

FT-IR ANALYSIS OF THE CRUDE SAMPLE OF ACHYRANTHES ASPERA L. LEAVES

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ABSTRACT

Achyranthes aspera L. belonging to the family Amaranthaceae commonly known as 'Aghedo' is an important medicinal herb found as a weed throughout India. The whole plant is of immense importance because of a wide range of pharmacological actions. Hence, the present study was undertaken to identify the functional groups present within the leaves. The FT-IR results showed the presence of 11 peaks, which confirmed the presence of essential phytochemicals present in the crudesample of powdered *A.aspera* leaves.

Keywords: *Achyranthes*, medicinal, pharmacological, leaves

INTRODUCTION



Achyranthes aspera L. belonging to the family Amaranthaceae commonly known as 'Aghedo' is an important medicinal herb found as a weed throughout India. It is a stiff erect annual herb. Stems are angular, ribbed and simple or branched from the base, often with tinged purple colour, branches (1-2m height) absolutely quadrangular, striate, pubescent and with thick leaves. The plant possesses activities like

antiperiodic, diuretic, purgative, laxative, antiasthmatic, hepatoprotective, anti-allergic and various other important medicinal properties. Decoction of powdered leaves with honey or sugar candy

is useful in early stages of diarrhoea and dysentery. (Srivastav *et al.*, 2011, Qureshi and Solanki, 2018).

METHODOLOGY

The plant parts were collected from the Gujarat University campus identified by Prof. Hitesh Solanki at Department of Botany with the help of Flora of Gujarat (Shah, 1978) and the voucher specimen was submitted to Gujarat University Herbarium. The leaves were collected, washed and dried in shade according to WHO Quality control standards. The leaves when properly dried were grinded to fine powder and stored in airtight containers for further use. Using the Single Reflection Attenuated Total Reflection (ATR), the powdered plant samples were placed on the diamond crystal and FT-IR analysis was performed for the powdered *A. aspera* leaf sample.

RESULTS

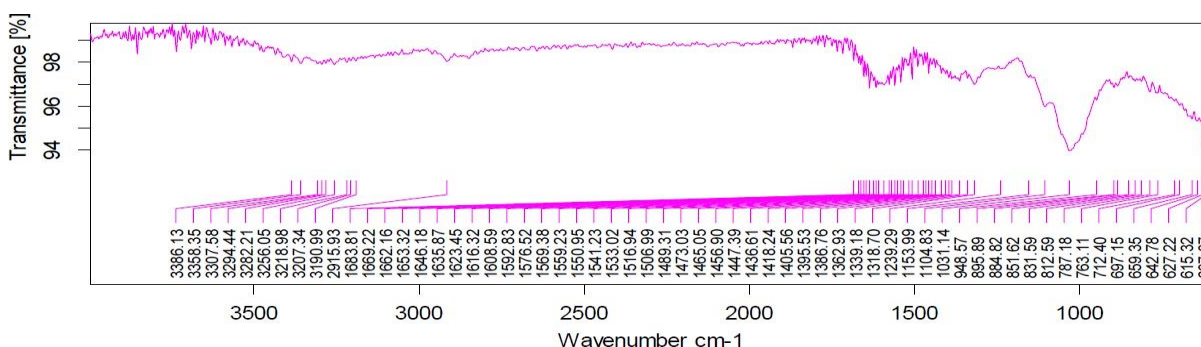


Fig. 1. FT-IR analysis of *Achyranthes aspera* L. leaves

DISCUSSION

Achyranthes aspera L. leaves IR spectra showed 11 peaks (fig.1). The 11 peaks showed the presence of following functional groups: Aromatic ethers, tertiary aromatic amines, -OH alcohols, aromatic isonitriles, esters, acetates, alcohols, aliphatic nitriles, alkyls, epoxide and tertiary amides and the wave numbers were 3386.12 cm^{-1} , 3358.35 cm^{-1} , 3307.5818 cm^{-1} , 3294.43 cm^{-1} , 3282.20 cm^{-1} , 3256.05 cm^{-1} , 3218.97 cm^{-1} , 3207.33 cm^{-1} , 3190.99 cm^{-1} , 2915.92 cm^{-1} ,

1683.81 cm^{-1} , 1669.21 cm^{-1} , 1646.18 cm^{-1} , 1635.87 cm^{-1} , 1623.44 cm^{-1} , 1616.31 cm^{-1} .

Similar results were obtained by Pai *et al.* (2016) who studied betulinic acid, oleanolic acid and ursolic acid from *Achyranthes aspera* L. using FT-IR have shown similar bands representing triterpenes, betulinic acid and oleanolic acid with carboxylic acid group and O-H spectra. Also, presence of alkanes and stretching vibration for ursolic acid too. Priya *et al.* (2012) performed the FT-IR showed absorption band at 3438.03 cm^{-1} representing -OH group of phenolic compounds. At absorption frequency, 665.58 cm^{-1} - functional groups C-O-O, P-O-C bonding (aromatic) phosphate, absorption frequency-774.90 cm^{-1} -functional groups CH out of plane bending (carbohydrate), absorption frequency- 1076.89 cm^{-1} - functional groups C-O stretching of polysaccharides, 1323.64 cm^{-1} -C-H deformations of -CH₂ or -CH₃ groups (lignin) in aliphatics, 1628.58 cm^{-1} C=O carbonyl stretching (secondary amides), 2927.55 cm^{-1} aliphatic - CH₃ and -CH₂ Stretching (chlorophyll) and 3438.03 cm^{-1} -OH group for phenols.

CONCLUSION

Achyranthes aspera L. plant is highly important in Ayurvedic medicines. However, the use of leaves is done in formulations due to its good antioxidant potential and presence of essential phytochemicals. The presence of Phytochemicals was confirmed by the FT-IR studies. Hence, it can be considered as one of the quality parameters to assess the quality of the powdered material.

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