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Phytochemical investigation study of ethnomedicinal herb *Corynandra chelidonii var pallae*

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Abstract
Plant kingdom is a Treasure house of many Ethnomedicinal plants. Medicinal plants are being served as the source of many drugs such as Anticancer, Antipyrretic, Antitussive, Analgesic, Anaesthetic etc. The phytochemicals are the plant primary and secondary metobolites, which renders the plant to serve as drug source. The aim of the present study is the phytochemical investigation in the ethnomedicinal herb Corynandra chelidonii var pallae. The plant material was shade dried and fine powder was underwent soxhlet extraction with solvents like hydroalcoholic, Methanol, and n-hexane. Our investigations revealed the presence of various bioactive primary and secondary metabolites like, Proteins, Alkaloids, Flavonoids, Steroids, Cardiac glycosides, Saponins, Tannins, and Phenols etc. The present study provides evidence that the extract of the plant contain many medicinally important bioactive compounds, which justifies its ethnomedicinal nature and their usage by tribal people in their diet and traditional medicine.

Keywords: *Corynandra chelidonii var pallae,* phytochemical investigation, sohxlet extraction

Introduction
Corynandra chelidonii var pallae was a new variety of Corynandra chelidonii, belongs to the family Cleomaceae. This new variety was described from the pakhal lake, Warangal district, northern Telangana. (reddy and raju 2001) [2]. This plant species is having ethno medicinal, Ecological, and Economic Importance. This plant is commonly called as "Adavi aavalu". As the plant is rare, endemic, and the distribution of the plant is very less, besides its economic and medicinal importance it is being over exploited which can be witnessed by, it has not been seen at pakhal lake (from where it is explored) since past four years. Corynandra Schard. ex Spreng., the earlier name for the segregated genus Arivelia Raf. of Cleome (Cleomaceae) was reinstated. Accordingly," Cleome feline", "Cleome flava" and "Cleome viscoasa" were transferred to Corynandra. So, Cleome chelidonii has to be called as Corynandra chelidonii (Cocharane & amp; Iltis [3]). As it was used as major condiment by tribal people it might be the source of vital and essential medicinal traits.

Materials and Methods
The plant material-Corynandra chelidonii var pallae was collected from Gonglur of Sangareddy district in the month of july. And the plant was identified and authenticated by Botanical survey of India, Deccan regional centre, Hyderabad, Telanagna.

Preparation of the Extracts
The healthy plant material was shade dried and powdered. The fine powder is then subjected to soxhlet extraction with Hydroalcoholic, Methanol and n-hexane. All the Extracts were subjected toproximate chemical analysis (Kokate, C. K. 1996). It has taken 3-5 cycles for each extract. Solvents used to carry out this work is of Analytical reagent grade "(Merck,Mumbai)".

Preliminary Phytochemical Investigation
The preliminary phytochemical analysis gives a primary idea about presence of phytochemical in crude drugs.
The preliminary chemical tests were carried out for;

1. Test for Alkaloids
a. Dragendorff's test: To the extract add dil. HCl and Dragendorff's reagent, reddish brown precipitate indicates presence of alkaloids.
b. Tannic acid test: To the extract add dil. HCl and tannic acid solution, buff colored precipitate indicates presence of alkaloids.

2. Test for Proteins
a. Test with trichloroacetic acid: To the extract add trichloroacetic acid, precipitate is formed.
b. Xanthoprotein test: To the (5 ml) of extract, add 1 ml of concentrated nitric acid and boil, yellow precipitate is formed. After cooling it, add 40 % sodium hydroxide solution, orange color is formed.

3. Amino Acids
a. Millon's test: To the extract add about 2 ml of Millon's reagent. white precipitate indicates presence of amino acids.
b. Ninhydrine test: To the extract add Ninhydrine solution, boil, violet color indicates presence of amino acids.

4. Test for Carbohydrates
a. Molisch's test: To the extract add few drops of alcoholic a-naphthol, then add few drops of concentrated sulphuric acid through sides of test tube; purple to violet color ring appears at the junction.
b. Barfoed's test: 1ml of extract is heated with 1 ml of Barfoed's reagent, if red cupric oxide is formed, monosaccharide is present. Disaccharides on prolong

heating (about 10 minutes) may also cause reduction, owing to partial hydrolysis to monosaccharide's.

c. Seliwinoff's test (Test for ketohexoses): To the extract add crystals of resorcinol and equal volume of concentrated hydrochloric acid and heat on a water bath, rose color is produced. (e.g. Fructose, honey)
d. Test for pentoses: To the extract add equal volume of hydrochloric acid containing a small amount of Phloroglucinol and heat, red color is produced.

5. Test for Flavonoids

a. Shinoda test: To the extract add few magnesium turnings and concentrated hydrochloric acid dropwise, pink scarlet, crimson red or occasionally green to blue color appears after few minutes.
b. Alkaline reagent test: To the extract add few drops of sodium hydroxide solution, intense yellow color is formed which turns to colorless on addition of few drops of dilute acid indicate presence of flavonoids.
c. Zinc hydrochloride test: To the extract add a mixture of zinc dust and conc.hydrochloric acid. It gives red color after few minutes.

6. Test for Phenolic compounds

a. Ferric chloride test: Treat the extract with ferric chloride solution, blue color appears if hydrolysable tannins are present and green color appears if condensed tannins are present.

7. Specific chemical tests for tannins

a. Test for gallotannins: To the extract add KI solution. Pink color (free gallic acid shows orange).
b. Test for ellagitannins: To the extract add acetic acid and conc. HNO 3. Pink at first, color turn purple, then blue.

8. Test for Steroids and triterpenoids

a. Salkowski test: Treat the extract with few drops of concentrated sulphuric acid red color at lower layer indicates presence of steroids and formation of yellow colored lower layer indicates presence of triterpenoids.

9. Test for Saponin glycosides

a. Froth formation test: Place 2 ml solution of drug in water in a test tube, shake well, stable froth (foam) is formed.

10. Test for Anthraquinone glycosides

a. Borntrager's test: Boil the test material with 1 ml of sulphuric acid in a test tube for 5minutes. Filter while hot. Cool the filtrate and shake with equal volume of dichloromethane or pet ether. Separate the lower layer of dichloromethane or pet ether and shake it with half of its volume of dilute ammonia. A rose pink to red color is produced in the ammoniacal layer.

Results and Discussion

The phytochemical invesigation carried out on Ethnomedicinal herb Corynandra chelidoni var pallae revealed the existance of Proteins, Carbohydrates,Alkaloids, Flavonoids, Cardiacglycosides, Saponins Tannins, and Phenols etc. Pharmacologically, Alkaloids are well known as anaesthetics, anti-inflammatory and cardioprotective agents (Heinrich, et.al 2021) [4]. Corynandra chelidonii var pallae is rich in Alkaloids. Flavonoids have Antioxidant and Hepatoprotective Activity. Flavonoids are known to inhibit cell growth and act as an anticancer agents. The antiproliferative and apoptotic effects of flavonoid compounds in several cancer cell lines, including breast prostate, melanoma, pancreatic, lung leukaemia, neuroblastoma andrenal adenocarcinoma. and its antioxidant effects associated with various diseases such as cancer, Alzheimer's disease. Cardiac glycosides can induce apoptosis and inhibit the growth of cancer cell lines. Glycosides were present in leaf extracts of Corynandra chelidonii var. pallae. These Glycosides lower the blood pressure according to many studies and reports (Nyarko and Addy 1990) [16]. The phenolic compounds are the large group of plant metabolites, and they are present in leaf extracts of Corynandra chelidonii var. pallae. They show medicinal properties such as anticarcinogen, obesity, antiinflammation, Alzhimer's diesease. Tannins have antimicrobial and antihelmenthic properties plays an important role in protein metobolism of ruminants (Shahin et.al 2011) [5]. Tannins known to hasten the healing wounds and inflammed mucous membrane. Terpenoidal compounds witnessed antibacterial, antiviral, antimalarial, and also useful for the prevention and treatment of Cardiovascular dieseases. They posses hypoglycemic effect, antiaging and nueroprotection properties too. Saponins Exhibits wide range of activities including Expectorant, anti-inflammatory, Vasoprotective, hypocholesterolemic, immunomodulatory, hypoglycemic, antifungal, and antiparasitic activities. Plants like Glycyrrhiza glabra-rich in saponins used as food and emulsifiers or sweetners besides its medicinal properties. steroidal sapogenins used as raw materials for the production of steroidal harmones. Phytochemical investigations made on Corynandra chelidonii var pallae revealed that this ethnomedicinal herb is the richest source of many vital secondary metobolites like Saponins, Flavanoids, Cardiac glycosides, Alkaloids, tannins etc with many pharmacological activities towards the prevention of many diseases.

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Table 1

S.NO	Phytochemicals	Test	Result		
			Hydro alcohol	Methanol	N-hexane
1	Proteins	Trichloroacetic Acid Test	Positive	Positive	Positive
		Xanthoprotein Test	Positive	Negative	Negative
2	Alkaloids	Dragendroff's Test	Positive	Positive	Positive
		Tannic acid Test	Positive	Positive	Positive
3	Amino Acids	Millons Test	Negative	Negative	Negative
		Ninhydrin Test	Negative	Negative	Positive
4	Carbohydrates	Molisch's Test	Positive	Negative	Positive

		Barfoed's Test	Positive	Positive	Positive
		Seliwinoff's test	Positive	Negative	Positive
		Test for Pentoses	Negative	Negative	Negative
5	Flavonoids	Shinoda Test	Positive	Positive	Positive
		Alkaline reagent Test	Negative	Negative	Negative
		Zinc hydrochloride test	Negative	Negative	Negative
6	Phenolic Compounds	Ferric chloride test	Negative	Positive	Positive
7	Steroid s & Triterpenoids	Libermann- Burchard Test	Negative	Positive	Positive
		Salkowaski test	Negative	Positive	Positive
8	Glycosides				
	a) Cardiac Glycosides	Legal's test	Positive	Positive	Positive
9	b) Saponin glycosides	Froth formation Test	Positive	Positive	Positive
	c) Anthraquinone Glycosides	Borntrager's test	Negative	Positive	Positive

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