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ABSTRACT

Large numbers of natural plants play an important role in modern pharmaceutical industry. They serve as therapeutic agents and raw materials for the manufacturer of traditional and modern medicines. The investigation was carried out to determine the possible chemical components present in leaf extract of Elytraria acaulis using preliminary screening and GC-MS study. The phytochemicals such as, alkaloids (Fraction I), flavonoides (Fraction II, terpenoid I (Fraction III), terpenoid II (Fraction IV) and terpenoid III (Fraction V) isolated from E. acaulis crude extract (ethyl acetate). In GC-MS analysis, 8 bioactive phytochemical compounds were identified in leaf powder of Elytraria acaulis. The tested extract may possess a great potential for biological activity and can be a curative agent in therapeutic purposes.

INTRODUCTION

Plants have vast biological uses, especially as traditional medicine and pharmacopoeial drugs. Plants play a pivotal role in health care. According to World Health Organisation (WHO), 80% of the world’s population relies on traditional medicine, particularly plant drugs for primary health care. Natural products play a dominant role in the development of novel drug leads for the treatment and prevention of diseases (Iyengar, 1995; Evans, 2000; Cragg and Snadder, 2003). Plants are rich sources of bioactive compounds and thus serve as important raw material for drug production. The most important bioactive constituents of the plants are alkaloids, tannins, flavonoids and phenolic compounds (Ugochukwu et al., 2013; Hussain et al., 2012; Nigg and Seigier, 1992). These different active phytochemicals have been found to possess a wide range of activities, which may help in the protection against incurable diseases (Zou et al., 2005; Mbaebie et al., 2012; Harborne, 1998). The present investigation deals with extraction of essential biological active compounds from Elytraria acaulis using phytochemical screening and GC-MS analysis. This study will help to design the new drugs for many incurable diseases.

EXPERIMENTAL

MATERIALS

Preparation of plant extract

The plant material was shade dried in the laboratory for one week and then coarsely powdered. The leaf powder of the plant (500 g) was sequentially soaked in ethyl acetate for 96 h with intermittent shaking. The solution was filtered and the filtrate was concentrated under reduced pressure using rotary vacuum evaporator after 96 h. The crude extract thus obtained was stored in air tight glass vials and Petri dishes.

METHODS

Preliminary phytochemical screening

The testing of different phytochemicals (flavonoids, alkaloids, terpenoids, steroids, carotenoids, saponins, tannins etc) in the tested plant material was identified by standard procedures (Harborne, 1998). It gives general idea regarding the nature of constituents present in crude extract and their pharmacological activity.

GCMS analysis

The GC-MS analysis of Elytraria acaulis leaves extract with in absolute alcohol, was performed using a Clarus 500 Perkin

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Elmer gas chromatography equipped with a Elite-5 capillary column (5% phenyl 95% dimethyl polysiloxane) (30mm X 0.25mm ID X 0.25μmfd) and mass detector turbomass gold of the company which was operated in EI mode. Helium was the carriers gas at a flow rate of 1ml/min. and the injector was operated at 290°C and the oven temperature was programmed as follows; 50°C at 8°C/min to 200°C (5min) at 7°C/min to 290°C(10min).

Identification of components

Interpretation on mass spectrum of GC-MS was done using the database of National Institute Standard and Technology (NIST), WILEY8, FAME having more than 62,000 patterns. The mass spectrum of the unknown component was compared with the spectrum of the known components stored in the (NIST), WILEY8, FAME library. The name, molecular weight and structure of the components of the test materials were ascertained (Nezhadali et al., 2010; Sathyaprabha et al., 2012).

RESULTS AND DISCUSSION

Phytochemical screening

The phytochemicals such as, alkaloids (Fraction I), flavonoids (Fraction II), terpenoid I (Fraction III), terpenoid II (Fraction IV) and terpenoid III (Fraction V) isolated from E. acaulis crude extract using phytochemical screening.

GC-MS study

The chemical components of crude ethyl acetate extract of Elytraria acaulis were analyzed by GC-MS and shown in Figure 1. The spectroscopic study revealed eight compounds namely, Octacosane, Tricyclo[5.4.0.0(2,5).0(3,8).0(4,7)]Undeca-3,5,10-Trien-8-One, 1- Naphthalenol, 5,6,7,8-Tetrahydro-2,5-Dimethyl-8-(1-Methylethyl), Phytol Acetate, Dursban, 4-Imidazolidinone, 5-methyl-2-thioxo-9-Bromopentacyclo[4.4.0.(2,5).0(3,8).0(4,7)] decane, Thymoyl 1-thiocarboxylimidazolide.

CONCLUSION

The phytochemical screening of the ethyl acetate extract of Elytraria acaulis has helped to predict the compounds presents in it and is used to evaluate the pharmacological activity of the extract. The GCMS study showed the presence of eight compounds in the plant extract and it explains the importance of phytochemicals in pharmacological activity. The presence of various chemical compounds in Elytraria acaulis confirms the application of medicinal value and further plan of study includes isolation and purification of chemical compounds. These results suggest that the leaves of Elytraria acaulis can be probed further for effective and safer formulations in future.

References