Evaluation of Preliminary Phytochemical Analysis of Leaf Extract of Nephelium Lappaceum

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Abstract- *The knowledge of traditional medicine, medicinal plants and their scientific study lead to the discovery of newer and cheaper drugs. A large number of plants are found to possess the medicinal properties in the traditional system and are most widely used by people all over the world. Nephelium lappaceum (rambutan) is well known to cure several diseases and used in various folk medicinal preparation. In this study, phytochemical screening was carried out to identify various compounds present in the leaves of Nephelium lappaceum.*

Keywords- Nephelium lappaceum, phytochemical analysis, leaf extract, ethanol.

I. INTRODUCTION

Plants are used as sources for centuries as a most powerful remedy for treating many diseases because of presence of numerous bioactive constituents of immense therapeutic values. The world is now looking towards the production of new drugs for different diseases because of its undefinable medicinal properties[1].

Nephelium lappaceum or Rambutan (King of fruit) is a tropical fruit belongs to sapindaceae family, which is delicious and sweet, unique odour and formidable thorn covered hersk [2]. The fresh fruits are used for making jellies and jams. The seeds are rich in fat and oil that is used to cook and soap manufacturing. Rambutan leaves has been most widely recognized in Indonesia to treat many serious diseases. It has been claimed that the fruit possess great rejuvenating power. This plant also has several therapeutical applications like antimicrobial, antioxidant, anti-diabetic, anti-atheroschlerosis, anti-carcinogenic, anti-proliferative and hypoglycemic activities [2,3and 4]. The pulp of rambutan has been reported to possess high abundant of carbohydrates, fats, proteins, phosphorus, iron, calcium and flavonoids. Its leaves, root and bark have important function in the production of dyes.The fruit of rambutan act as a vermifuge which is a medicine that destroys intestinal worms and it also used to cure diarrhea and dysentery. Roots of rambutan is used for treating fever .The bark is used as a remedy for thrush, as an astringent for tongue diseases and leaves are used for headaches[5]. The present study were carried out to analyze the presence of phytoconstituents in leaves of Rambutan.

II. MATERIALS AND METHODS

Collection and Preparation of Plant Materials

Healthy fresh leaves of *Nephelium lappaceum* are collected from Malappuram District, Kerala. The leaves are rinsed with water and dried at room temperature under well ventilated shade. The dried leaves are powdered and stored in air-tight container for further analysis.

Extraction of Plant material

30 g of powdered leaves extract is prepared in 300 ml of ethanol for 24 hours in a soxhlet apparatus. After 24 hours, the crude solvent is allowed to evaporate at room temperature to obtain ethanolic extract of Rambutan.

III. PRELIMINARY PHYTOCHEMICAL SCREENING

Ethanolic extractof *Nephelium lappaceum Linn* was analyzed for the presence of various phytoconstituents like carbohydrate, alkaloids, saponins, phytosterol, tannins, flavonoids, proteins and amino acids, glycosides and phenolic compounds[6-15].

Test for Carbohydrates

Extracts were dissolved in 5 ml of distilled water and filtered. The filtrates were used for analyzing the presence of carbohydrates.

Molisch's test: 2 ml of extract was treated with Molisch's reagent and 1 ml of concentrated sulphuric acid was added along the sides of the test tube. The formation of deep violet colure ring indicates the presence of carbohydrates.

Fehling's test: 2 ml of extract was heated with equal volume of Fehling's A & B solutions. The formation of orange red precipitate indicates the presence of reducing sugar.

Benedict's test: 2 ml of extract is heating with 2 ml of Benedict's reagent. The formation of brown precipitate which indicates the presence of sugar.

Test for Proteins and Aminoacids

Xanthoproteic test: 3ml extract was treated with 1 ml of concentrated sulphuric acid. The formation of white precipitate which turns to yellow on boiling which indicates the presence proteins.

Ninhydrin test: 3 ml extract was treated with 3 drops of 0.25%w/v Ninhydrin reagent and boiled for few minutes. The change in colour of solution to blue indicates the presence of amino acid.

Test for Phenols

Ferric chloride test: 3ml of extract was treated with 3ml of 5%w/v ferric chloride solution. The formation of blue-black color indicates the presence of tannins and phenols.

Test for Glycosides

Extracts were hydrolyzed with dilute hydrochloric acid and then subjected to test for glycosides.

Borntrager's test: 2 ml of extract was treated with 2 ml of dilute sulphuric acid added, boiled for 5 minutes and filtered. To the filtrate, equal volumes of chloroform was added and mixed well. Organic layers were separated and ammonia was added. The formation of pinkish red color of the ammonia layer indicates the presence of glycosides.

Test for Saponins

Foam test: The extract was shaken vigorously with 20 ml water. Formation of persistent foam indicates the presence of saponins.

Froth test: The extract were diluted to 20 ml with distilled water and this was shaken in a graduated cylinder for 15 minutes. Formation of 1cm layer of foam indicates the presence of saponins.

Test for Phytosterols

Salkowaski test: 2 ml of extract was treated with 5 drops of concentrated sulphuric acid, shaken and allowed to stand. Formation of greenish blue color indicates the presence of triterpenoids.

Libermann Burchard's test: 2 ml of the test solution was treated with 10 drops of acetic anhydride. To this 5ml of concentrated sulphuric acid was added from the sides of the test tube. Formation of greenish blue color of indicates the presence triterpenoids.

Test for Alkaloids

Extract was dissolved in dilute hydrochloric acid and filtered.

Wagner's test: 2ml of the test solution was treated with 1 ml of Wagner's reagent (Iodine in potassium iodine).Formation of brown or reddish precipitate indicates the presence of alkaloids.

Hager's test: 2 ml of filtrate was treated with Hager's reagent (saturated sulphuric acid).Presence of alkaloids was confirmed by the formation of yellow coloured precipitate.

Test for Flavanoids

Alkaline reagent test: 2 ml of the extract was treated with few drops of sodium hydroxide solution. Formation of intense yellow color which becomes colorless on addition of dilute hydrochloric acid indicates the presence of flavonoids.

Lead acetate test: 2 ml of extract was treated with 10% lead acetate solution. Formation of white precipitate indicates the presence of flavonoids.

Test for Tannins

Gelatin test: 2 ml of gelatin solution was treated with 1% gelatin solution containing 10% sodium chloride. Formation of white precipitate indicates the presence of tannins.

IV. RESULTS AND DISCUSSION

The result of phytochemical analysis of *Nephelium lappaceum* clearly showed the presence of variousphytoconstituents like carbohydrate, alkaloids, diterpenoids, saponins, phytosterol, tannins, flavonoids, proteins and amino acids, glycosides and phenolic compounds.

Table. 1 Phytochemical screening

S.No	Phytoconstituents	Results
1	Carbohydrates	+++
2	Alkaloids	+++
3	Saponins	+++
4	Phytosterols	+++
5	Tannins	+++
6	Flavonoids	+++
7	Proteins and amino acids	+++
8	Glycosides	+++
9	Phenols	+++

The present study revealed the presence of phytoconstituents like carbohydrate, alkaloids, saponins, phytosterols, tannins, flavonoids, proteins and amino acids, glycosides and phenoliccompounds in the leaf extract of *Nephelium lappaceum*.These phytoconstituents also has several therapeutical applications, for example alkaloids protected against chronic diseases. Saponins protect against hypercholesterolemia and antibiotic properties[16]. Steroids also can contribute to the development and maintenance of central nervous system [17].Flavonoids has been referred to as nature's biological response modifiers because of their inherent ability to modify the body's reaction to allergies and viruses and they showed their antiallergic,anti-inflammatory, antimicrobial and anticancer activities[18].The results are in agreement with Nethaji R *et al.*, they found that the methanolic extract of Rambutan was rich in carbohydrates, proteins and amino acids, steroids, alkaloids, flavonoids, tannins, triterpenoids and glycosides[19]. Additionally, Sylvia Soeng*et al*., found that 70% ethanolic extract of Rambutan seeds showed the presence of highest terpenoids, lowest alkaloids. Tannins, steroids, saponins, and flavonoids were undetected in Rambutan seed extract. The hexane, ethyl acetate and butanol extract of Rambutan also showed the presence of moderate level of phenols[20]. Mahendran Sekar *et al*., found that crude methanolic extract of red and yellow Rambutan peels showed the presence of carbohydrates, proteins and amino acids, steroids, flavonoids, tannins, triterpenoids and fixed oils [21]. Phytochemical analysis of the medicinal plants is important and have commercial interest in bothpharmaceutical companies and research institutes for manufacturing of new drugs for the treatment of various diseases. Thus, the bioactive principles identified in the present study of *Nephelium lappaceum*leaves will be helpful in the treatment of various ailments.

V. CONCLUSION

From the present study, it was concluded that the ethanolic extract of leaves of *Nephelium lappaceum* are excellent source of bioactive phytoconstituents like carbohydrate, alkaloids, saponins, phytosterols, tannins, flavonoids, proteins and amino acids, glycosides and phenoliccompounds.Compared to extraction from fruits and other parts of the tree, leaf extracts of Rambutanmay be useful in the detection of the bioactive principles and subsequently may lead to the drug discovery at a cheaper cost.

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