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PHARMACOGNOSTICAL ANALYSIS OF *ATLANTIA RACEMOSA*, AS ETHNOBOTANICAL DRUG IN CHITTOOR DT. OF ANDHRA PRADESH

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Abstract

The present study was carried out to provide a scientific basis of the identification and the authenticity of *Atlantia racemosa* an important medicinal plant which is prescribed and used as a crude drug prepared with whole plant extract (stem:leaf:root in equal ration) for various ailments by ethnobotanists in and around chittoor district of Andhra Pradesh. Pharmacognostical studies pertaining to Physicochemical and florescence analysis were performed on whole plant drug powder of *A.racemosa*. The observations confirmed that *A.racemosa* drug has apparent pharmacognostical distinctiveness, which provide a reliable basis for identification, purity, quality and classification of the plant drug which differentiate adulterants.

Introduction

Pharmacognostic evaluation is a simple and reliable tool which helps to screen the commercial varieties, substitutes, adulterants and any other quality control to obtain information about biochemical and physical properties of crude drug. Intentional adulteration or substitution is also a menace in the crude drug markets (Tulasi Rao *et al.*,2012).

Botanical extract standardization provides a certain level of quality control, but not complete quality assurance (Ninfali *et al.*,2009). The collection of raw phytodrugs by untrained personnel may lead to unintentional adulteration of drugs (Krishnan and Gopi, 2015). To detect the adulterants from the original ones, the crude drugs are subjected for microscopic analysis with anatomical parameters. Many of the plant species are also sold in herbal drug market by the same vernacular name. Previous workers have investigated on Botanical standardization viz.,Arjuna by Sivaji et al (2012).,Kakanasa by Ramesh et al.(2013), Jatamansi by Traesel et al.,(2017). Botanical identity of the phytodrug is important prerequisite for understanding the analysis of medicinal properties of any plant. If the plant identity of the drug is incorrect, the entire work on the plant becomes invalid (Tulasi Rao *et al.*,2012).

Present study is aimed to authenticate identity and validity of all these speculated species on the basis of taxonomical characters. Botanical investigations, viz. macro & microscopical comparison with the drugs used under the name of have not yet been carried out. Therefore, the present study is an attempt to establish macro and microscopic characteristic of *Atlantia racemosa* to differentiate other adulturerant species.

Materials and Methods

The whole plant coarse powder (Leaf, root and stem in 1:1:1 ratio) of *Atlantia racemosa* was used for physicochemical studies as per ethnic healers formulations.

Powder microscopic studies were carried out by examining the powder of the plant

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samples as well as by macerating the plant samples using Jeffery's maceration fluid (Johansen, 1940; Sass, 1940).

Physicochemical parameters like ash values, extractive values and solubility values were determined according to the standard procedures recommended as per WHO guidelines (Anonymous,2009) and Kokate,(2008). Fluorescence analysis of the whole plant powder drugs was carried out according to the methods followed by Chase and Pratt (1949) and Kokoski *et al.*, (1958).

Preparation of extract for phytochemical and pharmacognostic analysis was done according to modified method of Manipal *et al*.,(2017)

Figure :1 A: *Atlantia racemosa* twig ;B: Dried Plant material C : Chopped P: Powder

Results and Discussion

Preliminary qualitative phytochemical analysis of *Atlantia racemosa* whole plant drug powder revealed the presence of Alkaloids, Terpenoids, Steroids, Coumarins, Tannins, Saponins, Flavonoids, Quinones, Anthroquinones, Phenolic compounds, Proteins, Carbohydrates, Glycosides, Gums, Starch, Fixed oils and Fats, Phytosterols, Lipids, Lignins, Lignans, Anthocyanidins, Indoles, Reducing sugars and Amino acids.

Elements present are Iron, Magnesium, Calcium and Zinc. Alkaloids, Terpenoids, Steroids, Coumarins, Tannins, Saponins,Flavonoids, Quinones, Anthroquinones, Phenolic compounds, Proteins are present. Qualitative analysis of anthocyanidins revealed the presence of Delphinidin, Petunidin and Malvidin. Qualitative analysis of flavonoid compounds detected Rutin, Myricetin, Kaempferol and Apigenin. Qualitative analysis of phenolic compounds detected are Protocatechnic acid, Chlorogenic acid, homo-Protocatechuic acid Gentisic acid, cis-p-Coumaric acid, trans-p-Coumaric acid, p-Hydroxybenzoic acid, Phloretic acid, Aesculetin, cis-Sinapic acid, trans-Sinapic acid, Vanillic acid, Syringic acid, Salicylic acid, Cinnamic acid and some of Unidentified compounds (3). Amino acid Qualitative analysis of detected Aspartic acid, Arginine , Asparagine , α-Alanine, β-Alanine, Cysteine, Cystine, Glutamic acid, Glutamine, Glycine, Histidine, Leucine , Lysine, γ-Methylene glutamine, Ornithine, Proline, Serine, Threonine, Tyrosine, Valine. Quantitative analysis of lipids detected are Phosphatidyl serine, Phosphatidyl inositol, Phosphatidyl ethanolamine, Digalactosyl diglyceride, Phosphatidyl glycerol,

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Sulphoquinovosyl diglyceride, Diphosphatidyl glycerol, Monogalactosyl diglyceride and Steryl glycoside

Powder characteristics of the drug is found to be in fine powder Appearance with pale green, aromatic odour and in bitter taste.

Ash values of the drug is as follows : Total ash - 4.89, Water soluble ash - 5.73 , Acid soluble ash - 5.56 (% w/w), Alkalinity of water soluble ash is 0.2 (ml).

Extractive values of the drug: Ethanol soluble extract 30.98, Water soluble extract 37.81, Hexane soluble extract, 3.69, Chloroform soluble extract 3.3468 (% w/w).

Solubility values of the drug : Ethanol 57.83 , Water (aqueous), 21.84, Methanol, 63.34 (% w/w).

Table :1 Powder analysis of the drug

Powder Treatment	***Observation***
Powder treated with water	non-sticking
Powder shaken with water	foam like froth
Powder treated with 5% aqueous NaOH	pale brown
Powder treated with 60% aqueous sulphuric acid	pale brown
Powder pressed between filter paper for 24 hours	no oil stain

Table 2: Fluorescence analysis of various extracts of the drug

Extract	Treatment	*Colour*
Ethanol	Day light	brown
	Short UV	green
	Long UV	brown
Water	Day light	brown
	Short UV	green
	Long UV	brown
Hexane	Day light	green
	Short UV	brown
	Long UV	green
Chloroform	Day light	brown
	Short UV	green
	Long UV	reddish green

Table-3: Fluorescence analysis of the drug powder

Experiments	**Visible / Day light**	**UV light**	
		254 nm	**365 nm**
Drug powder	pale green	green	pale brown
Drug powder + 1 N NaOH (aq.)	brown	green	dark brown
Drug powder + 1 N NaOH (alc.)	brown	green	dark brown
Drug powder + 1 N HCl	brown	pale green	colourless
Drug powder + 50% H_2SO_4	brown	pale green	pale brown
Drug powder + 50% HNO_3	brown	pale green	colourless
Drug powder + Picric acid	brown	green	yellow
Drug powder + Acetic acid	brown	green	brown
Drug powder + Ferric chloride	brown	pale green	brown
Drug powder + HNO_3 + NH_3	brown	green	pale brown

The microscopic observations on the gross anatomical features coupled with tissue disposition and cell inclusions are more trustworthy techniques in the crude sample drugs (Krishnan and Gopi, 2015).

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Conflict Of Interest

We declare that no conflict of interest.

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