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### PREPARATION OF GILOY BARK INCORPORATED ORANGE SQUASH

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**Abstract:** Giloy bark and orange were taken as key ingredients for the preparation of value added product squash. When value addition is performed in any existing product or an entirely new product is developed this process is called new product development. Objective: To prepare a nutrition rich beverage using giloy. Firstly, giloy juice was extracted and mixed at four different proportions (10, 20, 30, and 40 mL) along with orange juice in squash preparation. On performance of sensory evaluation, it was found that T2 that is sample with combination (80:20) found to be most acceptable to the panel having a mean over all acceptability score of 4.40. Vitamin content increased in the product in nutrient analysis. The acceptability of the squash decreased with consequent increase in the giloy bark juice content decreasing amount of orange squash in T3 and T4 respectively. Hence the sample having combination (80:20) was most favorable. Glass bottles were used to store the standard as well as other samples and study was conducted for shelf life for a period of three weeks. The product on storage had no microbial growth and sensory scores were within the acceptable range. Prepared product is a novel, nutritious fruit based beverage.

**Keywords:** Preparation; Giloy; Incorporation; New product; Orange.

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### INTRODUCTION

The herbal medicine is being used widely for its remedial purposes and have acquired great support in the developing world. Due to toxicity and side effects of allopathic medicines, there has been a considerable increase on dependence on its use. Traditional medicines are being used by more than 75% of the population in our country for their primary health care and other purposes. Consequently, an immense need for the acceptance of the remedial and economic benefits of flora and fauna, which are found mostly in Himalayas. *Tinospora cordifolia* (Menispermaceae) widely acknowledged as Giloy, a mythical name is cited to the holy Elixir. Giloy is valued in the classical healing system since a long time. Its stem and particularly roots are valued as herbal medicines. The plant can be

identified in tropical and also subtropical areas of our subcontinent which stretches from Himalayas to the south. Its known by a broad, smooth, deciduous ascending shrub. The stem of the plant is bitter in taste and encourage secretion of bile juice from pancreas. It has been used for curing jaundice. It is one of the best treatment for most of the children who are experiencing respiratory tract infections (Vedavathy and Rao 1991). The raw juice of dehydrated stem of *Tinospora cordifolia* amplify immune system related responses (Manjrekar *et al.* 2000). The extract of *cordifolia* has an anti- hyperglycemic property (Rajalakshmi *et al.* 2009). The plant may help to amplify the phagocytic and also leucocytes cells (Dikshit *et al.* 2000). Over a long period of time people has been consuming it in the raw form as a medicinal and therapeutic measure in treating

most of the diseases. Some work has to be performed on the assessment of various quality characteristics and formulation of Giloy product. Alkaloids, steroids, aliphatic compound, glycosides, essential oils, mixture of polysaccharides and fatty acids are identified in the giloy. The alkaloids comprise of ammonium salt, bitter gilonin, non-glycoside gilonin gilsterol. The major phytoconstituent in *Tinospora cordifolia* are tinosporine, tinosporide, tinosporaside, cordifolide, cordifol, heptacosanol, clerodane furano diterpene, diterpenoid furanolactone tinosporidine, columbin and b-sitosterol. Berberine, Tembertarine, Palmatine, Choline, Magniflorine, and Tinosporin are found in its stem. Pharmacological Activities of *Tinospora cordifolia* are widely used in the world. In ayurvedic medicine, giloy is having a very good impact in the maintenance of overall health including reproductive system. Perhaps it has been adopted to conduct treatment for various conditions, such as gout, jaundice and also tuberculosis, however some of the therapeutic uses are being upheld by scientific proof. (Singh *et al.*, 2013).

Orange (*Citrus cinensis*) is the most common winter fruit. It is primitively found in north eastern India and also in China and south eastern Asia. In China around 2500 BC farming of orange was first recorded. There has been found significant increase in volume of production and also consumption. This increasing trend grows every year. Lately the production of oranges jumped to around 50 million tons around the world. Brazil is the prominent country in production of oranges accounting for approximately 35.6 million tons and having about 30% of the output of the world. Essentially orange juice is exploited as a fruit juice all over the globe and is usually extracted from the Orange fruit endocarps (Galaverna *et al.*, 2014). It provides a good amount of vitamin C up to 65% and also is a rich source of potassium, folic acid and a good source of bioactive anti-oxidant. Representative of French population found that orange contributes 16% of the daily vitamin C consumption for adults and about 31% vitamin C

intake for children (Rolle *et al.*, 2016). Health benefits of oranges play crucial roles in human life. Recently the utmost familiar reason of premature death in the world is heart disease. Flavonoids (Hesperidin) found in oranges, have the capability to defend body against heart disease. It is a major recognized source of antioxidant and fiber which benefits in reduction of the risk of heart disease. Orange juice can be used to prevent kidney stone formation which can be largely attributed to the citric acid and citrate found in the oranges (Asgary and Keshvari, 2013).

The foundation of the squash is made by the Citrus fruits (particularly orange, lime and lemon) or a blend of fruits and berries. Blackcurrant with apple, grapes with pomegranate, and raspberry, orange or peach with mango are some of the favored blends. Less popular single-fruit squashes are also produced, such as pineapple, pomegranate, raspberry, and strawberry. Blending is the process of combining varieties or grades of the same substance to obtain a mixture of a particular character, quality, or consistency. Oranges are type of citrus fruits which are round in shape and are characterized by finely-textured skins and have pulpy flesh; there is considerable variation in thickness of their skin, the thickness may vary from very thin to very thick. They generally range from about two to three inches in diameter. Vitamin C occur as mainly water-soluble antioxidant in our system, destroys free radicals and prevents harmful effects in the aqueous environment both inside and outside cells. A significant amount of diverse nutrients is present in oranges. Calories are less in oranges, contains with hardly any saturated fats. Cholesterol is also absent in oranges, but dietary fiber, pectin is found in oranges in significant amount. The body develop resistance against infectious agents and other harmful agents when we intake foods which are good source of vitamin c Pro-inflammatory free radicals from the blood are also destroyed. A very good amount potassium is present in orange. It is an essential component of cell and mainly body fluids that helps in controlling blood pressure and heart rate through interfering with sodium

ions. Orange also contain calcium (Joseph *et al.*,2015). The test of sensory qualities can be performed on the application of principles of experimental design and analysis of statistics with human senses such as properties like smell, taste and texture. Generally, squash is prepared by mixing one-part concentrate with four to five parts water which can be carbonated or either still (Steinberg, 2008). To make thicker double-strength squash and traditional cordials two parts concentrate is used (Thomson, 2011).

## GILOY

*Tinospora cordifolia* belongs to family menspermeaceae and is often called as Guduchi. It's is found at higher altitude and is a genetically diverse, large shrub. It has greenish yellow classic flowers (Upadhyay *et al.*, 2010). This shrub is indigenous to India. Ayurvedic medicine uses its roots, leaves and bark. Malaysia, India and Srilanka are countries where giloy is commonly found. All over the world the world about 40 species of giloy are noticed mainly in the parts of Africa, Southern Eastern Asia, and Australia continent. India has four species out of forty species found all over the world. The main parts of the plant comprise of roots and stems. Giloy an evergreen herbaceous climbing shrub existing for a long time throughout the year. Giloy hangs from over the tree and grows on big tress and can cover entire canopy some of the times. The stem of the giloy is soft in texture and leaves have shape of heart. In English it is also known as Heartleaf Moon. It is an herb which is used for multi-purposes in many Ayurvedic preparations. Tropical and sub-tropical climate is favorable for the growth of the plant.

Cultivation of giloy can be performed in oraganic compound rich soil acquainted with good drainage facility. Medium black soil or red soil is the best for the cultivation of *Tinospora cordifolia*. High rainfall is detrimental for its growth (www.vikaspedia.com). Cultivation of giloy in all climate is achievable but warm climate is preferable for its cultivation. Vegetative cutting can be used for its propagation. Two nodes containing 15 to 18cm length long stem with thickness of

small finger is used as a cutting. Reports have been found where shoot cuttings are used for promotion of rooting with the application of exogenous application of auxins. (Hartmann *et al.*, 1997). Giloy utilization is done by extraction of a nutrient starch, found in the giloy stem is carried out which is then used for medical purposes. It tastes bitter sweet which generally has any well-defined flavor. It is called Amritam in Sanskrit because it is known to provide youthfulness, vitality and longevity. Diabetes treated with tonic of giloy. Blood glucose levels are reduced and anti-spasmodic, anti-viral, anti-bacterial, anti-inflammatory and anti-pyretic properties are found in it. The immune system is strengthened and resistance of the body against infections is significantly enhanced. Pre-mature ageing is slowed down. Digestion of food increases with the intake of giloy fresh juice. Blood is purified by this herb and skin diseases are treated. Cardiac weakness, anemia, chronic fever and jaundice make use of giloy extract in the formulation of medicine. Longevity enhancement, intelligence promotion, disease prevention is some of the attributes given to giloy which as per concept of ayurveda is a rasayana herb. Rate of demand of the medicinal herbs by the consumer is increasing corresponding to the increase in demand by the pharmaceutical companies. From 1993 to 1996 it was calculated around 10 percent per year (Suneetha and Chandrakanth, 2002). Various active compounds such as lactones, alkaloid, steroids and glycosides are extracted from the different parts of the plant. Anti-diabetic, anti-allergic, anti-stress, anti-leprotic and anti-neoplastic are some of its medicinal properties that have fascinated sizeable attentiveness of researchers all over the globe (Upadhyay *et al.*, 2010).

Most of the parts of giloy plant are used for various medicinal purposes. Pain and edema can be reduced effectively by the use of the plant's oil similarly gout and skin diseases can also be treated. Longevity, enhancement of memory, improvement in health condition and luster of the skin can be accorded by this herb. Digestive

ailments such as hyperacidity, colitis, worm infestations, loss of appetite, abdominal pain, excessive thirst, and vomiting and even liver disorders like hepatitis can be treated. Starch extracted from the plant is used widely as a home remedy for chronic fever, burning sensation. It is used to increase energy and also appetite. A mixture with formulated with nimba and vasa, relieves itching and discharge. It fights weakness, dyspepsia, impotency, dysentery, secondary syphilis, tuberculosis, jaundice, constipation, leprosy, general debility, cutaneous rashes and condylomata. It helps to get rid of renal calculi and it helps in reduction of blood urea level. The broth of guduchi and sunthi is a wonderful combination which is used to treat gout and rheumatic disorders. Leucorrhoea can be prevented by drinking guduchi juice with milk of cow. Bowel obstruction can be treated with guduchi root because it is a strong emetic (Sarangi and Soni, 2015) Immune system is strengthened by taking giloy juice. It enhances body and defense system against infections. also Pre-mature ageing stops on drinking its juice. It's herbal juice also aids digestion. Blood gets purified and skin diseases are treated (Suneetha and Chandrakanth, 2002). Medicinal uses of giloy are studied and published in many papers such as a study published in Evidence-Based Complementary and Alternative Medicine demonstrated that giloy may help prevent negative side effects of radiation treatment Giloy may also be beneficial for people with HIV and other autoimmune disorders (Kalikar *et al.*, 2008)

Origin and history of oranges provide an insightful knowledge. Orange belongs to the genus Citrus, lemon, lime and grapefruit are other famous members. *Citrus sinensis* is the scientific name of the sweet variety of orange, *Citrus aurantium* is the name of the bitter variety of orange. Around 7000 years back orange cultivation started and South Asia and southeast Asia are believed to be its origin. Italy got introduced to it in 15<sup>th</sup> century, Spain and Portugal (www.buzzle.com, 2009). South East Asia is believed to be its place of origin, and China is

sought to be one of the initial places of cultivation around 2500 BC (Nicolosi *et al.*, 2008), "Chinese" apple was the name referred to the orange in china (Ehler, 2011). Nutritional value of orange can be attributed to very high amount of vitamins and its antioxidant properties for which it is cultivated all over the world and is very important part of human diet. (Mortton, 1987). Orange cultivation is one of the main agrarian activity. Andhra Pradesh, Maharashtra, Orissa, Gujarat and Uttarakhand are one of the most significant states in the union of India (NHB, 2011). In the year (2010- 11) uttarakhand had about fourteen percent of total fruit area cultivated under *Citrus spp.* Subtropical regions of the world are suitable for growth of the fruit. Major Citrus growing regions of Uttarakhand is in Garhwal with 50.20 per cent of the total Citrus area in the year 2010-11 and has got the maximum production, which was around 51.1 per cent (67729 metric tonnes) of the total Citrus production in state in the year 2010-11 was received from the area (Acharya, 2007).

The 14°-38° C is the favorable temperature range for its cultivation. 35° to 50° F is the appropriate temperature range for dormancy period in winter. Below 25° F mature trees in dormancy are able to survive for ten hours freezing -30° to -26° freezing temperature damages the fruit as it affects the physio-chemical properties in the fruit. Oranges fights bacteria, there are anti-fungal, anti-diabetic, orange juice is known to keep good health of our heart, oranges juice helps to fight cancer, it can prevent arthritic, it can help us to not acquire typhoid (Milind *et al.*, 2012). Chemical composition and active compound of giloy and orange are very beneficial for medicinal uses. Anti-oxidant properties of orange are attributed to phyto nutrients present in it such as Vitamins C and E, carotenoids, flavonoids and phenolic components. Antioxidants found in fruits are beneficial to human body function and to stop or slow down degenerative processes (Indrawati *et al.*, 2004). Phytonutrients such as carotenoids, vitamin C, flavonoids and phenolic compounds are present in large quantity in oranges. Synephrine, tyramine which are one of

the alkaloids are present in orange, similarly glycosides which predominantly consist of hesperidin and narirutin are also present (CSIR.1982) The major phytoconstituent in *Tinospora cordifolia* include tinosporine, tinosporide, tinosporaside, cordifolide, cordifol are present in giloy (Singh *et al.*, 2003). Essential oils, fatty acid mixture, heptacosanol, clerodane furano diterpene, diterpenoid furanolactone tinosporidine, columbin and b-sitosterol. Berberine, Palmatine, Tembertaine, Magniflorine, Choline, and Tinosporin are also found in the stem of giloy.

### SQUASH PROCESSING

Fruit juice, water, and sugar or a sugar substitute are used in preparation of squash. Extracts of herbs like elderflower and ginger are incorporated in squash. Mix squash with water before drinking (Joseph and Sangeeta, 2015). Processing of fruits reduces post-harvest losses. Temperature, boiling time, sugar or acid content, extent of ripeness of fruit and storage conditions of the product are the critical factors in determining the product's nutrient quality (Kim and Zakour, 2004; Garcia-Viguera *et al.*, 1999) Changes in the chemical constituent of the mixed fruit squash have been observed as an increasing trend was observed in the acid content of fruit squash throughout the storage period stored at room temperature. As the storage period increases reduction in total sugar content has been reported in squash. Thus storage condition and storage period have significant effect on the properties of squash (Selvi *et al.*, 2013).

### CONCLUSION

Giloy, also known as Amrita or Guduchi, is an herb that helps boost immunity. It has heart-shaped leaves that resemble betel leaves. Giloy is useful in managing dengue fever. It has anti-inflammatory and antipyretic (that reduce fever) properties. Regular intake of Giloy during dengue helps in improving the immune system. It also helps in increasing platelet count. There are no serious side-effects of consuming Giloy since it is a natural and safe herbal remedy. However, in some cases - the use

of Giloy can cause constipation and lower blood sugar levels. So if you are diabetic and have been consuming Giloy on a long-term basis, monitor your blood sugar levels regularly.

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