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FLUORESCENCE ANALYSIS OF THE LEAVES OF *PUNICA GRANATUM* L

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ABSTRACT

Traditional medicine using herbal drugs exists in every part of the world. Although the philosophies of these traditional medicines have resemblance with each other, they differ widely from modern Western medicine. Higher plants have been extensively investigated for understanding the biological activities of their parts used or active principles potentially useful in therapeutic applications. Traditional use of herbs in curing many diseases is being recorded through ethnobotanical approaches and the evaluation of their biological activity is done through experimental practices. Fluorescence analysis is an important parameter in the study of crude drugs. In the present study the fluorescence analysis of the leaves of *Punica granatum* L. was carried out. The leaves are of medicinal importance. The results show that there is presence of bioactive constituents in the leaf extract suggesting that it has a potential use as medicine.

KEYWORDS: Fluorescence analysis, *Punica*, medicinal, bioactive constituents.

INTRODUCTION

In view of the progress of western medicine, not only new synthetic drugs but also herbal drugs have to fulfill the international requirements on quality, safety and efficacy. Herbal drugs have the advantage of being available for patients in the geographical area of the special traditional medicine. The development procedure of herbal drugs for worldwide use has to be different from that of synthetic drugs (Vogel, 1991). Diseases that have been managed traditionally using medicinal plant include malaria, epilepsy, infantile convulsion, diarrhea, dysentery, fungal and bacterial infections (Sofowara, 1996).

The plant *Punica granatum* is commonly called as Pomegranate. The term Pomegranate is derived from Medieval Latin word "*pomum*" means "apple" and "*granatum*" means "seeded". Previously placed in its own family Punicaceae but recent phylogenetic studies have shown that it belongs to the family Lythraceae according to APG system. The genus having two species *Punica granatum* L. and *Punica protopunica* Balf. The term "*Punica*" is derived from Latin word which means "pertaining to Carthage – Cartheginian apple" and *"granatum*" means "filled with seeds" (Yadav et al., 2002).

It is cultivated throughout India like Himalaya, Jammu, Kashmir, Maharashtra (Savantwadi, Purandar, Nagpur, Pune, Victoria garden, Bombay University garden, Vidarbha, Maharajbag, Nagpur), Gujarat (Kheda, Baroda, Dholka, Jamnagar). It is also found in Iran, Afghanistan, Baluchistan, Maskat, Persia and Kandhar (Yadav et al., 2002).

The plant is deciduous small tree, branches sometime spiny, leaves are simple, oblong or obovate, axillary or terminal inflorescence, actinomorphic, bisexual red flowers having gamosepalous and polypetalous condition, numerous stamens, inferior ovary with axile and parietal placentation.

Phytochemical Constituents

Tannins are obtained from fruit rind, stem, root bark and leaves (Bhattacharjee, 2008).

Fruit contains sugars, vitamin B and vitamin C (Sheth, 2005). Compounds belonging to the terpenoids, alkaloids and flavonoids are used as drugs or as dietary supplements to heal or prevent various diseases and some of these compounds seem to be competent in preventing and inhibiting various types of cancer (Kumar A. *et al*, 2013). The various extracts (aqueous, ethanol, chloroform) of peel, whole fruit and seeds of *Punicagranatum*have revealed the presence of triterpenoids, steroids, Glycosides, Saponins, Alkaloids, Flavonoids, Tannins, Carbohydrates and Vitamin C (Bhandary *et al*, 2012). The phytochemicals prevent cancer, cardiovascular diseases, diabetes, dental conditions, erectile dysfunction, bacterial infection and act as antibiotic and anti-inflammatory (Chakraborty, 2012).

Uses

Pomegranate leaves are used to calm the stomach disorder or diarrhea triggered due to any kind of digestive problems. Drinking tea made from the leaves of pomegranate helps in curing digestive problems (Bhowmik *et al*, 2013).

MATERIALS AND METHODS

The plant material i.e. leaves and stems of *Punica granatum* for the present work was collected from Pawan Baug Malad (W.) & authenticated.

Fluorescence Analysis

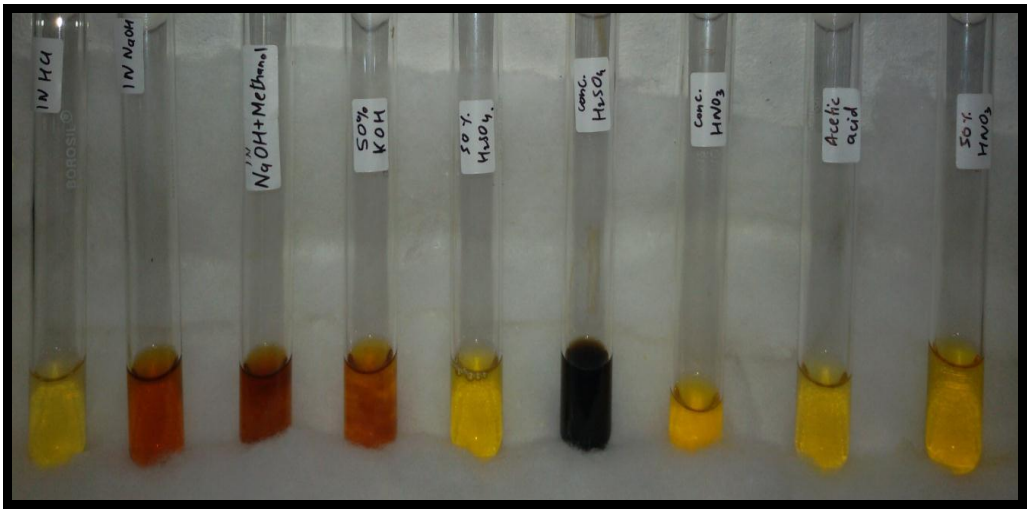
For fluorescence study of powder is as per the method described by Chase & Pratt (1969).

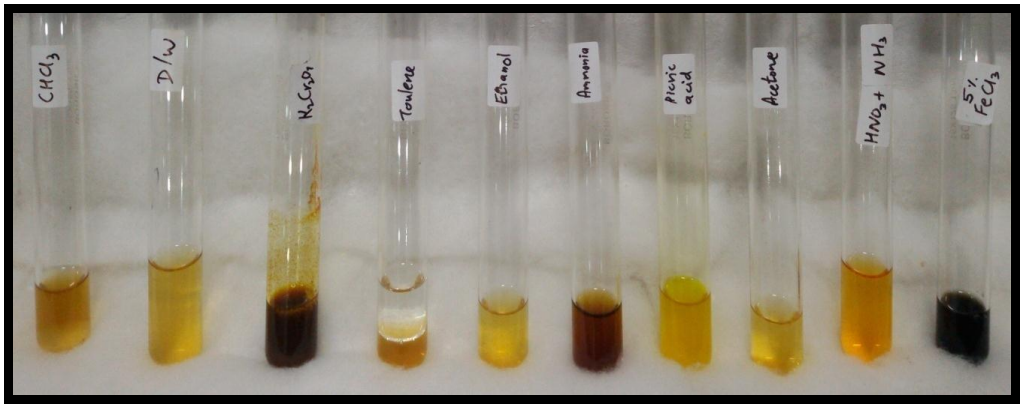
RESULTS AND OBSERVATIONS

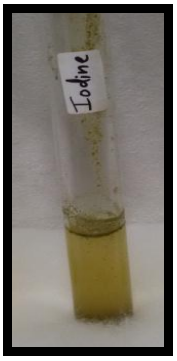
Fluorescence Analysis

Powder + Reagent	Visible light	U.V. light
1N HCl	Light yellow	Light green
1N NaOH	Dark yellow	Black
1N NaOH + Methanol	Dark yellow	Pink
50% KOH	Dark yellow	Pale green
50% H_2SO_4	Green	Pale green
Conc. H_2SO_4	Black	Black
Conc. HNO_3	Orange	Fluorescent green
Acetic Acid	Green	Orange
50% HNO_3	Yellow	Green
$CHCl_3$	Green	Pink
Distilled water	Green	Green
$K_2Cr_2O_7$	Red	Red
Toluene	Green	Pink
Ethanol	Green	Pink
Ammonia	Yellow	Blue
Picric acid	Yellow	Blue
Acetone	Green	Pink
$HNO_3 + NH_3$	Yellow	Green
5% $FeCl_3$	Black	Black
Iodine solution	Green	Blue

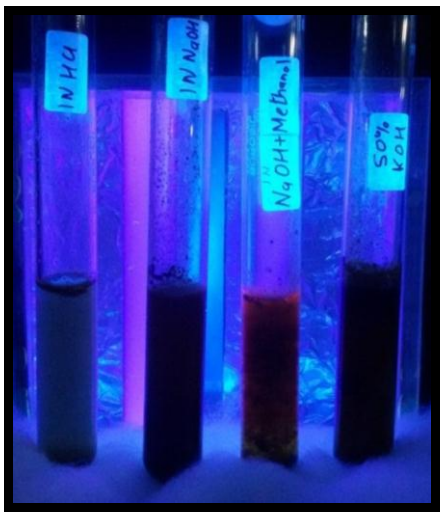
Under Visible Light (Powder)

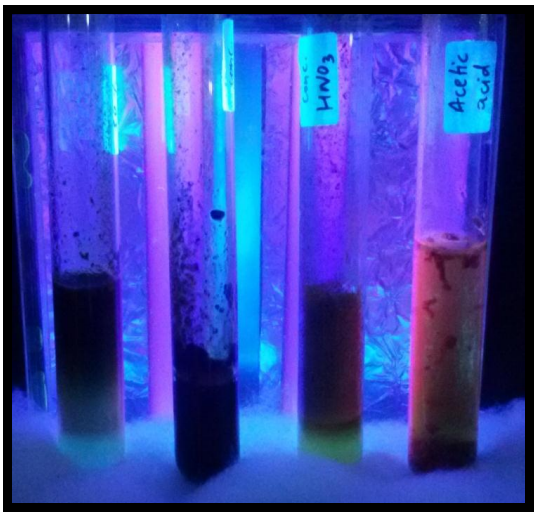


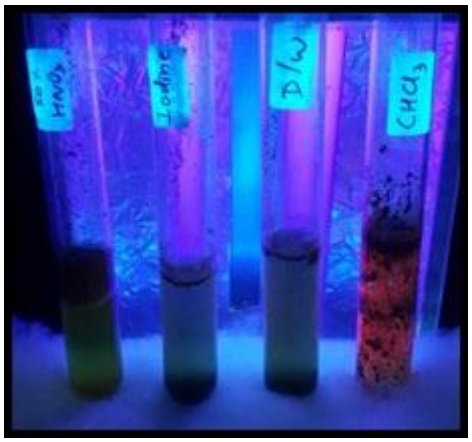


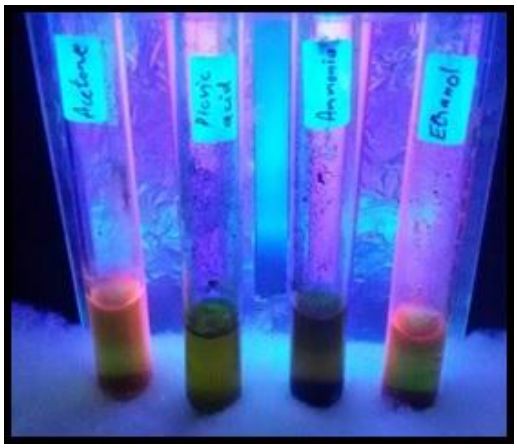


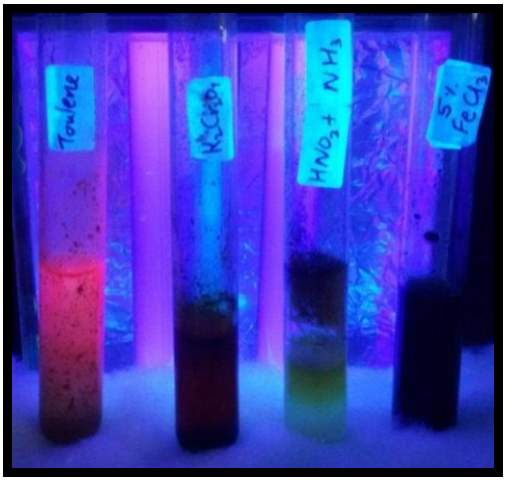
Under U. V. Light (powder)











SUMMARY AND CONCLUSION

Vaidya (2016) carried out fluorescence analysis of *Musa paradisiaca* L. and *Zizyphus jujuba* leaves (2017) and fruit (2017) and *Luffa acutangula* fruit (2016 a).

Some of the constituents present in the leaves of *Punica* may not be visible in daylight but are visible in UV light after production of fluorescence. They are converted into florescent derivatives or decomposition products by using reagents (Zhao et al., 2011). The fluorescence analysis also confirms that there is presence of bioactive constituents and the quality of crude drugs can be assessed in this manner as fluorescence analysis is an important parameter in the evaluation of crude drugs.

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