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# Study on *Artabotrys Hexapetalus* Flower and its Application

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**ABSTRACT:** *Artabotryshexapetalus* is a flower that belongs to Annonaceae our aim is to identify the different characteristics of the flower and to explore the phenolic and antioxidant activity of the flower extract with various solvents and by varying the temperature of drying. The application step was also taken to an extent of developing herbal tea from the powder. It was identified that the flower exhibited significant antioxidant and phenolic activity with both extract on all the solvents used. and the polyphenol was identified to be great in the temperature of 45°C. Our research shows the potential scope of *A. hexapetalus* to be used as natural additive or for bio fortification while developing the functional foods and also preservative for bio film etc

**KEYWORDS:** Extraction, solvent, total polyphenolic content, antioxidant activity

## I. INTRODUCTION

*Artabotryshexapetalus* also known by its common name in India as Hari Champa has absolutely intoxicating fragrance. This species is native to India and tropical Asia. A medium size climbing shrub 8-10 ft, producing flowers that are greenish in color and fade to yellow with age, and are extremely fragrant. Once picked they are very long lasting and hold their scent for days, if kept in water, permeating an entire room. Flowers have three outer and three inner greenish yellow petals - hence the name *A. hexapetalus*. It is a fruity sweet smell

It is commonly cultivated as an ornamental in the tropics, especially in southern China, Indo-China, the Philippines and also in Java, valued especially for the intoxicating aroma of the flowers. Once picked, the flowers are very long lasting and hold their scent for days, if kept in water, permeating an entire room. Evaluation and selection of extraction methods are dependent on the study objectives, samples and target compounds. Volatile substances are generally present at low concentrations and must be extracted from the plant matrix before they can be analyzed. They are known to be thermally sensitive and vulnerable to chemical changes, thus adequate care is required in selecting an extraction method. Loss of some volatile compounds, low extraction efficiency, degradation of unsaturated or ester compounds through thermal hydrolytic effects and toxic solvent residue in the extract are some of the challenges encountered when using different extraction methods. These shortcomings have led to the consideration of the use of new green extraction techniques and procedures that may contribute to environmental preservation by reducing the use of solvents, fossil energy and generation of hazardous substances

## II. RELATED WORK

[1] Flavonoids from *Artabotryshexapetalus* et al [2] Formulation of Substantial Natural Flavors from Plant Materials for Food and Beverage Industries Mesfin, et al [3] Flavonoid and megastigmane glycosides from *Artabotryshexapetalus* leaves Jamnian Somanawat, Nusorn Talangsri, Saijai Deepolngam, Rawiwun Kaewa et al [4] Extraction methods for the determination of phenolic compounds from *Equisetum arvense* L herb by Anna Oniszczuk, et al [5] Chemical composition of hibiscus L. flower A study of extraction methods by Maria Ines Melcchi, Migdalia M. Martinezal, APR 2002

[6] Antifungal and Antifumonisin activities of chemically characterized Essential oil of *Artabotryssodoratissimus* by Housur Narayanappa Venkatesh, Tungeti Sudharshana, Borah Nayana, Kiragandur Manjunath al., SEP 2018 [7] Fatty acid degradation in different maturity stages of Kradang Nag Chin (*Artabotryshexapetalus*) flower - Noichinda S, Bodhipadma K, Puangsiri Chikhuntod 2014 [8] Flavour extraction from mono bora myristica and tetrapleura tetraptera land production of flavoured popcorn from the extract - Enwereuzoh, R.O Okafor, B. CU Zoukwu 2010 [9] Investigation of In-vitro Anthelmintic and cytotoxic Activities of *Artabotryshexapetalus* (Family;



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### III .METHODOLOGY

#### Analysis

Antioxidant activity and total phenolic content was analysed for the solvent extract both the fresh flowers and the flowers dried at varying temperature

#### Extract preparation

##### Fresh flower extract

The fresh flower procured from the supplier of quantity 150g was crushed using mortar and pestel after removing stalk,pollen and washing of flowers with fresh water distilled water and ethanol(99%) grade was used as solvents.The extraction was performed by hydrodistillation and maceration with both ethanol and water as solvent of quantity 250ml for 2-3 hours and the extract was stored in refrigerated condition 4-5°C until further analysed

##### Drying of flowers

The flowers were dried using tray dryer at 40°C,45°C ,50°C and 55°C after removing the pollens, stalk and washing with water the dried flower petals were grinded in blender and it was sieved with the size of 500micron.The sieved powder was stored in air tight container avoiding exposure to air and sunlight and wad stored at 4-5°C until further analysed for identification of optimal drying condition

##### Antioxidant activity

The classical method to determine the scavenging activity of plant extract is evaluated by easuring the disappearance of H<sub>2</sub>O<sub>2</sub> at the wavelength of 240nm.it is a simple and rapid colometric assay developed to determine the H<sub>2</sub>O<sub>2</sub> scavenging activity of plant extracts and standard antioxidant based on the reaction system.The antioxidant activity of the fresh and dried flower extract was identified by using H<sub>2</sub>O<sub>2</sub> assay.H<sub>2</sub>O<sub>2</sub> 400µl was taken in different test tubes for blank,standard and sample fot100µl sample and standard which is gallic acid 500µl of phosphate buffer and made upto 4 ml the identical reaction mixture without standard and sample acted as blank .The test tubes were covered with Aluminium foil incubated under dark condition for 30 minutes and the absorbance was measured at the wavelength of 240nm against phosphate buffer.The results were plotted in graph against standard graph and the concentration was obtained and expressed as gallic acid mg/ml



**IV. EXPERIMENTAL RESULTS  
FRESH FLOWER EXTRACT**

Fresh flower extract was obtained through different methods and solvents using different solvent and was further analysed for different parameters

FIG (A)

FIG (B)

FIG (C)

FIG (D)

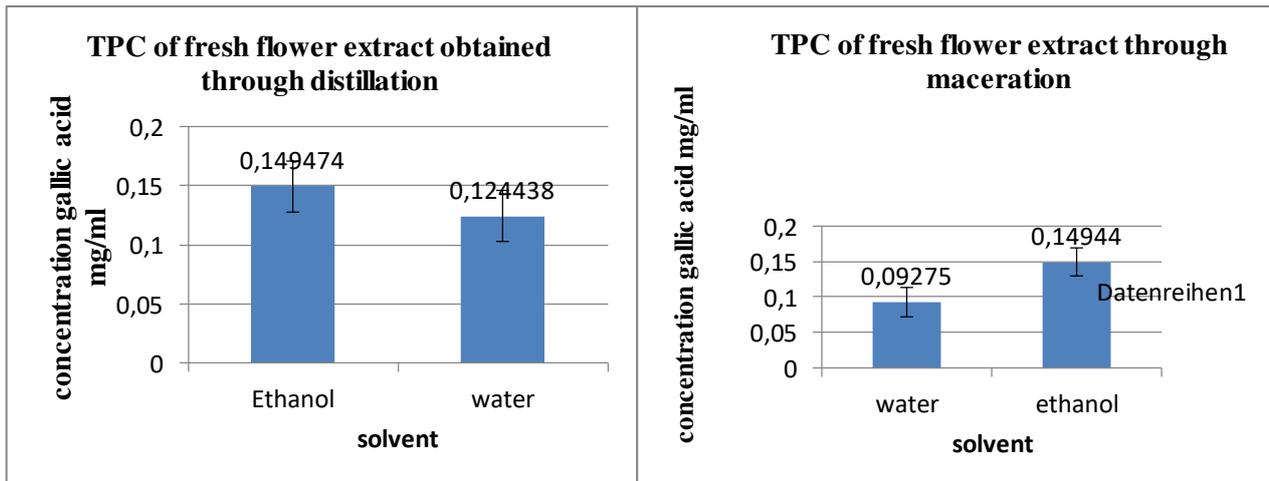
MACERATED ETHANOL EXTRACT    MACERATED WATER EXTRACT    DISTILLATED WATER EXTRACT    DISTILLED ETHANOL EXTRACT



1. The extract obtained are shown in Fig (a) extract obtained through maceration using ethanol as solvent Fig (b) extract obtained through maceration using water as solvent Fig (c) extract obtained through distillation using water as solvent Fig (d) extract obtained through distillation using ethanol as solvent

**TOTAL POLYPHENOLIC CONTENT AND ANTIOXIDANT ACTIVITY**

The total polyphenolic content and antioxidant activity of fresh flower extract obtained through various methods and solvents and dried flower sample at various temperature was analysed using U-V spectrophotometer at the wavelength of 760nm and 20nm for polyphenolic content and antioxidant activity respectively and the results were plotted in graph



FIG(A) TOTAL POLYPHENOLIC CONTENT

FIG (B) TOTAL POLYPHENOLIC CONTENT

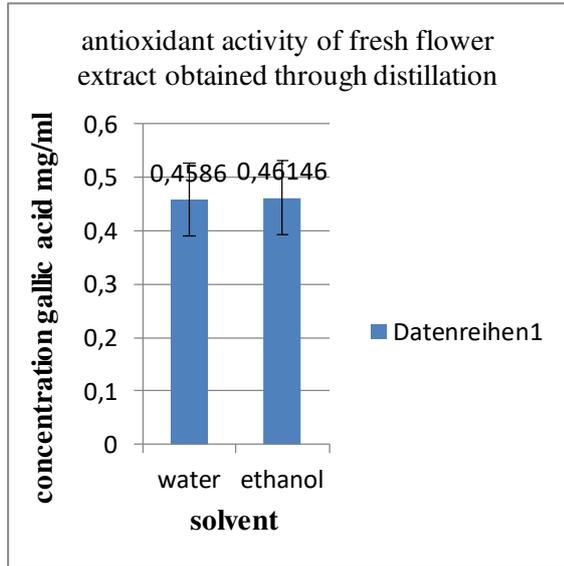
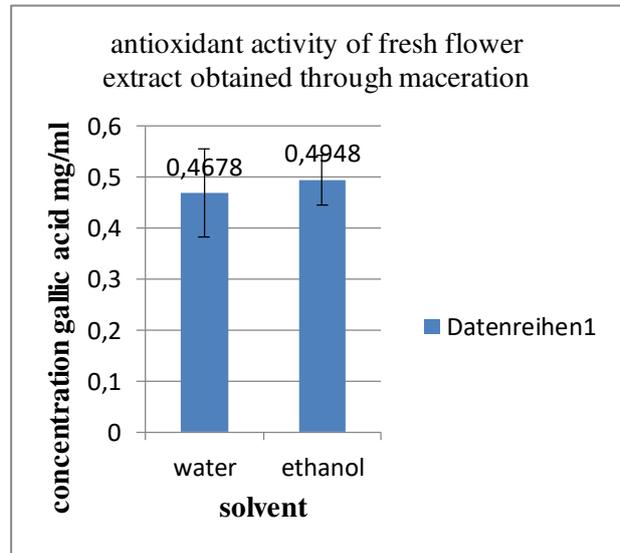


FIG (C) ANTI OXIDANT ACTIVITY



FIG(D) ANTI OXIDANT ACTIVITY

The total polyphenolic content and antioxidant activity of the fresh flowers obtained through various methods and solvents are mentioned in the graph. FIG(a), FIG.4.2(b), FIG(c) and FIG(d). It clearly shows that in both of the extraction methods water and ethanol exhibit moderate amounts of total polyphenolic content and antioxidant activity; therefore, the physicochemical parameters are greatly influenced by the solvent used for extraction.

**DRYING RATE**

The drying rate of the flower sample in a tray dryer at various temperatures was obtained through the drying curve. The constant weight obtained by the flower at each temperature was plotted as graph 3.a.

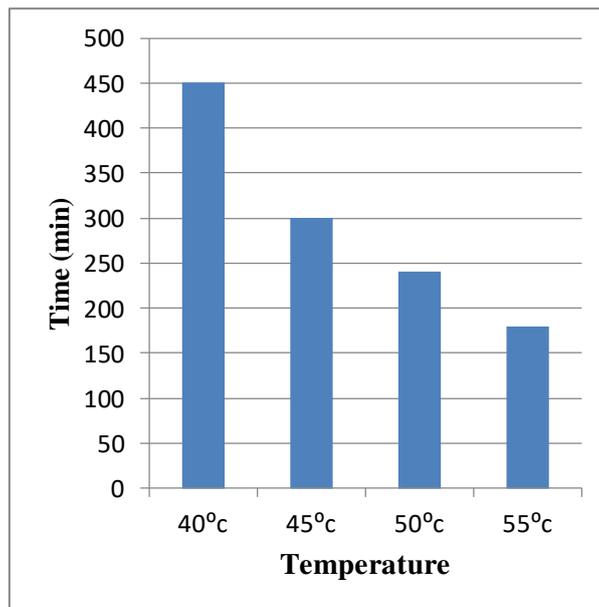


Fig.a (DRYING RATE)

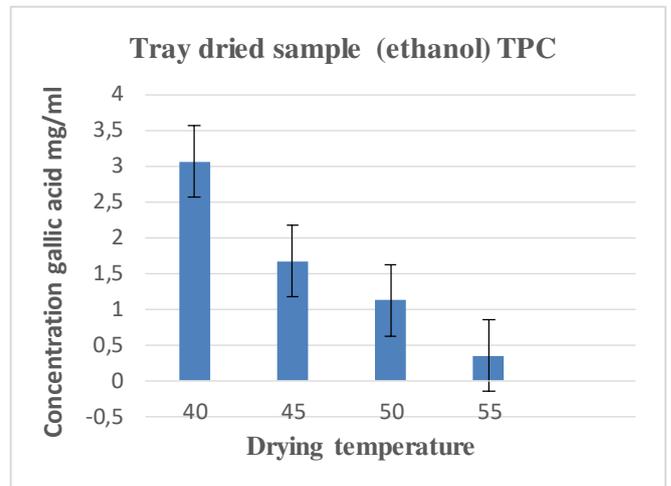
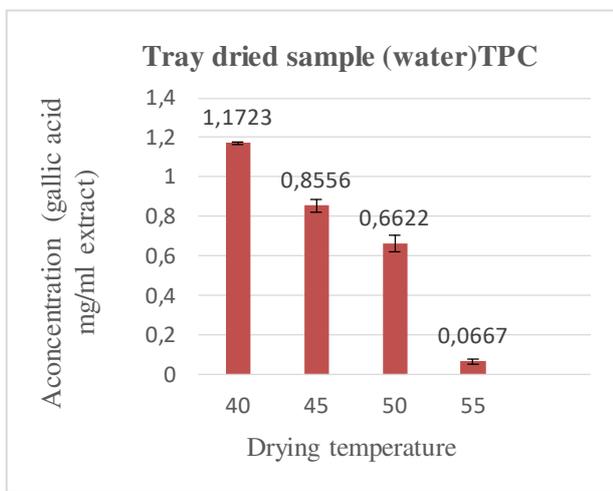


From the graph we can observe that there was a constant fall on the weight of the flower at each temperature 12g and the time varied with respect to temperature the maximum time was taken when the flowers were dried at 40°C and minimum time was taken when dried at 55°C.

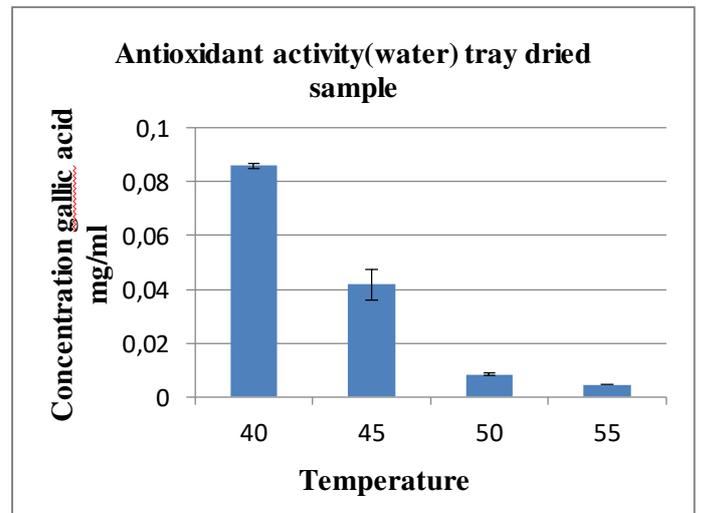
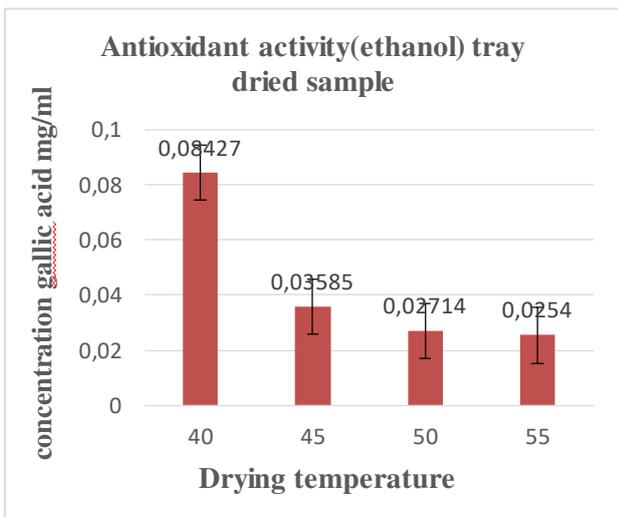
**TOTAL POLYPHENOLIC CONTENT AND ANTIOXIDANT ACTIVITY OF TRAY DRIED SAMPLE**

4. The powder sample obtained by drying at each temperature was analysed for total polyphenolic content and antioxidant activity and the results are shown in the graph

**FIG (A) TOTAL POLYPHENOLIC CONTENT FIG (B) TOTAL POLYPHENOLIC CONTENT**



**Fig (c) Anti oxidant activity Fig (d) Anti oxidant activity**





## V. CONCLUSION

This study shows that *A.hexapetalus* flower has a potential antioxidant on the scavenging capacity of hydrogen peroxide and it can be used as a curative against free radical disease. It also clearly shows that the significant amount of total polyphenol content is due to the presence of secondary metabolite which is sesquiterpenes. *Artabotryshexapetalus* belongs to the family of Annonaceae containing approximate 128 genera which are generally considered to be a natural family which includes trees shrubs. The oil from the flower is extensively used in aromatherapy and it has several positive chronotropic and ionotropic effect and also as mind stimulant and relaxing agent. The same species in china is used in several areas like flavouring agent, scented beverages and as antioxidant agent but the indigenous species of this plant still remains unexplored and widely being used only for ornamental purposes. The extract from this flower can be used as preservative and additives in beverages and other functional foods. It has a huge scope in the field of food technology that serves various purposes. Future work has to be done on the flavour extraction and clinical trials.

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