



**PROFILING OF BIOACTIVE COMPONENTS PRESENT IN *Ziziphus mauritiana* Lam FOR *IN-VITRO* ANTIOXIDANT AND *IN-VIVO* ANTI-INFLAMMATORY ACTIVITIES**

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Article Received on: 02/09/17 Approved for publication: 27/09/17

**DOI: 10.7897/2230-8407.089153**

**ABSTRACT**

The aim of the present study is to analyze the methanol extract of *Ziziphus mauritiana* Lam leaves for its chemical composition using gas chromatography – mass spectroscopy (GC- MS) analysis correlating *in-vitro* anti-oxidant, *in vivo*-anti-inflammatory activity and to determine the total phenolic & flavonoid contents. The processed plant material was extracted using methanol. Phytochemical profiling of the extract revealed presence of flavonoids, terpenoids, alkaloids and glycosides. The antioxidant activity of the extracts was determined using 2,2'-Diphenyl-1-picrylhydrazylhydrate (DPPH), 2,2'-azino bis-3-ethylbenzothiazoline-6 sulfonic acid (ABTS) and reducing power assay. Anti-inflammatory activity was evaluated by cotton pellet granuloma in wistar rat model. Twenty three phytoconstituents identified using GC-MS analysis out of that nine were familiar with earlier reports on its pharmacological background. The IC<sub>50</sub> values for the DPPH activity was 7.64µg, for ABTS activity 43.79 µg and for reducing power assay 26.35µg. The methanol extract of *Z. mauritiana* leaves showed a significant reduction ( $p < 0.001$ ) in the cotton pellet granuloma in a dose-dependent with a maximum that reaches at 500 mg/kg. Hence, flavonoids and phenolic compounds were associated with the antioxidant and anti-inflammatory activities observed for *Z. mauritiana*. The effect of the extract might be due to the presence of active phytomolecules such as n – hexadecanoic acid and L-(+)-ascorbic acid 2, 6-dihexadecanoate. From these results it was clearly evident that the phenolic and flavonoid compounds from *Z. mauritiana* leaves are responsible for anti-inflammatory and antioxidant activities.

**Keywords:** *Ziziphus. mauritiana*, anti-inflammatory, terpenoids, alkaloids glycosides & flavonoids.

**INTRODUCTION**

Drugs from natural origin play a significant role in the public health care system of the nation <sup>1</sup>. Plants are regarded as molecular factory, as they have capacity to synthesize enormous diversity of metabolites termed as bioactive compounds <sup>2</sup>. Plants contain a variety of phyto pharmaceuticals, which are found to possess important applications in the field of agriculture, human and veterinary medicine. Population raise, demand for drugs, increase in the cost of treatment, side effects of drugs and resistance formation of drugs are the main reasons that leads to pay more attention for plant based herbal medicines for a variety of human disorders <sup>3</sup>. It is quite interesting to notice that the developed countries primarily used modern medicines, but as a result of side effects of these drugs people turned their minds towards phyto medicines and medicinal plants in the recent era. Currently, traditional herbal medicine has been widely used not only in the developing countries but also in the industrialized world as an alternative <sup>4</sup>. Many scientists and researchers have compensated attention to the crude extracts and active pure compounds isolated from plants species used in herbal and traditional remedies <sup>5</sup>. Nearly about 80% of the world's populations still depend upon traditional remedies together with folklore system mainly based on phytotherapy. Its efficacy, safety, lesser cost-factor and almost nil adverse effects have attracted the attention of economically developed and developing countries. The ethno botanical use of medicinal plants was transmitted from generation to generation. Intake of edible medicinal plants as a source of diet has been increased in the recent era due to the presence of important health components <sup>6</sup>.

*Ziziphus mauritiana* Lam. is an evergreen shrub or trees distributed throughout low latitudes of warm, tropical and subtropical regions including Asia, Africa and Australia. The genus *Ziziphus* (Rhamnaceae) comprises of approximately 170 species and is importantly used in the treatment of various diseases. The ripe fruits of *Z. mauritiana* are mostly consumed raw and the leaves are cooked and eaten in Indonesia <sup>7</sup>. Hence, the present study was aimed to standardize and to identify the phyto-constituents present in the methanol extract of *Z. mauritiana* Lam leaves by GC-MS and to perform *in-vitro* antioxidant and *in-vivo* anti-inflammatory activities.

**MATERIALS AND METHODS**

**Chemicals**

Gallic acid was purchased from SD fine Chemicals, India. 2, 2'-Diphenyl-1-picrylhydrazylhydrate (DPPH) was purchased from Hi media. Folin-ciocalteu reagent, trichloroacetic acid, was purchased from Qualigens fine chemicals, India. 2, 2'-azino-bis (3-ethylbenzthiazoline-6-sulfonic acid (ABTS), N-(1-Naphthyl) ethylenediamine dihydrochloride and 5, 5-dimethyl-1-pyrroline-N-oxide (DMPO) were purchased from Sigma-Aldrich (St. Louis, MO, USA). Phosphoric acid and potassium ferricyanide were from Merck, USA. All chemicals and solvents used in this study were of analytical grade.