Review Article

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Quick Response Code:

Website: www.ijp-online.com

DOI: 10.4103/ijp.IJP_262_18

Are plants used in the Eastern Cape province for cosmetics fully commercialized?

Idowu Jonas Sagbo, Wilfred Otang Mbeng

Abstract:

Plants have been used for years for various cosmetic purposes. In the Eastern Cape province of South Africa, a large proportion of the population reliant (to some extent) on botanical resources for beauty and health. Despite the use of these botanical resources for various cosmetic purposes, only a few have been fully commercialized or used as ingredients in cosmetic formulation. The present study aimed to review plant species that are fully explored commercially for cosmetic products in the Eastern Cape province. A survey of cosmetic products with plant-based ingredients was done covering the major supermarkets (SPAR, Shoprite, and Pick n Pay), cosmetic shops (Clicks), and pharmacies in the Eastern Cape province, and electronic databases including Embase, Google Scholar, Medline, PubMed, Scopus, SciFinder®, Springer, Science Direct, and Web of Science were used as data sources for ethnobotanical information. Surprisingly, out of 150 plant species used by both Xhosa men and women for various cosmeceutical purposes, only six plant species have been used commercially with regard to cosmeceutical application. These plants species belong to five major plant families, namely *Lamiaceae* (two species), *Asphodelaceae* (one species) *Cucurbitaceae* (one species), *Oleaceae* (one species), and *Verbenaceae* (one species). The findings revealed that the use of Eastern Cape plants for cosmetic purposes has not been fully explored commercially. Thus, there is a need for cosmeceutical industries to explore these species commercially in order to develop new possible cosmetic products for local and international markets.

Keywords:

Commercialization, cosmetics, Eastern Cape, plants, Xhosa

Introduction

The use of cosmetics for cleansing and beautifying purposes dates back to 6000 years of human existence.[1] The word "cosmetic" is described as beauty or alteration of appearance, most especially with regard to the human body. The earliest record of cosmetic is generally believed to have emanated from the ancient Egypt, about 3100–2907 BC.[2] In ancient Egypt, men and women used olive oil fragrant with aromatic plants to clean and soften their skin. There have been various documented uses of plant oil in ancient culture for cosmetic purposes. For example, oil derived from lavender is used by ancient Egyptians and Romans for cosmetics and wound cleaning. Castor oil, olive oil, and rose water are also used by several ancient cultures for cosmetics such as skin cream. In the Middle Ages, cosmetics usage spread throughout the Europe where tattooing and scarification are practiced by many peoples and the use of *Isatis tinctoria* (Brassicaceae family) by both men and women of ancient Britons to paint their bodies blue are all forms of cosmetics.

In modern times, there has been a major interest globally in the use of natural content in botanicals for cosmetic purposes with the intention to formulate new and improved cosmetic products to enrich the human

School of Biology and Environmental Sciences, University of Mpumalanga, Mbombela, South Africa

Address for correspondence:
Dr. Idowu Jonas Sagbo, School of Biology and Environmental Sciences, University of Mpumalanga, Mbombela Campus, Private Bag X11283, Mbombela, 1200, South Africa.
E-mail: jonas.sagbo@ump.ac.za

Submission: 30-09-2018
Accepted: 10-06-2019

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How to cite this article: Sagbo IJ, Mbeng WO. Are plants used in the Eastern Cape province for cosmetics fully commercialized?. Indian J Pharmacol 2019;51:140-9.

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body with nutrients and other useful mineral resources. In South Africa, most people indeed, still prefer herbal products for their personal care to improve their beauty as these products devoid of synthetic chemicals, supply the body with nutrients and reported to have relatively fewer side effects.[3] In the Eastern Cape province of South Africa, most men and women tend to be more traditional, with many aspects of traditional culture being part of their daily life.[4] A huge proportion of the population are dependent on botanical resources for beauty and health. However, most of these botanical resources are acquired in the wild and also obtainable from local herbal shops where they are cheap unless they are sourced from beyond the Eastern Cape province.

The search for plants with cosmeceutical properties has been enormous interest to many cosmetic industries globally. Plants are the main source of such secondary metabolites which can modify or bring back external beauty and healthy skin. These secondary metabolites (phytochemicals) with cosmetic applications include saponins, steroids, phenolics, carotenoids, coumarins, flavonoids, polysaccharides, organic acids, anthocyanins, and lignans. Studies have indicated that there have been a number of plant species that are commercially explored or used as part of ingredients in the formulation of cosmetic products by industries to produce new plant-based products with pharmacological actions.[5,6] Nevertheless, a large number of such plant species are also used traditionally in the Eastern Cape province for various cosmetic purposes but are yet to be fully explored commercially. Therefore, the present study was undertaken to review plant species that are fully explored commercially for various cosmetic purposes in the Eastern Cape province. This study will also provide guidance for cosmeceutical industries on the commercially underexploited plants.

Materials and Methods

A survey of cosmetic products with plant-based ingredients was done covering the major supermarkets (SPAR, Shoprite, and Pick n Pay), cosmetic shops (Clicks), and pharmacies in the Eastern Cape province. Out of the 105 plant species previously reported for various cosmetic purposes in the Eastern Cape (unpublished), only six plant species were identified and used as part of ingredients in some cosmetic products during the survey. The six plants namely *Aloe ferox*, *Citrullus lanatus*, *Leonotis leonurus*, *Olea europaea*, *Salvia stenophylla*, and *Lippia javanica* were reviewed for their cosmeceutical and pharmacological activities in this study. The ethnobotanical information regarding all the plant species reported in this study was obtained through a comprehensive literature survey from Embase, Google Scholar, Medline, PubMed, Scopus, SciFinder, Springer, Science Direct, and Web of Science when keywords such as concern plant names and cosmeceuticals were typed in.

Results and Discussion

Commercialized plant species used for cosmetic products

A few Eastern Cape plants have been used as ingredients in the form of extracts or purified concentrates by many industries for cosmeceutical formulations. These plants are used as ingredients mainly because of their cosmeceutical properties such as moisturizing, smoothing, anti-wrinkling, antioxidant, and anti-aging. The major commercialized species together with the cosmetic products in which they are used as part of ingredients are listed in Table 1. The plants listed in Table 1 are endemic to Eastern Cape province in South Africa, and detailed reviews of these plants are reported in this study.

Species discussion

A comprehensive information of the six Eastern Cape plants identified in some cosmetic products during the survey is given below. These plants are discussed, with emphasis on what is known about their traditional usage and pharmacological and cosmeceutical properties.

Aloe ferox Mill

A. ferox is commercially known as Cape aloe and is one of the species of *Asphodelaceae* family. It is one of the most famous plants in South Africa, particularly in Eastern Cape with a long history of medicinal use. The plant reaches 2–3 m in height, with its leaves organized in a rosette. *A. ferox* is widely spread across the South Western Cape to Southern KwaZulu-Natal. It also grows in the Southern and Eastern Cape provinces. In parts of South Africa, most especially in the Eastern Cape province, the sap from *A. ferox* is applied directly to treat skin irritation, bruises, and eczema.[7,8] *A. ferox* has been widely used as an ingredient in cosmetics. For example, a cosmetic product made from *A. ferox* with the brand name "Makhaleng Herbal Petroleum jelly" is used for skin smoothing. Studies have indicated that *A. ferox* extracts exhibit strong activity as a pigmentation-altering agent for cosmeceutical applications.[9] The anti-tyrosinase, anti-arthritic, and anti-inflammatory properties of *A. ferox* extracts have been widely reported in several studies.[7,10] A literature survey of *A. ferox* phytochemicals revealed that several compounds such as anthraquinones, anthrones, and anthrone-C-glycosides have been found in the extracts of *A. ferox* which could be the main compounds responsible for its strong cosmeceutical and biological activities.[11]

Table 1: List of Eastern Cape plants used commercially in cosmetic products

Plant name	Family	Local name (Xhosa)	Brand name	Cosmetic product usage	Company/ manufacturers
Aloe ferox Mill.	Asphodelaceae	iKhala	Makhaleng Herbal Petroleum jelly	The product is used for skin smoothing	TMB Trading
Citrullus lanatus (Thunb.) Matsum. and Nakai.	Cucurbitaceae	uinxoxozi	Royal Honey and Kalahari Desert Melon	It is used to repair damaged hair	Demart
Leonotis leonurus (L.) R.Br.	Lamiaceae	umfincafincane	Miracle Green Ointment	The product is used to treat bites and stings, skin diseases, and muscular cramps	Gotha Health
Olea europaea L subsp. africana (Mill.) P.S.Green.	Oleaceae	umnquma	Dawn	It is used for intensive skin care to restore moisture and nourish the skin deeply	Unilever South Africa
Salvia stenophylla Burch. Ex Benth.	Lamiaceae	N/A	Blue Mountain Sage	The product is used to treat various skin ailments and facial care	Oshadhi
Lippa japoniva (Burm.f.) Spreng.	Verbenaceae	inZinziniba	Derma Gel Treatment	It is used for soothing, hydrating, and purifying all skin types	Elixir Skin care

N/A=Not available

Citrullus lanatus (Thunb.) Matsum. and Nakai

C. lanatus (*Cucurbitaceae* family) is commonly known as Kalahari Tsamma melon.[12] It is a plant of up to 10-m long with wide-ranging organized leaves.[13] *C. lanatus* is normally found on river banks or disturbed areas across all provinces of South Africa.[14] The fruits or seeds of the plant are used in many ways in most countries. Studies have shown that in Europe, the plant is used by most cosmetic industries as part of ingredients in the formulation of some plant-based cosmetic products for skin revitalization and moisturizing.[15] In South Africa, the fruit of this plant is used as an ingredient in lotions to treat sunburns and hair damage. Furthermore, our survey in the Eastern Cape province also indicated that "Royal Honey and Kalahari Desert Melon," a lotion made from *C. lanatus* under the trade name "DeMert®," helps to repair and prevent hair damage [Table 1]. However, several studies have also revealed that *C. lanatus* exhibit high natural antioxidant and anti-inflammatory potential, an aspect that plays an important qualitative factor for cosmetic usages.[16,17] The phytochemical analysis survey of *C. lanatus* showed the presence of gallic, protocatechuic, p-hydroxybenzoic, α-tocopherol, p-coumaric, γ-tocopherol, vanillic, ferulic, syringic (trace), and caffeic acids.[15] These secondary metabolites have anti-oxidant and anti-inflammatory properties which could be the main reason for the potential usage of this plant in cosmetic and pharmaceutical industries.

Leonotis leonurus (L.) R. Br.

L. leonurus is commonly called wild dagga (English) and belongs to the *Lamiaceae* family. *L. leonurus* grows along forest margins mainly on river banks, and it is naturally distributed over large parts of South African provinces, most especially along the coast. Conventionally, the fresh or dried leaf decoctions of the plant are used for the treatment of a variety of skin-related conditions.[18,19] Commercially, the plant is being used by cosmetic industries as an ingredient in the preparation of skin care products. For example, a cream called "Miracle Green Ointment," made from *Leonotis leonurus* is used for softening and remarkably smoothing of the skin [Table 1]. A literature survey revealed that *L. leonurus* has been broadly studied for a wide variety of biological activities. *L. leonurus* aqueous extract has been reported for its anticonvulsant,[20] antioxidant,[21] and anthelmintic activities.[22] In addition, the psychoactive activity of this plant has been reported and attributed to the presence of alkaloid and leonurine, but yet to be confirmed. Numerous phytochemical analyses have also revealed that terpenoids and labdane diterpenes are the main active compounds found in the leaf extracts of *L. leonurus*.[23,24] Wu *et al*.[25] also reported isolated compounds such as Leoleorin A, Leoleorin B, and Leoleorin C from *L. leonurus* extracts.

Olea europaea L subsp. africana (Mill.) P. S. Green

O. europaea (olive tree) belongs to the member of the *Oleaceae* family and is commonly used in traditional medicine. It is often found near water and widely spread across Africa, the Mascarene Islands, and India. In South Africa, traditional remedies prepared from this plant are used for eye lotion. In addition, the leaves of *O. europaea* are used traditionally for the treatment of eye infection and skin disorder. The plant has been used as a source of commercial products such as food, medicine, and cosmetics. In terms of its cosmeceutical usage, this plant has been used as part of ingredients in some cosmetic products. For example, a cream made from the fruit oil of *O. europaea* with a brand name "Olive de Provence" is used for body massage. A lotion made from *O. europaea* with the trade name "Argan oil" is very effective to repair dry/damaged hair. In addition, cream prepared from six plants including *O. europaea* with a trade name "Hair Mayonnaise™" is used for hair conditioning and treating damaged hair. In literature, oleuropein, which is the main constituent of *O. europaea*, has been reported for its various pharmacological properties including

anti-atherogenic,[26] antimicrobial,[27] antioxidant,[28] anti-inflammatory,[29] anti-platelet aggregation,[30] anti-rheumatic,[29] and antipyretic effects.[31] Studies have also indicated that *O. europaea* contains several fatty acids which include carotenoids, sterols, tocopherols, triglycerides, squalene, and tocopherols.[32,33]

Salvia stenophylla Burch. Ex Benth

S. stenophylla is a perennial shrub, which belongs to the *Lamiaceae* family. It grows on grassy or storny slopes and is native to a wide area of Southern Africa, most especially in South Africa (Cape provinces, Kwazulu-Natal, and Free State).[34,35] Conventionally, the leaves of the plant are used to treat scrapes, wounds, sores, and bites. In addition, it is also used to give relief by providing a cooling sensation. Commercially, an aromatherapy essential oil with a trade name "Blue Mountain Sage" prepared from *S. stenophylla* leaves is used to treat various skin-related ailments. Several researches have also reported that *S. stenophylla* essential oil exhibit antioxidant, anti-inflammatory, and anticancer activities.[36,37] These activities have been attributed to the presence of terpenes found in *Salvia* plants. Isolated compounds such as (-)-α-bisabolol, δ^{-3}-carene, D-limonene, α-pinene, β-pinene, manool, and β-bisabolene have also been reported in the extracts of *S. stenophylla*.[38]

Lippia javanica (Burm. f.) Spreng

L. javanica (*Verbenaceae* family) is a high woody shrub stand erect plant. The plant disperses from the Eastern Cape, South Africa, extending into other African countries such as Botswana, Kenya, Tanzania, Malawi, and Mozambique. Conventionally, the infusions of the plant are used to treat lice, rashes, and scabies. The plant has been reportedly used as an ingredient in some cosmetic products.[33] For example, a preparation called "Derma Gel Treatment," made from *L. javanica,* is used for hydrating, soothing, and purifying all skin types. The literature surveyed also revealed that the essential oil of *L. javanica* reported to exhibit antimicrobial activity against respiratory pathogens[39] and promising anti-inflammatory activities.[40] Omolo *et al*.[41] also reported that the oil exhibited moderate repellent activity against mosquitoes. The literature reports also revealed that several components have been identified in *L. javanica* oil. Myrcene, myrcene ipsenone, linalool, p-cymene, ipsenone, ipsdienone, and carvone were found to be the main components.[42,43]

Commercialized unexplored plants with regard to cosmeceutical application in the Eastern Cape: Commercialization needed

Around 150 medicinal plant species that are regularly used by the people of the Eastern Cape province for various cosmetic purposes, only 94 indigenous species have not been commercialized with regard to their cosmeceutical usage [Table 2]. For example, species such as *Cotyledon orbiculata* (*Crassulaceae*), *Ficus natalensis* (*Moraceae*), *Acacia karroo* (*Fabaceae*), *Asparagus africanus* (*Asparagaceae*), *Bulbine frutescens* (*Asphodelaceae*), *Gnidia capitata* (Thymelaeaceae), *Halleria lucida* (*Scrophulariaceae*),

Table 2: List of plants used traditionally in the Eastern Cape province for cosmetic purposes with commercial potential but no commercialization

Scientific name	Family	Local name (Xhosa)	Plant part used	Modes of administration	Cosmetic properties	References
Acokanthera oppositifolia (Lam.) Codd.	Apocynaceae	iNtlungunyembe	Leaf pulp	Pulp applied directly to wounds	Wounds	[18,33]
Acacia karroo Hayne.	Fabaceae	Umnga	Bark/leaves	Applied directly to the skin	Bumps on the skin, boil, and thrush	[44,45]
Aristea ecklonii Baker.	Iridaceae	umhushuza	Whole plant	Applied topically	Shingles	[46]
Artemisia afra Jacq. ex Willd.	Asteraceae	umhlonyane	Leaves	Decoction	Acne and boil	[18,47]
Albizia adianthifolia (Schumach.) W. Wight var.	Fabaceae	Umhlandlothi	Bark	Applied directly	Skin beauty and eczema	[48]
Alepidea amatymbica (Ecl and Zeyh)	Apiaceae	Umvuthuza	Root	Decoction	Pimples	[48]
Aloe arborescens Mill.	Xanthorrhoeaceae	ikalene	Leaves	Applied topically	Wounds, burns, and various skin ailments	[49]
Asparagus africanus Lam.	Asparagaceae	ubumhlope/ umathunga	Aerial part	Applied directly	Hair growth	[50]
Athrixia phylicoides DC.	Asteraceae	N/A	Whole plant	Plant infusion	Sores and boils	[18]
Bauhinia bowkeri Harv.	Fabaceae	umDlandlovu	Leaves and bark	Applied directly	Steaming and bathing	[51]
Bulbine asphodeloides (L.) Spreng.	Asphodelaceae	Uyakayakane or Intelezi	Leaves or leaf gel	Applied directly	Wounds, itches, burns, sunburns, and rough skin	[48]

Contd...

Table 2: Contd..

Scientific name	Family	Local name (Xhosa)	Plant part used	Modes of administration	Cosmetic properties	References
Bulbine latifolia	Asphodelaceae	ibhucu	Leaf sap	Applied directly	Wound, burns, eczema, rashes, and itches	[19,52]
Bulbine frutescens (L.) Willd.	Asphodelaceae	N/A	Slimy leaves	Applied topically	Wound and rash	[33,53]
Bowiea volubilis Ex Hook.f. subsp. *volubilis*	Hyacinthaceae	Umagaqana	Bulb	Applied topically	Pain-killing effect on the skin	[48]
Carpobrotus dimidiatus (Haw.) L. Bolus.	Mesembryanthemaceae	N/A	Leaf juice	Ointment	Dressing wounds and burns	[33]
Carpobrotus edulis (L.) Bolus.	Mesembryanthemaceae	Igcukuma	Leaf juice and pulp	Juice directly applied to the skin	Eczema, wounds, and burns	[52]
Calodendrum capense (L.f.) Thunb.	Rutaceae	umbaba/ umsitshana	Bark	Ointment	Skin ingredients for ointment	[54]
Cassipourea flanaganii (Schinz) Alston.	Rhizophoraceae	Umemezi	Bark	Applied directly	Skin lightning and complexion	[2]
Centella asiatica (L.) Urban	Apiaceae	N/A	Leaves	Tinctures	Wounds and acnes	[55,56]
Centaurea benedicta (L.) L.	Asteraceae	N/A	Whole plant	Topical	Wounds and ulcers	[52]
Cheilanthes viridis (Forssk.) Sw.	Pteridaceae	N/A	Whole plant	Applied directly	Burns, wounds, and sores	[57]
Cissampelos capensis L.	Menispermaceae	umayisake	Rhizomes, roots, and leaves	Paste	Boils, wounds, ulcers, and syphilis sores	[58,59]
Cissampelos torulosa E. Mey. Ex.	Menispermaceae	isitorhom	Roots	Chewed	Toothache	[60]
Clausena anisata (Willd) Hook. f. ex Benth.	Rutaceae	Umnukandiba/ Umtuto	Crushed leaves	Applied externally	Wounds and sores	[33]
Clematis brachiata Thunb.	Ranunculaceae	ityolo	Root	Applied directly	Thrush	[60]
Clerodendrum glabrum E. Meyvar.	Verbenaceae	umqwaqwanam	Leaves	Decoction	Wounds	[33]
Cotyledon orbiculata Forssk.	Crassulaceae	imphewula	Leaf juice	Applied topically	Boils, corns, and warts	[60]
Crinum moorei Hook. F.	Amaryllidaceae	N/A	Bulbs and leaves	Topical	Sores, boils, and acne	[18]
Croton sylvaticus Hochst.	Euphorbiaceae	umFeze/ uMagwaqane	Bark	Applied directly	Bleeding gums	[61]
Curtisia dentata (Burm.f.) C.A. Smith.	Cornaceae	Umlahleni	Root	Decoction	Pimples, itches, rashes, and acnes	[33]
Cucumis hirsutus Sond.	Cucurbitaceae	N/A	Leaves and roots	Decoction	Inflammation	[10,33]
Datura stramonium L.	Solanaceae	umhlavuthwa/ ibhudabhutha	Leaves	Skin patch	Wounds, sores, swellings, boils, and abscesses	[47,62]
Dalbergia obovata E. Mey.	Fabaceae	umzungulu	Stem	Applied directly	Sore mouths in infants	[60]
Diospyros lycioides Desf.	Ebenaceae	Umbhongisa	Bark and root	Decoction	Inflammation	[19]
Dodonaea viscosa Jacq.	Sapindaceae	N/A	Twigs	Chewed	Oral thrush	[63,64]
Elephantorrhiza elephantina (Burch.) Skeels.	Fabaceae	intolwane	Roots and rhizomes	Infusion applied topically, the root powder is sprinkled onto wounds and burns	Acne, wounds, burns, and other skin diseases	[65,66]
Eriocephalus africanus L.	Asteraceae	N/A	Essential oil	Topical	Skin care	[33,53]
Erythrina lysistemon Hutch.	Fabaceae	umsintsi	Bark	Applied as poultice or powdered burnt bark for open wounds and sores	Sores, abscesses, and open wounds	[67]
Eucomis autumnalis (Mill.) Chitt.	Hyacinthaceae	Umathunga	Bulbs	Applied directly	Beauty, wounds, and ulcer	[48]

Contd...

Table 2: Contd..

Scientific name	Family	Local name (Xhosa)	Plant part used	Modes of administration	Cosmetic properties	References
Euphorbia ingens E.Mey. ex Boiss.	Euphorbiaceae	Umlonhlo	Stem and milky fluid	Applied directly	Skin rash, postinflammatory spots	[48]
Ficus natalensis Hochst.	Moraceae	umngqege/ umgwenyezinja	Leaves	Applied as poultice	Wounds, boils, warts, and growth	[68,69]
Foeniculum vulgare Mill.	Umbelliferae	N/A	Leaves	Leaves	Fragrance component	[33]
Gerbera piloselloides (L) Cass.	Asteraceae	Umsa	Root	Infusion	Postinflammatory spots, pimples	[48]
Greyia flanaganii Bolus.	Greyiaceae	uSinga lwamaxhegokazi	Leaves	Applied directly	Skin ailment	[7,33]
Grewia occidentalis L.	Malvaceae	umNqabaza	Bark	Bark soaked in hot water	Wound dressing	[18,70]
Gunnera perpensa L.	Gunneraceae	iphuzi lomlambo, ighobo	Leaf, root, and rhizome	Infusion	Wound dressing	[71]
Gnidia anthylloides (L.f.) Gilg.	Thymelaeaceae	Intozwane	Ground root	Infusion applied topically, the root powder is sprinkled onto wounds and burns	Wounds, burns	[48]
Gnidia capitata L.F	Thymelaeaceae	Umsila	Ground root	Applied directly	Wounds, rashes, fractures, snake bites, and sore throat	[48]
Harpephyllum caffrum Bernh. ex Krauss	Anacardiaceae	ingwenye	Bark	Topical	Acne and eczema	[52,69]
Halleria lucida L.	Scrophulariaceae	N/A	Whole part	Topical	Skin complaints	[18,72]
Helichrysum odoratissimum (L.) Sweet.	Asteraceae	Imphepho	Leaf	Decoctions	Pimples	[33]
Helichrysum petiolare Hilliard and B.L. Burtt.	Asteraceae	Imphepho	Leaves	Decoction	Skin texture and beauty, wounds	[48]
Helichrysum nudifolium (L.) Less.	Asteraceae	Indlebe	Leaves and twig	Applied topically	Skin beauty	[48]
Hydnora africana (Thunb)	Hydnoraceae	umavumbuka	Fruiting body	Soaked in a little water	Acne and other skin blemishes	[70]
Hypoxis hemerocallidea Fisch. C.A.Mey. and Ave-Lall.	Hypoxidaceae	Inongwe	Ground corm	Applied directly	Pimples and improvement of beauty	[2]
Ilex mitis (L.) Radlk.	Aquifoliaceae	umDuma	Ground bark	Paste or decoction	Skin rash and sores on the face	[71]
Kniphofia drepanophylla Baker.	Asphodelaceae	Ixonyi	Ground rhizomes	Applied directly	Wounds, pimples, acne, and eczema	[48]
Leucosidea sericea Eckl. and Zeyh.	Rosaceae	isidwadwa/ umyityi	Leaves	Paste	Acne	[33]
Macaranga capensis (Baill.) Benth.ex Sim.	Euphorbiaceae	Umpumelelo	Bark	Decoction	Pimples, wounds, eczema, and acne	[48]
Malva parviflora L.	Malvaceae	umajikanelanga/ ijongilanga	Roots or leaves	Decoction	Dandruff and to soften hair	[73,74]
Melianthus comosus L.	Melianthaceae	ubuhlungu/ bemamb	Leaf and poultices	Decoction	Septic wounds and sores	[75,33]
Melianthus major L.	Melianthaceae	ubuhlungu/ bemamba/ ubutyayi	Leaf poultice and leaf	Decoction	Septic wounds, sores, and bruises	[66,74]
Mentha longifolia (L.)	Lamiaceae	inixina/ inzinziniba	Leaves	Applied topically	Wounds	[76]
Miscanthus capensis (Nees) Andersson.	Poaceae	Umpumelelo	Bark	Decoction	Pimples, wounds, eczema, and acne	[48]
Pelargonium sidoides DC.	Geraniaceae	umsangela	Whole plant	Applied topically	Skin disorders	[70]

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Table 2: Contd..

Scientific name	Family	Local name (Xhosa)	Plant part used	Modes of administration	Cosmetic properties	References
Pentanisia prunelloides (Klotzsch ex Eckl. and Zeyh.) Walp.	Rubiaceae	itshamlilo	Root	Applied topically	Burns and swellings	[66]
Plumbago auriculata Lam.	Plumbaginaceae	Umabophe	Powdered root/leaves	Applied topically	Warts, rashes, acne, and pimples	[48]
Protea repens (L.) L.	Proteaceae	N/A	Leaves	Applied directly	Inflammation	[70]
Protea simplex E. Phillips.	Proteaceae	N/A	Whole plant	Applied topically	Inflammation	[18]
Protorhus longifolia (Bernh.) Engl.	Anacardiaceae	ikhubalo	Bark	Decoction	Wounds, cuts, bruise and graze ringworm, acne, and eczema	[48]
Rothmannia capensis Thunb.	Rubiaceae	iBolo	Sap from fruits	Topical	Burns and wounds	[18,77]
Rapanea melanophloeos	Myrsinaceae	umaphipha	Powdered bark	Paste	Facial cosmetic paste to protect against evil	[2]
Rauvolfia caffra Sond.	Apocynaceae	umJelo/ umThundisa	Bark	Infusion	Skin rashes	[18,33]
Rumex lanceolatus Thunb.	Rubiaceae	Dolonyana	Leaves	Applied topically	Abscesses, boils, bruises, and tumors	[48]
Sansevieria hyacinthoides (L.) Druce.	Asparagaceae	isikholokotho	Leaf	Decoction applied topically	Swellings, burns, and wounds	[33]
Sarcophyte sanguinea Sparrm. subsp.	Balanophoraceae	umavumbuka	Dried fruiting body	Soaked in a little water	Acne and other skin blemishes	[2]
Scadoxus puniceus (L.) Friis and Nordal.	Amaryllidaceae	inkuphulwana	Bulbs and roots	Decoction applied topically	Wound and ulcer	[18,52]
Scilla natalensis Planch	Hyacinthaceae	N/A	Bulbs	Ointments applied externally	Boils and sores	[40,54]
Scabiosa columbaria L.	Dipsacaceae	Makgha	Powdered leaves/roots	Mixed with oil animal fat and applied topically	Wound bruises and cuts	[48]
Senecio speciosus	Asteraceae	Ustukumbini	Leaves or stem	Paste applied directly	Swellings, cuts, burns, and sores	[48]
Sideroxylon inerme L. subsp. *Inerme*.	Sapotaceae	umQwashu	Bark	Applied topically	Lighten the skin	[33]
Siphonochilus aethiopicus Schweif.	Zingiberaceae	N/A	Leaves	Applied topically	Oral thrush	[60]
Solanum incanum L. Ruiz and Pav.	Solanaceae	umthuma	Leaves and roots	Applied topically	Wounds, furuncles, and ringworm	[78]
Spirostachys africana Sond.	Euphorbiaceae	umthombothi	Powdered wood of the plant	Applied directly	Smearing the face of infants	[2]
Sutherlandia frutescens (L.) R.Br.	Fabaceae	umnwele	Leaf	Decoction	Washing wounds	[33]
Syzygium cordatum Hochst.ex C.Krauss.	Myrtaceae	Umswi	Bark	Paste is applied topically	Blisters, pimples, inflammations, acne, and eczema	[48,79]
Tecoma capensis (Thunb.) Spach.	Bignoniaceae	umsilingi/ icakatha	Bark	Infusion	Inflammation	[18]
Tetradenia riparia Hochst.	Lamiaceae	iboza	Leaf	Infusions	Mouth ulcers	[60]
Trichilia emetica Vahl.	Meliaceae	umkhuhlu	Leaves or fruits	Poultices	Bruises and eczema	[69]
Trichilia dregeana	Meliaceae	umKhuhlu	Seeds	Ointment	Hair oil	[18,33]
Tulbaghia alliacea	Alliaceae	Itswele	Bulb	Infusion	Boils, wounds, pimples, eczema, and herpes	[48]
Valeriana capensis Thunb.	Valerianaceae	umvuthuza	Roots	Topically	Cuts and wounds	[33]
Vernonia natalensis Sch.Bip. ex Walp.	Valerianaceae	umthi/wezulu	Root/leaf	Decoctions	Boils	[18,79]

Contd...

Table 2: Contd..

Scientific name	Family	Local name (Xhosa)	Plant part used	Modes of administration	Cosmetic properties	References
Warburgia salutaris (Bertol. f.) Chiov.	Canellacea	N/A	Bark	Applied topically	Skin complaints	[47,80]
Withania somnifera (L.) Dunal.	Solanaceae	ubuvimba/ ubushwa	Leaves	Ointment	Cuts, wounds, abscesses, and inflammation	[18,62]
Xysmalobium undulatum (L.) Aiton f.	Apocynaceae	nwachaba/ iShongwane	Powdered root	Applied topically	Cuts and wounds	[47,81]
Zantedeschia aethiopica Spreng.	Araceae	mtebe/inyibiba	Leaves	Applied topically	Sores	[33,70]
Zanthoxylum capense Harv.	Rutaceae	Isifutho	Leaves	Applied topically	Sores	[18,82]
Ziziphus mucronata Willd.	Rhamnaceae	uinphafa	Leaves, roots, and barks	Decoction applied topically	Boils, sore, and swelling	[52,69]

N/A=Not available

Ilex mitis (*Aquifoliaceae*), *Hydnora africana* (*Hydnoraceae*), *Macaranga capensis* (*Euphorbiaceae*), *Leucosidea sericea* (*Rosaceae*), *Vernonia natalensis* (*Valerianaceae*), *Withania somnifera* (*Solanaceae*), and *Zanthoxylum capense* (*Rutaceae*) show promising and significant cosmeceutical activities but are yet to be used as ingredients or commercialized for cosmetic products. Hence, it is worth exploring these species commercially in industries, thereby helping in the development of new possible cosmetic products.

Conclusion

The current development in cosmeceutical industry has formed a new and reliable category of cosmetics called "herbal cosmetics," in which one or more herbal ingredients are used for beautification and personal care purposes. From this review, the findings revealed that the use of Eastern Cape plants for cosmetics purposes has not been explored commercially. Thus, there is a need for cosmeceutical industries to explore these species commercially in order to develop new possible cosmetic products for the local and international markets.

Financial support and sponsorship

This study was financially supported by the National Research Foundation (Grant no: 105161) and University of Mpumalanga research support grant.

Conflicts of interest

There are no conflicts of interest.

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