

Biochemical Estimation of Primary Metabolites of *Euphorbia neriifolia* linn

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ABSTRACT

Euphorbia neriifolia belongs to family euphorbiaceae which consist of herbs, shrubs trees and cactus growing in different altitudes, *E. neriifolia* is found in rocky areas. It is full of spines popularly known as sehund, thohur and milk hedge. The present investigation is the estimation of primary metabolites content in the various plant parts, the investigation revealed that the maximum amount of starch, ascorbic acid, lipids and protein were present in leaves. Maximum amount of total soluble sugars were present in stem. Flowers contained the largest amount of phenols.

I. INTRODUCTION

Plants have the ability to synthesize wide range of chemical compounds, which are used to perform important biological function and also to defend it from predators like insects, fungi and herbivorous mammals. Many of these phytochemicals have beneficial effects on long term health and also in the cure of human disease. At least 12000 such compounds have been isolated, which is actually about less than 10% of the total (Tapsell, L.C, Hemphill I, Cobiac L, *et al* 2006). These medicinal plants or herbs also show the antimicrobial and chemo preventive properties (Lai PK and Roy J 2004). Ethno botany is recognized as the effective way to discover future medicine. In 2001, researchers identified 122 compounds which are used in modern medicine, 80% of them have the ethno medical use of the active element of the plant (Fabricant DS, Farnsworth NR, 2001).

Euphorbia neriifolia of euphorbiaceae family have the highest number of species around the world (Murillo, 2004). This family consists of the latex bearing plants in habiting the arid part of the world. Known ingredients of latex are proteins, alkaloids, tannins, terpenes, starch, sugar, oil, resins, gums, and enzymes (Pandey, 2001). This plant have anti-inflammatory properties so great effort has been made to identify Euphorbiaceae derived therapeutic target against different human diseases (Garcia 1975; Bentancur galvis *et al*, 2002; Muthu *et al*, 2006) in the traditional system leaves are used as afrodisiac, diuretic and in cough and cold. It is also used in the treatment of bronchitis, bleeding piles (anorectal fistula). The tribal population of Chhattisgarh region uses the milky latex as an ingredient of afrodisiac mixture. Latex is used to de-root skin warts, in earache and arthritis.

The presence of these medicinal activities is due to presence of different metabolites i.e. primary metabolites and secondary bioactive compounds. Primary metabolites are of prime importance and are essentially required for example sugar, protein, lipid, starch. Many primary metabolites act as precursor of pharmacologically active metabolites.

The present study deals with the study of primary metabolites in different plant parts of *Euphorbia neriifolia* linn

II. EXPERIMENTAL SECTION

Collection of Plant Material: Plant material was collected from the eastern outskirts hilly areas of Harmada region which is 15 KM away from Jaipur It was then authenticated by Herbarium, Department of Botany, University of Rajasthan, Jaipur. The identification number given by the herbarium is RUBL209013.

Preparation of Extracts: The stem leaves and fruits of *Euphorbia neriifolia* linn was properly washed under tap water, shade dried and powdered. All the plant parts were then evaluated quantitatively to estimate the total levels of soluble sugars, starch, proteins, lipids, phenols, and ascorbic acid following the established methods for the sugars, starch (Dubois M, Gilles K, Hamilton JK, Rebers PA and Smith,1951), protein (Lowry OH, Rosebrough NJ, Farr AL and Randall RJ,1951), lipids (Jayaraman J, 1981), phenols (Bray HG and Thorpe, 1954), amino acid (Roe JH and Kuether CA ,1943), ascorbic acid (Lee YP and Takahashi T, 1966). All experiments were repeated five times for precision and mean values were taken.

III. RESULTS AND DISCUSSIONS

All the plant parts of *Euphorbia neriiifolia* linn were evaluated quantitatively for the analysis of total soluble sugars, starch, protein, phenol, lipid, and ascorbic acid.

Plants are rich sources of high value metabolites like proteins, phenols, sugars, starch, lipids, amino acids and ascorbic acids which are directly involved in the normal growth, development and reproduction and are useful in flavoring, fragrances, insecticides, sweeteners and natural dyes (Kaufman PB, Duke JA, Briclman H, Cseke S and Warber S, 1999).

Starch is biodegradable and renewable in nature. They are increasingly being considered as an eco-friendly alternative to the use of synthetic additives in many other products, including plastics, detergents, pharmaceutical tablets, pesticides, cosmetics and even oil-drilling fluids. The highest amount of starch was observed in stems i.e. 1.98mg/gdw. and minimum amount was observed in leaves i.e. .09mg/gdw.

Quantitative estimation of sugar shows that content of sugar is highest in stems i.e. 6.80 mg/gdw. and minimum i.e 3.00 mg/gdw. in flowers.

Plant sugars can be used as artificial sweeteners and they can even help diabetics by supporting the body in its rebuilding (Freeze H, 1998).

The total levels of lipid were found to be higher in leaves i.e. 63 mg/gdw. and lowest in roots and flowers i.e. 55 mg/gdw. The higher amount of plant lipid can be used as essential oils, spice oleoresins and natural food colors. With a strong foundation in research and development, plant lipids have developed products that work with diverse requirements, be it culinary, medicinal or cosmetic (Yadav PR and Tyagi R, 2006).

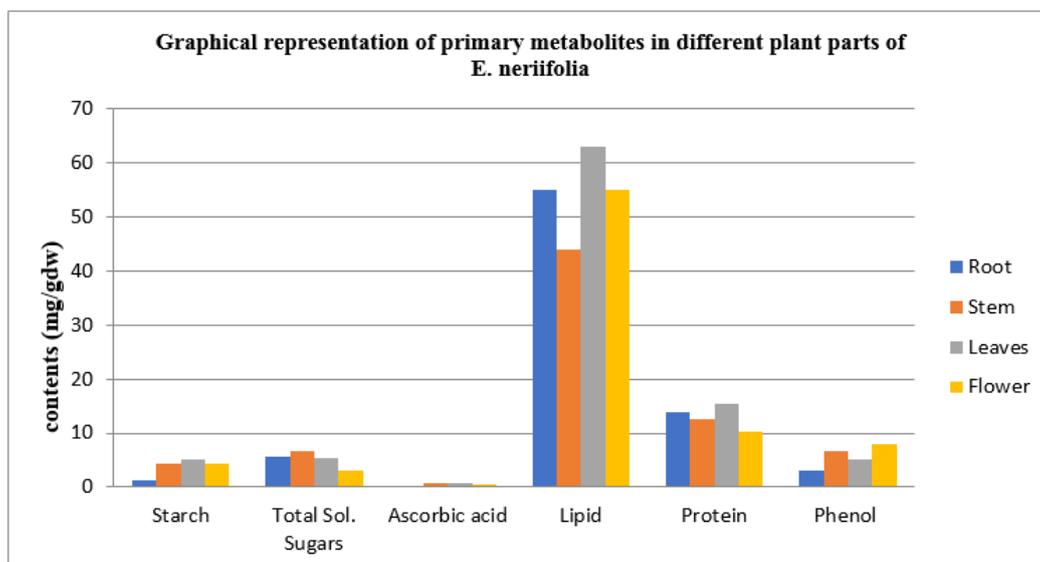
Ascorbic acid (vitamin C) is a familiar molecule because of its dietary significance, most aspects of its metabolism and some aspects of its function in plants are very poorly understood (Nicholas, 1996). Total levels of ascorbic acid were found to be highest in leaves i.e. 0.88 mg/gdw and minimum in roots i.e. 0.12 mg/gdw. .

Proteins are the primary components of living things. The presence of protein level in the plant points towards their possible increase food value or that a protein base bioactive compound could also be isolated in future 21. Total levels of protein were found to be highest in leaves i.e. 15.55 mg/gdw. and minimum in flowers i.e. 10.30mg. Total levels of phenols were found to be highest in flowers i.e. 8.0mg/gdw. and lowest in roots i.e. 3.2mg/gdw.

The higher amount of phenols is important in the regulation of plant growth, development and diseases resistance. It can be used as fungicide, pesticides, an antiseptic, disinfectant and in the manufacture of resins, explosives, plastics, detergents and pharmaceutical substances.

TABLE 1: CONCENTRATION OF PRIMARY METABOLITES *Euphorbia neriiifolia* linn (MG/GDW)*

	root	Stem	Leaves	flower
Starch	1.26	4.32	5.26	4.50
Total soluble sugar	5.60	6.80	5.45	3.00
Ascorbic acid	0.12	0.76	0.88	0.62
Lipids	55	44	63	55
Proteins	13.93	12.53	15.55	10.30
Phenols	3.2	6.8	5.2	8.0



IV. CONCLUSION

Euphorbia nerifolia linn contain many primary metabolites like carbohydrates, proteins, phenols, lipids, amino acids and ascorbic acids. Highest amount of soluble sugar were found to be in stems (6.80mg/ gdw.), starch in Leaves (5.26mg/gdw.), lipids in leaves (63mg/gdw.), proteins in leaves (15.55mg/gdw.), phenol in flowers (8.0/gdw.) and ascorbic acid in leaves (0.88mg/ gdw.). These results are suggestive of primary bioactive compound of commercially importance and may result in great interest in plants pharmaceuticals. These primary metabolites further used for biosynthesis of secondary metabolites or bioactive compounds (Vijayvergia R and Kumar J, 2007).

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