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Cissus incisa: a potential source of therapeutic agents

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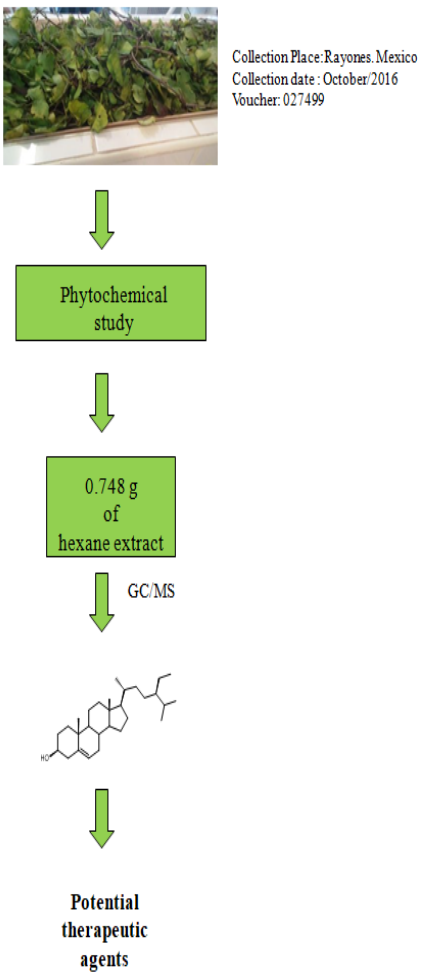
Graphical Abstract



Abstract.

Nature is an abundant source of drugs, however, it is estimated that only 5 to 15% of the approximately 250,000 species have been studied worldwide. Of the medicinal plants active ingredients of marked importance in the current investigation are obtained. This century has been characterized by the discovery and development of drugs based on an extensive exploration of natural products. There are several factors that enhance these studies: the increase in the withdrawal of drugs due to serious side effects, the increase in bacterial resistance, the resistance of tumor cells to current anticancer treatments, among others. That is why the pharmaceutical industry and researchers of any area are interested in finding new medicines from natural sources. Our objective is the study of *Cissus incisa* as a potential source of

therapeutic agents. As result of the HPLC analysis of the hexane extract, it is obtained that it contains interesting phytocompounds. These compounds are: phytol, β-Sitosterol, α-Amyrin, β-Amyrin and β-Amyrone. Which have previously been repotted biological properties as antimicrobial and anticancer.

Keywords: natural products; extracts, biological activity; *Cissus incisa*

Introduction

The research carried out from the natural product to the obtaining of pharmacotherapeutic agents, can be considered the most complete cycle of a plant originally used to treat various diseases. [1]Mexico has a rich culture in terms of the use of plants to treat diseases. However, it is estimated that less than two percent of the plants have been studied in terms of their phytochemical and pharmacological content. In this context, the study of medicinal plants as potential pharmacotherapeutic agents is of vital importance.[2]

Cissus incisa (Nutt.) Des Moul. Ex S. Watson, commonly known “hierba del buey”, is a plant native to the southern United States and adjacent parts of northern Mexico. It is fast growing, climbing, with attractive serrated green leaves. This plant flowers in summer and in autumn its fruits are blackish. In the traditional Mexican medicine, its leaves are used to treat skin infections, abscesses, and tumors.[3]With the study of *C. incisa* we will be able to contribute as much to the scientific knowledge of the Mexican flora, as well as of potential pharmacotherapeutic agents since until now, there are no reports of the chemical composition or of biological tests that endorse the traditional use of this plant.

Materials and Methods

Vegetal material. *Cissus Incisa* was collected in Rayones, Nuevo Leon, in October 2016 and identified by the biologist MC Mauricio Gonzalez Ferrara. A reference sample was deposited in the herbarium of the Faculty of Biology of the Autonomous University of Nuevo Leon obtaining the voucher number: 027499. The aerial parts were dried in the shade for 2 weeks and then ground in a knife mill, obtaining 809 g of plant material.

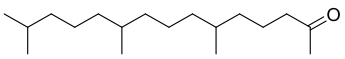
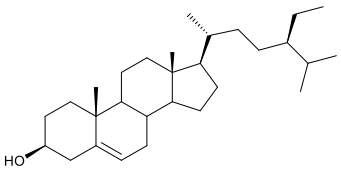
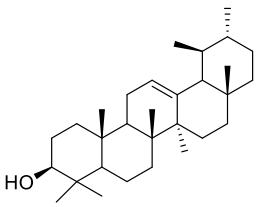
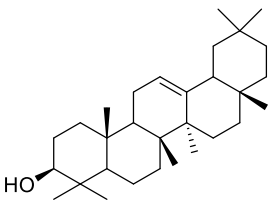
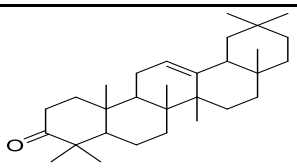
Preparation of the extract. The hexane extract was prepared as following: it were taken 10 g of the plant material and extracted with n-hexane (250 ml) for 24 hours. Subsequently, it was filtered by gravity and under vacuum. Finally it was concentrated in rotary evaporator to obtain 0.0237 g of the dried hexane extract.

GC/ MS analysis

Conditions	
Column	HP-5MS de 30 mx 0.250 mmx 0.25microM
Gas carrier	Helium 1mL per minute constant flow
Oven	50°C-0 min, 2°C/min-285°C-35 min
Injector	250°C Splitless
Detector	MSD
Ionic source	230°C

Results

Table 1. Compounds with biological activity identified in hexane extract

Compound	Chemical structure	Bacteria /cell lines tested
phytol		*Pseudomona aeruginosa*[4]
		MCF-7, SW-480
β-Sitosterol		*Staphylococcus aureus, Bacillus cereus, B. subtilis, B. anthracis, Micrococcus luteus, Mycobacterium smegmatis* [5]
		A549, PC3,MCF-7[6]
α-Amyrin		*S.aureus , B.cereus , Listeria monocytogenes , E. coli , Salmonella typhimurium, Citrobacter freundi* [7]
		PC3, Bcap-37, MGC-803 [8]
β-Amyrin		*Staphylococcus aureus , Escherichia coli., Bacillus cereus, Enterobacter cloacae* HeLa, MCF-7, Jurkat, HT-29 [9]
		S. aureus , B.subtilis, Salmonella typhi , E. coli, P. aeruginosa [10]
β-Amyrone		*B. cereus*[11]
		MCF-7[11]

Conclusions

Cissus incisa is a plant that until now has no reports of phytochemical or biological studies. Our group of investigation is currently working for give scientific authentication to this plant. As consequences of this research, it is possible to validate the use of this species in traditional mexican medicine for the treatment of infections. The compounds identified in the hexane extract are active biologically and they have already been previously reported in the literature. In the same way its antimicrobial and anticancer activities, for that reason it can expected that, our extract can be active for these properties.

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