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Phytochemical analysis of *Areca catechu* Leaf

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Abstract: *Herbal medicines are respected for its medicinal values through generations. Plantae represents a huge reservoir of biologically active compounds. Around 60% of the drugs utilized medicine are of obtained from plant origin. It's important to use phytochemical methods to screen and analyze biological active components and their therapeutic mechanisms. Unlike pharmaceutical chemical these phytochemical don't have any side effects.* ***Areca catechu*** *is commonly utilized in Herbal medicine.* ***Areca catechu*** *belongs to the family Arecaceae is usually called as Betel nut. They are much grown in tropical zone.* ***Areca catechu*** *produces wide range of phytochemical constituents which are secondary metabolites. Pure, Distilled water, Acetone, Alcohol extract of* ***Areca catechu*** *leaf were used for phytochemical analysis. The extract were screened for their phytochemical constituent by standard protocol and showed to contain carbohydrate, protein, amino acid, steroid, tannin, saponin, flavonoid, alkaloid, terpenoid.*

Key Words: *Areca catechu, Biological active compounds, Phytochemical constituents, Standard protocol.*

1. INTRODUCTION:

India is rich in many cultural traditions related to medicative plants. The requriement of searching for phytochemical constituents is incredibly vital for medicinal purposes. Phytochemical constituents help to find out secondary compound present in plant. Plants have evolved the power to synthesize chemical compounds that help them defend against attack from a good sort of predators like insects, fungi and herbivorous mammals. Several compounds of secondary metabolites typically concerned in plant adaptation to environmental stress conditions. Several drugs used these days are straightforward artificial modifications or copies of the naturally obtained substances. A huge range of natural plant-based extracts and chemicals are imagined to have helpful effects are present in India. (Senthil Amudhan et al. 2019). Herbal medicine plays a crucial role within the primary health care delivery system in most developing countries. The WHO estimates that 80% of the population living in rural areas use or depend upon herbal medicine for anyone's health needs (WHO Traditional Medicine Strategy, 2002).

Medicinal plants naturally synthesize and accumulate some secondary metabolites like alkaloids, sterols, terpenoids, and flavonoids (Aathira E. P et al., 2019). Many phytochemicals present within the plants has future beneficial effects when consumed by humans. The phytochemicals appear to possess structure and mode of action distinct from those of the antibiotics in current use suggesting the cross resistance with agents already in use. Hence, it's significant to study the phytochemicals and their activity. The phytochemicals prevent diseases in man and they act as prophylactic and therapeutic agents in cardio protection (Vasanthi HR et al., 2012). Herbal medicines are known as any preparation containing many active herbal substances or herbal extractives. For majority of those preparations, the active principles or compounds are unknown. Among the primary priorities designed by WHO in its strategy for Traditional Medicine, the study of plants for external use with antiseptic and wound healing promoting activity are emphasized (Akerele, 1984). Plant constituents are isolated either directly or indirectly and used for the synthesis of varied drugs. *Areca catechu* is usually belongs to the family Arecaceae cultivated in tropical Pacific, Asia and parts of East Africa. *Areca catechu* is commercially used in the market. *Areca catechu* may be medium-sized palm tree. The husks, leaves, young shoots, nuts, buds and roots of *Areca catechu* are utilized in various medicative preparations. The palm reaches a mature height of 10–20 m (33–66 ft.) (Exceptionally up to 30 m [100 ft.]), with a trunk 25–40 cm (10–16 in) in diameter. Typhoons and tropical storms usually prevent the trees from reaching their maximum height. The cover is usually 2.5–3 m (8–10 ft.) in diameter and consists of 8–12 fronds. *Areca catechu* fronds square measures even-pinnately compound, 1–1.5 m (3.3–5 ft.) long; pinnae (leaflets) 30–50, lanceolate, 30–70 x 3–7 cm (12–28 x 1.2–2.8 in), leaf base protection, longest close to middle of frond; encircling trunk and forming a green crown shaft, ca. 55 x 15 cm (22 x 6 in) (George W. Staples et al., 2006). This study is to analyses the phytochemical constituents present in *Areca catechu* leaf extract by using standard method.

2. MATERIALS AND METHOD:

2.1. Sample Collection:

Fresh leaves of *Areca catechu* was collected during September month from Dadar. They were shade dried and ground to fine powder and stored in air tight container for further analysis**.**

2.2. Extraction :

The powdered *Areca catechu* leaves were collected and 15 g of it were measured and introduced in to 100 ml of ethanol, acetone, and water extraction carried out by shaker system for 48 hours. The presence and yield of the extract were noted. The extracts were stored in a refrigerator at 4°C for further study. The extracts of *Areca catechu* leaves were tested for flavonoids, alkaloids, tannins, saponins, terpenoid, carbohydrates, proteins, amino acids, steroids, glycosides. For pure no solvent was added. This phytochemical analysis using different extracts was administrated by standard methods (Ramman, 2006; Karpagam et al., 2008; Kokate et al., 2001).

2.2.1. Carbohydrates Test: Add two drops of the Molish reagent (a solution of α napthol in 95%ethanol) to 2ml of test solution. Solution is then poured slowly in to a test tube containing 2 ml of conc.Sulphuric acids so that two layers form. The formation of a purple product at the interface of the two layers indicates the presence of carbohydrate.
2.2.2. Proteins Test: It is used to find the presence of peptide bonds in protein. Add 3% NaOH and a few drops of 1% CuSO4 to 3ml of test sample. The presence of protein solution indicates when solution turns from blue to violet (purple) or to pink.
2.2.3. Starch Test: Add few drops of dilute iodine solution to 3 ml of test solution. Mix well. Blue colour appears. It disappears on cooling and reappears on heating.
2.2.4. Amino acids Test: Add a few drops of 40% NaOH and 10% of lead acetate to 5ml of test sample solution and boil the solution. Formation of black precipitate shows the presence of amino acids.
2.2.5. Steroids Test: Add 2 ml of chloroform and conc. Sulphuric acid to 2ml of extract. Shake well, chloroform one layer appears and acid layer show greenish yellow florescence this indicate the presence of steroids.
2.2.6. Glycosides Test: Add glacial acetic acid, few drops 5% ferric chloride and concentrated sulphuric acid to the solution of extract. Observe for a reddish brown coloration at the junction of two layers and bluish green colour in upper which indicates presence of glycosides.
2.2.7. Flavonoids Test: Add few drops of 1% of Ammonia solution to 2ml of extract. A yellow coloration is observed for the presence of flavonoids.
2.2.8. Alkaloids Test: Add 5ml of 1% of aqueous hydrochloric acid to 0.5g of each extracts and keep it water bath: 1ml of the filtrate is to be treated with Mayer's reagent (Potassium iodide). The presence of alkaloids indicates the formation of a yellow coloured precipitate
2.2.9. Tannins Test: Add 1 ml of water and 1-2 drops of ferric chloride solution to 0.5ml of extract solution. Blue colour was observed for Gallic tannins and black colour for catecholic tannins.
2.2.10. Saponins Test: Add 1 ml of water to 1 ml of extract solution and shake it. Persistent foam indicates presence of saponins.
2.2.11. Terpenoids Test: 2ml test solution was mixed with 2ml of chloroform in a test tube. To this 3ml of conc. Sulphuric acid was added along the walls of the tube to form a layer. The interface with a reddish brown coloration shows the presence of terpenoids.
2.2.12. Gums Test: Add 3ml of Dil. Hcl solution is added drop by drop to 1ml of test solution till red coloration. Red coloration visualizes the presence of gums.

3. DISCUSSION:

The medicinal plants are used for healing and curing of human disease due to the presence of phytochemical constituents. Phytochemicals present within the medicinal plants leaves, vegetables, and roots. Phytochemicals are primary and secondary compounds chlorophyll, proteins, and common sugars are including primary constituents and secondary compounds have terpenoid, alkaloids and phenolic compounds. The present investigation was carried to find out phytochemical and biochemical constituent present in *Areca catechu* leaves. The compounds that are liable for therapeutic effects are usually the secondary metabolites. The extracts were subjected to phytochemical analysis for the presence of chemical constituents like carbohydrates by Benedict's test, proteins by Biuret test, alkaloids by Wagner's reagent test, flavonoids by ferric chloride test, saponins by foam test, steroids by Leibermann-Burchards test, tannins by ferric chloride and test terpenoids by Salkowski's test (Kokate, 1993; Hosamani et al., 2011).

4. RESULT:

Table 1: Phytochemical analysis of *Areca catechu* leaves

Sr.no	Phytochemical constituents	Pure extract	Acetone extract	Ethanol extract	Water extract
1	Carbohydrates	Present	Present	Present	Present
2	Proteins	Present	Absent	Absent	Absent
3	Starch	Absent	Absent	Absent	Absent

4	Amino acids	Present	Absent	Absent	Absent
5	Steroids	Absent	Present	Present	Present
6	Glycosides	Absent	Absent	Absent	Absent
7	Flavonoids	Absent	Present	Present	Absent
8	Alkaloids	Absent	Present	Present	Absent
9	Tannins	Present	Present	Present	Present
10	Saponins	Present	Present	Present	Present
11	Terpenoids	Present	Absent	Present	Present
12	Gums	Absent	Absent	Absent	Absent

5. CONCLUSION:

Phytochemical screening shows the presence of valuable secondary metabolites, so there is no doubt about that this ancient medicative plant will give clues for the formation of new drugs. In the present work was undertaken with a preliminary phytochemical screening of *Areca catechu* leaves showed the presence of active compound in the extract. Phytochemical analysis carried out in Pure Areca *catechu* leaves extract revealed the presence of carbohydrate, protein, amino acid, tannin, alkaloid, saponin, terpenoid. Ethanol extract of revealed the presence of carbohydrate, steroid, tannin, saponin, alkaloid, flavonoid, terpenoid. Acetone extract revealed that the presence of carbohydrate, steroid, tannin, saponin, flavonoid, alkaloid. These phytochemicals present in *Areca catechu* improve the medicinal and therapeutic properties and have potential on becoming on effective drug product.

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