

ABSTRACT

The term “Natural Product” refers to the secondary metabolites produced by an organism that are not strictly necessary for the survival of that organism. The most common secondary metabolites are alkaloids, flavonoids, terpenes, glycosides. Phyto chemistry is the study of natural products derived from plants and animals and involves their chemical structure characterization, biosynthesis and metabolism, their natural distribution and biological functions. The use of natural extracts in the treatment of illnesses and diseases dates back thousands of years to ancient China with the Traditional Chinese Medicines (TCM) (~3,000 BC), India with Ayurvedic medicine (~1,000-3,000 BC) and Egypt with the ancient Ebers papyrus and Kahun papyrus describing early Egyptian medicinal knowledge (~3,000 BC). Despite the increasing progress in development of synthetic medicinal substances by the pharmaceutical industries during the 20th century to the present day, it is estimated by the World Health Organization (WHO) that 75% of the world’s population still relies on traditional medicines for primary health care.

Eupatorium is a genus of flowering plants in the aster family, Asteraceae, containing from 36 to 60 species depending on the classification system. *Chromolaena odorata* is a rapidly growing perennial herb. It is a multi-stemmed shrub to 2.5 m (100 inches) tall in open areas. It is used as a traditional medicine in Indonesia. The young leaves are crushed, and the resulting liquid can be used to treat skin wounds. The leaves of the herb are used as tea to break up the common cold and for intermittent fevers and influenza. *Chromolaena odorata* (L.) extract has been used to stop bleeding and in wound healing in many tropical countries. Based on medicinal importance of this plant, the author intended to isolation of chemical constituents and evaluates their biological activities. The author isolated 21 compounds and evaluates their anti-oxidant activity, anti-inflammatory potential and antimicrobial activities. The present study revealed that 90 % methanol, 60 % methanol and Water extracts of *C. odorata* exhibited potent Superoxide, DPPH, FRAP inhibition activity. In addition, the compound **2.45** exhibited most potent Superoxide and FRAP inhibition activity, when compared to the positive control, vitamin C. Some of these compounds also exhibited potent anti-adipogenic activities, which may be partly responsible for the activity of the extract.

Sphaeranthus indicus is a flowering plant of the genus *Sphaeranthus*. It is distributed throughout India and has been studied for its potential health-promoting properties, primarily as an anti-inflammatory. *Sphaeranthus indicus* Linn. (Asteraceae) is widely used in Ayurvedic system of medicine in various conditions like epilepsy, mental illness, hemicrania, jaundice, hepatopathy, diabetes, leprosy, fever, pectoralgia, cough, gastropathy, hernia, hemorrhoids, helminthiasis, dyspepsia and skin diseases. Generally the 7-hydroxyfrullanolide belongs to eudesmanolide structure and isolated from *Sphaeranthus indicus*. *Sphaeranthus indicus* (Asteraceae) is a medicinally important plant used as folk medicine.

The author Isolated and characterised of new eudesmanolide, (11 α ,13-dihydro-7 α -hydroxyfrullanolide-13-yl)-adenine (**3.57**), from the flower heads of *Sphaeranthus indicus* are described. In addition, 5 α -hydroxyisosphaerantholide (**3.58**) and 11 α ,13-dihydro-eudesman-3,5,7-triene-6 α - 12-olide (**3.59**) are reported first time as a metabolite of *S. indicus* and as a natural product, respectively along with eight known compounds. The structures of these compounds were established from rigorous analysis of their high-resolution mass, IR, UV, ¹H NMR, ¹³C NMR and 2D NMR spectral data.

Annona squamosa, the sugar-apple, sweetsop, or sugar-pineapple, is a species in the Annonaceae family that is native to the tropical Americas. *Annona squamosa* contained acetogenins, which are having broad range of biological activities including cytotoxicity, anti-obesity, anti-inflammatory and anti-oxidant activity. The author selects the *Annona squamosa* and isolate twelve compounds from *Annona squamosa* leaf extract. The structures of the isolated compounds were elucidated using ¹HNMR, ¹³CNMR, mass spectral analysis. Among the isolated compounds one new compound, two are reported first time from the *Annona squamosa*. The isolated compounds were evaluated their anti-inflammatory and cytotoxicity using 5-LOX and BSLT in-vitro models respectively. The compound **4.77** exhibited potent 5-LOX inhibitory activity with IC₅₀ of 26.26 μ g/ml and showed strong cytotoxicity with ED₅₀ of 2.92 μ g/mL.

LIST OF PUBLICATIONS

1. Suryachandra Rao Ravada, **Lakshmareddy Emani**, Machi Raju Garaga, Trimurtulu Golakoti. Synthesis of Potent Cytotoxic Analogs of Boswellic Acids. *Archives of Natural and Medicinal Chemistry*, Received Date: 4 April, 2017; Accepted Date: 17 April, 2016; Published Date: 24 April, 2017.
2. **Lakshma Reddy Emani**, Suryachandra Rao Ravada, Machi Raju Garaga, Bharani Meka & Trimurtulu Golakoti, Four new Sesquiterpenoids from *Sphaeranthus indicus*, *Natural product research*, Pages 1-8 | Received 22 Dec 2016, Accepted 01 Apr 2017, Published online: 17 Apr 2017.
3. **Lakshmareddy Emani**, Suryachandrarao Ravada, Bharani Meka, Machi raju Garaga and Trimurtulu Golakoti. A New Flavanone from the Leaves of *Chromolaena odorata*. *Natural Product Communications*, 2015, 10 (9), 1555-1559.
4. Suryachandra R Ravada, **Lakshmareddy Emani**, Ganeswara R Mallula, Trimurtulu Golakoti. Synthesis and Biological Evaluation of Nonaprenylsulfates. *Natural product communications*, 2013, 8(11):1595-8
5. Suryachandra Rao Ravada, **Lakshma Reddy Emani**, Machi Raju Garaga, Bharani Meka and Trimurtulu Golakoti, Synthesis of Coenzyme Q10. *American Journal of Infectious Diseases* 5 (2): 83-89, 2009.