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PRELIMINARY PHYTOCHEMICALS SCREENING OF DIFFERENT PEEL EXTRACT OF SECHIUM EDULE

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Abstract

Medicinal plants are the important bioactive compounds against various oxidative degenerative diseases. The present study is to evaluate the preliminary phytochemical analysis of aqueous and methanol peel extracts of Sechium edule. According to the results of phytochemical screening, the bioactive chemicals tannins, phenols, saponins, terpenoids, and glycosides are absent from the aqueous and methanol peel extract of Sechium, although several secondary metabolites such as alkaloids, carbohydrates, flavonoids, steroids, and quinones are present. From the data obtained, it can be concluded that the peel extract of Sechium edule can be used as a possible source of treatment for problems associated with oxidative stress as well as strong anticancer activity.

Keywords: Medicinal plants, Sechium edule, Phytochemicals and oxidative stress.

1 Introduction

People have been using plants to make medicines since the dawn of time. The significance of looking for novel therapeutic drugs from these plants has been highlighted by the traditional usage of natural products in the treatment of illnesses [1]. Plants' medicinal value is determined by the kinds of phytochemical chemicals they contain, which have a range of physiological impacts on people. Therefore, these chemicals found in plants can be found using the phytochemical screening approach, which could serve as the foundation for contemporary medication development [2]. Plants are abundant in a wide range of chemical substances that provide them therapeutic qualities. In addition to other phytochemicals, plants are found to include flavonoids and phenolic compounds, which have been shown to have a variety of biological effects, such as anti-inflammatory, anti-carcinogenic, free radical scavenging, and antioxidant properties [3].

Since they slow down the oxidative deterioration of lipids and enhance the nutritional content and quality of food products, crude extracts of herbs, spices, and other plant materials that are high in phenolic compounds are gaining attention in the food business. It is known that flavonoids, a class of polyphenolic chemicals, can scavenge free radicals and inhibit oxidative and hydrolytic enzymes as well as inflammation [4]. The therapeutic qualities of plants have been studied since antiquity. The function of plants with strong antioxidant properties has been emphasized in recent years by scientific research and advancements in these studies.

Antioxidants can disrupt the oxidation process by reacting with free radicals, chelating catalytic metals, and serving as oxygen scavengers, as they have been shown to counteract oxidative damage brought on by free radicals [5]. Sechium edule (Jacq.) Swartz (Cucurbitaceae), also known as chayote, is an herbaceous plant originally native to Mesoamerica. This plant has been cultivated in Mexico and Central America since pre Columbian times, where

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their fruits are very appreciated in rural zones because of their nutritional value. Nowadays, this crop is produced in many tropical countries such as China, India and Madagascar. Chayote is called cidrayote, chayote, chiote, Cho-Cho, choko, chow-chow, christophene, custard, hayatouri, hu-isquil, squash mango, mirliton and sayote [6]. Chayote plants are monoecious strong and energetic creepers. It grows from a single, thick root, which produces roots rooted. Its stems are angular-corru-gated and thickened to the base and woody, while there are many thin and firm branches at the top. The stem of this plant can reach 30 to 50 feet (9 to 15 m) in one-year. Leaves have grooved petioles with a length of 8-15 cm. The size of the cha-yote leaf grows from the shoots to the bottom of the plant. Like almost all Cucurbitaceae chayote plants develop tendrils for support. Although adult green fruit is mainly eaten, other parts of the plant are also found to be eaten in young sprout and roots sections that can provide essential nutrient sources [7]. The present study was carried out to establish the preliminary phytochemical analysis of aqueous and methanol extract of peel extract of Sechium edule.

2 Experimental Sections

2.1. Collection of Vegetables

The fresh vegetable of Sechium edule will be purchased from a local market in Tirupattur and used for the study. These vegetable are washed thoroughly with distilled water to devoid of any impurities. The skin of cleaned Sechium edule was peeled off carefully with a skin peeler. The peeled skin is shade dried for dehydration for about a week. The completely dried skin is made in to a fine powder using electric mixing grinder. The ground powder is sieved stored in an air tight container and used whenever it was needed.

2.2. Preparation of Peel Extract

Take 5 grams of Sechium edule peel powder + 50 ml of distilled water and 5 g of Sechium edule peel powder + 50 ml of methanol. This will be kept at room temperature for 24 hrs the test tube is removed after that period and allowed to filtered through whatman No:1 filter paper. The filtrate can be used for further studies by storing in refrigerator at 4OC not more than a week.

2.3. Phytochemical Analysis

The Aqueous and methanol peel extract of Sechium edule solutions were assessed for the existence of the phytochemical analysis by using the following standard methods [8].

1. Test for Anthraquinones

10 ml of benzene was added in 6 g of the Ephedra powder sample in a conical flask and soaked for 10 minutes and then filtered. Further 10 ml of 10% ammonia solution was added to the filtrate and shaken vigorously for 30 seconds and pink, violet, or red color indicated the presence of anthraquinones in the ammonia phase.

2. Test for Tannins

10 ml of bromine water was added to the 0.5 g peel extract. Decoloration of bromine water showed the presence of tannins.

3. Test for Saponins

5.0 ml of distilled water was mixed with peel extract in a test tube and it was mixed vigorously. The frothing was mixed with few drops of olive oil and mixed vigorously and the foam appearance showed the presence of saponins.

4. Tests for Flavonoids

2 ml of 2.0% NaOH mixture was mixed with peel extract; concentrated yellow color was produced, which became colorless when we added 2 drops of diluted acid to mixture. This result showed the presence of flavonoids.

5. Tests for Glycosides

Added 2 ml H2SO4 concentrated to the whole peel extract. A reddish brown color formed which indicated the presence of steroidal aglycone part of the glycoside.

6. Test for Terpenoids

2.0 ml of chloroform was added with the 5 ml peel extract and evaporated on the water path and then boiled with 3 ml of H2SO4 concentrated. A grey color formed which showed the entity of terpenoids.

7. Test for Steroids

2 ml of chloroform and concentrated H2SO4 were added with the 5 ml peel extract. In the lower chloroform layer red color appeared that indicated the presence of steroids [8, 9]. The Fig.1. Shows the Sechium edule are below,

Fig.1. *Sechium edule* and their peel

8. Test for Alkaloids

The solvent free extract (50mg) was stirred with one ml of dilute hydrochloric acid and filtered. The filtrate was tested for alkaloids. To the filtrate, a drop of Mayer's reagent was added along the sides of the test tube. A white precipitate indicates the test as positive.

9. Carbohydrates

To 0.5ml of the extract of the plant sample, 1ml of water and 5-8 drops of Fehling's solution was added at hot and observed for brick red precipitate.

10. Detection of Quinones

About five ml of the extract was boiled with10% HCl for few minutes in a water bath. It was filtered and allowed to cool. Equal volume of Chloroform was added to the filtrate.Few drops of 10% ammonia was added to the mixture and heated. Formation of pink colour indicates the presence of anthraquinones [10].

3.Results and Discussion

3.1. The Preliminary Phytochemical Analysis

According to the results of phytochemical screening, the bioactive chemicals tannins, phenols, saponins, terpenoids, and glycosides are absent from the aqueous and methanol peel extract of Sechium, although several secondary metabolites such as alkaloids, carbohydrates, flavonoids, steroids, and quinones are present. The Table 1 and Fig.2, 3 shows the Preliminary phytochemical analysis of aqueous and methanol peel extract of Sechium edule as follows,

It was discovered that several solvent extracts included medically active substances, including reducing sugars, glycosides, cardiac glycosides, polyphenols, tannins, flavonoids, steroids, terpenoids, and coumarins [11].

Table 1: The Preliminary Phytochemical Analysis

Phytochemical Constituents	Peel extract of *Sechium edule*	
	Aqueous	Methanol
Carbohydrates	+	+
Alkaloids	-	-
Flavonoids	+	+
Steroids	+	+
Terpenoids	-	-
Tannins	-	-
Quinones	+	+
Phenols	-	-
Saponins	-	-
Glycosides	-	-

Indicated as: + means Presence, - means Absence

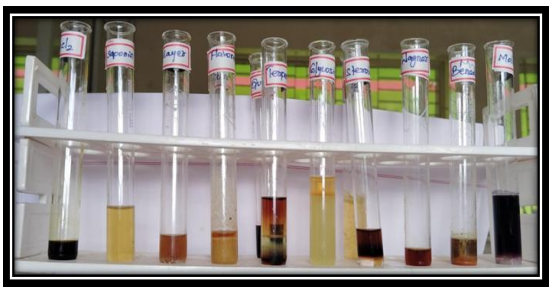

Fig.2. Phytochemical analysis of aqueous peel extract of *Sechium edule*

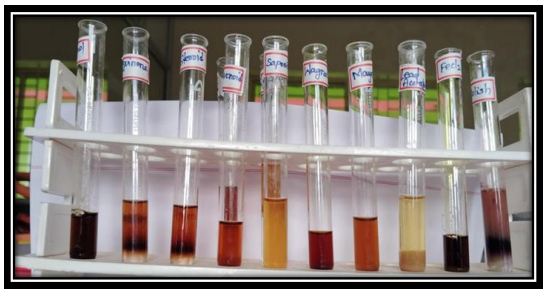

Fig.3. Phytochemical analysis of methanol peel extract of *Sechium edule*

For R. communis, the acetone extract contained all of the phyto-constituents, the petroleum ether extract

failed to contain glycosides, the aqueous extract failed to contain reducing sugars and coumarins and the chloroform extract failed to contain cardiac glycosides, flavonoids, and terpenoids. The findings showed that the highest numbers of components were obtained from acetone extract and the lowest number from chloroform extract [12].

The Preliminary phytochemical screening of V. iodocalyx and M. salicifolia methanolic leaf extracts showed the presence of phytochemical compounds which are terpenoids, alkaloids, flavonoids, phenols, tannins and saponins. Among the identified bioactive components, Caryopyllene oxide and Aromadendrene from Aquilaria rassna in Malaysia have been documented to exhibit antifungal and antibacterial activities respectively [13]. Additionally, Trans-Cinnamic acid has been reported to exhibit anticancer, neuroprotective and antidiabetic activity. Furthermore, Squalene has been reported to exhibit skin dehydration and antioxidant properties.. On the other hand, aromadendrene and beta.-Guaiene have been respectively documented to exhibit antidepressant and antiinflammatory activity [14]. Also, nhexadecanoic acid has been documented to exhibit antipsychotic and ant-androgenic activities. Eugenol and Vanillin have been reported to exhibit antiviral and cardioprotective respectively [15].

The findings of the study on the phytochemical composition of selected medicinal plants resemble those of [16] The study on phytochemical screening and acute oral toxicity of Myrica salicifolia (Bayberry) extracts done in Kenya, showed the presence of flavonoids, alkaloids, saponins, steroids, tannin and phenolics from methanolic extract of Myrica salicifolia [17]. On the other hand, the study from Kenya showed the presence of only alkaloids from petroleum ether extract contrary to our study which revealed the absence of alkaloids but the presence of terpenoids, flavonoids and tannins [18]. Differences in phytochemical composition between these two studies may be influenced by geographical area and seasons of harvesting which influence the content of plant extracts. Temperature, humidity, sunlight and precipitation can all impact the synthesis of phytochemicals in plants [19]. Most of the phytochemical constituents identified from M. salicifolia and V. iodocalyx are sources of drug synthesis. Some sesquiterpenoids show potential as lead compounds for the development of drugs for conditions including diabetes, Alzheimer's disease and cardiovascular diseases. Fatty acids are known as a source of drugs for skin disorders, neurological disorders and skin diseases [20].

4. Conclusion

It can be concluded the Phytochemical screening results show that the aqueous and methanol peel extract of Sechium does not contain the bioactive chemicals tannins, phenols, saponins, terpenoids, and glycosides, but it does contain a number of secondary metabolites, including alkaloids, carbohydrates, flavonoids, steroids, and quinones. From the data obtained, it can be concluded that the peel extract of Sechium edule can be used as a possible source of treatment for problems associated with oxidative stress as well as strong anticancer activity.

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Conflict of Interest: Nil

5. References

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