

PHYTOCHEMICAL ANALYSIS OF LUBEG (*Syzygium lineatum* (DC).Merr & L.M. Perry) SPECIES IN APAYAO

MARIA CHRISTINA ZARATE-MANICAD

Apayao State College, San Isidro Sur, 3813 Luna, Apayao, Philippines

Abstract: Preliminary phytochemical screening was done to ascertain the presence of secondary metabolites to Lubeg species, ethanolic extract were used in the study. The qualitative phytochemical analysis were employed using colour forming and precipitating chemical reagents to produce preliminary data on the constituents of secondary metabolites of the leaves and fruit extracts of Lubeg species.

The phytochemical analysis revealed that Flavanoids, Tannins and saponins are present in both leaves and fruit extracts except for alkaloids. There is very poor result on the saponin content of both leaves and fruits but this is an evidence that saponin is present in Lubeg species. The results of the study are promising thus providing a basis for the wide utilization of the Lubeg leaves not only its fruits and may be considered as a valuable plant in both in the traditional and folk medicines.

Keywords: *Syzygium lineatum*.

1. INTRODUCTION

Rationale

Apayao province, dubbed as the last forest frontier of the far-north is indeed blessed with diverse plant species, which inhabitants or the people living in the area should learn to utilized and conserve. Practices on the proper utilization and conservation of the species found in the area should be fully considered and understood.

Further, little is known about unexploited plant resources used in the food system or in traditional medicine to cure various diseases. Fruits and other parts of lesser-known tree species in the area covers an important part of staple foods and dishes for rural people living therein and are rich sources of proteins, carbohydrates, vitamins, and minerals such as calcium, iron and phosphorus [1].

Trees and or plants are of huge significance to the health of individuals and communities. The importance of trees and or plants lies in the nutritional value but also in some chemical substance they contain that produces definite physiological action on human body. Fortunately, many of this indigenous tree parts are used as foods and or medicines[2].

Since ancient times, people have been exploring the nature particularly medicinal plants or trees in search of new drugs. Medicinal plants are used by 80% of the world population for their basic health needs.

Traditional systems of medicines are prepared from a single plant or combinations of more than one plant. This value depends upon the current knowledge about taxonomic features of plant species, plant parts and biological Property of medicinal plants which in turn depends upon the occurrence of primary and secondary metabolites [3].

Phytochemicals are naturally occurring biochemical in plants that help to give plants their characteristic colour, flavour, smell and texture. Apart from that, phytochemicals could prevent diseases and inhibit pathogenic microorganisms. Indeed, the proper composition of phytochemicals appears to confer plants and plant parts with peculiar medicinal properties [4].

Despite the many researches conducted regarding the lesser-known species, the Lubeg, remains to be un-characterized and explored in terms to its phyto-chemical composition, it is for this desire to explore the said components of the species. This research is therefore one of its kind study regarding the species.

Lubeg (*Syzygium lineatum* (DC.)Merr. & LM. Perry) is an erect, medium fruit tree usually 4 to 5 meters in height and belongs to family MYRTACEAE. Leaf are simple attached to the stem oppositely arranged. Leaves opposite, rarely alternate, simple, entire, rarely denticulate or crenate, 3 nerved or penninerved, often pellucidotted, estipulate or stipules small and deciduous, frequently with an intra-marginal nerve leaves elliptical to elliptical- lanceolate, 5-12 cm x 2-5 cm, with numerous and close – set secondary veins fairly distinct below, petiole up to 12 mm long; The margin usually entire and the base wide and obtuse, apex acuminate and with a 1-15 cm cuspidate. Bark surface smooth, cracking and scaly, reddish brown. The bark flaky and corky, it has a grayish brown bark that is rough and fissured; the flower usually regular, perfect solitary or in axillary spikes, many with pair of bracts from the base, white, red or yellow, calyx superior or perigynous, 4 or 5 toothed or lobed, the links persistent or deciduous, either valvate or imbricate, petals inserted upon a disk – like operculum (lid or cap) alternating with the calyx lobes, rarely wanting stamens are many; inserted in several rows with the petals upon the calyx rim; filaments free or more or less coherent. Towards the base; anthers small; rounded, ovary inferior or nearly so; crowned by fleshy disks; ovules are numerous; with simple style. Flowers have an inferior ovary regular and complete. Flowers in axillary and terminal panicles and persistent; Fruit are berry with thick and fleshy, spongy, leather or brittle rind, oblong – ovoid or ellipsoid, up to 13 mm long. Fruit are berry with thick and fleshy, spongy, leather or brittle rind, oblong – ovoid or ellipsoid, up to 13 mm long it is highly perishable and lasts per about two weeks when ripen. The ripe fruit of Lubeg can be potentially processed as Jam, Jelly, and can be fermented to produce wine and vinegar [5]

Objectives

The present study therefore aimed to ascertain the phytochemical components of the Lubeg species particularly its leaves and fruits.

2. METHODOLOGY

Research Design

The study deals with qualitative phytochemical screening of the Lubeg species in Apayao utilizing the fruits and leaves extract, the study made use of descriptive research based on colour reaction indications, to test the reliability of the qualitative phytochemical analysis of Lubeg species, three (3) replications with three sample test tube for each plant parts were prepared and tested for each of the phytochemical constituents.

Collection and Preparation of Extracts

Collection

The leaves and fruits of Lubeg species were collected from the different matured mother tree from the different municipalities of Apayao, were cleaned, washed and properly air dried, chopped thinly to at least ¼ inch in width. A composite sample specimen of 3 kilos of chopped Lubeg leaves and one kilo of Fresh Lubeg fruits were brought to FPRDI- UPLB where facilities to conduct the study are available.

Ethanollic Extract

The ethanollic extract of both leaves and fruits of Lubeg species were prepared by the method of Soxhlet extraction:

Procedure: the sample (powdered fruits and leaves of Lubeg species 500grams each) were weighed and placed in the thimble made from thick filter paper, which was then loaded into the main chamber of the Soxhlet extractor. The extractor was then placed onto a flask containing the extraction solvent (Ethanol 500ml). The Soxhlet was then equipped with a condenser. The solvent was heated to reflux. The chambers containing the solid material were slowly filled with warm

solvent to dissolve some of the desired compound. When the Soxhlet chamber was almost full, the chamber was automatically emptied by a siphon side arm, with the solvent running back and down to the distillation flask. This cycle was repeatedly done for about 36 hours. During each cycle, a portion of the non-volatile compound dissolved in the solvent and a desired compound were concentrated over the hot water bath to remove the solvent.

Phytochemical Screening

Chemical tests were carried out ethanolic fruit and leaves extracts for the qualitative determination of phytochemical constituents as describe by Harborne (1973), Trease and Evans (1989), Sofowora (1993) as cited by Abbhi, Joseph and George (2011).

Alkaloids

0.5g extracts from fruits and leaves of Lubeg species was diluted with 10ml of acid alcohol, boiled and filtered. To 5 ml of the filtrate was added 2 ml of dilute ammonia, 5 ml of chloroform was added and shaken gently to extract the alkaloid base. The chloroform layer was extracted with 10ml of acetic acid. This was divided into two parts each of the fruit and the leaves. Mayer’s reagent was added to one portion of the fruit extract and the leaves extract and Draggendoff’s reagent was added to other portion of extract. The formation of cream (with Mayer’s reagent) or reddish brown precipitate (with Draggendoff’s reagent)[6].

Saponins

To 0.5g of extract was added 5ml of distilled water in a test tube. The solution was shaken vigorously and observed for a stable persistent froth. The frothing was mixed with 3 drops of olive oil and is shaken vigorously. An appearance of creamy mass of small bubbles indicated the presence of saponins [7].

Tannins

0.5 g of the extracts (fruits and leaves) were boiled separately in 10ml of water in a test tube and then filtered. A few drops of 0.1% ferric chloride were added and were observed. The appearance of brownish green or a blue-black colouration indicates the presence of tannins [8].

Flavanoids

Add few fragments of magnesium ribbon to the test solution and add Hydrochloric acid, pink scarlet, crimson red or occasionally green to blue colour appears after few minutes [9].

3. RESULTS AND DISCUSSION

The Qualitative Phytochemical analysis of Lubeg leaves and fruits were done by using colour forming and precipitating chemical reagents to produce preliminary data on the constituents or secondary metabolites of the leaves and fruit extracts of Lubeg species.

Table 1. Result of Preliminary Qualitative Phytochemical Analysis of Lubeg Species (*Syzygium lineatum* (Roxb) Merr. & Perry)

Plant parts	Phytoconstituents			
	Alkaloids (Mayers Reagent & Dragendorff’s Reagent)	Flavanoids (Shinoda Test-addition of Magnesium ribbon and HCl acid)	Tannin (addition of 0.9 Ferric Chloride)	Saponin (Froth test)
leaves	-	+	+	+
Fruits	-	+	+	+

-ve sign indicate absence of constituents
+ve sign indicate presence of constituents

Table 1 shows the result of preliminary qualitative phytochemical analysis. The screening conducted on the Lubeg species particularly in the leaves and fruit extracts showed the absence of alkaloids and the presence of flavanoids, tannins, and saponins.

These phytochemicals were known to exhibit medicinal physiological activities [10].

In the study conducted on the preliminary phytochemical screening of Lubeg species, the leaves and fruit extract did not show the presence of alkaloids in any of the extracts (Aqueous extract and Ethanolic Extract) that were tested for its presence.

The various phytochemical compounds detected are known to have a beneficial importance in medicinal sciences.

Flavanoids was found out to be present in Lubeg species, both in leaves and in fruits extract respectively, after the addition of Magnesium ribbon and Hydrochloric acid to the extracts (leaf and fruit) presence of deep red coloration occurs which indicates a positive result for flavanoid.

Based from the result of the study, the type of flavanoid present in the Lubeg species (leaves and fruit extracts) are the cyanidin and the leucoanthocyanin.

Ukoha et al (2011) cited that flavonoid is an integral phytochemical constituents of higher plants. They have antioxidant potentials hence, could offer protection against heart disease and cancer by enhancing the body defense against pathology induced free radicals.

Further a study in Japan by Takanori Tsua, et.al [11] indicated that cyanidin a type of flavonoids may have benefits for the prevention of obesity and diabetes; it also reduces blood glucose level and improves insulin sensitivity.

After a successive test (three trials) made by adding a ferric chloride to leaves and fruits extract, the result of the interaction of the tannin solution with the test reagents revealed formation of prominent greenish brown precipitates which indicates possible presence of condensed tannins for leaves and formation of bluish black precipitates which also indicates presence of hydrolysable tannins in fruits.

In the preliminary screening conducted for saponins the result revealed that there is a poor froth formation both in the leaves and fruit extracts, for leaves froth formation ranges from 2cm – 2.5 cm and for the fruit the froth formation ranges from 0.3cm-0.4 cm.

Though the result revealed a poor froth formation, Lubeg species still showed presence of saponins but only in a small amount which still indicates that Lubeg species possess this kind of secondary metabolites which have so many health benefits wherein some studies have illustrated the beneficial effects on blood cholesterol levels, cancer, bone health and stimulation of the immune system.

4. CONCLUSIONS AND RECOMMENDATION

The Qualitative Phytochemical analysis of Lubeg leaves and fruits were done by using colour forming and precipitating chemical reagents to produce preliminary data on the constituents of secondary metabolites of the leaves and fruit extracts of Lubeg species.

The screening conducted on the Lubeg species particularly in the leaves and fruit extracts showed the absence of alkaloids and the presence of flavanoids, tannins, and saponins.

The various phytochemical compounds detected are known to have a beneficial importance in medicinal sciences such as the flavonoids, tannins and the saponins. These secondary metabolites found in Lubeg leaves and fruits extracts believe to have a health promoting properties such as antioxidants, reduces blood sugars, anti-toxic, anti-inflammatory, anti-cancer, heart health, skin protection, bone health and stimulation of the immune system.

On the whole, the present study is the first one which systematically reports the phytochemicals present through ethanolic extracts of Lubeg leaves and fruits extracts, the results of the study are promising thus indicating the utilization of the Lubeg leaves not only its fruits and may be considered as a valuable plant in both traditional (ayurvedic) and modern drug development areas of its useful medicinal uses.

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In view of the various uses associated with the compounds found from the result of the study, the following are recommended:

1. A follow-up study should be done to verify/confirm the result before it will be finally endorsed to the Department of Health for its promotion as being an indigenous fruit tree with pharmacological benefits;
2. A research should be done likewise to quantify the concentration of the different compounds per known amount for industrial uses. Since, the compounds found in the Lubeg species both leaves and fruits could be harnessed for industrial and medicinal utilization; and
3. Research on product development such as formulation of nutra-ceutical beverage (tea) that could offer a whole lot of health benefit to the users should be done;

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