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"Review on: Pharmacological and Phytochemical study on Clitoria ternatea Linn"

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ABSTRACT

Clitoria ternatea is a plant with an assortment of ethnic therapeutic employments. The subjective investigation of Clitoria ternatea shows the presence of bioactive mixtures like Alkaloids, Tannins, Glycosides, Tars, Steroids, Saponins, Flavonoids and Phenols. The quantitative assessment of complete Saponins, Flavonoids and Phenols in establishes and of Flavonoids in shoots, blossoms and seeds is additionally revealed which is vital for the drug industry.Which has been utilized the customary and folkloric medication in the different infections. It is experimentally assessed for calming, antipyretic, pain relieving, larvicidal, insecticidal, antimicrobial, anxiolytic, upper hepatoprotective, sedating and narcotic property . phytochemical analysis observed thepresence of flavonoids, carbohydrates, phenol, saponins , tannins, quinines, terpenoids and oxalate components in leaves and seeds extract of methol.

Key Words : Clitoria ternatea, Phytochemical , Butterfly pea.

1. INDRODUCTION

A large and increasing number of patients in the world use medicinal plants and herbs for health purpose. Therefore, scientific scrutiny of their therapeutic potential, biological properties, and safety will be useful in making wise decisions about their use. There are hundreds of significant drugs and biologically active compounds developed from the traditional medicinal plants. Plant showed wide range of pharmacological activities including antimicrobial, antioxidant, anticancer, hypolipidemic, cardiovascular, central nervous, respiratory, immunological, anti-inflammatory, analgesic antipyretic and many other pharmacological effects. The preliminary phytochemical screening showed that Clitoria ternatea contained tannins, phlobatannin, carbohydrates, saponins, triterpenoids, phenols, flavanoids, flavonol glycosides, proteins, alkaloids, antharaquinone, anthocyanins, cardiac glycosides, volatile oils and steroids. The plant showed many pharmacological effects including antioxidant, hypolipidemic, anticancer, antiinflammatory, analgesic, antipyretic, antidiabetic, CNS, antimicrobial, gastro-intestinal antiparasitic, insecticidal and many other pharmacological effects.[1] The quantitative estimation of total Saponins, Flavonoids and Phenols in roots and of Flavonoids in shoots, flowers and seeds is also reported which is very important for the pharmaceutical industry.

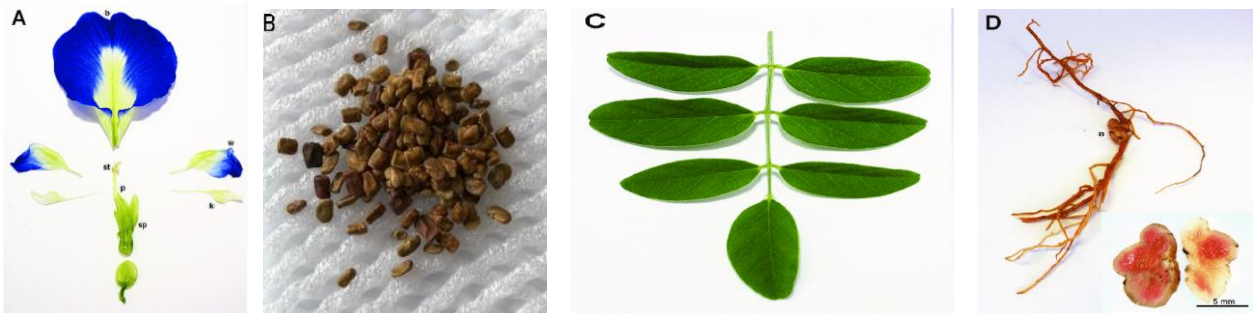
Synonyms:

Clitoria albiflora Mattei, Clitoria bracteata Poir., Clitoria mearnsii De Wild., Clitoria tanganicensis Micheli, Clitoria zanzibarensis Vatke

Common names:

Arabic: Mazerion Hidi, Baslat el-Zuhoor; **Bengali** : Aparajita, **Chinese**: die dou**; English**: blue- pea, bluebellvine, butterfly-pea, cordofan-pea, Darwin-pea; **French**: honte; **German**: blaue Klitorie; **Hindi** : Aparajita, **Punjabi**: Koyal; **Sanskrit**: Girikarnika, Vishnukranta; **Tamil**: Kakkanam and **Telugu** : Dintena[1]

2. PART'S OF CLITORIA TERNATEA PLANT :



Flower **Seeds** **Leaf** **Roots**

Fig:-Clitoria Ternatea Linn.

2.1 Scientific Classification

Scientific name : Clitoria ternatea
Kingdom : Plantae
Order : Fabales
Family : Fabaceae
Genus : Clitoria
Species : C. ternatea

A) Flower :
Phytochemicals -Saponin, Tannins, Alkaloids, Glycosides, Phytosterols, Carbohydrates.
Function - Anti-inflammatory, analgesic, Ethanol extract is used as antidiabetic.
Ethanol extract is used as antidiabetic.[2]

B) Seed :
Phytochemicals -
The seeds contain nucleoprotein with its amino-acid sequence similar to insulin, delphinidin-3,3,5-triglucoside, essentialamino-acids, pentosan, water-soluble mucilage, adenosine, an anthoxanthin glucoside, greenish yellow fixed oil a phenol glycoside, 3,5,7,4-tetrahydroxy-flavone-3-rhamoglycoside, an alkaloid , ethyl D-galactopyranoside, p-hydroxycinnamic acid polypeptide, a highly basic protein-finotin, a bitter acid resin, tannic acid, 6% ash and a toxic alkaloid.
Function - Seeds are cathartic, Root diuretic and purgative and aperients.[3] They are used in swollen joints, dropsy and enlargement of abdominal viscera**.** [4]

C) Leaf :
Phytochemicals - Alkaloids, reducing sugars, flavonoids, steroids, glycosides
Function -
Prevention of neurodegenerative diseases and diabetes mellitus and Effectively controls excessive sweating.[3,4]

D) Root :
Phytochemicals -1,1-diphenyl-2-picrylhydrazyl (DPPH**)**
Function - It is used as an antioxidant and the root bark is diuretic and laxative; a decoction is given as a demulcent in the irritation of the bladder and urethra.[2,3,5]

3.PHARMACOLOGICAL ACTIVITIES:

3.1 Wound healing activity: The effects on wound healing were investigated using excision, incision and dead-space models in rats. Seed and root extracts significantly improved wound healing property when administered orally by gavages as well applied topically as ointment which are comparable to that of cotrimoxazole ointment. The finding of this study suggested that plant possesses effects on all three phases of wound healing: inflammatory, proliferative and remodeling phase [6]

3.2 Cytotoxic activity: The crude methanol extract of stem-bark, leaves and seeds of C. ternatea demonstrated a significant cytotoxic activity in a brine shrimp lethality bioassay test. The LC50 values of the crude methanol extract of stem-bark, leaves and seeds were found to be 179.89, 25.82, 110.92 µgm/ml) respectively. Among them crude methanol extract of leaves (25.82 µgm/ml) and methanol fraction of leaves (22.28 µgm/ml) showed a very promising cytotoxic activity [7]

3.3 Antimicrobial activity: The antimicrobial screening was evaluated against Extended Spectrum Beta Lactamase (ESBL) producing Salmonella enteritidis, Salmonella typhimurium, Klesiella pneumonia, Enteropathogenic E.coli, Uro-pathogenic E.coli, and Pseudomonas aureginosa isolated from patients with urinary tract infection and acute gastroenteritis. Disc diffusion method was used to test the above mentioned extracts for their activity. Water, methanol and chloroform extracts of C. ternatea flowers was exhibited activity against uropathogenic E.coli, Enteropathogenic E.coli, Enterotoxigenic E.coli, Salmonella typhimurium, Klesiella pneumoniae and Pseudomonas aureginosa. Methanol extract of C. ternatea exhibits comparatively high activity as compared with chloroform and aqueous extracts. The inhibitory zone produced by water, methanol and chloroform extracts at a concentration of 4 mg/disc was found 12 mm, 16 to 26 mm and 14 mm to 18 mm respectively while petroleum ether and hexane extracts did not exhibit any activity [8]

3.4 Antihistamine activity

Antihistaminic activity of Clitoria ternatea L. roots by Clonidine-induced catalepsy in mice and Haloperidol-Induced Catalepsy model was analyzed. Clonidine, a α2adrenoreceptor agonist induces dose-dependent catalepsy in mice, which was inhibited by histamine H1 receptor antagonists but not by H2 receptor antagonist. Clonidine releases histamine from mast cells which is responsible for different asthmatic conditions. Finding of investigation showed that chlorpheniramine maleate (CPM) and extract of Clitoria ternatea root (ECTR) inhibit clonidine induced catalepsy significantly $P < 0.001$ when compared to control group, while CPM and ECTR fail to inhibit haloperidol-induced catalepsy. The present study concludes that ECTR possesses antihistaminic activity.[9]

3.5 Antipyretic activity: Evaluation of anti-pyretic potential Of Methanolic Extract of C. ternatea L. Root (MECTR) of blue flowered variety (Family: Fabaceae) on normal body temperature and yeast-induced pyrexia in albino rats. Increase in rectal temperature was observed after 19 hours of Yeast suspension (10 ml/kg body wt.) subcutaneous injection. The extract produced significant reduction in normal body temperature at doses of 200, 300 and 400 mg/kg body wt., p.o., and yeast-provoked elevated temperature in a dose-dependent manner. The effect extended up to 5 hours after the drug administration. The anti-pyretic effect of the extract was comparable to that of paracetamol (150 mg/kg body wt., p.o.), a standard anti-pyretic agent [10]

4. PHYTOCHEMICAL CONSTITUENTS :

Table no-1- Phytochemical Study of clitoria ternatiea linn.[11]

Phytochemical	Leaf	Root	Shoot	Flower	Seed
Alkaloid	-	-	+	+	+
Tannins	+	-	+	+	+
Glycosides	+	-	+	+	+
Resins	+	-	+	+	+
Steroids	+	-	-	-	-
Saponins	-	+	-	-	-
Flavonoids	-	+	+	+	+
Phenols	-	+	-	-	-

+ Presence of the compound
- Absence of the compound

5. Preliminary Phytochemical Analysis -

5.1 Test forTannins:

Five grams of the ground powder was extracted with 10 ml ammonical chloroform and 5 ml chloroform. The mixture was filtered and the filtrate was shaken with 10 drops of 0.5M sulphuric acid. Creamish white precipitate was observed forthepresenceof tannins.

5.2 Test for Glycosides:

About 0.5 gm of methanol extract was taken in a test tube and 1 ml glacial acetic acid containing traces of ferric chloride was added to it. To this solution, 1 ml concentrated sulphuric acid was added and observed for the formation of reddish brown colour at the junction of the two layers and the upper layer turned bluish green in the presence of glycosides.

5.3 Test for Resins:

For the tests concerning the presence of Resins, 0.5 gm of methanol extract was taken in a test tube and 5 ml of distilled water was added to it and observed for turbidity which indicates the presence ofResins.

5.4 Test for Steroids:

About 0.5 gm of methanol extract was taken in a test tube and 2 ml of acetic anhydride was added to it and 2 ml of sulphuric acid was added by the sides of the test tube and observed for the colour change to violet or blue green.

5.5 Test for Saponins:

About 0.5 gm of methanol extract was taken in a test tube and 5 ml distilled water was added to it. The solution was shaken vigorously and observed for persistent froth. The frothing was mixed with 3 drops of olive oil and shaken vigorously after which it was observed for the formation of an emulsion.

5.6 Test for Flavonoids:

About 0.5 gm of extract was introduced into 10 ml of ethyl acetate in a test tube and heated in boiling water for 1 min. The mixture was then filtered. About 4 ml of the filtrate was shaken with 1 ml 1% aluminium chloride solution and incubated for 10 min. Formation of yellow colour in the presence of 1 ml dilute ammonia solution indicated the presence of flavonoids.

5.7 Test for Phenols:

About 0.5 gm of extract was taken in a test tube, mixed with 100ml distilled water and heated gently. To this, 2 ml of ferric chloride solution was added and observed for the formation of green or blue colour.

6. CONCLUSION

It is presumed that Clitoria ternatea is a plant with an assortment of ethnic therapeutic employments. The subjective examination of Clitoria ternatea shows the presence of bioactive mixtures like Alkaloids, Tannins, Glycosides, Pitches, Steroids, Saponins, Flavonoids and Phenols. The quantitative assessment of absolute Saponins, Flavonoids and Phenols in establishes and of Flavonoids in shoots, blossoms and seeds is likewise announced which is very important for the drug business. This is significant data for arrangement of medications in drug industry and stress the requirement for more serious exploration in this therapeutic plant since the mixtures assume an incredible part in medical services.

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