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**PROXIMATE AND PHYTOCHEMICAL SCREENING FOR THE LEAVES OF SOME  
IMPORTANT SPICES USED IN TRADITIONAL MEDICINE**

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**ABSTRACT**

A significant portion of the population in most of the nations is receiving healthcare through traditional medical systems based on medicinal plants. Worldwide, the use of herbal products made from them is rising because of being natural and with less or no side effect. The utilisation of herbal medicines as a significant source for the development of novel pharmaceutical compounds to treat severe ailments has been well-documented. The plant species include phytoconstituents which are responsible for the pharmacological effects. The traditional spice namely *Pimenta dioica* *Syzygium aromaticum* and *Syzygium cumini*, has been used for food preservation and has a number of medicinal properties. In the present study, the proximate and phytochemical screening were carried out for the leaves of these spices. The leaves of the spices are not utilized and the present study reveals the presence of similar phytoconstituents and nutrients present in the leaves of the selected spices.

**KEYWORDS:** *Pimenta dioica* *Syzygium aromaticum*, *Syzygium cumini*, proximate, and phytochemical analysis

## INTRODUCTION

Traditional medicine encompasses physical, manual, and spiritual therapies as well as medical processes, methods, beliefs, and practises that use medications obtained from plants, animals, and minerals. To treat, diagnose, prevent, or maintain health, these approaches can be utilised singly or in combination. In tradition medicine, plant, animals and their by-products were mostly used. Among plants, food spices are aromatic and pungent dried vegetable components that are ingested by humans and provide flavour, colour, and perfume to food (Gadekar and Yerramilli, 2006). Spices have a wide range of functions, including flavouring food, preserving food, and providing medicine. The phytochemical constituents were responsible for their various activities.

Phytochemical substances are often non-nutritive secondary metabolites with additional functional features including antimicrobial activity against a variety of foodborne bacteria. Due of their complex chemical makeup, phytochemicals are typically divided into different classes. These classes include polyphenols, carotenoids, alkaloids, sulfur-containing groups, terpenes, and terpenoids. (Prakash et al., 2020).

The leaves of the spices namely *Pimenta dioica*, *Syzygium aromaticum* and *Syzygium cumini* were selected for the present study to evaluate their proximate and phytochemical constituents.

### Spices selected

*Pimenta dioica* (Merr.) L., belongs to the family Myrtaceae is widely distributed in Asia, Mexico, and South America. It is known as allspice, pimento, clove pepper, and Jamaica pepper. It is traditionally used as a spice and condiment, but it is also used commercially for tanning, as a flavouring and fragrance ingredient in soaps and

tonics, as well as for enhancing medications. In addition to being used to treat rheumatic pains, indigestion, flatulence, diabetes, viral infections, sinusitis, bronchitis, depression, psychological exhaustion, hysterical paroxysms, arthritis, and fatigue, various plant parts have also been used to treat dental and muscular problems. (Arquín-Enríquez et.al., 2021)

The dried flower bud *Syzygium aromaticum*, often known as clove, is a member of the Myrtaceae family and has recently been grown throughout the world. Due to their antioxidant and antibacterial qualities, cloves are one of the spices that have the potential to replace chemical preservatives in many dishes, particularly when preparing meat. They are also used commercially for a variety of medical uses and in the perfume industry. Many studies have shown that certain fragrant herbs, such as cinnamon, oregano, clove, thyme, and mint, have antibacterial, antiviral, anticarcinogenic, and antifungal properties. In Chinese and Indian traditional medicine, cloves are employed as a warming and stimulating stimulant. Cloves have long been used as a stimulant for the nervous system as well as a treatment for nausea, vomiting, flatulence, liver, intestine, and stomach diseases. Cloves have been shown to treat a variety of pathogens in tropical Asia, including scabies, cholera, malaria, and tuberculosis (Gaber El-Saber Batiha et.al., 2020).

*Syzygium cumini* commonly known as black plum, or Java plum, is found commonly in most of the places and the fruits are more popular. This belongs to the family Myrtaceae. The jambolan has a long history in alternative medicine and can be utilised medicinally in all parts of the plant. The fruits have been utilised for a wide range of illnesses from all over the world, including ringworm, cough, diabetes,

diarrhoea, and inflammation. Moreover, it has a long medical history, is an age-old medicinal plant, and has been discussed in classical literature for more than a century. It is readily available throughout India and is mentioned in Indian traditional medicine as a means of treating diabetes mellitus. Several portions of the plant are used by various traditional healers in India to treat conditions like diabetes, mouth blisters, cancer, colic, diarrhoea, digestive disorders, dysentery, piles, acne, and stomachaches ( Muniappan Ayyanar and Pandurangan Subash-Babu, 2012)

## **Materials and Methods**

### **Collection and processing of Plant Materials**

The fresh plants were collected from a Kanyakumari district, TamilNadu. The plants collected were identified and authenticated by the expert. The fresh leaves of the spices were air dried at 28°C for 30 days. They were grounded into fine powder using an electric blender and stored in a cool dry container until use.

### **Proximate analysis**

The AOAC-recommended method was used to determine the protein content (Kjeldahl method), fat content (solvent extraction), ash content, and crude fibre content (2005). The carbohydrate content was estimated using the methodology proposed by Olawoye and Gbadamosi (2020).

### **Methods for Phytochemical Screening**

Phytochemical screening was carried out for the sample by following the standard procedures 2

#### **Test for saponins**

Exactly 0.5 g of the powder and 5 ml of distilled water were placed to a test tube. The liquid was violently shaken before being examined for the presence of a stable, long-

lasting froth. The mixture was shook ferociously before being checked for the presence of an emulsion by adding three drops of extra virgin olive oil.

#### **Test for steroids**

The powder was dissolved in 10 ml of chloroform along with an equal volume of concentrated H<sub>2</sub>SO<sub>4</sub> by the sides of the test. The presence of steroids is indicated by the layer's reddish upper layer and yellowish sulphuric acid layer with green fluorescence.

#### **Test for cardiac glycosides (Keller-Killiani Test)**

2 ml of glacial acetic acid solution containing one drop of ferric chloride solution was added to 0.5 g of the powder that had been dissolved in 5 ml of water. 1ml of concentrated H<sub>2</sub>SO<sub>4</sub> was used as a foundation. Cardenolides with deoxysugar properties were visible at the contact as a brown ring. In the acetic acid layer, a greenish ring may emerge slightly above the brown ring and eventually expand throughout this layer, while a violet ring may appear below the brown ring.

#### **Test for flavonoids**

Three minutes of heating a portion of the powder with 10 ml of ethyl acetate over a steam bath followed by filtering the mixture and shaking 4 ml of the filtrate with 1 ml of diluted ammonia solution. The presence of flavonoids was indicated by a yellow colouring.

#### **Test for alkaloids**

The sample was dissolved in diluted HCl and filtered. Filtrates was treated with Mayer's reagent (potassium mercuric iodide) and precipitate with a yellow hue forms indicates the presence of alkaloids. For another test, the filtrate was treated with Dragendroff's reagent (solution of potassium bismuth iodide). The

presence of alkaloid is shown by the formation of red precipitate. Hager's reagent (saturated picric acid solution) was used to treat the filtrate. Yellow coloured precipitate is produced, which serves as confirmation of the presence of alkaloid.

### Test for tannins

The mixture of 0.5 g of the powder and 10 ml of warm water was then filtered in a test tube. We tested the solution for the presence of any brownish green or blue-black colouring after adding a few drops of 0.1% ferric chloride.

### Result and discussion

The proximate analysis were carried for the leaves of *Pimenta dioica*, *Syzygium aromaticum* and *Syzygium cumini*. The moisture content of the dried leaves of *P. dioica* showed  $41.52 \pm 1.3$  percentage. The total ash content of the sample showed  $6.53 \pm 0.97$  percent. Total fibre content of the leaf showed  $18.53 \pm 0.33$  percent, protein content of the leaf showed  $6.89 \pm 1.4$  percent. Carbohydrate percentage of the leaves showed maximum in our analysis such as  $20.03 \pm 1.06$  percent.

Moisture content of the dried leaves of *S. aromaticum* showed  $30.07 \pm 1.65$  percentage. The total ash content of the sample showed  $4.62 \pm 0.52$  percent. Total fibre content of the leaf showed  $12.45 \pm 0.55$  percent, protein content of the leaf showed  $3.16 \pm 1.21$  percent. Carbohydrate percentage of the leaves showed maximum in our analysis such as  $33.67 \pm 0.36$  percent.

Dried leaves of *S. cumini* showed moisture content of  $31.25 \pm 1.17$  percentage. The total ash content of the sample showed  $6.34 \pm 0.82$  percent. Total fiber content of the leaf showed  $7.08 \pm 1.22$  percent, protein content of the leaf showed  $2.02 \pm 1.03$  percent. Carbohydrate percentage of the leaves showed maximum in our analysis such as  $26.23 \pm 1.37$  percent.

Among the selected spices, the protein content of *P. dioica* was found to be more.

Protein is very essential. But the source of protein with purity and affordable price is less. The plant proteins provide a source of nutrients, particularly for the less fortunate population in developing nations. When other energy sources are scarce, proteins, one of the macromolecules, can be used as a substitute. Food protein serves as the building blocks for the production of essential compounds such as hormones, brain chemicals, antibodies, digestive enzymes, and DNA. Certain proteins aid in structural support, while others are necessary for movement or microbial defence in the body. As a result of their higher than 12% protein content in terms of caloric value, some spices can be regarded as good sources of protein. Thus, the spices' protein content will go a long way towards satisfying the locals' need for protein.

In the present study, the result shows that the fiber content is more in the leaves of *P. dioica* than the other two selected spices. Fiber has nutritional significance since fibre helps the body absorb and digest trace elements in the gut and lowers cholesterol levels. Moreover, the plants' crude fibre levels fell within the range of the published values for a few vegetables from Nigeria (Abu et.al., 2020)

In the present study, the result shows that the fat content was low in the leaves of *P. dioica* than the other two selected spices. According to Jacob et al., (2022) reported that plants with minimal fat contents, making them suitable for inclusion in diets intended to help people lose weight. Low-fat foods lower cholesterol levels, which in turn lower obesity rates and all other degenerative diseases linked to dietary fat consumption.

In the present study, the result shows that the ash content was more in the leaves of *S. cumini* than the other two selected spices. The presence of ash contents is an indication of the level of minerals and organic matter present in the plant thereby justify the traditional importance of the plants (Olaniyi et.al., 2018).

In the present study, the result shows that the ash content was more in the leaves of *S. aromaticum* than the other two selected spices. Carbohydrate

is the sources of energy and hence the plant leaves be used as the source of energy too.

Table 1: Phytochemical present in the selected leaves of spices.

Phytochemical	<i>P. dioica</i>	<i>S. aromaticum</i>	<i>S. cumini</i>
Alkaloid	+	+	+
Flavonoid	+	+	+
Saponin	+	+	+
Steroids	-	-	+
Tannins	+	+	+
Cardiac glycosides	-	+	+

‘+’ present and ‘-’ absent

The three spices namely *P. dioica*, *S. aromaticum* and *S. cumini* were selected for the present study and their leaves were screened for the presence or absence of various phytochemicals. Table 1 shows the presence/absence of phytoconstituents in the sample.

The chosen spices were traditionally utilised for their diverse therapeutic properties; as a result, they may be a suitable source of medication for preventing the onset of degenerative disorders (Iqbal and Hamayun, 2002). The presence of numerous bioactive chemicals in the medicinal plants was discovered through phytochemical screening of the plant extracts, and it was determined that these compounds contributed to both the medical value and physiological activity of the users. They were acknowledged to possess both therapeutic and physiological properties (Shirolkar et al (2013)). Research proved that plants may indeed contain medicinal compounds that may be responsible for reducing or controlling a variety of disease-related problems.

In medicine, saponins were utilised for hypercholesterolemia, hyperglycemia, antioxidant, anti-cancer, anti-inflammatory,

anti-fungal, weight reduction, immunological modulatory action, and cholesterol reducing activity etc (Ngbede et al., 2008). Caesalpinoideae are known to have a lot of tannin sacs, which are also known to have antiviral, antibacterial, and anticancer properties. Moreover, it was shown that certain tannins can act as diuretics and selectively limit HIV replication. Moreover, tannic acids and tanning chemicals used commercially come from plant tannins (Trease and Evans 2002). Many pharmacological actions of flavonoids and phenols include antioxidant, anti-inflammatory, antiplatelet, anti-allergic, cytotoxicity, and a decreased risk of heart disease (Mohammad and Etham, 2013).

### Conclusion:

The present study were carried out to evaluate the presence of various phytoconstituents in the leaves of the commonly used spices namely *P. dioica*, *S. aromaticum* and *S. cumini*. The result revealed the presence of important phytochemicals in the leaves of the spices. In general, the spices are more valued and commonly used for fragrance and aroma in food processing and in medicines. This basic study could conclude that the leaves of these spices can also be used an alternate in terms of the phytoconstituents and proximate content. Further studies are required to quantify the chemical present in the leaves as well as the medicinal values

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