

Preliminary Phytochemical Evaluation of *Passiflora* Fruits

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Abstract - *Passiflora edulis* is a commonly cultivated plant in the Passifloraceae family that is also known as passion fruit. Passion fruit is high in antioxidants and a good source of nutrients, particularly fibre, vitamin C, and provitamin A. According to a review of the plant's literature, the leaves, flowers, and fruits are used as medicine in many countries. The current study is concerned with the physicochemical, powder behaviour, and preliminary phytochemical screening of fruit pulp. A physicochemical analysis of fruit pulp reveals that it contains 92 percent ash, 70 percent moisture, and 30 percent dry matter. The presence of phenols, flavones, tannins, coumarins, saponins, alkaloids, starch, xanthoproteins, reducing sugar, and oil has been confirmed by powder behaviour and preliminary phytochemical analysis of the results. Dry fruit pulp was extracted in various solvents to study preliminary phytochemical screening. According to the study findings, methanol extract had a high extractive yield as well as phytochemical constituents. As a result of these findings, the passion fruit has been identified as a possible source for the development of novel drugs.

Index Terms - *Passiflora* fruits, physicochemical study, phytochemical study, powder behaviour.

INTRODUCTION

The plant *Passiflora* is also known as Krishna kamal or passion fruit crop. The plants are primarily grown for their ornamental flowers as well as highly flavorful fruit juice. A fruit has a soft to juicy interior that contains a few seeds. Plants have been cultivated in the Satara region for ornamental purposes in gardens due to suitable growing conditions. If the demand for passion fruits expands in the local market, it will provide opportunities for both growers and local farmers. Natural plant products have gained significant value as a source of drug development as a result of increased public awareness. Modern pharmaceutical industries are also interested in plant-based medicines, so more than half of all drugs contain

natural ingredients (1). Plants are known to mine phytochemicals such as flavonoids, tannins, coumarins, saponins, and phenolic acids, which have disease-resistance and disease-resolution properties (2,3). According to research, *Passiflora* has both edible and therapeutic properties. Anxiety, attention deficit hyperactivity disorder, insomnia, cancer, and opiates withdrawal are among the therapeutic qualities of *Passiflora* plant parts (4,5,6,7,8,9). *P. edulis* Sims and *P. edulis* f. *flavicarpa* seeds have been found to be edible and high in oil in a number of tests (10). Coumarins, alkaloids, phenols, flavonoids, tannins, saponins, starch, xanthoproteins, reducing sugar, and oil are the principal phytoconstituents of *Passiflora* fruits studied. Because of the phytochemical and nutritional significance of *Passiflora* fruits, the current research is also aimed at promoting the species' preservation.

MATERIAL AND METHODS

1. Collection of plant material

Plants were collected in the Karad Tehsil of Maharashtra's Satara district and identified by using Kolhapur district's flora (11)

2. Drying of plant material

The plant fruits were washed, the pulp removed, and dried in the shade and in the oven. With the use of an electric grinder, the oven dried pulp was pulverised till a fine powder was obtained. The physicochemical properties, powder behaviour, and preliminary phytochemicals of this powder were investigated further.

3. Powder behaviour

Under natural light, the powder behaviour of the fruit with various chemical reagents was investigated (12, 13)

4. Extraction and Phytochemical screening

Various solvents, such as Petroleum ether, Acetone, Methanol, Ethanol, and Aqueous, were used to extract values. Preliminary phytochemical analyses of the extract were done using particular reagents by techniques, and the % yield of the extract was calculated (14, 15, 16, 17, 18).

RESULTS

The foundation for understanding the quantitative characteristics of plants is physicochemical analysis (Table 1). In this study, the physicochemical analysis of *Passiflora* fruit reveals an orange-colored pulp with a pleasant acetose scent and acidic in the test. After all moisture and organic material, such as carbohydrate, protein, fat, and vitamins, have been removed from the sample, ash is the leftover residue, which indicates the actual concentration of minerals in the original food. Because passion fruit pulp contains 92 percent ash, it has a higher mineral concentration. Plant moisture content is significant for material processing, preservation, and storage. In the current investigation, it was discovered that fruit pulp contains 70% moisture and 30% dry matter. The colour pattern of powdered passion fruit pulp was discovered after it was tested with various chemical reagents. The presence of tannins, alkaloids, starch, cystiene, xanthoprotein, and oil is indicated by powder behaviour (Table 2).

Fruit pulp was extracted using various solvents such as petroleum ether, acetone, methanol, ethanol, and distilled water (Fig 1). As a result, methanol had a higher extractive value than ethanol, distilled water, acetone, and petroleum ether. Preliminary phytochemical analysis of the fruits of *Passiflora edulis* revealed the presence of phenols, flavonoids, tannins, coumarins, saponins, alkaloids, xanthoproteins, reducing sugar, and oil (Table 3). Ethanol and aqueous extract revealed a high number of distinct phytoconstituents when compared to all other solvents. Because each chemical has its own medical properties, the current findings suggest that the fruits have medicinal potential.

DISCUSSION

Plant phytochemicals serve an important role in protecting plants from insects, microbes, diseases, and the effects of the environment. These components are

actually secondary metabolites that have been utilised as medications to treat a variety of ailments. As a result, preliminary phytochemical screening is critical for predicting the sorts of active chemicals that may be detected in plants (19).

In investigated bromatological and spectroscopic study of leaves of *Passiflora foetida* L. (20). The basic food elements protein, lipids, glucose, ash, moisture, and fibre were abundant in *Passiflora* leaves. Saponins, tannins, cardiac glycosides, alkaloid, anthraquinones, steroid, and flavonoid were found in an ethanol extract of the leaves. Flavonoids, alkaloids, steroid, and saponins were found in *P. edulis* seed extract (21). Phytochemicals such as glycosides, alkaloids, saponins, phenolic compounds, carbohydrates, tannins, proteins, amino acids, and triterpenoids are found in the leaves and fruits of *Passiflora foetida* (22). Alkaloids, flavanoids, tannins, phenols, steroids, cardioglycosides, carbohydrate, oils, lipids, saponins, and terpenoids are found in the unripe peel, completely mature peel, leaf, seed, and root of *P. foetida* (23). Seeds of *P. edulis*, *P. quadrangularis*, and *P. maliformis* have similar amounts of moisture, ash, crude protein, crude fat, crude fibre, carbohydrate, and other nutrients (24). Alkaloids, saponins, tannins, and triterpenes are represented in ethanol and chloroform extracts of *P. edulis* leaf (25).

Table 1. Physicochemical Parameters

<i>Passiflora edulis</i>	Fruits
Colour	Orange
Odour	Acetose
Taste	Acidic
Total Ash (%)	92%
Moisture content	70%
Dry matter	30%

Table 2. Powder behaviour of fruit pulp with different chemical reagents

Sr. No.	Reagent	Colour / Behaviour	Inference
1	Powder as such	Dark orange	-
2	Powder + 5% FeCl ₃	Sepia brown	Tannin present
3	Powder + Picric acid	Gold yellow	Alkaloids Present
4	Powder + 5% Iodine	Raw umber brown	Starch present
5	Powder+ 40 % NaOH + LeadAcetate	Buff brown	Cystiene Present

6	Powder + Conc.HNO3 +Ammonia	Fulvous brown	Xanthoprotein Present
7	Powder + Sudan III	Lion brown	Oil Present

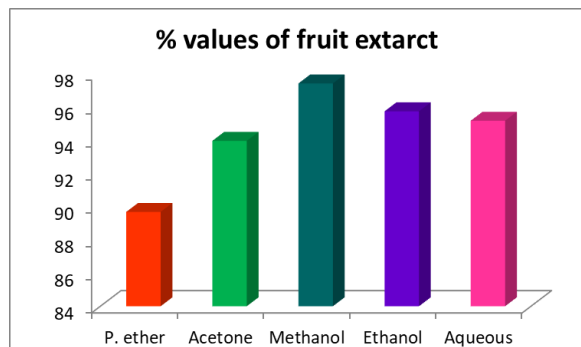


Fig 1. Extractive values of fruit pulp

Table 3. Preliminary Phytochemical Screening of fruit

Compound	P. ether	Acetone	Methanol	Ethanol	Aqueous
Colour	Orange	Dark orange	Orange	Orange	Light orange
Phenols	-	-	+	+	+
Flavones	-	-	+	++	++
Tannins	-	-	+	+	+
Coumarins	-	-	+	-	-
Saponin	-	-	+	+	++
Alkaloids	-	-	+	+	+
Xanthoproteins	-	+	+	+++	++
Reducing Sugar	+	-	++	++	++
oil	++	+	++	++	++

Where, +++ High, ++ Moderate, + Slight, - Negative, P. ether- Petroleum ether

CONCLUSION

The *Passiflora* fruit extract contains phenols, flavones, tannins, coumarins, saponins, alkaloids, starch, xanthoproteins, reducing sugar and oil. The current study shows that a solvent extract of *Passiflora* fruit contains medicinally relevant phytoconstituents, proving that plant species can be used as traditional medicine to treat a variety of ailments.

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