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Studies on Fluorescent Analysis of Two Ethnomedicinal Plants *Duranta erecta* L. and *Phyla nodiflora* (L.) Greene

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Abstract: ***The fluorescent studies on two ethnomedicinal plants belongs to family Verbenaceae , Duranta erecta L. and Phyla nodiflora (L.) Greene. The present study will assist in standardization for quality, purity and sample identification. The etnomedicinal plants were analysed using standard methods.. The fluorescence analysis for two ethno-medicinal plants were conducted by using the visible light and ultra violet at 254nm and 354 nm, reveals the various colouration ranges from sea weed green to berry blue coloured highlighted compared with the source , Lularoe chart. The present study concludes that the data obtained can be used to authenticate, classify and standardize the above four ethno-medicinal plants.***
Keywords: Ethnomedicinal plants, fluorescent study, UV wavelength.

I. INTRODUCTION

The World Health Organization states about 80% of the population globally depends on traditional medicine. Moreover, use of plants in the United States is increasing significantly, to the phase that almost all pharmacies and supermarkets provide herbal products easily .[1] Right identification and quality control of plant materials is necessary to ensure the reproducible outcome of herbal medicinal products, which will lead to their health and effectiveness [2]. Fluorescence analysis is one of the pharmacognostic procedures useful in the identification of authentic samples and recognizing adulterants [3]. In the fluorescence analysis, the plant parts or crude drugs may be examined as such, or in their powdered form or in solution or as extracts. [4] Although most of the cases the actual substances responsible for the fluorescence properties has not been identified, the merits of simplicity and rapidity of the process makes it a valuable analytical tool in the identification of plant samples and crude drugs [5]. Pharmacognostic criteria for unproblematic identification, such as microscopy, physicochemical analysis, fluorescence analysis, are only a few of the essential labels for herbal standardization [6].

II. MATERIAL AND METHODS

The fresh healthy plant leaves of *Duranta erecta* L., *Phyla nodiflora* (L.) Greene, were collected from different areas of Ranchi viz. The plant was identified and authenticated by Botanical Survey of India by Dr. S. Rajan, Field Botanist and from the Herbarium of the University Department of Botany, Ranchi University, Ranchi. The collected voucher specimens were preserved in the University Department of Botany. The leaves were washed, shade dried and is made powder mechanically and the fine powder was used for fluorescent study.

The dried powder of selected plants parts was sieved through the sieve plate No. 120 and was used for fluorescent studies. 1 gm of this powder was taken in a clean test tube with about 1.5 ml of solvent extract. Likewise, several tubes were made by adding various solvents like, ethyl alcohol, formic acid, acetic acid, dil. sulphuric acid, nitric acid. All the tubes were shaken well and incubated for about 30 min. The colour of the drug solution thus obtained were observed for their characteristic colour reaction under the visible light (fluorescent tube) and the ultraviolet light (UV 254) and were recorded by comparing with standard colour charts[7,8].

III. RESULTS

The solutions obtained were observed under the visible light, and the UV light of short wavelength (254nm) and UV of long wavelength (365nm) for characteristic colour of four plants.

The plant powder of all four plants were treated with different solvent viz. ethanol, acetic acid, nitric acid, formic acid and sulphuric acid shows all the plant are produced distinct characteristics colour under visible light as well as short and long wavelength of UV in table (Table 1 to 4, Fig. 1 to 4). Source: Lularoe Color Chart

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Table 1 : Fluorescence analysis of leaves powder of *Duranta erecta* L.

Powder Treatment	Visible light	UV light at 254nm	UV light at 365nm
Powder as such	Green	Seaweed green	Reddish black
Powder + Ethanol	Dark green	Fluorescent green	Black
Powder + Acetic acid	Blackish green	Black	Prussian blue
Powder + Nitric acid	Brick red	Reddish brown	Space blue
Powder + Formic acid	Brownish green	Brownish	Berry blue
Powder + Sulphuric acid	Blackish	Blackish	Berry blue

Table 2: Fluorescence analysis of leaves powder of *Phyla nodiflora* (L.) Greene

Powder Treatment	Visible light	UV light at 254nm	UV light at 365nm
Powder as such	Green	Seaweed green	Lapis blue
Powder + Ethanol	Dark green	Deep green	Peacock blue
Powder + Acetic acid	Blackish green	Brownish black	Space blue
Powder + Nitric acid	Brick red	Reddish brown	Cobalt blue
Powder + Formic acid	Brownish green	Brownish	Admiral blue
Powder + Sulphuric acid	Blackish	Blackish	Berry blue

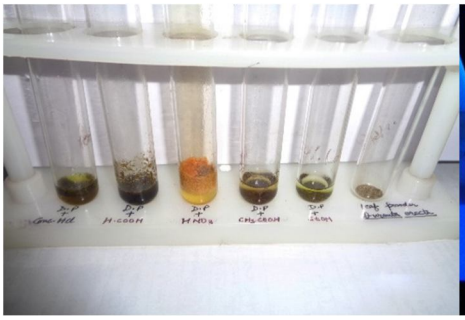


Fig. 1

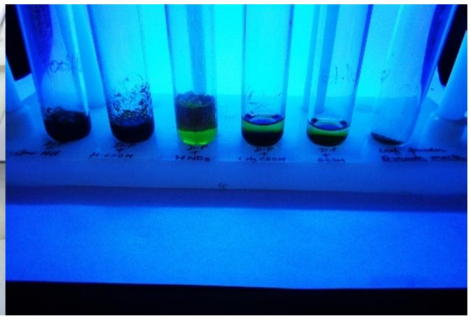


Fig. 2

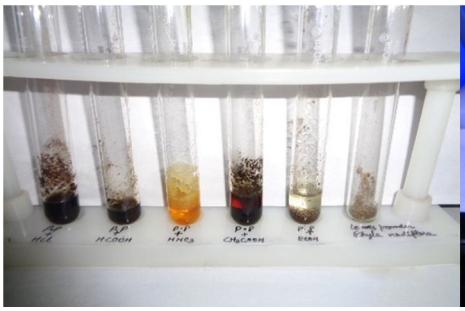


Fig. 3

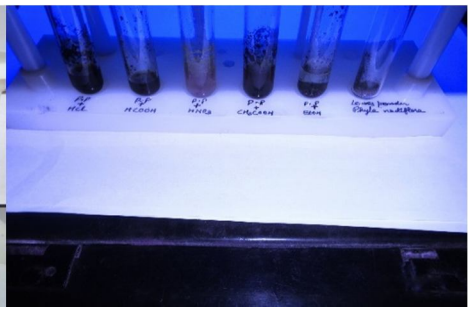


Fig. 4

Fig 1: *Duranta erecta* L. in visible light (Appearance of powder in case of HCOOH)
Fig. 2 : *Duranta erecta* L. in short ultraviolet wavelength (254nm)
Fig 3 : *Phyla nodiflora* (L.) Greene in visible light (Appearance of powder in case of HCl, HCOOH, HNO_3 and CH_3COOH)
Fig 4: *Phyla nodiflora* (L.) Greene in ultraviolet short wavelength (254nm)

IV. CONCLUSION

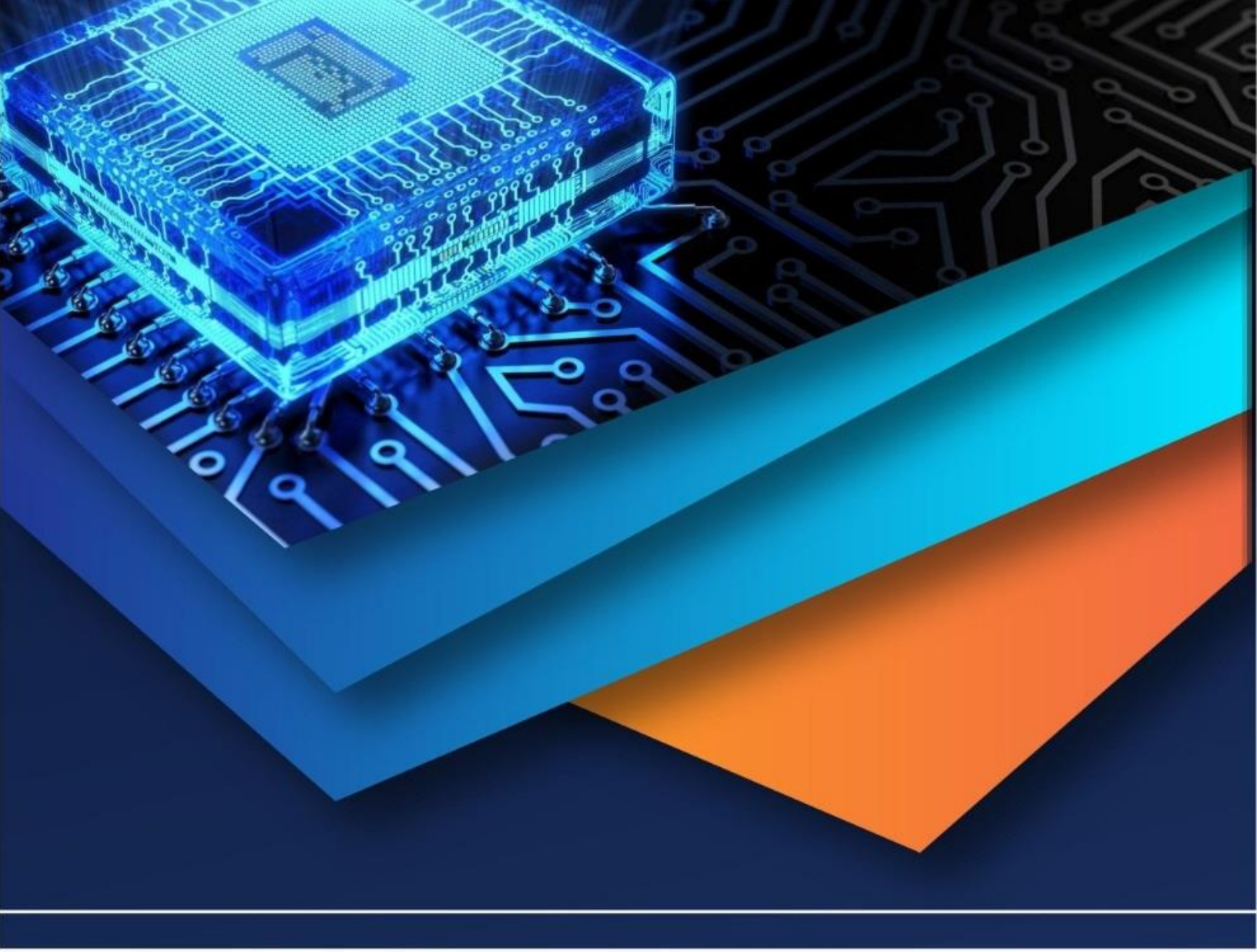
Powdered form of drugs examined in ultra voilet light gives marked differences in fluorescence can be easily distinguished from different plant powder. Drug evaluation may be defined as the identity refers to identification of biological source of drug, quality- the quantity of active constituents present and purity- the extent of foreign organic material present in crude drugs. Under visible and ultra voilet light the characteristics colour of plant powder changes with different chemical reagents are important aspect consider for the authentication of crude drugs.

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