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A REVIEW ARTICLE

CUTANEOUS ADVERSE REACTIONS TO HERBAL MEDICINES

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ABSTRACT

The use of medicinal plants is as old as human history. The adoption of plants in the prevention and treatment of diseases has maintained its position in various societies and cultures. Many people believe using medicinal herbs is not detrimental if there is no benefit.

In recent years, due to the tendency of people to increase the consumption of medicinal plants, extensive research has been carried out in the pharmaceuticals on the use of medicinal plants and their properties for the treatment of diseases.

Skin diseases are among the most common diseases in the world. Some of the most common skin disease symptoms are skin rashes, itchy skin, prominent bumps, peeling, blisters or sores, discoloration, etc. Since the skin plays a vital role as the first defense barrier of the body, skin diseases can cause dangerous problems for all age groups, from infants to the elderly.

Therefore, investigating the possible adverse effects of medicinal plants on the structure and function of the skin is of particular importance. Plants can cause side effects or reduce other pharmaceutical medication effects when improperly used.

According to studies, adverse skin responses to herbal medications can be caused by dermal contact or prolonged exposure to medicinal herbs. These reactions are also linked to several risk factors, such as adverse effects, dose, health state, and interactions.

This article reviews the findings and data available in articles published between 1953 and October 2022 on the skin side effects of medicinal plants in various databases, including Google Scholar, PubMed, and Scientific Information Database.

KEYWORDS: *adverse effect, allergic skin responses, side effect, medicinal herb.*

INTRODUCTION

Throughout history, people have searched for medicines to treat various diseases and improve general health [*Gavanji S et al., 2015; Akhtar M, 2022*]. Herbal medicine has historically had a significant impact on human health. Their therapeutic effects have been able to treat a wide range of psychological to physical illnesses and promote general health and well-being [*Gavanji S, Larki B, 2017; Sarris J, 2018*]. Herbs are used in the therapeutic process majority and daily food preparation in modern society. Moreover, over 25% of current modern pharmaceuticals are made from natural resources [*Anand U et al., 2019; Gavanji S et al., 2014; Zhang*

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J et al., 2015]. An issue of concern to health authorities in various societies is the side effects of self-medication with herbal medicines, as many people believe that herbal medicines have few side effects [*Abdelmola A et al., 2021; Okaiyeto K, Oguntibeju O, 2021*].

According to estimates, about 70 to 80 percent of the world's population needs (wholly or in part) plant-based medications for their primary medical treatment [*Ernst E, 2003*]. Self-medication is related to several factors, such as accessibility, deceptive advertising, and incorrect and unfounded beliefs [*Ekor M, 2014; Faerber A, Kreling D, 2014*].

Some people have the misconception that using herbal remedies for self-medication is a cost-effective treatment option for curing various diseases. Nevertheless, it can impose a significant financial burden and delay seeking and receiving appropriate medical care [*Akhtar M, 2022*]. Patients remain to face the potential for dangerous disease and misdiagnosis [*Ruiz M, 2010*]. One of the main risks associated with the potentially toxic effects of self-treatment is the prescription of medicinal herbs by unqualified practitioners without proper medical training in traditional medicine and clinical practice, which can cause serious harm to the body. On the other hand, improper use of herbal remedies can raise a variety of undesirable consequences and alter the efficacy of more widely used pharmaceuticals, leading to a variety of unanticipated unpleasant and dangerous outcomes [*Hu Z et al., 2005; Ruiz M, 2010; Fatima N, Nayeem N, 2016*]. Self-medication with herbal medicines can have negative dermatological consequences, from minor to severe [*Akhtar M, 2022*].

To overcome it is possible, due to the uniting the knowledge and will of all doctors in the world

Skin disorders such as skin irritations, allergies, and rashes that can be caused by exposure to toxic plants, chemicals, or other environmental elements are referred to as dermatotoxic conditions [*Matsumoto K, Saida T, 2008; Ernst E, 2000; Anderson S, Meade B, 2014*]. Herbs used improperly can have various negative consequences, including allergic contact dermatitis, irritant contact dermatitis and allergic skin responses [*Gavanji S et al., 2014; Zhang J et al., 2015*]. Some of these disorders need medical attention and hospitalization [*Gavanji S, Larki B, 2017; Anand U et al., 2019; Akhtar M, 2022*].

Various studies have shown that cutaneous adverse responses to herbal remedies can result from dermal contact with toxic plants or from prolonged exposure that is not immediate and linked to several risk variables, including harmful effects, dose, health condition, and interactions. This review article renders correlated information about the cutaneous adverse reactions to herbal medicines.

MATERIAL AND METHODS

All reports on skin responses and skin toxicological risks associated with herbal medicines were collected for this overview from relevant articles published between 1953 and October 2022 in various databases, including Google Scholar, PubMed, and Scientific Information Database. Searches using the numerous combinations of keywords were skin toxicity, side effects, herbal medicines, and toxicology. Search includes title, abstract, keywords, and full text. In this article, selected documents and books have been used according to specific details to present the potential adverse effects of herbal medicine, which induce skin toxicity.

RESULTS

Asteraceae: The *Asteraceae*, or sunflower family, which has a long history in traditional Chinese medicine and comprises hundreds of plants, is crucial in treating ailments. Studies have shown that 20 members of the *Asteraceae* family can be harmful to the skin. Skin sensitivity can be caused by three different Artemisia species, including *A. annua, A. vulgaris*, and *A. afra*. According to a study, 50 patients who had been exposed to *A. annua* extract had a positive reaction and allergic rhinitis [*Ma R et al., 2000*]. A case report study stated that a patch test of mugwort or *A. vulgaris* extract induced allergic contact dermatitis [*Haw S et al., 2010*]. *A. afra* causes irritant contact dermatitis [*Otang W et al., 2014*]. *Arnica montana*, a different plant from the *Asteraceae* family, has been used by homeopaths to treat various diseases [*Stevinson C et al., 2003*]. *A. montana* has been linked to dermatitis in studies by

Rudzk E. and Grzywa Z. (1977) and Hausen B. (1980). Self-treatment with *A. montana* has also been identified with sensitization and contact dermatitis [*Hausen B, 1980*]. Indians of central Mexico have long used *Dahlia pinnata*, a species of the sunflower family commonly known as the garden dahlia, for medicinal purposes. It is widely cultivated throughout the world [*Whitley G, 1985*]. According to a study in 1990, the flower and leaves of *D. pinnata* can cause contact dermatitis [*Sharma S, Kaur S, 1990*]. *Cichorium endivia* (*C. endivia*) and *Cichorium intybus* (C. intybus) are two important species of the *Asteraceae* family. *C. endivia* is used in folk medicine to treat liver diseases [*Chen C et al., 2011*]. *C. intybus* is a medicinal plant with a long history in traditional medicine and has been widely used for centuries to treat various ailments [*Street R et al., 2013*]. According to research, *C. endivia* can cause severe chronic dermatitis and vesicular, intense itching [*Krook G, 1977*]. People who work on farms and have a direct touch with *C. endivia* may get contact dermatitis, according to Malten K. (1983). Humans are susceptible to severe allergic responses from several plants. One of the most common herbs, *C. intybus*, may occasionally lead to occupational contact sensitization [*Paulsen E, 2017*].

The sunflower family also contains the medicinal plant *Cynara scolymus (C. scolymus)*, which has anti-inflammatory, anti-hyperglycemic, and antioxidant properties [*Ben Salem M et al., 2017*]. According to a finding of the study, long-term direct contact with plants can cause contact dermatitis in individuals who handle food and sell vegetables. This study showed that a 44-year-old man who sold vegetables was exposed to *C. scolymus* and developed contact dermatitis [*Meding B, 1983*]. In order to prevent skin allergies, it is necessary to wear gloves in jobs that may cause occupational dermatitis. *Lactuca sativa*, a member of the *Asteraceae* family, is one of the most widely consumed and significant vegetables. Based on a study, L. sativa can cause occupational dermatitis and intense itching [*Krook G, 1977*]. *Chamomilla recutita* (*C. recutita*), chamomile, is a medicinal plant of the *Asteraceae* family, which is used as a traditional and favorable drink to treat various diseases. A case report research showed that *C. recutita* (chamomile tea) when consumed and exposed to the vapor of hot teas, caused airborne contact dermatitis in a 75-year-old woman [*Anzai A et al., 2015*]. Another ornamental plant from the *Asteraceae* family that has historically been used to treat viral infections is *chrysanthemum morifolium* (*C. morifolium*) [*Youssef F et al., 2020; Liu X et al., 2022*]. Researchers have reported that exposure to *C. morifolium* may induce contact dermatitis [*Sharma S et al., 1989*]. A research study stated that a 60-year-old woman who worked as a farmer in the garden had suffered a strong reaction and eczema because of contact with *C. morifolium* flowers [*Aberer W, Jarisch R, 1987*]. Two other medicinal plants with various medicinal properties which belong to the *Asteraceae* family are *Tagetes minuta* (*T. minuta*) and *Tagetes indica* (*T. indica*) (Table). Based on a study, the extract of *T. minuta* can induce sensitization and contact dermatitis [*Verhagen A, Nyaga J, 1974*]. Moreover, research dating 1989 showed that *T. indica* airborne contact dermatitis [*Sharma S, Kaur S, 1989*]. As a result, it is crucial to use caution and only under a doctor's supervision when consuming natural products and medicinal plants. *Dittrichia viscosa (D. viscosa)*, which has been used to treat wounds, is a valuable plant in cure wounds [*Mssillou I et al., 2022*]. Fresh leaves of the *D. viscosa* induced contact dermatitis, according to Gonçalo and Gonçalo [*Gonçalo M, Gonçalo S, 1991*]. *Inula helenium* (*I. helenium*) is a different *Asteraceae*-family medicinal plant that has long been used to treat respiratory and infectious diseases, as well as diarrhea [*Buza V et al., 2022*]. The findings of a study suggested that liniment of *I. helenium* extract could lead to contact dermatitis [*Pazzaglia M et al., 1995*]. The *Asteraceae* plant *Helenium autumnal (H. autumnale)*, sometimes known as sneezeweed, is another species having antibacterial capabilities [*Mukku V et al., 2013*]. Guin J. (1987) demonstrated that *H. autumnale* might induce dermatitis. *Parthenium hysterophorus* (*P. hysterophorus*) is a plant of the *Asteraceae* family, which has been used in folk medicine to treat skin infections in central America and the Caribbean [*Kaur L et al., 2021*]. Based on a study, *P. hysterophorus* can cause airborne contact dermatitis in 78 percent of patients [*Sharma S, Kaur S, 1989*]. One of the popular plants within Europe and other countries with anti-inflammatory and antimicrobial properties is *Solidago virgaurea*

TABLE 1.

Cutaneous adverse reactions (SCAR) to herbal medicines

Plant name	Family	Potential therapeutic application (Traditional medicine)	Type of adverse effect	References
Anacardium occidentale	Anacardiaceae	Antihypertensive, therapeutic effect on the eyes and skin	Itching, fissuring and exudative lesions	[*Pasricha J et al., 1988*]
Apium graveolens	Brassicaceae	Prevention of cardiovascular disease, antimicrobial effect	Acute irritant contact dermatitis	[*Ermertcan AT et al., 2007*]
Artemisia annua	Asteraceae	Malaria treatment	Allergic rhinitis	[*Tang R et al., 2015*]
Artemisia vulgaris	Asteraceae	Antioxidant, anti-inflammatory, anticancer, and antimicrobial properties	Allergic contact dermatitis	[*Haw S et al., 2010*]
Artemisia afra	Asteraceae	Treat various disorders including coughs, colds, influenza, and malaria	Allergic contact dermatitis	[*Otang WM et al., 2014; Du Toit A, Van der Kooy F, 2019*]
Arnica montana	Asteraceae	Treat of bruises, sprains, muscle aches, wound, superficial phlebitis	Dermatitis	[*Rudzki E, Grzywa Z, 1977; Hausen B, 1980*]
Allium sativum	Amaryllidaceae	Treat of cancer, blood pressure, atherosclerosis, and hyperlipidemia	Allergic contact dermatitis	[*Otang WM et al., 2014*]
Alstroemeria	Alstroemeriaceae	No medicinal uses listed	Contact dermatitis	[*Rycroft R, Calnan C, 1981; Santucci B et al., 1985; Marks JG, 1988*]
Aloe vera	Xanthorrhoeaceae	Immunomodulatory, wound and burn healing, anticancer, gastro-protective	Severe prolonged allergic dermatitis	[*Hunter D, Frumkin A, 1991*]
Brassica oleracea	Brassicaceae	Cancer treatment	Allergic contact dermatitis	[*Hermanides H et al., 2006; Palacín A et al., 2006*]
Cichorium endivia	Asteraceae	Treat of bilious complaints	Contact dermatitis	[*Krook G, 1977; Malten K, 1983*]
Cichorium intybus	Asteraceae	Treat of various ailments ranging from wounds to diabetes	Allergic reaction	[*Paulsen E, 2017*]
Citrus limon	Rutaceae	Treat of sore throats, fevers, rheumatism, high blood pressure, chest pain	Contact dermatitis	[*Cardullo AC et al., 1989; Alessandrello C et al., 2021*]
Cynara scolymus	Asteraceae	Treat of stomach tonic, cholagogue, fever, liver disorders	Allergic contact dermatitis	[*Meding B, 1983*]
Chamomilla recutita	Asteraceae	Anti-inflammatory effects	Contact dermatitis	[*Anzai A et al., 2015*]
Chrysanthemum morifolium	Asteraceae	Antiinflammatory, antipyretic, sedative, antiarthritic, and antihypertensive	Contact dermatitis	[*Aberer W, Jarisch R, 1987; Sharma S et al., 1989*]
Daucus carota	Apiaceae	Treat wound, cardiovascular disorders, antispasmodic activity	Allergic contact dermatitis	[*Kawai M et al., 2014*]
Dittrichia viscosa	Asteraceae	Cancer treatment	Allergic contact dermatitis	[*Gonçalo M, Gonçalo S, 1991*]
Dahlia pinnata	Asteraceae	Treat epilepsy, skin problems such as rashes, cracks and soothe tired feet	Contact dermatitis	[*Sharma S, Kaur S, 1990*]
Eriodictyon parryi	Namaceae	Neuroprotective activity and treatment of Alzheimer's disease (AD)	Contact dermatitis	[*Czaplicki CD, 2013*]
Eucalyptus pulverulenta	Myrtaceae	Reduce symptoms of coughs, colds, and congestion	Contact dermatitis	[*Gyldenløve M et al., 2014; Higgins C et al., 2015; Paulsen E et al., 2018; Hashimoto T, Yokozeki H, 2019*]

TABLE 1.

Cutaneous adverse reactions (SCAR) to herbal medicines

Plant name	Family	Potential therapeutic application (Traditional medicine)	Type of adverse effect	References
Frullania dilatata	Jubulaceae	Antiseptic	Contact dermatitis	[*Quirce S et al., 1994*]
Frullania tamarisci	Jubulaceae	Antiseptic	Contact dermatitis	[*Quirce S et al., 1994*]
Ginkgo biloba	Ginkgoaceae	Treat of asthma and other respiratory problems; infectious diseases	Contact dermatitis	[*Lepoittevin J-P et al., 1989; Castelli D et al., 1998*]
Grevillea robusta	Proteacea	Treat sore throats, earache, chest problems	Contact dermatitis	[*Tully J, Woodruff CM, 2022*]
Grevillea banskii	Proteacea	No medicinal uses listed	Contact dermatitis	[*Lothian N, 1989*]
Grevillea hookeriana	Proteacea	Antimicrobial activity	Contact dermatitis	[*Lothian N, 1989*]
Helenium autumnale	Asteraceae	Antipyretic	Contact dermatitis	[*Guin JD, 1987; Foster S, Duke JA, 2000*]
Hevea brasiliensis	Euphorbiaceae	Antimicrobial activity	Itching and dermatitis	[*Pumphrey R, 1994*]
Inula helenium	Asteraceae	Treat of respiratory, digestive problems	Contact dermatitis	[*Pazzaglia M et al., 1995*]
Juglans regia	Lamiaceae	Treat of helminthiasis, diarrhea, sinusitis, stomachache, arthritis, asthma	Irritant contact dermatitis	[*Corazza M et al., 2019*]
Lactuca sativa	Asteraceae	Treat of pain, inflammation, stomach problems	Contact dermatitis	[*Krook G, 1977*]
Laurus nobilis	Lauraceae	Treat of digestive disease	Allergic contact dermatitis	[*Paulsen E, 2017*]
Mangifera indica	Anacardiaceae	Antiseptic, astringent, diaphoretic, stomachic, vermifuge, tonic, laxative	Allergic reaction, skin irritation	[*Oka K et al., 2004*]
Parthenium hysterophorus	Asteraceae	Treat of skin infections, dermatitis, amoebic dysentery	Contact dermatitis	[*Sharma S, Kaur S, 1989*]
Primula obconica	Primulaceae	Treat of liver disorders	Contact dermatitis	[*Fernandez de Corres L et al., 1987*]
Rosmarinus officinalis	Lamiaceae	Treat of headache, dysmenorrhea, stomachache, epilepsy, rheumatic pain	Contact dermatitis	[*Miroddi M et al., 2014*]
Solidago virgaurea	Asteraceae	Treat of wounds	Contact dermatitis	[*Minciullo PL et al., 2017*]
Smodingium argutum	Anacardiaceae	Antimycobacterial and anti-inflammatory efficacy	Allergic contact dermatitis	[*Heyl T et al., 1987*]
Toxicodendron vernix	Anacardiaceae	No medicinal uses listed	Allergic contact dermatitis	[*Fyfe S et al., 2020*]
Toxicodendron toxicarium	Anacardiaceae	No medicinal uses listed	Allergic contact dermatitis	[*Fyfe S et al., 2020*]
Toxicodendron radicans	Anacardiaceae	No medicinal uses listed	Allergic contact dermatitis	[*Fyfe S et al., 2020*]
Toxicodendron vernicifluum	Anacardiaceae	Antioxidant, anti-inflammatory and anti-cancer activities	Allergic contact dermatitis	[*Fyfe S et al., 2020*]
Tagetes minuta	Asteraceae	Anti-inflammatory activity	Contact dermatitis	[*Verhagen AR, Nyaga JM, 1974*]
Tagetes indica	Asteraceae	Treat of digestive problems	Contact dermatitis	[*Sharma S, Kaur S, 1989*]
Tanacetum parthenium	Asteraceae	Treat of fevers, migraine headaches, rheumatoid arthritis, stomach aches	Contact dermatitis	[*Hashimoto T, Yokozeki H, 2019*]

(S. virgaurea), which has been used to treat kidney disorders [*Fursenco C et al., 2020*]. Minciullo P. and co-authors (2017) demonstrated that *S. virgaurea* could cause contact dermatitis. *Tanacetum parthenium*, also known as feverfew, belongs to the *Asteraceae* family and is used in natural drugs for various diseases treatment. Hashimoto T. and Yokozeki H. (2019) reported that *T. parthenium* could induce contact dermatitis.

Anacardiaceae: The *Anacardiaceae* family of flowering plants exhibits a wide range of pharmacological properties. This family comprises about 700 species [*Montanari R et al., 2012*]. A group of plants belonging to the *Toxicodendron* genus, that four plants of this genus, including *T. vernix*, *T. toxicarium*, *T. radicans*, and *T. vernicifluum*, can induce skin allergies [*Fyfe S et al., 2020; Monroe J, 2020*]. Another important species of the *Anacardiaceae* family is *Anacardium occidentale (A. occidentale)*, that is widely used in traditional medicine to treat inflammatory diseases [*Siracusa R et al., 2020*]. *A. occidentale* caused occupational contact sensitization as a result of working in the nut factory [*Pasricha J et al., 1988*]. *Mangifera indica (M. indica)*, also known as mango, is a popular fruit with a spectrum of medicinal possibilities [*Mirza B et al., 2021*]. *M. indica* has been shown to cause contact dermatitis in sensitive individuals [*Oka K et al., 2004*]. *Smodingium argutum (S. argutum)*, another member of this family, is linked to multiple severe allergic responses. According to Heyl T. and co-authors (1987) *S. argutum* can cause acute allergic contact dermatitis.

Apiaceae: The herbal remedy *Daucus carota (D. carota)*, often known as the wild carrot, is a member of the *Apiaceae* family and has a long history of use in traditional medicine to treat different ailments [*Molkara T et al., 2018*]. A study stated that *D. carota* could induce sensitization and contact dermatitis [*Kawai M et al., 2014*].

Alstroemeriaceae: An ornamental flowering plant known as an *alstroemeria*, also known as a lily, belongs to the *Alstroemeriaceae* family. Numerous studies have shown that Peruvian lily can lead to occupational allergies and contact dermatitis [*Rycroft R, Calnan C, 1981; Santucci B et al., 1985; Marks J, 1988*].

Amaryllidaceae: Garlic, also known as *Allium sativum (A. sativum.*, is a significant medicinal plant that is a member of the *Amaryllidaceae* family and is frequently used to treat coughs, colds, tuberculosis, and a variety of other illnesses. *A. sativum* may be responsible for contact dermatitis, based on a report [*Otang W et al., 2014*].

Brassicaceae: One of the remarkable medicinal plants containing high amounts of phenolic compounds and antioxidants is *Apium graveolens (A. graveolens)*, which belongs to the *Brassicaceae* family. The result of a case report study showed that *A. graveolens* could induce acute irritant contact dermatitis [*Ermertcan A et al., 2007*]. Another plant of this family is *Brassica oleracea* which has been widely used for treating various diseases, including cancer, infectious disease, and diabetes. Several studies have shown that this plant can induce occupational allergens [*Hermanides H et al., 2006; Palacín A et al., 2006*].

Euphorbiaceae: *Hevea brasiliensis*, a member of the *Euphorbiaceae* family and popularly referred to as the rubber plant, is used to make furniture and other products. Pumphrey R. (1994) stated that *Hevea* latex could induce Allergy.

Ginkgoaceae: A plant known as *ginkgo biloba* has long been utilized in traditional medicine to treat various illnesses. According to research, *ginkgo biloba* could lead to allergic contact dermatitis [*Lepoittevin J et al., 1989; Castelli D et al., 1998*].

Jubulaceae: *Frullania dilatata* and *Frullania tamarisci* are two species of the *Jubulaceae* family that can induce allergic reactions and airborne contact dermatitis [*Quirce S et al., 1994*].

Lamiaceae: *Rosmarinus officinalis* (*R. officinalis*) is a valuable species of the *Lamiaceae* family which has been traditionally used in the treatment of hysteria, depression, rheumatic pain, stomachache, headache, and infectious diseases [*Rahbardar M, Hosseinzadeh H, 2020*]. Miroddi M. and colleagues (2014) suggested that *R. officinalis* may cause contact dermatitis. Another plant of the *Lamiaceae* family is *Juglans regia (J. regia)*, which has various therapeutic effects on different diseases. A research study stated that extract *of J. regia* leaves induces contact dermatitis [*Corazza M et al., 2019*].

Lauraceae: *Laurus nobilis (L. nobilis)*, a member of the *Lauraceae* family of ornamental plants, has been grown in various countries. Research revealed that *L. nobilis* may be the etiology of contact dermatitis [*Paulsen E, 2017*].

Myrtaceae: A member of the *Myrtaceae* family called *Eucalyptus pulverulenta*, often known as silver-leaved mountain gum, can lead to contact dermatitis [*Gyldenløve M et al., 2014; Higgins C et al., 2015; Paulsen E et al., 2018; Hashimoto T, Yokozeki H, 2019]*.

Namaceae: Poodle-dog bush *Eriodictyon parryi*, which is a member of the *Namaceae* family, can cause contact dermatitis [*Czaplicki C, 2013*].

Primulaceae: *Primula obconica (P. obconica)* is a flowering plant that belongs to the *Primulaceae* family and is frequently grown for decorative purposes. It was shown that *P. obconica* elicited contact dermatitis [*Fernandez de Corres L et al., 1987*].

Proteacea: Three main *Proteacea* species that are proposed as decorative plants are *Grevillea robusta*, *Grevillea banskii*, and *Grevillea hookeriana*. Some investigations have concluded that *Grevillea* species can induce contact dermatitis [*Lothian N, 1989; Tully J, Woodruff C, 2022*].

Rutaceae: Lemon is a member of the *Rutaceae* family and is also known as *citrus limon (C. limon)*. It has long been used to cure numerous illnesses. According to several studies, *C. limon* can cause allergic contact dermatitis [*Cardullo A et al., 1989; Alessandrello C et al., 2021*].

Xanthorrhoeaceae: Aloe vera or *Aloe barbadensis* is an important medicinal plant and a member of the *Xanthorrhoeaceae* family, which has been used in folk medicine to treat various diseases such as malaria, fever, abdominal pains, arthritis, and infectious diseases [*Adams K et al., 2014*]. Hunter D. and Frumkin A. (1991) displayed that Aloe vera gel may induce an adverse reaction on the skin and cause severe prolonged allergic dermatitis.

Conclusion

The use of medicinal plants and herbal products is widespread in the health system of many countries throughout the world. Additionally, one of the biggest threats to the health system is the widespread belief that using medicinal herbs is beneficial and safe because of their naturalness. Several studies suggest that several plants used for therapeutic and medical purposes might seriously harm users or exacerbate existing illnesses. Many plants are contaminated with chemical pesticides, heavy metals, and fungal contaminations during the cultivation and exploitation process. Finally, according to the existence of standard procedures and system requirements in herbal medicine manufacturing companies, it seems necessary to use authentic herbal medicines.

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