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Spectroscopic evaluation of the chloroform extract of the medicinal plant *Solanum nigrum* L. (*Solanaceae*)

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Abstract
The whole plant of *Solanum nigrum* L. was extracted with chloroform given the percentage yield of 10.01%. The UV analysis shows two major absorption peaks at wavelengths of 280nm and 343nm. Mass spectra of isolated component revealed Fragmentation pattern by electron impact ionization. One of the chemical constituent of *Solanum nigrum* L. is Solasodine alkaloid with molecular formula $C_{27}H_{43}NO_2$ the molecular weight of the compound is 413.63 Da and M+23 is at m/e of 330 relatively abundant peak in the spectrum.

Keywords: extract, absorption, peaks, analysis, spectrum

Introduction
Natural products have coming from various source materials including terrestrial plants, terrestrial microorganisms, marine organisms, terrestrial vertebrates and invertebrates have importance as they provide an amazing source of new drugs as well as new drug leads and new chemical entities for further drug development (McCurdy & Scully, 2005; Chin *et al.*, 2006) [5, 2]. Morphine, vincristine, codeine, digitoxin, quinine, galantamine and taxol are just some of the typical examples of drugs that have been introduced from natural sources (Heinrich *et al.*, 2004; Balunas & Kinghorn, 2005) [6, 7].
Natural products can be mainly divided into three groups such as primary metabolites, secondary metabolites and high molecular weight polymeric materials (Hanson, 2003) [3]. Primary metabolites including nucleic acids, amino acids, sugars; occur in all cells and play a central role in the metabolism and reproduction of the cells. High molecular weight polymeric materials such as cellulose, lignins and proteins take a part in the cellular structure. Secondary metabolites, small molecules which are not essential for the growth and development of the producing organism have importance because of their biological activities on other organisms.

Material and methods

Fig 1

The plant *Solanum nigrum* L. was collected and washed thoroughly under running tap water and then rinsed in distilled water and allowed to dry for some time. Then the plant was shade dried without any contamination for about 3 to 4 weeks.

The powder was extracted according to (Rashmi *et al*., 2010). The dried plant was powdered (coarse) and subjected to Soxhlet appratus (Figure 2) using petroleum ether, ethyl acetate and chloroform respectively. Almost all the chlorophyll and lipid is deposited on the side of the flask and was removed carefully. The extraction was done with each solvent until the supernatant in the Soxhlet became transparent for 36 hours. Every time before taking the solvents of higher polarity to remove the traces of previous solvents, exhausted marc was completely dried. All the extracts were filtered, dried and weighed.

Showing Soxhlet apparatus

Maximum yield was obtained with chloroform as solvent. Yield with petroleum ether was very less hence was discarded for further *in-vitro* and *in-vivo* investigation.

Results

Spectral analysis

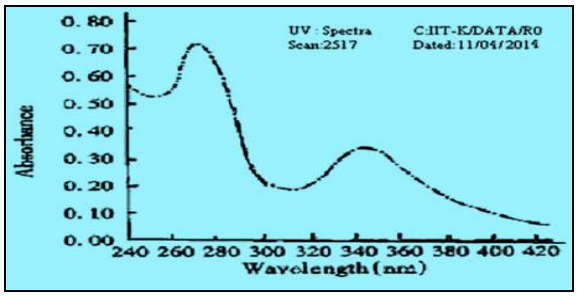

Fig 2: Showing UV Spectroscopy

Table 1: Showing UV spectroscopy.

Plant	Fraction	Wave Length
Solanum nigrum L.	F9-F12	Max. at 280nm and 343nm

UV analysis of fraction F9-F12 showed two major peaks at wavelength of 280nm and 343nm (Figure, Table-19).

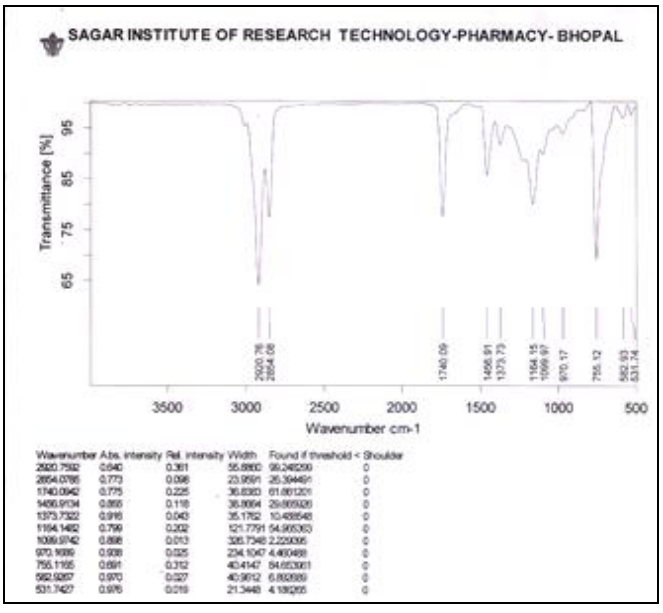

Fig 3

IR spectra (fig) of isolated component revealed γcm^{-1}: 2920 strong peak C-H stretch of CH2, 2854 peak indicate medium intensity peak of CH3, 1740 peak indicate C=O carbonyl stretch, 1456 and 1370 strong and broad peak indicate deformation vibration of CH2 and deformation vibration of CH3, 1164 and 1099 weak peaks present C-O-C etheral stretch and out of plane bending of substituted alkenes and 755 bi-substituted benzene or of alkenes.

Showing Infra Red (IR) Spectra

The Infra Red spectrum indicates various organic functional groups of the compound. The vibrational frequencies are characteristic frequencies of each and every functional group making IR as one of the important tool for structural interpretation of organic compound. The major finding by IR data presence of carbonyl for presence of benzene peaks are expected in double bond region but are absent in the spectrum benzene absent. The methyl methylene and carbonyl is the finding of IR spectrum.

Discussion

NMR spectrum helps to confirm equivalent protons or groups of protons, chemical shift position confirm different types of protons, intensity of peak confirm number of each type of protons and splitting pattern confirms nature and number of neighboring protons. The extended spectrum of isolated component showed six groups of protons appearing at δ ppm 0.809 alkyl or of methyl protons it is splitted peak may be triplet with coupling constant of 8.07Hz indicate vicinal coupling; 1.089 methylene protons intense peak and spilitted with high coupling coupling constant of 35. 1Hz; 1.5, 2.0, 2.5, 2.7 not intense peak but are splitted peaks with peak coupling interaction may be of methylene protons; 4 to 5 four groups of equivalent protons and are coupled. Splitted peaks observed. The protons may be alkene proton; 5.5 may be of hydroxyl proton; 7.129 may be of solvent proton. The data confirms the presence of alkenes and aromatic protons. The whole data confirms that the isolated compound may be solasodine alkaloid.

Conclusion

One of the chemical constituent of *Solanum nigrum* L. is Solasodine alkaloid with molecular formula $C_{27}H_{43}NO_2$ the molecular weight of the compound is 413.63 Da and M+23 is at m/e of 330 relatively abundant peak in the spectrum. The whole data confirms that the isolated compound may be Solasodine alkaloid.

References

1. Ahmad AL, Chan CY, Abd Shukor SR, Mashitah MD, Sunarti AR. Isolation of Carotenes from Palm Oil Mill Effluent and Its Use as a Source of Carotenes. Desalination and Water Treatment. 2009; 7-251-256.
2. Chin Y, Balunas MJ, Chai HB, Kinghorn AD. Drug Discovery from Natural Sources. The AAPS Journal. 2006; 8:239-253.
3. Hanson JR. Natural Products the Secondary Metabolites. The Royal Society of Chemistry, Cambridge, UK, 2003, 1-27.
4. Sarker SD, Latif Z, Gray AI. Natural Products Isolation

(Second Edition), Humana Press, New Jersey, United States of America, 2006.
5. McCurdy CR, Scully SS. Analgesic substances derived from natural products (natureceuticals). Lice Sciences. 2005; 78:476-484.
6. Balunas MJ, Kinghorn AD. Drug Discovery from Medicinal Plants. Life Sciences. 2005; 78:431-441.
7. Heinrich M, Barnes J, Gibbons S, Williamson EM. Fundamentals of Pharmacognosy and Phytotherapy. Churchill Livingstone, Spain, 2004.
8. Capizz RL, Cheng YC. Therapy of neoplasia with asparaginase, In Holcenberg iS, Roberts J (eds) Enzymes as drugs John Wiley & Sons, New York, 1981, 1-24.
9. Creasy WA. Cancer an introduction. Oxford University Press, New York, 1981.