

ESSENTIAL PHYTOCHEMICAL GROUPS STUDY THROUGH FT-IR ANALYSIS OF THE CRUDE SAMPLE OF *BOERHAAVIA DIFFUSA* L. ROOTS.

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ABSTRACT

Boerhaavia diffusa L. belongs to the family Nyctaginaceae commonly known as “Punarnava” is one of the important plants of Ayurveda, Charaka Samhita and Sushruta Samhita. The plant has immense benefits as a Rasayana- in Rejuvenation benefits. *Boerhaavia diffusa* L. roots are a very good source of Antioxidants and a natural drug which has innumerable benefits. Hence, the present study was undertaken to identify the functional groups present within the roots. The FT-IR studies showed 12 peaks which confirmed the presence of essential phytochemicals in the crude powdered plant roots.

Keywords: *Boerhaavia*, Rasayana, antioxidants, roots.

INTRODUCTION



Boerhaavia diffusa L. commonly known as Raktapunarnava is a herbaceous plant species growing prostrate or ascending upward in habitats like grasslands, agricultural fields, fallow lands, wastelands and residential compounds. The plant is mentioned in the Atharveda with the name ‘Punarnava’ because the top plant dries up during rainy season. *Boerhaavia diffusa* is one of the famous medicinal plants in India, South

America and Africa. (Goyal *et al.*, 2010) *Boerhaavia diffusa* L. has single, thick deep penetrating root bearing few rootlets occasionally brown. Root is stout and fusiform with a woody rootstock. Stems are creeping, many arising from root stock and swollen at the nodes. Microscopically, the mature root of *B. diffusa* L. shows a complete ring of wood surrounding the ventral vascular region (Agarwal *et al.*, 2011). *Boerhaavia diffusa* L. is widely used plant in jaundice, hepatitis, oedema, anaemia, inflammation, eye diseases, hepatoprotective, diuretic, anti-inflammatory, anti-stress, immunomodulation, anti-fertility, anti-microbial, antiviral, insecticidal activities, anti-metastatic activity, anti-diabetic, anti-proliferative, anti-estrogenic activity, analgesic, anti-lymphoproliferative activity, antifibrinolytic activity, chemoprevention and bronchial asthma. (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 roots were collected, washed and dried in shade according to WHO Quality control standards. The roots 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 plant sample.

RESULTS

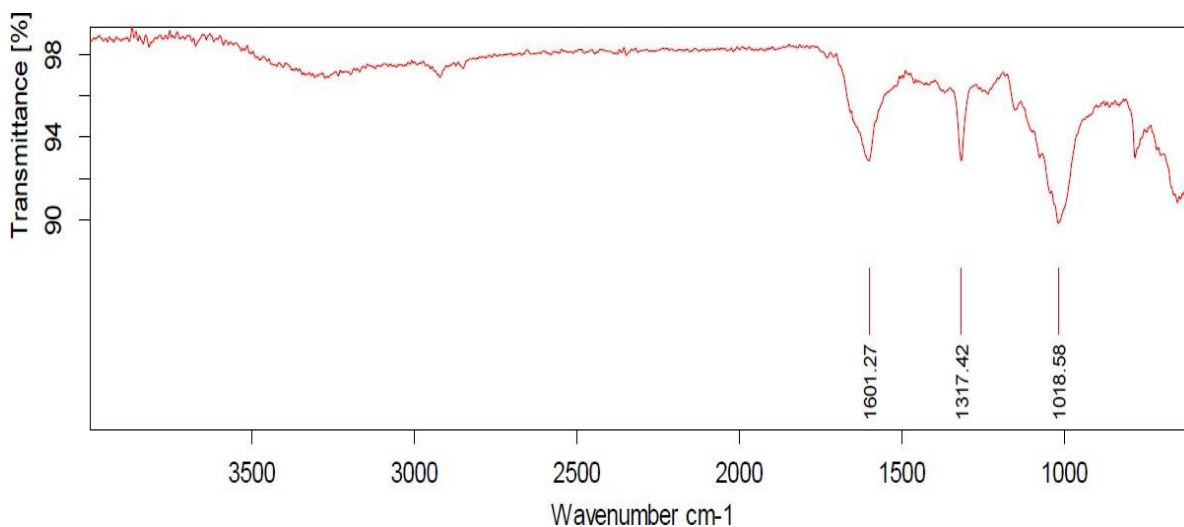


Fig. 1. FT-IR Analysis of *Boerhaavia diffusa* L. roots

DISCUSSION

Boerhaavia diffusa L. root IR spectra shows 12 peaks. The 12 peaks represent the following functional groups: Tertiary aromatic amines, aliphatic nitro compounds, carboxylic acids, aromatic ethers, primary amides, alkanes, nitro compounds-nitrites, alcohols, conjugated alkenes, primary aliphatic amines and primary aromatic amines. The wave numbers were: 1601.26 cm^{-1} , 1317.41 cm^{-1} , 1018.57 cm^{-1} . Vadivel and Brindha (2017) performed the FTIR analysis of *Boerhaavia diffusa* L. root. Their results showed peaks at 3421 cm^{-1} , 2923 cm^{-1} , 1638 cm^{-1} , 1383 cm^{-1} , 1318 cm^{-1} , 1244 cm^{-1} , 1048 cm^{-1} , 781 cm^{-1} , 662 cm^{-1} and 519 cm^{-1} .

CONCLUSION

Boerhaavia diffusa L. plant has been of immense importance for curing a number of diseases. Due to the presence of essential phytochemicals, the plant is widely used in the formulations as described in our Ancient Literatures like Ayurveda, Sushruta Samhita and Charaka. The FT-IR analysis confirms the presence of the essential phytochemical groups and hence, it can be considered as one of the quality parameters to assess the quality of the powdered material. The plant powder being a rich source of phytochemicals should be continued for use as mentioned in our ancient Literatures.

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