Pharmacognosy Reviews, 2023; 17(33):69-103.
Journal Website

Review Article

Medicinal Plants Used in the Management of Skin Disorders in Kenya: A Review

Lucy Wanga, Divinah Kwamboka Nyamboki*

Egerton University, Biashara Kilimo Road, KENYA.

ABSTRACT

Skin health has increasingly become a great aspect in primary health care globally especially with the increasing number of immunocompromised individuals and the worrying increase in antimicrobial resistance. In the low and middle income countries such as Kenya, the conditions are further exacerbated by poor living conditions and inadequate access to proper medical care. Different ethnic communities in Kenya use various plants to manage and alleviate symptoms of skin disorders. This research aimed to critically review the different medically important plants that have been used by different communities over the years to treat skin and soft tissue infections (SSTIs) and fungal infections as a source of alternative medicine. Scientific evaluation of some of the presented medicinal plants have also been summarized in this study. The information presented in this study was obtained from primary and review scientific studies and ethno-botanical books published until the year 2022 from the Google Scholar databases, Science Direct, AJOL, and PubMed. Atleast one hundred and eighteen Kenyan medicinal plant species from fifty families have been recorded for traditional medicinal therapies for various skin disorders. Scientific evidence of the medicinal importance of some of the listed plants have also been reported however, there is no clear scientific report on the toxicity of these medicinal plants. Alternative medicine is widely practiced in rural Kenya, however there is limited scientific knowledge that supports their ethno-botanical importance in the management of skin disorders. Hence substantial further research is recommended on the various medicinal plants listed in this study.

Keywords: Dermatophytosis, Skin infections, Medicnal plants.

Correspondence:
Lucy Wanga
Egerton University, Biashara Kilimo Road
Egerton University, KENYA.
Email id: lucywanga15@gmail.com

Received: 28-09-2022;
Revised: 18-10-2022;
Accepted: 03-11-2022.

INTRODUCTION

Skin disorders is a common occurance among patients of all races and age-groups globally irrespective of the geographical location. However, significantly high number of incidences has been reported from developing countries, among the socio-economically disadvantaged society as well as the rural communities.[1] While these infections may affect everyone, they mostly occur as opportunistic and secondary infections among the immunocompromised individuals.[2,3] Reports indicate that approximately 1.7 billion people globally, reflecting to an estimate of 25% of the total word's population, have been reported to contract at least one fungal infection.[4] While the global burden estimate on the skin and soft-tissue bacterial infections (SSTIs) rate is at 0.04%.[5] Notably, skin disorders form a great disease burden in most Sub-Saharan African countries.[6]

Approximately 40 (Fourty) pathogens have been identified to cause fungal infections in human, however nearly all the reported infections are caused by closely related fungal pathogens or dermatophytes which belong to three genera namely *Trichophyton, Microsporum* and *Epidermophyton* spp. Due to their similarity, infections caused by dermatophytes presents almost similar symptoms in most patients hence fungal infections generally classified depending on the infected site rather than the pathogenic source of the infection.[1,7] Dermatophytes may affect any exterior surface of the body, however conditions such as warm and moist environments may further exacerbate and contribute to increased infections in specific body parts especially those with high rate of perspiration and skin folds. The severity of dermatophytic infections may depend on various factors such as the site of infection, the general health of the host, the rate of co-infections in an individual, immune response of an individual and the infecting dermatophyte species. One or more fungal pathogen may contribute towards the manifestation of an infection, for instance tinea capitis (scalp ringworm infection) is primarily caused by several species of *Microsporum* and *Trichopyton* dermatophytes.[1,8]

DOI: 10.5530/097627870276

The most notorious cause of skin and soft tissue infection is *Staphylococcus aureus* including the methicillin resistant strain (MRSA) is the main cause of cellulitis (the most common SSTI) and necrotizing fasciitis. MRSA has also been termed as the main cause of infection in surgical wounds, hence making a very prominent pathogen in the cause of skin and soft tissue infections (SSTIs).[9] Gram negative bacilli such as *Klebsiella* sp. are less encountered in the clinical scenarios of skin and soft tissue infections.[10,11] Some of the identified predisposing factors to skin and soft tissue infections are psoriasis,[12] chronic skin inflammation, a break in the skin barrier through cuts, poor lymphatic or venous circulation, obesity and immunosuppression.[13,14]

Dermatophytosis in Human

As earlier mentioned, dermatophytosis is a very predominant condition that is experienced globally. Dermaophytosis, generally reffered to a tinea infections, affects different parts of the body, hence the disease is reffered to using a unique name depending on the infected site. For instance, *tinea pedis*, commonly known as athelet's foot, is one of the most commonly clinically reported dermatophytosis. It is reported that, athlete's foot affects 15% of the estimated world's total population at any given time.[8] *Tinea pedis* infection clinically presents symptoms such as itching, cracking, scaling, redness as well as inflammation on the feet. This infection may affect any part of the foot however, it is worsened by the warm and moist conditions around the soles of the feet and between the toes.[8] *Tinea pedis* is generally caused by a combination of *Micrsporum, Trichophyton* and *Epidermatophyton* species which may be found in the soil, infected bedding and clothing, and household surfaces. Infection may also results from skin to skin contact with infected individuals.[1] Jock itch, also known as tinea cruris, often occur together with *Tinea pedis* infection especially in males. Jock itch is mainly caused by *Trichophyton rubrum*, though other causative agents are *T. mentagrophytes* and *E. floccosum.*[15] Infections by *Candida albicans* may also aide in the manifestation of tinea cruris infection symptoms. Despite not being classified as a dermatophyte, infection of *C. albicans* is also aided by moist and humid conditions and also presents symptoms that are identical to dermatophytosis hence regarded as one of the major channel of dermatophytosis infection.[16] *Tinea corpis*, also known as the body ringworm, is also a common infection especially among the school going children. This infection manifests as circular rash, scaly, itchy and red rash that occur in the arms, legs and trunk sections of the body. Ringworm is generally versatile and can be caused by approximately 40 fungal species with *Microsporium, Trichophyton* and *Epidermatophyton* species accounting for most of the infections. Similar ring shaped symptoms of dermatophytic infection may occur when these fungal pathogens affect other regions of the body; on the face (tinea faciel), hands (tinea manum), or scalp (tinea capitis). Dermatophyte infection on the nails (toe nails or fingernails) is referred to as tinea unguium or onchomychosis which is caused by multiple fungal pathogens but the three genera of dermatophytes are the main causative agent. Other species responsible onchomycosis infection is *Fusarium* species and *C. albicans.*[17-19]

Skin and Soft tissue Bacterial Infection

Skin and soft tissue infections (SSTIs) are the most frequently reported infections caused by bacterial pathogens in human[13] with the reported incidences ranging from 500 episode in every 10,000 people per year.[11] Due to the increasing numbers of immunocompromised or critically ill patients and the emergence of multidrug resistantance among the clinically important bacterial pathogens, there has been a steady and worrying increase in incidences of SSTIs globally.[20] SSTIs may present different symptoms ranging from mild to very serious life threatening diseases and infections irrespective of the host or age group. Their etiology is quite different depending on the patients' immunological status, geographical location, history of antimicrobial treatment, surgery, trauma, animal exposure or bites.[21] This calls for a critical clinical observation and diagnosis to avoid misdiagnosis of SSTIs, particularly on the incidences of honey bee sting and stasis dermatitis.

Pyoderma, a general term used to describe inflammation on skin due to bacterial infection, is mainly caused by *S. aureus* and *Streptococcus pyogenes.*[22] These diseases include but are not limited to cellulitis, impetigo, folliculitis, furuncle, tropical ulcers, and carbuncle among others which are mainly characterized by pus production.[23] *Acne vulgaris* is another common skin infection among the adolescents. It is a serious and chronic inflammatory skin disease caused by as *Propionibacterium acnes* mainly found in the sebaceous glands.[24] If not well managed, acne vulgaris may lead to social, psychological (reduced self-esteem, depression and anxiety) and emotional issues among the adolescents.[25] Approximately 11.1% and 11.9% or SSTIs, are also reported to be caused by beta- lactamase producing enterobacterium and *Pseudomonus aeruginosa* carbapenem resistant bacterial respectively.[26] Other strains of bacteria such as *Stenotrophomonas maltophilia* and *P. auroginosa* may also lead to cytotoxic therapy induced granulocytopenia experienced by bone marrow transplant patients.[27] Despite the high frequency of the bacterial skin infections and major drive of morbidity, there is limited knowledge and information on the incidence and fluctuation of common bacterial skin infections such as erysipelas, impetigo, folliculitis or non-necrotizing cellulitis.[28] Additionally, the reports on effects of skin and soft tissues infections in relation to serious permanent disability has not been well analysed, studied and evaluated[29] need for further research in that sector.

Modern treatment options for skin disorders and antibiotic drug resistance

Since the conception of modern medicine in the 18th century, many scientific inventions and discoveries have taken place over time leading to industrial and economic growth.[30] Scientists have made milestones in identifying, preventing and treating various diseases with skin disorders being no exception. Topical therapy including; gels, creams, ointments and lotions which provide the active ingredient have been developed over time. They hydrate the skin and create a protective shield and barrier to the skin.[31] There are various types of topical gels treatments such as; antipruritics (such as calamine) which are used to relieve and manage itching on the skin; keratolytics (for instance salicylic acid and urea) which are used to alleviate hyperkeratotic skin; tars that act by reducing the epidermal thickness; corticosteroids that have immunosuppressive and anti-inflammatory effects which are useful in treating many skin infections; calcipotriol (1,25-dihydroxycholecalciferol analogue) which reduces proliferation of the epidermis and is important in local treatment of plaque psoriasis; retinoids which have an influence on the function of the immune and anti-inflammatory activity hence used in treatment of acne; antiseptics (benzoyl peroxide), chlorhexidine, antifungal agents, analgesics and sunscreens.[31]

Skin and soft tissue infections shows a wide range of clinical challenges that require efficient and effective management strategies in order to determine the right course of action to be taken depending on the severity.[32] This difficulty in diagnostic and management tools of SSTI's rises from the insufficient information that supports a particular management approach.[33] SSTIs are mainly managed or treated by a selection of antibiotics depending on clinical experience, retrospective data and progression of infection.[34] Other factors of management consideration for drug administration are route of drug administration (oral or parenteral) and site of care either at the hospital or home. It is advisable the drug administration should include broad spectrum antibiotics that involve the coverage of *S. aureus* especially in regions of high prevalence's MRSA.[35] In cases of moderate to severe infections and failure of narrow spectrum treatment, it is recommended that the drug coverage should include a coverage of gram negative bacilli.[36]

For a clear and conclusive management of skin infections, several factors has to be put into place in order to achieve the desirable goal. For instance, a study was conducted on school going children in rural parts of Kisumu, Kenya with the aim of determining long-term results of a dermatological research study within the primary health care system. In this study, hydrocortisone acetate 1% cream was used for the treatment of dermatitis, Whitfield's ointment (6% benzoic acid and 3% salicylic acid) and griseofulvin for treatment of dermatophytoses especially tinea capitis as well as superficial fungal infections of glabrous skin. Gentian violet 1% solution was used for bacterial skin infections, tropical ulcers and infected wounds. Benzylbenzoate emulsion 25% was used for treatment of scabies.[37] The authors approach to skin diseases was successful with reduction in severity, however, the prevalence rate did not change within the study area.[37] It was found out that infectious dermatoses in the rural regions of Africa can only be eliminated when the medical treatments will be accompanied by improved hygiene, standards of living and health education.[38]

Overview of bacterial and fungal skin infections in Kenya

The global disease burden report of 2010 indicates that diseases of the skin are the fourth leading cause of non-fatal infections in human. This report also shows that the burden of skin conditions was high in both developed and developing countries.[39] Notably, skin diseases pose a threat to patients who are suffering from HIV/AIDS because they manifest as opportunistic diseases. Statistics indicate that, 92% of individuals infected by HIV suffer from mucosal and cuteneous complications. Approximately 4 million people have been reported to live with HIV-AIDS in Kenya, 750 of these people die daily of AIDS-related complications.[40] It is therefore, evident that skin health is a major aspect in the Kenyan healthcare system especially for HIV-AIDS patients.

Approximately 7% of the Kenyan total population are affected by a significant number of fungal infection for instance recurrent tinea capitis and vaginitis infections which accounts for 82% of the infections at any given time.[41] Tinea infections among the low income population with poor hygiene, overcrowding, and sharing fomites has remained to be a great problem in the public health sector.[42] These rate of infections are distributed all over the world, however, most cases have been reported in Asia, Africa, East and Southern Europe.[43] The rates of tinea infections range from 10-30% with Africa having the highest burden, this is mostly experienced among the school going children.[44] In Kenya, there has been reports of 11.2% tinea infection rates among the population living in low income settlement areas such as Korogocho, Kibera, Mukuru kwa Njenga and Mathare slums in Nairobi, Kenya.[45] The residents of these slums are faced with challenging living conditions such as poor housing and health which are presumed to be a great contributing factor towards the high tinea infection rates.[46] Apart from low income settlements, a high rate of tinea infection is also experienced in rural areas. The population in this areas are always in close contact with animals and livestock which provides an extra avenue of zoonotic infection.[1]

The data on the prevalence of SSTIs' in Kenya is not very conclusive however in a study which aimed at examining antibiotic prescription patterns amongst patients in Kenyan hospitals, the authors reported that, skin and soft tissue infections formed 68% of patients who received inappropriate treatment.[47,48] In a retrospect study to model and map the burden of diseases in Kenya, it is reported that, specific ethnicities

were associated with Years of Life Lost (YLL)[49] due to a higher risk of skin diseases and other communicable diseases.[50] Approximately 6% of the reported infections are due to surgical site infection which may be regarded as secondary infection[51] leading to prolonged hospital stay. Due to increase poverty levels, a vast majority of the Kenyan population depend on traditional medicine and over-the-counter drugs in the management of SSTIs' hence further contributing to the inconclusive data on the prevalence in the country.

MATERIALS AND METHODS

The main objective of this review was to identify Kenyan medicinal plants traditionally used in the treatment and management of human skin disorders. The information presented in this document was obtained from several ethno-botanical books[51,53] and a great collection of published review articles.[54-63] Electronic databases such as Google Scholar, PubMed, Science direct and Scopus were also used to source for the published scientific research papers. As search filters, the following terms were used either alone or in combination; "Kenyan", "medicinal plants" "traditional medicine" "ethnobotany" "skin and soft tissue infection" "pyoderma" "*Staphylococcus aureus*" "gram negative bacteria" "gram positive bacteria" "cellulitis" "furniclulitis" "acne" "acne vulgaris" "antibacterial" "*Candida*" "fungal skin infection" "dermatophytosis" "dermatophyte" "tinea" "*Microsporum*" "ringworm" "*Trichophyton*" "*Epidermatophyton*" "antifungal". The plants listed in this work includes those that are native to Kenya as well as those species that were introduced as long as they were documented for traditional medicine. From the literature search, one hundred and eighteen medicinal plants were identified for their usage in the treatment and management of skin disorders, majority of which are native of Kenya. Further literature search was undertaken to identify the scientific knowledge and basis for the usage of each medicinal plant. Some of the plants listed have been studied scientifically for their benefits as traditional medicine, while others have not been studied, leaving a gap in the scientific knowledge. Despite the gap, we did not give priority to the scientific evidence to support the traditional usage, but the priority was based on the reported medicnal plants that are used in traditional medicine. This calls for further analysis of the scientific evidence of the traditional usage of the medicinal plants listed in this review.

Kenyan medicinal plants used in the treatment of skin infections

Medicinal plants play great role in the healthcare system especially in the rural regions of Africa.[64] This is accredited to the fact that medicinal plants are rich sources of secondary metabolites which have potential in drug development.[65] As outlined above, there are different causative agents of skin infections which exerts a great burden to the healthcare system in Kenya. The convectional management method of these infections have been faced with various challenges such as multidrug resistance in bacterial pathogens. There has also been reports of emergence of resistance fungal pathogen strains due to horizontal pressure and reduced efficacy of the available drugs.[66] Resistant *Candida* species have also been reported, not only in Kenya but in different regions around the world.[41] With a greater percentage of Kenyans living below the poverty levels, traditional medicine approach has been employed in the management of these infections.[52] Healthcare systems have prioritized management of skin conditions due to the association opportunistic infections of the skin and HIV/AIDS.[67] Management of skin conditions such as dermatitis / eczema, impetigo, scabies and fungal skin infections are among the diseases in the Kenya primary healthcare strategic framework 2019-2024. The aim of the primary healthcare package for Kenya is improving skin health.[68]

The primary healthcare in the rural communities of Kenya heavily relies on traditional medicine.[52,53] As already reported, both the developed and developing countries have a burden of skin infections, which accounts for notable morbidity across the globe[69] hence dermatological conditions are amongst the many ailments managed using traditional medicinal resources.[40,70] While drugs have been developed for the treatment of most skin infections, medicinal plants play a vital role in the healthcare systems of less-developed countries. The utilization of herbal medicines in the local healthcare systems has provided a basis for modern drug development research. A lot of research has been done to isolate the active components and validate the use of these plants in medicine.[71-73] Efficacy trials have also been carried out revealing that some of the plants used in traditional medicine have antiviral, antimicrobial and anti-inflammatory effects.[40,74] A number of studies have been conducted in various regions of Kenya with the intention of documenting the traditional uses of various plant species. Table 1 shows plant species commonly used in the management of various skin conditions amongst Kenyan communities.

Traditional medicine often targets multiple infections and diseases that may present similar symptoms. Some of the skin complaints or infections managed by traditional medicine include cuts, rashes, sores, boils, abrasion as well as infections.[1] Even if specified, some skin infections could be due to multiple pathogens either bacterial or fungal or even as a results on secondary infection due to an underlying condition. Herein we have listed one hundred and eighteen medicinal plants used by various communities in the management of skin disorders in Kenya (Table 1). The listed plants are from a wide range of fifty families such as *Fabaceae, Bombacaceae, Asteraceae, Acanthaceae, Aloeaceae, Amaranthaceae, Asparagaceae, Euphorbiaceae, Apocynaceae, Caesalpinioideae, Solanaceae, Chenopodiaceae, Rutaceae, Lamiaceae, Combretaceae, Burseraceae, Cucurbitaceae, Vitaceae, Solanaceae, Sterculiaceae,* and *Salicaceae* with *Fabaceae*

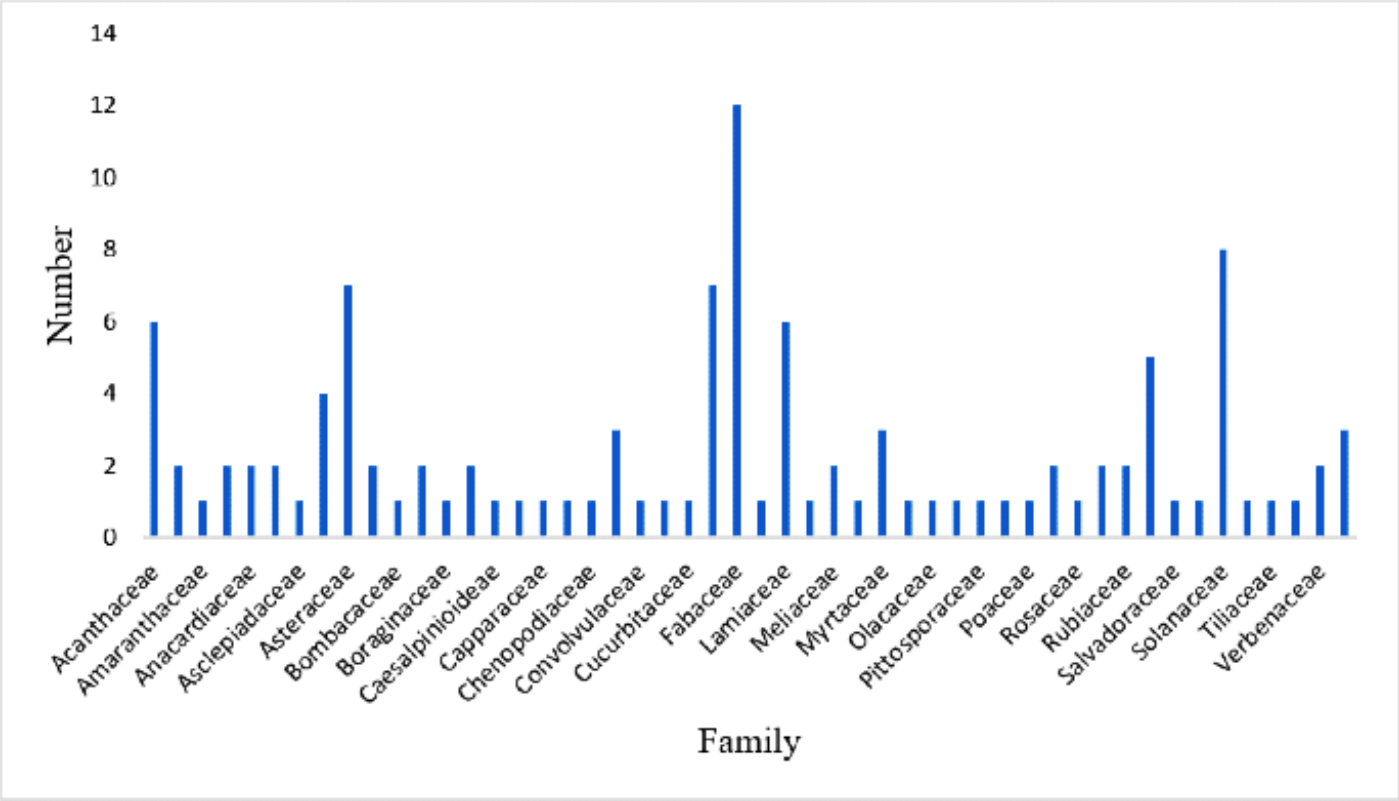

Figure 1: Number of plant species per family of medicinal plants used in the management of skin infections in Kenya.

family having the largest number of medicinal plants used in the management of skin infection in Kenya (Figure 1).

Scientific evidence of some of the listed species have been shown through the reported and published antibacterial and antidermatophytic/antifungal properties (*in vitro* and *in vivo*) which validate their importance in traditional medicine (Table 2) while other species only had their traditional usage documented.

Scientific evidence of antibacterial and antifungal activity of Kenyan medicinal plants

Previous studies and scientific reports have shown the ability of the listed Kenyan medicinal plants to inhibit fungal and bacterial skin pathogens. Most of the reported outcomes have been done *in vitro* while a few outcome have been reported from *in vivo* experiments using animal models. In this review, one hundred and eighteen (118) Kenyan medicinal plants, seventy two medicnal plants have been reported for their antibacterial activity (*in vitro*) against the various bacterial pathogens that cause or worsen skin infections such as *S. aureus, P. aeruginosa* and *Streptococcus* species. Antifungal and antidermatophytic activity against the three genera of dermatophytes (*Microsporum, Epidermatophyton*, and *Trichophyton*), *C. albicans* and other fungal pathogens have been documented in fourty eight (48) of the reported medicinal plants in this review. Medicinal plants with proven wound healing capability *in vivo* documented in this review are fourteen (14) while the remaining fourty six (46) medicinal plants have only been documented for their traditional usage with no scientific evidence (Table 2). Interestingly, most of the essential oils producing medicinal plants such as *Rosmarinus officinalis, Ricinus communis, Cajanus cajan, Eucalyptus* sp., and *Psidium guajava* have been reported to be used in the formulation of topical wound healing formulations, which is a great achievement in the skin care industry.[99,100,215,213,133]

This data indicates that approximately 41% of the documented medicinal plants have not been proven scientifically for their importance in traditional medicine, leaving a great scientific gap on the validation of the remaining 59%. Most of the reported biologically active important medicinal plants lack the evidence of their toxicity, mode of action and their synergist activity when used in combination with other plants. This leaves a lot of scientific gaps on the safety, mode of action and general relevance of these medicinal plants in formulation of various skin care products. Hence more research needs to be done to validate all the needed evidences and validation.

CONCLUSION

The results presented in this review shows the great potential of medicinal plants in the management of skin infections. Various research articles have shown that, medicinal plants are great source of antimicrobials that may be used in combating antimicrobial resistance that is a great manace among both the bacterial and fungal pathogens. Scientific reseach done on some

Table 1: Plant species used in the management of skin conditions in various regions in Kenya.

Scientific name	Family	Use (s)	Method	County	Reference
Acacia brevispica Harms	Fabaceae (Mimosaceae)	Treatment of Old wounds and Ringworm.	Dried leaves are pounded and the powder applied to old wounds.. Powder mixed with lotion and fat and smeared and rubbed into ringworm sores.	Makueni	[57]
Acacia tortilis (Forrsk.) Hayne	Fabaceae	Treatment of Wounds.	The bark is tied around fresh wounds.	Tharaka	[55]
Acanthus eminens C.B.CL	Acanthaceae	Treatment of Skin diseases and wounds.	Infusion of leaves used internally and Externally for skin infections and wounds.	Nandi	[54]
Adansonia digitata L.	Bombacaceae	Management of Skin infection.	Decoction of stem bark is drank and applied topically.	Tharaka	[55]
Agave sisalana Perrine	Asparagaceae	Used in Wounds and Cuts.	Leaf sap squeezed and applied on wounds and cuts. Fibre used as bandage.	Machakos, Central Kenya	[59,61]
Ageratum conyzoides Linn	Asteraceae	Treatment of Wounds and burns.	Leaves and roots crushed/boiled and topically applied.	Kakamega	[62]
Albizia gummifera J. F. Gmel.	Fabaceae	Treatment of skin cancer.	Bark and stem boiled and administered orally.	Kakamega	[62]
Aloe kedongensis Reynolds (*Aloe nyeriensis* subsp. *kedongensis* (Reynolds) S.Carter)	Asphodelaceae	Treatment of skin diseases, wounds.	Root and leaves infusion is applied topically.	Nandi	[54]
Aloe secundifolia Engl.	Asphodelaceae	Treatment of ringworm, Pimples, Warts, skin rushes, and burns, wounds Sores, Abscesses.	Leaves and stems are crushed and the sap applied topically on the affected area.	Central, Makueni	[57,61]
Aloe lateritia Engl	Asphodelaceae	Treament of Ringworm; Skin disorders.	Gel is topically applied.	Turkana, Kamba, Kisii	[75]
Aloe morijensis	Asphodelaceae	Treatment of Itchy Skin.	Gel is topically applied.	Maasai	[75]

Aloe ngongensis Christian	Asphodelaceae	Treatment of Itchy skin, Skin disorders and Wounds.	Gel is topically applied.	Maasai, Kamba,	[75]
Aloe nyeriensis Christian in Verd.	Asphodelaceae	Treatment of wounds.	Gel is topically applied.	Samburu	[75]
Alternanthera sessilis L.	Amaranthaceae	Management of Skin disease, wounds.	Leaves boiled and administered orally.	Kakamega	[62]
Asparagus africanus	Asparagaceae	Treatment of boils.	Leaves are crushed in water and paste applied on the affected area of the skin.	Makueni	[57]
Asparagus flagellaris (Kunth) Bak.	Asparagaceae	Treatment of boils and abscesses.	Paste made from the crushed leaves and applied on the affected area of the skin.	Makueni	[57]
Asparagus setaceus (Kunth) Jessop	Asparagaceae	Treatment of boils.	Leaves and stems crushed and applied directly on the affected area.	Central Kenya	[61]
Aspilia pluriseta Schweinf.	Asteraceae	Treatment of wounds and pimples.	Leaf Sap squeezed and applied topically on the affected area.	Machakos, Kitui, Central Kenya, Kakamega	[58,59,62]
Asystasia schimperi T.Anders	Acanthaceae	Management of Skin diseases.	Infusion of leaves drunk and applied topically.	Kakamega	[62]
Bauhinia taitensis Taub	Fabaceae	Treatment of sores and wounds.	Crushed roots and the sap topically applied on the affected area.	Tharaka	[55]
Bridelia micrantha Baill	Euphorbiaceae	Treatment of skin disease and allergy.	Leaves, bark and roots crushed/ boiled and taken orally or topically applied.	Kakamega	[62]
Cajanus cajan (L.) Millsp.	Fabaceae	Management of Wounds.	Leaves boiled and taken orally.	Kakamega	[62]
Cascabela theretia	Apocynaceae	Treatment of wounds.	Fruit and Leaves Infusion taken orally orally or sap applied on wounds.	Machakos	[59,62]
Cassia didymobotrya Fres.	Caesalpinioideae	Treatment of skin disease and ring worms.	Infusion of roots and leaves are made and taken orraly.	Nandi	[54]

Capsicum annuum L.	Solanaceae	Treatment of cellulitis.	Dry fruits are pounded, powder stirred in water to make a paste then applied on the affected area.	Makueni	[57]
Chenopodium opulifolium Schrad. ex W. D. J. Koch and ZizDC.	Chenopodiaceae	Treatment of wounds.	Bark crushed and sap topically applied on the affected area. Leaves and roots boiled and administered orally.	Central Kenya, Kakamega	[61]
Citrus limon Burm.f.	Rutaceae	Treatment of skin rashes and cellilitis.	Fruit eaten, Dry fruits are pounded and the powder stirred in water to make a paste then applied topically on the affected area.	Machakos, Makueni	[57,59]
Clerodendrum myricoides Hochst.	Lamiaceae	Treatment of wounds.	Leaves are boiled orally taken.	Kakamega	[62]
Combretum aculeatum Vent.	Combretaceae	Treatment of wounds and sores.	Leaves are crushed and the sap topically applied. Leaves or a fresh twig are boiled and taken orally.	Tharaka	[55]
Combretum apiculatum Sond	Combretaceae	Treatment of skin diseases and acne.	Root and Bark are boiled, orally taken.	Kakamega	[62]
Combretum molle R.Br. ex G. Don	Combretaceae	Treatment of Wounds and warts.	Bark Roots are bolied and orally taken. Root decoction is applied topically to treat skin warts.	Kakamega, Tharaka	[55,62]
Commiphora habessinica (O. Berg) Engl.	Burseraceae	Management of old wounds.	Exudate from the bark applied as ointment.	Makueni	[57]
Commiphora ovalifolia J.B. Gillet in ed.	Burseraceae	Treatment of cellulitis.	Bark dried, pounded, and powder mixed with water to make paste then applied topplically on the affected area.	Makueni	[57]
Conyza sumatrensis (Retz.) E.H. Walker	Asteraceae	Treatment of Pimples.	Leaves crushed and applied on skin.	Central Kenya, Kakamega	[61,62]

Crotolaria pallida Aiton. Hort.	Fabaceae	Treatment of skin diseases.	Root chewed and the sap can be topically applied.	Kakamega	[62]
Croton macrostachyus Del.	Euphorbiaceae	Treatment of wounds, sores, ringworm and warts.	Sap from leaves and young twigs applied directly on the affected area.	Central Kenya, Kakamega	[61,62]
Croton megalocarpus Hutch.	Euphorbiaceae	Treatment of wounds.	Topical application of leaf sap.	Central Kenya	[61]
Cucumis aculeatus Cogn.	Cucurbitaceae	Treament of Ringworm.	Fruit juice topically applied.	Central Kenya	[61]
Cyphostemma cyphopetalum	Vitaceae	Treatment of dermatitis.	Leaves soaked in water and infusion used for bathing.	Makueni	[57]
Cyphostemma ukerewense (Gilg) Desc.	Vitaceae	Cleaning and treatment of abscess infested with maggots.	Leaves Crushed and orally taken.	Kakamega	[62]
Datura stramonium L.	Solanaceae	Treatment of swellings on skin (Inflammation).	Sap used as massage.	Central Kenya	[61]
Dicliptera laxata C. B. Clarke	Acanthaceae	Treatment of rashes and itching skin.	The Root and Leaves chewed/ boiled and taken orally.	Kakamega	[62]
Dombeya burgesinae Gerrard	Sterculiaceae	Treatment of ringworm.	The leaf Sap is applied applied directly to the affected area.	Central Kenya	[61]
Dovyalis macrocalyx Warb.	Salicaceae	Treatment of boils.	The leaves and roots are crushed and the sap taken orally.	Kakamega	[62]
Duosperma kilimandscharicum (Lindau). Dayton	Acanthaceae	Used in the management of cuts, sores and wounds.	Crushed leaves are topically applied on the affected area.	Tharaka	[55]
Dyschoriste radicans Nees	Acanthaceae	Treatment of skin diseases and wounds.	Infusion (internal and external) of leaves are made and applied topically.	Nandi	[54]
Dyschoriste thumbergiiflora (S. Moore) Lindau	Acanthaceae	Treatment of skin diseases and wounds.	Infusion (internal and external) of leaves are made and applied topically.	Nandi	[54]
Ehretia cymosa Thonn	Boraginaceae	Treatment of wounds.	Infusion of roots and leaves are applied directly on the wound.	Nandi	[54]

Eucalyptus globulus Labill.	Myrtaceae	Treatmen of pimples and ringworms.	Patient bathed in boiled leaves.	Central kenya	[61]
Eucalyptus tereticonis	Myrtaceae	Management of small pox.	Leaves boiled and used for bathing.	Machakos	[59]
Euphorbia gossypina Pax	Euphorbiaceae	Treatment of ringworm and warts.	Milky latex is applied on the affected area.	Tharaka, Makueni	[55,57]
Euphorbia tirucalli L.	Euphorbiaceae	Treatment of warts.	Latex topically applied on the affected area.	Central Kenya, Makueni	[57,61]
Entada leptostachya Harms	Fabaceae (Mimosaceae)	Treatment of cuts, boils and abscesses.	Stem juice is squeezed and applied on the affected area, Tuber boiled and decoction drunk.	Kitui, Makueni	[57,58]
Eleusine coracana (L.) Asch. and Gr.	Poaceae	Treatment of ringworm.	Powder from the seeds mixed with water and paste smeared onto the ringworm.	Makueni	[57]
Erythrina abyssinica DC	Fabaceae (Papilionaceae)	Treatment of abscesses and old wounds.	Root boiled and decoction drunk for abscesses. Dried, pounded and powder applied to wounds.	Makueni	[57]
Fagaropsis hildebrandtii (Engl.) Milne-Redh	Rutaceae	Treatment of abscesses.	Root dried, grounded and decoction taken orally in water.	Makueni	[57]
Ficus sycomorus L.	Moraceae	Treatment of boils and scabies.	Fruit juice topically applied on the affected area.	Central Kenya	[61]
Flueggea virosa (Roxb. ex Willd.) Royle	Phyllanthaceae	Alleviates itching.	Fruit applied on the affected area.	Tharaka	[55]
Fuerstia africana T.C.E.Fr.	Lamiaceae	Treatment of ringworm and abscesses.	Leaves dried, crushed, mixed with oil and applied onto ringworm sores. Leaf decoction drunk for abscesses.	Makueni	[57]

Grewia bicolour A.Juss.	Tiliaceae	Treatment of boils and rashes.	Crushed stem bark applied on the affected area. Leaves or stem fibres soaked in water and the infusion used for bathing.	Tharaka, Makueni	[55,57]
Heliotropium zeylanicum (Burmf.f.) Lam.	Boraginaceae	Treatment of boils and abscesses.	Roots are boiled and decoction drunk.	Makueni	[57]
Hyptis pectinata (L.) Poit.	Lamiaceae	Treatment of burns.	Leaves or stem burnt and powder applied on the affected area.	Makueni	[57]
Ipomea cairica L.	Convolvulaceae	Treatment of measles.	Leaves are boiled and taken orally.	Kakamega	[62]
Jatropa podagrica	Euphorbiaceae	Treatment of skin infections.	Leaves are boiled and taken orally.	Kakamega	[62]
Kigelia africana (Lam.) Benth.	Bignoniaceae	Treatment of skin diseases.	Bark, seeds and roots decoction are taken orally.	Nandi	[54]
Kalanchoe densiflora Rolfe	Crussulaceae	Management of swellings on skin, injuries, wounds and dermatitis.	Leaves used for massage The leaves are boiled and taken orally.	Central Kenya, Kakamega, Makueni	[57,61,62]
Landolphia buchananii	Apocynaceae	Treatment of wounds.	Leaves infusion taken orally and topically applied.	Nandi	[54]
Lantana camara L.	Verbenaceae	Treatment of wounds.	Leaves crushed and infusion taken orally.	Machakos, Tharaka	[55,59]
Lepidagathis scariosa Nees.	Acanthaceae	Treatment of wounds.	Infusion of the leaves taken orally.	Nandi	[54]
Lonchocarpus eriocalyx Harms.	*Fabaceae* (*Papilionaceae*)	Treatment of wounds and ulcers.	Leaves are crushed and applied on the affected area.	Tharaka	[55]
Lycopersicon esculentum Mill.	Solanaceae	Treatment of cellulitis.	Fruit contents applied topically on the affected area.	Makueni	[57]
Maerua endlichii Gilg. And Bened.	Capparaceae	Treatment of swollen and bruised skin.	Crushed bark is applied on the inflammmed skin.	Tharaka	[55]
Mangifera indica Kiembe	Anacardiaceae	Treatment of ringworm.	Leaves, Bark and Roots are boiled or Roasted and Grinded or pounded and infusion orally administered.	Machakos	[59]

Markhamia lutea (Benth) K. Schum.	Bignoniaceae	Treatment of wounds.	Leaf, Bark and Roots are boiled and taken orally.	Kakamega	[62]
Maytenus arbutifolia var. sidamoensis	Celastraceae	Helps in wound healing.	Leaf are crushed and topically applied.	Kakamega	[62]
Melia azardirachta L.	Meliaceae	Treatment of skin rashes and measles.	Leaves, bark and roots, boiled and patient bathed or can be taken orally.	Central Kenya, Kakamega	[61,62]
Melia volkensii	Meliaceae	Treatment of boils.	Stem bark Boiled and decoction taken orally.	Kitui	[58]
Microglossa pyrifolia (Lam.) Kuntze	Asteraceae	Treatment of wound, boils and skin abscesses.	Root, Leaf and Stem chewed Crushed or boiled and either taken orally or applied topically.	Kakamega, Makueni	[57,62]
Ochana ovate F. Hoffm	Ochnaceae	Used on Inflamed skin.	Crushed leaves sap applied on the affected area.	Tharaka	[55]
Ormocarpum trichocarpum (Taub.) Engl.	Fabaceae (Papilionaceae)	Treatment of ringworms.	Leaves dried and mixed with fat and smeared onto ringworm sores.	Makueni	[57]
Oxygonum sinuatum (Meisn.) Dammer	Polygonaceae	Treatment of boils and cellulitis.	Leaves and fruits crushed in water and paste applied on the affected area.	Makueni	[57]
Periploca linearifolia Dill. and Rich	Asclepiadaceae	Treatment of warts.	Milky latex applied on the affected area.	Nandi	[54]
Plectranthus comosus Sims	Lamiaceae	Treatment of warts.	Sap from young leaves topically applied on the affected area.	Central Kenya	[61]
Plectranthus pseudomarubioides R.H.Willemse	Lamiaceae	Treatment of skin abscesses.	Leaves or Stem boiled and decoction drunk.	Makueni	[57]
Plumbago zeylanica L.	Plumbaginaceae	Treatment of boils, abscesses and burns.	Roots burnt and powder applied to burns. Root infusion drunk for boils and abscesses.	Makueni	[57]
Prunus africana (Hook.f.) Kalkm	Rosaceae	Treatment of pimples and skin itches.	Patient bathed in boiled bark.	Central Kenya	[61]

Pittosporum mannii Hook. F.	Pittosporaceae	Treatment of measles.	Leaf and bark is boiled and orally taken.	Kakamega	[62]
Plectranthus barbatus Andrews	Lamiaceae	Treatment of skin diseases, wounds and sores.	Leaf and root decoction is taken orally.	Kakamega	[62]
Psidium guajava L.	Myrtaceae	Treatment of wounds.	Bark, Root and Flowers are boiled and taken orally.	Kakamega	[62]
Pteridium aquilinum (L.) Kuhn Bracken	Aspidiaceae	Treatment of skin diseases.	Leaves shoots infusion are taken orally as well as topically applied.	Nandi	[54]
Physalis minima L.	Solanaceae	Treatment of boils.	Leaves are crushed and taken orally.	Kakamega	[62]
Physalis peruviana L.	Solanaceae	Treatment of dermatitis.	Flowers and Leaves are boiled and orally taken.	Kakamega	[62]
Rhoicissus tridentate (L.f.) Wild and Drum	Vitaceae	Treatment of pimples.	Patient bathed in boiled leaves.	Central kenya	[61]
Rhus vulgaris Meikle	Anacardiaceae	Treatment of scabies.	Ash applied on the affected areas.	Central Kenya	[61]
Ricinus communis L.	Euphorbiaceae	Treatment of skin rashes, Wound and burns.	Topical application of oil from seeds. Root and leaves are boiled or chewed and taken orally or applied topically.	Central kenya, Kakamega, Makueni	[57,61,62]
Rosmarinus officinalis L.	Labiatae	Treatment of boils and wounds.	Leaves are boiled and taken orally or inhalled.	Kakamega	[62]
Rotheca myricoides (Hochstetter) Steane and Mabberley (*Clerodendrum myricoides*)	Verbenaceae	Treatment of abscesses.	Roots are crushed in water and infusion taken orally.	Makueni	[57]
Rubia cordifolia L.	Rubiaceae	Treatment of ringworm, skin disorders and helps in wound healing.	Leaf, Stem bark and Roots are burned or taken orallyl.	Kakamega	[62]
Rumex abyssinicus Jacq	Polygonaceae	Assists in wound healing.	Leaves are boiled and taken orally.	Kakamega	[62]
Salvadora persica L.	Salvadoraceae	Treatment of abscesses.	Roots are boiled and decoction drunk.	Makueni	[57]

Senna didymobotrya (Fresen.) Irwin and Barneby	Papillionaceae	Treatment of pimples, scabies, warts and measles.	Patient bathed in boiled leaves.	Central Kenya	[61]
Solanum aculeastrum Dunal	Solanaceae	Treatment of ringworm and wounds.	Topical application of fruit juice and sap from bark.	Central Kenya	[61]
Solanum renschii Vatke	Solanaceae	Treatment of boils and skin abscesses.	Roots pounded, soaked in water and infusion drunk.	Makueni	[57]
Senecio discifolius Oliv.	Asteraceae	Treatment of ring worms.	Leaves infusion is taken orally.	Nandi	[54]
Sida tenuicarpa Vollesen	Malvaceae	Treatment of boils and helps in Wound healing.	Leaves and roots are crushed or chewed and taken orally or applied topically.	Kakamega	[62]
Sida ovate Forrsk.	Malvaceae	Treatment of wounds.	Crushed leaves sap are applied to the affected area.	Tharaka	[55]
Solanecio mannii (Hook. f) C. Jeffrey	Asteraceae	Treatment of skin diseases and skin cancer.	Leaves and roots are boiled or crushed and applied topically or taken orally.	Kakamega	[62]
Spermacoce princeae (K. Schum.) Verdc.	Rubiaceae	Treatment of skin diseases and boils.	Leaves and roots are boiled and taken orally.	Kakamega	[62]
Teclea simplicifolia	Rutaceae	Treatment of skin rashes.	Leaves and /or stem bark infusion is applied topically.	Kitui	[58]
Vepris nobilis Delile	Rutaceae	Treatment of skin diseases.	Roots are boiled and taken orally.	Kakamega	[62]
Vepris Vernonia auriculifera Hiern.	Asteraceae	Helps in wound healing, and in treatment of measles.	Leaves are crushed and applied topically.	Kakamega	[62]
Vigna unguiculata (L.) Walp	*Fabaceae* (*Papilionaceae*)	Treatment of boils.	Dry seeds crushed in water to make a paste, then applied topically to the affected area.	Makueni	[57]
Xerophyta spekei Bak.	Velloziaceae	Treatment of burns.	Stem are burnt and powder applied to the affected area.	Makueni	[57]
Ximenia americana L.	Olacaceae	Treatment of abscesses.	Root are boiled and decoction taken orally.	Makueni	[57]

Warbugia ugandensis Sprague	Canellaceae	Treatment of measles.	Bark and roots are boiled and taken orally. They are also chewed.	Kakamega	[62]
Zanha africana (Radlk.) Exell	Sapindaceae	Treatment of abscesses.	Roots are boiled and decoction taken orally.	Makueni	[57]
Zanthoxylum chalybeum Engl.	Rutaceae	Treatment of boils and sores.	Root decoction is taken orally.	Tharaka	[55]

Table 2: Scientific evaluations of the inhibitory activity of Kenyan plants against fungal and bacterial skin pathogens.

Plant Species	Common Names	Family	Plant Part Used	Formulation	Results	Reference
Acacia tortilis	Umbrella thorn (English) Mulaa(Kamba)	Fabaceae	Leaves	Ethanol Extract	Bioactive against *S. aureus, E. coli* and *C. albicans* with an MIC ranging from 0.8- 3.6µg/ml	[76]
Adansonia digitata	Baobab monkey-bread tree, (English)	Malvaceae	Leaves, Flowers and Fruit baks	Methanolic and Ethanolic	All the extracts exhibited antibacterial activity against both gram negative and gram-positive bacteria with an MIC ranging from 13-26µg/ml	[77,78]
Agave sisalana	Sisal hemp (English)	Asparagaceae	Leaves	hydroalcoholic solution (3:7); methanol	The leaf extracts were active against dermatophytes; *Trichophyton tonsurans, Microsporum gypseum, E. floccosum; S. aureus* and *E coli*	[79]
Ageratum conyzoides Linn.	Billy goat weed (English) kimavi cha kuku (Kiswahili), Gathenge (Kikuyu).	Asteraceae	leaves	Methanol, distilled water, ethanol	Both the alcoholic and aqueous extracts exhibited wound healning activity of 90% and 70% respectivly. The leaf alcoholic extract showed a strong activity against *E. floccosum,T. Mentagrophytes and M. Gypseum*, with an inhibition of 80.28, 78.43 and 68.24%, respectively. Aqueous extracts were active against *A. viscolactis, K. aerogenes, B. cereus and S. pyogenes*	[80-82]

Albizia gummifera J. F. Gmel.	Peacok flower (English) Kumulukhu (Luhya) Mchani mbao (Swahili)	Fabaceae	Stem bark	Cyclohexane; EtOAc, and MeOH extracts	Ethyl acetate extract from the stem barkof Albizia gummifera exhibited an MIC of 6.3 µg/ml against *C. albicans* Same extracts showed activity against *S. aeruginosa* and *P. aeruginosa*	[83]
Aloe secundifolia Engl.	Kil(/r)uma (Kikuyu), Suguroi, (Maasai)	Asphodelaceae	Leaves	Methanol	The methanol leaf extract was active aginst *S. aureus* (0.39 ± 2 - 0.46 ± 2 mg/ml), *B. subtilis* (0.43 ± 1 - 0.47 ± 1 mg/ml), *K. pneumoniae* (0.35 ± 2 - 0.48 ± 2 mg/ml), *E. coli* (0.25 ± 1 - 0.45 ± 2 mg/ml), *C. albicans* (0.34 ± 1 - 0.46 ± 1 mg/ml)	[84]
Aloe nyeriensis Christian in Verd.	Kipapa (Taita), Suguroi (Samburu)	Asphodelaceae	Leaves	Methanol	Methanolic extracts of the leaves exhibited antibacterial and antifungal activities against *S. aureus, E. coli, Bacillus* ssp, *K. pneumoniae, S. typhi, P. mirabilis, P. aerigunosa*, and *C. albicans*	[85]
Aloe lateritia Engl	Kiluma (Kambaa), Omugaka (Kisii), suguroi (Maasai)	Asphodelaceae	Leaves	Methanol	Leaf methanol extract exhibited antifungal activity against oral candidiasis and dermatophytes, Fusarium oxysporum	[86]
Alternanthera sessilis L.	Sessile joyweed (English)	Amaranthaceae	Leaves	Chloroform, methanol and distilled water (aqueous extract)	The chloroform extract dose of 200 µg/mL showed significant wound healing activity. Aqueous extract showed antimicrobial activity against gram positive and gram-negative bacteria	[87-89]
Asparagus flagellaris (Kunth) Bak.	-	Asparagaceae	Stem bark and leaves	Aqueus, Ethanol, Essential oil	Ethanol extract inhibited the growth of *E. coli* and *C. albicans invitro* Essential oils showed antimicrobial activity against *E. coli, S aureus* and *P. aeruginosa*	[90,91]

Aspilia pluriseta Schweinf.	Dwarf aspilia (English) muuti (Kikuyu) Shilambila (Luhya).	Asteraceae	Leaves, Stems bark and Flower	Methanol, Dry plant ointment, water	Dry plant ointment exhibited wound healing activity on guinea pigs; The methanol extract exhibited antibacterial activity aginst *B. cereus, S. aureus* and *S. agalactiae* Methanol and aqueous extracts exhibited antibacterial activity against *S. aureus, E. coli* and *C. albicans* Leaf and stem bark methanol extracts exhibited antidermatophytic activty against *T. rubrum, M. canis and E. fluccosum*	[92-94]
Bersama abyssinica Verdc.	Sagawaita-(Ogiek)	Melanthiaceae	Stem Bark, Roots	MeOH root extracts, Secondary metabolites from stem Bark	Methanol root extracts active against; *S. aureus, C. albicans, C. brusei, K. pneumoniae, C. neoformas, T. mentagrophyte, M. gypseum*. Secondary metabolites from the stem bark active against *S. aureus*	[95,71]
Bridelia micrantha Baill	Mitzeerie or coastal golden leaf (English)	Euphorbiaceae	Leaves; stem bark	Methanol, Ethylacetate, water	The methanol extract showed antimicrobial activity against *C. albicans S. pyogenes* and *E. coli* with an MIC ranging from 1.25 to 2.5 mg/mL. The aqueous cream made from methanol leaf extract exhibited wound healing activty on Male Sprague-Dawley rat. The stem bark methanol extract exhibited antimicrobial activity against *S. aureus; E. coli* Ethyacetate extract exhibited activity against *S. aureus*	[96-98]

Cajanus cajan (L.) Mill sp.	Pigeon pea; (English)	Fabaceae	Leaves	Methanol, Petroleum ether, Aqueous, Essential oil, supercritical fluidextraction (SFE); chloroform	The methanol, petroleum ether, aqueous extracts were active against *E. coli,S. aureus* (MIC range of 0.125 and 0.25 mg/ml). The essential oil exhibited antimicrobial activity against *S. aureus* and *E. coli.* SFE extracts exhibited antibacterial activity against *S. aureus* Bioassay guided fractionation of chloroform extract led to the isolation of Cajanuslactone Pinostrobin and cajaninstilbene acid which has antibacterial activity against *S. aureus;*	[99-101]
Cascabela theretia	Be-still tree, (English)	Apocynaceae	Leaves Flowers, Whole plant	Chloroform, Ethyl acetate, Hexane and Methanol	Chloroform, Ethyl acetate, Hexane and Methanol leaf extracts exhibited antibacterial and antifungal activity against *S. aureus, P. aeruginosa* and *C. albicans* Floral Ethylacetate extract exhibited antifungal activity against *C. albicans*	[102-104]
Cassia didymobotrya Fres.	Wild senna (English) lubino (Luhya), mwino; (Kikuyu), omovenyu(Gusii), senetwet (Kipsigis)	Fabaceae	Leaves and Stem bark	Methanol and Ethylacetate; Aqueous	Both Methanol and Ethylacetate extracts exhibited strobg antifungal activty against *C. albicans*, slight activty against *S. aureus* and *E. coli;* Both methanol and Aqueous extracts ehibited antbacterial activity against *S. aureus, P. aeruginosa,* and *B. subtilis* Leaf extracts exhibited antidermatophytic activity against *T. rubrum, M. canis,* and *E. floccussum*	[105-107]
Chenopodium opulifolium syn. *Chenopodium ugandae*	Grey goosefoot (English)	Chenopodiaceae	Leaves	Water (Aqueous)	Water (Aqueous) extracts exhibited activity against *M. canis, E. flocossum, T. rubrum* and *C. albicans*	[94]

Citrus limon Burm.f.	Lemon (English)	Rutaceae	Leaves, Fruits, Stem bark	Essential oil; Methanol	Essential oil from the leaf exhibited antibacterial activity against *S. aureus* and *E. coli* with an MIC of 0.5mg/ml and 0.2mg/ml respectively. Essential oil from the fruit peels showed moderate antibacterial and antifungal activity with MIC ranging from 2-16mg/ml. Methanol extracts of the stem bark exhibited antibacterial activity against *E. coli, S. aureus* and *C. albicans*	[108-1 11]
Clerodendrum myricoides Hochst.	Munjuga-iria" (Mbeere)	Lamiaceae	Roots	Methanol, Dichloromethane, Petether, Ethylacetate,	All the extracts exhibited antibacterial activity against *S. aureus, S. Aureus* (MRSA), *P. aeruginosa* and *E. coli*	[112]
Combretum aculeatum Vent.		Combretaceae	Leaves	Petroleum ether; Methanol	Methanol extracts exhibited antibacterial activity against *S. aureus* and *E. coli* obtained from an wound. Petroleum Ether exhibited antifungal Activity against *M. canis* and *C. albicans.*	[113]
Combretum apiculatum Sond		Combretaceae	Leaves	Acetone, Hexane, Dichloromethane and Methanol	All the extracts exhibited antifungal activity against *M. canis* and *C. albicans*	[114]
Combretum molle R.Br. ex G. Don	Velvet bush willow (English)	Combretaceae	Leaves	Acetone, Hexane, Dichloromethane and Methanol	All the extracts exhibited antifungal activity against *M. canis* and *C. albicans.* Methanol extracts exhibited antidermatophytic activity against *E. floccosum, M. gypseum, T. mentagrophytes, T. rubrum, C. albicans* and *M. canis.*	[115,116]
Commiphora habessinica (O. Berg) Engl. Syn. *C. abyssinica* (Engl.) Engl. And *C. assaortensis* Chiov.	Myrrh tree (English)	Burseraceae	Leaves	Petroleum ether, Ethylacetate	Petroleum ether and Ethylacetate extracts inhibited the growth of *C. albicans and A. flavus* MIC of 32mg/ml	[117]

Crotolaria pallida Aiton. Hort.	Moreton Island rattlepod (English)	Fabaceae	Leaf	Methanolic	Methanolic extracts exhibited antibacterial activity against MIC 25mg/ml.	[118]
Croton macrostachyus Del.	Broad-leaved croton (English)	Euphorbiaceae	Stem bark, fruit, Leaf and root	Methanol, Ethylacetate, Aquoeus, Hexane	Methanol and Ethylacetate extracts exhibited inhitory activity against *E. coli*, and *C. albicans.* Methanol Fruit extracts inhibited growth of *S. aureus,* Leaf and root extracts exhibited antibacterial activity Methanol and water extracts inhibited the growth of *Trichophyton* species. Hexane extracts of the leaves exhibited antibacterial activity against *S. aureus, E. coli and B. subtilis*	[119-122]
Croton megalocarpus Hutch.		Euphorbiaceae	Roots, Stem-bark and Leaves	Methanol and hexane	Methanol and hexane leaf extracts inhibited growth of *S. aureus* and *E. coli*	[122]
Datura stramonium L.	Downy thorn-apple, (English)	Solanaceae	Leaves, Seeds	Methanol and Chloroform; ethanolic	Chloroform and Methanol leaf extracts exhibited considerable activity against *S. aureus* and *P. aeruginosa.* The methanolic extract of effectively inhibited *E.coli* with minimum bactericidal concentration (MBC) of 25µg/ml. Methanolic extract was found to be quit efficient in inhibiting *S. aureus* with MIC of 12.5 µg/ml. Ethanolic extracts exhibited wound healing activity on Wistar albino rats.	[123-125]
Ehretia cymosa Thonn		Boraginaceae	Whole plant, Leaves	Ethanolic, Methanol	Ethanolic and Methanolic extract exhibited antibacterial activity against both gram negative and gram-positive bacterial pathogens.	[126,127]

Eucalyptus globulus Labill.	Gum, Blue Eucalyptus (English)	Myrtaceae	Fruits, Leaf	Essential oils	Globulol isolated from the leaves exhibited antimicrobial activity. Essential oils from the fruits exhibited antimicrobial activity against both gram negative and gram-positive bacteria. Essential oils from the leaves exhibited antimicrobial activity against both gram positive and gram-negative bacteria. Esssential oils used to develop anti-acne ointment. Essential oil showed Wound healing activity.	[128-133]
Eucalyptus tereticonis	Forest red gum (English)	Myrtaceae	Leaves, plant parts; Bark	Essential oils, methanolic extract	Essential oils exhibited antfungal activity against a range of pathogens. Essential oils exhibited antidermatophytic activity against the three genera of dermatophyte. Methanolic extract of the leaves exhibited antimicrobial activity against gram positive and gram negative bacetria. Methanolic extract showed antimicrobial activity against *S. aureus, P. aeruginosa* and *C. albicans.*	[134-138]

Euphorbia tirucalli L.		Euphorbiaceae	Leaves, Latex, stem	Methanolic, latex, Chloroform	Methanolic extract of the stem bark exhibited antifungal and antibacterial activity against a wide range of human pathogens Phenolic secondary metabolites islated from the leaves exhibited antibacterial activity against a wide range of bacterial pathogens. Extracts of the latex exhibited antibacterial activty. Stem extracts exhibited antibacterial activity. Chloroform extract wasactive extract against *B. subtilis, E. coli, P. vulgaris, S. aureus*.	[139-142]
Entada leptostachya Harms		Fabaceae	Roots and bark	Methanolic	Methanol extract exhibited antibacterial activity against *S. aureus, P. aeruginosa and C. albicans*	[143]
Eleusine coracana (L.) Asch. and Gr.	Finger millet	Poaceae	Seeds	Polyphenol Ethanolic and Methanolic	Polyphenols from the seeds and the whole plant exhibited antimicrobial activity. Methanolic and ethanolic extracts exhibited antimicrobial activity against *S. aureus and B. subtilis.*	[144-146]
Erythrina abyssinica DC	Flametree, (English); Mjafari or Mwamba (Kiswahili), Kumurembei (Luhya)	Fabaceae	Leaf and stem bark; Stem androot barks, whole plant, leaves	Methanol; Ethanol, chloroform, water Hexane, dichloromethane, methanol	Leaf and stem bark Methanolic extract exhibited 85% wound healing activity in 15 day. Methanolic and ethanolic extract of the root, leaves and stem bark showed antibacterial activity against *S. aureus, E. coli* and *B. subtilis*. Root bark extracts showed antifungal and antibacterial activity at different MIC ranges. Stem barks hexane, DCM and methanol extracts exhibited antidermatophytic activity against *M. gypseum, T. mentagrophytes*, (MIC of 25mg/ml.	[147-150]

Fagaropsis hildebrandtii (Engl.) Milne-Redh	Muvindavindi (Kamba community)	Rutaceae	Roots	Aqueous and hexane	All extracts showed bactericidal effects against *S. aureus* (IC_{50} 64 mg/mL) however ther was no effect against *C. albicans*	[151,152]
Faurea saligna Harr.	Mosomboriet-(Ogiek)	Proteaceae	Root	Methanol extract	Methanol root extracts active against *S. aureus, C. albicans, P. aeruginosa, C. brusei, K. pneumoniae, C. neoformas, T. mentagrophyte, M. gypseum.*	[95]
Ficus sycomorus L.	Sycamore fig (English)	Moraceae	Stem-bark, leaves and fruits, latex	Methanol	Methanolic extracts of leaves and stem bark exhibited antidermatophytic activity against *T. mentagrophytes* and *Microsporum audouinii.* Fruit methanolic extract showed significant antibacterial activity. Silver nano partcles, leaf and latex extracts showed antibacterial activity.	[153-155]
Hyptis pectinata (L.) Poit.	Comb hyptis (English)	Lamiaceae	Leaves	Essential Oil, hyptolide crystals	Essential oil exhibited antibacterial activity against gram positive bacteria and yeast. Hyptolide and epoxy hyptolide extracts exhibited broad spectrum antibacterial actvity.	[156-158]
Jatropa podagrica	Gout plant (English)	Euphorbiaceae	Roots, stem bark	Hexane, chloroform and methanol	Hexane, Chloroform and Methanol extracts exhibited antibacterial and antifungal activity against *S. aureus, B. subtilis, and C. albican* with the hexane extract being the most active. Diterpenoids isolated from the roots exhibited antibacterial activity against gram positive bacteria Methanolic extracts from the stem bark exhibited antibacterial activity against gram positive bacteria	[159-162]

Kigelia africana (Lam.) Benth.	Sausage tree (English)	Bignoniaceae	Fruits and roots; Stem bark	Methanol, Aqueous, Chloroform, Ethanolic	Methanolic extract exhibited the growth of gram-positive bacteria; stem bark aqueous extract exhibited antimicrobial activity. Chloroform extract and crude ethanolic extracts exhibited activity against *S. aureus and C. albicans*	[163-165]
Lantana camara L.	Lantana (English)	Verbenaceae	Leaves; Stem bark; Root; Seeds	Essential oil; acetone, Methanol; Petroleum ether, ethyl acetate, water, and ethanol	Essential oils exhibited broad spectrum antimicrobial activity. Methanolic and acetone extracts exhibited anibacterial activity against both gram positive and gram-negative bacterial pathogens. Petroleum ether extract exhibited the highest activity at a concetration of 200mg/ml against gram positive and gram-negative bacteria. The ethanol nleaf extract exhibited wound healing activity.	[166-174]
Lonchocarpus eriocalyx Harms.		Fabaceae	Leaves	Chloroform, Methanol	Flavonoids isolated from the leaves exhibited mild antibacterial and antifungal activity	[175]
Lycopersicon esculentum Mill.	Tomato (English)	Solanaceae	Seeds	Methanol	The Methanol seed extracts exhibited antibacterial actvity against both gram positive and gram-negative bacteria	[176]
Markhamia lutea (Benth) K. Schum. synonym *Dolichondron lutea*		Bignoniaceae	Leaves	Methanol extracts	Methanolic extracts exhibited broad spectrum antibacterial activity	[177]

Melia azardirach L.	Chinaberry (English)	Meliaceae	Leaves, Seeds, Fruits	Methanol, Ethanol, Petroleum ether and water	All the leaf and seed extracts exhibited antimicrobial activity against human pathogens. The ethanolic fruit extracts exhibited antidermatophytic activity against *M. canis and C. albicans* (MIC 50-300mg/ml) Methanol extracts exhibited wound healing activity	[178-181]
Melia volkensii	Melia (English)	Meliaceae	Seeds, Stem bark, root bark	Methanol, DCM, Hexane	Methanol and Dichloromethane seed, hexane stem bark and methanol root bark extracts exhibited activities towards *E. coli, S. aureus, Aspergillus niger* and *Plasmodium falciparum*	[182,183]
Microglossa pyrifolia (Lam.) Kuntze		Compositae	Leaf, Stem bark	Methanol and water extract	Methanol extract exhibited slight antifungal activity agaist *T. rubrum M. canis* and *E. Floccusum*	[94, 166-171]
*Ormocarpum trichocarpum (*Taub.) Engl.	Neckless fruit (English)	Fabaceae	Leaves	Methanol; DCM	Biflavonoids isolated from the leaves exhibited antibacterial activity against selected *S. Aureus, E. coli, B. subtilis* (MIC values in the range of 4.0 to 136.7 μM) DCM extracts exhibited a dose dependent antibacterial activity against both gram positive and gram-negative bacteria.	[65,184, 185]
Periploca linearifolia Dill. and Rich		Apocynaceae		Aqueous, chloroform and methanol	All the extracts exhibited antibacterial activity agaisnts both gram positive and gram-negative bacteria	[186,187]

Plumbago zeylanica L.	Wild white leadwort, Ceylon plumbago (English)	Plumbaginaceae	Roots, stems, leaves, and whole plants	Water, chloroform or methanol	Plumbagin isolated from the roots exhibited antibacterial activity agaisnt *S. aureus, B. subtilis, P. aeruginosa.* Chloroform, water and methanol crude extracts from the root exhibited antibacterial activity against both gram negative and gram-positive bacteria. The stem and leaves extracts exhibited antimicrobial activity against both gram positive and gram-negative extracts with the stem extracts exhibiting a great antimicrobial activity.	[188-192]
Prunus africana (Hook.f.) Kalkm	African cherry (English)	Rosaceae	Stem bark	Ethylacetate, Methanol	Ethylacetate and methanol extract exhibited antibacterial activity. The stem bark extracts exhibited antibacterial activity against both gram positive and gram-negative bacteria. It also exhibited antifungal activity against *M. gypseum, and T. mentagrophyte.*	[60, 193-195]
Plectranthus barbatus Andrews		Lamiaceae	Leaves, root bark	Aqueous extract, acetone, water, Essential oil	The leaf extracts showed antibacterial activity against gram negative and gram-positive bacteria. It also showed antidermatophytic activity against *T. rubrum.* Root bark extracts exhibited great activity against *S. aureus, MRSA and B. cereus* strains. Essential oil from the leaves exhibited antibiofilm activity in *C. violaceum* and *P. aureginosa.*	[196-198]
Psidium guajava L.	Guava (English)	Myrtaceae	Stem bark, Leaves	Chloroform, methanol, aqueous petroleum ether, Butanol; Essential oil	Chloroform, Methanol and water extract exhibited broad spectrum antibacterial activity. Leaf extract exhibited antibacterial activity.	[199-202]

Pteridium aquilinum (L.) Kuhn Bracken	Bracken fern (English	Dennstaedtiaceae	Leaves, fiddleheads	Essential oil	Essential oil exhibit antibaterial activity. Essential oils from the fiddlehead exhibited antibacterial activity.	[203,204]
Physalis minima L.	Wild gooseberry (English)	Solanaceae	Leaf and callus, stem, Fruit, Whole plant	benzene, chloroform, methanol and petroleum ether	Both the leaf and callus extracts exhibited broad spectrum antibacterial activity. The leaf, stem and fruit extracts exhibited antibacterial activity against *S. aureus* and *E. coli.*	[205-207]
Physalis peruviana L.	Cape gooseberry, gooseberry (English)	Solanaceae	Fruits, seed,body, leaf and root extracts	Ethanolic Extract,	Ethanolic fruit extract has antimicrobial activty against *S. aureus, E. coli and C. albicans.* The fruit extracts also exhibited antidermatophytic activity against *Trichophyton* sp. *and Epidermophyton* sp.	[208-211]
Rhus vulgaris Meikle	Sumac (English)	Anacardiaceae	Stem bark, Leaves	Methanol: dichloromethane (1:1), methanol and aqueous	The stem bark and leaf extracts exhibited antibacterial activity against MRSA *S. aureus, S. aureus, C. albicans*	[63,212]
Ricinus communis L.	Castor oil plant (English)	Euphorbiaceae	Leaf, stem and root powder extracts	acetone, hexane, Ethanol, Essential oil	Ethanol, hexane and acetone extracts exhibited anitbacterial activity The essential oil exhibited a broad-spectrum antibacterial activity with *S. aureus* being the most susceptible. Essential oil exhibited wound healing activity	[213-215]
Rosmarinus officinalis L.	Rosemary (English)	Lamiaceae	Leaves	Essential oil, ethanolic and water extract	Essential oil exhibited broad spectrum antibacterial activity The hydroethanolic extract exhibited antidermatophytic activity against *T. rubrum, T. mentagrophytes and M. gypseum.*	[216-219]

Rotheca myricoides (Hochstetter) Steane and Mabberley (*Clerodendrum myricoides*)	Butterfly Bush (English)	Lamiaceae	Leaves and seeds	Methanolic, Ethanolic, water	All the extracts were active against both gram positive and gram-negative bacteria	[220]
Rubia cordifolia L.	Manjishtha, Indian madder (English)	Rubiaceae	Roots	Ethanol, Methanol, Chloroform	Root extract was reported for wound healing properties in experimental animal model. Ethanolic extract and the hydrogel formulation of root was found to be effective in wound healing. Ethanolic roots extract inhibited ß-Lactamase producing uro-pathogenic in *E. coli*. Methanol and Chloroform extracts exhibited antibacterial activity on gram-positive strains. The gram-negative *P. aeruginosa* was also inhibited by themethanol extracts in a dose dependent manner. The Aqueous extracts exhibited activity against *S. aureus* and *B. subtilis*. The green synthesiszed nano- particles also exhibited antimicrobial activity.	[221-226]
Rumex abyssinicus Jacq		Polygonaceae	Whole plant, Leaves, Fresh Rhizomes	Methanol, Aqueous,	Secondary metabolites isolated from the leaves, stem bark exhibited varying ranges of antimicrobial activity. Ointments made from rhizomes exhibited wound healing activity in swiss albino mice.	[227-230]
Salvadora persica L.	Meswak tree (English / Arabic)	Salvadoraceae	Roots, stem bark	Methanol, Aqueous	Root methanolic extracts exhibited antibacterial activity against bacterial pathogens that cause dental plaque. Green silver nano-particles exhibited antimicrobial activity.	[231-234]

Senna didymobotrya (Fresen.) Irwin and Barneby	African senna (English)	Fabaceae	Leaves, flowers, stem bark, immature pods and root barks	Methanol; Ethanol;	All the extracts exhibited antifungal activity aginst *C. albicans* and *Trichophyton tonsurans.*	[235,236]
Solanum aculeastrum Dunal	Poison apple, (English)	Solanaceae	Berries and leaves, root bark	Acetone, methanol, and water	The leaf and berries extracts exhibited antimicrobial activity against a wide range of pathogens. Methanolic extracts exhibited antibacterial activity.	[237,238]
Vepris nobilis Delile (*Teclea nobilis*)	Small-fruited teclea (English)	Rutaceae	Leaves, Stem bark, roots	Hexane, Ethylacetate, DCM, Methanol	All the extracts exhibited antimicrobial activity against *S. aureus, B. subtilis* and *C. albicans.*	[239,240]
Vepris Vernonia auriculifera Hiern.		Rutaceae	Leaves,	Methanol	Triterpenes isolated from the leaves exhibited antimicrobial properties.	[241]
Vigna unguiculata (L.) Walp	Cowpea, (English)	Asteraceae	Leaves, seeds	Methanol, Ethylacetate, Water; seed oil	Ethylacetate extract exhibited antimicrobial activity. Aqueous, methanol, ethanol extracts exhibited antibacterial activity. The leaves methanolic extracts also exhibited antibacterial activity. Seed oil exhibited antimicrobial activity against *S. aureus, E. coli* and *C. albicans*	[242-245]
Ximenia americana L.	Hog plum (English)	Olacaceae	Bark, leaves, root and stem bark	Chloroform, Methanol, Water	All the extracts exhibited antibacterial activity against *E. coli, B. subtilis, P. aeruginosa* and *S. aureus.* Methanolic and water extracts exhibited antibacterial activity against *S. aureus, B. subtilis,* and *P. aeruginosa.*	[246,247]

Warbugia ugandensis Sprague		Canellaceae	Leaf, stem bark,	Methanol, dichloromethane and ethyl acetate	Methanolic extract was active against MRSA and *S. aureus.* All the extracts were active against *M. gypseum, C. albicans* and *Cryptococcus neoformans* with an MIC of 0.78mg/ml. Methanolic leaf extracts exhibited antibacterial activity agaisnt *S. aureus* isolated from infected wound.	[248-251]
Zanha africana (Radlk.) Exell		Sapindaceae	Bark, roots and stem	DCM, Methanol, Ethylacetate	All the extracts exhibited antibacterial activity against both gram positive and gram-negative bacterial pathogens	[252]
Zanthoxylum chalybeum Engl.	Lemon-scented knobwood (English)	Rutaceae	Root bark, Stem bark, Leaves	Methanol, Hexane and Water	Methanol and hexane extracts of the root bark and stem bark exhibited antibacterial activity against *S. aureus* and *E. coli.* Green synthesis of silver nano-particles exhibited broad spectrum antibacterial activity	[122, 197, 253]

of the medicinal plants also justifies the use of these medicinal plants in traditional medicine. From this knowledge, these medicinal plants may be incorporated into the mainstream clinical usage once all the necessary research has been completed.

Scientific analysis on the application of the medicinal plants in traditional usage is recommended for the listed medicinal plants that have not been studied. Further analysis on the cytotoxicity, drug interaction and mechanism of action of these medicinal plants should be carried out. The medicinal plants that have exhibited great antimicrobial activity can be studied on the interaction with the convectional topical drugs that have been used in the management of skin infections not only in Kenya but also in other developing and developed countries. To safeguard the herbal industry, cultivation of the wild medicinal plants is recommended to prevent the danger of extinction.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

ABBREVIATIONS

AJOL: African Journals Online; **MRSA:** Methicillin Resistant *Staphylococcus aureus;* **SSTIs:** Skin and Soft Tissue Infections.

REFERENCES

1. Cock IE, Van Vuuren SF. A review of the traditional use of southern African medicinal plants for the treatment of fungal skin infections. J Ethnopharmacol. 2020;251:112539. doi: 10.1016/j.jep.2019.112539, PMID 31899200.
2. Köhler JR, Casadevall A, Perfect J. The spectrum of fungi that infects humans. Cold Spring Harb Perspect Med. 2014;5(1):a019273. doi: 10.1101/cshperspect.a019273, PMID 25367975.
3. Weldegebreal T, Ahmed I, Muhiye A, Belete S, Bekele A, Kaba M. Magnitude of opportunistic diseases and their predictors among adult people living with HIV enrolled in care: National level cross sectional study, Ethiopia. BMC Public Health. 2018;18(1):820. doi: 10.1186/s12889-018-5733-x, PMID 29970047.
4. Havlickova B, Czaika VA, Friedrich M. Epidemiological trends in skin mycoses worldwide. Mycoses. 2008;51;Suppl 4:2-15. doi: 10.1111/j.1439-0507.2008.01606.x, PMID 18783559.
5. Karimkhani C, Dellavalle RP, Coffeng LE, Flohr C, Hay RJ, Langan SM, *et al*. Global skin disease morbidity and mortality: An update from the global burden of disease study 2013. JAMA Dermatol. 2017;153(5):406-12. doi: 10.1001/jamadermatol.2016.5538, PMID 28249066.
6. Hay RJ, Johns NE, Williams HC, Bolliger IW, Dellavalle RP, Margolis DJ, *et al*. The global burden of skin disease in 2010: An analysis of the prevalence and impact of skin conditions. J Invest Dermatol. 2014;134(6):1527-34. doi: 10.1038/jid.2013.446, PMID 24166134.
7. Lakshmipathy DT, Kannabiran K. Review on dermatomycosis: Pathogenesis and treatment. Nat Sci. 2010;02(7):726-31. doi: 10.4236/ns.2010.27090.
8. Brown GD, Denning DW, Gow NA, Levitz SM, Netea MG, White TC. Hidden killers: Human fungal infections. Sci Transl Med. 2012;4(165). doi: 10.1126/scitranslmed.3004404, PMID 23253612.
9. Cranendonk DR, Van Vught LA, Wiewel MA, Cremer OL, Horn J, Bonten MJ, *et al*. Clinical characteristics and outcomes of patients with cellulitis requiring intensive care. JAMA Dermatol. 2017;153(6):578-82. doi: 10.1001/jamadermatol.2017.0159, PMID 28296993.
10. Raff AB, Kroshinsky D. Cellulitis: A review. JAMA. 2016;316(3):325-37. doi: 10.1001/jama.2016.8825, PMID 27434444.

11. Ray GT, Suaya JA, Baxter R. Incidence, microbiology, and patient characteristics of skin and soft-tissue infections in a US population: A retrospective population-based study. BMC Infectious Disease. 2013;13(1):1-11.
12. Wakkee M, De Vries E, Van den Haak P, Nijsten T. Increased risk of infectious disease requiring hospitalization among patients with psoriasis: A population-based cohort. J Am Acad Dermatol. 2011;65(6):1135-44. doi: 10.1016/j.jaad.2010.08.036, PMID 21664719.
13. Esposito S, Noviello S, Leone S. Epidemiology and microbiology of skin and soft tissue infections. Curr Opin Infect Dis. 2016;29(2):109-15. doi: 10.1097/QCO.0000000000000239, PMID 26779772.
14. Grupper M, Nicolau DP. Obesity and skin and soft tissue infections: How to optimize antimicrobial usage for prevention and treatment? Curr Opin Infect Dis. 2017;30(2):180-91. doi: 10.1097/QCO.0000000000000356, PMID 28118218.
15. Darade RB, Zambare KK, Jaiswal NR, Kaware AA. An overview on pharmacotherapy of jock itch (tinea cruris); 2019.
16. Ganaie HA, Wani MA. Candidiasis and dermatophytosis: Infections and their prevention. Fungal Biology. 2021:(35-47) doi: 10.1007/978-3-030-69507-1_3.
17. Sobel JD. Vulvovaginal candidosis. Lancet. 2007;369(9577):1961-71. doi: 10.1016/S0140-6736(07)60917-9.
18. Gnat S, Łagowski D, Nowakiewicz A. Major challenges and perspectives in the diagnostics and treatment of dermatophyte infections. J Appl Microbiol. 2020;129(2):212-32. doi: 10.1111/jam.14611, PMID 32048417.
19. Ramos-e-Silva M, Lima CMO, Schechtman RC, Trope BM, Carneiro S. Superficial mycoses in immunodepressed patients (AIDS). Clin Dermatol. 2010;28(2):217-25. doi: 10.1016/j.clindermatol.2009.12.008, PMID 20347666.
20. Esposito S, De Simone G. Update on the main MDR pathogens: Prevalence and treatment options. Infez Med. 2017;25(4):301-10. PMID 29286008.
21. Miller LG, Eisenberg DF, Liu H, Chang CL, Wang Y, Luthra R, *et al*. Incidence of skin and soft tissue infections in ambulatory and inpatient settings, 2005-2010. BMC Infect Dis. 2015;15(1):362. doi: 10.1186/s12879-015-1071-0, PMID 26293161.
22. Brook I, Frazier EH, Yeager JK. Microbiology of nonbullous impetigo. Pediatr Dermatol. 1997;14(3):192-5. doi: 10.1111/j.1525-1470.1997.tb00235.x, PMID 9192410.
23. Mahé A, Faye O, N'Diaye HT, Ly F, Konaré H, Kéita S, *et al*. Definition of an algorithm for the management of common skin diseases at primary health care level in sub-Saharan Africa. Trans R Soc Trop Med Hyg. 2005;99(1):39-47. doi: 10.1016/j.trstmh.2004.03.008, PMID 15550260.
24. Borelli C, Merk K, Schaller M, Jacob K, Vogeser M, Weindl G, *et al*. *In vivo* porphyrin production by P. acnes in untreated acne patients and its modulation by acne treatment. Acta Derm Venereol. 2006;86(4):316-9. doi: 10.2340/00015555-0088, PMID 16874416.
25. Titus S, Hodge J. Diagnosis and treatment of acne. Am Fam Physician. 2012;86(8):734-40. PMID 23062156.
26. Ballus J, Lopez-Delgado JC, Sabater-Riera J, Perez-Fernandez XL, Betbese AJ, Roncal JA. Surgical site infection in critically ill patients with secondary and tertiary peritonitis: Epidemiology, microbiology and influence in outcomes. BMC Infect Dis. 2015;15(1):304. doi: 10.1186/s12879-015-1050-5, PMID 26223477.
27. Bodey GP. Unusual presentations of infection in neutropenic patients. Int J Antimicrob Agents. 2000;16(2):93-5. doi: 10.1016/s0924-8579(00)00241-7, PMID 11053786.
28. Bernard P. Management of common bacterial infections of the skin. Curr Opin Infect Dis. 2008;21(2):122-8. doi: 10.1097/QCO.0b013e3282f44c63, PMID 18317033.
29. Poulakou G, Lagou S, Tsiodras S. What's new in the epidemiology of skin and soft tissue infections in 2018? Curr Opin Infect Dis. 2019;32(2):77-86. doi: 10.1097/QCO.0000000000000527, PMID 30664027.
30. Toole AA. The impact of public basic research on industrial innovation: Evidence from the pharmaceutical industry. Res Policy. 2012;41(1):1-12. doi: 10.1016/j.respol.2011.06.004.
31. Warrell DA, Cox TM, Benz EJ, Firth JD. Oxford textbook of medicine. Oxford University Press; 2003.
32. Ki V, Rotstein C. Bacterial skin and soft tissue infections in adults: A review of their epidemiology, pathogenesis, diagnosis, treatment and site of care. Can J Infect Dis Med Microbiol. 2008;19(2):173-84. doi: 10.1155/2008/846453, PMID 19352449.
33. Stevens DL, Bisno AL, Chambers HF, Everett ED, Dellinger P, Goldstein EJ, *et al*. Practice guidelines for the diagnosis and management of skin and soft-tissue infections. Clin Infect Dis. 2005;41(10):1373-406. doi: 10.1086/497143, PMID 16231249.
34. Eron LJ, Lipsky BA, Low DE, Nathwani D, Tice AD, Volturo GA, *et al*. Managing skin and soft tissue infections: Expert panel recommendations on key decision points. J Antimicrob Chemother. 2003;52;Suppl 1:i3-i17. doi: 10.1093/jac/dkg466, PMID 14662806.
35. Bassetti M, Baguneid M, Bouza E, Dryden M, Nathwani D, Wilcox M. European perspective and update on the management of complicated skin and soft tissue infections due to methicillin-resistant *Staphylococcus aureus* after more than 10 years of experience with linezolid. Clin Microbiol Infect. 2014;20;Suppl 4:3-18. doi: 10.1111/1469-0691.12463, PMID 24580738.
36. Garau J, Ostermann H, Medina J, Avila M, McBride K, Blasi F, *et al*. Current management of patients hospitalized with complicated skin and soft tissue infections across Europe (2010-2011): Assessment of clinical practice patterns and real-life effectiveness of antibiotics from the REACH study. Clin Microbiol Infect. 2013;19(9):E377-85. doi: 10.1111/1469-0691.12235, PMID 23663184.
37. Schmeller W, Dzikus A. Skin diseases in children in rural Kenya: Long-term results of a dermatology project within the primary health care system. Br J Dermatol. 2001;144(1):118-24. doi: 10.1111/j.1365-2133.2001.03962.x, PMID 11167692.
38. Ruiz-Montaldo R. Summary report by the Steering Committee of the workshop on basic training in skin diseases for developing countries. The proceedings of the 18th World Congress of Dermatology. In: Dermatology. Progress and Perspectives. New York: Parthenon Publishing Group; 1992:146-8.
39. Hollestein LM, Nijsten T. An insight into the global burden of skin diseases. J Invest Dermatol. 2014;134(6):1499-501. doi: 10.1038/jid.2013.513, PMID 24825057.
40. Gebre-Mariam TG, Neubert R, Schmidt PC, Wutzler P, Schmidtke M. Antiviral activities of some Ethiopian medicinal plants used for the treatment of dermatological disorders. J Ethnopharmacol. 2006;104(1-2):182-7. doi: 10.1016/j.jep.2005.08.071, PMID 16233967.
41. Guto JA, Bii CC, Denning DW. Estimated burden of fungal infections in Kenya. J Infect Dev Ctries. 2016;10(8):777-84. doi: 10.3855/jidc.7614, PMID 27580321.
42. Ayaya SO, Kamar KK, Kakai R. Aetiology of tinea capitis in school children. East Afr Med J. 2001;78(10):531-5. doi: 10.4314/eamj.v78i10.8963, PMID 11921597.
43. Oguzkaya Artan M, Koc AN, Baykan Z, Buldu H. Prevalence of *Tinea capitis* in primary school children. Int J Med Investig. 2013;2(2).
44. Chepchirchir A, Bii C, Ndinya-Achola JO. Dermatophyte infections in primary school children in Kibera slums of Nairobi. East Afr Med J. 2009;86(2):59-68. doi: 10.4314/eamj.v86i2.46934, PMID 19894469.
45. Moto JN, Maingi JM, Nyamache AK. Prevalence of Tinea capitis in school going children from Mathare, informal settlement in Nairobi, Kenya. BMC Res Notes. 2015;8(1):274. doi: 10.1186/s13104-015-1240-7, PMID 26116079.
46. Mutisya E, Yarime M. Understanding the grass-roots dynamics of slums in Nairobi: The dilemma of Kibera informal settlements. Int Trans J Eng Manag Appl Sci Technol. 2011;2(2):197-213.
47. Maina M, Mwaniki P, Odira E, Kiko N, McKnight J, Schultsz C, *et al*. Antibiotic use in Kenyan public hospitals: Prevalence, appropriateness and link to guideline availability. Int J Infect Dis. 2020;99:10-8. doi: 10.1016/j.ijid.2020.07.084, PMID 32781162.
48. Maina EK, Kiiyukia C, Wamae CN, Waiyaki PG, Kariuki S. Characterization of methicillin-resistant *Staphylococcus aureus* from skin and soft tissue infections in patients in Nairobi, Kenya. Int J Infect Dis. 2013;17(2):e115-9. doi: 10.1016/j.ijid.2012.09.006, PMID 23092752.
49. Frings M, Lakes T, Müller D, Khan MMH, Epprecht M, Kipruto S, *et al*. Modeling and mapping the burden of disease in Kenya. Sci Rep. 2018;8(1):9826. doi: 10.1038/s41598-018-28266-4, PMID 29959405.
50. Adler NE, Newman K. Socioeconomic disparities in health: Pathways and policies. Health Aff (Millwood). 2002;21(2):60-76. doi: 10.1377/hlthaff.21.2.60, PMID 11900187.
51. Patil RK, Kabera B, Muia CK, Ale BM. Hospital acquired infections in a private paediatric hospital in Kenya: A retrospective cross-sectional study. Pan Afr Med J. 2022;41:28. doi: 10.11604/pamj.2022.41.28.25820, PMID 35291367.
52. Kisangau D, Kokwaro JO. Use of medicinal plants: Kenya. Examples of the successful conservation and sustainable use of dryland biodiversity. 2004;60-3.
53. Kokwaro J. Conservation status of the Kakamega Forest in Kenya; 1988.
54. Jeruto P, Lukhoba C, Ouma G, Otieno D, Mutai C. An ethnobotanical study of medicinal plants used by the Nandi people in Kenya. J Ethnopharmacol. 2008;116(2):370-6. doi: 10.1016/j.jep.2007.11.041, PMID 18215481.
55. Kaigongi M, Musila F. Ethnobotanical study of medicinal plants used by Tharaka people of Kenya. Internationa Journal of Ethnobiology and Ethnomedicine. 2015;1(1):1-8.
56. Kariba RM. Antifungal activity of *Ajuga remota*. Fitoterapia. 2001;72(2):177-8. doi: 10.1016/s0367-326x(00)00280-x, PMID 11223230.
57. Kisangau DP, Herrmann TM. Utilization and conservation of medicinal plants used for primary health care in Makueni District, Kenya. Int J Biodivers Sci Manag. 2007;3(3):184-92. doi: 10.1080/17451590709618172.
58. Kisangau DP, Kauti M, Mwobobia R, Kanui T, Musimba N. Traditional knowledge on use of medicinal plants in Kitui County, Kenya. International Journal of Ethnobiology and Ethnomedicine. 2017;4(1):1-10.
59. Mutwiwa C, Rotich B, Kauti M, Rithaa J. Ethnobotanical survey of medicinal plants in Mwala sub-county, Machakos County, Kenya. Journal of Diseases and Medicinal Plants. 2018; 4:110-9. doi: 10.11648/j.jdmp.20180404.12
60. Mwitari PG, Ayeka PA, Ondicho J, Matu EN, Bii CC. Antimicrobial activity and probable mechanisms of action of medicinal plants of Kenya: *Withania somnifera*, *Warbugia ugandensis*, *Prunus africana* and *Plectrunthus barbatus*. PLOS ONE. 2013;8(6):e65619. doi: 10.1371/journal.pone.0065619, PMID 23785437.
61. Njoroge GN, Bussmann RW. Ethnotherapeautic management of skin diseases among the Kikuyus of Central Kenya. J Ethnopharmacol. 2007;111(2):303-7. doi: 10.1016/j.jep.2006.11.025, PMID 17207950.
62. Odongo E, Mungai N, Mutai P, Karumi E, Mwangi J, Omale J. Ethnobotanical survey of the medicinal plants used in Kakamega County, Western Kenya. Applied Medical Research. 2018;4(1):22. doi: 10.5455/amr.20180315095706.
63. Mutuku A, Mwamburi L, Keter L, Ondicho J, Korir R, Kuria J, *et al*. Evaluation of the antimicrobial activity and safety of *Rhus vulgaris* (Anacardiaceae) extracts. BMC Complement Med Ther. 2020;20(1):272. doi: 10.1186/s12906-020-03063-7, PMID 32912200.

64. Wambugu SN, Mathiu PM, Gakuya DW, Kanui TI, Kabasa JD, Kiama SG. Medicinal plants used in the management of chronic joint pains in Machakos and Makueni counties, Kenya. J Ethnopharmacol. 2011;137(2):945-55. doi: 10.1016/j.jep.2011.06.038, PMID 21782014.
65. Nyamboki DK, Wanga LA. Review of the phytochemical and pharmacological studies of the genus Ormocarpum. Pharmacogn Rev. 2022;16(32):95-9. doi: 10.5530/phrev.2022.16.14.
66. Majid I, Sheikh G, Kanth F, Hakak R. Relapse after oral terbinafine therapy in dermatophytosis: A clinical and mycological study. Indian J Dermatol. 2016;61(5):529-33. doi: 10.4103/0019-5154.190120, PMID 27688443.
67. Mosam A, Dlova NC. HIV/AIDS in sub-Saharan Africa. Dermatol Clin. 2006;24(4):421-9. doi: 10.1016/j.det.2006.06.003, PMID 17010772.
68. Ministry of Health. Kenya, report-MOHK; 2020.
69. Seth D, Cheldize K, Brown D, Freeman EF. Global burden of skin disease: Inequities and innovations. Curr Dermatol Rep. 2017;6(3):204-10. doi: 10.1007/s13671-017-0192-7, PMID 29226027.
70. Saikia AP, Ryakala VK, Sharma P, Goswami P, Bora U. Ethnobotany of medicinal plants used by Assamese people for various skin ailments and cosmetics. J Ethnopharmacol. 2006;106(2):149-57. doi: 10.1016/j.jep.2005.11.033, PMID 16473486.
71. Nyamboki DK, Bedane KG, Hassan K, Brieger L, Strohmann C, Spiteller M, *et al*. Cytotoxic compounds from the Stem Bark of two subsp. of *Bersama abyssinica*. J Nat Prod. 2021;84(5):1453-8. doi: 10.1021/acs.jnatprod.0c01141, PMID 33974421.
72. Nyamboki DK, Bedane KG, Hassan K, Spiteller M, Matasyoh JC. Cytotoxic compounds from the leaf of *Bersama abyssinica* subspecies abyssinica. Phytochemistry. 2022;198:113153. doi: 10.1016/j.phytochem.2022.113153, PMID 35240134.
73. Chepkirui C, Yuyama KT, Wanga LA, Decock C, Matasyoh JC, Abraham WR, *et al*. Microporenic acids A–G, biofilm inhibitors, and antimicrobial agents from the Basidiomycete Microporus species. J Nat Prod. 2018;81(4):778-84. doi: 10.1021/acs.jnatprod.7b00764, PMID 29489350.
74. Houghton PJ, Hylands PJ, Mensah AY, Hensel A, Deters AM. *In vitro* tests and ethnopharmacological investigations: Wound healing as an example. J Ethnopharmacol. 2005;100(1-2):100-7. doi: 10.1016/j.jep.2005.07.001, PMID 16040217.
75. Bjorå CS, Wabuyele E, Grace OM, Nordal I, Newton LE. The uses of Kenyan aloes: An analysis of implications for names, distribution and conservation. J Ethnobiol Ethnomed. 2015;11(1):82. doi: 10.1186/s13002-015-0060-0, PMID 26607663.
76. Alajmi MF, Alam P, Alqasoumi SI, Ali Siddiqui NA, Basudan OA, Hussain A, *et al*. Comparative anticancer and antimicrobial activity of aerial parts of *Acacia salicina, Acacia laeta, Acacia hamulosa* and *Acacia tortilis* grown in Saudi Arabia. Saudi Pharm J. 2017;25(8):1248-52. doi: 10.1016/j.jsps.2017.09.010, PMID 29204075.
77. Zingare AK. Antimicrobial activity of *Adansonia digitata* and *Cochlospermum religiosum* extracts against *E. coli* and *S. aureus* isolates. International Journal of Researches in Bioscien ces. Agric Technol. 2015:11-4.
78. Samatha T, Shama N, Chandrakala G, Thirupathi K, Rama Swamy N. Antibacterial activity of *Adansonia digitata* L.: A globally endangered tree. Int J Pharmacogn Phytochem Res. 2017;9(11):1410-3.
79. Santos JD, Branco A, Silva AF, Pinheiro CS, Neto AG, Uetanabaro AP, *et al*. Antimicrobial activity of *Agave sisalana*. Afr J Biotechnol. 2009;8(22). doi: 10.5897/AJB09.862
80. Mishra DN, Dixit V, Mishra AK. Mycotoxic evaluation of some higher plants against ringworm causing fungi. Indian Drugs. 1991;28(7):300-3.
81. Perumal Samy RP, Ignacimuthu S, Raja DP. Preliminary screening of ethnomedicinal plants from India. J Ethnopharmacol. 1999;66(2):235-40. doi: 10.1016/s0378-8741(99)00038-0, PMID 10433484.
82. Kamboj A, Saluja AK. *Ageratum conyzoides* L.: A review on its phytochemical and pharmacological profile. Int J Green Pharm (IJGP). 2008;2(2). doi:10.1186/1471-2334-13-252
83. Mbosso EJT, Ngouela S, Nguedia JCA, Beng VP, Rohmer M, Tsamo E. *In vitro* antimicrobial activity of extracts and compounds of some selected medicinal plants from Cameroon. J Ethnopharmacol. 2010;128(2):476-81. doi: 10.1016/j.jep.2010.01.017, PMID 20093175.
84. Waithaka PN, Gathuru EM, Githaiga BM, Kazungu RZ. Antimicrobial properties of *Aloe vera, Aloe volkensii* and Aloe *secundiflora* from Egerton University. Acta Sci Microbiol. 2018;1(5):06-10.
85. Anywar G, Tugume P, Kakudidi EK. A review of Aloe species used in traditional medicine in East Africa. S Afr J Bot. 2022;147:1027-41. doi: 10.1016/j.sajb.2021.07.036.
86. Hamza OJ, Van den Bout-van den Beukel CJ, Matee MI, Moshi MJ, Mikx FH, Selemani HO, *et al*. Antifungal activity of some Tanzanian plants used traditionally for the treatment of fungal infections. J Ethnopharmacol. 2006;108(1):124-32. doi: 10.1016/j.jep.2006.04.026, PMID 16829001.
87. Jalalpure SS, Agrawal N, Patil MB, Chimkode R, Tripathi A. Antimicrobial and wound healing activities of leaves of *Alternanthera sessilis* Linn. Int J Green Pharm (IJGP). 2008;2(3)
88. Kumari MEVN, Krishnan V. Antimicrobial activity of *Alternanthera sessilis* (L.) R. BR. Ex. DC and *Alternanthera Philoxeroides* (Mart). Griseb. World Journal of Research and Review. 2016;3(3):262897.
89. Pe NN. Functional groups determination and antimicrobial activity of isolated compound from *Alternanthera sessilis* (L.). DC; 2019.
90. Mshelia EH, Zaria LT, Mohammed AH, Jaji N. Phytochemical analysis and antibacterial screening of *Asparagus flagellaris* (Kunth) Bak used in the traditional treatment of sexually transmitted diseases and urinary infections. Ethiop J Env Stud and Manag. 2008;1(2):44-8. doi: 10.4314/ejesm.v1i2.41579.
91. Odeja OO, Ibok MG, Okpala EO. Composition and biological assays of the leaf essential oil of *Asparagus flagellaris* (Kunth) Bak. Clin Phytosci. 2021;7(1):1-8.
92. Kuria JM. Efficacy of *Aspilia pluriseta* schweinf in cutaneous wound healing in a mouse model ([doctoral dissertation]. University of Nairobi); 2014.
93. Njeru SN, Muema JM. Antimicrobial activity, phytochemical characterization and gas chromatography-mass spectrometry analysis of *Aspilia pluriseta* Schweinf. Extracts. Heliyon. 2020;6(10):e05195. doi: 10.1016/j.heliyon.2020.e05195, PMID 33083626.
94. Cos P, Hermans N, De Bruyne T, Apers S, Sindambiwe JB, Vanden Berghe DV, *et al*. Further evaluation of Rwandan medicinal plant extracts for their antimicrobial and antiviral activities. J Ethnopharmacol. 2002;79(2):155-63. doi: 10.1016/s0378-8741(01)00362-2, PMID 11801376.
95. Amuka O, Machocho AK, Okemo PO, Mbugua PK. Antifungal and antibacterial activity of Crude Stem Bark Extracts' of *Bersama abysinicca* Verdc. and *Faurea saligna* Harr. Res Journal of Medicinal Plants. 2015;9(4):160-9. doi: 10.3923/rjmp.2015.160.169.
96. Asumang P, Boakye YD, Agana TA, Yakubu J, Entsie P, Akanwariwiak WG, *et al*. Antimicrobial, antioxidant and wound healing activities of methanol leaf extract of *Bridelia micrantha* (Hochst.) Baill. Sci Afr. 2021;14:e00980. doi: 10.1016/j.sciaf.2021.e00980.
97. Ngane RAN. Antibacterial activity of methanol extract and fractions from stem Bark of *Bridelia micrantha* (Hochst.) Baill. (Phyllanthaceae). EC Pharmacol Toxicol. 2019;7:609-16.
98. Adefuye AO, Ndip RN. Phytochemical analysis and antibacterial evaluation of the ethyl acetate extract of the stem bark of *Bridelia micrantha*. Pharmacogn Mag. 2013;9(33):45-50. doi: 10.4103/0973-1296.108139, PMID 23661993.
99. Okigbo RN, Omodamiro OD. Antimicrobial effect of leaf extracts of pigeon pea (*Cajanus cajan* (L.) Mill sp.) on some human pathogens. J Herbs Spices Med Plants. 2007;12(1-2):117-27. doi: 10.1300/J044v12n01_11.
100. Qi XL, Li TT, Wei ZF, Guo N, Luo M, Wang W, *et al*. Solvent-free microwave extraction of essential oil from pigeon pea leaves [*Cajanus cajan* (L.) Mill sp.] and evaluation of its antimicrobial activity. Ind Crops Prod. 2014;58:322-8. doi: 10.1016/j.indcrop.2014.04.038.
101. Kong Y, Fu YJ, Zu YG, Chang FR, Chen YH, Liu XL, *et al*. Cajanuslactone, a new coumarin with anti-bacterial activity from pigeon pea [*Cajanus cajan* (L.) Mill sp.] leaves. Food Chem. 2010;121(4):1150-5. doi: 10.1016/j.foodchem.2010.01.062.
102. Sowjanya KM, Narendra K, Swathi J, Satya K. Phytochemical extraction and antimicrobial efficiency of crude leaf extract of medicinal plant, *Cascabela thevetia*. International Journal of Research in Pharmaceutical and Biomedical Sciences. 2013;4(2):465-70.
103. Solomon S, Muruganantham N, Senthamilselvi MM. Antimicrobial activity of *Cascabela thevetia* (Flowers). Journal of Pharmacognosy and Phytochemistry. 2016;5(5):335.
104. Seetharaman S, Indra V, Sundar N, Geetha S. Phytochemical profiling, antibacterial activity and antioxidant potential of *Cascabela thevetia* (L.) whole plant extracts. J Pharmacogn Phytochem. 2017;6(3):93-7.
105. Singh SA, Singh NR. Antimicrobial activity of *Cassia didymobotrya* and *Phlogacanthus thyrsiflorus*. J Chem Pharm Res. 2010;2(4):304-8.
106. Musau J, Wanjiru I. Phytochemical Screening and *in vitro* antibacterial activity of *Cassia didymobotrya* Fres; 2020.
107. Hussein HJ, Sahi NM, Saad AM, Altameme HJ. The antibacterial Effect of bioactive compounds extracted from *Cassia didymobotrya* (Fresenius) Irwin and Barneby against Some Pathogenic Bacteria. Ann Trop Med Public Health. 2019;22(1).
108. Hojjati M, Barzegar H. Chemical composition and biological activities of lemon (Citrus limon) leaf essential oil. Nutr Food Sci Res. 2017;4(4):15-24. doi: 10.29252/nfsr.4.4.3.
109. Hamdan D, Ashour ML, Mulyaningsih S, El-Shazly A, Wink M. Chemical composition of the essential oils of variegated pink-fleshed lemon (*Citrus limon* L. Burm. f.) and their anti-inflammatory and antimicrobial activities. Z Naturforsch C J Biosci. 2013;68(7-8):275-84. doi: 10.1515/znc-2013-7-804, PMID 24066512.
110. Kirbaşlar FG, Tavman A, Dülger B, Türker G. Antimicrobial activity of Turkish citrus peel oils. Pak J Bot. 2009;41(6):3207-12.
111. Salawu KM, Oyerinde AA, Bello RH. Antiproliferative and antimicrobial activities of *Citrus limon* (L.) Burm. f. Stem Bark Extract. Niger J Basic Appl Sci. 2021;29(1):49-54. doi: 10.4314/njbas.v29i1.6.
112. Njeru SN, Obonyo M, Nyambati S, Ngari S, Mwakubambanya R, Mavura H. Antimicrobial and cytotoxicity properties of the organic solvent fractions of *Clerodendrum myricoides* (Hochst.) R. Br. ex Vatke: Kenyan traditional medicinal plant. J Intercult Ethnopharmacol. 2016;5(3):226-32. doi: 10.5455/jice.20160416122003, PMID 27366347.
113. Khalil OM, Almagboul AZ, Ahmed MA. Antibacterial activity pf *Combretum aculeatum* vent; 2001.
114. Mangoyi R, Mafukidze W, Marobela K, Mukanganyama S. Antifungal activities and preliminary phytochemical investigation of Combretum species from Zimbabwe. J Microb Biochem Technol. 2012;4:37-44.

115. Masoko P, Picard J, Eloff JN. The antifungal activity of twenty-four southern African Combretum species (Combretaceae). S Afr J Bot. 2007;73(2):173-83. doi: 10.1016/j.sajb.2006.09.010.
116. Lima GRDM, De Sales IRP, Caldas Filho MRD, De Jesus NZT, Falcão HDS, Barbosa-Filho J. M, *et al*. Bioactivities of the genus Combretum (Combretaceae): A review. Molecules. 2012;17(8)
117. Hamedi A, Zomorodian K, Safari F. Antimicrobial activity of four medicinal plants widely used in Persian folk medicine. Res J Pharmacogn. 2015;2(1):25-33.
118. Kiruthiga R, Rakkimuthu R, Aravinthan KM. Antibacterial activity of *Crotalaria pallida* Aiton. (Fabaceae). Indian J Pharm Biol Res. 2014;2(1):82-5. doi: 10.30750/ijpbr.2.1.13.
119. Obey JK, Von Wright A, Orjala J, Kauhanen J, Tikkanen-Kaukanen C. Antimicrobial activity of *Croton macrostachyus* stem bark extracts against several human pathogenic bacteria. J Pathog. 2016;2016:1453428. doi: 10.1155/2016/1453428, PMID 27293897.
120. Teugwa MC, Sonfack DC, Fokom R, Penlap BV, Amvam ZP. Antifungal and antioxidant activity of crude extracts of three medicinal plants from *Cameroon pharmacopea*. J Med Plants Res. 2013;7(21):1537-42.
121. Maroyi A. Ethnopharmacological uses, phytochemistry, and pharmacological properties of *Croton macrostachyus* Hochst. Ex Delile: A comprehensive review. Evid Based Complement Alternat Med. 2017;2017:1694671. doi: 10.1155/2017/1694671, PMID 29234365.
122. Matu EN, Van Staden J. Antibacterial and anti-inflammatory activities of some plants used for medicinal purposes in Kenya. J Ethnopharmacol. 2003;87(1):35-41. doi: 10.1016/s0378-8741(03)00107-7, PMID 12787952.
123. Vadlapudi V, Kaladhar DSVGK. Antimicrobial study of plant extracts of *Datura metel* L. against some important disease causing pathogens. Asian Pac J Trop Dis. 2012;2:S94-7. doi: 10.1016/S2222-1808(12)60130-3.
124. Dhiman A, La R, Bhan M, Dhiman B, Hooda A. Plebeian assessment of anti microbial and *in vitro* antioxidant zest of *D. fastuosa* L. seeds. J Pharm Sci Innov. 2012;1(4):49-53.
125. Gaire BP, Subedi L. A review on the pharmacological and toxicological aspects of *Datura stramonium* L. J Integr Med. 2013;11(2):73-9. doi: 10.3736/jintegrmed2013016, PMID 23506688.
126. Sarkodie JA, Squire SA, Oppong Bekoe E, Kretchy IA, Domozoro CYF, Ahiagbe KMJ, *et al*. The antihyperglycemic, antioxidant and antimicrobial activities of Ehretia cymosa; 2015.
127. Amsalu A, Gelaye A, Fesseha H. *In-vitro* antibacterial Effects of *Laggera alata* and *Ehretia cymosa* against *Staphylococcus aureus* and *Streptococcus aglactiae* Isolated from Bovine Mastitis. J Vetmed Anim Sci. 2020;3(1):1036.
128. Tan M, Zhou L, Huang Y, Wang Y, Hao X, Wang J. Antimicrobial activity of globulol isolated from the fruits of *Eucalyptus globulus* Labill. Nat Prod Res. 2008;22(7):569-75. doi: 10.1080/14786410701592745, PMID 18569693.
129. Mulyaningsih S, Sporer F, Reichling J, Wink M. Antibacterial activity of essential oils from *Eucalyptus* and of selected components against multidrug-resistant bacterial pathogens. Pharm Biol. 2011;49(9):893-9. doi: 10.3109/13880209.2011.553625, PMID 21591991.
130. Bachir RG, Benali M. Antibacterial activity of leaf essential oils of *Eucalyptus globulus* and *Eucalyptus camaldulensis*. Afr J Pharm Pharmacol. 2008;2(10):211-5.
131. Bachir RG, Benali M. Antibacterial activity of the essential oils from the leaves of *Eucalyptus globulus* against *Escherichia coli* and *Staphylococcus aureus*. Asian Pac J Trop Biomed. 2012;2(9):739-42. doi: 10.1016/S2221-1691(12)60220-2, PMID 23570005.
132. Athikomkulchai S, Watthanachaiyingcharoen R, Tunvichien S, Vayumhasuwan P, Karnsomkiet P, Sae-Jong P, *et al*. The development of anti-acne products from *Eucalyptus globulus* and *Psidium guajava* oil. J Health Res. 2008;22(3):109-13.
133. Tomen I, Guragac FT, Keles H. Reunanen M, Kupeli-Akkol E. Characterization and Wound Repair Potential of Essential Oil *Eucalyptus globulus* Labill. 2017.
134. Shalinder K, Harminder PS, Daizy RB, Ravinder KK. Chemical characterization, antioxidant and antifungal activity of essential oil from *Eucalyptus tereticornis*. J Med Plants Res. 2011;5(19):4788-93.
135. Baptista EB, Zimmermann-Franco DC, Lataliza AAB, Raposo NRB. Chemical composition and antifungal activity of essential oil from *Eucalyptus smithii* against dermatophytes. Rev Soc Bras Med Trop. 2015;48(6):746-52. doi: 10.1590/0037-8682-0188-2015, PMID 26676500.
136. Arango WM. Ruíz JMA, Jaramillo CAP. Fungicidal activity of *Eucalyptus tereticornis* essential oil on the pathogenic fungus *Fusarium oxysporum*. Rev Cuba Farm. 2011;45(2):264-74.
137. Ammer MR, Zaman S, Khalid M, Bilal M, Erum S, Huang D, *et al*. Optimization of antibacterial activity of *Eucalyptus tereticornis* leaf extracts against *Escherichia coli* through response surface methodology. J Radiat Res Appl Sci. 2016;9(4):376-85. doi: 10.1016/j.jrras.2016.05.001.
138. Tiwari P, Sahu PK. *Eucalyptus tereticornis*: Phytochemical constituents and medicinal properties. Res J Pharm Technol. 2018;11(6):2677-80. doi: 10.5958/0974-360X.2018.00496.1.
139. Upadhyay B, Singh KP, Kumar A. Ethno-medicinal, phytochemical and antimicrobial studies of *Euphorbia tirucalli* L. J Phytol. 2010;2(4).
140. De Araújo KM, De Lima A, Silva Jdo N, Rodrigues LL, Amorim AG, Quelemes PV, *et al*. Identification of phenolic compounds and evaluation of antioxidant and antimicrobial properties of *Euphorbia tirucalli* L. Antioxidants (Basel). 2014;3(1):159-75. doi: 10.3390/antiox3010159, PMID 26784670.
141. Swapna NL, Prasad M, Prasad SHKR. Efficacy of *Euphorbia tirucalli* (L.) towards microbicidal activity against human pathogens. Int J Pharm Biol Sci. 2011;2:12-8.
142. Mali PY, Panchal SS. *Euphorbia tirucalli* L.: Review on morphology, medicinal uses, phytochemistry and pharmacological activities. Asian Pac J Trop Biomed. 2017;7(7):603-13. doi: 10.1016/j.apjtb.2017.06.002.
143. Rechab SO, Ngugi CM, Maina EG, Madivoli ES, Kareru PG, Mutembei JK, *et al*. Antioxidant activity and antimicrobial properties of *Entada Leptostachya* and *Prosopis juliflora* extracts. J Med Plants Econ Dev. 2018;2(1):1-8.
144. Viswanath V, Urooj A, Malleshi NG. Evaluation of antioxidant and antimicrobial properties of finger millet polyphenols (*Eleusine coracana*). Food Chem. 2009;114(1):340-6. doi: 10.1016/j.foodchem.2008.09.053.
145. Jayawardana SAS, Samarasekera JKRR, Hettiarachchi GHCM. Antimicrobial properties of ethanolic and methanolic extracts of finger millet (*Eleusine coracana* (L.) Gaertn.) Varieties cultivated. Interface Sci Lanka. 2020.
146. Aisoni JE, Yusha'u M, Orole OO. Antimicrobial and antidiabetic potentials of processed finger millet (*Eleusine coracana*); 2018.
147. Korir K, Bii C, Kiiyukia C, Mutai C. Antimicrobial activities of *Clutia abyssinica* and *Erythrina abyssinica* plants extracts used among the Kipsigis community of Bomet District in Kenya. Natural Product. 2011;7(5):247-52.
148. Marume A, Matope G, Katsande S, Khoza S, Mutingwende I, Mduluza T, *et al*. Wound healing properties of selected plants used in ethnoveterinary medicine. Front Pharmacol. 2017;8:544. doi: 10.3389/fphar.2017.00544, PMID 28932192.
149. Wagate CG, Mbaria JM, Gakuya DW, Nanyingi MO, Kareru PG, Njuguna A, *et al*. Screening of some Kenyan medicinal plants for antibacterial activity. Phytotherapy Research: An. Int J Devoted Pharmacol Toxicol Eval Nat Prod Derivatives. 2010;24(1):150-3.
150. Manyarara TE, Chifamba J, Tarugarira FT. Antifungal activity of *Ziziphus mucronata* and *Erythrina abyssinica* bark crude extracts on *Cryptococcus neofomans* and Candida albicans species. BJPR. 2016;10(3):1-11. doi: 10.9734/BJPR/2016/23843.
151. Mukavi J, Omosa LK, Nchiozem-Ngnitedem VA, Nyaga J, Omole R, Bitchagno GTM, *et al*. Anti-inflammatory norhopanes from the root bark of *Fagaropsis angolensis* (Engl.) HM Gardner. Fitoterapia. 2020;146:104690. doi: 10.1016/j.fitote.2020.104690, PMID 32707156.
152. Mutinda ES, Mkala EM, Nanjala C, Waswa EN, Odago WO, Kimutai F, *et al*. Traditional medicinal uses, pharmacology, phytochemistry, and distribution of the Genus Fagaropsis (Rutaceae). J Ethnopharmacol. 2022;284:114781. doi: 10.1016/j.jep.2021.114781, PMID 34715298.
153. Zakaria A, Abdel-Motaal F, Mahalel U. Antifungal activity of *Ficus sycomorus* L. extracts against dermatophytes and other associated fungi isolated from Camels ringworm lesions. J Biol Stud. 2018;1(3):116-32.
154. Mohamed ZS, Hayssam MA. Antimicrobial activities and phytochemical composition of extracts of Ficus species: An over view. Afr J Microbiol Res. 2013;7(33):4207-19.
155. Salem WM, Haridy M, Sayed WF, Hassan NH. Antibacterial activity of silver nanoparticles synthesized from latex and leaf extract of *Ficus sycomorus*. Ind Crops Prod. 2014;62:228-34. doi: 10.1016/j.indcrop.2014.08.030.
156. Santos PO, Costa MdJC, Alves JAB, Nascimento PFC, de Melo DLFMd, Barbosa Jr AM, *et al*. Chemical composition and antimicrobial activity of the essential oil of *Hyptis pectinata* (l.) Poit. Quim Nova. 2008;31(7):1648-52. doi: 10.1590/S0100-40422008000700009.
157. Malan K, Dusart G, Marion C, Loukou Y, Siméon de Buochberg M, Attisso M, *et al*. Antibacterial activity of the essential oil of *Hyptis pectinata* (L.) Poit. Plantes Médicinales et Phytothérapie. 1986;20(4):323-9.
158. Cahyono B, Suzery M, Amalina ND, Bima DN. Synthesis and antibacterial activity of epoxide from hyptolide (*Hyptis pectinata* (L.) Poit.) against Gram-positive and Gram-negative bacteria. J Appl Pharm Sci. 2020;10(12):013-22.
159. Aiyelaagbe OO, Adesogan EK, Ekundayo O, Adeniyi BA. The antimicrobial activity of roots of *Jatropha podagrica* (Hook.). Phytother Res. 2000;14(1):60-2. doi: 10.1002/(sici)1099-1573(200002)14:1<60::aid-ptr597>3.0.co;2-b, PMID 10641053.
160. Aiyelaagbe OO, Adesogan K, Ekundayo O, Gloer JB. Antibacterial diterpenoids from *Jatropha podagrica* Hook. Phytochemistry. 2007;68(19):2420-5. doi: 10.1016/j.phytochem.2007.05.021, PMID 17604062.
161. Odebiyi OO. Antibacterial property of tetramethyl-pyrazine from the stem of *Jatropha podagrica*. Planta Med. 1980;38(2):144-6. doi: 10.1055/s-2008-1074850, PMID 7367488.
162. Minh TN, Xuan TD, Tran HD, Van TM Andriana Y, Khanh TD, *et al*. Isolation and purification of bioactive compounds from the stem bark of *Jatropha podagrica*. Molecules. 2019;24(5):889. doi: 10.3390/molecules24050889, PMID 30832436.
163. Bello I, Shehu MW, Musa M, Zaini Asmawi MZ, Mahmud R. *Kigelia africana* (Lam.) Benth. (Sausage tree): Phytochemistry and pharmacological review of a quintessential African traditional medicinal plant. J Ethnopharmacol. 2016;189:253-76. doi: 10.1016/j.jep.2016.05.049, PMID 27220655.
164. Grace OM, Light ME, Lindsey KL, Mulholland DA, Van Staden J, Jager AK. Antibacterial activity and isolation of active compounds from fruit of the traditional African medicinal tree *Kigelia africana*. S Afr J Bot. 2002;68(2):220-2. doi: 10.1016/S0254-6299(15)30424-5.
165. Owolabi OJ, Omogbai EK, Obasuyi O. Antifungal and antibacterial activities of the ethanolic and aqueous extract of *Kigelia africana* (Bignoniaceae) stem bark. Afr J Biotechnol. 2007;6(14).

166. Deena MJ, Thoppil JE. Antimicrobial activity of the essential oil of *Lantana camara*. Fitoterapia. 2000;71(4):453-5. doi: 10.1016/s0367-326x(00)00140-4, PMID 10925025.
167. Sonibare OO, Effiong I. Antibacterial activity and cytotoxicity of essential oil of *Lantana camara* L. leaves from Nigeria. Afr J Biotechnol. 2008;7(15).
168. Pradeep BV, Tejaswini M, Nishal P, Pardhu G, Shylaja S, Kumar KCh. Phytochemical screening and antimicrobial activities of plant extract of *Lantana camara*. J Environ Biol. 2013;34(3):645-9. PMID 24617153.
169. Remya M, Vashum N, Sivasankar S. Bioactivity studies on *Lantana camara* Linn. Int J Pharm Biol Sci. 2013;4(1):81-90.
170. Rizvi ZF, Mukhtar R, Chaudhary MF, Zia M. Antibacterial and antifungal activities of *Lawsonia inermis*, *Lantana camara* and *Swertia angustifolia*. Pak J Bot. 2013;45(1):275-8.
171. Amutha S. Phytochemical investigation and *in vitro* evaluation of *Lantana camara* seed extracts on selected human pathogenic bacteria. Int J Pharm Biol Sci. 2014;5(4):416-21.
172. Mahmood AA, Pouya H, Hapipah MA, Suzita MN, Fouad HM, Nor S, *et al*. Acceleration of wound healing potential by *Lantana camara* leaf extract in experimental rats. Res J Med Sci. 2009;3(2):75-9.
173. Inbaraj SD, Menezes G, Josephine G, Muniappan M, Muthiah NS. Antibacterial effect of *Lantana camara* Linn. On Gram negative bacteria and NDM-1 strain: An *in vitro* study. Asian J Pharm Clin Res. 2014;7(2):9-12.
174. Mekala S, Naresh MK, Das L, Shetty N, Amuthan A, Vulli V, *et al*. Evaluation of wound healing activity of ethanolic extract of *Lantana camara* in streptozotocin induced diabetic rats. Int J Pharm Pharm Sci. 2014;6(1):631-3.
175. Onyango Arot Manguro L, Okind Owuor P, Atieno Ochung A. Isolation, characterization and biological activities of phytoconstituents from *Lonchocarpus eriocalyx* Harms leaves. 2018.
176. Taveira M, Silva LR, Vale-Silva LA, Pinto E, Valentão P, Ferreres F, *et al*. Lycopersicon esculentum seeds: An industrial byproduct as an antimicrobial agent. J Agric Food Chem. 2010;58(17):9529-36. doi: 10.1021/jf102215g, PMID 20707344.
177. Lucy AW, Isabel NW, Ramadhan M, Josphat CM. Antimicrobial activity of metabolites extracted from *Zanthoxylum gilletii, Markhamia lutea* and their endophytic fungi against common bean bacterial pathogens. Afr J Biotechnol. 2018;17(27):870-9. doi: 10.5897/AJB2018.16463.
178. Sen A, Batra A. Evaluation of antimicrobial activity of different solvent extracts of medicinal plant: *Melia azedarach* L. Int J Curr Pharm Res. 2012;4(2):67-73.
179. Khan AV, Ahmed QU, Mir MR, Shukla I, Khan AA. Antibacterial efficacy of the seed extracts of *Melia azedarach* against some hospital isolated human pathogenic bacterial strains. Asian Pac J Trop Biomed. 2011;1(6):452-5. doi: 10.1016/S2221-1691(11)60099-3, PMID 23569812.
180. Carpinella MC, Herrero GG, Alonso RA, Palacios SM. Antifungal activity of *Melia azedarach* fruit extract. Fitoterapia. 1999;70(3):296-8. doi: 10.1016/S0367-326X(99)00009-X.
181. Saleem R, Ahmed SI, Shamim SM, Faizi S, Siddiqui BS. Antibacterial effect of *Melia azedarach* flowers on rabbits. Phytotherapy Research: An. Int J Devoted Pharmacol Toxicol Eval Nat Prod Derivatives. 2002;16(8):762-4.
182. Kamau RW, Juma BF, Baraza LD. Antimicrobial compounds from root, stem bark and seeds of *Melia volkensii*. Nat Prod Res. 2016;30(17):1984-7. doi: 10.1080/14786419.2015.1101104, PMID 26517430.
183. Rogers LL. Bioactive constituents of *Melia volkensii* Gurke (Meliaceae) ([doctoral dissertation]. Purdue University); 1998.
184. Chukwujekwu JC, Amoo SO, Van Staden J. Antimicrobial, antioxidant, mutagenic and antimutagenic activities of *Distephanus angulifolius* and *Ormocarpum trichocarpum*. J Ethnopharmacol. 2013;148(3):975-9. doi: 10.1016/j.jep.2013.06.003, PMID 23751394.
185. Chukwujekwu JC, De Kock CA, Smith PJ, Van Heerden FR, Van Staden J. Antiplasmodial and antibacterial activity of compounds isolated from *Ormocarpum trichocarpum*. Planta Med. 2012;78(17):1857-60. doi: 10.1055/s-0032-1315386, PMID 23059633.
186. Gathu LW. Evaluation of antimicrobial activity of some plants used by herbalists in Central Province, Kenya ([doctoral dissertation], Kenyatta University). 2006.
187. Sharififar F, Ansari M, Eslaminejad T, Ohadi M, Mobarrez B, Raeiszadeh M, *et al*. Antimicrobial potency of plant species: A review. Eur J Med Plants. 2016;11(1):1-17. doi: 10.9734/EJMP/2016/20114.
188. Jeyachandran R, Mahesh A, Cindrella L, Sudhakar S, Pazhanichamy K. Antibacterial activity of plumbagin and root extracts of *Plumbago zeylanica* L. Acta Biol Cracoviensia Bot. 2009;51(1):17-22.
189. Subhash K, Wabale AS, Kharde MN. Phytochemical screening and antimicrobial studies on *Plumbago zeylanica* L. Adv Biol Res. 2013;4(3):115-7.
190. Mallikadevi T, Paulsamy S. *Plumbago zeylanica* L. a potential plant for antimicrobial activity. Plant Arch. 2010;10(2):547-50.
191. Roy A, Bharadvaja N. A review on pharmaceutically important medical plant: *Plumbago zeylanica*. J Ayu Her Med. 2017;3(4):225-8. doi: 10.31254/jahm.2017.3411.
192. Singh MK, Pandey A, Sawarkar H, Gupta A, Gidwani B, Dhongade H, *et al*. Methanolic extract of *Plumbago zeylanica*-a remarkable antibacterial agent against many human and agricultural pathogens. J Pharmacopuncture. 2017;20(1):18-22. doi: 10.3831/KPI.2017.20.004, PMID 28392958.
193. Madivoli ES, Maina EG, Kairigo PK, Murigi MK, Ogilo JK, Nyangau JO, *et al*. *In vitro* antioxidant and antimicrobial activity of *Prunus africana* (Hook. f.) Kalkman (bark extracts) and *Harrisonia abyssinica* Oliv. Extracts (bark extracts): A comparative study. J Med Plants Econ Dev. 2018;2(1):1-9.
194. Bii C, Korir KR, Rugutt J, Mutai C. The potential use of *Prunus africana* for the control, treatment and management of common fungal and bacterial infections. J Med Plants Res. 2010;4(11):995-8.
195. Ngule MC, Ndiku MH, Ramesh F. Chemical constituents screening and *in vitro* antibacterial assessment of *Prunus africana* bark hydromethanolic extract. Extraction. 2014;4(16)
196. Cordeiro MF, Nunes TRS, Bezerra FG, Damasco PKM, Silva WAV, Ferreira MRA, *et al*. Phytochemical characterization and biological activities of *Plectranthus barbatus* Andrews. Braz J Biol. 2021;82:e236297. doi: 10.1590/1519-6984.236297, PMID 33787716.
197. Nguta JM, Kiraithe MN. In vitro antimicrobial activity of aqueous extracts of *Ocimum suave* Wild, *Plectranthus barbatus* Andrews and *Zanthoxylum chalybeum* Engl. against selected pathogenic bacteria. Biomed Biotechnol Res J. 2019;3(1):30. doi: 10.4103/bbrj.bbrj_128_18.
198. Chatterjee B, Vittal RR. Quorum sensing modulatory and biofilm inhibitory activity of *Plectranthus barbatus* essential oil: A novel intervention strategy. Arch Microbiol. 2021;203(4):1767-78. doi: 10.1007/s00203-020-02171-9, PMID 33474610.
199. Metwally AM, Omar AA, Harraz FM, El Sohafy SM. Phytochemical investigation and antimicrobial activity of *Psidium guajava* L. leaves. Pharmacogn Mag. 2010;6(23):212-8. doi: 10.4103/0973-1296.66939, PMID 20931082.
200. Sanches NR, Garcia Cortez DA, Schiavini MS, Nakamura CV, Dias Filho BP. An evaluation of antibacterial activities of *Psidium guajava* (L.). Braz Arch Biol Technol. 2005;48(3):429-36. doi: 10.1590/S1516-89132005000300014.
201. Biswas B, Rogers K, McLaughlin F, Daniels D, Yadav A. Antimicrobial activities of leaf extracts of guava (*Psidium guajava* L.) on two gram-negative and gram-positive bacteria. Int J Microbiol. 2013;2013:1-7. doi: 10.1155/2013/746165.
202. Dhiman A, Nanda A, Ahmad S, Narasimhan B. *In vitro* antimicrobial activity of methanolic leaf extract of *Psidium guajava* L. J Pharm Bioallied Sci. 2011;3(2):226-9. doi: 10.4103/0975-7406.80776, PMID 21687350.
203. Bouchekouk C, Kara FZ, Tail G, Saidi F, Benabdelkader T. Essential oil composition and antibacterial activity of *Pteridium aquilinum* (L.) Kuhn. Biologia Futura. 2019;70(1):56-61.
204. Barine IN, Comfort CM, Augustine AU. Chemical composition of essential oil from the fiddleheads of *Pteridium aquilinum* L. Kuhn found in Ogoni. J Med Plants Res. 2014;8(1):77-80. doi: 10.5897/JMPR2013.5093.
205. Shariff N, Sudarshana MS, Umesha S, Hariprasad P. Antimicrobial activity of *Rauvolfia tetraphylla* and *Physalis minima* leaf and callus extracts. Afr J Biotechnol. 2006;5(10).
206. Nathiya M, Dorcus D. Preliminary phytochemical and antibacterial studies on *Physalis minima* Linn. Int J Curr Sci. 2012:24-30.
207. Durga B, Julius A, Pavithradevi S, Fathima A. Study of phytochemical constituents and antibacterial activity of methanol Extract of *Physalis minima* Linn. Eur J Mol Clin Med. 2020;7(3):1733-40.
208. El-Beltagi HS, Mohamed HI, Safwat G, Gamal M, Megahed BMH. Chemical composition and biological activity of *Physalis peruviana* L. Gesunde Pflanzen. 2019;71(2):113-22. doi: 10.1007/s10343-019-00456-8.
209. GÖZTOK F, Zengin F. The antimicrobial activity of *Physalis peruviana* L. Bitlis Eren University. J Sci Technol. 2013;3(1):15-7.
210. Ertürk Ö, Ayvaz MÇ, Can Z, Karaman Ü, Korkmaz K. Antioxidant, antimicrobial activities and phenolic and chemical contents of *Physalis peruviana* L. from Trabzon, Turkey. Indian J Pharm Educ Res. 2017;51(3s):s213-6. doi: 10.5530/ijper.51.3s.15.
211. Kasali FM, Tusiimire J, Kadima JN, Tolo CU, Weisheit A, Agaba AG. Ethnotherapeutic uses and phytochemical composition of *Physalis peruviana* L.: An overview. Scientific World Journal. 2021;2021:5212348. doi: 10.1155/2021/5212348, PMID 34671227.
212. Anteneh A, Meshesha DS. Preliminary phytochemical screening, isolation, characterization, structural elucidation and antibacterial activities of leaves extracts *Rhus vulgaris* (Kimmo); 2021.
213. Kensa VM. Phytochemical screening and antibacterial activity on *Ricinus communis* L. Ecol Environ Conserv. 2012;18:319-25.
214. Zarai Z, Chobba IB, Mansour RB, Békir A, Gharsallah N, Kadri A. Essential oil of the leaves of *Ricinus communis* L.: *In vitro* cytotoxicity and antimicrobial properties. Lipids Health Dis. 2012;11(1):1-7.
215. Jena J, Gupta AK. *Ricinus communis* Linn: A phytopharmacological review. Int J Pharm Pharm Sci. 2012;4(4):25-9.
216. Wang W, Li N, Luo M, Zu Y, Efferth T. Antibacterial activity and anticancer activity of *Rosmarinus officinalis* L. Essential oil compared to that of its main components. Molecules. 2012;17(3):2704-13. doi: 10.3390/molecules17032704, PMID 22391603.
217. Jordán MJ, Lax V, Rota MC, Lorán S, Sotomayor JA. Effect of bioclimatic area on the essential oil composition and antibacterial activity of *Rosmarinus officinalis* L. Food Control. 2013;30(2):463-8. doi: 10.1016/j.foodcont.2012.07.029.
218. Okoh OO, Sadimenko AP, Afolayan AJ. Comparative evaluation of the antibacterial activities of the essential oils of *Rosmarinus officinalis* L. obtained by hydrodistillation and solvent free microwave extraction methods. Food Chem. 2010;120(1):308-12. doi: 10.1016/j.foodchem.2009.09.084.
219. Endo EH, Costa GM, Nakamura TU, Nakamura CV, Dias Filho BP. Antidermatophytic activity of hydroalcoholic extracts from *Rosmarinus officinalis* and *Tetradenia riparia*. J Mycol Med. 2015;25(4):274-9. doi: 10.1016/j.mycmed.2015.09.003, PMID 26603099.

220. Ayinkamiye C. Antibacterial activity and phytochemical composition of crude acqueous, ethanolic and methanolic extracts of leaves and seeds of *Rotheca myricoides* against selected enteric gram-negative bacteria isolated from diarrheaic children attending Mulago National Referral Hospital ([doctoral dissertation]. Makerere University); 2020.
221. Biswas TK, Mukherjee B. Plant medicines of Indian origin for wound healing activity: A review. Int J Low Extrem Wounds. 2003;2(1):25-39. doi: 10.1177/1534734603002001006, PMID 15866825.
222. Karodi R, Jadhav M, Rub R, Bafna A. Evaluation of the wound healing activity of a crude extract of *Rubia cordifolia* L. (Indian madder) in mice. Int J Appl Res Nat Prod. 2009;2(2):12-8.
223. Sawhney R, Berry V, Kumar A. Inhibitory Activity of *Rubia cordifolia* plant extract against ESBL producing Urinary *E. coli* isolates. J Pharm Res. 2012;5(3):1328-30.
224. Li X, Liu Z, Chen Y, Wang LJ, Zheng YN, Sun GZ, *et al*. Rubiacordone A: A new anthraquinone glycoside from the roots of *Rubia cordifolia*. Molecules. 2009;14(1):566-72. doi: 10.3390/molecules14010566, PMID 19169203.
225. Mariselvam R, Ranjitsingh AJA, Nanthini AUR. Preparation and characterization of silver nanoparticles using *Rubia cordifolia* plant root extract and their microbial properties. Int J Adv Res. 2013;1:56-61.
226. Patil R, Mohan M, Kasture V, Kasture S. *Rubia cordifolia*: A review. Adv Trad Med. 2009;9(1):1-13. doi: 10.3742/OPEM.2009.9.1.001.
227. Tsamo LDF, Yimgang LV, Wouamba SCN, Mkounga P, Nkengfack AE, Voutquenne-Nazabadioko L, *et al*. A new ceramide (Rumexamide) and other chemical constituents from *Rumex abyssinicus* Jacq. (Polygonaceae): Isolation, characterization, antibacterial activities and chemophenetic significance. Adv Biol Chem. 2021;11(5):266-82. doi: 10.4236/abc.2021.115018.
228. Mulisa E, Asres K, Engidawork E. Evaluation of wound healing and anti-inflammatory activity of the rhizomes of *Rumex abyssinicus* J. (Polygonaceae) in mice. BMC Complement Altern Med. 2015;15(1):341. doi: 10.1186/s12906-015-0878-y, PMID 26423525.
229. Shĺfa M, Abdlssa D, Asere TG. Chemical constituents of *Rumex abyssinicus* roots and evaluation of its antimicrobial activities. J Turk Chem Soc Sect A Chem. 2021;8(1):21-46. doi: 10.18596/jotcsa.797560.
230. Al-Asmari ARK, Siddiqui YM, Athar MT, Al-Buraidi A, Al-Eid AS, Horaib GB. Antimicrobial activity of aqueous and organic extracts of a Saudi medicinal plant: Rumex nervosus. J Pharm Bioallied Sci. 2015;7(4):300-3. doi: 10.4103/0975-7406.168031, PMID 26681888.
231. Ahmad H, Rajagopal K. Biological activities of *Salvadora persica* L. Meswak. Med Aromat Plants. 2013;2(4):1-5.
232. Abhary M, Al-Hazmi AA. Antibacterial activity of Miswak (*Salvadora persica* L.) extracts on oral hygiene. J Taibah Univ Sci. 2016;10(4):513-20. doi: 10.1016/j.jtusci.2015.09.007.
233. Ahmad H, Rajagopal K. *Salvadora persica* L. (Meswak) in dental hygiene. Saudi J Dent Res. 2014;5(2):130-4. doi: 10.1016/j.sjdr.2014.02.002.
234. Miri A, Dorani N, Darroudi M, Sarani M. Green synthesis of silver nanoparticles using *Salvadora persica* L. and its antibacterial activity. Cell Mol Biol (Noisy-le-grand). 2016;62(9):46-50. PMID 27585261.
235. Jeruto P, Arama PF, Anyango B, Akenga T, Nyunja R, Khasabuli D, *et al*. *In vitro* antifungal activity of methanolic extracts of different *Senna didymobotrya* (fresen.) HS Irwin and Barneby plant parts. Afr J Trad Complement Altern Med. 2016;13(6):168-74. doi: 10.21010/ajtcam.v13i6.24.
236. Ocharo CM. Isolation and identification of antibacterial and antifungal compounds from selected Kenyan medicinal plants ([doctoral dissertation]. Kenyatta University); 2005.
237. Koduru S, Grierson DS, Afolayan AJ. Antimicrobial Activity of *Solanum aculeastrum*. Pharm Biol. 2006;44(4):283-6. doi: 10.1080/13880200600714145.
238. Wanyonyi AW, Chhabra SC, Mkoji G, Njue W, Tarus PK. Molluscicidal and antimicrobial activity of *Solanum aculeastrum*. Fitoterapia. 2003;74(3):298-301. doi: 10.1016/s0367-326x(03)00030-3, PMID 12727499.
239. Omujal F, Tenda KI, Lutoti S, Kirabo I, Kasango SD, Nambatya KG. Phytochemistry and anti-inflammatory activity of ethanolic root bark extract of *Vepris nobilis* Mziray (Rutaceae family). Sci Afr. 2020;9:e00484. doi: 10.1016/j.sciaf.2020.e00484.
240. Mulu T. Phytochemical investigation on the root extract of *Teclea nobilis* [doctoral dissertation]; 2017.
241. Kiplimo JJ. The phytochemistry and biological activity of secondary metabolites from Kenyan Vernonia and Vepris species [doctoral dissertation]; 2012.
242. Vats S, Tiwari R, Alam A, Behera KK, Pareek R. Evaluation of phytochemicals, antioxidant and antimicrobial activity of *in vitro* culture of *Vigna unguiculata* (L.) Walp. Researcher. 2012;4:70-4.
243. Sandeep D. Evaluation of antibacterial activity of seed extracts of *Vigna unguiculata*. Int J Pharm Pharm Sci. 2014;6(1):75-7.
244. Ashraduzzaman M, Alam MA, Khatun S, Absar N. Antimicrobial activity of *Vigna unguiculata* L. Walp seed oil. Int J Biotech Well Indus. 2016;5(3):70-5. doi: 10.6000/1927-3037.2016.05.03.1.
245. Kritzinger Q, Lall N, Aveling TAS, Van Wyk BE. Antimicrobial activity of cowpea (*Vigna unguiculata*) leaf extracts. S Afr J Bot. 2005;71(1):45-8. doi: 10.1016/S0254-6299(15)30147-2.
246. Omer ME, Elnima EI. Antimicrobial activity of *Ximenia americana*. Fitoterapia. 2003;74(1-2):122-6. doi: 10.1016/s0367-326x(02)00302-7, PMID 12628405.
247. Maikai VA, Maikai BV, Kobo PI. Antimicrobial properties of stem bark extracts of *Ximenia americana*. J Agric Sci. 2009;1(2):30.
248. Morrissey JP, Osbourn AE. Fungal resistance to plant antibiotics as a mechanism of pathogenesis. Microbiol Mol Biol Rev. 1999;63(3):708-24. doi: 10.1128/MMBR.63.3.708-724.1999, PMID 10477313.
249. Olila D, Olwa-Odyek J, Opuda-Asibo J. Antibacterial and antifungal activities of extracts of *Zanthoxylum chalybeum* and *Warburgia ugandensis*, Ugandan medicinal plants. Afr Health Sci. 2001;1(2):66-72. PMID 12789119.
250. Denis O, Richarh K, Motlalepula GM, Youngmin K. A review on the botanical aspects, phytochemical contents and pharmacological activities of *Warburgia ugandensis*. J Med Plants Res. 2018;12(27):448-55. doi: 10.5897/JMPR2018.6626.
251. Merawie Y, Sahile S, Moges F, Husen A. Antimicrobial activity of crude and semi-purified fractions of *Warburgia ugandensis* against some pathogens. J Coast Life Med. 2013;1(3):184-91.
252. Maroyi A. *Zanha africana* (Radlk.) Exell: Review of its botany, medicinal uses and biological activities. J Pharm Sci Res. 2019;11(8):2980-5.
253. Mahamadi C, Wunganayi T. Green synthesis of silver nanoparticles using *Zanthoxylum chalybeum* and their antiprolytic and antibiotic properties. Cogent Chem. 2018;4(1):1538547. doi: 10.1080/23312009.2018.1538547

Cite this article: Khaire M, Bigoniya J, Bigoniya P. Wanga L, Nyamboki DK. Medicinal Plants Used in the Management of Skin Disorders in Kenya: A Review Pharmacog Rev. 2023;17(33):69-103.