucostmum Worosch. The results shown in the article indicate that immiscible solvent system (TISS) of chloroform- methanol-0.2 mol/L hydrochloric acid in the ratio of 4:1 and 5:2 are highly efficient in the production of 98% pure Lappaconitine from 250 mg of the crude alkaloid extract [5]. The article also indicated that the isolated portion was highly pure and suitable for further application in the pharmaceutical industry.

Apart from these research articles, the current issue also published a review article that presented a thorough and systematic review of plant based flavonoids. The review article specifically highlighted the potential roles of flavonoids in the form of remedial treatment measures as well as development of standardized pharmaceutical formulations [6]. The article also presented a brief yet insightful section on the application of bio-organic engineering for the synthetic production of plant based flavonoids for pharmaceutical applications.

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