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Review Article

A Review on: Morphological, Phytochemical and Medical Important of Some Wild Euphorbiaceae Poisonous Plants

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Abstract

The plants are very important for living organisms, there would be no life on earth if plants did not exist. Furthermore, when animals or humans consume many plants, they can have negative consequences. Plant toxicity is associated with a multitude of chemical toxins such as alkaloids, glycosides, proteins, and amino acids. There are numerous examples of poisonous species present in different families, one of them Euphorbiaceae. Euphorbiaceae is one of the four largest cosmopolitan families of flowering plants with 313 genera and around 8100, species. Morphological, phytochemical properties and medical uses for 11 wild species of Euphorbiaceae growing in Saudi Arabia were collected in this paper. Two species (*Euphorbia fractiflexa* and *Jatropha glauca*) don't have data for its chemical and medical properties and need a lot of study. For the species growing on the Saudi Arabia, all studied species need further study except for *Euphorbia granulata* and *Ricinus communis*.

Keywords: Morphology, chemical properties, Medical important, Poisonous plants, Euphorbiaceae, Saudi Arabia.

INTRODUCTION

Poisonous plants are plants, which can cause harmful effect for animals or human by direct effect or by of accumulative action of toxic substance found on the plant. The plants which contain some secondary metabolic substance as, alkaloids, glucosides, amines, toxalbumins, picrotoxins, resins, saponins, tannins etc., consider poisonous plant since this substance are harmful to animal and man life Katewa *et al*., (2006). This secondary metabolic substance produced by the plant as Chemical defenses to avoid, tolerate or defend themselves against natural enemies such as predators, parasites, and competitors. Chemical defenses are chemical compounds produced by plants as secondary metabolites or as by-products from the essential functions of the plant and are stored in vacuoles in the plant cells. Many of these plants are also ethnobotanically used for treatment of various diseases in Humans and animals Asgarpanah & Ramezanloo, (2012). The toxicity of the plants different according to the stage of growth or the type of the soil as, *Lolium temulentum* is very toxic after flowering and *Solanum nigrum* is more toxic in damp soil than in dry soil. Poisonous plant does not mean the whole plant are toxic it may be part of it is poisonous as, *Corchorus olitorius* its leaves are edible after cooking while the seeds are toxic and *Carissa grandiflora* leaves and stems are toxic while the fruit are edible. Poisonous plants are inevitable part of our habitat and are of widespread distribution as wild species in streets, parks and in pastures, or in doors as ornamental plants Lynn *et al*., (2005) and El Ghazali and Mousa (2014). The poisonous plans found in a lot of many plants family one of them is Euphorbiaceae family.

Euphorbiaceae is one of the four largest cosmopolitan families of flowering plants with 313 genera and around 8100, species. It is widely distributed epically in tropical, subtropical, and temperate regions. In Saudi Arabia it represented by 7 genera and 26 species according to Megahed, (1978) and 15 genera, 68 species and 6 variety according to Chaudhary, (2001), recently Thomas, (2011) recorded 67 species and 15 genera in the family.

The family characteristic by monoecious or dioecious plant with prostrate, climbing, or erect stem. The most species are herbs, but some are shrubs or trees. The leaves are alternate to opposite or whorled with petiole or sessile, simple, or compound are always palmate, never pinnate. Stipules may be reduced to hairs, glands, or spines, or in succulent species are sometimes absent. The member of the family may contain milky juice or colored sap Chaudhary, (2001). The family contains a large variety of phytotoxins (toxic substances produced by plants), mainly diterpene esters, alkaloids, glycosides, and ricin-type toxins Charles *et al*., (2007). Most of the species of Euphorbiaceae are known to be toxic and poisonous plants because their milky latex has strong skin irritant activity, and chronic exposure can result carcinogenic effect. The toxic constituents of Euphorbiaceae species are specific diterpenes, called in common as phorboids. These compounds (tigliane, ingenane and daphnane derivatives) possess extreme pro-inflammatory and tumor promoting effects due to the activation of protein kinase C enzyme. The present study gives a survey about morphology, phytochemical and medical important for some poisonous plant of Euphorbiaceae present in Saudi Arabia to established if there some of this plant need more study.

REVIEW METHODOLOGY

The results of this survey are based on the information derived from the internet database as show in (Fig 1). Many keywords used for the search as, morphology, phytochemical, medicinal important, Euphorbiaceae, poisonous plants in Saudi Arabia and names of the species. The online sources such as Google Scholar, PubMed, Web of Science, and Scopus are used to collect the data. Also, books and other journal articles obtained from the university library are used. The morphology photo for the studied plants were collected from the websites of the flora of Saudi Arabia (Photo gallery (plantdiversityofsaudiarabia.info), flora of Qatar (Flora of Qatar - list of plants sorted by family) and other sources as (https://www.sciencedirect.com/science/article/abs/pii/S0031942220312644).

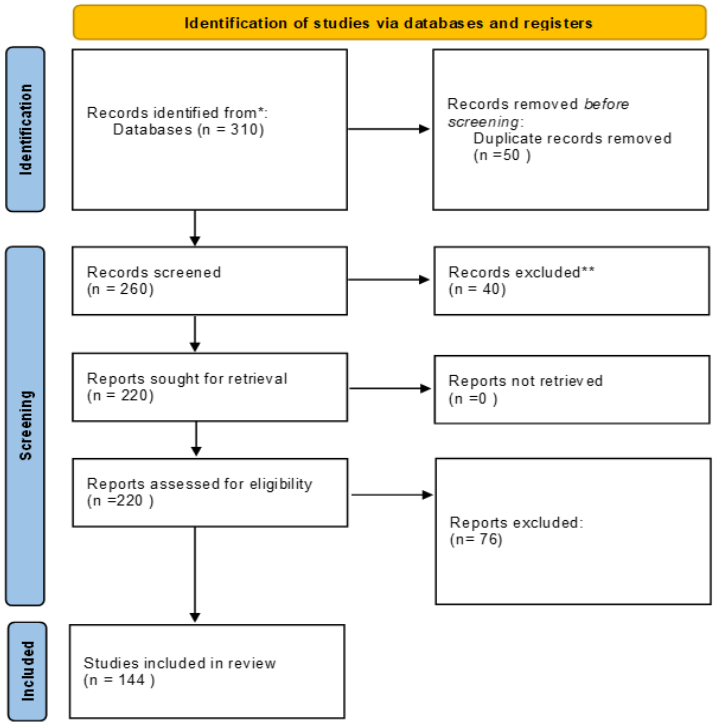


Figure 1: Workflow of this articles review according to PRISMA guideline.

RESULTS

***Chrozophora* Neek.ex Juss.**

The genus *Chrozophora* is the only genus in the subtribe chrozophorinae and according to Chaudhary (2001) and Tene Vicente *et al*., (2007), the genus is dispersed across Pakistan, India, West Africa, Asia, and the Mediterranean regions. Prior phytochemical research on the genus Chrozophora led to the isolation of a variety of chemical components, including alkaloids and coumarins, diterpenoids, phenylpropanoid glycosides, phenolic acids, tannins,

anthraquinones, saponins, and xanthones (Abdel-Sattar, 1985; Mohamed *et al.*, 1994, 1995; Tabussum *et al*., 2007). Furthermore, all species of the genus Chrozophora have been shown to contain flavonoids (Vassallo *et al*., 2006; Hawas, 2007; Tabussum *et al*., 2013). According to Delazar *et al*., (2006) and Hawas (2007), Chrozophora taxa have antioxidant, antibacterial, and anticancer properties. Vassallo *et al*., (2006), Jamil *et al*., (2012) and Usman *et al*., (2007) have likewise reported on these properties. Additionally, some varieties of Chrozophora are employed in conventional medicine to treat several ailments (Dipankar *et al*., 2011).

Genus *Chrozophora* is a small genus represented by 6-7 species according to Chaudhary, (2001) and consists of nine species reported by Marzouk *et al*., (2015). In Saudi Arabia, it is exemplified by 4 species according to Megahed (1978) and two species according to Chaudhary (2001) and Thomas (2011), one of them is recorded as a poisonous plant by Sharawy andand Alshammari (2009).

***Chrozophora tinctoria* (L.) Raf.** = *Croton tinctorium* L., (1753).

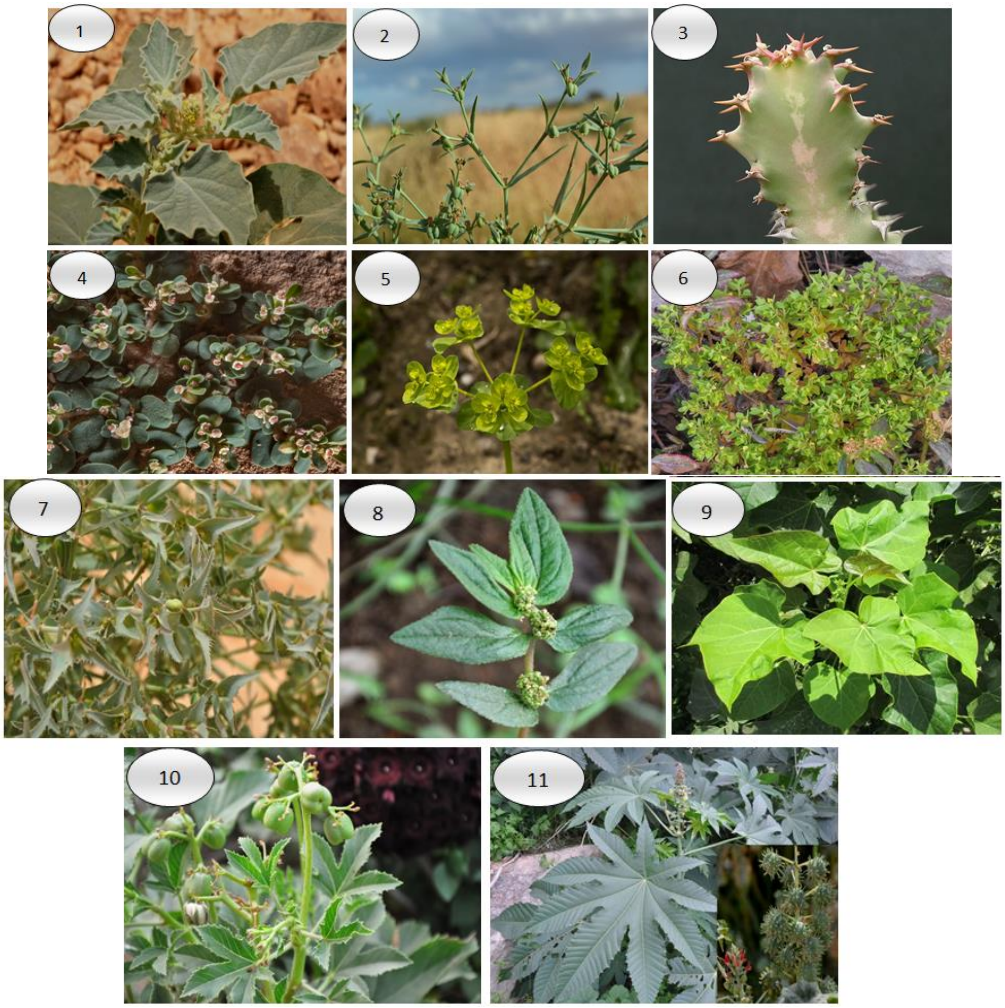


Plate 1: Morphological photo for 11 species of Euphorbiaceae wild poisonous plant growing in Saudi Arabia: 1. *Chrozophora tinctoria*; 2. *Euphorbia dracunculoides*; 3. *Euphorbia fractiflexa; 4. Euphorbia granulata*; 5. *Euphorbia helioscopia*; 6. *Euphorbia peplus*; 7. *Euphorbia retusa*;8. *Euphorbia hirta*; 9. *Jatropha curcas*; 10. *Jatropha glauca*; 11. *Ricinus communis*

Morphological Characters

The plant is an annual, greyish to bluish green, dichotomously branched herb up to 1 m. tall. Leaves are spirally arranged and simple. Flowers are unisexual with yellowish-green petals. Fruit capsule with 3-lobed, 6-8 mm. across, sub-globose, covered with dense, peltate scales. The seed is oblong, rugulose and glabrous, Chaudhary (2001).

Phytochemical Characters

Some studies were done on the *Chrozophora tinctoria* plant to investigate the phytochemicals existing in the diverse parts of the herb; Delazar *et al*., (2006) isolated five flavonoid glycosides from the plant one of them called *chrozophorin* and stated as a novel natural product. Marzouk *et al*., (2015) isolated nine flavonoids' compounds and three kaempferol aglycone and their glycosides component from *Chrozophora*

tinctorial and reported that the only *Chrozophora* species capable of synthesising kaempferol aglycone and its glycosides is *Chrozophora tinctoria*.

Medical importance

Traditional medicine has utilised the plants of *C. tinctoria* in therapeutic and emetic therapies and for fever and warts (Delazar *et al*., 2006). *C. tinctoria*'s seeds, stems, and leaves have all been utilised in both commercial and food products. Maurya, (2018), reported that *C. tinctoria* had antimicrobial action against gram-positive and gram-negative organisms. Furthermore, the plant shows antifungal action against certain fungal strains like *Candida albicans*, *Aspergillus flavus* and *Aspergillus niger* (Maurya, 2018).

Euphorbia

According to Ali *et al*., (2013), the genus Euphorbia is one of the six largest genera, with around 1600 species known to exist. These species are primarily found in tropical, subtropical, and warm temperate climates. Because it includes several secondary metabolites such as phenolic chemicals, terpenes, tannins, alkaloids, glucosinolates, flavonoids, and lipids, the species Euphorbia plays a significant role in medical usage. It is used to treat a variety of health issues, such as spasmolytic, and to strengthen capillaries (Bondarenko, 1972), anti-inflammatory and analgesic (Singh *et al*., 1984; Heirmann and Bucar, 1994), a modest antiviral and diuretic (Liu *et al*., 2002). It possesses bactericidal, anticancer, PGE2-inhibitory, anti-HIV, and analgesic properties according to Halowish *et al*., (2003), and Jassbi (2006) and are beneficial to the smooth muscle of the human airway (Chaabi *et al*., 2007).

In Saudi Arabia, about12 species are recorded by Migahid, (1978), but Chaudhary, (2001) recorded 39 species with two cultivated species. Recently, Thomas, (2011) recorded 43 species of Euphorbia found in the flora of Saudi Arabia and he furthermore recorded 8 of them as wild poisonous plants.

***Euphorbia dracunculoides* Lam.**

Morphological characters

The plant is characterised by ascending to the erect, glabrous, annual herb. Leaves are exstipulate, sessile, alternate to opposite, entire and acute. It is scattered in Southwest Asia, North Africa and South Europe and is widespread in Saudi Arabia Chaudhary (2001).

Phytochemical characters

Some phytochemical studies were done on the *Euphorbia dracunculoides* to detect the different components existing in the plant. Majid *et al*., (2015) studied the phytochemical composition of the plant and recorded four compounds, rutin, catechin, caffeic acid and quercetin of polyphenolic compound. Wang *et al*., (2015) isolated 19 diterpenoids from above-ground parts of *E. dracunculoides*. Khattak *et al*., (2017) detect different compound as; starches, proteins, flavonoids, phenolics, tannins, alkaloids, glycosides, saponins and sterols in the plant.

Medical importance

The various plant components have been utilized for a variety of medical purposes, including the removal of warts from the skin using the fruits (Mossa *et al*., 1987). Snakebite and epilepsy are treated with leaves (Sharma *et al*., 2010). According to Majid *et al*., (2015), the herb contains hepatoprotective, anti-inflammatory, and antioxidant properties. The aerial part methanol solution can be used to reduce the oxidative stress brought on by CCl4 and can be an effective treatment for illnesses linked to oxidative stress (Batool *et al*., 2017).

***Euphorbia fractiflexa* S. Carter and JRI Wood**

Morphological characters

E. fractiflexa is a spiny, leafless, succulent, usually trunkless shrub, diffusely branched from ground level. Leaves are exstipulate, sessile, small and deciduous. Inflorescence cymes in clusters, of 2-5-pedicellate flowers. Fruit is a capsule with ovoid to subglobose seeds. It is distributed in southwestern plain and heights in Saudi Arabia (Chaudhary, 2001).

Phytochemical characters:

No data were found.

Medical importance:

No data were found.

***Euphorbia granulata* Forssk.**

Morphological characters

The plant is an annual, prostrate, densely hairy to glabrous herb. Leaves are petiolated with 0.5 mm. long petiole, stipules and subulate; blades opposite (3-8, 1-5 mm.) obovate to oblong or linear, slightly asymmetric, obtuse and entire. It is found in Canary Island, Africa, Arabia, S and C. Asia and is widespread in Saudi Arabia (Chaudhary, 2001). The plant has two varieties in Saudi Arabia: var. *graulata* and var. *glbrata*.

Phytochemical characters

Several phytochemical studies on *E. granulata* were conducted to observe secondary metabolic compounds such as saponins, flavonoids, and tannins (Saleem *et al*., 2015). The plant's alkaloids and terpenes were isolated by Bousselessela *et al*., (2013). Triterpenes, apigenin, luteolin, and their glycosides are the most important bioactive phytochemicals found in *E. granulate* according to Nasrollahzadeh and Sajadi (2016). Furthermore, it is rich in many nutrients such as carbohydrates, lipids (saturated and unsaturated fatty acids), minerals, and protein (amino acids) (Awaad *et al*., 2017).

Medical importance

The herb is used as an antiparasitic, diuretic, anti-pyretic and blood cleanser in traditional medicine (Baquar, 1989). The white latex is used for taking care of snake bites, scorpion stings, and intestinal worms (Al-Shanwani *et al*., 1996). According to Hussein *et al*., (1999), the human immunodeficiency virus (HIV-1) protease was suppressed by *E. granulata*. Its latex is used in Saudi Arabia as a purgative, anthelmintic, diuretic, as well as for its capacity to purify the blood (Gurib-Fakim and Schmelzer, 2008). The E. granulate can be used for its strong diuretic properties (Saleem *et al*., 2015). According to Bousselessela *et al*., (2013) and Ahmad *et al*., (2018), pharmacological studies reveal that *E. granulata* extracts exhibit antioxidant, antibacterial, antifungal, diuretic, anti-ulcerative colitis, and spasmolytic activities. Besides that, even at higher doses, *E.granulata* is safe for human consumption (Parvez *et al*., 2015).

***Euphorbia helioscopia* L.**

Morphological characters and distribution

The plant is a smooth annual herb with an upright, robust stem. The leaves are dispersed along the stem and range in size from a half to four inches long, with a fine saw-edged margin and a short stalk. It is present in Europe, North Africa, Asia, and is a widespread weedy species in Saudi Arabia **(**Chaudhary, 2001).

Phytochemical characters

Different studies were done to determine the secondary metabolites profile of the plant. Durrani *et al*., (1967) and Zhang and Guo (2006) isolated the di/tri-terpenoids, flavonoids, tannins and lipids from this species. Saleem *et al*., (2014) evaluated the crude powder of this plant and analyzed total lipids, proteins, and carbohydrates and discovered that the pulverised stem and leaves had the highest concentrations of lipids, proteins, and carbohydrates. Moreover, he analyzed glycosaponins, alkaloids, flavonoids and polyphenolics in this plant.

Medical importance

The *Euphorbia helioscopia* has great medicinal importance and since it is widely distributed it was used in medicinal propose in different places (Qureshi *et al*., 2007). In addition, pus is released using milky juice from the young stems and leaves (Ahmed *et al*., 2006). Its milky juice has been used as a diuretic and an antiscorbutic in Jordan (Al Quran, 2009). As a traditional remedy in China, *E. helioscopia* has been used to treat osteomyelitis, bacillary dysentery, and malaria (Lu *et al*., 2008). The entire plant is used for the treatment of ascites, oedema, pulmonary TB, tinea, and cervical tuberculous lymphedema (Feng *et al*., 2009, 2010). The roots of the plant are used as an anthelmintic, the seeds are combined with roasted pepper to treat cholera, and the oil from the seeds has purgative qualities (Uzair *et al*., 2009). Additionally, some studies have been done to determine different pharmacological activities of this plant as; molluscicidal (Najia *et al*., 2000), anti-allergic and anti-asthmatic (Park *et al*., 2001), insulin secretagogue (Hussain *et al*., 2004), cytotoxic (Zhang *et al*., 2006), antiviral (Ramezani *et al*., 2008), antibacterial (Ramezani *et al*., 2008; Uzair *et al*., 2009; Farhat *et al*., 2011), antifungal (Uzair *et al*., 2009; Farhat *et al*., 2011), anticancer and or antitumor (Wang *et al*., 2012).

***Euphorbia peplus* L.**

Morphological characters

This plant is characterized by an erect, glabrous herb, 15-30 cm tall, simple or several-branched from the base. Leaves exstipulate, cauline leaves alternate, petiolate, 1-2 x 0.4-1 cm, obovate to elliptic-obovate or somewhat sub-orbicular, entire, obtuse, cuneate at base. Cymes terminal and axillary, 3-rayed pseudoumbels, rays repeatedly bifurcated in the terminal cymes; pseudoumbel-leaves in cluster of 3, almost similar to cauline leaves; ray-leaves opposite, progressively smaller distally, usually ovate-deltoid. Cyathia shortly pedunculate, glands lunate, with 2, yellowish, subulate horns longer than the width of the gland. Capsule 1.5-2 mm long, 3-lobed, smooth, each lobed slightly 2 winged. Seeds ovoid, hexagonous, c. 1-1.5 mm long, with a longitudinal groove on each of the inner side, and 2-3 rounded or slightly elongated pits in each of the 2 dorsal and 2 lateral sides, caruncle conical, depressed, oblique, Chaudhary, (2001). It is native to Europe and North Africa (Zhi-Qin *et al*., 2010) and widespread common weed in Saudi Arabia (Chaudhary, 2001).

Phytochemical characters

Some studies were done on the *E. peplus* to determine its active compounds. According to certain studies, the less polar fractions of the latex of *E. peplus* contained nonpolar triterpenoids such as lanosterol, cycloartenol, 24-methylenecycloartanol, acyclic triterpene peplusol, and a diterpenoid called 20-deoxyingenol 3-angelate (Giner *et al*., 2000).The diterpene esters had been determined by Ramsay *et al*., (2011). Many studies show that *E. peplus* (petty spurge) contains different secondary metabolites like sterols (β-sitosterol (0.1%), campesterol, stigmasterol and cholesterol), triterpenes (pentacyclic and saponin), tannins, flavonols and diterpenes (Rizk *et al*., 1980; Hohmanna *et al*., 1999; Ali *et al*., 2012; Frezza *et al*., 2018).

Medical importance

It is generally recognised that the Euphorbia peplus species has several therapeutic qualities. It is employed to reduce blood pressure (Mossa *et al*., 1987). Additionally, it functions as an antibiotic, cytotoxic, antipyretic, antiasthmatic, antitussive, anticancer, and anti-inflammatory drug (Al-Okbi, *et al*., 2002; Ramsay *et al*., 2011; Ahamed *et al*., 2013). Human nonmelanoma skin malignancies can be treated with the

sap from *E. peplus* (Ramsay *et al*., 2011). Numerous non-polar secondary metabolites produced by the *E. peplus* plant can be exploited as drug leads to treat leishmaniasis (Amin *et al.*, 2017). It also signalled the possible use of plant latex compounds as novel all-natural insecticides and fungicides. The plant had a defence role of its latex-specialized metabolites against insect herbivores and diseases (Hua *et al.*, 2017).

***Euphorbia retusa* Forssk.**

Morphological characters

The plant is 10-60 cm tall, erect, annual, branched from the base, glabrous, glaucous, and has reddish branches. Sessile, exstipulate, and bluish-green leaves. Cymes forked; pseudo umbels 3(5)-rayed; cyathia pedicellate, glands 2-4, entire or weakly 2-horned; bracts fringed 5-6 mm long ovoid capsule with three obscurely lobed lobes. Smooth, ovoid seeds. It is distributed in N. Africa, Palestine, Arabia, and the plant is popular in Saudi Arabia **(**Chaudhary, 2001).

Phytochemical characters

Some scientific work on *Euphorbia retusa* has reported that the plant contains many compounds such as flavonols and glycosides (Salah, 1985); diterpenoids, triterpenoids and fatty acids (Haba *et al*., 2009).; carotenoids, fatty alcohol chains, triterpenes, essential fatty acids and numerous diverse oxygenated hydrocarbons (Shaaban *et al*., 2018). Seven known phenolic compounds were successfully isolated and later identified by chromatographic and spectroscopic analysis from the aqueous methanolic extract of *Euphorbia retusa* forssk. aerial parts: kaempferol-3-O-D-glucopyranoside (1), quercetin -3-O-D-glucopyranoside (2), 3,3'-dimethoxy ellagic acid (3), ellagic acid (4), (Ghareeb *et al.*, 2018). The maximum phenolic and flavonoid content is found in *E. retusa* capsules (Lahmadi *et al*., 2019). The aerial parts extract from *E. retusa* was subjected to phytochemical analysis, which resulted in the identification of 21 secondary metabolites, the majority of which are polyphenol derivatives, and the isolation of four secondary metabolites (Elgamal *et al*., 2021).

Medical importance

Euphorbia retusa has traditionally been used to treat warts, trichiasis, and venomous bites (Bellakhdar, 1997; Sdayria *et al*., 2018). It is used as a local herbal medicine in Saudi Arabia, as well as an anti-asthmatic, anti-cough, and expectorant (Abdallah, 2014).

Furthermore, the plant demonstrated antioxidant, antinociceptive, and anti-inflammatory activities in vitro and in vivo, according to Sdayria *et al*., (2018), which makes it a potent cure for inflammation and pain. Additionally, the importance of *E. retusa* as a source of diverse bioactive molecules contributed to the treatment of some contagious diseases; it exhibits antibacterial activity (Shaaban *et al*., 2018), and hepatoprotective activity (Ghareeb *et al*., 2018), and other biologically active properties. Due to its significant inhibitory activity against the enzymes collagenase, elastase, hyaluronidase, and tyrosinase, the *E. retusa* extract may be a contender for further investigation as a treatment for postponing and combating skin ageing and its accompanying symptoms (Elgamal *et al*., 2021).

Euphorbia hirta L.,

Morphological characters

The plant is identified by its annual, prostrate, or decumbent, mildly branched, hispid herb with segments 10-30 (60) cm long and pale yellow, multi-cellular hairs that are tightly packed at the nodes. Stipules and petioles are subulate stipules are the morphology of leaves. Cyathia grows in dense, pedunculate, axillary clusters with pinkish, rounded glands and bracteate bracts. Styles are bifid almost to the bottom. Capsule with three acute lobes, spiky on the outside and smooth on the inside. Ovoid, 4-angular, dull-pinkish, and ecarunculate seeds. The plant is native to Mexico and tropical America, however, it is now found in both regions and is a common weed in Saudi Arabia (Chaudhary, 2001).

Phytochemical characters

This plant contains a variety of phytochemicals, including flavonoids, polyphenols, tannins, triterpenes, phytosterols, and alkaloids (Basyal *et al*., 2021). Other components include caffeic acid, benzoic acid, epicatechin 3-gallate acid, quercetin, kaempferol, rutin, myricitrin, -sitosterol, -amyrin, euphorbin-A, euphorbin-B, euphorbianin, euphorbin-C, euphorbin-D, gamma-tocopherol, leucocyan (Ali *et al*., 2021).(Terpenoids, essential oils, and their derivatives have moreover been discovered. As minor secondary metabolites, saponins and amino acids have moreover been detected (Hazra *et al*., 2009). Many flavonoids, including quercetin, quercitrin, quercetin, and derivatives, have now been recognized in *E. hirta* (Tran *et al*., 2020). Several more phytoconstituent substances, including saponin, sterol, terpene, alkaloids, polyphenols, tannins, terpenoids, steroids, and flavonoids, have been discovered in this plant's aerial parts (Abu Bakar *et al*., 2020).

Medical importance:

Traditional uses of *Euphorbia hirta* provide the treatment of hypertension, oedema, diarrhoea, fatigue, vomiting, intestinal worms, heartburn, as well as duodenal ulcers (Ali *et al*., 2021). Besides that, traditional medicine experts have widely used the blending of the plant to treat several conditions such as asthma, kidney stones, coughs, and menstrual problems (Abu Bakar *et al*., 2020). Furthermore, the extract of the entire plant has been used to treat esoenteritis and diarrhoea in pigs, cattle, horses, sheep, and fish (Ghosh, *et al.*, 2019).

Furthermore, research has revealed that the plant has galactogenic, antimicrobial, antioxidant, antidiarrheic, antihypertensive, anticancer, antimalarial, repellent, and antifeedant properties Basyal *et al*., (2021). The antibacterial activity of *E. hirta* has been observed and demonstrated using a variety of extracts against *Shigella* species, *Escherichia coli*, Staphylococcus aureus, Pseudomonas aeruginosa, and *Bacillus subtilis*. *E. hirta* aqueous extract also demonstrated antioxidant activity and radical - scavenging ability. Moreover, plant extracts have been shown to have anticancer activity. Many phytopharmacological studies revealed that its bioactive constituents acquired a wide range of pharmacological properties Ghosh, *et al*., (2019). Recent pharmacological studies demonstrated that *E. hirta* and its phytocomponents inhabited a broad spectrum of biological activities, including anti-inflammatory, antifungal, antibacterial, and antidiarrheal properties (Bach *et al*., 2020).

***Jatropha* L.**

Jatropha is a genus of about 175- 200 species of succulent, caudiciform, herbaceous perennials, and woody plants in the Euphorbiaceae family. It has leaves that are simple to palmately arranged (Félix-Silva *et al*., 2014; Kolawole *et al*., 2017). They are monoecious or, on rare occasions, dioecious trees, lactiferous shrubs, or tuber-bearing herbs. Branches can be hairy or glabrous. Leaves are specified as sessile or petiolate, simple, or lobed, and alternate (Chaudhary, 2001). Many species continue to go unnoticed despite having significant phytochemical and biological effects. On the other hand, a small number of Jatropha species have been identified for their potential as pharmacological agents that exhibit antibacterial, antifungal, antioxidant, anti-inflammatory, antidiarrheal, antihypertensive, antidiabetic, anticoagulant, and anticancer properties. For instance, in Africa, Asia, and Latin America, Jatropha species are commonly employed as vermifuges or as ornamental plants in traditional medicine to cure a variety of clinical ailments such as skin inflammation, eye infection, chest pain, stomach ache, and itching. In reality, "Jatropha" is a combination of the Greek terms "jatros" (doctor) and "trophe" (food), which may have something to do with the plant's well-known pharmacological effects. (Singh and Sharma, 2012). Alkaloids, cyclic peptides, terpenes (a monoterpene, sesquiterpene, diterpene, and triterpene), flavonoids, lignans, coumarins, coumarin-lignoids, non-cyanogenic glucoside, phloroglucinols, ester ferulates, polyphenolic compounds, and fatty acids are among the chemical components of Jatropha that have been isolated (Sabandar *et al*., 2013).

In Saudi Arabia, 2 species are recorded by Migahid (1978) and Chaudhary (2001). Recently, Thomas (2011) recorded 4 species of Jatropha found in the flora of Saudi Arabia, 2 of them are recorded as wild poisonous plants.

***Jatropha curcas* L.**

Morphological characters

The plant seems to have a soft-wooded, glabrous, lactiferous, large shrub or small tree with bulbous stems that grow 2-8 m tall. The bark is soft and smooth, and it is peeling off in transparent scales. Leaves with relatively minor, fugacious stipules; blades extensively ovate or shallowly quinquelobate, 7-18 cm across, cordate; inflorescence extra-axillary, often paired or sub corymbiform; peduncle 2-7 cm long; bracts linear-lanceolate, 5-10 x 2-4 mm. In male flowers calyx lobes elliptic-ovate, 2 x 2 mm; corolla lobes oblong-ovate, 3 x 1.5 mm, hairy within, greenish yellow; stamens 8, 5 outers free, 3 inners connate, c. 3 mm long; disc-glands free, rounded, erect. But female flowers have calyx lobes that are 4-5 mm long and hairy; petals that are elliptic-oblong and 6 x 2.5 mm, free; disc glands that are free, rounded, and erect; staminodes that are 10; and an ovary that is ellipsoid, 3-lobed, glabrous, and 2 x 2 mm. Caruncle minute, seeds oblong-ellipsoid, black with white markings, Notably It is commonly grown as a hedge plant and for therapeutic purposes. Extremely purgative curcas oil is produced by the seeds. It is a new world species that was introduced to the old world early on, where it has been recognized and is found in the southwestern heights of Saudi Arabia (Chaudhary, 2001).

Phytochemical characters

Several phytochemical studies on *J. curcas* outlined the following secondary metabolites in the different parts of the plant: tannins, alkaloids, sterols, glycosides and saponins (Arekemase *et al*., 2011; Olabinri *et al*., 2014), vanillic acid, acetic acid and oleic acid (Namuli *et al*., 2011), cardiac glycosides (ÇiFtçi andAydin, 2018), coumarin and phenolic compounds (Rahu *et al*., 2021).

Medical importance

The use of *Jatropha curcas* in the treatment of many diseases has been significant. A decoction of the root is used to cure sexually transmitted diseases, while a preparation of the leaves is used as an antiseptic during childbirth (Joubert *et al*., 1999; Gubitz *et al*., 1984). According to Mossa *et al*., (2000), the leaf juice is applied to wounds, eczema, and scabies. In Mali and Madagascar, decoctions made from the leaves are used to treat malaria (Mkamilo and Van der Vossen (2007). According to Sabandar *et al*., (2013), J. curcas leaf extract was used to treat solid tumours. *J. curcas* seed oil has a variety of benefits, including treating rheumatism, various skin illnesses, and intestinal parasites (Van der Vossen and Mkamilo, 2007), as well as stimulating hair growth in Indonesia (Thomas *et al*., 2008). Plant latex is well-known for its potential to heal skin issues or its capacity to thin the blood. It possesses anticoagulant and anticoagulant qualities, and is used to treat infected wounds, ulcers, eczema, and dermatophytes (Osoniyi and Onajobi, 2003). Mujumdar and Misar (2004) have employed the substance

separated from the leaves and roots as an anti-inflammatory. The herb also has antibacterial and antifungal properties, according to Rahu *et al*., (2011) and Namuli *et al*., (2021).

***Jatropha glauca* Vahl** =Croton lobatum sensu Forssk. (1775) no L., (1753); Jatropha lobate (Forssk) Muell. Arg. (1862) nom. Illeg.

Morphological Characters

Monoecious, sparsely branched shrublet with thick-based stem and glabrous, smooth, pale bark; 15-40 cm tall, occasionally reaching 1 m. leaves are dull-brown, 4-6, persistent, subulate, 6-10 mm long, and gland-tipped; petioles are 1-7 cm long; blades are deeply 3-5-lobed, lobes coarsely irregularly serrate, central lobe oblanceolate, 2-8 x 1-4 cm, glabrous, and the laterals are smaller. It is found in Africa (Djibouti, Ethiopia, and Sudan), Yemen, and Saudi Arabia's southwestern region (Chaudhary, 2001).

Phytochemical Characters:

No data were found.

Medical importance: The traditional medicines use the plant of *J. glauca* to treat chronic skin diseases (Mossa *et al*., 2000). Moreover, the plant can be used for the treatment of certain antibacterial and antifungal diseases (Alam *et al*., 2018).

Ricinus

A large, monoecious, glabrous, annual, or perennial shrub or arborescent shrub. Leaves have glandular petioles and caducous stipules; blades are peltate, alternate, palmately 7-lobed, and serrate. The inflorescence is leaf-opposed or subterminal, with staminate flowers in the lower half and pistillate flowers in the upper half, or all pistillate flowers. Carunculate compressed-ovoid or oblong seeds. Originating primarily in the East, Northeast, and Middle East, but naturalized in the warmer regions of both Worlds Chaudhary, (2001).

R. communis is the only species in its genus and has 22 subspecies, variations, and a few cultivars created by plant breeders and ornamental horticulturists O'Connell *et al*., (2006). R. communis has many uses in daily life for people; the oil from the seeds is used to varnish clothes and armor, and castor oil is used to make a variety of products such wax, polish, colored chalks, candles, and carbon paper Jombo and Enenebeaku (2007). Its use has been confidently made to cure a variety of illnesses, including convulsions, arthritis, asthma, boils, burns, cancer, carbuncles, catarrh, cholera, colds, and craw (an itch-causing skin disease) (2007).

Its use has been confidently made to cure a variety of illnesses, including convulsions, arthritis, asthma, boils, burns, cancer, carbuncles, catarrh, cholera, colds, and craw (an itch-causing skin disease). A great amount of work has been reported regarding the pharmacological, phytochemical, toxicological and to some extent biological activities of *R. communis* for example, Visen *et al*., (1992), Okwuasaba *et al*., (1997), Leonardo *et al*., (2001), Sandhyakumary *et al*., (2003), Upasani *et al*., (2003). Ilavarasan *et al*., (2006), Ogunniyi, (2006), Zhang *et al*., (2007), Jombo and Enenebeaku (2008), Shokeen *et al*., (2008), Garcia *et al*., (2009), Ramos-López *et al*., (2010), Salimon *et al*., (2010) and Islam *et al.*, (2010). Other studies such as Ross (2001, 2003), Singh *et al*., (2009, 2015) studied the phytochemical and medical importance.

Ricinus communis L.

Morphological characters and distribution

A large shrub or tree-like plant that grows to be 3-8 m tall, with a hollow stem and pruinose young branches. Stipules connate, forming on ovate, up to 2 cm long sheath, caducous, leaving a circular scar on 5-20 cm long petiole. Seeds seems to be greyish, speckled brown, 7-15 x 4-8 mm, shiny. The plant is widely cultivated and escaping all over the world and is even found around habitations in Saudi Arabia (Chaudhary, 2001).

Phytochemical characters

R. communis, also known as castor beans, contains 40 to 60 percent oil that is rich in fatty acid triglycerides, primarily the component known as ricinolein, and a poison known as ricin, which is also found in higher concentrations throughout the plant. Alkaloids, steroids, tannins, phenol compounds, flavonoids resins, fatty acids, and gums are just a few examples of the secondary metabolites that make up the majority of the plant's hazardous organic components. All of these molecules have distinct physiological effects on the body (Pandhure, 2014; Kumar, 2017). Two alkaloids and six flavones were visible in the dried leaves. The main phenolic components identified from the leaves are monoterpenoids, asesquiterpenoids, gallic acid, quercetin, gentisic acid, rutin, epicatechin, and ellagic acid (Kumar, 2017). Ricinoleic acid, oleic acid, linoleic acid, stearic acid, palmitic acid, ecosanoic acid, dihydroxystearic acid, and other substances are present in the seed oil (Aziz *et al.*, 2016). Additionally, *R. communis* includes bioactive phytoconstituents like ricin, kaempferol-3-O, ingenol, triterpenoids, quercetin, and gallic acid, as well as thujone, camphor, and beta thujone (Abdul *et al*., 2018). Carotenoids, phenolics, phospholipids, phytochemicals, phytosterols, tocopherols, and tocotrienols are a few additional minor biologically active substances that can be found in the oil (Yeboah *et al*., 2020).

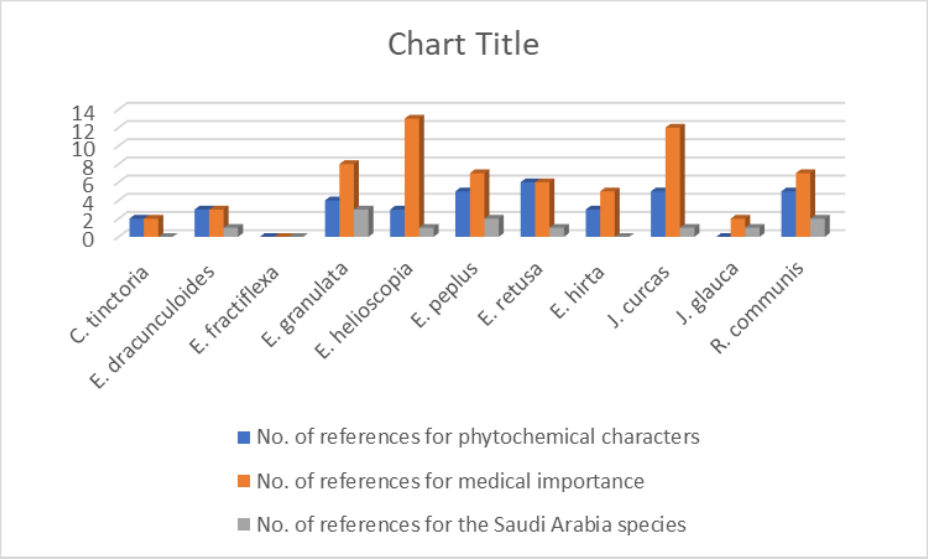
Medical importance

The plant used for the treatment of scrofulous sores, boils, and rheumatic swellings (Mossa *et al*., 1987). R. communis is capable of performing a wide range of biological actions, such as abortifacient, acid

phosphatase inhibition, acid phosphatase stimulation, agglutination, alkaline phosphatase inhibition, anticonvulsant, free radical scavenging, hepatoprotective, and insecticidal and repulsive actions (Marwat *et al*., 2017); a nti-fertility, laxative, anti-implantation, anti-asthmatic, bone regeneration, molluscicidal, antiulcer, antihistamine, wound-healing, antifungal, anticancer, antidiabetic, antiinflammatory, antimalarial, antioxidant, central analgesic, anticonvulsant, antinociceptive, and anthelminthic activities (Abdul *et al*., 2018; Pandhure, 2014). Moreover, the plant is used to treat hepatitis, skin cancer, and breast cancer Abbas *et al*., (2018). Oils of *R. communis* have been linked to antimicrobial, anti-cancer, and cell-reinforcement properties Aziz *et al*., (2016) and Shobha *et al*., (2019).

Table 1: The No. of references for phytochemical and medical importance for 11 species of Euphorbiaceae wild poisonous plant

Species	No. of references for phytochemical characters	No. of references for medical importance	No. of references for the Saudi Arabia species
Chrozophora tinctoria	2	2	0
Euphorbia dracunculoides	3	3	1
Euphorbia fractiflexa	0	0	0
Euphorbia granulata	4	8	3
Euphorbia helioscopia	3	13	1
Euphorbia peplus	5	7	2
Euphorbia retusa	6	6	1
Euphorbia hirta	3	5	0
Jatropha curcas	5	12	1
Jatropha glauca	0	2	1
Ricinus communis	5	7	2



CONCLUSION AND RECOMMENDATIONS

As a result of the numerous human-necessary metabolites found in poisonous plants, including carbohydrates, proteins, flavonoids, phenolic compounds, tannins, alkaloids, glycosides, sterols, saponins, and sterols, some poisonous plants have medicinal value as antioxidants, antimicrobials, antifungals, cancer fighters, diabetes treaters, and anti-inflammatory agents.

In this study, morphological, phytochemical characters and medicinal importance were collected for 11 species of Euphorbiaceae wild plants growing in Saudi Arabia. Some species have a lot of studies in phytochemistry and medicinal characters, but others need further research to find their important chemical contents and their medicinal value. For the species growing in Saudi Arabia, all studied species need further study except for *Euphorbia granulata* and *Ricinus communis*.

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