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Isolation And Identification Of Naphthoquinone From Roots Of Plumbago Europaea

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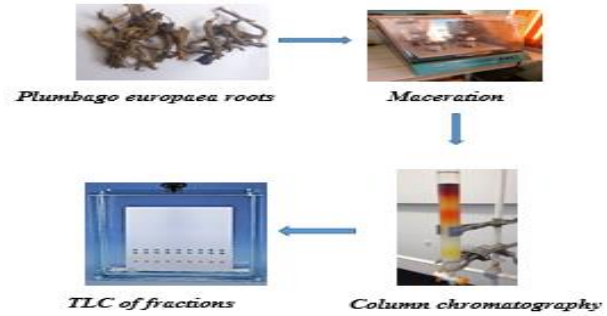
INTRODUTION

Extraction is the crucial first step in the analysis of medicinal plants for further separation and characterization. The process of identifying and characterizing bioactive substances is still quite difficult since plant extracts typically occur as a combination of different types of bioactive compounds or phytochemicals with different polarity. The purpose of this work was to isolate natural naphthoquinones from roots of Plumbago europaea, a medicinal plant commonly used in Tlemcen region

MATERIALS AND METHODS

1) Isolation Of Major Active Compounds



2) GC-MS Analysis

Purified fraction were analyzed with a Perkin–Elmer TurboMass quadrupole analyzer, coupled to a Perkin-Elmer Autosystem XL, equipped with 2 fused-silica capillary columns.

3) NMR Analysis

The NMR analysis were recorded on a Bruker Avance 400 spectrometer equipped with a 5 mm BBFO Bruker probe and a gradient amplifier under a temperature of 25 °C, the gradient force field provided in the z direction can reach 47,5 G / cm. Data processing and results were performed using Bruker Topspin software (version 2.1)..

RESULTATS AND DISCUSSION

1) Fractionation and isolation of compounds from the ethanolic extract:

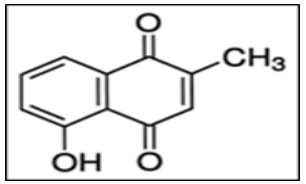
The purification of ethanolic extract prepared from roots of plumbago europaea by solvent extract was carried out using Silica gel column chromatography (40 mm width 60 mm length).). Elution was carried out using organic solvent with different polarities. Fractions of 15 ml were collected separately and subjected to TLC to detect the presence of phytocompounds. Similar fractions (with the same Rf value) were pooled and dried using rotary evaporator at 45°C.This fractionation resulted in three main fractions named F1, F2 and F3.

2) GC-MS analysis of Fraction F1 and F2:

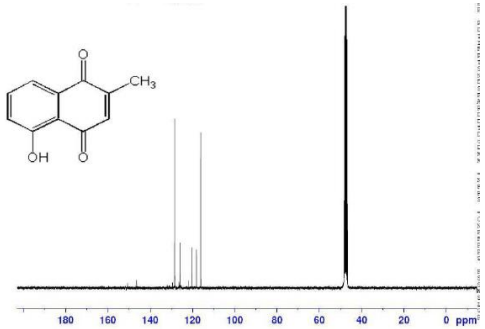
GC-MS analysis of fraction F1 revealed the presence of thirty eight compounds with different retention time representing 100% of the total frcation . 5-hydroxy-2-methyl-1,4-naphthoquinone known under the name plumbagin was the main compound. In the other hand The GC-MS analysis of frcation F2 was recorded the presence of four phytochemical constituents. Stigmast-5-en-3-ol, oleate was the major compound.

3) NMR analysis:

NMR analysis proved unequivocally that compound C1 is 5-hydroxy-2-methyl-1,4-naphthoquinone known as plumbagin



Plumbagin



13C NMR spectrum of isolated constituent

CONCLUSION

The obtained data confirmed the chemical structure of the isolated constituent to contain the important functional groups of plumbagin which agrees with the data obtained for the same compound in other research works which confirms the chemotaxonomic role of plumbagin for this genus and family and the existence of a similar chemical profile in species belonging to the same tribe;

REFRENCES

Kishore et al, 2010. Phytochemistry Letters

Serrilli et al ,2014. Natural Product Research: Formerly Natural Product Letters

Bele al, 2011. International journal of pharmaceutical sciences and research.