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Effectual qualitative chemical evaluation of *Euphorbia neriifolia* Linn. by using fluorescence analysis

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ABSTRACT

Objective -Plants contain numerous biologically active compounds, many of these have been shown to exhibit therapeutic and antimicrobial properties and therefore they were in use as antimicrobial drugs in traditional medicines. *Euphorbia neriifolia* Linn. belongs to the family Euphorbiaceae. Assessment of medication implies affirmation of its personality and assurance of its quality and virtue and recognition of nature of debasement. Throughout the years the nature and level of assessment of rough medications has experienced an efficient changes. Hence, in the present study an attempt has been made for effectual qualitative evaluation of dried powdered leaves and stem of *Euphorbia neriifolia Linn.* by fluorescence analysis.

Design & Intervention- The dried powdered sample of *Euphorbia neriifolia Linn.* leaves and stem has been used to perform fluorescence analysis under the visible day light and UV light of short wavelength (254 nm) and long wavelength (365 nm) for their characteristic colour.

Main outcome measures- The ultra violet light creates fluorescence in numerous common items, which don't noticeably fluoresce in sunshine. In the event that the substances themselves are not fluorescent, they may frequently be changed over into fluorescent subordinates or disintegration items by applying diverse reagents. The hues created by these reagents speak to the nearness of dynamic constituents.

Results- The fluorescence character of any powdered character of any powdered medication is exceptionally particular and supportive distinctive highlights for the assurance of a medication.

Conclusion- The dried powder and herbal extracts of Euphorbia neriifolia Linn. leaves and stem showed varied fluorescence character which is an essential parameter for standardization of herbs.

Keywords: *Euphorbia neriifolia* Linn., Standardization, Fluorescence analysis, Evaluation, Euphorbiaceae.

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1. INTRODUCTION

The restorative plants are of incredible enthusiasm to human wellbeing. The restorative plants (Rasayana) are the plants whose parts (leaves, seeds, stems, roots, natural products, foliage and so on.) removes, imbuement, decoctions, powders have been broadly utilized in the Indian conventional (Ayurveda) arrangement of medication for the treatment of various sicknesses of people.[1]

Plant based drugs have been a piece of customary social insurance in many parts of the world for a huge number of years. [2, 3] Plants contain numerous biologically active compounds, many of these have been shown to exhibit therapeutic and antimicrobial properties and therefore they were in use as antimicrobial drugs in traditional medicines. Plants utilized in conventional medication contain a huge range of substances that can be utilized to treat incessant and even irresistible ailments. As per a report of World Health Organization, over 80% of world's populaces rely upon conventional drug for their essential social insurance needs. Therapeutic properties of plants have likewise been researched in the light of later logical improvements all through the world, because of their strong pharmacological exercises, low poisonous quality and monetary suitability, when contrasted and engineered drugs. [1]

Euphorbia neriifolia Linn. has a place with the family Euphorbiaceae develops lavishly around the dry, rough, sloping territories of North, Central and South India. Euphorbia neriifolia Linn. is worldwide dispersed in Baluchistan, Burma, India and Malaysian Islands. Inside

India, it is visit in rough ground all through Deccan Peninsula and Orissa. It is habitually cultivated for hedges in villages all over India. 4, 5 The scientific categorization of plant comprise of space: Eukaryota, kingdom: Plantae, sub-kingdom: Tracheobionta, division: Magnoliophyta, super-division: Spermatophyte, class: Magno-liopsida, sub-class: Rosidae, arrange: Euphorbiales, sort: Euphorbia, family: Euphorbiaceae and species: neriifolia Linn. [6]

It is a herb loaded with spine, famously known as Sehund, Thohar and Milk Hedge. The leaves are thick succulent, 6 to 12 inches in length, ovular fit as a fiddle. Ayurveda portrays the plant as unpleasant, impactful, purgative, carminative, enhances hunger helpful in stomach inconveniences, bronchitis, tumors, loss of awareness, incoherence, leucoderma, heaps, aggravation, broadening of spleen, pallor, ulcers and fever. [7, 8] The latex of Euphorbia neriifolia Linn. is a functioning element of numerous Ayurvedic definitions like Abhaya lavana, Avittoladi bhasma, Citrakadi taila, Jatyadi varti, Snuhidugdhadi varti, Snuhi ghrta and Jalodarari ras. Euphorbia neriifolia Linn. has been customarily shown in Vatavyadhi, Gulma, Udara, Sula, Sotha, Arsas, Kusta and Medoroga. [9, 10]

Assessment of medication implies affirmation of its character and assurance of its quality and virtue and recognition of nature of defilement. The assessment of an unrefined medication is important due to these fundamental reasons I) biochemical variety in the medications ii) detoriation because of treatment and capacity, and iii) substitution and contaminated, an after effect of thoughtlessness, numbness or misrepresentation.

Throughout the years the nature and level of assessment of unrefined medications has experienced a deliberate changes. At first, the unrefined medications were distinguished by examination just with the standard depiction accessible. Because of progression in the compound learning of rough medications, at present, assessment additionally incorporates strategy for evaluating dynamic constituents present in the unrefined medication, notwithstanding its morphological and infinitesimal examination. With the advent of separation techniques and instrumental analysis, it is possible to perform chemical evaluation of a crude drug, which could be both of qualitative and quantitative in nature. [11]

Hence, in the present study an attempt has been made for effectual qualitative evaluation of dried powdered leaves and stem of *Euphorbia neriifolia Linn.* by fluorescence analysis.

2. MATERIAL AND METHOD

2.1 Plant material- The leaves and stem of *Euphorbia neriifolia Linn.* were collected from the forest, a nearby place of Gangrar, Chittorgarh, Rajasthan. Their botanical identities were determined & authenticated by Scientist-in-Charge, Botanical Survey of India, Ministry of Environment and Forests, Govt. of India, Jodhpur- 342 008, Rajasthan, India. Several voucher specimen numbers were submitted to the authority for future references (Voucher Specimen Number-BSI/AZRC/I/12012/2018-19/326).The leaves and stem were dried under shade for 15 days, coarsely powdered and stored in air tight container for the further study.

2.2 Reagent and Chemicals- All reagents and chemicals used for fluorescence analysis and extraction were analytical grade obtained from SRL Chemical, Rankem, Otto, Himedia Pvt Ltd.India.

2.3 Extraction- Extraction of Euphorbia neriifolia Linn. leaves and stem carried out by Maceration and Soxhlation process with the use of various aqueous and non aqueous solvents. [11]

2.4 Fluorescence analysis- Take about 0.5gms of plant powder into clean and dried test tubes. To each tube 5ml of different organic solvents like distilled water, picric acid, glacial acetic acid, 1N HCl, 1N H_2SO_4, conc. HNO_3, ferric chloride (5%), iodine solution (5%), ammonia solution, 1N NaOH, potassium dichromate, HNO_3 + NH_3 solution, methanol, ethanol and toluene were added separately. At that point, every one of the cylinders was shaken and they were permitted to represent around 20-25 min. The solutions obtained were observed under the visible day light and UV light of short wavelength (254 nm) and UV light of long wavelength (365 nm) for their characteristic colour. [12-16]

3. RESULTS

The behaviour of Euphorbia neriifolia Linn. leaves powder upon treatment with different chemical reagents showed Light green colour when powder was as such; Light green colour with distilled water; greenish yellow with picric acid; Light yellow with glacial acetic acid; Brownish yellow with 1N HCl; Magenta with 1N H_2SO_4; yellow with Conc. HNO_3; Green with ferric chloride (5%); Yellow with iodine solution (5%); Yellow green with ammonia solution; Orangish with 1N NaOH; Brown with potassium dichromate; Orangish with HNO_3 + NH_3 solution; Light Green with methanol, ethanol and toluene. Likewise the fluorescence characteristics of powdered leaves after treatment with different reagents emitted various colour radiations under ultraviolet light (Table-1). The fluorescence characteristics of different extracts of leaf was also studied under ordinary and UV light (365 nm), wherein the leaf extracts showed the visibility of varying colours which are tabulated in the Table-3.

The behaviour of Euphorbia neriifolia Linn. stem powder upon treatment with different chemical reagents showed Green colour when powder was as such; Green colour with distilled water; greenish yellow with picric acid; Yellow with glacial acetic acid; Brown with 1N HCl; Magenta with 1N H_2SO_4; yellow with Conc. HNO_3; Green with ferric chloride (5%); Yellow with iodine solution (5%); Yellow green with ammonia solution; Orangish brown with 1N NaOH; Dark brown with potassium dichromate; Orangish brown with HNO_3 + NH_3 solution; Green with methanol, ethanol and toluene. Likewise the fluorescence characteristics of powdered stem after treatment with different reagents emitted various colour radiations under ultraviolet light (Table-2). The fluorescence characteristics of different extracts of stem was also studied under ordinary and UV light (365 nm), wherein the stem extracts showed the visibility of varying colours which are tabulated in the Table-3.

Table 1- Florescence characteristic of the powder of *Euphorbia neriifolia* Linn. leaves in different means

S.N.	Treatments with leaves powder	UV Short (254 nm)	UV Long (365 nm)	Visible
1	Powder as such	Light yellow	Light yellow	Light green
2	Distilled water	Yellow green	Fluorescent green	Light green
3	Picric acid	Light green	Fluorescent green	Greenish yellow
4	Glacial acetic acid	Yellow	Light orange	Light yellow
5	1N HCl	Dark brown	Grayish	Brownish yellow
6	1N H_2SO_4	Magenta	Magenta	Magenta
7	Conc. HNO_3	Yellow	Dark brown	Yellow
8	Ferric Chloride (5%)	Dark brown	Fluorescent green	Green
9	Iodine solution (5%)	Greenish yellow	Brown	Yellow
10	Ammonia solution	Green	Fluorescent green	Yellow green
11	1N NaOH	Green	Fluorescent green	Orangish
12	Potassium dichromate	Dark green	Fluorescent green	Brown
13	HNO_3 + NH_3 solution	Yellow	Orangish	Orangish
14	Methanol	Light Green	Light Grey	Light Green
15	Ethanol	Light Green	Fluorescent green	Light Green
16	Toluene	Light Green	Yellow	Light Green

Table 2- Florescence characteristic of the powder of *Euphorbia neriifolia* Linn. stem in different means

S.N.	Treatments with leaves powder	UV Short (254 nm)	UV Long (366 nm)	Visible
1	Powder as such	Yellow	Yellow	Green
2	Distilled water	Yellowish green	Green	Green
3	Picric acid	Mild green	Mild green	Greenish yellow
4	Glacial acetic acid	Yellow	Mild orange	Yellow
5	1N HCl	Brown	Dark brown	Brown
6	1N H_2SO_4	Magenta	Magenta	Magenta
7	Conc. HNO_3	Yellow	Dark Yellow	Yellow
8	Ferric Chloride (5%)	Dark brown	Mild green	Green
9	Iodine solution (5%)	Mild yellow	Dark brown	Yellow
10	Ammonia solution	Green	Mild green	Yellowish green
11	1N NaOH	Green	Mild green	Orangish brown
12	Potassium dichromate	Green	Mild green	Dark brown
13	HNO_3 + NH_3 solution	Yellow	Orangish	Orangish brown
14	Methanol	Green	Grey	Green
15	Ethanol	Green	Mild green	Green
16	Toluene	Green	Yellow	Green

Table 3- Florescence characteristic of different extracts of *Euphorbia neriifolia* Linn.

S.N.	Solvent	Under Ordinary light	Under UV light (366 nm)
1	Pet-ether extract (L)	Yellowish green	Mild green
2	Benzene extract	Dark green	Mild blue
3	$CHCl_3$ extract (L)	Light green	Light green
4	Ethyl Acetate extract (L)	Brownish green	Greenish brown
5	Ethanolic extract (L)	Dark brown	Purplish Brown
6	Aqueous extract (L)	Dark Brown	Blackish brown
7	Aqueous extract (S)	Dark Brown	Blackish brown

(L)- Leave extract (S)- Stem extract

4. DISCUSSION

Fluorescence is a critical marvel shown by different concoction constituents present in plant material. A few constituents indicate fluorescence in the unmistakable range in sunshine. The ultra violet light delivers fluorescence in numerous characteristic items (for example alkaloids like berberine), which don't noticeably fluoresce in sunlight. On the off chance that the substances themselves are not fluorescent, they may frequently be changed over into fluorescent subsidiaries or decay items by applying distinctive reagents, subsequently some rough medications are regularly surveyed subjectively thusly and it is an essential parameter of pharmacognostical assessment. [17-19]

The qualitative chemical evaluation of the drug was carried out with different concentrated mineral acids. The hues delivered by these reagents speak to the nearness of dynamic constituents. The fluorescence character of any powdered character of any powdered medication is exceptionally unmistakable and supportive distinctive highlights for the assurance of a medication. The

examination of powdered medication under bright light sets up the shade of the medication, all things considered and after treatment with various reagents.

5. CONCLUSION

In creating nations more than 80 percent of the populace depends on conventional medications, for the most part plant drugs, for their essential social insurance. The present study was conducted to evaluate the standardizing parameter for qualitative chemical evaluation of Euphorbia neriifolia Linn. with respect to fluorescence activity. The dried powder and herbal extracts of Euphorbia neriifolia Linn. leaves and stem showed varied fluorescence character which is an essential parameter for standardization of herbs.

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CONFLICTS OF INTEREST

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

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