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A Review on Passion Fruits and it's Pharmacological Benefits

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Abstract: *Passiflora edulis is a passion fruits ,due to the various pharmacological activity of these fruits This plant has a base of medicinal properties used as a home remedy .the largest family of passionflowers is the passion fruit used as a verity of marketed product .passion fruit and the whole plant are very use-full has pharmacological activities such as anti -diabetic, analgesic anti-microbial anti-neoplastic anti- oxidant, anti-inflammatory, anti- cancer with around 600 species ,the pass flora genus is the largest of the Passiflora family. Among them, passionflower has many medicinal values. It comes from the passionflower vine, native to Brazil and Argentina A member of the passionflower family, it is widely grown in south America, the Caribbean, south Florida south Africa and Asia. The fruit is native to south America belongs to the pass flora family and is one of the fruits with the highest export value. Passiflora comes in two different from belongs to the pass flora, family and is one of the fruits with the highest export value. Passiflora comes in two different from standard yellow which vary in acidity and starch content the annual production is about 120 tons. variety there are two types of passion fruit in Bhutan the purple type and the yellow between 900and 2000meters above sea level .and the yellow type can generally grow below 1000 meters above sea level. The temperature 18-23 c is conducive to flowering and fruit setting of purple passion fruit type, is higher is needed to promote juice production and improve quality of soil passion fruit grows on a verity of soil types, but light to heavy sandy loam of medium texture is suitable and there are also many useful chemical components, such as volatile oils , flavonoids, lipids and terpenoids ,as well as aldehydes ,ketones, tridecane palmitic acid, stearic acid, lino oleic acid, quercetin, apigenin . This chemical constituent can be used for various pharmacological and biological activities and market potential of plant and herbal preparation made from the leaves, stems, fruits and pericarp of p edulis.*

Keywords: passion fruit, Passiflora edulis, Krushna KAMAL

I. INTRODUCTION

Passion fruits also kwon Passiflora edulis is popular in producing countries in Africa Latin America and Asia where it is commonly processed into juices and other product .in Kenya it is one of the most important fruits trees and it is mainly grown by small farmers across the country. Passion fruits can be eaten fresh but it is most often heated or cooled to extract and preserve the Pulp The juice has a unique full-bodied flower and high acidity, making it a natural concentrate. Delicious non concentrated it is delicious and mixes well with other fruits juice.

It is a rich mineral wealth besides being loaded with vitamin A, vitamin C, flavonoids, and Fiber. The Indian name of passion fruits is the Krushna phal .it is originated is south America.it is cultivated in many worm weather region including part of India like western ghats.

Passion fruits is the short-term crop with a life span of up to 2 years. edulis is a perennial vine plant belonging to the Passiflora family. there are 18 genera under the Passiflora family that consist 530 species.

Soil with a pH of 6.5 to 7.5 is a best. Preparation of the ground the ground must be well prepared by deep ploughing levelling and fertilization areas with strong winds should be avoided to avoid damage and trellising work on the vines

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typical processed product are ice cream, sorbet, nectars, fruit juices, concentrates, pumpkins, jams, and jellies, syrups, purees, spreads confectionery, kombucha drink, sauces, butters, candies. In addition passionflowers are often grown as ornamental plant for their showy flowers. The different type of passion fruits. purple passion fruits. they are typically smaller with dark purple skin when ripe.

The yellow pulp is generally larger than purple, which is less acidic and more intensely Flavors often with a higher juice percentage than yellow pulp, either way, both type of passion fruits make excellent juice blends. Purple passion fruit is the domination species of the two fruits in Kenya with the highest production in the rift valley, followed by the Eastern highlands together accounting for the over 74per of national production, Passiflora [Krushna phal; Indian name]it is a famous herb with a verity of pharmacological activity and can also be as medicinal to treat various disease and disorder. with around 600 species, the Passiflora genus is a largest of the Passiflora Argentina. a member of the Passiflora family.

The Chromatographic analysis of passion fruits revealed the presence of 46 volatile compounds, including ethyl butyrate, ethyl hexanoate, and ethyl acetate, indicating the substantial Potential for these flower-application.

Passion fruits are a rich bioactive-compounds such as carotenoids [b-carotene, lutein] polyphenols [gallic acid, piceatannol, neochlorogenic acid] and flavonoids [vitex] These natural phytochemicals and bioactive substance have a gaine attention for their antioxidant properties and potential health benefits. passion fruits also exhibit anti-inflammatory properties which can be benefits against chronic disease such as heart disease and diabetes. During passion fruits juice production are discarded however, extract from west have show medicinal effect and a wide Reng of pharmacological activity non-communicable diseases, including anti- diabetic, anti- cancer, wound repairing, anti-inflammatory, hypolipidemic, hypertensive capacities. Passion fruits wastes, including leaves, peels, bagasse, and seeds are an excellent source of bioactive compounds with potential application I various industry such as food, pharmaceutical and cosmetic this compound can be utilized as natural, additive, flowering, preservative of drug formulation, and skin benefit property.

TYPES OF PASSION FRUITS;

THE different type of passion fruits are as follow.

1] purple passion fruits [Passiflora edulis]

2] yellow passion fruit [Passiflora edulis f.]

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3] sweet granadilla [Passiflora ligularis]
4] banana passion fruits [Passiflora tripartite var. mollissima]
5] giant granadilla [Passiflora quadrangularis]
6] other notable varieties; Passiflora alata, Passiflora incarnata

Figure 2 plant profile

1] ***purple passion fruits [Passiflora edulis];***

The purple passion fruits is the most commonly cultivated type in the united state. the purple passion fruits is a good source of vitamin A and C, which are antioxidants that can help reduce inflammation within the body and boost the immune system, the fruits also contain some potassium, phosphorus, iron, and folate. the pharmacological activity of purple passion fruits is the reduce the symptoms of Anxiety, Insomnia.

2] yellow passion fruits [Passiflora edulis f.]

The yellow passion fruits is a scientifically known as the Passiflora edulis f. a tropical evergreen climbing vine that produces a large, bright yellow round-to -oval fruits with a tough rind and a tart-sweet juice, orange-colour pulp. The fruits is between 6.5-8 cm long and 5.1-7cm in dimeter is the yellow passion fruits pharmacological activity show by the immune system support heart health, digestive health and weight management, skin and eye health, blood sugar regulation, may aid relaxation

3] sweet granadilla [Passiflora ligularis]

Also known as sweet granadilla. features a smooth pale yellow to orange rind, the good source of vitamin such as A, B1, B2, B3, B9, C, E and K.

4] Banana passion fruits [Passiflora tripartite var]

Banana passion fruits is an even- green climbing vine from the genus Passiflora that produces oblong, yellow, Edible fruits, typically named for their resemblance to bananas rather than their flower, native to the high-elevation cloud forests of south America, the vine and its aromatic orange-pulped fruits are used in juice, desserts, and drinks.

5] Giant granadilla [Passiflora quadrangularis]

Features is a large-oblong fruits. the pulp is sweet and aromatic. grows in tropical and subtropical regions.

6] other notable varieties.

1] Passiflora alata,2] Passiflora incarnata

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II. LITERATURE REVIEW

A literature review on passion fruits the passion fruits is also known as Passiflora edulis there are several studies have attempted to all study of passion fruits and the relationship between passion fruits and its pharmacological benefits. The fruits is widely appreciated not only for its refreshing flower but also for its nutritional and medicinal properties. Passion fruits is rich vitamins, antioxidant, dietary Fiber, and bioactive compounds, including Flavonoids, alkaloids, carotenoids, and essential fatty acids. Thes review aims to compile current research on the pharmacological benefits of passion fruits, focusing on its therapeutic potentials in various health condition.

The study conducted by the SINGH et al. in [2014] investigated the antioxidant potential of passion fruits pulp and its application of human health. the passion fruits show by the antioxidant properties due to the high content of polyphenols and flavonoids. the antioxidant help combat oxidative stress, a major factor in aging and chronic diseases such as cancer and heart disease.

The ALMEIDA et al. in [2018] studied by the demonstrated that Passiflora edulis extracts could inhibit pro-inflammatory cytokines, providing evidence of its potential for treating inflammatory condition. The several studies suggest that the bioactive compound in passion fruits, particularly Flavonoids, and alkaloids, exert significant anti-Inflammatory effects, which may contribute to reducing chronic inflammation and related disease.

The SANTOS et al. in [2012] reviewed the anxiolytic properties of Passiflora edulis and traditional use in treating sleep disorders. the alkaloids, particularly harming and harmaline, are thought to contribute to the sedative and anxiolytic effect of passion fruits. Passion fruits been traditionally used as in for insomnia and anxiety.

The FURTADO et al. [2017] found that extract from passion fruits exhibited antimicrobial activity against both gram-positive and gram-negative bacteria. Passion fruits extract shown by the potential in inhibiting the growth of several pathogenic microorganisms, making them a candidate for use in natural antimicrobial agents.

The OLIVEIRA et al. in [2019] highlighted the cardiovascular benefits of passion fruits, particularly the role of fatty acids in reducing the risk of hearth disease. The seeds of Passiflora edulis, rich in essential fatty acids and antioxidants, have shown potential in lowering blood pressure, reducing cholesterol levels, and supporting overall heart health

The ALMEDIDA et al. [2018] explored the antioxidant activity of passion fruits extract and highlighted the role of flavonoids in scavenging free radicals. the quercetin, kaempferol, and rutin are among the most prominent flavonoids found in passion fruits, flavonoids have anti-oxidant, anti-inflammatory, and anti-cancer properties.

The LEAL et al.in [2013] focused on the alkaloid content of Passiflora edulis and their pharmacological application, the alkaloids like harming and harmaline are identified in passion fruits seed. These-compound have been shown to have mild sedative effect and may help reduce anxiety.

The RODRIGUES et al. [2012] examined the antioxidant properties of carotenoids in passion fruits and their potential to reduce oxidative stress. The passion fruits is a source of carotenoids, including beta-carotene, which contributes to its health-promoting properties, particularly for vision and skin health.

The ROHIT SANJAY SAHANE AND DIPAK MADHAV SANAP in [2023] studied by the IN vitro and IN vivo pharmacological studies like antifungal activity, antitumor activity, cytotoxic activity, anti-inflammatory activity, anti-anxiety activity, anti-hypertensive activity. And other study like background of passion fruits, verities passion fruits etc.

BACKGROUND

Passion fruits widely grow in south America, the Caribbean, south Florida, south Africa, Asia, and small part of India. Native to south America, it belongs to the Passiflora family.

Variety

The different type of variety of passion fruits, purple passion fruits, yellow passion fruits, sweet granadilla, banana passion fruits, giant granadilla, other notable varieties Passiflora alata, and Passiflora incarnata. Purple passion fruits is most common variety.

Recommended seeding rate

Seeding rate is depending on the variety of passion fruits, and cropping system, cultivars used. The Kniffin drive system is most commonly used. In this system of plant planted at a spacing of 2m x 3m, it will accommodate

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approximately 670 plant/acre. Passiflora occurs in two distinct forms, standard yellow and purple, which is very in acidity and starch content. The annual production is about 120MT.

FIELD PREPRATION

The land must be adequately prepared by deep levelling and fertilization. Areas with strong winds should be avoided to avoid damage and trellising work on the vines. Dig 45cm X 45cm X 45cm pits at 3m X 2m or 3m intervals on hillsides or plains. The pit is filled with a mixture of part topsoil and one part compost.

Botanical characteristics

A fast-growing, climbing vine.
Flowers are large, ornate, and typically purple and white
Fruits is round or ovel, with a tough rind and a juice interior full of seeds surrounded by aromatic, sweet-tart pulp.

GEOGRAPHICAL DISTRIBUTION

The while native to south America, passion fruits is now cultivated in tropical and subtropical regions worldwide, including BRAZIL [largest producer], COLOMBIA, ECUADOR, KENYA, INDIA, INDONESIA, AUSTRALIA, SOUTH AFRICA, HAWAII,

NURSERY MANAGEMENT

The nursery should be constructed in a location where the greenhouse and water supply facilities are convenient, all types of passionflower species can be propagated by seed, cuttings, aerial layers, or grafting, rootstocks, are made entirely from seed.

Seed

Fruits from good yielding, quality vines. The pulp is extracted and left to ferment for 72 hours to separate the seed from the pulp. The passionflower seeds are then carefully washed, dried and sown in well-prepared beds as soon as possible in march-April. The seedlings, after developing 4-6 leaves, were transplanted into 10 cm x 22cm plastic bags filled with a mixture of soil, compost and send. After about three months, these -seedling will be ready for transplanting to major countries.

Climate

The purple type can generally grow between 900 and 2000 meters above sea level, and the yellow type can generally grow below 1000 meters above sea level. The temperature of 18-23c is conducive to flowering and fruits setting of purple passion fruits type, but higher temperature is needed to promote juice production and improve quality.

Soil

Passion fruits Grows on a variety of soil types, but light to heavy sandy loam of medium texture is suitable. Soil with a PH of 6.5 to 7.5 is best.

Cuttings

Cutting of semi-hardwood of about 30-35 cm with 3-4 nodes are ideal. Cuttings should first be placed in sand beds/pots for rooting, then transferred to plastic bags to facilitate rooting.

Grafting

Grafting is also method of propagating hybrids and reducing pest damage using passion fruits resistant rootstocks. Rootstock material should be planted in a separate area to avoid hybridization with other fruiting varieties. Split or wedge grafts are the most effective grafting methods.

Planting

Planting is best planted in cloudy weather in June-July after the onset of the monsoon so that the plants develop well at the end of the monsoon.

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Cultural practices

Passion fruits is a woody vine that requires supports and trellises for good growth and fruiting. Among the different types of trellis, the Kniffin system is the most economical. This drive system requires 2.5m long poles spaced 6m apart with 8-10gauge wire attached to the poles.

Pruning

Pruning is usually done twice a year, once in march and April and again in October and November, depending on the crop.

Nutrient management

The application of organic fertilizers is essential for vigorous plant growth and optimum yield. 10 kg FYM per stock are recommended the first year of planting and 15 kg of FYM per stock from the second year. Fertilization should be carried out in February-march.

Water management

Crops need 750 to 1250 mm of regular rainfall. A prolonged dry period between January and march reduces the main summer harvest and negatively affects flower development, leading to premature fruits drop and fruits shrinkages. Supplemental irrigation such as drip irrigation can be very helpful in times of drought. on averages, passion fruits requires 12-15 L/Vine/day in summer and 6-8 L/vine/ day in winter.

Pests

Passion fruits not reported any serious pest problems. There have been reports of bedbugs puncturing young passion fruits, but the fruits usually developing more or less normally without any control measures being necessary.

Diseases

The most common passion fruits disease is brown spot caused by Alternaria macrospores. Appears mainly in spring and early summer. The disease presents as concentric brown spots bordered with green. In severe cases, a branch belt and premature defoliation will occur, affected branches should be cut and burned. Another disease is root rot caused by phytophthora Nicotine. A parasite that eventually kill the plant. Rinse with1% Bordeaux mixture to help control disease. Affected plants should be filled with soil to encourage new root formation. Fusarium wilt or crown rot is a destructive disease caused by FUSARIUM OXYSPORUM. Affected plant die immediately within a day or two.
There is no control other than having tolerant/ resistant varieties or using resistant rootstocks.

Brown spot disease

Harvest

The vines start fruiting 10 months after planting and the fruits peaks at 16-18 months. The fruits take about 80-85 days to ripen after flowering. The purplish fruits and a small amount of stem/pedicel should be collected. The skin will

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wrinkle when dry, but the pulp will hold well for days.it can produce 3to 7 tons per hectare. The normal productive life is 3 year in tropical climates and up to 8 year.

Post-harvest management

Passion fruit is generally not eaten as table fruits. Its good commercial value, especially in the processing industry as a row material for the preparation of juices, concentrates, pumpkins, ice cream and candies, etc. purple passion fruits can be stored at 5c with 80-90 % humidity for up to 5 week with minimal quality loos.

Uses in traditional or ethnic medicine

Passionflower varieties have been widely used as folk medicines due to their calming and sedative properties. Early European Travelers to north America noted that the Algonquian Indians of Virginia and the creeks of Florida ate p. edulis fruits from both cultivated and wild sources. European settlers of the time also ate the fruits and praised its taste, suggesting that prehistoric people consumed passionflower as a fruits [Brickell, 1968]. Passionflower was first praised for its medicinal use in Peru in 1569 by the Spanish research. Various varieties of passionflower are widely used to traditional healing systems in many countries. In south America, extracts from the leaves of p. edulis are commonly used to treat symptoms of alcoholism, anxiety, migraines, nervousness and insomnia. a deink made from the flowers is believed to treat asthma, bronchitis and whooping cough. In traditional medicine, the plant has been used as a cardiotonic, mild diuretic, digestive stimulant and treatment of urinary tract infections.

Brazil, the species, called ‘maracuja’, is used as an anxiolytic, sedative, diuretic and analgesic. P edulis is used in south America as a sedative, stimulant and tonic for high blood pressure, menopausal symptoms, diuretic, vermifuge, antidiarrheal, and colic in infants. In madeira, the fruits of p. edulis was considered a digestive stimulant and used as a remedy for stomach cancer fresh leaves of p. edulis in Nagaland [India]. Eating fruits can relieve constipation. An infusion of the leaves of p. edulis has been used in Nigeria to treat hysteria and insomnia. The plant is widely this plant is widely used by south African Traditional healers. These traditional uses include alcohol abstinence, antibacterial, anticonvulsant, antispasmodic, aphrodisiac, asthmatic, ADHD, burns [skin], cancer, chronic pain, cough, drug addiction, Epstein-Barr virus, fungal infections, gastric [nervous] disorders stomach, helicobacter pylori infection, high blood pressure, menopausal symptoms [hot flashes] neuralgia, pain [general], skin inflammation, tension and prevention of wrinkles.

III. IN VITRO AND IN VIVO PHARMACOLOGICAL STUDIES

Traditional use of passion fruits are the production of medicine and syrup and other use.

Passion fruits show different pharmacological activity are as follow.

Antioxidant activity

The leaves of p. edulis, traditionally used in American folk medicine for inflammation and nociception, are rich in polyphenols, which are reported to be natural antioxidant. The antioxidant capacity of p. edulis leaves was also examined against DPPH radical and various reactive oxygen species [superoxide radical, hydroxyl radical and hypochlorous acid], which showed to be concentration dependent, although hydroxyl radicals have been noted to have pro-oxidation. These finding suggest the p. edulis leaf extract has potent in vitro and ex vivo antioxidant property and can be considered as a possible new source of natural antioxidant. Further research is-needs to investigation the potential use of p edulis extract in the prevention of diseases such as diabetes and neurodegenerative diseases in which oxidative stress damage to proteins appears to play a major role.

The previous result obtained by KANDANDAPANI et al. showed that subacute administration of p. edulis extract significantly controlled blood sugar in diabetic rats. In addition, seaweed extract protects end organs by restoring antioxidant enzymes, significantly increasing the level of superoxide dismutase in internal organ, and reducing the levels of catalase and Thio-barbituric acid reactive substance.

In conclusion, p edulis extract has antidiabetic and antioxidant effects on streptozotocin- induced diabetes.

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Antifungal activity

These peptides are generally characterized by low molecular weight and a cationic charge. Pellegrini et al. dedicated to the purification and characterization of a new plant peptide extracted from 50 KDA, pe-AFP-1[antifungal peptide], purified from passion fruits seeds [p edulis]. In vitro tests showed that peAFP-1 was able to inhibit the development of the filamentous fungi Trichoderma HARZIANUM, fusarium OXYSPROUM, and aspergillus FUMIGGATUS with IC50 values of 32,34 and 40ug/ ml, respectively [PELEGRINIET at. al, pe-the discovery of AFP1 could in the near future contribute to the development of biotechnological products such as antifungal agent and transgenic plant that are more resistant to pathogenic fungi.

Antitumor activity

The inhibitory effect of the fruit decoction of p. edulis on the activity of matrix metalloproteinases gelatinases [MMP-2 and MMP-9], involved in TUMOR invasion, metastasis and angiogenesis, has been evaluated. Different concentrations of aqueous extraction of p, edulis inhibit these enzymes [Puricelli et al.,2003].

Cytotoxic activity

The Artemia lethality biological test is widely used in the biological assay of bioactive compounds [Meyer et al.,1982; Zhao et al., 1992]. A simple animal organism [artemia] is used as a convenient monitor for screening. Artemia eggs were performed hatched in artificial seawater 8% NACL solution]. for 48 hours to mature shrimp called nauplii. Cytotoxicity assays were performed on brine shrimp nauplii using the MEYER method [Meyer et al.,1982]. crude petroleum ether and chloroform extracts of leaves and stem of p. edulis were less lethal to brine shrimp than a salt marsh after 24 hours of exposure of samples to the vincristine sulphate positive control. This technique is used to determine the general toxicity of plant extracts. The chloroform extract of the stem had the lowest values and the petroleum ether extract of the leaves had the highest LC50 values of 6.63 and 11.17 g/ml.

Anti- inflammatory activity

Aqueous extracts of leaves of plant of the genus Passiflora have shown potent anti-inflammatory effects in experimental in vivo model [BENINCA et al., 2007]. Aqueous extracts of leaves of p edulis has significant anti- inflammatory activity in mice. Systemic administration showed significant anti-inflammatory effects characterized by inhibition of leukocyte influx into the pleural cavity and correlated with myeloperoxidase, nitric oxide, TUMOR necrosis factor and interleukin in an acute model of induced inflammations significant blockade of -1 levels correlated by intrathoracic injection in mice. In one experiment, p. edulis was more effective than dexamethasone in suppressing TUMOR necrosis factor and interleukin-1 levels [Capasso and Sorrentino,2005]. therefore, p. edulis could be a source of new therapeutic candidates with a spectrum of activity similar to current anti-inflammatory steroids such as dexamethasone.

Anti-anxiety activity

Anxiety is a very common mental health problem in the general population. P. edulis is a popular remedy used to treat anxiety disorders. Several species of passionflower have been widely used as traditional medicines due to their calming and sedative effect [Barbosa et al.,2008]. The anxiolytic activity of p. edulis was assessed based on the performance of mice in elevated maze, open field, and horizontal line tests [coleta et al.,2001].

The aqueous extract showed anxiolytic activity without any significant effect on locomotor activity. When comparing the muscle relaxant effect of diazepam [6mg/kg] and chrysin [13], compound 13 did not show muscle relaxant effects in the horizontal line test even in the dose range from 0.6 to 30mg/kg, this suggests that 13 is an anxiolytic with no sedative or muscle relaxant side peripheral benzodiazepine receptors [medina et al.,1990].

Antihypertensive activity

Despite advance in pharmacological and mechanical therapy, cardiovascular disease remains the leading cause of morbidity and mortality worldwide. Passiflora's relative, p. edulis, has been reported to have antihypertensive effects and is used in traditional medicine to treat hypertension. [ICHMURA et al.,2006] reported that oral administration of a

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methanolic extract of this plant [10-50mg/kg] or compound 8[50mg/kg], a polyphenol in the extract, significantly reduced systolic blood pressure and diastolic blood pressure in spontaneously hypertensive patients. Rats [SHR]. Quantitative analysis by liquid CHROMATOGHRAPHY tandem mass spectrometry [LC-MS/MS] showed that the extract contained 20 g/g dry weight of 8 and 41 g/g dry weight of luteolin-6-C-glucoside. It also contains gamma-aminobutyric acid [GABA,2.4mg/g dry weight by LC-MS-/MS], which is believed to be an SHR may be mainly due to the antihypertensive effect induced by GABA, partly due to the vasodilating effect of polyphenols, including luteolin.

Antidiabetic activity

The in-vitro and in-vivo study of various part of passion fruits plant, particularly the peel, seed, leaves have antidiabetic potential. The beneficial effect are attributed to bioactive compound like FIBER, and polyphenols, including piceatannol and flavonoids

The hydrochloric extract from Passiflora edulis leaves significantly increased glucose uptake in a yeast cell model. At a concentration of 5mg/ml, it mediated an 83.4% uptake of glucose, suggesting it promotes glucose utilization similar to peripheral tissues in the body the enzyme inhibition are the extract from Passiflora ligularis fruits demonstrated potent inhibitory effect on key enzyme involved in carbohydrate metabolism. Acetone fruits extract significantly inhibited both [alpha]- amylase [82.56%] and [alpha]- glucoside [75.36%] which helps reduce the release of glucose from starches. The bioactive compound piceatannol, found in passion fruits seeds, has been shown to combat insulin resistance. In cultured myotubes, it enhance the activation of AMP-activated protein kinase [AMPK] and the translocation of glucose transporter type-4[glut4] to increase glucose uptake even without insulin.

Anti-microbial

The passion fruits exhibits antimicrobial activity, primarily due to its rich content of phenolic compound and other phytochemical like polyphenols and flavonoids. The passion fruits extract from both passion fruits pulp and peel have inhibitory effect on various bacteria, include gram-positive and gram-negative strains, with some studies noting stronger activity against gram-positive bacteria like bacillus. The seed extract also contains compound that can inhibit specific bacteria such as Propionibacterium acnes.

IV. CONCLUSION

Passion fruits is appreciated for its attractive nutritional and organoleptic properties for the health and wellbeing of consumers around the world. The secondary metabolism of passion fruits have attracted considerable attention as these-compound have numerous health benefits and economic value, and have therefore been used in nutraceuticals, cosmetic and medicine. passion fruits and its products are rich in various chemical compound and phytonutrients, high in water and relatively low in nutrients, while purple fruits are rich in vitamin C, vitamin A, FIBER and calcium. Different part of plant [leaves, buds, skin, pulp, fruits, steam, and branches] and growth stage of p. edulis contain various bioactive components such as total food and polyphenols.

The yellow passion fruits has a higher pectin content in the peel, a higher carotene, quercetin and kaempferol content in the pulp, and in a higher total dietary FIBER content in the seeds. The purple fruits is characterized by a high content of anthocyanins in the skin and seeds. As food waste, passion fruits rind accounts for 50% of the total fruits, and because it is rich in bioactive ingredients, it is also highly susceptible to obtaining functional ingredients. Due to passion fruits unique bioactive components various nutritional and medicinal benefits have been studied and documented. P. edulis different excerpts from different part. P. edulis has shown various pharmacological activities, including anti-oxidant, analgesic, anti-inflammatory, anti-bacterial, anti-hypertensive, hepatoprotective and lung-protective, anti-TUMOR, anti-diabetic, hypolipidemic, anti-depressant and anxiolytic-like properties. In particular, acute and subacute toxicity studies suggest that passion fruits may be safe in reasonable daily doses. These excellent result suggest that passion fruits may have a range of health benefits, such as controlling inflammation and neurological disorders, and preventing certain chronic diseases, such as high blood pressure and heart disease.

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There are also research opportunities to better utilize passion fruits and its by- product for human consumption passion fruits and its by product are rich source of polyphenols, so it is important to optimize appropriate processing method to stabilize and improve the quality of this processed product.

The structure and properties of polysaccharides in fruits remain to be studied. Pesticides may be present on the fruits and must be strictly monitored and controlled. The effect of genetic diversity, processing methods and living environment on the chemical composition and nutritional value of passion fruits needs further investigation. Research on p. edulis species is vary limited, especially on the confusion between p. edulis and p. incarnata still exist and deserve special attention from botanists. Reports on the pharmacological activity of p. edulis plant are mainly based on preliminary evaluations using models without appropriate criteria or reasonable doses. P edulis has shown therapeutic potential as an in vitro anticancer agent against various TUMOR cell lines, but the in vitro cytotoxic activity needs to be supported by in vivo studies and clinical trials to confirm its role as an anticancer agent. The structure- activity relationship and molecular mechanism of its biologically active compounds or crude extract will also be the focus of future research and practice. Additionally, there are few clinical trials on the efficacy and safety of p. edulis to support claims of efficacy.

The future focus in research should focus on conducting rigorous clinical trials to confirm the benefits seen in pre-clinical studies and to establish the safety of passion fruits at therapeutic dosages. In future the study of passion fruits conduct more human studies to confirm the health benefits observed in animal studies, particularly regarding the antioxidant, antihypertensive and other pharmacological benefits of passion fruits

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