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Review Article

A Review: Phytochemical Investigation and Medicinal Applications of Herb's

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A B S T R A C T

Now a day's major population over the world is facing the issue of allopathic drug and their adverse effect in treatment of various diseases. Ayurveda is one of the traditional medicinal systems of India. The philosophy behind Ayurveda is preventing unnecessary suffering and living a long healthy life. Herbal medicines have existed world-wide with long recorded history and they were used in ancient Chinese, Greek, and Indian medicine for various therapies purposes.Herbals are one of the best alternativesin treatment of acute and chronic diseases.

In this review different herb has been studied due to its medicinal, pharmacognostic and therapeutic application. This article enlists some commercial and non-commercial Polyherbal all around the world. In which plants, fruits, leaves, seeds and powder of *Momordica dioica, Lantana camara L., Curcuma longa,Carthamustinctorius and Acacia catechu* has been studied. This article provides a general idea about different herbs, their phytochemical contents, method of extraction and applications in treatment of various diseases.

Keywords: Herbal drugs, Momordica dioica, Lantana camara L., Curcuma longa, Carthamustinctorius, Acacia catechu

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INTRODUCTION:

Momordica dioica perennial, dioceous climbing creeper belong to family Cucurbitaceae. Its common name is Parora,kakora. *Momordicadioica*also known as spiny gourd or spine gourd, bristly balsam, melons and cucurbits[1].Kakrol is considered as an underutilized vegetable, although having significant presence of certain compounds containing higher nutritional value than many frequently consumed vegetables. It is used as a vegetable in all regions of India and some parts in South Asia. It has commercial importance and is exported and used locally as well as inside the body[2].

Figure 1: *Momordica Dioica*fruits

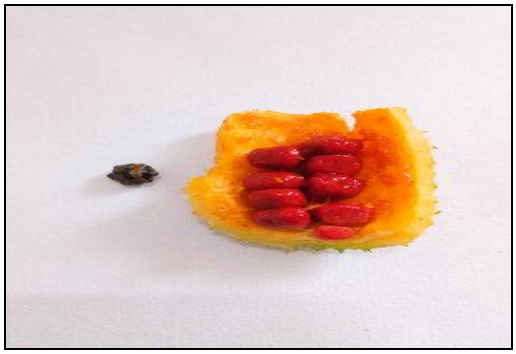

Figure 2: *Momordica Dioica* seed

Momordica dioica maycontain near about 80 species. Climber plant commonly known as Teasle Gourd or Small bitter-gourd is a relatively small oval to ovoid vegetable[(2)]. It is reported up to an altitude of 1500 m in Assam and Garo hills of Meghalaya. Kakrol is a Cucurbitaceous crop originated in the Indo–Malayan region. The *Momordica* species have been used in indigenous medical systems in various jangle karela. It is often cultivated for its fruits, which are used as vegetable. Teasle gourd is a cucurbitaceous popular summer vegetable .The green fruit is extensively used as vegetable by cooking or frying(3). Leaves are 1.5-4 inches long, cordate, acute more or less 3-5 lobed. Flowers large, dioecious and yellow in colour; Fruit 1-3 inches long, shortly beaked, densely covered with soft spines. This is climbing creeper generally found throughout India, Pakistan, Bangladesh, Himalayas to Ceylon. Flowering occurs during June to July fruiting during September to November[(4)(5)].

Classification:

Table 1: The plants database

Kingdom	Plante
Subkingdom	Tracheobionata
Super division	Spermatophyta
Division	Magnoliphyta
Class	Mgnoliopsida
Subclass	Dillemidae
Order	Violates
Family	Cucurbetaceae
Geneus	Momoedica
Species	Dioica

Phytochemical constituents of *Momordica Dioica*:

- It contains Lectins, proteins, triterpenes and vitamins.
- The fruit contains a high amount of vitamin C.
- The fruit is rich in ascorbic acid and contain iodine.
- The fruit also contain alkaloid, flavonoids, glycosides and amino acids.
- *Momordica dioica* as the average nutritional value per 100 g edible fruit was found to contain 84.1% moisture, 7.7 g carbohydrate, 3.1 g protein, 3.1 g fat, 3.0 g fibre and 1.1 g minerals.
- It also contained small quantities of essential vitamins like ascorbic acid, carotene, thiamine, riboflavin and niacin[(6)].

Table 2: Phytochemical constituents of *Momordica Dioica*

Nutrients contents	Daily Nutritional requirement	Per 100 gm of Momordica Dioica contains
Carbohydrate	225-325 gm	7.7
Protein	0.8 gm	3.1
Fat	97 gm	3.1
Potassium	1600-2000 mg	4.63
Sodium	2300 mg	1.62
Calcium	700 mg	7.37
Iron	8.7 mg	5.04
Zinc	8 mg	3.83

Extraction

Methods for *Momordica dioica:*

Soxhlet Method:

The extraction of *Momordica dioica*was carried out by soxhlation method dried powder was subjected to Soxhlet extraction unit and ethanol used as solvent. soxhlation process was allowed to carry out for 12 cycle with the maintenance of 78^{o}c for ethanolic solvent respectively the solvent extract was concentrate in water bath at temperature 40^{0}c using beaker and preserved in air tight bottles at 50^{o}C for further experimentation the extract were diluted and then used for the test[(7)].

Maceration Method:

The 22 g powdered leaves were placed in a sealed container where ethanol and distilled water in the ratio of 30:70 will be added. The treatment is kept for 7-8 days with periodic shaking. Afterwards,the mixture was filtered using filter paper and the filtrate was collected .Then the filtrate was kept in the oven at 80^{0}c and evaporated to dry(8).

Phytochemical screening:

Solvent extract obtained from whole plant were analysed for detection of phytochemical compound. Following phytochemical analysis test were useful based on the visual observation of colour modification or precipitate formation after the addition of specific reagents[9].

Detection of alkaloids: About 0.2 g extract warmed with 2% H_2so_4 for two minutes, filtered and few drop of dragendroff's reagent added, orange red precipitate indicates the presence of alkaloid[10].

Detection of tannins: Small quantity of extracts mixed with water, heated, filtered and ferric chloride added a dark green solution indicate the presence of tannins(Padole *et al.*, 2021).

Detection of flavonoids: Test for flavonoids extract of about 0.2 g dissolved in dilute Sodium hydroxide (NaoH) and Hydrochloric acid (HCl) was added. A yellow solution that turns colourless indicates the presence of flavonoids.

Detection of glycosides: The extracts hydrolysed with HCl solution and neutralized with NaoH solution. A few drops of Fehling solution A and B were added red precipitate indicate the presence of glycosides.

Detection of protein: Take a 2 ml Sodium Hydroxide (NaoH) and then add 5 to 6drops of copper sulphate solution and small quantity of extract mix well. formation of bluish violet colour indicates the presence of protein.

Detection of carbohydrate: Take 1 ml distilled water and 5 to 8 drops of Fehling'ssolution then add 0.5 ml of extract and kept for 15 min at 60 degrees. The presence of brick red colour indicates the presence of carbohydrate.

Detection of calcium: Take 0.2 ml sample solutions add about 1 ml glacial acetic acid then add 0.5 ml potassium ferrocyanide then adds 50 mg ammonium chloride. The presence of white precipitate indicates the presence of calcium[12].

Detection of sodium: Take 1 ml sample solutions add 4 ml pyro-antimonite dissolve in it. The presence of yellow colour, indicate the presence of sodium.

Detection of iron: Take 1 ml sample solution add 1 mg iron dissolve in 2 ml then adds 1 ml potassium ferrocyanide presence of blue precipitate indicates the presence of iron[13].

Medicinal Applications of *Momordica dioica*:

Diabetes Treatment: Fruits, leaves, and tuberous roots of *Momordica dioica* are used as a folk remedy for diabetes mellitus. The aqueous extract of *Momordica dioica* fruit possesses very good anti-diabetic activity and is having high margin of safety.

Antioxidant Activity: Compounds derived from natural sources are capable of providing protection against free radicals.

Analgesic Activity: Vaidya and Shreedhara reported that both hexane extract and soluble portion of methanolic extract of Momordica dioica fruit pulp exhibited analgesic activity.

Nephroprotective Activity: The ethanol extract of seeds was screened and marked Nephroprotective as well as curative activities was found without any toxicity caused by nephrotoxin-like gentamicin.

Anti-allergic Activities: The anti-allergic activity of its extract in mice was observed. The alcoholic extract was evaluated and its efficacy to inhibit passive cutaneous anaphylaxis was found in mouse and rat.

Antiulcer Activity: *Momordica dioica* extract mediated antiulcerogenic effect on ethanol-induced ulcer model of rat.

Anticancer Activity: Showed that the $CHCl_3$ extract of roots and five isolated constituents had anticancer activity during pharmacological testing on cancer cell.

Antimicrobial Activity:

Studied methanolic extract and aqueous extract of fruit and found that methanolic extract had more promising antimicrobial activity.

Antimalarial Activity:

Alcoholic extract *in-vivo* and *in-vitro* for antimalarial effect against NK65 strain of *Plasmodium berghei*, *Jurineamacrocephala*, and *Aegle marmelos* and found them to possess schizontocidalactivity[14].

LANTANA CAMARA

Introduction

*Lantana camara L.*is an aromatic, evergreen shrub belonging to the family Verbenaceae. It is a reservoir of several important bioactive molecules. It has been listed as one of the important medicinal plant. *L. camara* is also known as Lantana, Wild Sage, Surinam Tea Plant, Spanish flag and West Indian lantana. *L. camara* is a well known medicinal plant in traditional medicinal system and recent scientific studies have emphasized the possible use of *L. camara* in modern medicine. *Lantana camara* is a species of flowering plant within the verbena family, native to the American tropics. It is a very adaptable species, which can inhabit a wide variety of ecosystems; once it has been introduced into a habitat it spreads rapidly; between 45ºN and 45ºS and more than 1,400 metres in altitude[15].

Scientific name	Lantana camara
Rank	Species
Family	Verbenaceae
Kingdom	Plantae
Order	Lamiales

It has spread from its native range to around 50 countries, where it has become an invasive species. It first spread out of the Americas when it was brought to Europe by Dutch explorers and cultivated widely, soon spreading further into Asia and Oceania where it has established itself as a notorious weed, and in Goa it was introduced by the Portuguese[15].

L. camara is native species, leading to a reduction in biodiversity. It can also cause problems if it invades agricultural areas as a result of its toxicity to livestock, as well as its ability to form dense thickets which, if left

unchecked, can greatly reduce the productivity of farmland. The species is found in a variety of environments, including agricultural areas, forest margins and gaps, riparian zones, grasslands, secondary forest, and, beach fronts[16].

L. camara is rarely found in natural or semi-natural areas of forest, as it is unable to compete with taller trees due to its lack of tolerance for shade. Instead, it grows at the forest edge. *L. camara* can survive in a wide range of climatic conditions, including drought different soil types, heat, humidity and salt. It is also relatively fire tolerant and can quickly establish itself in recently burnt areas of forest[17]

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Figure 3: *Lantana camara* flower

Figure 4: *Lantana camara* plant

Phytochemical screening:

Phytochemical composition of the *L. camara* has been extensively studied in last few decades. Different parts of *L. camara* are reported to possess essential oil, phenolic compounds, flavonoids, carbohydrates, proteins, alkaloids, glycosides, iridoid glycosides, phenyl ethanoid, oligosaccharides, quinine, saponins, steroids, triterpenes, sesquiterpenoides and tannin as major phytochemical groups[18].

Identification test:

Alkaloids: Crude extract was mixed with 2ml of 1% Hydrochloric acid (HCl) and heated gently. A Mayer's and Wagner's reagent was then added to the mixture. Turbidity of the resulting precipitate was taken as evidence for the presence of alkaloids[19].

Glycoside: Crude extract was mixed with each of 2ml of chloroform and 2ml of acetic acid. The mixture was cooled in ice. Carefully concentrated $H_2SO_4$was added. A colour change from violet to blue to green indicated the presence of steroidal nucleus, glycine portion of glycoside.

Flavonoids: Dilute sodium hydroxide was added to 0.2 ml of extract it created intense yellow colour, on addition of HCl it turned colourless which suggests the presence of flavonoids.

Carbohydrate:1 ml of distilled water and 5-8 drop of Fehling's solution was added to o.5 ml of plant extract and allowed to 60˚C for 15 min. Formation brick red precipitate indicated the presence of carbohydrate[20].

Tannins: Crude extract was mixed with 2ml of 2% solution of FeCl3. A blue-green or black coloration indicated the presence of tannins.

Sr No	Test	Methanol	Distilled Water
1	Alkaloids	-ve	+ve
2	Glycoside	+ve	+ve
3	Carbohydrate	+ve	-ve
4	Flavonoids	+ve	+ ve
5	Tannins	+ve	+ve

Extraction method of *lantana camara*:

Preparation of plant extracts:

Method 1:- The prepared powder was put in each of water, petroleum ether, chloroform, and ethyl acetate solvents (plant material to solvent ratio was 1:10, w/v) and extracted for 24hr at room temperature with shaking at 150 rpm. The extracts were filtered and dried at 40°C. The dried extracts were resuspended in 1 ml of acetone[21].

Method 2:- The 50g powdered leaves were placed in a different sealed container where 250mL of methanol will be added. The treatment is kept for 24hrs with periodic shaking. Afterwards, the mixture was filtered using filter paper and the filtrate will be collected. The procedure was repeated for three times using fresh volume of methanol. The final filtrates were concentrated using rotary vacuum evaporator and evaporated to dryness[21].

Method 3: -Extraction by maceration process:

The 22 g powdered leaves were placed in a sealed container where ethanol and distilled water in the ratio of 30:70 will be added. The treatment is kept for 7-8 days with periodic shaking afterwards, the mixture was filtered using filter

paper and the filtrate will be collected .Then the filtrate was kept in the oven at 80^0c and evaporated to dryness[22].

Medicinal applications of *Lantana camara*:

- Used in traditional herbal medicines for treating a variety of ailments, including cancer, skin itches, leprosy, chicken pox, measles, asthma and ulcers[23].
- Lantana leaves can display antimicrobial, fungicidal and insecticidal properties.
- It is mainly used as herbal medicine but other uses like providing a source of firewood, mulch, making hedges.
- It shows the mosquito repellent activity.
- L. camara extract has shown to reduce gastric ulcer development.
- Lantana camera can display antioxidant, anti-inflammatory, antihypertensive, anti-asthmatic, antidiabetic, Antimotility activity.
- Preventing or minimizing mosquito-borne diseases transmission depends completely on control of the mosquito vectors or interference of human-vector contact.
- The plant extract has been used in folk medicine for the treatment of cold, headache, asthma, ulcers, skin rashes, tetanus and fistula.
- Used as expectorant as antiseptic for wounds. It shows the high antimicrobial activity. Antibacterial, antifungal, antiprotozoal, and nematode, and antiviral activities of L. camara were reported[24].

CURCUMA LONGA:

Introduction: Turmeric is an ancient spice derived from the rhizomes of *Curcuma longa*, which is a member of the ginger family (Zingiberaceae). Also known as 'Golden Spice of India' turmeric has been used in India for medicinal purposes for centuries. It has been used in traditional medicine as a household remedy for various diseases, including biliary disorders, anorexia, cough, diabetic wounds, hepatic disorders, rheumatism and sinusitis. In addition to its use as a spice and pigment, turmeric and its constituents mainly curcumin and essential oils shows a wide spectrum of biological actions[25].

Figure 5: Turmeric powder and Rhizomes

These include its anti-inflammatory, antioxidant, anti-carcinogenic, anti-mutagenic, anticoagulant, antiseptic, anti-diabetic, antibacterial, antifungal, antiprotozoal, antiviral, anti-fibrotic, anti-venom, antiulcer, hypotensive and hypercholesteremic activities. Modern interest on turmeric started in 1970's when researchers found that the herb may possess anti-inflammatory and antioxidant properties.

Safetyevaluation studies indicate that both turmeric and curcumin are well tolerated at a very high dose without any toxic effects. Thus, turmeric and its constituents have the potential for the development of modern medicine for the treatment of various diseases.

Rank	Scientific Name
Kingdom	Plantae
Subkingdom	Tracheobionta
Super division	Spermatophyta
Division	Magnoliophyta
Class	Liliopsida
Order	Zingiberales
Family	Zingiberaceae
Genus	Curcuma
Species	Longa
Scientific Name	Curcuma Longa

Phytochemical constituents:

- Itcontains 1, 8-cineole, 2-bornanol, 2-hydroxymethyl-anthraquinone, 4-hydroxybisabola-2. Alpha-atlantone, Alpha pinene, Alpha terpineol, Turmerone, Arabinose [26].
- It contains acidic polysaccharides: utonan, Volatile Oil (4.2%).
- Its main content is turmerone, arturmerone, curcumin, germacrone.
- The herbal classics CHMM (Chinese Herbal Materia Medica).
- Other chemicals: Turmeric contains protein (6.3%), fat (5.1%), minerals (3.5%), carbohydrates (69.4%) and moisture (13.1%).
- Phenolic diketone, curcumin (diferuloyl methane) (3-4%) is responsible for the yellow colour, and comprises curcumin I (94%), curcumin II (6%) and curcumin III (0.3%).
- Other chemicals compound are copper, zinc, campesterol, stigmasterol, betasitosterol, cholesterol, fatty acids and metallic elements potassium, sodium, magnesium, calcium, manganese, iron[27].

Phytochemical screening:

The chemical evaluation includes qualitative chemical tests which have been used for identification of various phytoconstituents present in the powdered crude drug. Preliminary phytochemical investigations of aqueous extract, acetone extract, ethanolic extract, chloroform extract and methanolic extract of Curcuma longa rhizome using commonly employed precipitation and coloration reactions were performed byvarious researchers which reveals the presence such as carbohydrates, proteins, alkaloids, glycosides, terpenes, steroids, flavonoids, tannins andsaponins.

Identification test:

Test for Alkaloid:

The extract was mixed with 3 ml of dilute hydrochloric acid and then filtered thoroughly. The filtrate was tested carefully with following test

Mayer's Test: To a 1 ml or 2 ml of filtrate, few drops of Mayer's reagent are added by the side of the test tube. The white or creamy precipitate indicated test as positive (presence of alkaloids).

Wagner Test: 1 ml or 2 ml of the filtrate extract was treated with Wagner's reagent; formation of brown reddish precipitate shows positive result of alkaloids.

Dragendroff's Test: To a few ml of filtrate, 1–2 ml of Dragendroff's reagent was added formation of prominent yellow precipitate indicates the presence of alkaloids.

Test for Glycosides:

To 2 ml test solution, added with equal quantity of Fehling's solution A and B and solution was heated gives the positive result of glycoside. A brick red precipitate was observed.
Legal's Test: To 2 ml or 1 ml test solution, pyridine and alkaline sodium nitroprusside was added, get a blood red or pink colour indicate presence of glycoside.
Keller-Killani Test: To 2 ml glacial acetic acid containing a drop of FeCl3 treated with extract.Formation of a brown colour ring indicates the presence of glycoside.
Borntrager's Test: Firstly extract was boiled with dilute sulphuric acid, filtered and to the filtrate chloroform was added and shaken well. The organic layer was separated to which ammonia is added slowly. It also shows positive result, by pink to red colour in the ammonical layer[28].

Test for Flavonoids:

Shinoda Test: 2 ml test solution added with few fragments of Magnesium ribbon, dropwise conc. H2SO4 was added. The results show pink scarlet or crimson red color.
Alkaline Reagent Test: The test solution was treated with sodium hydroxide solution, which gives a yellow or red color.
Zn Test: 2 ml extract were mixed with Zn dust and conc. HCl, after a few minutes red color observed and it means presence of flavonoids.

Test for Tannins:

Ferric Chloride Test: The extract solution mixed with drops of ferric chloride solution. Presence of Gallic tannins, blue colour was observed and green black for catecholic tannins.
(Gelatin Test: A white precipitate is obtained by mixing of 2 ml test solution and 1% Gelatin solution containing 10% sodium chloride.

Test for Saponins: - Foam Test: Researchers tries to find out the presence of Saponins as follows:

5 ml extract was shaken with 20 ml distilled water and then heated to boil. Frothing shows the presence of saponins.

Test for Triterpenoids:

Salkowski Test: The test solution was added with 2 ml chloroform and few drops of conc. Sulphuric acid (3 ml), and shaken well. Formation of reddish brown colour at lower layer indicates presence of steroids and yellow colour shows the presence of triterpenoids.

Test for Phenol:

Ferric Chloride Test: 4 drops of Alcoholic FeCl3 solution were added in the test extract. Appearance of bluish black colour indicates the presence of phenol.

Test for Fats and Fixed Oils:

Stain Test: Between the two filter papers small amount of the extract was pressed, the stain on the filter paper indicates the presence of fixed oils
Saponification Test: Small quantity to the extract solution with a drop of phenolphthalein was treated with few drops of 0.5 N alcoholic potassium hydroxide and heated on a water bath for 1–2 hr. The result shows formation of soap or partial neutralization for the alkali indicates the presence of fats and fixed oils.

Test for proteins and amino acids:

Millon's Test: 2 ml test solution is added with Millon's reagent gives a white precipitate, which on heating changes to red.
Ninhydrin Test: To 2 ml test solution, ninhydrin solution was treated and then boiled. Formation of blue colour indicates the presence of amino acid. Again 2ml test solution, 0.2% ninhydrin solution was treated with amino acids and proteins, and then boiled shows a violet colour(28).

Test for Carbohydrates: The extract was dissolved in 5–10 ml of distilled water and filtered through Whatman No.1 filter paper and the filtrate is used for the following test of carbohydrates.

Molisch's test: Firstly 2 ml solution was placed in a test tube then 1 drop of Molisch's Reagent was added. 2 ml of conc. HCl was added from the sides of the test tube. A violetring was observed in the test tube. Formation of a violet ring at the junction of the two liquidsindicates presence of carbohydrates.

Fehling Test: Dilute HCl was hydrolyzed with 2 ml of extract and extract also neutralized with alkali and heated with Fehling's solution A and B, formation of red precipitate it indicates the presence of reducing sugar.

Benedict's test: The filtrate was treated with Benedict's reagent and heated gently, appearance of orange red precipitate indicates the presence of reducing sugar.

Iodine Test: 5 drops of Iodine solution were treated with 2 ml of extract; gives blue colour indicates the positive test.

Method of Extraction:

Maceration technique: About 15 g of finely ground turmeric powder was dissolved in 100 ml of 70% alcohol. The preparation was left undisturbed for 48 hours. The filtrate obtained was used to stain the tissues[29].

Soxhlet technique: Nearly 100 g of finely ground turmeric was weighed and placed in the condenser of Soxhlet extractor; 100 ml of 70% alcohol was brought to boiling

point. The vapors containing the extract was collected. The Soxhlet extraction procedure was completed by 7-10 days.

Applications of curcuma longa:

Turmeric is used as an herbal medicine for rheumatoid arthritis, chronic anterior uveitis,conjunctivitis, skin cancer, small pox, chicken pox, wound healing, urinary tract infections, and liver ailments.
Turmeric Gradually Increases Antioxidants in Your Body.
Turmeric Can Help Prevent and Treat Alzheimer's disease.
Curcuma longa is commonly used as a spice in curries, food additive and also, as a dietary pigment.
It has also been used to treat various illnesses in the Indian subcontinent from the ancient times[30].

BLACK CATECHU

Introduction: Catechu is an extract of acacia trees used variously as a food additive, astringent, tannin, and dye(31). It is extracted from several species of Acacia, but especially Senegalia catechu (Acacia catechu), by boiling the wood in water and evaporating the resulting brew. It is also known as cutch, black cutch, cachou, cashoo, terra Japonica, or Japan earth, and also katha in Hindi, kaath in Marathi, khaira in Odia, khoyer in Assamese and Bengali, and kachu in Malay (hence the Latinized Acacia catechu chosen as the Linnaean taxonomy name of the type-species Acacia plant which provides the extract).

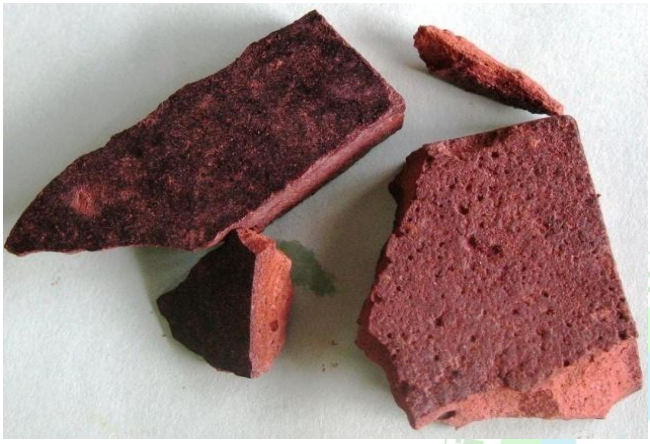

Figure 6: Black catechu

Figure 7: Catechu powder

Scientific Classification of Curcuma Longa:

Rank	Scientific Name
Kingdom	Plantae
Clade	Tracheophytes
Species	S.catechu
Biological Name	Senegalia catechu
Species	S.catechu
Order	Fabales
Family	Fabaceae
Subfamily	Caesalpinioideae
Clade	Mimosoid clade
Genus	Senegalia

Chemical Constituent:-The drug mainly contains (+)-catechin (7-33%), catechutannic acid (22-50%). Other constituents are catechu red, quercitin and gambier fluorescin, a fluorescent substance.

Method of Extraction:

Maceration: This is an extraction procedure in which coarsely powdered drug material, either leaves or stem bark or root bark, is placed inside a container; the menstruum is poured on top until completely covered the drug material. The container is then closed and kept for at least three days.The content is stirred periodically, and if placed inside bottle it should be shaken time to time to ensure complete extraction. At the end of extraction, the micelle is separated from marc by filtration or decantation. Subsequently, the micelle is then separated from the menstrum by evaporation in an oven or on top of water bath.

Decoction: This is a process that involves continuous hot extraction using specified volume of water as a solvent. A dried, grinded, and powdered plant material is placed into a clean container. Water is then poured and stirred. Heat is then applied throughout the process to hasten the extraction.The process is lasted for a short duration usually about 15min. The ratio of solvent to crude drug is usually 4:1 or 16:1. It is used for extraction of water soluble and heat stable plant material[32].

Phytochemical investigation: Phytochemicals analysis was carried out according to the methods specified by Siddiqui. The phytochemicals analyzed were alkaloids, tannins,

saponins, flavonoids, steroids, phenols, cardiac glycoside, carbohydrates, amino acids, proteins, terpenoids and phlobatannins.

Screening Procedure:

Test for Tannins and Phenols:

To 0.5 ml of extract solution 1 ml of water and 1-2 drops of ferric chloride solution was added. Blue color was observed for gallic tannins and green black for catecholic tannins[33].

Test for Alkaloids: The plant extract produces white yellowish precipitate when a few drops of Mayer's reagents are added. Most alkaloids are precipitated from neutral or slightly acidic solution by Mayer's reagent. The alcoholic extract was evaporated to dryness and the residue was heated on a boiling water bath with 2% hydrochloric acid. After cooling, the mixture was filtered and treated with a few drops of Mayer's reagent. The samples were then observed for the presence of turbidity or yellow precipitation.

Test for Saponins:

About 1 ml of filtrate was stirred with 10 ml distilled water. Frothing indicates the presence of saponins.

Test for Terpenoids and Steroids: Four milligrams of extract was treated with 0.5 ml of acetic anhydride and 0.5 ml of chloroform. Then concentrated solution of sulphuric acid was added slowly and red violet color was observed for terpenoids and green bluish color for steroids.

Test for Flavonoids: About 200 mg of powdered plant material was stirred in 10 ml ethanol and filtered. Few pieces of magnesium ribbon were added in 2 ml filtrate and then few drops of concentrated HCl were carefully added. Red color indicates the presence of flavonoids.

Test for Phlobatannins: About 1 ml of filtrate was boiled with 1% aqueous HCl. Deposition of a red color indicates the phlobatannins are present and then filtered. 2 ml of $FeCl_3$ was added to the filtrate. Blue-black Precipitate indicates the presence[34].

Test for Glycosides: Glycosides are compounds which upon hydrolysis give rise to one or more sugars (glycones) and a compound which is not a sugar (aglycone or genine). To the solution of the extract in glacial acetic acid, few drops of ferric chloride and concentrated sulphuric acid are added, and observed for a reddish-brown coloration at the junction of two layers and the bluish green color in the upper layer.

Test for Carbohydrates:5-8 drops of Fehling's (A and B) solution were added to 1 ml of filtrate. The resultant mixture was boiled for 2 minutes; brick red precipitate indicates the presence of carbohydrates.

Test for Amino acids (Ninhydrin test):5-7 drops of ninhydrin reagent was added in 2 ml of filtrate and heated content in a boiling water bath for about 5 minutes. Purple indicates the presence of amino acid.

Test for Proteins (Biuret test): 5-7 drops of 5% NaOH and 5-7 drops of 1% Cu $(SO_4)2$ was added in 2 ml of filtrate. Violet color indicates the presence of proteins[35]

Medicinal Applications of black catechu:

- Catechu is most commonly used by mouth for stomach problems such as diarrhea, swelling of the colon (colitis), and indigestion.
- It is also used orally for pain from osteoarthritis and topically to treat pain, bleeding, and swelling (inflammation).
- It is also used in diarrhea and in preparation of lozenges[36].

SAFFLOWER SEEDS

Introduction:

Safflower,

Its *Carthamustinctorius*, is a highly branched, herbaceous, thistle-like annual plant in the family Asteraceae. It is commercially cultivated for vegetable oil extracted from the seeds and was used by the early Spanish colonies along the Rio Grande as a substitute for saffron Plants are 30 to 150 cm (12 to 59 in) tall with globular flower heads having yellow, orange, or red flowers. Each branch will usually have from one to five flower heads containing 15 to 20 seeds per head. Safflower is native to arid environments having seasonal rain[37]. It grows a deep taproot which enables it to thrive in such environment.

Figure 8: Safflowerflower

Figure 9: Safflower seeds

Scientific Classification

Kingdom	Plantae
Clade	Tracheophytes
Clade	Asterids
Order	Asterales
Family	Asteraceae
Genus	Carthamus

The safflower seed (SS) is well suited for organic skin care products, and has beenclinically proven to be highly beneficial in lowering serum cholesterol levels. It is also used quite commonly as an alternative to sunflower seeds in birdfeeders. Today, Safflower Seed the source is used for meal, birdseed, in the food and industrial products markets, and foots to manufacture soap, but it is primarily grown foritsoil[38].

Phytochemical composition:

Almost 50% of safflower seed is hull. Where the oil is concerned, one could almostspeak about single-acid triglycerides because linoleic acid makes up almost 80% of the fatty acids. In addition to the main fatty acids, traces of linolenic acid (in special varieties up to 3%) and up to 1.5% myristic acid can be found. Because of the highproportion of linoleic acid, almost 90% of all triglycerides contain four double bonds ormore, and more than half ofit is trilinoleate[39].

Phytochemical screening:

Test for alkaloids:

Mayer's test**:** Few drops of Mayer's reagent were added to 1ml of extract. Ayello wish or white precipitate was formed, indicating the presence of alkaloids.

Test for terpenoids:

Salkowski test**:** Extract (5ml) was mixed with chloroform (2ml), and concentrated sulphuric acid(3ml)was carefully added to formalayer. A reddish-brown coloration of the inter face was formed to show positive results for the presence of terpenoids.

Test for tannin:

Small quantity of extracts mixed with water, heated, filtered and ferric chloride added a dark green solution indicate the presence of tannins.

Test for Saponin:

Foam test**:**1ml solution of extract was diluted with distil water to 20 ml and shaken in a graduated cylinder for 15 minutes. Development of stable foam suggests the presence of Saponin.

Test for flavonoids:

Extract of about 0.2 g dissolved in dilute Sodium hydroxide (NaoH) and Hydrochloric acid (HCl) added. A yellow solution that turns colorless indicates presence of flavonoids.

Test for carbohydrates:

Take 1ml distilled water and 5 to 8 drops of Fehling solution B then add 0.5 mlextract and kept for 15 min at 60 degrees. The presence of brick red colour indicates the presence of carbohydrates.

Test for proteins:

Take 2ml of NaoH and then add 5 to 6 drops of copper sulphate solution and small quantity of extract mix well formation of bluish violet colour indicate the presence of protein.

Method of extraction:

Soxhlet extraction:

Soxhlet extraction, which is traditionally considered as the extraction method resulting with the maximum yield, was carried out in a classic Soxhlet extract in the presence of ethanol, diethyl ether, petroleum ether, hexane or acetone as a solvent. 10 g of safflower seed mixed with 200 mL solvents was processed until the oil in ground seeds were all played out. After the operation completed, the solvent was removed until the oil came to the constant weighing. Oil yield was further calculated at the dry material base[40].

Maceration process:

The 200g powered seeds were placed in a sealed container where ethanol and distilled water in the ration of 30:70 will be added. The treatment is kept for 7-8 days with periodic shaking, afterwards the mixture was filtered using filter paper and the filtrate will be collected. Then the filtrate was kept in the oven at 80^0c and evaporated to dry[40].

Medicinal application:

Safflower seed oil is used for preventing heart disease, including "hardening of the arteries" (atherosclerosis) and stroke. It is also used to treat fever, tumours, coughs, breathing problems, clotting conditions, pain, heart disease, chest pain, and traumatic injuries. Some people use it for inducing sweating; and as a laxative, stimulant, antiperspirant, and expectorant to help loosen phlegm.

- Women sometimes use safflower oil for absent or painful menstrual periods.
- They use safflower flower to cause an abortion.
- In foods, safflower seed oil is used as cooking oil.
- In manufacturing, safflower flower is used to colour cosmetics and dye fabrics. Safflower seed oil is used as a paint solvent. [41][40].

CONCLUSION:

Herbals are playing an important role in the present days. Herbals products are safety and secure as compare to synthetic drug. Herbals have an important role as alternative to allopathic and to reduce the adverse effect. Even combination of different herbs can be used in effective treatment of various diseases. *Momordica dioica, Lantana camara L., Curcuma longa, Carthamustinctorius and Acacia catechu* plant have reported the antidiabetic, mosquito repellent, antibacterial as well as effective for multiple diseases. The investigation and information about this herbs can bring them in to the era of research and can helpful for development of various medicinal products.

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