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### Antioxidant property of medicinal plants locally available in Assam

**Dr. Rita Nath, KK Baruah, Satya Sarma, Robin Bhuyan, DC Roy and Mithu Dutta**

#### Abstract

The purpose of this study was to estimate the Vitamin C and Vitamin E content of selected plant leaves to know their antioxidant property. The leaves were collected from different places of Nagaon district, Assam as very little study has been done from this area. After collection the leaves were sun dried and ground with the mixer grinder and stored in plastic containers at room temperature till analysed. Vitamin C and Vitamin E were estimated by Spectrophotometer method. After analysis it was observed that Vitamin C content was 10.37, 17.18, 31.25, 11.62, 9.87, 12.20, 17.44, 22.09, 4.65, 19.18, 9.3 and 18.02 mg/100g and Vitamin E content was 45.05, 35.54, 53.98, 49.46, 41.57, 29.39, 37.11, 47.43, 42.96, 48.99, 47.54, 49.34 μ/gm for *Artocarpus heterophyllus*, *Carica papaya*, *Terminalia bellirica*, *Tinospora cordifolia*, *Bryophyllum pinnatum*, *Terminalia chebula*, *Terminalia arjuna*, *Aegle marmelos*, *Murraya koenigii*, *Xanthium strumarium*, *Syzygium cumini*, *Psidium guajava* respectively. The data generated may be useful in exploring medicinal properties of plants.

**Keywords:** Vitamin C, vitamin E and plants

#### Introduction

Herbalism is a traditional medicine or folk medicine practice based on the use of plants and plant extracts. It is also known as botanical medicine, medical herbalism, herbal medicine, herbology and herblore (1). Plants have evolved the ability to synthesize chemical compounds that help them defend against attack from a wide variety of predators, such as insects, fungi and herbivorous mammals. By chance, some of these compounds whilst being toxic to plant predators treat human diseases (2). Plant-derived substances have recently become of great interest owing to their versatile applications. Medicinal plants are the richest bio-resource of drugs of traditional systems of medicine, modern medicines, nutraceuticals, food supplements, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs [3]. Extraction (as the term is pharmaceutically used) is the separation of medicinally active portions of plant (and animal) tissues using selective solvents through standard procedures. The products so obtained from plants are relatively complex mixtures of metabolites, in liquid or semisolid state or (after removing the solvent) in dry powder form, and are intended for oral or external use. Photochemical are plants secondary metabolites that have been used as drugs for millennia. Vitamins are organic compounds required as vital nutrients in tiny amounts by an organism. Vitamins serve as biocatalysts in many chemical reactions as well as precursors to various body factors. They also required for a variety of biological processes such as mental alertness e.g. Niacin, resistance to infections e.g. vitamin C. Although, the medicinal properties of these plant products are well recognised, data with regard to their chemical composition are scanty. It is necessary to evaluate the chemical composition of plants in addition to their components that promote health care. North East India is rich in flora and fauna but are not studied. The purpose of this study was to perform the Vitamin C and Vitamin E content of selected plant leaves locally available in NE region of India.

#### Materials and Methods

##### Sample Collection

The present study was conducted to determine the Vitamin C and Vitamin E contents in locally available leaves in Assam.

### Sample preparation

The plant materials were shade dried until all the water molecules evaporated and plants became well dried for grinding. After drying, the plant materials were grounded well using mechanical blender into fine powder and transferred into airtight containers with proper labelling for future use.

### Estimation of Ascorbic Acid

#### Extraction of sample

Grind 1gm of sample material using pestle and mortar in 25ml 4% Oxalic Acid. Centrifuge or filter and collect the liquid. Transfer an aliquot 10ml to a conical flask and add bromine water drop wise with constant mixing. The enolic hydrogen atom in ascorbic acid is removed by bromine. When the extract turns orange yellow due to excess bromine, expel it by blowing in air. Make up to a known volume 25ml with 4% oxalic acid solution.

#### Procedure

Pipette out 0.1ml of standard dehydroascorbic solution into a series of tubes. Similarly pipette out different aliquot 1ml of brominated sample extract. Make up to volume in each tube to 3ml by adding distilled water. Add 1ml of DNPH reagent followed by 1-2 drops of thiourea to each tube. Set a blank as above but with water in place of ascorbic acid solution. Mix the content of the tubes thoroughly and incubate at 37 °C for 3hr. After incubation dissolve the orange-red osazone crystals formed by adding 7ml of 80% sulphuric acid. Measure the absorbance at 540nm (4)

### Estimation of Vitamin E

#### Extraction of sample

Weigh accurately 0.5g of homogenized tissue into a stopper tube. Slowly add 10ml of 0.1N sulphuric acid without shaking. Stopper and allow the content to stand overnight. The next morning, shake the contents vigorously and filter Whatman No.1 filter paper. Use aliquot of the filtrate for estimation.

#### Procedure

Pipette out into three centrifuge tube (test, standard and blank) 1.5 ml of tissue extract. 1.5ml of standard and 1.5ml of water, respectively and cap the tubes. To the test and blank add 1.5ml of ethanol and to the standard 1.5ml of water and centrifuge. Transfer 1ml of xylene to each tube, close with the cap, mix and centrifuge. Transfer 1ml of xylene layer into another stopper tube taking care not to include any ethanol or protein. Add 1ml of 2, 2'-dipyridyl reagent to each tube, stopper and mix. Pipette out 1.5ml of the mixture into cuvette; read the extinction of test and standard against the blank at 460nm. Then beginning with the blank, in turn add 0.33ml of ferric chloride solution mix well. After exactly 15min read the test and standard against the blank at 520nm Rosenberg (1992) [5]

#### Calculation

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| $\text{Amount of tocopherol in } \mu\text{g/g of tissues} = \frac{\text{OD of test at 520nm} - \text{OD of test at 460nm}}{\text{Reading of standard at 520nm}} \times 0.29 \times 15 \times \frac{\text{Total volume of homogenate}}{\text{Volume used} \times \text{weight of the tissue}}$ |
|---|

### Results and Discussion

After analysis it was observed that Vitamin C content was 10.37, 17.18, 31.25, 11.62, 9.87, 12.20, 17.44, 22.09, 4.65, 19.18, 9.3 and 18.02 mg/100g and Vitamin E content was 45.05, 35.54, 53.98, 49.46, 41.57, 29.39, 37.11, 47.43, 42.96, 48.99, 47.54, 49.34µ/gm for *Artocarpus heterophyllus*, *Carica papaya*, *Terminalia bellirica*, *Tinospora cordifolia*, *Bryophyllum pinnatum*, *Terminalia chebula*, *Terminalia arjuna*, *Aegle marmelos*, *Murraya koenigii*, *Xanthium strumarium*, *Syzygium cumini*, *Psidium guajava* respectively. Natural ascorbic acid is very good for body performance. Lack of ascorbic acid impairs the normal formation of intercellular substances in the body viz., collagen, bone matrix and tooth dentine. The striking patho-physiological change resulting from this defect includes the weakening of the endothelial walls of the capillaries due to reduction in the amount of intercellular substances. Therefore, the clinical manifestations of scurvy haemorrhage from mucous membrane of the mouth and gastrointestinal tract, anaemia, pains in the joints can be related to the association of ascorbic acid. This function of ascorbic acid can also be accounts for its requirement in normal wound healing (6). As a result of the availability of ascorbic acid in *N. hindostana*, this plant may be used as herbal medicine in future for the treatment of various ailments.

### Conclusion

Conservation and use of medicinal plants has taken considerable amount of attention in recent years. The indigenous and marginal communities for curing various diseases from time immemorial have used it globally. Most of the plant species are also used as food supplement along with its oral decoctions. However, little have been done so far to

verify the uses in this regard. The present research is an effort in doing so. Our current study on vitamin C and E evaluation of *Artocarpus heterophyllus*, *Carica papaya*, *Terminalia bellirica*, *Tinospora cordifolia*, *Bryophyllum pinnatum*, *Terminalia chebula*, *Terminalia arjuna*, *Aegle marmelos*, *Murraya koenigii*, *Xanthium strumarium*, *Syzygium cumini*, *Psidium guajava* had revealed that these plants are good source of vitamin C and E.

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