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Herbal Sunscreens and Photo Protection Compositions: A Patent Review

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Abstract

Solar ultraviolet type B radiations (UVB) is fundamentally liable to be absorbed by keratinocytes leading to production of free radicals or reactive oxygen species (ROS) which might cause skin erythema, sunburn, skin cancer and premature ageing. Herbal sunscreen guard skin from sun's radiations which reduces sunburns with reduced risk of skin harms. Anti-oxidants quench free radicals and ROS which might aid photo-protection effect. This review compiled previously patented herbal photo protection compositions and sunscreens.

Keywords: Skin Erythema; Sunscreen; Photo Protection

Abbreviations: UVB: Ultraviolet Type B; ROS: Reactive Oxygen Species

Introduction

Solar ultraviolet radiations at the earth's surface encompass approximately 95-98 % UVA and 2-5 % UVB. The frequency of ultraviolet type B is fundamentally liable to be absorbed by keratinocytes leading to production of free radicals or reactive oxygen species (ROS) which might cause skin erythema, sunburn, skin cancer and premature ageing [1,2]. Anti-oxidants quench free radicals and ROS which might aid photo-protection effect. Herbal sunscreen topical products guard skin from sun's radiations which reduces sunburns with reduced risk of skin harms. This review compiled previously patented herbal photo protection compositions and sunscreens. Few herbal photo protectants have been represented in Figure 1.

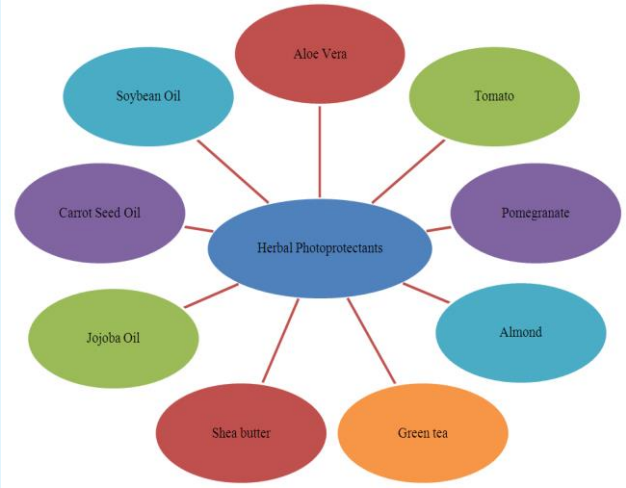


Figure 1: Examples of herbal photo protectants.

Ultimate Characteristics of Sunscreen Product

A high-quality sunscreen ought to absorb or riddle out the sunburn emission causing and must be non-toxic and non-irritating. It should be stable under air, light and moisture. Moreover, it must be moderately non-volatile, subsequently will not evaporate [3]. Herbal sun protection compositions and sunscreens patented for patented for sunscreen and photo protection activity has been listed in Table 1, 2, respectively.

Publication No./ Publication date/ Applicant	Title of patent	Disclosure	Reference
US 7311896 B2/ Dec 25, 2007/ Mmi Corporation	Natural sunscreen compositions and processes for producing the same	Extracts of Hedychium spicatum and/or Alpinia galanga as natural sunscreen	[4]
US 20130243709 A1/ 19 Sep 2013/ James E. Hanson, Cosimo Antonacci	Natural Sunscreen Composition	UV-blocking component comprising of: · Natural extracts of milk thistle, white willow, St John's wort, griffonia seed, Galla chinensis, olive leaf, hops, gentian, bilberry, chrysanthemum, coptis root, magnolia bark, rhubarb, red clover, rose hip, schisandra berry, valerian root and grape seed. · Natural oils of cinnamon bark, cocoa, coffee, cognac, ravensara, tansy blue, vanilla and yarrow. · Nutrients i.e. vitamin D, folic acid, riboflavin, pyridoxine, cyanocobalamine, collagen or partially hydrolyzed collagen, silk protein or partially hydrolyzed silk protein, thymine, cytosine, adenine, guanine, rutin, quercetin, azalein, hyperoside, isoquercetin, kampferitin, myricitrin, robinin, speraeoside, xanthorhamin, icariin, truxrutin, vitamin K and coenzyme Q.	[5]
US 20050042186 A1/ 24 Feb 2005/ Peter Zahner	All natural sunscreen lotion	Natural topical sunscreen composition includes 0.01% to 5% by weight of biological melanin, 2% to 10% by weight of green tea extract with polyphenol content greater than 40% and 2% to 10% by weight of either titanium dioxide and/or zinc oxide.	[6]
US 5817299 A/ 6 Oct 1998/ E-L Management Corp.	Non-chemical sunscreen composition	Non-chemical sunscreen comprising about 50% by weight of proanthocyanidins, γ-oryzanol, ferulic acid, titanium dioxide and scutellaria extract.	[7]
WO 2012055678 A1/ 3 May 2012/ Unilever Nv, Unilever Plc, Hindustan Unilever Limited	A stable sunscreen composition	Discloses a stable sunscreen containing zingerone as sunscreen stabilizer which is a derivative of gingerol found in ginger.	[8]

Table 1: Herbal photo protection compositions patented for sunscreen activity.

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Publication No./ Publication date/ Applicant	Title of patent	Disclosure	Reference
EP 0953337 A1/ 3 Nov 1999/ Ioannis Papadakos	Preparation of sun protection oil	Sun protection oil is prepared with pure virgin olive oil in combination with vitamins E and A.	[9]
US 20050112156 A1/ 26 May 2005/ Stefan Busch, Rolf Kawa, Alfred Westfechtel	Sun protection compositions	New sun protection compositions with improved water resistance have an effective content of diol dimer fatty acid esters and dimer diol dimer fatty acid esters.	[10]
WO 2014016349 A1/ Jan 30, 2014/ Biosynthis	Photo protective composition	Photo-protective containing karanja oil and ioned polyester.	[11]
US 20080138446 A1/ 12 June 2008/ Lavender Hill Projects Pvt Ltd	Herbal composition	Herbal composition containing extracts from Thuja, Poke, Sweet violet, Red clover, Greater celandine and Calendula.	[12]
US 7344728 B1/ Mar 18, 2008/ Perry Stephen C	Insect repellent with sun protection factor	An insect repellent composition which includes natural oils (citronella and orange), synthetic ingredients (D-limonene and phtalic acid), sunscreen vitamin F and volatile silicones.	[13]
EP 2144608 A1/ Jan 20, 2010/ Sytheon Ltd.	Sunscreen compositions and methods	Sunscreen compositions comprising of UV-B or UV-A/UV-B sunblock active, meroterpene (Bakuchiol) and dermatological acceptable carrier.	[14]
US 9173823 B2/ 3 Nov 2015/ Institut Biophytis Sas, Universite Pierre Et Marie Curie	Preparation for sun protection	Food preparation containing norbixin, or bixin intended to be administered orally for protection of mammalian skin against UV-radiation.	[15]
WO 2003020236 A2/13 Mar 2003/ Hadasit Medical Research Services & Development Limited, Yissum Research Development Company of The Hebrew University of Jerusalem	The utilization of natural pigments from lichens, cyanobacteria, fungi and plants for sun protection	Natural extract from fungus, cyanobactria, plants, lichens or a mixture having an ultra violet absorbency in range of 220 nm to 425 nm.	[16]
US 5614197 A/ 25 Mar 1997/ Industrial Farmaceutica Cantabria S.A.	Polypodium extract as photoprotectant	Sunscreen containing extracts from ferns of Polypodium.	[17]
US 20090324522 A1/ 31 Dec 2009/ Western Holdings, Llc	Skin protectant compositions	A topical sunscreen synergistic composition includes extracts of hibiscus flower, ferula assa foetida root, pear fruit, and green tea leaf.	[18]
US 4806344 A/ 21 Feb 1989/ Gaskin Frances C	Sun protectant composition and method	The topical sunscreen composition containing melanin as an active ingredient. It also contains sunscreens, vitamins and emollients. These ingredients are rapidly blended through ultrasound for 2-3 hours to enhance sun protective factor.	[19]

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US 6235271 B1/ 22 May 2001/ Ciba Specialty Chemicals Corporation	UV-protection formulation	Sun protection agent comprising of micronized organic UV absorber, an oil-soluble, non-micronized UV absorber and/or an inorganic micro pigment; and polymeric hollow sphere additive and/or xanthan and/or polyvinylpyrrolidone.	[20]

Table 2: Herbal sunscreens patented for photo protection.

Conclusion

This patent review involves previously patented herbal photo protection compositions and sunscreens which are valuable to avert skin damage caused by acute or persistent exposure to solar UV radiations. This patent review was carried using the keywords herbal sunscreen, photo protection and photo ageing.

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