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# Comparative account on the Nutritional value of AnnonasquamosaandAnnona reticulataapromisingdietarysupplement.

M.Ananthavalli[1]andDrS. Karpagam[2]

1. *Research scholar,DepartmentofBotany, QueenMary'sCollege,Chennai-04.*
2. *AssociateProfessorand Head oftheDepartmentofBotany,Queen Mary'sCollege, Chennai-04.*

***ABSTRACT***
*Annona squamosa commonly known as custard apple and Annona reticulataknown as bullock-heart are tastytropicalfruitsconsumedfortheirnutritivevalues.Itisanabundantsourceofdietaryfibre,vitaminC,antioxidantand containsmineralslikepotassium,magnesiumandcalciuminlargequantities.Annonasquamosa is rich in carbohydrates, vitamin B6, copper and excellent source of iron. They are also low in fatlevels so can be consumed by all. Annona squamosa and Annona reticulata pulp have primary and secondarymetabolites that can be used for curative purpose, as well as a preparatory medicine. The present study wasdesigned to evaluate the nutritional value of Annona squamosaand Annona reticulata and also the mineralcontentofthefruitpulp.*
***Keywords:****Annonasquamosa,Annonareticulata,NutritionalValue,minerals.*

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## I. INTRODUCTION

*Annona* genus have several common names, including sugar-apple, soursop, and guanabana, belongingto the family Annonaceae, is a tropical fruit tree with medicinal properties.As of date,seven *Annona* speciesare grown for domestic and commercial use, mostly for the edible and nutritious fruits; several others alsoproduce edible fruits [8]. Many of the species are used in traditional medicine for the treatment of a variety ofdiseases, though their efficacy has yet to be validated scientifically. Several *Annona* species have been found tocontain acetogenins, a class of natural compounds with a wide variety of biological activities [9][10]. They areeaten by the natives for their delicious pulp and traditionally usedfor many purposes. It is also known asSharifa, Sitaphal and Sugar apple.Custard apple is one of the most delicious a rid fruit. Its pulp is creamy verysweet and pleasantly flavored. The health-related components of the fruit include vitamins A, B, C, E, Kantioxidants, polyunsaturated fatty acids, and the presence of essential minerals.The pulp of *Annona* is rich inminerals and vitamins. This fruit have also been suggested to prevent osteoporosis in adults mainly for their richsources of calcium and other minerals. The fruit pulp is also used as a raw material for wine and alcoholproduction. The wine produced from the *Annona* fruits are referred to as the "Fruit Wine". The unripe fruit isused against diarrhea and dysentery, skin diseases. *Annona reticulata* have many nutritional values, rich inprotein,fat,fibre,carbohydrates,calcium,ironetc…Itpossessesseveralmedicinalpropertiessuchasanthelmintic, anti-inflammatory, antipyretic, wound healing, and cytotoxic effects. *Annona reticulata* helps toenhance the immune systemandmaintains skinhealth.
Inthepresentstudytwospeciesof*Annona*fruitpulpwasstudiedfortheirnutritionalvalue.

## II. MATERIALANDMETHODS

CollectionofplantmaterialsandpreparationofExtracts:

The fresh fruit of *Annona squamosa* and *Annona reticulata* were collected from Ponneri, ThiruvallurDistrict, Tamil Nadu, India. Each 100 g of edible pulp was used for analysis. Carbohydrate was estimated as perthe procedure described by Dubois et al., (1956), protein by Lowry et al., (Hartery, 1972), fat by folch et al.,(1957) and dietary fibre by AOAC (1985). Calcium, Magnesium and Iron was estimated as per the proceduredescribed byUSP27-NF22Pharmacopeialforum(2013).

## III. RESULTSANDDISCUSSION

*Annona squamosa* and *Annona reticulata* are one of the most delicious fruits that appeals to the tastebuds. They are smooth and creamy like custard, hence the name custard apple. *Annona squamosa* fruit pulp isrichincarbohydratewith21.45gwhencomparedto*Annonareticulata*whichis18.44g(Table1).Itisan

abundant source of dietary fibre.Minerals are rich in *Annona reticulata* namely, 61.69 mg of calcium, 19.87 mgof magnesium and 3.464 mg of iron for every 100 g of fruit pulp, when compared to *Annona squamosa* whichhaslessermineral content.It alsocontains highamounts ofvitamins especiallyvitaminAmeasuring0.0062mg / 100g of fruit pulp, and 118.05 mg /100 g of vitamin C. Vitamin A keeps our skin and hair healthy and vitaminC helps to fight free radicals in our body. The fruit has comparatively high vitamin content in *Annona reticulata*(Table1).

**Table1:Nutritionalvalueof*Annonasquamosa*and*Annonareticulata***

| S.NO | NUTRITIONALCOMPONENTS | *ANNONASQUAMOSA* | *ANNONARETICULATA* |
|---|---|---|---|
| | | per100g | per100g |
| 1 | Carbohydrate | 21.45g | 18.44gms |
| 2 | Protein | 2.44g | 2.89gms |
| 3 | Fat(lipids) | 0.1944g | 0.2019gms |
| 4 | Dietaryfibre | 4.11g | 4.56gms |
| 5 | VitaminA | 0.0045mg | 0.0062mg |
| 6 | VitaminC | 88.4mg | 118.05mg |
| 7 | VitaminD(ascorbicacid) | Belowdetectablelevel | Belowdetectablelevel |
| 8 | VitaminE | Belowdetectablelevel | Belowdetectablelevel |
| 9 | Calcium | 43.75 mg | 61.69 mg |
| 10 | Magnesium | 12.34 mg | 19.87 mg |
| 11 | Iron | 2.56mg | 3.464 mg |

Phytoingredients infruits suchasisflavoneshaveshowntobe protectiveagainst lens damagewhichoccurs duetohyperglycemiaandcertain flavonoidssuchas quercetin can prevent oxidant stress inthe pathogenesis of glaucoma. Also, a high intake of fruits was inversely associated with the risk of respiratorysymptoms. Highertotalfruitintake is alsoassociatedwith lowerrisk of cognitivedeclinehence provedbeneficial for mental health. Phytochemicals in fruits have been found to act as anti-obesity agents because theymay play a role in suppressing growth of adipose tissue. Adiposity is closely related to bio markers of oxidativestress and inflammation and diet rich in fruit can modify the adiposity related metabolic bio markers in overweightwomen.Somechemicalconstituentsareisolatedfromthe*Annonareticulata*showedanti-cancer,properties for bladder cancer and various cancer cell lines also. It is found to be a chemo preventive agent incancer therapy. The greater part of the prior studies was focused on the biological activities of the plant extract,further investigations on the biochemical and physiological functions of active compounds and the detailedmechanisms underlying these activities are completely pivotal for the development of pharmaceuticalandagriculturalproducts.

Despite its high sugar content, the glycemic index of custard apple is low. The fruit as anti-oxidantactivity making it suitable even for diabetic patients (4).In anti-diabetic studies onanimals,custardappleappearstomimicinsulinstimulating Its production and enhance dup take of glucose by muscles which leadsto stabilization of blood sugar concentrations. Infact, even leaf extracts are also effective in lowering bloodglucose levels and several reports indicates that *Annona squamosa* leaf extract can substitute effectively withdecreased doses of externally administered insulin (14). To increase nutritional value and accelerate the valueaddition of custard apple several products have been prepared viz., ice cream, carbonated beverages, smoothies,cheese cakes etc. the fruit pulp has shown numerous medicinal properties which include antioxidant, anti-diabetic,anti-infective and anti-dyslipidemia properties. It is the fruit of 21$^{st}$century, still the pulp of the fruit is not veryeasy for intake. There should be resurgence of intake of this fruit especially in the wake ofincreasedpercentage of diseases due to improper dietary habits and to reduce malnutrition. *Annona* species are usuallyconsumed as fresh fruit, but they are also widely used in semi-processed and processed products, especiallydesserts. With increasing world demand for exotic flavorsand healthy food, the use of *Annona* fruit is alsolikely to increase (PINTO et al., 2005). *Annona crassiflora*is widely used in human medicine as for treatment ofvarious diseases such as diarrhea, rheumatism and syphilis. It contains acetogenins that have cytotoxic, anti-parasitic and anti-mutagenic properties (VILAR et al., 2008). Besides medicinal uses, *Annona crassiflora* innatura pulp is very popular and has a potential for the food industry (Soares Junior et al., 2007, Rocha et al.,2004, 2008). (Roesler et al., 2007) observed the antioxidant potential of bioactive components widely reportedaspotentantioxidantssuchasascorbic,caffeic,quinic,andferulicacids,xanthoxylin,rutin,caffeoyltartaricacid caffeoylglucoseand (quercetin+hexose+pentose-H)1compoundsidentifiedfrom*Annonacrassiflora*pulp,

seeds and peel.The antioxidant potential can be further extended to exploit the possible application as naturalantioxidant for cosmetics, nutritive supplements, and functional ingredients for food products. In the preferencetest conducted by Rocha et al. (2008), the yogurt with 25% of *A.crassiflora* sweet was preferred instead 20 and30%.The*A.crassiflora*pulpandflouroffersignificantamountsoffiber,carbohydrates,mineralsandantioxidants suchaspolyphenols,vitaminandcarotenoids.

## IV. CONCLUSION

The Mother Nature has provided us with an enormous count of flora and fauna. *Annona reticulata* is thebest example of it. This study shows that *Annona reticulata*, is an important medicinal plant with diversepharmacological spectrum. Somechemical constituent isolated from *Annona reticulata* showed anti-cancerproperties and used for skin cancer therapy. Further assessment in needed to be carried out on *Annona reticulata*in order toexplore concealedareas andtheirpractical clinical application,whichcanbe usedfor thewelfareofthemankind.*Annonamuricata* isa covetedtropical tree,and awealthofphytochemical

Investigations has been conducted for this fruit plant. In addition to being an important source for thefood industry and an indigenous medicinal plant, *Annona muricata* is proven to possess a wide spectrum ofbiological activities. Among all former studies on *Annona*, the most promising activities are found to be itsanticancer, anti-parasitic and insecticidal activity. Because the greater part of the prior studies was focused onthebiologicalactivitiesoftheplantextract,furtherinvestigationsonthebiochemicalandphysiologicalfunctions of active compound sand the detailed mechanisms underlying these activities are completely pivotalfor the development of pharmaceutical and agricultural products. Custard apple or the sugar apple is the fruit of*Annona squamosa*,which is one of themostwidely grown species of Annona. Thefruit pulp has shownfrequentmedicinalpropertieswhichincludeantioxidant,anti-diabetic,anti-infectiveandantidyslipidemicproperties. Still the pulp of the fruit is not very easy for intake. There are a variety of recipes to overcome thehitch andincrease intake.

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