



HIBISCUS PETAL EXTRACTION FORTIFIED FRUIT JUICE- A HEALTH DRINK.

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Abstract:-

The aim of this paper was to bring out the beneficial properties present in petals of hibiscus flowers and their fortification in fruit juice. One of the flowers of Indian Subcontinent is "Hibiscus rosa sinensis" which is rich in antioxidants, anthocyanins, flavonoids. Main coloring pigment is anthocyanin which is proved to cure cancer, lower down cholesterol level and clear the digestive tract. Freshly plucked hibiscus flowers were taken and their petals were removed by hand. Petals were put in a tray drier for drying at 51.8°C. After drying they were crushed into fine pieces manually. 100 grams of powdered leaves were obtained. Anthocyanin being water soluble, the powder was boiled in water at 80°C. The anthocyanin pigment was extracted in liquid form. It was mixed with lime juice and polyphenol content was measured by gallic acid equivalent method. Final product obtained showed 13 times increase in polyphenol content compared to commercially available fruit juice. Hence the above juice can be used as an effective health drink for human consumption and protect the body from free radical damage.

Keywords: - Anthocyanins, polyphenols, gallic acid equivalent method.

INTRODUCTION

Flowers and other parts of the plant are used to make medicine. Hibiscus is used for conditions such as high blood pressure, high cholesterol, increasing the production of breast milk etc. It is a flower which is widely grown in the Indian subcontinent and is available around the year. Many varieties are available worldwide among which the variety which is widely available in India is "Hibiscus rosa sinensis". The herb "Hibiscus rosa sinensis" (Malvaceae) is native to China. Many species of Hibiscus are grown for their showy flowers. It is a shrub widely cultivated in the tropics as an ornamental plant and has several forms with varying colors of flowers. Hibiscus has also medicinal properties and takes part as a primary ingredient in many herbal teas. The red flowered variety is preferred in medicine as reported by Vincenta Khristi and V. H. Patel (2nd November, 2016). According to Pragya Singh et al (31st May, 2017), the flower plays a crucial role in treating medical problems including many cardiovascular disorders, helmenthic disease and cancer. The plant also act as an anti oxidant and used in obesity management. The vitamin C naturally found within the hibiscus works to complement the iron, increasing its absorption in blood and acts effective cure for anemic patients. Anthocyanin-rich mixtures of bioflavonoids may provide protection from DNA cleavage, estrogenic activity, enzyme inhibition, boosting production of cytokines, anti-inflammatory activity, decreasing capillary permeability and fragility, and membrane strengthening Mary Ann Lila (12th May, 2004). Being water soluble the pigment can be easily extracted by using water and thus by fortifying it with regular food items can serve as beneficial and cheap source of nutritional super foods. Studies of Yasuyuki Nakamura et al (8th September, 2014) showed that red colored pigments which are present in the flower are mainly anthocyanins which have been widely used as coloring agents. Major content present is cyanidin-3- sambubioside and delphinidin-3-sambubioside from which the conclusion comes that the major component in the petals of hibiscus flower is cyaniding-3-sambubioside, although it contain many other strains of anthocyanins including many hybrid forms so it is still a question that whether every hibiscus flower produces cyaniding-3-sambubioside as the major anthocyanin flora or not. Research of Jadhav et al (2nd July, 2009) all the parts of "Hibiscus rosa sinensis" and chemical constituents are used as anti-tumor, antifertility, antiovolutory, ant implantation, anti-inflammatory, analgesic, ant estrogenic, antipyretic, antispasmodic, antiviral, antifungal, antibacterial, hypoglycaemic, spasmolytic, CNS depressant, hypotensive and juvenoid activity. As recommended by the "World Health Organization" the traditional health and folk medicine systems have proved to be more effective in health problems worldwide. Hibiscus flower is certain to emerge in the near future as a major player in the growing field of herbal health supplements and medicines both in daily self-care and in professionally managed health care system.

Fresh bright red colored hibiscus flowers were plucked. Eight flowers were taken and manually the petals were separated out from the flowers. The petals were uniformly placed on a stainless steel tray and they were put inside a tray drier for drying. Temperature of the tray drier was kept at 51.8°C (Manufacturer: - Suan Scientific Instruments and Equipments, six tray capacity). After four hours the drying procedure was done. The dried petals were now crushed into fine pieces according to the studies of R.Ramprasath et al (May, 2017). 100 ml of water was taken and the dried petal pieces were put inside it and mixed together and heated at 50°C as anthocyanins are water soluble according to the work of Luis E. Rodriguez-Saona and Ronald E. Wrolstad (1st August, 2001) .The pigment was now extracted in the water. The excess pieces were sieved out manually from the liquid extract and the clear extract with the pigment was obtained. This extract which was obtained with the pigments was put in a freeze drier (Model- FDU-1200 with vacuum pump, manufacturer- Eyela) and the anthocyanin pigment was obtained in powder form. Fresh lime fruit was cut into equal halves and were manually extruded to obtain the juice. The powdered pigment extract was added to the lime juice obtained and kept in refrigeration for three days. After three days the polyphenol content of the product was measured using a UV Vis spectrophotometer (Jasco V 630 Spectrophotometer) at wavelength of 760 nm considering gallic acid equivalence as the standard frame of reference was taken as the solution. For analysis of polyphenol content, methanol was used as the solution.

METHODS

Fresh bright red colored hibiscus flowers were plucked. Eight flowers were taken and manually the petals were separated out from the flowers. The petals were uniformly placed on a stainless steel tray and they were put inside a tray drier for drying. Temperature of the tray drier was kept at 51.8°C (Manufacturer: - Suan Scientific Instruments and Equipments, six tray capacity). After four hours the drying procedure was done. The dried petals were now crushed into fine pieces manually as per the studies of R.Ramprasath et al (May, 2017). 100 ml of water was taken and the dried petal pieces were put inside it and mixed together and heated at 50°C as anthocyanins are water soluble according to the work of Luis E. Rodriguez-Saona and Ronald E. Wrolstad (1st August, 2001) .The pigment was now extracted in the water. The excess pieces were sieved out manually from the liquid extract and the clear extract with the pigment was obtained. Fresh lime fruit was cut into equal halves and were manually extruded to obtain the juice. The pigment extract was added to the lime juice obtained and kept in refrigeration for three days. After three days the polyphenol content of the product was measured using a UV Vis spectrophotometer (Jasco V 630 Spectrophotometer) at wavelength of 760nm considering gallic acid as the standard frame of reference. Methanol was used as the solution for analysis of polyphenol content.

RESULTS

Weight of tray-400 gm

Weight of tray + hibiscus petals-421gm

Weight of hibiscus petals -21gm

Weight of hibiscus petals after four hours-1.95gm

Percentage of Moisture Content removed (Wet Basis) =90.71%

Percentage of Moisture Content removed (Dry Basis) =976.92%

Volume of lime juice obtained=800ml

Volume of pigment extract obtained= 100ml

Amount of anthocyanin pigment powder obtained after freeze drying=20 gm

Total amount of final product (Anthocyanin fortified lime juice) =900ml

0.2gm of anthocyanin powder was added to 200 ml lime fruit juice (0.1% weight/volume ratio).

Table 1.0 showing the amount of polyphenol content obtained for the pigment fortified fruit juice using two different solvent:-

Serial No.	Solvent Used	Degree of dilution	Wavelength used(nm)	Polyphenol content(mg gallic acid/ 100 gram)
1	Methanol	None (Raw sample)	760	1594
2	Methanol	10 times	760	1520
3	Water	None (Raw Sample)	760	1485
4	Water	10 times	760	1320

Average value of polyphenol content obtained from Table 1.0 is 1479.95mg gallic acid /100 gram.

As per findings of Mondello et al. (1st September,2000) polyphenol content in orange juice was 217 mg GA/100 g, 134 mg GA/100 g in pineapple. Compared to these values, the value which was obtained for lime juice fortified with anthocyanin pigment extracted from hibiscus petals provided with a higher result of approximately 1480 mg gallic acid equivalents/100 gm or 1.479 gram gallic acid/100gram.

CONCLUSIONS

The conclusion can be reached that the following product prepared can be used as an effective health drink as it is enriched with freeze dried antioxidant pigment. The fruit juice selected is lime juice which provided an excellent platform as it is an immense source of Vitamin C which is a natural antioxidant and due to the low pH concentration it acts as a natural preserving agent as showed by the works of Michele Varvara et al (5th February, 2016) and hence providing with the necessary nutritional requirement and can act as an effective nutraceutical.

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