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ETHNOMEDICINAL, PHYTOCHEMICAL AND PHARMACOLOGICAL REVIEW OF EUPHORBIACEAE FAMILY MEMBERS IN THE TREATMENT OF SKIN DISEASE

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ABSTRACT

For their basic healthcare, the majority of people in underdeveloped nations still rely on traditional medicine, which is mostly based on plant species in humans and animals. Euphorbiaceae is a big spurge family that includes several medicinal plants. The purpose of this study is to document the many Euporbiaceae plant species that are used to treat skin problems. This review focuses on the ethnomedicinal, phytochemical, and pharmacological aspects of three genera and fifteen species of Euphorbiaceae family. Euphorbia thymepholia L., *Phyllanthus niruri* L., *Euphorbia hirta* L., *Acalypha indica* L., *Croton bonplandianum baill*, *Phyllanthus urinaria* L., and Euphorbia tithymaloides *Riccinus communicus* L., *Jatropha gossypiifolia* L., *Jatropha curcas* L., *Codiaeum variegatum* L. *Phyllanthus Emblica* L., *Euphorbia neriifolia* L., *Euphorbia tirucalli* L., *Croton macrostachyus Hochst*. ex. Del., L. are all important members of this family because they contain a variety of compounds such as alkaloids, flavonoids, steroids, saponin, phenolic compounds, fatty acids, esters, minerals, and many more. This research gives crucial information for identifying several Euphorbiaceae plants. Euphorbiaceae species are widely utilized as treatments for a variety of ailments.

Keywords: Euporbiaceae, Skin diseases, Ethnomedicine, Phytochemistry, Pharmacology

INTRODUCTION:

Angiosperm plants are the most dominant group in the plant kingdom. They are directly and indirectly useful for human beings. They provide food, clothing, fuel,

shelter, and many other things. They also have medicinal properties and are therefore useful in the pharmacological industry. Different types of plants are used in different types of diseases. Euphorbiaceae is a large family that occurs in the tropical region. Euphorbiaceae family has economical value plants, ornamental plants, and medicinal plants. It is divided into three subfamilies:

1. Acalyphoideaceae
2. Crotonoideae
3. Euphorbiaceae

A plant family which is the name Euphorbiaceae also used in the cure of different types of diseaszzzthey are called Euphorbias, which is also the name of a genus in

It has 300 genera and 7,500 species. It contains different forms of plants such as herbs, shrubs, and trees **[1]**. All have numerous medicinal values. Few examples of plants of the Euphorbiaceae family possessing medicinal properties are *Euphorbia thymepholia L, Euphorbia hirta L., Acalypha indica L, Croton bonplandianumbaill, Riccinus communicus L., Jatropha gossypiifolia L., Jattropa curccusL., Codiaeum variegatum L., Phyllanthus emblica L.*, *Euphorbia neriifolia L., Euphorbia tirucalli L., Phyllanthus niruri L.,Croton macrostachyus Hochst. ex. Del., Phyllanthus urinaria* L, *Euphorbia tithymaloides* L.

According to WHO 'A medicinal plant is any plant that, in one or more of its parts, contains a substance that can be used for therapeutic purposes or which is a precursor for the synthesis of useful drugs**.** Medicinal plants are a source of economic value, and India has a rich heritage of knowledge of plant-based drugs and preventive and curative medicines **[2]**.

All plants have two types of compounds, the Primary metabolites and the Secondary metabolites. Secondary compounds are the byproducts of the primary reactions of plants such as alkaloids, terpenoids, phenolic compounds, flavonoids, tannins, gums, resin, etc. These compounds may be toxic or nontoxic for human beings. Those compounds are which are non-toxic may be used in the cure of different types of diseases like – Diarrhea, gonorrhea, tumors, asthma, cough, and skin disease.

Skin is the most sensitive and protective covering of human body. It is the first layer of immune system. Skin is made up of epithelial tissue and manages many key functions in our body such as water loss, and protection against UV rays. Most important function is the synthesis of vitamin D. During recent years our climate has changed because of many human activities as a result of which humans face different types of diseases**.** Skin disease is a

common ailment and it affects all ages from the neonates to the elderly and causes harm in several ways. There are more than a thousand conditions that may affect the skin but most skin diseases can be categorized into nine common types **[3]**.

Viral infections: This happens when a virus enters the stratum corneum and infects the skin's inner layers. Herpes simplex, shingles (herpes zoster), and warts are few examples of viral skin illnesses. Chicken pox and measles are two examples of systemic viral diseases that can affect the skin.

Bacterial infections: Bacteria of several sorts, including staphylococci and streptococci, cause such infections. Impel folliculitis, cellulitis, and Lyme disease are just a few of the conditions that might occur.

Fungal infections: Fungi that aren't harmful are always present on the skin's surface. Athletes' feet, lock itch, and ringworm are examples of superficial infections that affect the skin, hair, and nails**.**

Parasitic infections: After being exposed to parasites like lice or scabies, these illnesses develop.

Rashes: A rash is a red inflamed skin or a group of individual spots. These may be caused by irritation, allergy, infection, or an underlying disease. Examples include acne, dermatitis, eczema, hives, pityriasis rosea, and psoriasis

Tumors and cancers: Skin cells expand at a quicker rate than usual, resulting in these growths. Basal cell cancer (the most treatable), squamous cell cancer (which can develop and spread), and malignant melanoma are the three forms of skin cancer (the deadliest form).

Pigmentation: The quantity of pigment in the skin is determined by the amount of melanin generated by the body. There are two forms of pigmentation: Hypopigmentation and Hyperpigmentation. Age spots, freckles, and melasma are all examples of hyperpigmentation. Vitiligo is a condition that causes hypopigmentation.

Trauma: A blow, a cut, or a burn to the skin is referred to as trauma. The body becomes more susceptible to infection and sickness when the skin's surface is damaged.

Method:

This review article deals with some members of the Euphorbiaceae family which are used in different skin types of disease and their phytochemical composition and their ethnomedicinal uses. A literature search was performed on the *Euphorbiaceae family* using ethnobotanical textbooks and scientific databases such as Pubmed, Scopus, Google Scholar, and other web sources.

1. *Euphorbia thymepholia*- Its local name is *choti dodhi.* This is found in common places and roadsides. It has different phytochemical compounds such as steroids, carbohydrates, glycoside, flavonoids, terpenoids, gums, fat, oil, tannin, and phenolic compounds. This plant does not have alkaloids, proteins, and amino acids.

Charkas prescribed dudhika as an ingredient of vegetable soup for diarrhoeal and painful bleeding piles. It is diuretic, laxative and detumescent, antimalarial, anti-diarrhetic, anti-rash, anti-dysentery, anti-carbuncle, detoxification, and anti-hemorrhoidal activity. It also has anti-oxidant, and anti-viral activities **[4]**. The whole plant body (leaves, root, flowers) of this plant, also have different phytochemical components such as quercetin galactoside, beta amyrin, beta-sitosterol_cholesterol, kaempferol, salicylic acid esters, n- alkanes, sterol glycoside, taxaxerol, crude protein, fat and fiber, total carbohydrate, starch, amylose, amylopectin, cellulose acid, insoluble and soluble ash, macro-minerals, viz Na. K, Ca, Li and micro-minerals viz Fe, Cu, Mn, and Co **[5]**. This plant is anti-inflammatory and proven to encourage healthy cell growth. It functions as an allergic, hemostatic, anti-thrombin, anti-oxidant, vasoprotective action, anti-viral, anti-allergic, anti-tumor, anti-oxidant, anti-helminthic, anti-bacterial, anti-diabetic, anti-lipidomics, anti-fungal, anti-microbial, anti-anxiety activity, anti-nociceptive activities **[6]**.

2. *Euphorbia hirta*: Its local name is 'Dhudhia". The plant body of this plant is herbaceous and it grows in the gardens as an ornamental plant but it also occurs everywhere. The whole plant body (Root, Stem, leave, & flower) has medicinal properties. The juice of this plant is used to treat Amoebiasis. Its phytochemical components are as below– Quercitrin, myricitrin, quercetin, leucocyanidin, quercitol, friedelin, kaempferol, maleic acid, tartaric acid, rutin, α-amyrin**.** Other phytochemical components are Flavonoids**:** Euphorbianin, leucocyanidol, camphol, quercitrin, and quercitol **[7, 8]**. Polyphenols: Gallic acid, myricitrin, 3,4-di-O-galloylquinic acid, 2,4,6-tri-O-galloyl-D-glucose, 1,2,3,4,6-Penta-O-galloyl-β- D-glucose; Tannins**:** Euphorbins A, B, C, D, E; Triterpenes and phytosterols**:** β-Amyrin, 24-methylenecycloartenol, and β-Sitosterol **[9]**. Alkanes**:** Heptacosane, n-nonacosane. It has different pharmacological activities like Antidiarrheal activity, anti-inflammatory activity, anti-malarial, anti-tumor activity, hypertensive, hepatoprotective, antioxidant, anti-microbial**,** hypoglycemic, antimutagenic activities, antifungal, antibacterial activities, cytotoxicity, immune regulatory activity, protein inhibition against cancer cell, antifungal, photosynthetic activity,

healing wound, platelet aggregation, anti-hyperglycemic activity as herbicide, fungicide, antiulcer activity, antibiotic in medicines, anticancer, antiparasitic, antiallergenic activity, antispasmodic activity **[8]**.

3. ***Acalypha Indica:*** This plant is commonly known as Indian acalypha. It is mostly found on the river banks and moist & shady places and is found in all parts of the tropics. It is an annual herbaceous plant. I has different phytochemicals like alkaloids, catechols, phenolic compounds, flavonoids, saponin, steroids, and tannin but tannin, triterpenoids, and anthraquinones are absent in leaf and root extract of this plant**.** The plant exhibits different pharmacological activities like antioxidant, antitubercular, analgesic, anti-inflammatory, anthelmintics, antibacterial and antifungal, molluscicidal, neuroprotective and neuro therapy, post-coital antifertility, antivenom, antiulcer and post-coital infertility **[10]**. These phytochemical compounds have analgesic, anti-inflammatory, anti-ulcer, anti-oxidant, anti-diabetic, post-coital activity, anti-fertility, anti-microbial, and anti-bacterial activity **[1]**. Traditionally, this herb has been utilized for medicinal purposes. This plant has diuretic, laxative, emetic, and expectorant properties. This plant is effective in the treatment of several illnesses, including scabies, pulmonary TB, asthma, pneumonia, and bronchitis. When treating scabies and ringworm, leaves are crushed with salt or lime juice and administered topically. Children who consume leaf juice become sick. This herb is employed in homeopathy to treat hemoptysis, phthisis, and severe coughs that are accompanied by pulmonary hemorrhage.

4. ***Croton bonplandianumbaill*****:** In dry, shaded areas, this plant can flourish. Its herbaceous body is used to make extracts and pastes used in the treatment of diseases like cholera, liver ailments, asthma, bronchitis, skin, and ringworm infections are treated using this plant's antiseptic properties.

It contains a variety of phytochemicals, including 1, 1-dodecene, 1, 1-dodecanol, 1, 3-bis (1, 1dimethylethyl) Phenol-containing ingredients include methyl stearate, n-Tetracosanol-1, triterpenes like squalene (2,6,10,15,19,23-hexamethyltetracosa, 2,6,10,14,18,22-hexaene), linoleate like octadeca-9,12-dienoic acidoxo (keto), and fatty acid esters such as Alkaloids, terpenoids, flavonoids, tannins, steroids, diterpenes such phytol, cardenolides, and 9-enoate.

The phytochemicals in plants have a variety of health-promoting properties, including wound healing activity, anti-tuberculosis activity, anti-fungal activity, antioxidant, anti-inflammatory activity, antibacterial,

anti-tubercular, cytotoxic activities, cancer preventive, immune stimulant, chemo preventive, lipoxygenase-inhibitor, pesticide, hypocholesterolemic, nematicide, antiarthritic, hepatoprotective, anti-androgenic, hypocholesterolemic 5-alpha reductase inhibitor, antihistaminic, anti-coronary, insecticide, antieczemic, anti-acne **[9]**.

5. *Ricinus communis:* It's a small tree-like plant that grows in an open shaded area. Its local name is "Bherenda". The whole plant utilizes in the treatment of different types of diseases. The seed oil of this plant is used for rheumatic pain, joint pain, paralysis, and internal use in constipation **[11]**. Leaves are used to cure headache. Leaf and root bark also have purgative properties.

Phyto chemical components are Palmitic, Stearic, Oleic C18:1n9, Oleic C18:1n10, Linoleic, Ricinoleic, Dihydroxy stearic acid, Unsaturated fatty acid (UFA), Saturated fatty acid (SFA). Mutagenicity, cytotoxic and antioxidant activities, anti-fertility, antibacterial activity, antimicrobial activity, analgesic activity, catalytic activity, larvicidal activity, resistance-modifying activity vinblastine-resistant human breast cancer, and photosynthetic activity, ani-inflammatory, anticancer activities, insecticidal activities, and antifungal activities **[12]**.

6. *Jatropha gossypiifolia:* "Lal Bherenda" is its local name. It's a shrub that is widely grown. Wound healing, ulcers, wounds, abrasions, ringworms, eczema, dermatomycosis, and scabies are all common uses for this herb. Its leaves are effective in treating carbuncles, eczema, and itching **[13]**. This plant's oil is used to treat rheumatoid arthritis and other skin infections.

Coumarin, lignoids, diterpenes, flavonoids, fatty acids, lignans, saponin, phenol, glycosides, and esters are some of the phytochemicals found in it.

It has anti-inflammatory, antimicrobial, and antibacterial properties, as well as anti-diarrhoeal, antifungal, phytochemical, allelopathic, antioxidant, and analgesic properties **[5]**.

7. *Jatropha curcas*: Local name of this plant is Bagh verenda, Ban verenda, Chanda, Jamalgota, Sadajeol, Baron. It is a multi-purpose perennial shrub or tree and is found in open sunny places. In English, this plant is commonly known as physic nut, purging nut, Barbados nut, and nutmeg plant**.** The pharmacological activity of this plant is antibacterial, antifungal, antiviral, anti-inflammatory, antioxidant, coagulant and anticoagulant, anti-diarrheal, pregnancy terminating effect, wound healing, insecticidal, larvicidal, and anthelmintic activity **[13]**.

Various parts of this plant can be used for the health care management of animals and human beings. seed oil and roosted seed of this plant are purgative, applied in rheumatism, herpes, and pruritus. Seed is toxic for humans **[14]**. The sap of this plant and leaves are styptic and applied to wounds and refractory ulcers. The plant is very effective in the treatment of scabies, eczema, ringworm, and toothache. Decoction of leaves is antidiarrheal.

The leaf, bark, and latex contain alkaloids like atropine, jatrophan, curcacycline A, curcain, tannins, glycoside, flavonoids, and spogenins with anti-cancerous properties **[15-17]**. These plant parts used in traditional medicine like seed oil has also been used medically as a purgative and as a remedy against syphilis.

Leaves, root, stem and stem bark, seed and seed oil are used to treat different types of disease, this type of study done by different scientist, here Some study is written down. Leaves are used in Ulcers, septic gums, cuts, wounds, burns, itching **[13]**. and blistered skin, ulcers, purgative, pneumonia, rubefacient, **[18]**. rheumatism, leprosy, fever, jaundice, gonorrhea **[19]**. Root/root bark is used in Inflammation, external parasite, gout, rheumatism **[20, 21]**. seeds/ seed oil is used in Eczema, skin diseases, rheumatic pain, and purgative**.**

8. *Codiaeum variegatum* L.: This plant is commonly known as croton or Joseph's coat. Croton is the second most extensive genus of Euphorbiaceae with 1250 species **[22]**. It is an indoor attractive plant and a member of the Euphorbiaceae family of medicinal plants. The foliage of this plant is brightly colored and contains a variety of leaf forms. It's a kind of evergreen shrub. It is an Indonesian native. Traditional remedies employ several components of this plant. Its sap is poisonous and can cause eczema in certain people.

It is used in gastric ulcers. Leaf extract of croton has many medicinal properties like purgative, sedative, antifungal, antiamoebic, anticancerous activity **[23, 24]**. irregular menstruation, wound healing activities **[25]**. Other pharmacological activity of this plant are anti-inflammatory **[26]**, antimicrobial, antiulcerogenic **[27]**, molluscicidal, anthelminthic **[28]**. It is used to treat diabetes, digestive disturbances, hypercholesterolemia, intestinal worms, fever, malaria and pain, and possesses antimalarial, larvicidal, and insecticidal activities.

Different parts of this plant like stem, root, leaf have different types of alkaloids, carbohydrates, glycoside, steroids, flavonoids, coumarins, saponins, fatty acids, tannins, proteins, amino acids, gum, mucilage, terpenoids, anthraquinones, and phenols. Valuable secondary phyto components of this plant genus are- alkaloids, terpenoids (diterpenes,

pentacyclic triterpenoids, and steroids), proanthocyanins, flavonoids, and phenolic compounds **[29]**.

9. *Phyllanthus emblica* L.:

The Euphorbiaceae family *Emblica Officinalis* (Gareth) is also known as Indian gooseberry or Amla. In the Ayurvedic and Unani systems, this is a very essential medicinal plant. It is one of the most nutrient-dense foods, with high levels of vitamin C, amino acids, and minerals The entire plant is therapeutic, but the fruit is most effective in Ayurveda. According to the two main classic texts on Ayurveda, **Charaka Samhita, and Sushruta Samhita,** it is considered a powerful Rasayana (Rejuvenator) and the best among the sour fruits **[30]**. It is often discussed with **Triphala.** It is an Ayurvedic medicine that is a combination of three plants- *Phyllanthus embilica, Terminalia chebula,and Terminellia belerica* **[31-33]**. It is used to cure common colds and fevers, as a diuretic, laxative liver tonic, refrigerant, stomachic, retroactive, antipyretic, hair tonic, and ulcer and dyspepsia prevention. Other components of this plant are used to treat diabetes, cough, asthma, bronchitis, cephalalgia, ophthalmopathy, colic, hyperacidity, skin disease, leprosy, hematogenesis, inflammation, diarrhea, dysentery, leucorrhoea, cardiac problem, cancer, and anemia, among other diseases **[343]**. It shows different types of activities to cure different diseases such as analgesic (Sharma *et al* 2004), anti-tussive, antiatherogenic anti-inflammatory and anti-mutagenic **[35]**, adaptogenic , cardio **[31]**, gastro **[36]**, nephron **[37]**, neuroprotective activity **[30]**. It also shows anticancer, antioxidant **[38]**, chemopreventive **[34],** free radical scavenging **[39]**, radio,chemo and immune-modulatory activities **[40]**.

The whole plant body contains different types of phyto components- **Amino acids:** glutamic acid, proline, aspartic acid, alanine cysteine, lysine**; Carbohydrate-** pectin; **vitamin**-ascorbic acid; **Flavonoids-** Quercetin, kaempferol, **Organic acid** – citric acid; tannins**; alkaloids**-phyllantine, phyllembein, phyllantidine and **phenols**-gallic acid, methyl gallate, ellagic acid, triallyl glucose. Fruit of this plant is very important. It contains more phytocompound than its whole plant body. Secondary phytocomponents of fruit are **hydrolysable tannins-**Emblicanin A and B21, Punigluconin, pedunculagin, and chebulinic acid (Ellagitannin), chebulagic acid (Benzopyran tannin), Corilagin (Ellagitannin), Geraniin (Dehydro ellagitannin) Ellagotannin. This type of study I found in another review article **[41]**.

10. *Euphorbia neriifolia*: *Euphorbia neriifolia* Linn. belongs to the family Euphorbiaceae. It commonly occurs in north and is found in the Deccan peninsula

of India. The vernacular name of this plant is *Thuar*. It is a branched, erect, succulent shrub. Ayurveda describes this plant (root, stem, and leaf,) as a better laxative, carminative, and improves appetite. This plant is beneficial in abdominal troubles, bronchitis, tumors, leukoderma, piles, inflammation, anemia, ulcer, and fever. In the traditional system, leaves of this plant are used as diuretic, aphrodisiac, bleeding piles, anorectal fistula, cold, and cough. Euphorbia neriifolia is one of the constituents of **Kshaarasoota** which is used in Indian medicine to heal anal-fistula. Kshaaratra is quite effective in treating various fistulous tracks. Latex of this plant shows different types of pharmacological activities like cytotoxic, antiarthritic, anti-inflammatory, and leaf extract show antioxidant, wound healer, and immunomodulatory activity **[42]**.

According **to Nadkarni** different types of phytoconstituents are present in this plant. Names of this phyto components are as-Euphorbin, resin, gum, caoutchouc, malate, and calcium. The whole plant body (root, stem, leaf) gives di terpene, tri terpene, and tri terpene alcohol. Phytochemical studies lead to the isolation of triterpenes like nerifolione, cycloartenol, euphorbol, nerifoliene, taraxerol, b-amyrin, glut-5(10)-en-1-one, and glut-5-en-3b-ol from latex of bark, root, and leaf. Anthocyanins like delphin and tulipanin, and diterpenes like antiquarian, 12-deoxy-4b-phorbol-13--20-acetate, and ingenol triacetate was isolated from bark and root **[42]**.

11. *Euphorbia tirucalli:* It's a cactus-like succulent plant. It thrives in dry environments. It is known as a petroleum plant because it produces gasoline (a hydrocarbon compound). This plant has been used to cure a variety of illnesses including asthma, cough, earache, cancer, epithelioma, skin disease, sarcoma, rheumatism, tumors, and as a folk treatment for syphilis **[43]**. This plant show different pharmacological activity like antibacterial **[44]**, antiherpetic, antimutagenic, and anticarcinogenic **[45]** and anti-HIV activity. *Euphorbia tirucalli* contains alkaloids, flavonoids, saponins, coumarins, polyphenols, tannins, cardiac glycosides, and tri terpene phytochemicals. Plant parts are used in traditional medicine eg. latex is used in the treatment of Asthma, Cancer, cough, Ear problems, Snakebite and scorpion, Toothache Intestinal parasites, and Skin problems. Leaves are used to treat Skin problems, nose ulcers, and hemorrhoids. Thorn extract for swelling, leprosy and paralysis, colic and gastric problems, and root used in rheumatism **[46]**.

12. *Phyllanthus niruri*: It's a once-a-year herb. It is a field weed that may be found in Asia, America, and China's tropical and subtropical areas. In many parts of the

world, it is known by different names. **Chalmari, Harfarauri**, and **bhuiaonla** are some of the Hindi names for it. It is known in Sanskrit as Amala, **Bhumyamlaki**, and in the Unani system as **Bhumiamla**, **Amlaye Jamen**. However, this plant is also known as "Chanca Pendra," which means "stonebreaker."

This plant has extensive medicinal properties –its use as a folk medicine to use to treat kidney stones, gallbladder stones, liver cancer, and jaundice. In the Ayurvedic system whole plant can be used for medicinal purposes. It is used in bronchitis, leprosy, anemia, urinary discharges, asthma, skin disease, cough, ulcer, etc. **Maharshi Charak** has considered the plant to be most effective in the treatment of asthma.

In the Unani system, this plant is good for sores and chronic dysentery. Seed is used in the treatment of ulcers, wounds, scabies, and ringworm infection **[47]**. It shows different pharmacological activity like hepatoprotective, antiviral, antioxidant, anti-inflammatory, anti-cancerous, antibacterial, chemoprotective, antiulcer, diuretic, anti-, antitumor, anti-nociceptive, properties **[9]**.

Phyllanthus niruri consists of different types of organic compounds of medicinal importance like alkaloids, flavonoids, hydrolyzable tannin (Ellagitannins), major lignans, polyphenols, triterpenes, sterols, volatile oil, saponins, coumarins. Many lignans are isolated from this plant like phyllanthin and hypophyllanthin **[48]**. This type of research work was carried out by **Narendra *et al*., 2012 [49]**.

13. *Croton macrostachyus:* This plant is knows as broad-leaved croton in English. The major distribution center of this genus is tropical America, India, and Africa. It is a shrub or deciduous tree. Croton plants have been used in folk medicine all over the world **[50]**.

It is used to treatment of various diseases such as malaria, hypertension, cancer, diabetes, digestive problem, inflammation, dysentery, rheumatism, leprosy, external wounds, fever, leukemia, narcotic, bronchitis, diarrhea, and ulcer. Leaves of this plant are used in the treatment of malaria, constipation, tetanus, epilepsy, skin cancer and TB. The bark of this plant is also used in the treatment of tapeworm infection, syphilis, and asthma. Secondary metabolites found in this plant include phenolic compounds, tannins, alkaloids, saponin, free anthraquinones, phytosterols, polyphenols, and flavonoids, among others. Methanol and dichloromethane extracts of the leaves and stems of this plant have antibacterial and antifungal properties. The essential oils of the plant have antibacterial and antileishmanial properties **[51]**. There are also reports claiming that various crude extracts of *Croton macrostachyus* had

larvicidal activity, molluscicidal activity, antimicrobial and anticonvulsant, and mitogenic activity on human lymphocytes and mice spleen lymphocytes **[52]**.

14. *Phyllanthus urineria L:* One of the most important groupings of plants in the Phyllantaceae family is the genus *Phyllanthus* (L.). The annual perennial herbal species *Phyllanthus urinaria* (L.) is found in tropical Asia, America, China, and the Indian Ocean islands. In folk medicine, *P. urinaria* is used to treat jaundice, diabetes, malaria, liver, and skin problems. In many parts of the world, the whole plant, roots, fruits, and leaves of P. urinaria have traditionally been used to cure numerous difficulties. Decoction of the whole plant of *P. urinaria* (Chinese name: Yexiazhu) may clear heat-toxin and eliminate dampness, therefore it is used to treat jaundice, enteritis, diarrhea, and dropsy in traditional Chinese medicine. *P. urinaria* is a highly effective diuretic, and the crushed plant is used as a fish poison **[53]**. An extract is utilized as a febrifuge in Papua New Guinea. To treat smallpox in Brunei, a leaf poultice with coconut milk is administered. It exhibits anticancer, hepatoprotective, antioxidant, antidiabetic, antibacterial, and cardioprotective activity, among other pharmacological properties. Tannins, flavonoids, lignins, phenolic compounds, terpenoids, and other secondary metabolites are also present.

15. *Euphorbia tithymaloides L.:* *Euphorbia tithymaloides* (L.) Poit (Family: Euphorbiaceae) is a common succulent plant native to tropical and subtropical regions of North and Central America, as well as some parts of South Asia. Pedilanthus tithymaloides have several common names in India: *Airi, Baire*, and *Agia*. *Euphorbia tithymaloides* is a plant with many branches spreading from the base that grows to be 0.4 to 3 meters tall and 40-60 cm wide. Slender, pencil-like fleshy tubular stems produce thick, dark-green fleshy, ovate leaves and odd beak-shaped blossoms on this plant. Because of its zigzag structure, the stem of this plant resembles the spinal column morphologically, garnering it the nickname "devil's backbone." Emetic, irritating, and caustic characteristics are all present in this plant. Asthma, mouth ulcers, venereal problems, ringworms, and insect bites are all treated with leaf extract. Calluses, earaches, bug bites, ringworm, skin cancer, toothaches, and umbilical hernias have all been treated with sap in the past**.** Steroids, tannins, triterpenes, coumarins, and saponins have been shown to have anti-diabetic, antioxidant, analgesic, stomachic, hemostatic, anti-microbial, antifungal, anti-helminthic, antimutagenic, anti-tubercular, antimalarial, anti-inflammatory, abortifacient, antivenom, antibiotic, antiseptic, antihemorrhagic, antiviral **[54]**.

CONCLUSION

In recent years, the study of Indian traditional medicinal plants has reappeared. Although alternative medical systems are effective, they are accompanied by a host of unpleasant side effects that frequently lead to major difficulties. The information presented here is intended to aid in the commercial identification of medicinal and economic plants. The pharmaceutical industry can use active principles extracted from various plants as leads for further medication development. This research gives crucial information for identifying several Euphorbiaceae plants. Many scholars working on plants in the Euphorbiaceae family will benefit from this review.

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