cosmetics

MDPI

Review

Medicinal Plants for Dermatological Diseases: Ethnopharmacological Significance of Botanicals from West Africa in Skin Care

Mokgadi Ursula Makgobole [1,*], Nomakhosi Mpofana [1] and Abdulwakeel Ayokun-nun Ajao [2]

[1] Department of Somatology, Durban University of Technology, 47 Steve Biko Road, Durban 4001, South Africa; nomakhosim@dut.ac.za
[2] Department of Botany and Plant Biotechnology, University of Johannesburg, P.O. Box 524, Auckland Park, Johannesburg 2006, South Africa; ajwak880@gmail.com
* Correspondence: mokgadim@dut.ac.za

Abstract: Skin disease is a severe health issue that affects a lot of people in Africa and is vastly underreported. Because of their availability, affordability, and safety, medicinal plants represent a major source of treatment for various skin diseases in West Africa. This review presents the medicinal plants used in treating skin diseases in West Africa and their available biological activities that have lent credence to their skin care usage. A total of 211 plant species from 56 families are implicated to be used in West Africa for several skin conditions such as aphthous ulcers, burns, eczema, scabies, sores, and wounds. Fabaceae is the most-implicated family (30 species) for the treatment of skin diseases, followed by Combretaceae (14 species) and Asteraceae (13 species). Most of the medicinal plants used are trees (93); leaves (107) were the most-used plant part, and decoction (73) was the preferred preparation method for the medicinal plants. The biological activities related to the pathology of skin diseases, such as antimicrobial and anti-inflammatory properties of 82 plants, have been evaluated. Based on their minimum inhibitory concentration, the most active antimicrobial plant is *Brillantaisia lamium*. Among the isolated phytochemicals, betulenic acid and lespedin were the most active, while plants such as *Kigelia africana* and *Strophanthus hispidus* showed significant wound-healing activities. This review highlights research gaps in the ethnobotanical studies of many West African countries, the biological activities of plants used to treat skin diseases, and the cosmetic potential of these plants.

Keywords: biological activities; cosmeceuticals; cosmetics; medicinal plants; skin diseases; West Africa

Citation: Makgobole, M.U.; Mpofana, N.; Ajao, A.A.-n. Medicinal Plants for Dermatological Diseases: Ethnopharmacological Significance of Botanicals from West Africa in Skin Care. *Cosmetics* **2023**, *10*, 167. https://doi.org/10.3390/cosmetics10060167

Academic Editor: Paulraj Mosae Selvakumar

Received: 14 November 2023
Revised: 2 December 2023
Accepted: 4 December 2023
Published: 7 December 2023

1. Introduction

The human body's largest and most vulnerable organ is the skin. It serves as a barrier and shield between the internal organs and direct microbial contamination and ultraviolet radiation [1]. It contains three layers: the epidermis, dermis, and subcutaneous. The epidermis, the outermost layer, protects the skin against infections caused by some microbes [2]. The dermis comprises follicles and glands and is essential for regulating body temperature, while the subcutaneous layer contains a network of connective tissues and fat [2]. Despite the dry and infertile nature of the skin, it is still home to millions of microbes, some of which are essential in preventing skin invasion by pathogens [3]. The nature of the skin significantly influences the type and abundance of microbes present, causing skin diseases or infections. For example, *Corynebacterium* and *Staphylococcus* species are abundant in the moist areas of the skin, while sebaceous areas are predominantly occupied by *Propionibacterium* species [4]. Also, different skin or systemic diseases may arise from broken skin or an imbalance between beneficial microbes and pathogens [5].

Skin disease is the fourth most common cause of illnesses in humans [6]. However, this may be inaccurate because reports have shown that a large percentage of people suffering

from different skin conditions do not consult dermatologists [7]. Medicinal plants have long played a significant role in treating a wide range of illnesses, including skin diseases, which are not always reported but are self-treated [8]. In the last few decades, extensive efforts have focused on documenting medicinal plants to identify species that may be used in drug development [9]. Among these, some studies have reported or reviewed the plants used to treat skin diseases around the globe. For example, there is documentation of medicinal plants used for skin diseases in southern Africa, Pakistan, the south Balkan, and the eastern Mediterranean regions [10–12]. Many people in West Africa rely on traditional medicine/medicinal plants due to their accessibility and believe they are more potent and efficient in curing disease than conventional medicines or healthcare, which is inadequate in the region [13,14]. Also, many skin diseases tend to be so persistent and recurring that patients resort to many remedies, including herbal ones [1]. Therefore, quite a number of studies have aimed at documenting plants used to treat skin diseases in different West African countries. For example, the Akwa Ibom state of Nigeria [15], the northern region of the Republic of Benin [16], the northwest region of Cameroon [17], and many others.

Moreover, to validate the traditional uses of some of the documented plants, some other studies have tested the extracts from the plants for pharmacological activities related to skin diseases, such as antioxidant, anti-inflammatory, and antimicrobial activities, to prove their efficacy. For example, Rosamah et al. [1] investigated the pharmacological significance of *Macaranga* in dermatological diseases; Udegbunam et al. [18] confirmed the therapeutic activity of *Crinum jagus* in wound healing; and *Anacardium occidentale* extracts were tested on pathogenic microbes to verify its usefulness in skin care cosmetics by Gonçalves and Gobbo [19]. There are also many similar studies, but this information is scattered in the literature, which may account for the fact that none of the many cosmetic plants recognized by the European Pharmacopoeia are of West African origin [20]. This also underscores the significance of studies in this field. Therefore, this review aims to appraise all available information on the use of plants for treating skin diseases in West Africa to highlight research gaps and give a proper direction to future research on the dermatological significance of medicinal plants from West Africa.

2. Methodology

A comprehensive search of major journal websites and academic databases, such as African Journal Online, Google Scholar, ScienceDirect, Scopus, and Web of Science, was conducted. This aimed to retrieve all published ethnobotanical studies in the West African region up until September 2023. The keywords used in the search include the names of West African countries, ethnobotany, medicinal plants, indigenous plants, skin diseases, skin ailments, cosmetics, wounds, and West Africa. From the papers retrieved, plants used for skin diseases were extracted from the general ethnobotany. Plant names and their family were verified and updated using databases, namely: Tropicos (www.tropicos.org; accessed on 7 October 2023), World Flora Online (https://www.worldfloraonline.org/; accessed on 29 November 2023), and WFO Plant List website (https://wfoplantlist.org/plant-list; accessed on 7 October 2023). The selection of articles for this review was made on the basis of the following criteria:

1. It is published in English or translated to English.
2. At least one plant is listed for the treatment of skin diseases.
3. It studied the bioactivity of at least one of the plants in the list of plants documented.
4. If the ethnopharmacological study is carried out outside West Africa but examines the bioactivity of any documented plants used to treat skin diseases in the region.

Figure 1 shows the PRISMA flowchart for the inclusion and exclusion procedure.

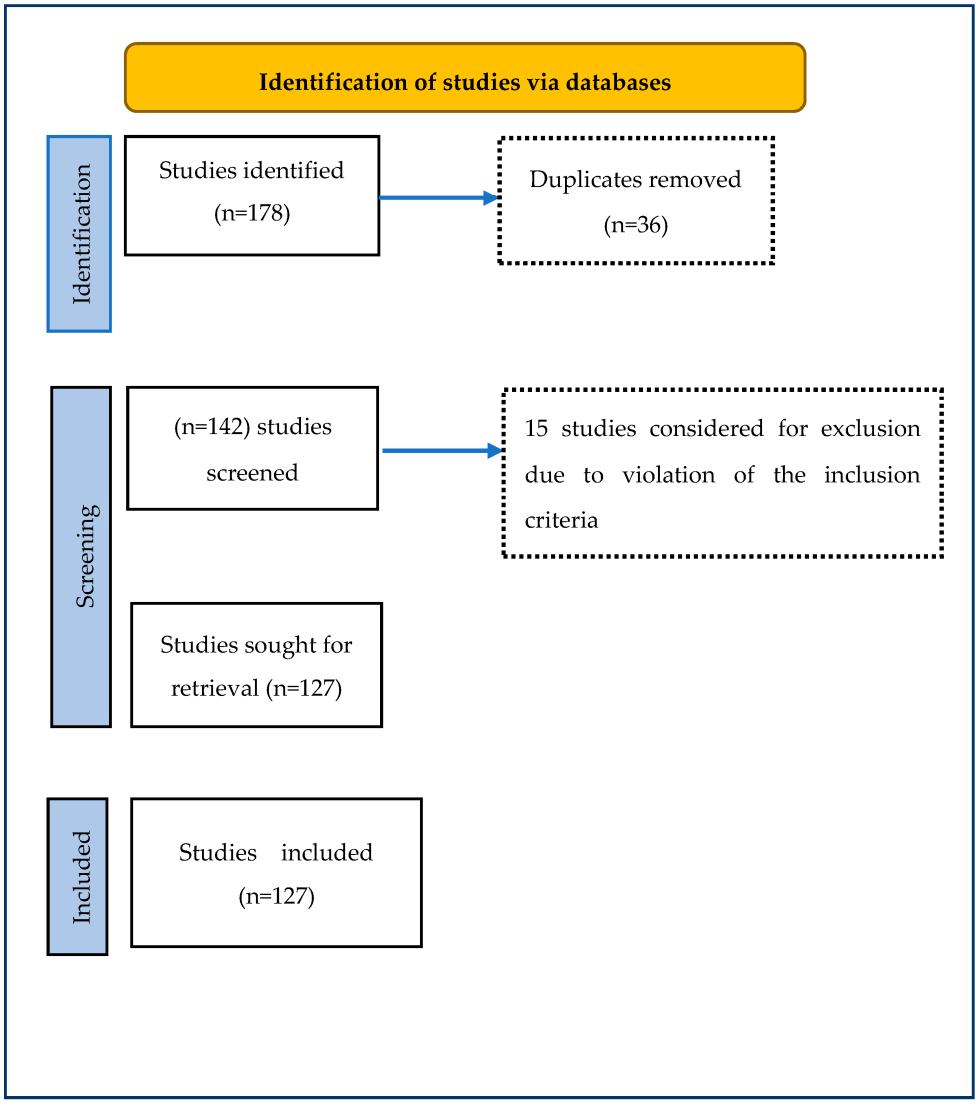

Figure 1. PRISMA flow chart showing total studies identified, removed, excluded, and included in the review.

3. Results and Discussion

3.1. Diversity of the Medicinal Plants Used for Skin Diseases in West Africa

The western part of Africa is a tropical region with high annual rainfall and temperature. Hence, it is known to have a wide flora diversity. A total of 211 taxa are reported in this review as used in the treatment of various skin diseases or infections in the western part of Africa (Table 1). In comparison, 100 plant species were reportedly used for skin diseases in southern Africa [10], 545 species in Pakistan [11], and 967 in the South Balkan and East Mediterranean region [12]. Over 90% of the plants were reported from Nigeria, the Republic of Benin, Togo, Ghana, Cameroon, and the Ivory Coast, implying a large research gap in the ethnobotanical studies of many West African countries. The reported taxa belong to 56 different families. Among these, plants of the Fabaceae family were overwhelmingly preferred for combating skin diseases in West Africa, as 30 species from 23 genera represent them. This is followed by the family Combretaceae, with 14 species, half of which are from the genus *Combretum*. Asteraceae and Euphorbiaceae are also well represented, with 13 and 12 species, respectively (Figure 2). Overall, nine families—Fabaceae (30), Combretaceae (14), Asteraceae (13), Euphorbiaceae (12), Phyllanthaceae (8), Rubiaceae (8), Moraceae (8), Malvaceae (7), and Apocynaceae (7)—represented over 50% of the recorded plant species, while 22 species, were the only members of their respective families. The legume family

(Fabaceae) is one of the most influential families of angiosperms in terms of medicinal uses across communities and regions worldwide [21]. Despite being the third largest family, its wide distribution worldwide could be a major reason for its widespread usage in traditional medicine [21]. The sustained use of the species of the Fabaceae family over time may also indicate their biological activities, and the phytochemistry of many species in this family has supported this hypothesis, showing that they contain critical active metabolites [22]. The biological activities and chemistry of the family Combretaceae have also revealed a wide range of useful phytochemicals [23]. However, other genera apart from the genera *Combretum* and *Terminalia* are rarely explored [24]. Asteraceae is the largest plant family and has always been highly represented in many ethnobotanical studies, and the family members are known to contain phytochemicals of medicinal importance [25].

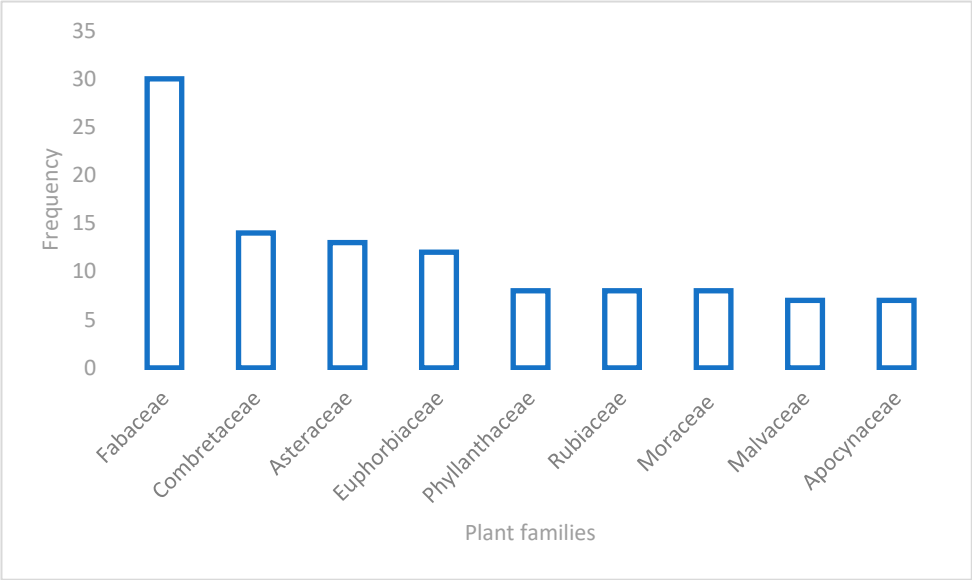

Figure 2. Most cited plant families.

3.2. Life Forms, Plant Parts Used, Mode of Preparation, and Conservation Statuses of the Plants

Over 60% of the plants implicated in this paper are woody species, comprising trees (93, 44%) and shrubs (40, 19%) (Figure 3). Other life forms are herbs (61, 29%) and climbers (17, 8%). Some studies have reported that herbs are the most-used medicinal plants due to their ease of harvesting [60,61]. Though this may be true for some individual studies, a holistic review of the ethnobotany of an area or an ailment category has revealed, in most cases, the prevalence of trees in traditional medicine [62,63]. Additionally, West Africa, being a tropical area, could be responsible for the abundance of trees in the region.

Table 1. Medicinal plants used to treat skin diseases in West Africa.

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Acanthaceae	*Acanthus montanus* (Nees) T. Anderson	Herb; LC	Nigeria	Mbara ekpe (Akwaibom)	Leaves	Poultice.	Abscess, boils, whitlow, and wounds	[15]
Acanthaceae	*Afrofittonia silvestris* Lindau	Herb; VU	Nigeria	Mmeme (Akwaibom)	Whole plant	Crushed and the juice is topically used for skin spots; Poultice is applied to whitlow.	Skin spots and whitlow	[15]
Acanthaceae	*Brillantaisia lamium* (Nees) Benth.	Herb; No Record	Cameroon	No record	Aerial parts	Decoction of aerial parts is used to bath.	Skin infections	[26]
Acanthaceae	*Justicia insularis* T. Anders	Herb; No Record	Nigeria	No record	Whole plant	Crushed and the juice applied; poultice.	Skin spots	[15]
Aiozoaceae	*Trianthema portulacastrum* L.	Herb; No Record	Nigeria	Ntia ntia ikon (Akwa Ibom)	Leaves	Decoction is used for bathing the affected area.	Wounds	[15]
Amaranthaceae	*Achyranthes aspera* L.	Herb; No Record	Nigeria	Udok mbiok	Leaves	Crushed and juice applied.	Skin ulcers	[15]
Amaranthaceae	*Alternanthera bettzickiana* (Regel) G. Nicholson	Herb; No Record	Nigeria	Nkpok isip essien	Leaves	Crushed and the juice applied.	Skin spots, measles	[15]
Amaranthaceae	*Amaranthus caudatus* L.	Herb; No Record	Nigeria	Inyan afia	Leaves	Leaf juice mixed with kaolin is applied.	Abscess, boil, eczema, and skin eruption	[15]
Amaranthaceae	*Celosia globosa* Schinz	Herb; No Record	Cameroon	NA	Leaves	Decoction of the leaves in Cameroon.	Athlete's foot	[26]
Amaranthaceae	*Cyathula prostrata* (L.) Blume	Herb; No Record	Cote d'Ivoire, Guinea and Nigeria	Nkibe ubuk	Leaves	Decoction is taken orally in Nigeria, and Cote d'Ivoire for leprosy; the juice from macerated leaves is applied to cuts and bruises in Guinea.	Leprosy, skin spots, scabies, sores, and rashes	[15,27,28]
Amaryllidaceae	*Allium cepa* L.	Herb; LC	Nigeria and West Africa	Alubosa (Yoruba)	Bulb	Poultice.	Scorpion sting and skin disease	[15,29]
Amaryllidaceae	*Allium sativum* L.	Herb; LC	Nigeria	Alubosa Ayu (Yoruba)	Clove	Poultice.	Skin spots, burns, ulcers, and scorpion sting	[15]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Amaryllidaceae	*Crinum jagus* (Thompson) Dandy	Herb; LC	Nigeria	Ayim ekpo, ekop-eyen (Akwa ibom), Ogede odo (Yoruba)	Bulb	Poultice.	Whitlow	[15]
Anacardiaceae	*Anacardium occidentale* L.	Tree; LC	Nigeria	Kashu, Cashew	Leaves	Poultice	Ringworm and leprosy	[15]
Anacardiaceae	*Lannea acida* A. Rich.	Shrub; LC	Nigeria and Senegal	Ayara nsukakara	Leaves	Crushed and juice applied.	Burns and skin infections	[15,30,31]
Anacardiaceae	*Lannea microcarpa* A. Rich	Tree; LC	Republic of Benin	Sinman	Root bark	The root bark is ground to powder and applied topically.	Wounds	[16]
Anacardiaceae	*Mangifera indica* L.	Tree; DD	Nigeria	Mongoro	Leaves	Decoction for bathing and applied topically.	Skin spots	[15]
Anacardiaceae	*Ozoroa pulcherrima* (schweinf.) R. & A.	Shrub; No Record	Republic of Benin	Mukentétié	Root bark	The root bark is ground into powder and applied topically.	Wounds	[16]
Annonaceae	*Annickia chlorantha* (Oliv.) Setten & Maas	Tree; LC	Nigeria and West Africa	Osopa (Yoruba)	Leaves, stem bark	Crushed and juice applied.	Sores, ulcers, and wounds	[32]
Annonaceae	*Annona senegalensis* Pers.	Tree; LC	Ghana, Mali, Nigeria, and Togo	Sawa-sawa (Yoruba), Tchoutchourè (Togo)	Leaves and fruits	A poultice made from the leaves is used for leprosy, sores, and wounds in Ghana, Mali, and Nigeria. Decoction of the leaves and fruits is taken orally for aphthous ulcers in Togo.	Leprosy, sores, and wounds	[15,27,33,34]
Annonaceae	*Monodora myristica* (Gaertn.) Dunal	Tree; LC	Nigeria	Enwun	Seeds	Seeds are ground to powder and applied externally.	Pediculosis and sores	[15]
Annonaceae	*Uvaria chamae* P. Beauv.	Shrub; LC	Nigeria and Senegal	Nkarika ekpo	Root	Sap from the crushed root is applied topically.	Snakebites and wounds	[15,35]
Annonaceae	*Xylopia aethiopica* (Dunal) A. Rich	Tree; No Record	Republic of Benin	Nadofacha	Seeds	Dried seeds are ground into powder and applied topically.	Wounds	[16]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Apocynaceae	*Alstonia boonei* De Wild.	Tree; LC	Cameroon, Cote d'Ivoire; Nigeria, Senegal	Ahun (Yoruba)	Stem bark	Crushed and applied.	Snakebites	[15,36]
Apocynaceae	*Calotropis procera* (Aiton) W.T. Aiton	Herb; LC	Gambia, Nigeria, and Senegal	Bomubomu (Yoruba)	Leaves	The poultice made from the leaves.	Smallpox, skin eruption, snakebites, and wounds	[15,27,37]
Apocynaceae	*Funtumia elastica* (Preuss) Stapf	Tree; LC	Cameroon and Nigeria	Eto okpo	Leaves	Juice from the crushed leaves is applied topically.	Snakebites and wounds	[15,36]
Apocynaceae	*Holarrhena floribunda* (G.Don) T.Durand & Schinz	Tree; LC	Togo	Kororo (Togo)	Leaves	Decoction of the leaves is taken orally.	Aphthous ulcers	[34]
Apocynaceae	*Leptadenia hastata* (Pers.) Decne	Climber; No Record	Senegal	Mboom (wolof) Duto (mandingo)	Stem	Infusion of woody stems is taken orally.	Snakebites	[15]
Apocynaceae	*Rauvolfia vomitoria* Afzel	Tree; LC	Nigeria	kiko	Leaves	Crushed and applied.	Ringworm and itchy body	[15]
Apocynaceae	*Strophanthus hispidus* DC.	Shrub; LC	Cote d'Ivoire, Ghana, Guinea, Nigeria, and Senegal	Ibok idan	Root bark	Crushed and applied.	Snakebites, scorpion stings, cuts, skin ulcers, and sores	[15,28,38–40]
Araceae	*Anchomanes difformis* (Blume) Engl	Herb; LC	Cote d'Ivoire and Nigeria	Nkokot	Bulb	Crushed and sap applied.	Wounds	[15,41]
Araceae	*Colocasia esculenta* (L.) Schott	Herb; LC	Nigeria and Cameroon	Ikpon ekpo Ndai (Cameroon)	Whole plant, tubers	Crushed and applied to the sore. Paste from grated tubers is applied on the part affected by whitlow and tied with a band.	Insect bites, sores, and whitlow	[15,17]
Araceae	*Elaeis guineensis* Jacq.	Tree; LC	Cameroon, Ghana, and Nigeria	Eyop	Fruit pericarp	Peeled and applied.	Boil, scabies, and wounds	[15,36,40]
Araceae	*Pistia stratiotes* L.	Herb; LC	Nigeria	Amana mmon	Whole plant	Powdered dry plant is applied topically.	Wounds and sores	[15]
Araceae	*Xanthosoma sagittifolium* (L.) Schott	Herb; No Record	Nigeria	Ikpon mbakara	Leaves	Crushed and juice applied.	Smallpox, skin spots, and fungal skin infection	[15]
Asparagaceae	*Agave sisalana* Perrine	Herb; No Record	Togo	Kolgragou	Root	Decoction of the root is taken orally.	Aphthous ulcers	[34]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Asparagaceae	*Dracaena arborea* (Willd.) Link	Tree; LC	Nigeria	Okno	Root bark	Poultice.	Boils and burns	[15]
Asparagaceae	*Sansevieria liberica* Gérôme & Labroy	Herb; No Record	Nigeria	Okono ekpe	Leaves, stem bark, Root	Decoction, poultice.	Eczema and snakebites	[15]
Asphodelaceae	*Aloe vera* (L.) Burm. f.	Herb; LC	Nigeria, Cameroon, Ghana, Togo, and Benin	Eti erin (Yoruba)	Leaves	Gel from the crushed leaves is applied topically.	Skin infections and wounds	[15,17]
Asteraceae	*Acanthospermum hispidum* DC	Herb; No Record	Togo	Kpangsoyè	Whole plant	Decoction of the whole plant is taken orally.	Aphthous ulcers	[34]
Asteraceae	*Ageratum conyzoides* L.	Herb; LC	Nigeria	Imi esu (Yoruba)	Whole plant	Crushed in water and applied topically. The same preparation is taken orally for general skin infections.	Rashes, skin ulcers, and wounds	[15,42]
Asteraceae	*Aspilia africana* (Pers.) C.D. Adams	Herb; No Record	Cameroon, Liberia, Nigeria, and Sierra Leone	Edemeron Wowoh (Cameroon)	Leaves	Decoction of the leaves in Cameroon. Leaves are crushed or squeezed on the wound in Nigeria and Cameroon.	Wounds	[15,17,20,27]
Asteraceae	*Bidens pilosa* L.	Herb; No Record	Cameroon, Cote d'Ivoire, Nigeria	Ntafion ison Shoctesuc (Cameroon)	Leaves	Crushed and juice applied.	Insect bites and wounds	[15,17,41]
Asteraceae	*Chromolaena odorata* (L.) R.M. King & H. Rob.	Herb; LC	Cameroon, Ghana, Nigeria	Mbiet (Ghana) Awolowo (Yoruba) Twigi (Cameroon)	Leaves	Crushed and juice applied. A poultice made from the leaves is used to cover the wound.	Rashes, scorpion sting, snakebites, and Wounds	[15,17,40]
Asteraceae	*Crassocephalum biafrae* (Oliv. & Hiern) S. Moore	Herb; No Record	Nigeria	Mkpafit	Leaves	Dried leaves are ground into powder and applied to the wound.	Wounds	[15]
Asteraceae	*Crassocephalum crepidioides* (Benth.) S. Moore	Herb; No Record	Nigeria	Mkpafit	Leaves	Juice from the crushed leaves is applied.	Boil, burns, and wounds	[15]
Asteraceae	*Cyanthillium cinereum* (L.) H.Rob	Herb; No Record	Togo	Kogbèdiyè	Aerial part	Decoction is taken orally.	Aphthous ulcers	[34]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Asteraceae	*Emilia coccinea* (Sims) G. Don	Herb; No Record	Nigeria, Cameroon	Utime nse Nsefouse (Cameroon) Femefouse (Cameroon)	Leaves	Juice from the crushed leaves is applied.	Measles, rashes, wounds	[15]
Asteraceae	*Emilia sonchifolia* (L.) DC	Herb; No Record	Nigeria	Utime nse, usio mmon	Leaves	Juice from the crushed leaves is applied.	Measles, rashes, and Wounds	[15]
Asteraceae	*Laggera decurrens* (Vahl) Hepper & J.R.I. Wood	Herb; No Record	Nigeria	Ewedorun (Yoruba)	Whole plants	Decoction of the whole plant is applied to the wound with cotton wool.	Wounds	[42]
Asteraceae	*Tridax procumbens* L.	Herb; LC	Nigeria	Ayara utimense (Akwa Ibom), imi esu or apasa funfun (Yoruba)	Leaves	Decoction of the leaves is taken orally.	Skin spots	[15]
Asteraceae	*Vernonia amygdalina* Delile	Shrub; LC	West Africa	Etidod (Akwa ibom) Ewuro (Yoruba) Ying (Cameroon)	Leaves	Juice from the crushed leaves is applied externally. The juice is mixed with palm oil in Yoruba culture.	Chickenpox, measles, ringworm skin spots, skin infections and wounds	[15,40]
Bignoniaceae	*Kigelia africana* (Lam.) Benth	Tree; LC	Cote d'Ivoire, Nigeria, and Senegal	Ntabinim	Stem bark	Dried stem bark is ground to powder and applied topically.	Leprosy, snakebites, sores, and wounds	[15,31,32]
Bignoniaceae	*Newbouldia laevis* (P. Beauv.) Seem	Tree; LC	Cote d'Ivoire and Nigeria	Tumo	Stem bark and root	Decoction of stem back and root is taken orally.	Boils and skin spots	[15]
Bignoniaceae	*Spathodea campanulata* P. Beauv.	Tree; LC	Nigeria	Esenim	Stem bark	Infusion of stem back is applied externally for burns, bruises, skin infections, ulcers and wounds.	Skin infections, ulcers and wounds	[15,41]
Bignoniaceae	*Stereospermum kunthianum* Cham.	Shrub; LC	Togo	Essogbalou	Leaves	Decoction is taken orally for herpes sores.	Herpes sores	[34]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Boraginaceae	*Heliotropium indicum* L.	Herb; LC	Benin, Ghana, Nigeria, Senegal, and Togo	Ewe akuko (Yoruba); Soucondiè (Togo), Koklosou dinkpadja (Benin)	Leaves and whole plant	Decoction of the leaves is taken orally for boil in Nigeria; a poultice made from the leaves is applied to wounds and insect bites in Ghana and Senegal. Decoction of the whole plants is taken orally for aphthous ulcers in Togo.	Boil, insect bites, and ulcers	[15,31,32,34,43]
Brassicaceae	*Brassica oleracea* L.	Herb; No Record	Nigeria	Efere mbakara	Leaves	Poultice.	Ringworm and skin ulcers	[15]
Burseraceae	*Commiphora africana* (A. Rich.) Engl.	Tree; LC	Nigeria	Eto komfi itiat	Stem bark	Decoction of the stem back is taken orally.	Rashes caused by measles	[15]
Burseraceae	*Dacryodes edulis* (G. Don) H.J. Lam	Tree; No Record	Cote d'Ivoire and Nigeria	Eben	Leaves	Decoction is applied externally.	Leprosy and skin spots	[15,27,44]
Burseraceae	*Dacryodes klaineana* (Pierre) H.J. Lam	Tree; LC	Nigeria	Eben ikot	Leaves and root	Decoction is of the leaves and root taken orally.	Skin spots	[15]
Cannabaceae	*Trema orientale* (L.) Blume	Tree; LC	Cameroon and Nigeria	No record	Whole plant	Decoction of the whole plant is used to bath or applied topically.	Abscesses and skin spots	[15,45]
Capparaceae	*Maerua angolensis* DC	Tree; LC	Republic of Benin	Fetounanfè	Root bark	The root bark is ground to powder and applied topically.	Wounds	[16]
Caricaceae	*Carica papaya* L.	Tree; LC	Cameroon	Pawpaw	Leaves	Leaf juice is applied on fresh wounds.	Wounds	[17]
Celastraceae	*Apodostigma pallens* (Planch. ex Oliv.) R.Wilczek	Climber; No Record	Republic of Benin	Mukentetie	Root	The chewed root is applied topically.	Wounds	[16]
Celastraceae	*Gymnosporia senegalensis* L. E. T. Loesener	Shrub; LC	Republic of Benin	Moukorou	Root bark	Root bark is ground to powder and applied topically.	Wounds	[16]
Celastraceae	*Maytenus senegalensis* (Lam.) Exell	Shrub; No Record	Togo	Liakpangsoyè (Togo)	Whole plant	Decoction of the leaves is taken orally.	Aphthous ulcers	[34]
Chrysobalanaceae	*Maranthes kerstingii* (Engl.) Prance	Tree; No Record	Togo	Poundoulayzay (Togo)	Leaves	Decoction of the leaves is taken orally.	Aphthous ulcers	[34]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Chrysobalanaceae	*Parinari curatellifolia* Planch. ex Benth.	Tree; LC	Togo	Malay (Togo)	Leaves	Decoction of the leaves is taken orally.	Aphthous ulcers	[34]
Clusiaceae	*Allanblackia floribunda* Oliv	Tree; VU	Nigeria	Udiaebion, ekporo-enin	Leaves	Decoction of the leaves is used for bathing.	Skin spots	[15]
Clusiaceae	*Symphonia globulifera* L. f.	Tree; LC	Cameron and Nigeria	No record	Bark, roots, and resin	Boiled bark and roots are used as a wash to treat itch, and the resin is used to treat wounds and prevent skin infections in Cameroon. Leaves decoction for skin disease and skin spots in Nigeria.	Itching, skin infections, and wounds	[15,46,47]
Cochlospermaceae	*Cochlospermum planchonii* Hook. f.	Shrub; No Record	Togo	Kalantcheyah (Togo)	Leaves	Decoction of the leaves is taken orally.	Aphthous ulcers	[34]
Combretaceae	*Anogeissus leiocarpus* (DC.) Guill. & Perr.	Tree; No Record	Cote d'Ivoire and Nigeria	Kolou (Togo)	Leaves and Stem bark	Infusion of stem bark in water is mixed with honey for skin ulcers, sores, and wounds. Decoction of leaves for aphthous ulcer.	Wounds, skin ulcers, and sores	[15,34,41]
Combretaceae	*Combretum collinum* Fresen	Tree; LC	Republic of Benin	Gberukporo	Root bark	The root bark is ground to powder and applied topically.	Wounds	[16]
Combretaceae	*Combretum glutinosum* Perr. Ex DC	Tree; LC	Republic of Benin	Oudadaribou	Root bark	Powdered root bark is incinerated and applied topically.	Wounds	[16]
Combretaceae	*Combretum hypopilinum* Diels	Shrub; No Record	Gambia	Katanyangkungo	Leaves and root	Decoction of both leaves and root is used to bath.	Itchy body	[48]
Combretaceae	*Combretum micranthum* G. Don	Shrub; LC	Cote d'Ivoire, Nigeria, and West Africa	Asaka	Leaves	Infusion of the leaves is taken orally.	Leprosy, sores and skin spots	[27,31]
Combretaceae	*Combretum racemosum* P. Beauv.	Shrub; No Record	Nigeria	Uyai asaka	Leaves	Juice from the crushed leaves is taken orally.	Skin spots	[15]
Combretaceae	*Combretum sericeum* G. Don	Tree; No Record	Republic of Benin	Cocopourka	Root bark	The root bark is ground to powder and applied topically.	Wounds	[16]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Combretaceae	*Combretum zeyheri* Engl. & Diels	Climber; LC	Nigeria	Ndia asaka	Leaves	Poultice.	Mump, skin eruption, and warts	[15]
Combretaceae	*Guarea thompsonii* Sprague & Hutch.	Tree; VU	Nigeria	Afia ikpok eto	Stem bark	Sap produced from the crushing of the stem bark is applied topically.	Skin diseases	[15]
Combretaceae	*Guiera senegalensis* J.F. Gmel.	Shrub; LC	Guinea, Senegal, and West Africa	No record	Leaves and twigs	Decoction of the leaves is taken for leprosy. The twigs are chewed for scorpion stings.	Leprosy and scorpion bites	[31,35,49]
Combretaceae	*Pteleopsis suberosa* Engl. et Diels	Tree; LC	Togo	Kézinzinang	Leaves and bark	Decoction is taken orally.	Aphthous ulcers	[34]
Combretaceae	*Terminalia avicennioides* Guill. & Perr. Fl. Seneg. Tent.	Tree; LC	Togo	Koyèkouloumryè	Aerial part	Decoction is taken orally	Aphthous ulcers	[34]
Combretaceae	*Terminalia ivorensis* A. Chev	Tree; VU	Cote d'Ivoire, Ghana, and Nigeria	Nkot ebene	Stem bark	Infusion of the stem bark is applied topically.	Sores and ulcers	[15,27,28]
Combretaceae	*Terminalia superba* Engl. & Diels	Tree; No Record	Nigeria	Afia eto	Leaves	Juice from the crushed leaves is applied externally.	Skin spots	[15]
Commelinaceae	*Commelina benghalensis* L.	Herb; LC	Cameroon	Wiwih	Latex	Latex is applied to the affected skin.	Ringworm	[17]
Commelinaceae	*Commelina diffusa* Burn. f.	Climber; LC	Nigeria	Ekpa ekpa ikpaha	Whole plant	Dried whole plant is ground to powder and applied externally.	Sores and burns	[15]
Convulvulaceae	*Ipomoea pileata* Roxb	Herb; No Record	Nigeria	Mkpafiafian	Leaves	Infusion of the leaves is applied topically.	Skin spots	[15]
Convulvulaceae	*Ipomoea quamoclit* L.	Herb; No Record	Nigeria	Ediam ikanikot	Leaves	Poultice.	Boil and wounds	[15]
Cucurbitaceae	*Citrullus colocynthis* (L.) Schrad.	Climber; No Record	Nigeria	Ikon	Seeds	Seeds are ground and applied topically.	Abscess and skin spots	[15]
Cucurbitaceae	*Cucurbita maxima* Duchesne	Climber; No Record	Ghana and Nigeria	Ikim	Leaves	Juice from the crushed leaves is applied topically.	Boil and skin spots	[15,27]
Cucurbitaceae	*Momordica balsamina* L.	Climber; No Record	Nigeria and Senegal	Mbiadon edon	Whole plant	Poultice.	Boil	[15]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Cucurbitaceae	*Momordica charantia* L.	Climber; No Record	Ghana, Mali, Nigeria, and Senegal	Mbiadon edon Nyenyen (Ghana)	Fruit	Poultice; infusion of whole plants is taken orally in Ghana for snakebites.	Boil, burns snakebites, and ulcers	[15,40,50]
Dioscoraceae	*Dioscorea dumetorum* (Kunth) Pax	Climber; No Record	Nigeria	Enem (Akwa Ibom); Esuru (Yoruba)	Leaves	Decoction of the leaves is applied topically.	Skin spots	[15]
Dioscoraceae	*Dioscorea rotundata* Poir	Climber; No Record	Nigeria	Eko	Leaves	Infusion of the leaves is applied topically.	Burns and skin spots	[15]
Ebenaceae	*Diospyros canaliculata* De Wild.	Tree; LC	Cameroon	No record	Stem bark	No record.	Skin infections	[26]
Euphorbiaceae	*Acalypha fimbriata* Schumach. & Thonn	Herb; No Record	Nigeria	Okokho nyin	Leaves and twigs	Decoction of leaves and twigs is used topically to bath.	Skin spots and sores	[15]
Euphorbiaceae	*Acalypha hispida* Burm. f.	Shrub; No Record	Nigeria	Okokho nyin	Leaves	Decoction of leaves is used externally to bath.	Skin spots and sores	[15]
Euphorbiaceae	*Acalypha wilkesiana* Müll. Arg.	Shrub; No Record	Nigeria	Okokho nyin	Leaves	Decoction of leaves is used topically to bath.	Skin spots	[15]
Euphorbiaceae	*Alchornea cordifolia* (Schumach. & Thonn.) Müll. Arg.	Shrub; No Record	Ghana, Nigeria, and West Africa	Mbom	Leaves and fruits	Infusion of the leaves; juice from the crushed fruits is applied topically.	Skin spots and skin ulcers, skin spots, scorpion stings, and snakebites	[15,29,40]
Euphorbiaceae	*Alchornea laxiflora* (Benth.) Pax & K. Hoffm.	Shrub; LC	Nigeria	Nwariwa	Leaves	Infusion of the leaves is used for skin spots and skin ulcers.	Skin spots and ulcers	[15]
Euphorbiaceae	*Euphorbia hirta* L.	Herb; No Record	Nigeria	Etinkene ekpo	Leaves	The poultice made from the leaves is applied topically.	Snakebites, scorpion stings, and insect bites	[15]
Euphorbiaceae	*Jatropha curcas* L.	Shrub; LC	Togo	Essogbalou (Togo) Medjai (Cameroon)	Leaves and latex	Decoction of the leaves is taken for cancer sores. Latex from the cut stem is applied to the wounds.	Cancer sores and wounds	[17,34]
Euphorbiaceae	*Jatropha gossypiifolia* L.	Shrub; LC	Nigeria	Eto oko obio nsit	Leaves	Juice from the crushed leaves is applied topically.	Eczema, ringworm, and scabies	[15]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Euphorbiaceae	*Macaranga barteri* Mull. Arg.	Shrub; LC	Ghana	Opam	Bark	Decoction of bark is taken orally.	Footrot	[50]
Euphorbiaceae	*Mallotus oppositifolius* (Geiseler) Müll. Arg.	Herb; LC	Cameroon, Ghana, and Nigeria	Uman nwariwa	Leaves or stem back	Decoction of the leaves is applied topically.	Skin spots	[15,40,51]
Euphorbiaceae	*Manniophyton fulvum* Müll. Arg.	Climber; No Record	Nigeria	Ekonikon	Leaves and stem bark	Infusion of the leaves and stem bark is applied topically.	Scabies, ringworm, and eczema	[15]
Euphorbiaceae	*Ricinus communis* L.	Shrub; LC	Nigeria	Eto kasto	Leaves and seeds	Infusion of the leaves; expression of the oil from the seeds.	Chickenpox smallpox, and skin spots	[15]
Fabaceae	*Abrus precatorius* L.	Climber; No Record	Nigeria	Nneminua (Akwa ibom); Oju ologbo (Yoruba)	Leaves	Juice from the crushed leaves is applied topically.	Skin spots	[15]
Fabaceae	*Afzelia africana* Sm.	Tree; VU	Nigeria	Eyin mbukpo	Stem bark	Sap produced from the crushed stem back is applied topically.	Leprosy, pimples, skin eruption, and wounds	[15]
Fabaceae	*Afzelia bella* Harms	Tree; LC	Nigeria	Enyin mbukpo	Leaves	Juice from the crushed leaves is applied topically.	Pimples	[15]
Fabaceae	*Aganope stuhlmannii* (Taub.) Adema	Tree; LC	Togo	Kpodougboou	Aerial part	Decoction is taken orally.	Aphthous ulcers	[34]
Fabaceae	*Albizia lebbeck* (L.) Benth.	Tree; LC	Nigeria	Ubam	Stem bark	Poultice.	Eczema and insect bites	[15]
Fabaceae	*Arachis hypogaea* L.	Herb; LC	Senegal	Gerte (wolof) Jamba katalig (mandingo)	Nut	Peanut oil mixed with powdered leaf of *A. digitata* is applied to wounds.	Burns	[52]
Fabaceae	*Baphia nitida* Lodd.	Tree; LC	Ghana and Nigeria	Afuo	Leaves	Juice from the crushed leaves is applied topically.	Boils, skin ulcers, and wounds	[15,40]
Fabaceae	*Burkea africana* Hook	Tree; LC	Togo	Tchangbali (Togo	Leaves	Decoction of the leaves is taken orally.	Aphthous ulcers	[34]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Fabaceae	*Cajanus cajan* (L.) Huth	Herb; No Record	Nigeria and Togo	Nkoti (Akwa Ibom); Otili (Yoruba); Assongoyè (Togo	Seeds and whole plant	Seeds are ground into powder and applied topically for measles, smallpox, sores, skin ulcers, and skin spots in Nigeria. Decoction of the whole plants is taken orally for aphthous ulcers in Togo.	Measles, sores, skin ulcers, skin spots, and smallpox	[15,34]
Fabaceae	*Daniellia oliveri* (Rolfe) Hutch. & Dalziel	Tree; LC	Nigeria and Togo	Enan-eto (Akwa Ibom); Hemou (Togo)	Root, bark, and leaves	Sap from the crushed root bark is applied topically in Nigeria. Leaves and bark are macerated and taken orally for aphthous ulcers in Togo.	Aphthous ulcers and rashes	[15,34]
Fabaceae	*Detarium microcarpum* Guill. & Perr	Tree; LC	Nigeria and Togo	Kpayè (Togo)	Bark, leaves, and roots	Dried roots and leaves are ground into powder and applied externally for cuts, ulcers and wounds in Nigeria. Stem bark is macerated and taken orally for aphthous ulcers in Togo.	Aphthous ulcers and wounds	[15,34]
Fabaceae	*Distemonanthus benthamianus* Baill.	Tree; LC	Nigeria	Eto-afia	Root bark	Decoction of the root bark is taken orally.	Skin spot	[15]
Fabaceae	*Faidherbia albida* (Delile) A. Chev	Tree; LC	Gambia	Bubrick	Root	NA	Snakebites	[48]
Fabaceae	*Lonchocarpus cyanescens* (Schumach. & Thonn.) Benth.	Shrub; No Record	Nigeria	Awa	Leaves	Infusion of the leaves is applied topically.	Skin ulcers and skin spots	[15]
Fabaceae	*Lonchocarpus sericeus* (Poir.) Kunth	Tree; LC	Nigeria	Ipappo (Yoruba)	Leaves	Decoction of the leaves with *Vernonia macrocynus* O.Hoffm is taken orally.	Skin infections	[42]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Fabaceae	*Parkia biglobosa* (Jacq.) R. Br. ex G. Don	Tree; LC	Nigeria and Togo	Ukon uyayak (Akwa Ibom); Igi iru (Yoruba); Soulou (Togo)	Stem bark	Dried stem bark is ground to powder for ringworms in Nigeria. Decoction of the stem bark is used externally for skin infection in Nigeria and taken orally for aphthous ulcers in Togo.	Aphthous ulcers, ringworm, and skin infection	[15,34]
Fabaceae	*Parkia clappertoniana* Keay	Tree; No Record	Nigeria and Ghana	Igba (Yoruba)	Leaves	Leaves are ground with *Loranthus* with potash and taken orally with pap (Nigeria); Extract from the husk is used for sores and wounds in Ghana.	Skin infections, sores, and wounds	[42,53]
Fabaceae	*Pentaclethra macrophylla* Benth	Tree; LC	Nigeria	Ukana	Stem bark	Decoction or infusion is used topically.	Skin spots	[15]
Fabaceae	*Piliostigma thonningii* (Schum.) Milne-Redh.	Tree; No Record	Republic of Benin, Nigeria, and Togo	Tilabaati (Benin); Pambakou (Togo) Abafe (Nigeria)	Root and root bark	Decoction of the root and fruit is taken orally for herpes sores and other skin diseases. The root bark is ground to powder and applied topically.	Herpes sores and skin disease	[16,34,42]
Fabaceae	*Pterocarpus erinaceus* Poir.	Tree; No Record	Nigeria and Togo	Ukpa (AkwaIbom, Nigeria); Tém (Togo)	Leaves and stem bark	Decoction of the leaves and stem bark is used externally for skin spots in Nigeria. Latex from the plant is applied topically for herpes sores and ringworm in Togo.	Herpes, ringworm sores, and skin spots	[15,34]
Fabaceae	*Pterocarpus santalinoides* L'Hér. ex DC.	Tree; No Record	Nigeria	Nkpa-inyan	Leaves	Decoction is used topically.	Skin spots	[15]
Fabaceae	*Senegalia ataxacantha* (DC.) Kyal. & Boatwr.	Tree; LC	Nigeria	Mbara okpok	Leaves	Juice from the crushed leaves is applied topically.	Burn and sores	[15]
Fabaceae	*Senna alata* L (Roxb	Shrub; LC	Nigeria	Asunwon (Yoruba); Akoria (Bennin)	Leaves and stem	Juice from the leaves and stem is applied externally.	Ringworms and skin spots	[42]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Fabaceae	*Senna hirsuta* (L.) H.S.Irwin & Barneby	Herb; No Record	Cameroon	Tulushine	Leaves	Decoction of leaves is taken orally.	General skin diseases	[17]
Fabaceae	*Senna occidentalis* (L.) Link	Herb; LC	Nigeria	Flower uduk-ikot	Leaves	Juice from the crushed leaves is applied topically.	Abscess and chickenpox	[15]
Fabaceae	*Senna tora* (L.) Roxb.	Herb; No Record	Nigeria	Mfan udukikot	Leaves	Infusion of the leaves is applied topically.	Skin spots and sores	[15]
Fabaceae	*Tamarindus indica* L.	Tree; LC	Nigeria and Togo	Okukuk mbakara (Akwa Ibom, Nigeria); Nidié (Togo)	Leaves and root bark	Decoction of the root bark is used externally for bathing for skin spots in Nigeria. Decoction of the leaves is taken orally for aphthous ulcers in Togo.	Aphthous ulcers and skin spots	[15,34]
Fabaceae	*Tetrapleura tetraptera* (Schumach. & Thonn.) Taub.	Tree; LC	Nigeria	Uyayak (Akwa Ibom); Aidan (Yoruba)	Fruits	Oil from the expression of the fruit is used externally for skin spots.	Skin spots	[15]
Fabaceae	*Vachellia nilotica* (L.) P.J.H. Hurter & Mabb	Tree; LC	Senegal	Nep nep (wolof) Mbano (mandingo)	Root	Root infusion is applied topically.	Herpes	[52]
Fabaceae	*Zornia latifolia* Sm.	Herb; No Record	Nigeria	Ubok etikoriko	Leaves	Sap from the crushed leaves or dried leaves ground into powder is applied topically.	Snakebites and scorpion stings	[15]
Gentianaceae	*Anthocleista djalonensis* A. Chev.	Tree; LC	Nigeria	Ibu (Akwa Ibom); Sapo (Yoruba)	Stem bark	Sap from the crushed stem bark is used topically.	Skin spots, sores, ulcers, and wounds	[15]
Hypericaceae	*Harungana madagascariensis* (Lam.) ex Poir.	Tree; LC	Nigeria	Oton	Leaves, stem, root	Infusion of the leaves, stem, and root is used topically.	Skin spots	[15]
Hypericaceae	*Hypericum Lanceolatum* Lam.	Shrub; No Record	Cameroon	No record	Stem bark	No record.	Skin infections	[26]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Hypericaceae	*Psorospermum febrifugum* Spach	Shrub; LC	Cameroon	No record	Stem bark and root	Decoction of the stem bark for skin sores in HIV/AIDS patients. Powdered root is used topically on parasitic skin diseases. It is used for pimples, eruptions, and wounds when ground up and mixed with oil.	Acne, leprosy, skin sores in HIV/AIDS patients, and skin infection.	[54,55]
Lamiaceae	*Clerodendrum splendens* G. Don	Climber; No Record	Mali and Nigeria	Mmon oyot adiaha ekiko	Leaves	Juice from the crushed leaves is applied topically.	Skin spots and snakebites	[15,29]
Lamiaceae	*Mesosphaerum suaveolens* (L.) Kuntze	Herb; No Record	Togo and Gambia	Pinbinè (Togo) Jammakarla (Gambia	Root	Root is macerated and taken orally for aphthous ulcers. Sap is applied to fresh cut.	Aphthous ulcers and fresh cuts	[34,48]
Lamiaceae	*Solenostemon monostachyus* (P. Beauv.) Briq	Herb; No Record	Nigeria	Ntorikwot	Leaves	Juice from the crushed leaves is added to water and applied topically.	Measles	[15]
Lamiaceae	*Vitex doniana* Sweet	Tree; LC	West Africa	Nkokoro	Root	Poultice.	Leprosy and wrinkles	[15,31,56]
Malvaceae	*Adansonia digitata* L.	Tree; No Record	Côte d'Ivoire, Gambia, and Nigeria and	Luru (Hausa) Buback (Gambia)	Leaves and fruits	Juice from the crushed leaves is applied topically. Fruit pulp is applied to body blisters.	Body blisters, scorpion stings, and snakebites	[15,48]
Malvaceae	*Bombax buonopozense* P. Beauv.	Tree; LC	Nigeria	Ukim	Stem bark	Infusion of the stem bark is applied externally.	Ringworm, rashes, and skin spots	[15]
Malvaceae	*Ceiba pentandra* (L.) Gaertn.	Tree; LC	Cote d'Ivoire and Nigeria	Akpu-ogwu (Igbo); Araba (Yoruba); Rimi (Hausa)	Stem bark	Decoction of the stem bark is used for bathing.	Leprosy, sores, and skin ulcers	[15,28]
Malvaceae	*Glyphaea brevis* (Spreng.) Monach	Shrub; LC	Nigeria	Ndodiro	Leaves	Poultice.	Burns and wounds	[15]
Malvaceae	*Gossypium hirsutum* L.	Shrub; VU	Nigeria	Eto-ofo	Leaves	Juice from the crushed leaves is applied topically.	Sores, skin eruption, and wounds	[15]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Malvaceae	*Sterculia tragacantha* Lindl.	Tree; LC	Nigeria	Udot eto	Stem bark	Sap from the crushed stem bark is applied topically.	Boil, skin ulcers, and wounds	[15]
Malvaceae	*Triumfetta cordifolia* Guill., Perr. & A. Rich	Shrub; No Record	Nigeria	Nkibbe ubuk	Leaves	Juice from the crushed leaves is applied topically.	Skin spots	[15]
Marantaceae	*Thaumatococcus danielli* Benth	Herb; No Record	Nigeria	Ewe iran	Leaves	Powder from the dried leaves is mixed with oil and applied to the affected area.	Skin infections	[57]
Melastomataceae	*Heterotis rotundifolia* (Sm.) Jacq.-Fél.	Shrub; LC	Nigeria	Nyie ndan	Whole plant	Decoction of the whole plant is used externally for bathing.	Measles	[15]
Meliaceae	*Azadirachta indica* A. Juss.	Tree; LC	Ghana and Nigeria	Ibok utoenyin	Leaves, stem bark, root	Infusion is used topically.	Eczema, ringworm, skin spots, and scabies	[15,40]
Meliaceae	*Carapa procera* DC.	Tree; LC	Ghana, Guinea, and Nigeria	Mkpono ubom	Seeds	Oil from the crushed seed is used externally.	Burns, insect bites, and scabies	[40,58]
Meliaceae	*Khaya grandifoliola* A. Juss.	Tree; VU	Nigeria	Odala (Igbo), Oganwo (Yoruba)	Stem bark	Decoction is used topically.	Skin spots	[15]
Meliaceae	*Pseudocedrela kotschyii* (Schweinf.) Harms	Tree; LC	Togo	Helitétéwiyé	Root	Root maceration is taken orally.	Aphthous ulcers	[34]
Menispermaceae	*Chasmanthera dependens* Hochst	Climber; No Record	Republic of Benin	Boborou	Stem	Ground stem is applied topically or mixed with shea butter.	Wounds	[16]
Moraceae	*Afromorus mesozygia* (Stapf) E.M. Gardener	Tree; No Record	Cameroon	No record	Roots, stem, and leaves	No record.	Dermatitis	[26]
Moraceae	*Artocarpus altilis* (Parkinson) Fosberg	Tree; No Record	Cameroon	No record	Roots	No record.	Abscesses, boils, and skin infections	[26]
Moraceae	*Ficus sycomorus* L.	Tree; LC	Nigeria	Sikamo	Root	Poultice.	Snakebites	[15]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Moraceae	*Ficus carica* L.	Tree; LC	Nigeria	Ukimo	Stem bark	Dried stem bark is ground to powder and applied to the wounds.	Wounds	[15]
Moraceae	*Ficus exasperata* Vahl	Tree; LC	Nigeria and Togo	Ukuok (Akwa ibom); Eepin (Yoruba); Laalayou (Togo)	Leaves and root	Sap from the crushed root is used externally for ringworms in Nigeria. Decoction of the leaves is taken orally for aphthous ulcers in Togo.	Ringworm	[15,34]
Moraceae	*Ficus ingens* (Miq.) Miq	Shrub; LC	Republic of Benin	Dekuru sanni	Root bark	The root bark is ground to powder and applied topically.	Wounds	[16]
Moraceae	*Ficus thonningii* Blume	Tree; LC	Benin republic	Kudoro	Roots	Adventitious roots of *F. thonningii* and bark of the root of *Newbouldia laevis* are ground into powder and applied topically.	Wounds	[16]
Moraceae	*Treculia obovoidea* N.E.Br	Tree; LC	Cameron	No record	Twigs	No record.	Skin disease	[26]
Myristicaceae	*Pycnanthus angolensis* (Welw.) Warb.	Tree; LC	Cameroon	No record	Stem bark	No record.	Fungal skin infection	[26]
Myrtaceae	*Eugenia uniflora* L.	Tree; LC	Nigeria	No record	Leaves	Decoction of the leaves is taken orally.	Skin spots	[15]
Ochnaceae	*Lophira lanceolata* Tiegh. ex Keay	Tree; LC	Nigeria and Togo	Tabsomang (Togo)	Leaves, root bark and stem	Decoction of the leaves and root back for chickenpox, fungal skin infection, and wounds in Nigeria. Stem is rubbed directly on the herpes sore in Togo.	Chicken pox, herpes sores, and skin infections	[15,34]
Ochnaceae	*Ochna rhizomatosa* (Tiegh.) Keay	Shrub; No Record	Republic of Benin	Yinkpenoka	Root bark	The root bark is ground to powder and applied topically for wounds.	Wounds	[16]
Ochnaceae	*Ochna schweinfurthii* F. Hoffm.	Shrub; LC	Republic of Benin	Yinkpenoka	Root bark	The root bark is ground to powder and applied topically for wounds.	Wounds	[16]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Olacaceae	*Coula edulis* Baill.	Tree; LC	Cameron	No record	stem bark	No record.	Skin disease	[26]
Phyllanthaceae	*Bridelia ferruginea* Benth.	Tree; LC	Nigeria	Udia afua	Stem bark	Infusion is used topically.	Fungal skin infections and wounds	[15]
Phyllanthaceae	*Flueggea virosa*, (Roxb. ex Willd.) Royle	Shrub; LC	Republic of Benin	Opanko (Benin), Tchaakatchaka (Togo)	Root bark and aerial part	Root bark is incinerated and applied topically to wounds. Decoction is taken orally for aphthous ulcers.	Aphthous ulcers and wounds	[16,34]
Phyllanthaceae	*Hymenocardia acida* Tul.	Shrub; LC	Togo, Republic of Benin	KpaiKpai (Togo), Sinkakakou (Benin)	Leaves, Root bark	Decoction of the leaves is taken orally for aphthous ulcers. Root bark is ground to powder and applied topically to wounds.	Aphthous ulcers and wounds	[16,34]
Phyllanthaceae	*Maesobotrya barteri* (Baill.) Hutch	Tree; LC	Nigeria	Nnyanyatet	Root	Sap from the crushed root is applied externally.	Skin spots	[15]
Phyllanthaceae	*Maesobotrya dusenii* (Pax) Pax	Tree; No Record	Nigeria	Nnyanyatet	Root	Sap from the crushed root is applied externally.	Skin spots	[15]
Phyllanthaceae	*Phyllanthus amarus* Schumach. & Thonn.	Herb; No Record	Nigeria	Oyomokiso	Whole plant	Decoction of the whole plant is taken orally and for bathing.	Skin spots	[15]
Phyllanthaceae	*Phyllanthus pentandrus* Schum. And Thonn	Shrub; No Record	Nigeria	Ehin olobe	Leaves and fruit husks	The dried leaves are ground with *Vigna* plant, and the powder is then mixed with shea butter; the ointment is applied to boils.	Boil	[42]
Phyllanthaceae	*Uapaca togoensis* Pax	Tree; LC	Côte d'Ivoire	No record	Root and stem bark	Preparation from the root and stem bark.	Leprosy and skin diseases	[59]
Poaceae	*Andropogon gayanus* Kunth	Herb; No Record	Nigeria	Mbokko ekpo	Leaves	Dried leaves are ground to powder and used topically.	Wounds	[15]
Poaceae	*Imperata cylindrica* (L.) Raeusch.	Herb; LC	Nigeria	Ndan inwan	Rhizome	Rhuzome is crushed and applied topically.	Abscess and scorpion sting	[15]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Poaceae	*Pennisetum polystachion* (L.) Schult.	Herb; LC	Nigeria	Nwan-mbakara	Shoot	Dried shoots are ground into powder and applied to the wounds.	Wounds	[15]
Poaceae	*Rottboellia cochinchinensis* (Lour.) Clayton	Herb; No Record	Nigeria	Mbokko enan ikot	Whole plant	Decoction of the whole plant is for bathing.	Measles	[15]
Polygalaceae	*Carpolobia lutea* G. Don	Shrub; LC	Nigeria	Ikpafun	Leaves	Decoction of the leaves is taken orally.	Skin spots	[15]
Polygalaceae	*Portulaca oleracea* L.	Herb; LC	Ghana and Nigeria	Uton ekpu	Whole plant	Decoction of the whole plant is used for bathing.	Dermatitis and skin spots	[15]
Rubiaceae	*Borreria verticillata* (L.) G. Mey.	Herb; No Record	Nigeria	No record	Leaves	Juice from the crushed leaves is applied topically.	Eczema and skin spots	[15]
Rubiaceae	*Chassalia kolly* (Schumach.) Hepper	Shrub; No Record	Togo	Tiyah (Togo)	Roots	Paste made from the roots is applied topically.	Ringworm	[34]
Rubiaceae	*Crossopteryx febrifuga* (Afzel. ex G.Don) Bents	Tree; LC	Republic of Benin	Otoupedou	Root bark	The root bark is ground to powder and applied topically.	Wounds	[16]
Rubiaceae	*Diodia sarmentosa* Sw.	Climber; No Record	Nigeria	No record	Leaves	Decoction of leaves is used topically.	Skin spots	[15]
Rubiaceae	*Gardenia ternifolia* schumach. & Thonn	Shrub; LC	Republic of Benin and Togo	Keyabouaka (Benin); Kaou (Togo)	Root and root bark	Root decoction is applied topically for ringworms in Togo. Root bark is incinerated and mixed with palm kernel oil and used topically for wounds in Benin.	Ringworm and wounds	[16,34]
Rubiaceae	*Morinda longiflora* G. Don	Climber; No Record	Nigeria	No record	Leaves	Infusion of the leaves in water and used externally.	Scabies	[15]
Rubiaceae	*Nauclea latifolia* Sm.	Tree; LC	Nigeria	No record	Leaves	Juice from the crushed leaves is applied externally.	Rashes	[15]
Rubiaceae	*Sarcocephalus latifolius* (Sm.) E.A.Bruce.	Tree; No Record	Togo	Kayou (Togo)	Root	Decoction of the root is taken orally.	Aphthous ulcers	[34]
Rutaceae	Clausena anisata (Willd.) Hook. f. ex Benth.	Shrub; LC	Nigeria	Mbiet ekpene	Stem bark	Decoction of the stem bark is taken orally.	Measles	[15]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Rutaceae	*Zanthoxylum gilletii* (De Wild.) Waterman	Tree; LC	Ghana and Nigeria	Nkek	Root bark	Sap from the crushed root back is applied topically.	Boil	[15]
Rutaceae	*Zanthoxylum zanthoxyloides* (Lam.) Zepern. & Timler	Tree; LC	Togo	Kolgragu	Aerial part	Maceration is taken orally.	Aphthous ulcers	[34]
Salicaceae	*Homalium letestui* Pellegr.	Tree; No Record	Nigeria	Oton idim	Leaves	Decoction or infusion of the leaves is taken orally.	Skin spots	[15]
Sapindaceae	*Blighia sapida* K.D. Koenig	Tree; LC	Benin Republic, Ghana, Nigeria, and Togo	Ishin (Yoruba), Kpiziyè (Togo)	Leaves, fruit, and stem bark	Pounded bark is taken as an antidote to snake and scorpion bites. Decoctions of bark or fruit walls are applied to wounds. The ground-up leaves and salts are applied as a paste to treat yaws and ulcers. A calcinate made from the fruit or bark is applied externally for aphthous ulcers and herpes sores in Togo.	Aphthous ulcers, herpes sores, snakebites, scorpion bites, and wounds	[34,40,55]
Sapindaceae	*Paullinia pinnata* L.	Tree; No Record	Republic of Benin and Togo	Dikitinintibou (Benin); Adjandj kpouzou (Togo)	Aerial Part and root bark	Decoction of the aerial part is taken orally for aphthous ulcers in Togo. Root bark is ground to powder and applied topically for wounds.	Aphthous ulcers and wounds	[16,34]
Sapotaceae	*Vitellaria paradoxa* C.F. Gaertn	Tree; VU	Republic of Benin	Somou	Leaf	Leaves powder is mixed with butter and applied topically.	Wounds	[16]
Simaroubaceae	*Hannoa undulata* (Guill. & Perr.) Planch	Tree; No Record	Republic of Benin	Okoupopode	Root bark	The root bark is ground and applied topically.	Wounds	[16]
Smilacaceae	*Smilax anceps* Willd.	Climber; No Record	Nigeria	No record	Leaves, twigs	Decoction is applied topically.	Skin spot	[55]
Solanaceae	*Datura metel* L.	Herb; No Record	Nigeria	Nnya ekpo	Leaves	Juice from the crushed leaves is applied topically.	Insect bites and scorpion stings	[15]
Solanaceae	*Nicotiana rustica* L.	Herb; No Record	Nigeria	No record	Leaves	Poultice.	Skin ulcers, skin cancer, and wounds	[15]

Table 1. *Cont.*

Family	Plant Species	Habit and Conservation Status	Country	Local Name	Plant Part(s) Used	Mode of Preparation	Ailment	References
Solanaceae	*Nicotiana tabacum* L.	Herb; No Record	Ghana and Nigeria	Ewe taaba (Yoruba)	Leaves	Poultice.	Skin ulcers, skin cancer, and wounds	[15,40]
Ximeniaceae	*Ximenia americana* L.	Shrub; LC	Nigeria	No record	Root	Sap from the crushed root is applied topically.	Skin ulcers, rashes, and ringworm	[15]
Zingiberaceae	*Aframomum melegueta* (Roscoe) K.Schum	Herb; DD	Republic of Benin	Fètcharinanfè	Seed	The dried powder of the seed is applied topically.	Wounds	[16]

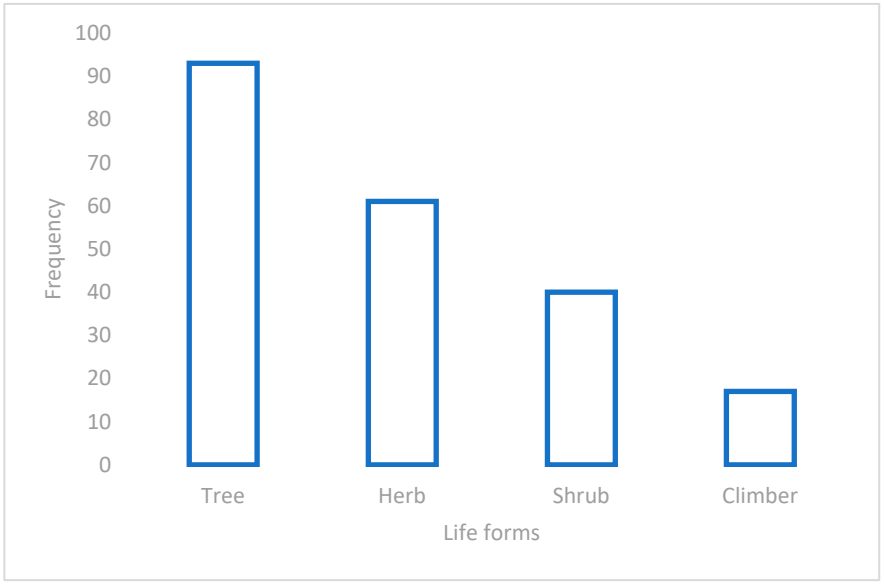

Figure 3. Life forms of the reported plants.

Regarding the plant parts or organs used in formulating or preparing various herbal medicines, leaves were more frequently used (107) than any other plant. Roots (55) and stems (39) were next, while all other plant parts had less than 20 use reports (Figure 4). The use of leaves in herbal remedies has always been highly reported, and the literature suggests it may be due to their ease of harvest [64]. It is also possible that leaves are especially well used for skin diseases because other reports on skin diseases [10,11] documented similar findings. However, the relatively high frequency of roots after the leaves could be related to the high prevalence of woody species implicated in this study. Also, the roots of plants are believed to contain a high quantity of phytochemicals because of their role in the absorption of nutrients [64]. Regrettably, harvesting medicinal plants' roots for medicinal purposes poses the greatest conservation risk to plants because they are difficult to regenerate. Considering the mode of preparation, decoction (73) was the most preferred method, followed by crushing/juicing (50), and powdering, grinding, or pounding (39) (Figure 5). The decoction method has been reported as the most common method of preparation of medicinal plants around the world [17]. However, there is no clear scientific reason why the method is widely used. The use of the method of crushing or juicing in this review may be attributed to the nature of the disease, as it is the easiest and quickest method to apply the extracts from the plant topically to the skin. Figure 6 shows the number of plants used to treat different skin diseases; wounds, being the highest, are treated with 65 plants. Skin ulcers are treated with 46 plants and skin spots with 58. The pain associated with wounds and ulcers may account for the observed figures. As for skin spots, it is general knowledge that many people love spotless skin.

An assessment of the recorded plants' conservation statuses revealed a lack of conservation status data for 43% of the recorded plants. Among the plants with conservation records, 113 have a conservation status of least concern (LC). Six plants (*Afrofittonia silvestris*, *Afzelia africana*, *Allanblackia floribunda*, *Gossypium hirsutum*, *Khaya grandifoliola*, and *Vitellaria paradoxa*) have a conservation status of vulnerable (VU), while two plants (*Aframomum melegueta* and *Mangifera indica*) have a conservation status of data deficient (DD). It was observed in this paper that most of the plants with no conservation assessments are herbs and climbers, implying that most conservation efforts have been centered on tree species. This highlights the need to intensify conservation studies on herbs and climbers that are used medicinally as they are also prone to extinction, like trees [65].

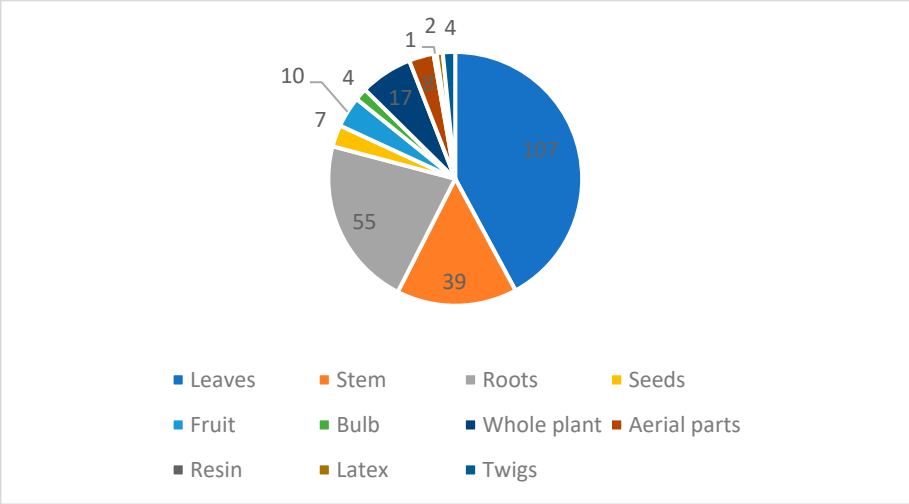

Figure 4. Parts of plants used to make herbal remedies.

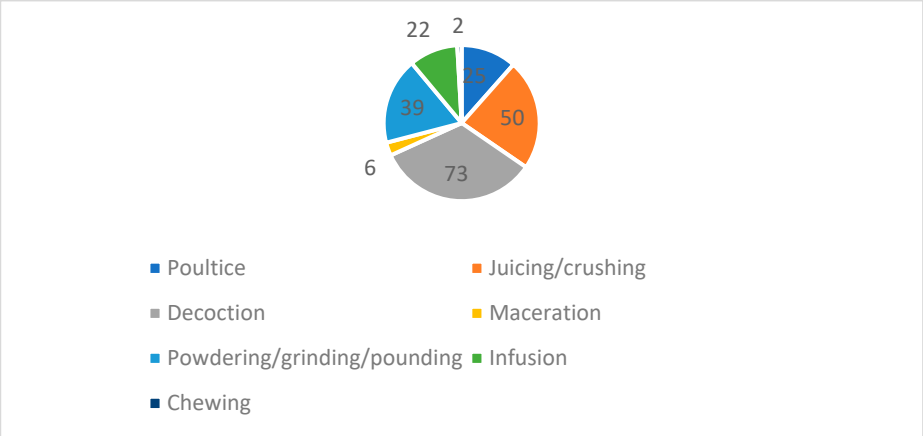

Figure 5. Mode of preparation.

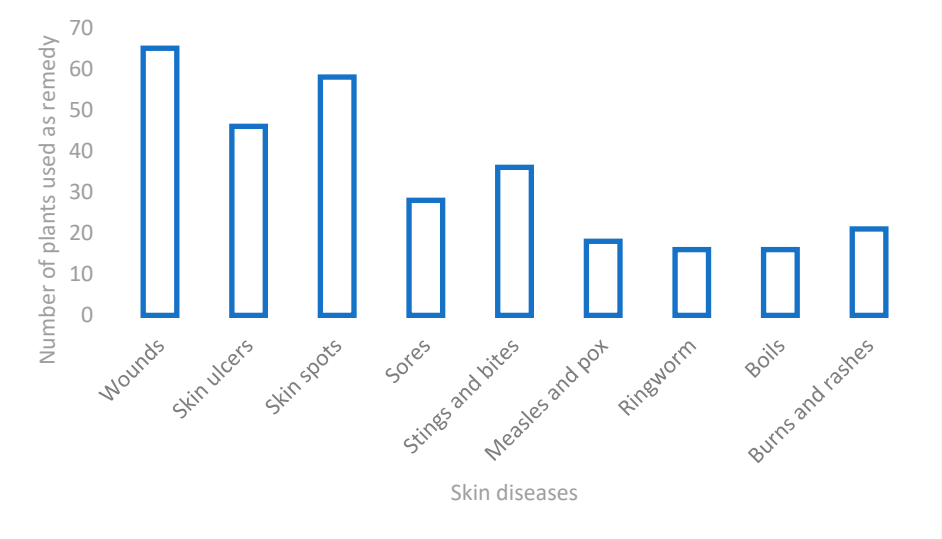

Figure 6. Number of plants used in treating different skin diseases.

3.3. Biological Activities of the Recorded Plants

Millions of beneficial microorganisms and pathogens inhabit the skin surface, and their imbalance or breaking of the skin could cause skin diseases [3,5]. Skin diseases recorded

in this review and treated with medicinal plants include abscesses, athlete's foot, boils, measles, skin spots, as well as ulcers, whitlows, wounds, and many other skin infections. Due to the diversity and nature of these diseases, medicinal plants employed in treating skin disorders should possess pharmacological properties such as antibacterial, antifungal, antioxidant, anti-inflammatory, and wound-healing activities. Still, the review revealed that a large percentage of the studies have focused on the antibacterial and antifungal studies of the plants used in the treatment of skin diseases. In contrast, only a few studies explored other biological activities. However, it should be noted that researchers have addressed, to a large extent, the recommendations from a previous study [10] by studying the response of some neglected bacteria to botanicals used in skin diseases. Out of the 211 plant species recorded in this review, the biological activities of 82 plants have been assessed (Table 2), while over 60% of the plants are yet to be evaluated for any activities related to skin diseases, highlighting the wide gap in research into the biological activities of traditionally used medicinal plants.

Most of the studies in this review examined the antibacterial and antifungal activities of the plants using different types of dermatophytes. Some of the most commonly chosen skin pathogens include the bacteria *Staphylococcus aureus*, *Epidermophyton floccossum*, *Bacillus subtilis*, and *Pseudomonas aeruginosa*, while species of fungi in the genus *Candida*, especially *C. albicans*, were the most commonly tested fungi. Biological activities are a means of validating the efficacy of the traditional uses of plants. However, some of the activities recorded in Table 2 may not necessarily validate the use of the plants against skin diseases because the plant parts reportedly used in traditional medicine are different from those tested, and it is common knowledge that the type and quantity of the phytochemicals accumulated by different plant parts may be widely different. For example, the leaf juice of *Achyranthes aspera* is folklorically used to treat skin ulcers [15], but Gupta et al. [70] evaluated the antimicrobial activities of its root and stem. Likewise, the antimicrobial activities of the stem bark of *Lannea acida* were evaluated [133], but ethnobotanical records showed the use of its leaves in skin diseases [15,25]. Some of the most active antibacterial and antifungal plants based on their low MIC include the aerial part of *Brillantaisia lamium* (6.25 µg/mL), the essential oil of the seeds of *Monodora myristica* (8 µg/mL), the leaves of *Flueggea virosa* (8 µg/mL), the leaves of *Dacryodes edulis* (12.5 µg/mL), the essential oil from the aerial parts of *Ageratum conyzoides* (64 µg/mL), the aerial parts of *Clerodendrum splendens* (64 µg/mL), and the leaves of *Pistia stratiotes* (125 µg/mL). As regards the range of microorganisms susceptible to the extracts, alcohol extracts of *Aloe vera* leaf gel inhibited 115 skin pathogens [81]. Conversely, some plants were completely inactive, while others had very high MICs, thus making them inactive. For example, the aqueous extract from leaves of *Lannea microcarpa* was not active in all the skin pathogens tested [134], while the leaves of *Sansevieria liberica* and the roots of *Hannoa undulata* had a MIC value of 62.5 mg/mL each [127,151]. Some of these studies have confirmed or validated the ethnobotanical use of the plants, while others did not support their use. This may be due to the solvent extract used for the biological activities. It is also common practice to prepare herbal remedies using more than one plant for a single ailment for synergistic purposes or to treat the disease and symptoms [64]. Therefore, it is important to test the biological activities of medicinal plants following the traditional method of preparation and administration.

Table 2. Biological activities of the plants used against skin diseases in West Africa.

Plant Species	Plant Part(s) Used	Biological Activities/Extract or Isolated Compound Used	Results	Active Metabolites	References
Acalypha wilkesiana	Leaf	Aqueous	The extract inhibited *C. albicans*, *E. coli*, *P. aeruginosa*, *P. vulgaris*, *S. aureus* with zones of inhibition between 12 and 19 mm.	Alkaloids, glycoside, terpenes, 15-hydroxy pentadecanoic acid, 1,2,3-propanetriyl ester, and 9-octadecanoic acid	[66]
Acanthospermum Hispidum	Whole plant	Antifungal/Ethanol	The extract inhibited pathogenic fungi, namely, *C. albicans*, *M. luteus*, *M. roseus*, *P. aeruginosa*, and *S. aureus*, with zones of inhibitions between 12–18 mm.	Acanthospermal B	[67]
Acanthus montanus	Root Leaf	Anti-inflammatory/Aqueous Antifungal/Methanol	The extract significantly inhibited acute oedema in the mouse ear and the rat paw at $p < 0.05$. *Extract completely* inhibited dermatophytic fungi, namely, *Cladosporium* sp., *Fusarium* sp., *Trichophyton mentagrophyte*, *T. rubrum* and *T. soudanense* at 100 mg/mL.	Carbohydrates, alkaloids, tannins, glycosides, carbohydrates, flavonoids, and steroids.	[68,69]
Achyranthes aspera	Root and stem	Antifungal/Aqueous Methanol	Methanolic, aqueous root extract and methanolic extract of the stem were effective against *Epidermophyton floccossum.*	Alkaloids, carbohydrates, flavonoids, proteins, amino acids, tannins, phenols, steroids, glycosides and saponins	[70,71]
Aframomum melegueta	Seed	Antifungal/Ethanol	Ethanol extract was active against a range of dermatophytes.	Flavonoids, phenols, tannins, saponins, and terpenoids	[72]
Afzelia africana	Leaf	Antibacterial/Methanol	*Streptococcus pyogenes* was significantly susceptible to the extract with 25.0 mm zone of inhibition.	Alkaloids, anthraquinones, flavonoids, phenolics, glycosides, terpenoids, and steroids	[73,74]
Ageratum conyzoides	Aerial part	Antimicrobial/Essential oil	Essential oil was active against *E. coli*, *E. faecalis*, and *S. aureus* with zones of inhibition between 6.7 to 12.7 mm and MIC values between 64 to 256 µg/mL.	β-caryophyllene, β-copaene, α-calacorene, and 1,10-di-epi-cubenol	[75]

Table 2. *Cont.*

Plant Species	Plant Part(s) Used	Biological Activities/Extract or Isolated Compound Used	Results	Active Metabolites	References
Alchornea cordifolia	Leaf	Antimicrobial and wound healing/Aqueous ethanol	Both extracts demonstrated good activities against *C. albicans*, *B. subtilis*, *E. coli*, *P. aeruginosa* and *S. aureus*, with MIC values between 2.5–10.0 mg/mL. Both extracts also elicited significant wound-healing capacity on day 1 and day 9.	Anthraquinones, cardiac glycosides, flavonoids, saponins, sterols, and tannins	[76]
Allanblackia floribunda	Leaf, bark, stem bark, and root	Antibacterial/Butanol, chloroform, ethyl acetate, ethanol, and n-hexane	The extracts displaced activity against *A. flavus*, *B. subtilis*, *C. albicans*, *E. coli*, *S. aureus*, *P. vulgaris*, *P. aeruginosa* with zones of inhibition between 5 and 35 mm.	Alkaloids, anthraquinones, cardiac glycosides, flavonoids, saponins, tannins, and terpenoids	[77,78]
Allium sativum	Bulb	Antifungal/Aqueous	The extract had a significant antifungal effect on *T. rubrum.*	Allicin, alkaloids, and tannins	[79,80]
Aloe vera	Leaf and Gel	Antimicrobial/Ethanol	The gel extracts showed activity against 115 g-positive and gram-negative skin pathogens, while the leaf extracts showed no such activity.	Flavonoids, tannins, terpenoids, and saponins.	[81,82]
Alstonia boonei	Stem bark Root bark	Antibacterial/Methanol Wound healing/ Alkaloid extract	*Streptococcus pyogenes* was significantly susceptible to extract with zone of inhibition of 25.0 mm. The total alkaloid extract increased the wound contraction and decreased the epithelialization period.	Alkaloids, cyanogenetic glycosides, flavonoids, terpenoids, saponins, and steroids	[73,83]
Alternanthera bettzickiana	Aerial part	Antifungal/Aqueous and methanol	Aqueous and methanol extracts inhibited *Candida albicans* and *E. floccossum* inhibition zone of 9–11 mm.	Alkaloids, anthocyanin, diterpenes, leucoanthocyanin, saponins, phenols, diterpenes, tannin, terpenoids, steroids, and xanthoprotein,	[84]

Table 2. *Cont.*

Plant Species	Plant Part(s) Used	Biological Activities/Extract or Isolated Compound Used	Results	Active Metabolites	References
Amaranthus caudatus	Whole plant	Antifungal/Dichloromethane, ethyl acetate, hexane, and methanol	The extracts were active against *C. albicans.*	Flavonoids, steroids, terpenoids, and cardiac glycosides	[85]
Anacardium occidentale	Fruit and stem bark	Antimicrobial/Water: Ethanol	Growth inhibition of *S. aureus* and *S. epidermidis* by the extracts.	Tannin and flavonoids	[19,86]
Anchomanes difformis	Leaf and Tuber	Antibacterial/Ethanol	Leaf extract was effective on *P. aeruginosa* with an inhibition zone of 21 mm; tuber extract inhibited *B. subtilis* and *P. aeruginosa* with zones of inhibitions of 35 and 29 mm, respectively.	Alkaloids, tannins, and saponins	[87]
Annickia chlorantha	Stem bark	Antifungal/Alkaloid fraction	The fraction and its ointment formulation demonstrated antifungal activities against *Candida* spp. and dermatophytes.	Alkaloids, flavonoids, glycosides, tannins, and saponins	[88,89]
Anogeisus leiocarpus	Leaf, stem bark, and root bark	Antibacterial/Ethanol	Individual extract and combination displayed strong activities against *E. coli S. aureus*, and *P. aeruginosa* with a zone of inhibition up to 15.80 mm.	Anthraquinones, alkaloids phenols, tannins, and ellagic acids	[90]
Anona senegalensis	Leaves	Antifungal/Aqueous and methanol	Aqueous and methanol were active against *Trichoderma* spp. with zones of inhibition of 14.5 mm and 8.3 mm respectively.	Alkaloids, flavonoids, and polyphenols	[91]
Anthocleista djalonensis	Root	Antibacterial/Methanol	The extract inhibited *E. coli*, *S. aureus*, and *Shigella* sp. with inhibition zones between 14 and 20 mm. The extracts also elicited significant wound healing in vivo.	Alkaloids, flavonoids, and volatile oils	[92]

Table 2. *Cont.*

Plant Species	Plant Part(s) Used	Biological Activities/Extract or Isolated Compound Used	Results	Active Metabolites	References
Aspilia africana	Leaf and root	Antimicrobial/Methanol	Both extracts were active against *B. substilis*, *E. coli*, *P. aeruginosa*, and *S. aureus*, with 3–6 mm inhibition zones.	Cardiac glycosides, flavonoids, saponins, tannins, and terpenoids	[93,94]
Azadirachta indica	Leaf	Antibacterial/Ethanol	The extract inhibited E. coli and S. aureus with a maximum inhibition zone of 16 mm.	β-sitosterol, flavonoid, lupeol, ferulic acid, and quercetin	[95]
Baphia nitida	Leaf and root	Antimicrobial/Ethanol	Extracts inhibited *C. albicans*, *E. coli*, *S. aureus*, *P. aeruginosa*, and *B. subtilis*, with a zone of inhibition up to 35 mm.	Flavonoids, glycosides, saponins, sterols, tannins	[96]
Bidens pilosa	Leaf	Antimicrobial/Ethanol	The ethanol extract was active against *E. coli*, *P. aeruginosa*, *S. pyogenes*, *S. aureus*, and *P. aeruginosa* inhibition zones between 2–5 mm.	Alkaloids, cardiac glycosides, flavonoids, and tannins	[97]
Brillantaisia Lamium	Aerial part	Antimicrobial activity/Dichloromethane and methanol (1:1)	Extract, fraction and lespedin, the isolated compound demonstrated antimicrobial activities against pathogenic bacterial and fungi, namely, *Candida tropicalis*, *Cryptococcus neoformans*, *Staphylococcus aureus* and *Enterococcus faecalis*.	β-sitosterol, sitosterol 3-O-β-D-glucopyranoside Aurantiamide acetate, campesterol, lespedin lupeol, and stigmasterol	[98]
Calotropis procera	Leaves	Antifungal/Ethanol	Extracts inhibited the growth of pathogenic fungi, namely, *Epidermophyton floccosum*, *M. gypreum*, *M. canis*, *T. mentagrophytes*, and *T. rubrum*, with MIC values between 250 and 1000 μg/mL.	Camphene, dodecanoic acid, linolenic acid, and thebaine	[99,100]

Table 2. *Cont.*

Plant Species	Plant Part(s) Used	Biological Activities/Extract or Isolated Compound Used	Results	Active Metabolites	References
Carapa procera	Leaf	Antibacterial and wound healing/Ethanol	The extract inhibited *E. coli* and *S. aureus* with MIC values between 2.5 and 5 mg/mL. The extract also demonstrated a significant wound-healing activity in rats.	Saponins, steroids, and tannins	[101]
Carica papaya	Flower	Antibacterial/Methanol	The flower extract inhibited *B. subtilis* and *E. coli* with the zones of inhibition between 10 to 40 mm.	Alkaloids, flavonoids, phenolics, saponins, and tannins	[102]
Chassalia kolly	Leaf	*Antioxidant and anti-inflammatory*/Ethanol	The extract elicited excellent antioxidant activity with IC_{50} = 0.05 µg/µL) and showed higher anti-inflammatory activities than aspirin.	Anthocyanins, flavonoids, and terpenes	[103]
Chromolaena odorata	Leaf, stem and root	Antimicrobial/Ethanol, hexane, and methanol	All the extracts inhibited the activities of pathogenic bacteria strains, such as *B. cereus*, *E. faecalis*, *S. epidermidis*, and *P. vulgaris.*	Alkaloids, aurone, chalcone, flavone flavonol, phytates, and tannins	[104,105]
Citrullus colocynthis	Fruit, seed and root	Antimicrobial/Ethanol	Extracts were active on pathogens, causing skin infections with zones of inhibition between 10 and 22 mm.	Alkaloids, flavonoids, glycosides, saponins, and tannins	[106,107]
Clerodendrum splendens	Aerial part	Antimicrobial and wound healing/Methanol	The extract was active against various bacteria and fungi with MIC values between 64 and 512 µg/mL. The extract also elicited wound-healing capacity by increasing wound epithelization, scar area and tensile strength.	D-glucopyranoside of (22E, 24S) and stigmasta-5,22,25-trien-3β-ol (3)	[108,109]
Colocasia esculenta	Leaf and tuber	Antibacterial/Methanol	Both extracts inhibited the growth of *E. coli*, *P. aeruginosa*, *P. mirabilis*, *S. aureus* with zones of inhibition between 4–30 mm.	10-fluoro trimethyl ester, 12,15-octadecatrienoic acid, decanoic acid, n-hexadecanoic acid, and pentadecanoic acid.	[110]

Table 2. *Cont.*

Plant Species	Plant Part(s) Used	Biological Activities/Extract or Isolated Compound Used	Results	Active Metabolites	References
Combretum collinum	Leaf	Antibacterial/Ethanol	The extract displayed activities against *S. epidermidis*, Methicillin-resistant *Staphylococcus aureus* and *S. aureus* with MIC values between 275.0 µg/mL and 385.5 µg/mL.	Myricetin-3-*O*-glucoside and myricetin-3-*O*-rhamnoside	[111]
Crinum jagus	Bulb	Antimicrobial/Methanol	The extract at 100 mg/mL inhibited *C. albicans*, *S. aureus* and *B. subtilis* with zones of inhibition of 14, 21, 25 mm, respectively.	Alkaloids, catechin, tannins, flavonoids, saponins, and triterpenes	[18,112]
Cyanthillium cinereum	Leaf	Antibacterial/Methanol	The extract inhibited the activity of *E. coli* and *S. aureus* with zones of inhibition of 21 mm and 19 mm, respectively.	Alkaloids, flavonoids, phenol, and terpenoids	[113,114]
Cyathula prostrata	Whole plant	Anti-inflammatory/ Ethyl acetate	The extract inhibited carrageenan, arachidonic acid, and xylene-induced tests.	Flavonoids, phenols, cardiac glycosides, and terpenes	[115]
Dacryodes edulis	Leaf	Antibacterial/Ethanol	Extract elicited significant activities against *B. cereus*, E. *coli*, *S. aureus*, *P. aeruginosa*, with the zone of inhibition between 8 and 13 mm and MIC values between 12.5 and 250 µg/mL.	Ethylgallate and quercitrin	[116]
Daniellia oliveri	Leaf and stem bark	Antifungal/Aqueous and methanol	Extracts were active against several species of fungi, especially the *Candida* species.	Alkaloids, anthraquinones, flavonoids, and saponins	[117]
Dioscorea dumetorum	Tuber	Antifungal/Methanol	Extracts were active against *Aspergillus niger* and C. albicans.	Alkaloids, flavonoids, phenols, saponins, and tannin	[118]
Elaeis guineensis	Leaf	Antibacterial/Methanol	Extracts showed potent activities against *B. cereus*, *E. coli*, and *P. aeruginosa* with inhibition zones of 7.7–11.3 mm.	Alkaloids, coumarins, flavonoids, saponins, tannins, and terpenoids	[119]

Table 2. *Cont.*

Plant Species	Plant Part(s) Used	Biological Activities/Extract or Isolated Compound Used	Results	Active Metabolites	References
Emilia coccinea	Leaf	Antimicrobial/Methanol	The extract was active against *A. niger*, *C. albicans*, *E. coli*, *S. aureus*, *B. subtilis*, and *P. aeruginosa* with MIC value between 5–25 mg/mL and inhibition zone up to 22 mm.	Alkaloids, flavonoids, oxalate, tannins, phenols, and terpenoids	[120,121]
Euphorbia hirta	Leaf and stem	Antibacterial/ Methanol aqueous	Extracts inhibited *E. coli*, *P. mirabilis*, *P. aeruginosa* and *S. aureus.*	Anthraquinones, alkaloids, flavonoids, and terpenoids	[122]
Ficus thonningii	Stem bark	Antibacterial/Methanol	The extract inhibited a range of skin pathogens, such as *P. aeruginosa* and *S. pyogenes*, with inhibition zone up to 33.3 mm and MIC values between 1 and 1.25 mg/mL.	Alkaloids, anthraquinones, saponins, and tannins	[123]
Flueggea virosa	Leaf	Antibacterial/Ethanol, chloroform and petroleum ether	Extracts were active against *S. aureus* with MIC values between 8–16 µg/mL.	β-sitosterol,11-*O*-acetyl bergenin, bergenin, daucosterol, kaempferol, gallic acid, and virosecurinine	[124,125]
Funtumia elastica	Stem bark	Antifungal/Crude extract	The extract was active on *A. flavus*, *C. albicans*, *T. mentagrophytes* and *Trichosporon cutaneum* zones of inhibition between 11 to 17 mm.	Anthocyanins, butacyanin, flavonoids, and tannins	[126]
Hannoa undulata	Root	Antibacterial/Ethanol	The extract was active against *Cutibacterium acnes*, *K. pneumonia*, *P. aeruginosa*, and *S. aureus* with zonesof inhibition between 12 and 15 mm and MIC value of 62.5 mg/mL.	Alkaloids, flavonoids, saponins, and triterpenes	[127]
Heliotropium indicum	Whole plant	Ethanol	The extract showed activities against selected skin pathogens with zones of inhibition between 12 and 25 mm.	Phenols, saponins, terpenoids, and cardiac glycosides	[128]

Table 2. *Cont.*

Plant Species	Plant Part(s) Used	Biological Activities/Extract or Isolated Compound Used	Results	Active Metabolites	References
Jatropha curcas	Leaf	Antibacterial/Methanol	Extract inhibited *E. coli* and *S. aureus* with zones of inhibition of 26 and 18 mm, respectively, as well as MIC of 0.125 mg/mL.	Alkaloids, Flavonoids, saponins, tannins, and saponins	[129]
Khaya grandifoliola	Leaf, Stem bark, and root	Antibacterial/Methanol ethyl acetate	Extracts were active against *S. aureus* and *S. pyogenes* with MIC value of 0.25 mg/mL.	Alkaloids, phenols, flavonoids, and terpenoids	[130]
Kigelia africana	Leaf and stem bark	Antimicrobial and wound healing/Methanol	Both extracts demonstrated healing properties by increasing wound contraction significantly by 72% at 7 days. Extracts from the plant were also active against *E. coli*, *P. aeruginosa*, *S. aureus*, *B. subtilis*, and *C. albicans* with MIC values between 2.5–7.5 mg/mL.	Flavonoids, iridoids, coumarins, naphthoquinones, terpenes, and terpenoids	[131,132]
Lannea acida	Stem bark	Antifungal/Crude	The extract inhibited the growth of fungi, namely *Aspergillus favus*, *C. albicans*, *C. tropicalis*, *Fusarium solani*, *Rhyzopus stolonifera*, with zones of inhibition ranging from 28.33 to 9.66 mm.	Flavonoids, phenols, terpenoids	[133]
Lannea microcarpa	Leaves	Antimicrobial/Aqueous	The extract was not effective against *E. coli*, *Pseudomonas aeruginosa* and *S. aureus*.	Flavonoids, phenolics, polyphenols, and terpenoids	[134]
Macaranga barteri	Bark	Anti-inflammatory and wound healing/Ethanol	Extract reduced inflammation and skin hyperalgesia in rats with carrageenan-induced edema.	Gallic acid, macabarterin, 3-*O*-methylellagic acid, 4-*O*-b-D-xylopyranoside, and 3-*O*-methylellagic acid	[1]

Table 2. *Cont.*

Plant Species	Plant Part(s) Used	Biological Activities/Extract or Isolated Compound Used	Results	Active Metabolites	References
Mallotus oppositifolius	Leaf	Antifungal/Crude extract, fractions, and isolated compounds	The extract, fractions and isolated compounds were active against dermatophytes (*Microsporum langeroinii*, *M. audouin*, *Trichophyton rubrum*, *T. soudanense*) with MIC values between 1.86 and 25,000 µg/mL.	Betulinic acid, quercetin, and quercitrin	[135]
Mangifera indica	Seed	Antimicrobial/Essential oil	The extract demonstrated antimicrobial activities against tested organisms, namely, *E. coli*, *C. albicans*, *S. aureus*, and *Mycobacterium smegmatis*, with a zone of inhibition between 10–18 mm.	Carbohydrates, polyphenols, terpenoids, sterols, carotenoids, fatty acids, and amino acids	[136,137]
Momordica charantia	Leaf and fruit	Antimicrobial/Methanol	Extracts from the leaf and fruit inhibited *C. albicans*, *E. coli*, *P. aeruginosa*, and *S. aureus*.	Anthocyanin, coumarin, cardiac glycosides, and tannins	[138,139]
Monodora myristica	Seed	Antimicrobial/Essential oil	The essential oil was active against different strains of *S. aureus* and *E. coli* with MIC values between 8 to 512 µg/mL.	Monoterpenes and sesquiterpenes	[140]
Nauclea latifolia	Stem bark	Antimicrobial/Methanol	Extracts inhibited *B. subtilis*, *C. albicans P. aeruginosa*, zones of inhibition between 13 and 18 mm and MIC values between 0.5 and 4 mg/mL.	Alkaloids, flavonoids, saponins, phytates, and tannins	[141,142]
Newbouldia laevis	Leaf	Antimicrobial/Methanol	The extract inhibited the growth *C. albicans*, *E. coli*, *P. aeruginosa*, and *S. aureus.*	Flavonoids, cardiac glycosides, and tannins, terpenes,	[143]
Piliostigma thonningii	Leaf	Antifungal/Methanol	The extract was active against dermatophytes with MIC values ranging from 13 to 24 mg/mL	Alkaloids, flavonoids, and terpenoids	[144]

Table 2. *Cont.*

Plant Species	Plant Part(s) Used	Biological Activities/Extract or Isolated Compound Used	Results	Active Metabolites	References
Pistia stratiotes	Leaf	Antifungal/Methanol	The extract was active against pathogenic fungi, namely, *E. floccosum*, *M. gypseum* and *M. nanum T. rubrum*, and *T. mentagrophytes* with MIC values between 125 µg/mL to 250 µg/mL.	Alkaloids, flavonoids, glycosides, and phytosterols	[145]
Psorospermum febrifugum	Stem bark	Antibacterial/Ethanol, Methanol, and aqueous	Extracts were active against *E. coli*, *S. aureus*, *P. aeruginosa* and *S. pyogenes* with inhibition zones between 11 and 19 mm and MIC value of 6.25 mg/mL.	Alkaloids, anthraquinones, flavonoids, steroids, tannins, terpenes, and xanthones	[146]
Pycnanthus angolensis	Stem bark	Antimicrobial/Aqueous and ethanol	Extracts were active against *C. albicans P. mirabilis*, *P. aeruginosa* and *S. aureus*.	Alkaloids, essential oils, glycosides, flavonoids, saponins, and tannins	[147]
Rauvolfia vomitoria	Stem bark	Antifungal/Dichloromethane	The extract was active against *A. niger* and *C. albicans* with a zone of inhibition of up to 19 mm.	Alkaloids, saponins, tannins, carbohydrates, and reducing sugars	[148,149]
Ricinus communis	Leaf	Antimicrobial/Aqueous and ethanol	Extracts exhibited strong inhibitory activities against *E. coli*, *K. pneumonia*, *S. aureus*, and *P. aeruginosa* with zones of inhibition up to 35 mm.	Tannins, saponins, terpenoids, flavonoids, and reducing sugar	[150]
Sansevieria liberica	Leaf	Antimicrobial/Methanol	The extract was active against *B. cereus* and S. *aureus* with MIC value of 62.5 mg/mL.	Carbohydrates, flavonoids, and triterpenes	[151]
Senna alata	Leaf	Antifungal/Methanol	The extract inhibited *C. albicans* and *S. pyogenes* with 25.0 mm zone of inhibition.	Alkaloids, flavonoids, tannins, saponins, and terpenoids	[73]
Spathodea campanulata	Leaf and flower	Antibacterial/Ethanol	Both extracts inhibited the growth of *B. subtilis*, *E. coli*, *S. aureus*, and *P. vulgaris*, with zones of inhibition between 6–11 mm.	Alkaloids, flavonoids, glycosides, phenolics, saponin, steroids, tannin, and terpenoids	[152]

Table 2. *Cont.*

Plant Species	Plant Part(s) Used	Biological Activities/Extract or Isolated Compound Used	Results	Active Metabolites	References
Stereospermum kunthianum	Leaf	Antibacterial/crude extract	Extract inhibited *E. coli*, *S. aureus*, and *P. aeruginosa* with a zone of inhibition of up to 35 mm. The MIC values of the extract on the organism also ranged between 2.09 mg/mL and 4.17 mg/mL.	Coumarins, fatty acids, and sterols	[153]
Strophanthus hispidus	Leaf and root	Antimicrobial and wound healing/Methanol	Both extracts improved wound contraction at day 11. The extracts were also active against *E. coli*, *P. aeruginosa*, *S. aureus*, *B. subtilis*, and *C. albicans* with MIC values between 2.5–7.5 mg/mL.	Alkaloids, flavonoids, cardiac and cyanogenic glycosides, and saponins	[131,154]
Symphonia globulifera	Leaf and stem bark	Antimicrobial/Aqueous	Leaf extract was active against *C. albicans*, *E. coli*, *S. aureus*, and *P. aeruginosa* with zones of inhibition between 13 and 21 mm.	Alkaloids, anthraquinones, flavonoids, tannins, and quinones	[155]
Terminalia avicennioides	Leaf	Wound healing and antioxidant/Methanol	The extract inhibited pathogens associated with wound infection and increased the concentration of superoxide dismutase and catalase from the healed skin tissues.	Ellagic acids, flavonoids, phenols, and tannins	[90,156]
Tetrapleura tetraptera	Leaf	Antibacterial/Methanol	The extract was active on *S. aureus* and *S. pyogenes* with a zone of inhibition of between 21.5 to 25 mm	Phenols, flavonoids, saponins, and alkaloids	[73]
Trianthema portulacastrum	Leaf	Wound healing/n-Butanol fraction of hydroethanol	Extract ointment (5% and 10% *w*/*w*) significantly promotes wound healing.	Caffeic acid, ferulic acid Chlorogenic acid, and protocatechuic acid	[157]

Table 2. *Cont.*

Plant Species	Plant Part(s) Used	Biological Activities/Extract or Isolated Compound Used	Results	Active Metabolites	References
Tridax procumbens	Leaf	Antimicrobial/Ethanol	The extract was active against bacterial, namely, *E. coli*, *S. pyogenes*, *S. aureus*, *B. subtilis* and *P. aeruginosa*, with inhibition zones between 4–9 mm.	Alkaloids, flavonoids, cardiac glycosides, and tannins	[97]
Uvaria chamae	Stem bark	Antimicrobial/Methanol	The extract was active against *E. coli*, *B. subtilis* and *S. aureus* with zones of inhibition between 18 and 28 mm.	Flavonoids, glycosides, saponins, tannins,	[158]
Vernonia amygdalina	Leaf	Antimicrobial/Aqueous	The extract displayed significant activities against different strains of multi-drug resistant *S. aureus.*	Alkaloids, flavonoids, phenol, tannins and terpenoids	[159]
Vitellaria paradoxa	Nuts, leaf, stem and root	Antimicrobial/Ethanol	Extracts showed activity against pathogens with zones of inhibition between 11 and 30 mm and MIC values between 60 and 70 mg/mL.	Alkaloids, carbohydrates, saponins, steroids, and tannins	[160,161]
Xanthosoma sagittifolium	Leaf, stalk, and root	Antifungal/Ethanol	The extract inhibited the pathogenic fungi, *T. rubrum*, with an inhibition diameter of 18 mm, close to the standard drug, amphotericin (20 mm).	Cardiac glycoside, flavonoids, tannins, phenols, and terpenoids	[162,163]
Xylopia aethiopica	Fruit	Antimicrobial/Aqueous. methanol and essential oil	The extract was active against the pathogenic fungi, namely *Microsporum canis*, *M. equinum*, and *T. mentagrophyte* with inhibition zones of 2.84 to 3.5 mm. The oil extract also showed significant activity against *B. subtilis*, *Enterobacter aerogenes*, *E. coli*, *S. pyogenes*, *S. aureus*, and *Serratia marcescens.* *Candida albicans* was highly susceptible to the methanol extract zone of inhibition of 25.0 mm.	α-pinene, β-linalool, α-terpineol, pinocarveol, terpinene-4-acetate, α-thugene, β-phellandrene, β-caryophyllene, γ-terpinene, 1,8-cineole, acetyleugenol, benzylbenzoate, eugenol, *cis*-ocimene, and sabinene	[73,164,165]

Plant secondary metabolites are the ingredients that confer therapeutic effects on medicinal plants [72]. An assessment of the antimicrobial activities of the phytochemicals of the plants in Table 2 was carried out. Though many of the plants have been evaluated for their phytochemistry, only a few phytochemicals have their antimicrobial activities carried out against skin pathogens. The alkaloidal fraction of *Annickia chlorantha* stem back showed significant antifungal activities both in vitro and in vivo [88]. Tamokou et al. [98] isolated seven compounds from the aerial part of *B. lamium*, among which lespedin (MIC = 6.25 µg/mL) and aurantiamide acetate (MIC = 50 µg/mL) significantly inhibited the growth of the tested skin pathogens. Betulenic acid isolated from the leaves of *Mallotus oppositifolius* also displayed a noteworthy activity against a dermatophyte, *Microsporum langeronii* with MIC value of 1.86 µg/mL [135]. Betulenic acid elicited the best antimicrobial activity with the lowest MIC value in this review.

Further research is required on the metabolite to ascertain its biotoxicity and synergistic effect with other antimicrobial metabolites to further explore its potency in developing a commercially available antimicrobial agent. Regarding the antioxidant and anti-inflammatory activities of the plants, ethanol extracts of the leaves of *Chassalia kolly* showed excellent activities with an IC_{50} of 0.05 µg/µL and also showed higher anti-inflammatory activities than aspirin [103]. This is traditionally used in the treatment of ringworm [34]. Similarly, using the xylene and chorioallantoic membrane (CAM) anti-inflammatory model, *Cyathula prostrata* showed moderate activity [115], despite its traditional use for sores and rashes [28]. It is recommended that further studies into the activities of *C. kolly* be carried out to assess its complete activities, isolate active metabolites, and harness its potential in treating skin ailments.

Wounds are one of the most common skin problems that may occur in any part of the skin due to breaking/puncturing the skin or rupturing other body tissues. For the wound-healing activities of the plants, the n-butanol fraction of the hydroethanolic leaf extract of *Trianthema portulacastrum* accelerated wound healing in rats by increasing the contraction and epithelialization of the wound and decreasing the level of inflammatory markers [157]. This result validated the use of the plant in the management of wounds in Nigeria [15]. The alkaloidal extract from the stem bark of *Alstonia boonei* also significantly increases the rate of contraction of the wound and reduced the epithelialization period in vivo [83]; the plant is traditionally used for snakebites [36]. Similarly, in an in vivo study, the methanol extracts of the leaves and roots of *Strophanthus hispidus* and the roots and stem bark of *Kigelia africana* significantly increased wound contraction at days 11 and 7, respectively [131]. Agyare et al. [76] revealed that the aqueous and methanol extracts of *Alchornea cordifolia* displayed wound-healing capacity at days 1 ($p < 0.05$) and 9 ($p < 0.001$). Other plants implicated in the study that have demonstrated wound-healing capacity include *Anthocleista djalonensis* [92], *Clerodendrum splendens* [108], and *Carapa procera* [101].

4. Conclusions

This review compiled the list of plants used traditionally in Western Africa for combating various skin ailments and the available scientific studies that have been carried out on the plants. A large percentage of the data was reported from a handful of countries, showing a large research gap in many West African countries on the traditional use of plants for skin ailments. The family Fabaceae is by far the most used, while Combretaceae, Asteraceae, and Euphorbiaceae were also well used. The most common habit of the plants was tree; leaf was the most-used plant part; and decoction was the most-preferred method of preparation. The biological activities of 82 out of the 211 plant species have been carried out, which means many plants still need to be investigated for biological activities related to skin diseases in West Africa. Plants such as *Brillantaisia lamium*, *Kigelia africana*, and *Strophanthus hispidus* that have demonstrated strong biological activities related to skin diseases are recommended for further research to identify the active metabolites and their mode of action.

Author Contributions: Conceptualization, A.A.-n.A., M.U.M. and N.M.; methodology, data curation, A.A.-n.A., M.U.M. and N.M.; writing—original draft preparation, A.A.-n.A., M.U.M. and N.M.; writing—review and editing, A.A.-n.A., M.U.M. and N.M.; funding acquisition, M.U.M. and N.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Acknowledgments: Many thanks to Mukaila Yusuf Ola for proofreading the manuscript.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Rosamah, E.; Haqiqi, M.T.; Putri, A.S.; Kuspradini, H.; Kusuma, I.W.; Amirta, R.; Arung, E.T. The potential of *Macaranga* plants as skincare cosmetic ingredients: A review. *J. Appl. Pharm. Sci.* **2023**, *13*, 001–012. [CrossRef]
2. McGrath, J.A.; Eady, R.A.J.; Pope, F.M. Anatomy and organization of human skin. *Rook's Textb. Dermatol.* **2004**, *1*, 2–3.
3. Paulino, L.C.; Tseng, C.H.; Strober, B.E.; Blaser, M.J. Molecular analysis of fungal microbiota in samples from healthy human skin and psoriatic lesions. *J. Clin. Microbiol.* **2006**, *44*, 2933–2941. [CrossRef] [PubMed]
4. Byrd, A.L.; Belkaid, Y.; Segre, J.A. The human skin microbiome. *Nat. Rev. Microbiol.* **2018**, *16*, 143–155. [CrossRef] [PubMed]
5. Belkaid, Y.; Segre, J.A. Dialogue between skin microbiota and immunity. *Science* **2014**, *346*, 954–959. [CrossRef] [PubMed]
6. Hay, R.J.; Johns, N.E.; Williams, H.C.; Bolliger, I.W.; Dellavalle, R.P.; Margolis, D.J.; Naghavi, M. The global burden of skin disease in 2010: An analysis of the prevalence and impact of skin conditions. *J. Investig. Dermatol.* **2014**, *134*, 1527–1534. [CrossRef] [PubMed]
7. Basra, M.K.; Shahrukh, M. Burden of skin diseases. *Expert. Rev. Pharmacoecon. Outcomes Res.* **2009**, *9*, 271–283. [CrossRef] [PubMed]
8. Tabassum, N.; Hamdani, M. Plants used to treat skin diseases. *Pharmacogn. Rev.* **2014**, *8*, 52–55. [CrossRef]
9. Mukaila, Y.O.; Oladipo, O.T.; Ogunlowo, I.; Ajao, A.A.N.; Sabiu, S. Which plants for what ailments: A quantitative analysis of medicinal ethnobotany of Ile-Ife, Osun State, Southwestern Nigeria. *Evid.-Based Complement. Altern. Med.* **2021**, *2021*, 5711547. [CrossRef]
10. Mabona, U.; Van Vuuren, S.F. Southern African medicinal plants used to treat skin diseases. *S. Afr. J. Bot.* **2013**, *87*, 175–193. [CrossRef]
11. Alamgeer, S.A.; Asif, H.; Younis, W.; Riaz, H.; Bukhari, I.A.; Assiri, A.M. Indigenous medicinal plants of Pakistan used to treat skin diseases: A review. *Chin. Med.* **2018**, *13*, 52. [CrossRef]
12. Tsioutsiou, E.E.; Amountzias, V.; Vontzalidou, A.; Dina, E.; Stevanović, Z.D.; Cheilari, A.; Aligiannis, N. Medicinal plants used traditionally for skin related problems in the south balkan and east mediterranean region—A review. *Front. Pharmacol.* **2022**, *13*, 936047. [CrossRef] [PubMed]
13. Kankara, S.S.; Ibrahim, M.H.; Mustafa, M.; Go, R. Ethnobotanical survey of medicinal plants used for traditional maternal healthcare in Katsina state, Nigeria. *S. Afr. J. Bot.* **2015**, *97*, 165–175. [CrossRef]
14. Zizka, A.; Thiombiano, A.; Dressler, S.; Nacoulma, B.M.; Ouédraogo, A.; Ouédraogo, I.; Ouédraogo, O.; Zizka, G.; Hahn, K.; Schmidt, M. Traditional plant use in Burkina Faso (West Africa): A national-scale analysis with focus on traditional medicine. *J. Ethnobiol. Ethnomed.* **2015**, *11*, 9. [CrossRef] [PubMed]
15. Ajibesin, K.K. Ethnobotanical survey of plants used for skin diseases and related ailments in Akwa Ibom State, Nigeria. *Ethnobot. Res. Appl.* **2012**, *10*, 463–522.
16. Codo Toafode, N.M.; Oppong Bekoe, E.; Vissiennon, Z.; Ahyi, V.; Vissiennon, C.; Fester, K. Ethnomedicinal information on plants used for the treatment of bone fractures, wounds, and sprains in the northern region of the Republic of Benin. *Evid.-Based Complement. Altern. Med.* **2022**, *2022*, 8619330. [CrossRef] [PubMed]
17. Simbo, D.J. An ethnobotanical survey of medicinal plants in Babungo, Northwest Region, Cameroon. *J. Ethnobiol. Ethnomed.* **2010**, *6*, 8. [CrossRef] [PubMed]
18. Udegbunam, S.O.; Udegbunam, R.I.; Nnaji, T.O.; Anyanwu, M.U.; Kene, R.O.C.; Anika, S.M. Antimicrobial and antioxidant effect of methanolic *Crinum jagus* bulb extract in wound healing. *J. Intercult. Ethnopharmacol.* **2015**, *4*, 239. [CrossRef]
19. Gonçalves, G.M.S.; Gobbo, J. Antimicrobial effect of Anacardium occidentale extract and cosmetic formulation development. *Braz. Arch. Biol. Technol.* **2012**, *55*, 843–850. [CrossRef]
20. González-Minero, F.J.; Bravo-Díaz, L.; Moreno-Toral, E. Pharmacy and fragrances: Traditional and current use of plants and their extracts. *Cosmetics* **2023**, *10*, 157. [CrossRef]
21. Maroyi, A. Medicinal uses of the Fabaceae family in Zimbabwe: A Review. *Plants* **2023**, *12*, 1255. [CrossRef]
22. Ajao, A.A.; Sibiya, N.P.; Moteetee, A.N. Sexual prowess from nature: A systematic review 315 of medicinal plants used as aphrodisiacs and sexual dysfunction in sub-Saharan Africa. *S. Afr. J. Bot.* **2019**, *122*, 342–359. [CrossRef]
23. Rogers, C.B.; Verotta, L. Chemistry and biological properties of the African Combretaceae. In *Chemistry, Biological and Pharmacological Properties of African Medicinal Plants*; Hostettman, K., Chinyanganga, F., Maillard, M., Wolfender, J.-L., Eds.; University of Zimbabwe Publications: Harare, Zimbabwe, 1996.

24. Eloff, J.N.; Katerere, D.R.; McGaw, L.J. The biological activity and chemistry of the southern African Combretaceae. *J. Ethnopharmacol.* **2008**, *119*, 686–699. [CrossRef] [PubMed]
25. Ccana-Ccapatinta, G.V.; Monge, M.; Ferreira, P.L.; Da Costa, F.B. Chemistry and medicinal uses of the subfamily Barnadesioideae (Asteraceae). *Phytochem. Rev.* **2018**, *17*, 471–489. [CrossRef]
26. Ntie-Kang, F.; Lifongo, L.L.; Mbaze, L.M.A.; Ekwelle, N.; Owono Owono, L.C.; Megnassan, E.; Efange, S.M. Cameroonian medicinal plants: A bioactivity versus ethnobotanical survey and chemotaxonomic classification. *BMC Complement. Altern. Med.* **2013**, *13*, 147. [CrossRef] [PubMed]
27. Dalziel, J.M. The Useful Plants of West Tropical Afica. In *Being an Appendix to "the Flora of West Tropical Africa"*; Crown Agents for the Colonies: London, UK, 1937.
28. Bouquet, A.; Debray, M. Plantes médicinales de la Côte d'Ivoire. *Trav. Doc. L'office Rech. Sci. Tech. Outre-Mer.* **1974**, *32*, 5–229.
29. Lewis, W.H.; Elvin-Lewis, M.P. *Medical Botany: Plants Affecting Human Health*; John Wiley & Sons: Hoboken, NJ, USA, 2003.
30. Kerharo, J.; Adam, J.G. Deuxième inventaire des plantes médicinales et toxiques de la Casamance (Sénégal). *Ann. Pharm. Françaises* **1963**, *21*, 773–792.
31. Kerharo, J.; Adam, J.G. *La Pharmacopée Sénégalaise Traditionnelle: Plantes Medicinales et Toxiques*; Vigot: Paris, France, 1974.
32. Irvine, F.R. *Plants of the Gold Coast*; Oxford University Press: London, UK, 1930.
33. Chevalier, A.; Laffitte, M. Une enquête sur les plantes médicinales de l'Afrique occidentale. *Rev. Bot. Appl. Agric. Trop.* **1937**, *27*, 165–175. [CrossRef]
34. Alfa, T.; Anani, K.; Adjrah, Y.; Batawila, K.; Ameyapoh, Y. Ethnobotanical survey of medicinal plants used against fungal infections in prefecture of sotouboua central region, Togo. *Eur. Sci. J.* **2018**, *14*, 342. [CrossRef]
35. Burkill, H.M. *The Useful Plants of West Tropical Africa*, 2nd ed.; Family A–D; Royal Botanic Gardens, Kew: London, UK, 1985; Volume 1.
36. Betti, J.L. An ethnobotanical study of medicinal plants among the Baka pygmies in the Dja biosphere reserve, Cameroon. *Afr. Stud. Monogr.* **2004**, *25*, 1–27.
37. Chopra, R.N.; Nayar, S.L.; Chopra, I.C. *Glossary of Indian Medicinal Plants*; CSIR: New Delhi, India, 1956.
38. Pobéguin, H. *Plantes Médicinales de la Guinée*; Challamel: Paris, France, 1912.
39. Kerharo, J.; Adam, J.G. Premier inventaire des plantes médicinales et toxiques de la Casamance (Senegal). *Ann. Pharm. Françaises* **1962**, *20*, 76–84.
40. Agbovie, T.; Amponsah, K.; Crentsil, O.R.; Dennis, F.; Odamtten, G.T.; Ofusohene-Djan, W. Conservation and sustainable use of medicinal plants in Ghana. *Ethnobot. Surv.* **2002**, *15*, 32–37.
41. Kerharo, J.; Bouquet, A. Indigenous Conceptions of Leprosy and its Treatment in the Ivory Coast and Haute-Volta. *Bull. Société Pathol. Exot.* **1950**, *43*, 56–65.
42. Bhat, R.B.; Etejere, E.O.; Oladipo, V.T. Ethnobotanical studies from central Nigeria. *Econ. Bot.* **1990**, *44*, 382–390. [CrossRef]
43. Dossou-Yovo, H.O.; Vodouhè, F.G.; Kaplan, A.; Sinsin, B. Application of ethnobotanical indices in the utilization of five medicinal herbaceous plant species in Benin, West Africa. *Diversity* **2022**, *14*, 612. [CrossRef]
44. Bouquet, A. Féticheurs et médicines traditionalles du Congo (Brazzaville). *Mémoires Off. Rech. Sci. Technol. Outre-Mer.* **1969**, *36*, 4–304.
45. Chifundera, K. Contribution to the inventory of medicinal plants from the Bushi area, South Kivu Province, Democratic Republic of Congo. *Fitoterapia* **2001**, *72*, 351–368. [CrossRef]
46. Oyen, L.P.A. Symphonia globulifera L.f. In *PROTA (Plant Resources of Tropical Africa/Ressources Végétales de l'Afrique Tropicale)*; Louppe, D., Oteng-Amoako, A.A., Brink, M., Eds.; Wageningen University: Wageningen, The Netherlands, 2005.
47. Fromentin, Y.; Cottet, K.; Kritsanida, M.; Michel, S.; Gaboriaud-Kolar, N.; Lallemand, M.C. *Symphonia globulifera*, a widespread source of complex metabolites with potent biological activities. *Planta Medica* **2015**, *81*, 95–107. [CrossRef]
48. Madge, C. Therapeutic landscapes of the Jola, The Gambia, West Africa. *Health Place* **1998**, *4*, 293–311. [CrossRef]
49. Aubréville, A. *Flore Forestière Soudano-Guinéene: A.O.F., Cameroun, A.E.F*; Société d'Éditions Géographiques Maritimes et Coloniales: Paris, France, 1950.
50. Boadu, A.A.; Asase, A. Documentation of herbal medicines used for the treatment and management of human diseases by some communities in southern Ghana. *Evid.-Based Complement. Altern. Med.* **2017**, *2017*, 3043061. [CrossRef]
51. Kabran, F.A.; Maciuk, A.; Okpekon, T.A.; Leblanc, K.; Seon-Meniel, B.; Bories, C.; Champy, P.; Djakouré, L.A.; Figadère, B. Phytochemical and biological analysis of *Mallotus oppositifolius* (Euphorbiaceae). *Planta Med.* **2012**, *78*, 1381. [CrossRef]
52. Ellena, R.; Quave, C.L.; Pieroni, A. Comparative medical ethnobotany of the Senegalese community living in Turin (Northwestern Italy) and in Adeane (Southern Senegal). *Evid.-Based Complement. Altern. Med.* **2012**, *2012*, 604363. [CrossRef] [PubMed]
53. Kuma, D.N.; Boye, A.; Kwakye-Nuako, G.; Boakye, Y.D.; Addo, J.K.; Asiamah, E.A.; Atsu Barku, V.Y. Wound healing properties and antimicrobial effects of *Parkia clappertoniana* keay fruit husk extract in a rat excisional wound model. *BioMed Res. Intern.* **2022**, *2022*, 9709365. [CrossRef] [PubMed]
54. Komakech, R. Herbs & Plants. Psorospermum febrifugum Spach. A Medicinal Plant for Skin Diseases. Available online: southworld.net/herbs-plants-psorospermum-febrifugum-spach-a-medicinal-plant-for-skin-diseases (accessed on 1 April 2023).
55. Tropical lants Database, Ken Fern. Available online: tropical.theferns.info/viewtropical.php?id=Psorospermum+febrifugum (accessed on 1 April 2023).
56. Rukangira, E. The African herbal industry: Constraints and challenges. Proceedings of the Natural Products and Cosmeceuticals, August 2001. *Erbor. Domani* **2001**, *1*, 1–15.

57. Adediwura, F.J.; Ajibesin, K.K.; Odeyemi, T.; Ogundokun, G. Ethnobotanical studies of folklore phytocosmetics of South West Nigeria. *Pharm. Biol.* **2015**, *53*, 313–318.
58. DeFilipps, R.A.; Maina, S.L.; Crepin, J. Medicinal Plants of the Guianas (Guyana, Surinam, French Guiana). In *Medicinal Plants of the Guianas (Guyana Surinam Fr. Guiana)*; Department of Botany, National Museum of Natural History, Smithsonian Institution: Washington, DC, USA, 2004.
59. Kitambala, M.M. Uapaca guineensis Müll.Arg. In *PROTA (Plant Resources of Tropical Africa/Ressources Végétales de l'Afrique Tropicale)*; Schmelzer, G.H., Gurib-Fakim, A., Eds.; Wageningen University: Wageningen, The Netherlands, 2023.
60. Kokwaro, J.O. *Medicinal Plants of East Africa*; University of Nairobi Press: Nairobi, Kenya, 2009.
61. Haq, I. Safety of medicinal plants. *Pak. J. Med. Res.* **2004**, *43*, 203–210.
62. Mlilo, S.; Sibanda, S. An ethnobotanical survey of the medicinal plants used in the treatment of cancer in some parts of Matebeleland, Zimbabwe. *S. Afr. J. Bot.* **2022**, *146*, 401–408. [CrossRef]
63. Makgobole, M.U.; Onwubu, S.C.; Nxumal, C.T.; Mpofana, N.; Ajao, A.A.N. In search of oral cosmetics from nature: A review of medicinal plants for dental care in West Africa. *S. Afr. J. Bot.* **2023**, *162*, 644–657. [CrossRef]
64. Petran, M.; Dragos, D.; Gilca, M. Historical ethnobotanical review of medicinal plants used to treat children diseases in Romania (1860s–1970s). *J. Ethnobiol. Ethnomed.* **2020**, *16*, 15. [CrossRef]
65. Howes, M.J.R.; Quave, C.L.; Collemare, J.; Tatsis, E.C.; Twilley, D.; Lulekal, E.; Nic-Lughadha, E. Molecules from nature: Reconciling biodiversity conservation and global healthcare imperatives for sustainable use of medicinal plants and fungi. *Plants People Planet* **2020**, *2*, 463–481. [CrossRef]
66. Iyekowa, O.; Oviawe, A.P.; Ndiribe, J.O. Antimicrobial activities of *Acalypha wilkesiana* (Red Acalypha) extracts in some selected skin pathogens. *Zimb. J. Sci. Technol.* **2016**, *11*, 48–57.
67. Ram, A.J.; Bhakshu, L.M.; Raju, R.V. In vitro antimicrobial activity of certain medicinal plants from Eastern Ghats, India, used for skin diseases. *J. Ethnopharmacol.* **2004**, *90*, 353–357.
68. Okoli, C.O.; Akah, P.A.; Onuoha, N.J.; Okoye, T.C.; Nwoye, A.C.; Nworu, C.S. *Acanthus montanus*: An experimental evaluation of the antimicrobial, anti-inflammatory and immunological properties of a traditional remedy for furuncles. *BMC Complement. Altern. Med.* **2008**, *8*, 27. [CrossRef] [PubMed]
69. Ndam, P.; Onyemelukwe, N.; Nwakile, C.D.; Ogboi, S.J.; Maduakor, U. Antifungal properties of methanolic extracts of some medical plants in Enugu, south east Nigeria. *Afr. J. Cli. Experiment. Microbiol.* **2018**, *19*, 141–148. [CrossRef]
70. Gupta, S.; Toppo, K.I.; Karkun, D.; Kumar, A.; Mishra, N.; Dadsena, R.; Thakur, T. Antimicrobial activity of *Achyranthes aspera* against some human pathogenic bacteria and fungi. *Intern. J. Pharmacol. Biol. Sci.* **2013**, *7*, 43–54.
71. Abhaykumar, K. Phytochemical studies on *Achyranthes aspera*. *World Sci. News* **2018**, *100*, 16–34.
72. Olatunji, B.P.; Idris, O.O.; Ogunmefun, O.T.; Abuka, D.U. Assessment of *Andrographis paniculata* and *Aframomum melegueta* on bacteria isolated from wounds. *J. Chem. Pharm. Sci.* **2019**, *12*, 2349–8552. [CrossRef]
73. Gbadamosi, I.T.; Oyedele, T.O. The efficacy of seven ethnobotanicals in the treatment of skin infections in Ibadan, Nigeria. *Afr. J. Biotechnol.* **2012**, *11*, 3928–3934. [CrossRef]
74. Vigbedor, B.Y.; Osei-Owusu, J.; Kwakye, R.; Neglo, D. Bioassay-guided fractionation, ESI-MS scan, phytochemical screening, and antiplasmodial activity of *Afzelia africana*. *Biochem. Res. Int.* **2022**, *2022*, 6895560. [CrossRef]
75. Kouame, B.K.F.P.; Toure, D.; Kablan, L.; Bedi, G.; Tea, I.; Robins, R.; Tonzibo, F. Chemical constituents and antibacterial activity of essential oils from flowers and stems of *Ageratum c onyzoides* from Ivory Coast. *Rec. Nat. Prod.* **2018**, *12*, 160–168. [CrossRef]
76. Agyare, C.; Ansah, A.O.; Ossei, P.P.S.; Apenteng, J.A.; Boakye, Y.D. Wound healing and anti-infective properties of *Myrianthus arboreus* and *Alchornea cordifolia*. *Med. Chem.* **2014**, *4*, 533–539. [CrossRef]
77. Ajibesin, K.K.; Rene, N.; Bala, D.N.; Essiett, U.A. Antimicrobial activities of the extracts and fractions of *Allanblackia floribunda*. *Biotechnol.* **2008**, *7*, 129–133. [CrossRef]
78. Ayoola, G.A.; Ipav, S.S.; Sofidiya, M.O.; Adepoju-Bello, A.A.; Coker, H.A.; Odugbemi, T.O. Phytochemical screening and free radical scavenging activities of the fruits and leaves of *Allanblackia floribunda* Oliv (Guttiferae). *Intern. J. Health Res.* **2008**, *1*, 87–93. [CrossRef]
79. Samuel, J.K.; Andrews, B.; Jebashree, H.S. In vitro evaluation of the antifungal activity of *Allium sativum* bulb extract against Trichophyton rubrum, a human skin pathogen. *World J. Microbiol. Biotechnol.* **2000**, *16*, 617–620. [CrossRef]
80. Yusuf, A.; Fagbuaro, S.S.; Fajemilehin, S.O.K. Chemical composition, phytochemical and mineral profile of garlic (*Allium sativum*). *J. Biosci. Biotechnol. Discov.* **2018**, *3*, 105–109. [CrossRef]
81. Bashir, A.; Saeed, B.; Mujahid, T.Y.; Jehan, N. Comparative study of antimicrobial activities of *Aloe vera* extracts and antibiotics against isolates from skin infections. *Afr. J. Biotechnol.* **2011**, *10*, 3835–3840.
82. Arunkumar, S.; Muthuselvam, M. Analysis of phytochemical constituents and antimicrobial activities of *Aloe vera* L. against clinical pathogens. *World J. Agric. Sci.* **2009**, *5*, 572–576.
83. Fetse, J.P.; Kyekyeku, J.O.; Dueve, E.; Mensah, K.B. Wound healing activity of total alkaloidal extract of the root bark of *Alstonia boonei* (Apocynacea). *Br. J. Pharm. Res.* **2014**, *4*, 26–42. [CrossRef]
84. Pamila, U.A.; Karpagam, S. Antimicrobial activity of *Alternanthera bettzickiana* (regel) g. Nicholson and its phytochemical contents. *Intern. J. Pharm. Sci. Res.* **2017**, *8*, 2594–2599.
85. Maiyo, Z.C. Chemical Compositions and Antimicrobial Activity of *Amaranthus hybridus*, *Amaranthus caudatus*, *Amaranthus spinosus* and *Corriandrum sativum*. Ph.D. Dissertation, Egerton University, Egerton, Kenya, 2008.

86. Silva, J.G.; Souza, I.A.; Higino, J.S.; Siqueira-Junior, J.P.; Pereira, J.V.; Pereira, M.S.V. Atividade antimicrobiana do extrato de *Anacardium occidentale* Linn. em amostras multiresistentes de *Staphylococcus aureus*. *Rev. Bras. Farm.* **2007**, *17*, 572–577. [CrossRef]
87. Oyetayo, V.O. Comparative Studies of the Phytochemical and Antimicrobial Properties of the Leaf, Stem and Tuber of *Anchomanes difformis*. *J. Pharmacol. Toxicol.* **2007**, *2*, 407–410. [CrossRef]
88. Nyong, E.E.; Odeniyi, M.A.; Moody, J.O. In vitro and in vivo antimicrobial evaluation of alkaloidal extracts of *Enantia chlorantha* stem bark and their formulated ointments. *Acta Pharma* **2015**, *72*, 14–52.
89. Odoh, U.; Okwor, I.; Ezejiofor, M. Phytochemical, trypanocidal and antimicrobial studies of *Enantia chlorantha* (Annonaceae) root. *J. Pharm. Allied Sci.* **2011**, *7*, 4.
90. Mann, A.; Yahaya, Y.; Banso, A.; John, F. Phytochemical and antimicrobial activity of *Terminalia avicennioides* extracts against some bacteria pathogens associated with patients suffering from complicated respiratory tract diseases. *J. Med. Plants Res.* **2008**, *2*, 9–97.
91. Tukur, A.; Musa, N.M.; Bello, H.A.; Sani, N.A. Determination of the phytochemical constituents and antifungal properties of *Annona senegalensis* leaves (African custard apple). *ChemSearch J.* **2020**, *11*, 16–24.
92. Chah, K.F.; Eze, C.A.; Emuelosi, C.E.; Esimone, C.O. Antibacterial and wound healing properties of methanolic extracts of some Nigerian medicinal plants. *J. Ethnopharmacol.* **2006**, *104*, 164–167. [CrossRef] [PubMed]
93. Obioma, A.; Chikanka, A.T.; Dumo, I. Antimicrobial activity of leave extracts of *Bryophyllum pinnatum* and *Aspilia africana* on pathogenic wound isolates recovered from patients admitted in University of Port Harcourt Teaching Hospital, Nigeria. *Ann. Clin. Lab. Res.* **2017**, *5*, 185–189. [CrossRef]
94. Johnson, E.C.; Eseyin, O.A.; Udobre, A.E.; Ike, P. Antibacterial Effect of Methanolic Extract of the Root of *Aspilia africana*. *Niger. J. Pharm. Appl. Sci. Res.* **2011**, *1*, 44–50.
95. Pandey, G.; Verma, K.K.; Singh, M. Evaluation of phytochemical, antibacterial and free radical scavenging properties of *Azadirachta indica* (neem) leaves. *Int. J. Pharm. Pharm. Sci.* **2014**, *6*, 444–447.
96. Agyare, C.; Oguejiofor, S.; Adu-Amoah, L.; Boakye, Y.D. Anti-inflammatory and anti-infective properties of ethanol leaf and root extracts of *Baphia nitida*. *Br. Microbiol. Res. J.* **2016**, *11*, 1–11. [CrossRef]
97. Owoyemi, O.O.; Oladunmoye, M.K. Phytochemical screening and antibacterial activities of *Bidens pilosa* L. and *Tridax procumbens* L. on skin pathogens. *Intern. J. Mod. Biol. Med.* **2017**, *8*, 24–46.
98. Tamokou, J.D.D.; Kuiate, J.R.; Tene, M.; Nwemeguela, T.J.K.; Tane, P. The antimicrobial activities of extract and compounds isolated from *Brillantaisia lamium*. *Iran. J. Med. Sci.* **2011**, *36*, 24. [PubMed]
99. Goyal, S.; Kumar, S.; Rawat, P.; Dhaliwal, N. Antifungal activity of *Calotropis procera* towards dermatoplaytes. *Intern. J. Adv. Pharm. Biol. Chem.* **2013**, *2*, 2277–4688.
100. Naser, E.H.; Kashmer, A.M.; Abed, S.A. Antibacterial activity and phytochemical investigation of leaves of *Calotropis procera* plant in Iraq by GC-MS. *IJPSR* **2019**, *10*, 1988–1994.
101. Udoumoh, A.F.; Eze, C.A.; Chah, K.F.; Etuk, E.U. Antibacterial and surgical wound healing properties of ethanolic leaf extracts of *Swietenia mahogoni* and *Carapa procera*. *Asian J. Trad. Med.* **2011**, *6*, 272–277.
102. Dwivedi, M.K.; Sonter, S.; Mishra, S.; Patel, D.K.; Singh, P.K. Antioxidant, antibacterial activity, and phytochemical characterization of *Carica papaya* flowers. *Beni-Suef Univ. J. Basic Appl. Sci.* **2020**, *9*, 1–11. [CrossRef]
103. Alain, K.Y.; Morand, A.J.; Andreea, B.D.; Théophile, O.; Pascal, A.D.C.; Alain, A.G.; Dominique, S.C.K. Phytochemical analysis, antioxidant and anti-inflammatory activities of *Chassalia kolly* leaves extract, a plant used in Benin to treat skin illness. *GSC Biol. Pharm. Sci.* **2021**, *15*, 063–072. [CrossRef]
104. Thophon, S.H.S.; Waranusantigul, P.; Kangwanrangsan, N.; Krajangsang, S. Antimicrobial activity of *Chromolaena odorata* extracts against bacterial human skin infections. *Mod. Appl. Sci.* **2016**, *10*, 159–171.
105. Ngozi, I.M.; Jude, I.C.; Catherine, I.C. Chemical profile of *Chromolaena odorata* L. (King and Robinson) leaves. *Pak. J. Nutr.* **2009**, *8*, 521–524. [CrossRef]
106. Najafi, S.; Sanadgol, N.; Nejad, B.S.; Beiragi, M.A.; Sanadgol, E. Phytochemical screening and antibacterial activity of *Citrullus colocynthis* (Linn.) Schrad against Staphylococcus Aureus. *J. Med. Plants Res.* **2010**, *4*, 2321–2325.
107. Hameed, B.; Ali, Q.; Hafeez, M.M.; Malik, A. Antibacterial and antifungal activity of fruit, seed and root extracts of *Citrullus colocynthis* plant. *Biol. Clin. Sci. Res. J.* **2020**, *2020*. [CrossRef]
108. Gbedema, S.Y.; Emelia, K.; Francis, A.; Kofi, A.; Eric, W. Wound healing properties and kill kinetics of *Clerodendron splendens* G. Don, a Ghanaian wound healing plant. *Pharmacogn. Res.* **2010**, *2*, 63. [CrossRef] [PubMed]
109. Oscar, N.D.Y.; Joel, T.N.S.; Ange, A.A.N.G.; Desire, S.; Brice, S.N.F.; Barthelemy, N. Chemical constituents of *Clerodendrum splendens* (Lamiaceae) and their antioxidant activities. *J. Dis. Med. Plants* **2018**, *4*, 120–127.
110. Chakraborty, P.; Deb, P.; Chakraborty, S.; Chatterjee, B.; Abraham, J. Cytotoxicity and antimicrobial activity of *Colocasia esculenta*. *J. Chem. Pharm. Res.* **2015**, *7*, 627–635.
111. Marquardt, P.; Seide, R.; Vissiennon, C.; Schubert, A.; Birkemeyer, C.; Ahyi, V.; Fester, K. Phytochemical characterization and in vitro anti-inflammatory, antioxidant and antimicrobial activity of *Combretum collinum* Fresen leaves extracts from Benin. *Molecules* **2020**, *25*, 288. [CrossRef] [PubMed]
112. Mvongo, C.; Noubissi, P.A.; Kamgang, R.; Minka, C.S.M.; Mfopa, A.; Oyono, J.L.E. Phytochemical studies and in vitro antioxidant potential of two different extracts of *Crinum jagus*. *Int. J. Pharm. Sci. Res.* **2015**, *6*, 2354–2358.
113. Suja, S.; Varkey, I.C. Medicinal and Pharmacological Values of *Cyanthillium Cinereum* (Poovamkurunilla) Extracts: Investigating the Antibacterial and Anti-Cancer Activity in Mcf-7 Breast Cancer Cell Lines. *Int. J. Res. Anal. Rev.* **2019**, *6*, 412–415.

114. Bharti, S.; Yadav, S.; Panday, J. Evaluation of anti-anxiety activity of the leaves of *Cyanthillium cinereum*. *NeuroQuantol.* **2023**, *21*, 733–746.
115. Ibrahim, B.; Sowemimo, A.; van Rooyen, A.; Van de Venter, M. Anti-inflammatory, analgesic and antioxidant activities of *Cyathula prostrata* (Linn.) Blume (Amaranthaceae). *J. Ethnopharmacol.* **2012**, *141*, 282–289. [CrossRef]
116. Ajibesin, K.K.; Essien, E.E.; Adesanya, S.A. Antibacterial constituents of the leaves of *Dacryodes edulis*. *Afr. J. Pharm. Pharmacol.* **2011**, *5*, 1782–1786. [CrossRef]
117. Coker, M.E.; Ogundele, O.S. Evaluation of the antifungal properties of extracts of *Daniella oliveri*. *Afr. J. Biomed. Res.* **2016**, *19*, 55–60.
118. Ifediba, C.J.; Okezie, U.M.; Onyegbule, F.A.; Gugu, T.H.; Egbuim, T.C.; Ugwu, M.C. Antifungal activity of the methanol tuber extract of *Dioscorea Dumetorum* (Pax). *World Wide J. Multidiscip. Res. Dev.* **2017**, *3*, 376–380.
119. Yin, N.S.; Abdullah, S.Y.; Phin, C.K. Phytochemical constituents from leaves of *Elaeis guineensis* and their antioxidant and antimicrobial activities. *Int. J. Pharm. Pharm. Sci.* **2013**, *5*, 137–140.
120. Erhabor, J.O.; Oshomoh, E.O.; Timothy, O.; Osazuwa, E.S.; Idu, M. Antimicrobial activity of the methanol and aqueous leaf extracts of *Emilia coccinea* (Sims) G. *Don. Niger. J. Biotechnol.* **2013**, *25*, 37–45.
121. Unegbu, C.C.; Ajah, O.; Amaralam, E.C.; Anyanwu, O.O. Evaluation of phytochemical contents of *Emilia coccinea* leaves. *J. Med. Bot.* **2017**, *1*, 47–50.
122. Edrees, W.H.A. The inhibitory effect of *Euphorbia hirta* extracts against some wound bacteria isolated from Yemeni patients. *Chron. Pharm. Sci.* **2019**, *3*, 780–786.
123. Usman, H.; Abdulrahman, F.I.; Usman, A. Qualitative phytochemical screening and in vitro antimicrobial effects of methanol stem bark extract of *Ficus thonningii* (Moraceae). *Afr. J. Tradit. Complement. Altern. Med.* **2009**, *6*, 289–295. [CrossRef] [PubMed]
124. Dickson, R.A.; Houghton, P.J.; Hylands, P.J.; Gibbons, S. Antimicrobial, resistance-modifying effects, antioxidant and free radical scavenging activities of *Mezoneuron benthamianum* Baill., *Securinega virosa* Roxb. &Wlld. and *Microglossa pyrifolia* Lam. *Phytother. Res. Intern. J. Devot. Pharmacol. Toxicol. Evaluat. Nat. Prod. Deriv.* **2006**, *20*, 41–45.
125. Guo-Cai, W.A.N.G.; Liang, J.P.; Ying, W.A.N.G.; Qian, L.I.; Wen-Cai, Y.E. Chemical constituents from *Flueggea virosa*. *Chin. J. Nat. Med.* **2008**, *6*, 251–253.
126. Adekunle, A.A.; Ikumapayi, A.M. Antifungal property and phytochemical screening of the crude extracts of *Funtumia elastica* and *Mallotus oppositifolius*. *West. Indian Med. J.* **2006**, *55*, 219. [CrossRef]
127. Kombate, B.; Metowogo, K.; Kantati, Y.T.; Afanyibo, Y.G.; Fankibe, N.; Halatoko, A.W.; Aklikokou, K.A. Phytochemical screening, antimicrobial and antioxidant activities of *Aloe buettneri*, *Mitracarpus scaber* and *Hannoa undulata* used in Togolese Cosmetopoeia. *J. Drug Deliv. Ther.* **2022**, *12*, 19–24. [CrossRef]
128. Tolulope, O. Phytochemical Screening, Antibacterial Activity and Fatty Acids from *Heliotropium indicum*. *Pharmacogn. J.* **2023**, *15*, 350–352.
129. Okorondu, S.I.; Akujobi, C.O.; Okorondu, J.N.; Anyado-Nwadike, S.O. Antimicrobial activity of the leaf extracts of *Moringa oleifera* and *Jatropha curcas* on pathogenic bacteria. *Intern. J. Biol. Chem. Sci.* **2013**, *7*, 195–202.
130. Agbo, I.A.; HlangothI, B.; Didloff, J.; Hattingh, A.C.; Venables, L.; Govender, S.; van de Venter, M. Comparative evaluation of the phytochemical contents, antioxidant and some biological activities of *Khaya grandifoliola* methanol and ethyl acetate stem bark, root and leaf extracts. *Trop. J. Nat. Prod. Res.* **2023**, *7*, 2829–2836.
131. Agyare, C.; Dwobeng, A.S.; Agyepong, N.; Boakye, Y.D.; Mensah, K.B.; Ayande, P.G.; Adarkwa-Yiadom, M. Antimicrobial, antioxidant, and wound healing properties of *Kigelia africana* (Lam.) Beneth. and *Strophanthus hispidus* DC. *Adv. Pharmacol. Pharm. Sci.* **2013**, *2013*, 692613.
132. Bello, I.; Shehu, M.W.; Musa, M.; Asmawi, M.Z.; Mahmud, R. *Kigelia africana* (Lam.) Benth.(Sausage tree): Phytochemistry and pharmacological review of a quintessential African traditional medicinal plant. *J. Ethnopharmacol.* **2016**, *189*, 253–276. [CrossRef] [PubMed]
133. Isaiah, O.O.; Olusegun, O.A.; Adesola, O.C.; Samson, A.O. Anti-infective Properties and time-killing assay of *Lannea acida* extracts and its constituents. *Biosci. Bioeng.* **2021**, *6*, 100.
134. Ouattara, M.B.; Bationo, J.H.; Kiendrebeogo, M.; Nacoulma, O.G. Evaluation of Acute Toxicity, Antioxidant and Antibacterial Potential of Leaves Extracts from Two Anacardiaceae's Species: *Lannea microcarpa* Engl. & K. Krause and *Mangifera indica* L. *J. Biosci. Med.* **2022**, *10*, 125–134.
135. Ngouana, V.; Fokou, P.V.; Menkem, E.Z.; Donkeng, V.F.; Fotso, G.W.; Ngadjui, B.T.; Boyom, F.F. Phytochemical analysis and antifungal property of *Mallotus oppositifolius* (Geiseler) Müll. Arg.(Euphorbiaceae). *Int. J. Biol. Chem.* **2021**, *15*, 414–426.
136. El-Gied, A.A.A.; Abdelkareem, A.M.; Hamedelniel, E.I. Investigation of cream and ointment on antimicrobial activity of *Mangifera indica* extract. *J. Adv. Pharm. Technol. Res.* **2015**, *6*, 53. [CrossRef]
137. Kumar, M.; Saurabh, V.; Tomar, M.; Hasan, M.; Changan, S.; Sasi, M.; Mekhemar, M. Mango (*Mangifera indica* L.) leaves: Nutritional composition, phytochemical profile, and health-promoting bioactivities. *Antioxidants* **2021**, *10*, 299. [CrossRef] [PubMed]
138. Daniel, P.; Supe, U.; Roymon, M.G. A review on phytochemical analysis of *Momordica charantia*. *Int. J. Adv. Pharm. Biol. Chem.* **2014**, *3*, 214–220.
139. Mwambete, K.D. The in vitro antimicrobial activity of fruit and leaf crude extracts of *Momordica charantia*: A Tanzania medicinal plant. *Afr. Health Sci.* **2009**, *9*, 34–39. [PubMed]
140. Dongmo, S.C.M.; Njateng, G.S.S.; Tane, P.; Kuiate, J.R. Chemical composition and antimicrobial activity of essential oils from *Aframomum citratum*, *Aframomum daniellii*, *Piper capense* and *Monodora myristica*. *J. Med. Plants Res.* **2019**, *13*, 173–187.
141. Azubuike, C.P.; Obiakor, C.V.; Igbokwe, N.H.; Usman, A.R. Antimicrobial and Physical Properties of Herbal Ointments Formulated with Methanolic extracts of *Persea americana* seed and *Nauclea latifolia* stem bark. *J. Pharm. Sci. Pharm. Pract.* **2014**, *10*, 166–172.

142. Eze, S.O.; Ernest, O. Phytochemical and nutrient evaluation of the leaves and fruits of *Nauclea latifolia* (Uvuru-ilu). *Communicat. Appl. Sci.* **2014**, *2*, 1.
143. Usman, H.; Osuji, J.C. Phytochemical and in vitro antimicrobial assay of the leaf extract of *Newbouldia laevis*. *Afr. J. Tradit. Complement. Altern. Med.* **2007**, *4*, 476–480. [CrossRef]
144. Chukwunonye, U.C.E.; Ebele, O.P.; Kenne, T.M.; Gaza, A.S.P. Phytochemical screening and antimicrobial activity of methanol extract and fractions of the leaf of *Piliostigma thonningii* Schum (Caesalpiniaceae). *World Appl. Sci. J.* **2017**, *35*, 621–625.
145. Premkumar, V.G.; Shyamsundar, D. Antidermatophytic activity of *Pistia stratiotes*. *Indian J. Pharmacol.* **2005**, *37*, 127.
146. Namukobe, J.; Sekandi, P.; Byamukama, R.; Murungi, M.; Nambooze, J.; Ekyibetenga, Y.; Asiimwe, S. Antibacterial, antioxidant, and sun protection potential of selected ethno medicinal plants used for skin infections in Uganda. *Trop. Med. Health* **2021**, *49*, 49. [CrossRef]
147. Chukwudozie, I.K.; Ezeonu, I.M. Antimicrobial properties and acute toxicity evaluation of *Pycnanthus angolensis* stem bark. *Sci. Afr.* **2022**, *16*, e01185. [CrossRef]
148. Kisangau, D.P.; Hosea, K.M.; Lyaruu, H.V.; Joseph, C.C.; Mbwambo, Z.H.; Masimba, P.J.; Sewald, N. Screening of traditionally used Tanzanian medicinal plants for antifungal activity. *Pharm. Boil.* **2009**, *47*, 708–716. [CrossRef]
149. Olatokunboh, A.O.; Kayode, Y.O.; Adeola, O.K. Anticonvulsant activity of *Rauvolfia vomitoria* (Afzel). *Afr. J. Pharm. Pharmacol.* **2009**, *3*, 319–322.
150. Donkor, A.M.; Mosobil, R.; Suurbaar, J. In vitro bacteriostatic and bactericidal activities of *Senna alata, Ricinus communis* and *Lannea barteri* extracts against wound and skin disease causing bacteria. *J. Anal. Pharm. Res.* **2016**, *3*, 00046.
151. Adelanwa, E.B.; Habibu, I. Phytochemical screening and antimicrobial activities of the methanolic leaf extract of *Jacaranda mimosifolia* D. DON and *Sansevieria liberica* THUNB. *J. Trop. Biosci.* **2015**, *10*, 1–6.
152. Kowti, R.; Harsha, R.; Ahmed, M.G.; Hareesh, A.R.; Thammanna Gowda, S.S.; Dinesha, R.; Satish Kumar, B.P.; Irfan Ali, M. Antimicrobial activity of ethanol extract of leaf and flower of *Spathodea campanulata* P. *Beauv. Res. J. Pharm. Biol. Chem. Sci.* **2010**, *1*, 691–698.
153. Aliyu, M.S.; Hanwa, U.A.; Tijjani, M.B.; Aliyu, A.B.; Ya'u, B. Phytochemical and antibacterial properties of leaf extract of *Stereospermum kunthianum* (Bignoniaceae). *Niger. J. Basic Appl. Sci.* **2009**, *17*, 235–239. [CrossRef]
154. Ojiako, O.A.; Igwe, C.U. A time-trend hypoglycemic study of ethanol and chloroform extracts of *Strophanthus hispidus*. *J. Herbs Spices Med. Plants* **2009**, *15*, 1–8. [CrossRef]
155. Lukubye, B.; Ajayi, C.O.; Wangalwa, R.; Kagoro-Rugunda, G. Phytochemical profile and antimicrobial activity of the leaves and stem bark of *Symphonia globulifera* Lf and *Allophylus abyssinicus* (Hochst.) Radlk. *BMC Complement. Med. Ther.* **2022**, *22*, 223. [CrossRef]
156. Adewumi, S.S.; Akinpelu, B.A.; Akinpelu, D.A.; Aiyegoro, O.A.; Alayande, K.A.; Agunbiade, M.O. Studies on wound healing potentials of the leaf extract of *Terminalia avicennioides* (Guill. & parr.) on wistar rats. *S. Afr. J. Bot.* **2020**, *133*, 285–297.
157. Yadav, E.; Singh, D.; Yadav, P.; Verma, A. Attenuation of dermal wounds via downregulating oxidative stress and inflammatory markers by protocatechuic acid rich n-butanol fraction of *Trianthema portulacastrum* Linn. in wistar albino rats. *Biomed. Pharmacother.* **2017**, *96*, 86–97. [CrossRef] [PubMed]
158. Ebi, G.C.; Ifeanacho, C.J.; Kamalu, T.N. Antimicrobial properties of *Uvaria chamae* stem bark. *Fitoterapia* **1999**, *70*, 621–624. [CrossRef]
159. Akinduti, P.A.; Emoh-Robinson, V.; Obamoh-Triumphant, H.F.; Obafemi, Y.D.; Banjo, T.T. Antibacterial activities of plant leaf extracts against multi-antibiotic resistant *Staphylococcus aureus* associated with skin and soft tissue infections. *BMC Complement. Med. Ther.* **2022**, *22*, 47. [CrossRef] [PubMed]
160. Kouakou, A.B.; Megnanou, R.M. Potential treatment of mycosic dermatoses by shea (*Vitellaria paradoxa*) nuts hulls and press cakes: In vitro efficacy of their methanolic extracts. *Arab. J. Med. Aromat. Plants* **2021**, *7*, 342–351.
161. Ndukwe, I.G.; Amupitan, J.O.; Isah, Y.; Adegoke, K.S. Phytochemical and antimicrobial screening of the crude extracts from the root, stem bark and leaves of *Vitellaria paradoxa* (GAERTN. F). *Afr. J. Biotechnol.* **2007**, *6*, 1905–1909. [CrossRef]
162. Schmourlo, G.; Mendonça-Filho, R.R.; Alviano, C.S.; Costa, S.S. Screening of antifungal agents using ethanol precipitation and bioautography of medicinal and food plants. *J. Ethnopharmacol.* **2005**, *96*, 563–568. [CrossRef]
163. Ashalata, N.; Swarnalata, N.; Laitonjam, W.S. Phytochemical Constituents, Total Flavonoid and Phenolic Content of *Xanthosoma sagittifolium* Stem Extracts. *J. Acad. Indust. Res.* **2021**, *10*, 1–4.
164. Onuora, C.C.; Florence, C.C. Antimycotic Efficacy of Aqueous Extract from *Xylopia aethiopica* Against Some Zoophilic Dermatophytes. *GSJ* **2020**, *8*, 4595–4604.
165. Usman, L.A.; Akolade, J.O.; Odebisi, B.O.; Olanipekun, B. Chemical Composition and antibacterial activity of fruit essential oil of *Xylopia aethiopica* D. grown in Nigeria. *J. Ess. Oil Bear. Plants* **2016**, *19*, 648–655. [CrossRef]