

A Review on Formulation and Evaluation of Sunscreen by Using Natural Sources

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Abstract: Sunscreen is a chemical compound that helps shield the skin from ultraviolet light. Sunburn is caused by UVB radiation, but UVA radiation may cause more skin damage. A sunscreen that blocks both wavebands is ideal. The aim of this study was to use medicinal herbs and specific fixed oils to create a topical herbal sunscreen composition. The goal of this project is to create and evaluate a cosmetic (herbal sunscreen) that shields skin from the sun. Natural ingredients with a range of uses, such as emollient, moisturiser, base, anti-acne, and anti-sweating, include hibiscus and aloe vera. Rose water, almond oil, vitamin E capsules, hibiscus flowers, etc. Actinic keratosis, squamous cell carcinoma, and melanoma can all be avoided with regular sunscreen use. Chemicals, either organic or inorganic, may be present in sunscreen. Sunscreen cream is another term for sunscreen. The object either absorbs or reflects solar radiation. UV radiation and provides skin defence. The use of screening materials that have been successful in lowering the indication has increased as a result of the rising incidence of skin cancers and the effects of UV radiation-induced photo damage.

Keywords: Herbal, sunscreen, skin, sunburn

REFERENCES

- [1] Mishra AK, Chattopadhyay P. Herbal Cosmeceuticals for Photoprotection from Ultraviolet B Radiation: A Review. Tropical Journal of Pharmaceutical Research. 2011; 10 (3): 351-360.
- [2] Skotarczak K, Osmola-Mankowska A, Lodyga M, Polanska A, Mazur M, Adamski Z. Photoprotection: facts and controversies. Eur Rev Med Pharmacol Sci. 2015; 19(1): 98-112. PM
- [3] Neema R, Singh R, Dubey B. Introduction and classification. Text book of cosmetics, CBS Publication and distributors 2009; (1): 82-87.
- [4] Caswell M. Sunscreen Formulation and Testing. Allureas Cosmetics and Toiletries Magazine. 2001; 116(9):49- 60.
- [5] Kaimal S, Abraham A. Sunscreens. Indian J Dermatol Venereol Leprol. 2011;77(2):238-43.
- [6] Saraf S, Kaur CD. Phytoconstituents as photo protective novel cosmetic formulations. Pharmacogn Rev. 2010; 4(7): 1-11.
- [7] Natural sunscreen Available from <http://wakeup-world.com/2012/05/14/naturalsunscreen/>
- [8] Emsley J. Better Looking, Better Living, Better Loving: How Chemistry can Help You Achieve Life's Goals. Weinheim: WILEY-VCH; 2007.
- [9] Erbaş S, Baydar H. Variation in scent compounds of oil-bearing Rose (Rosa damascene Mill.) Produced by headspace solid Phase micro-extraction, hydrodistillation and solvent extraction. Rec. Nat. Prod. 2016; 10: 555- 565.
- [10] Balakrishnan KP, Aswamy NN. Botanicals as sunscreens: Their role in the prevention of photoaging and skin cancer. Int. J. Res. Cosmet. Sci. 2011; 1: 1-12.
- [11] Sun L, Zhang Y, Zhuang Y. Antiphotoprotective Effect and Purification of an Antioxidant Peptide from Tilapia (Oreochromis niloticus) Gelatin Peptides. J. Funct. Foods. 2013; 5: 154-162. [CrossRef]
- [12] Snyder SM, Low RM, Stocks JC, Eggett DL, Parker TL. Juice, Pulp and Seeds Fractionated from Dry Climate Primocane Raspberry Cultivars (Rubus idaeus) Have Significantly Different Antioxidant Capacity, Anthocyanin Content and Color. Plant Foods Hum. Nutr. 2012; 67: 358-364. [CrossRef]

- [13] Oomah BD, Ladet S, Godfrey DV, Liang J, Girard B. Characteristics of raspberry (*Rubus idaeus* L.) seed oil. *Food Chem.* 2000; 69: 187–193. [CrossRef]
- [14] Alaluf S, Heinrich U, Stahl W, Tronnier H, Wiseman S. Dietary Carotenoids Contribute to Normal Human Skin Color and UV Photosensitivity. *J. Nutr.* 2002; 132: 399–403. [CrossRef]
- [15] Ryan AS, Goldsmith LA. Nutrition and the skin. *Clin. Dermatol.* 1996; 14: 389–406. [CrossRef] [16] Gašperlin M, Gosenc M. Main approaches for delivering antioxidant vitamins through the skin to prevent skin ageing. *Expert Opin. Drug Deliv.* 2011; 8: 905–919. [CrossRef]
- [17] Lee J, Jiang S, Levine N, Watson RR. Carotenoid supplementation reduces erythema in human skin after simulated solar radiation exposure. *Proc. Soc. Exp. Biol. Med.* 2000; 223: 170–174. [CrossRef]
- [18] Kole P, Jadhav H, Thakur P. Cosmetics Potential of Herbal Extracts. *Nat. Prod. Radiance.* 2005; 4(4): 315-321.
- [19] Gediya S, Mistry R, Patel U, Blessy M. Herbal Plants Used as a Cosmetics. *Scholars Research Library.* 2011; 1(1):24-32.
- [20] Ashawat M, Shailendra S, Swarnalata S. Biochemical and Histopathological Studies of Herbal Cream against UV Radiation Induced Damage. *Trend Med. Res.* 2007; 2(3): 135-141.
- [21] DebMandal, M. & Mandal, S. 2011. Coconut (*Cocos nucifera* L. *Arecaceae*): In health promotion and disease prevention. *Asian Pacific Journal of Tropical Medicine* 4(3): 241-247.
- [22] Nevin, K. G. & Rajamohan, T. 2010. Effect of topical application of virgin coconut oil on skin components and anti-oxidant status during dermal wound healing in young rats. *Skin Pharmacology and Physiology* 23(6): 290- 297.
- [23] Merlin Hernanto, Suswardana, Putu Dyah Ayu Saraswati, Sunardi Radiono 2008. Virgin coconut oil protection against UVB induced erythema and pigmentation. *Berkala Ilmu Kesehatan Kulit & Kelamin* 20(3): 208-211.
- [24] Kim, S., Jang, J. E., Kim, J., Lee, Y. I., Lee, D. W., Song, S. Y. & Lee, J. H. 2017. Enhanced barrier functions and anti-inflammatory effect of cultured coconut extract on human skin. *Food and Chemical Toxicology* 106(Part A): 367-375.
- [25] Rahmad, R., Earlia, N., Nabila, C., Inayati, I., Amin, M., Prakoeswa, C. R. S., Khairan, K. & Idroes, R. 2019. Antibacterial cream formulation of ethanolic *Pliek U* extracts and ethanolic residue hexane *Pliek U* extracts against *Staphylococcus aureus*. In *IOP Conference Series: Materials Science and Engineering* 523. Acheh: IOP Publishing. p. 012011.
- [26] Lin, T. K., Zhong, L. & Santiago, J. 2017. Anti-inflammatory and skin barrier repair effects of topical application of some plant oils. *International Journal of Molecular Sciences* 19(1): 70.
- [27] Vaughn, A. R., Clark, A. K., Sivamani, R. K. & Shi, V. Y. 2018. Natural oils for skin-barrier repair: Ancient compounds now backed by modern science. *American Journal of Clinical Dermatology* 19(1): 103-117.
- [28] Evangelista, M. T. P., Abad-Casintahan, F. & Lopez-Villafuerte, L. 2014. The effect of topical virgin coconut oil on SCORAD index, transepidermal water loss, and skin capacitance in mild to moderate pediatric atopic dermatitis: A randomized, double-blind, clinical trial. *International Journal of Dermatology* 53(1): 100-108.
- [29] Deore SL, Kombade S, Baviskar BA, Khadabadi SS. Photoprotective antioxidant phytochemicals. *International Journal of Phytopharmacy*, 2012; 2(3): 72-76.
- [30] Kim YH, Yang HE, Park BK, Heo MY, Jo BK, Kim HP; The extract of the flowers of *Prunus persica*, a new cosmetic ingredient protects against solar ultraviolet-induced skin damage in vivo. *Journal of Cosmetic Science*, 2002; 53(1); 27-34.
- [31] Wijeratne SS, Abou-zaid MM, Shahidi F; Antioxidant polyphenols in almonds and its coproducts. *Journal of Agricultural and Food Chemistry*, 2006; 54 (2); 312-318.
- [32] Sachdeva MK and Katyal T. Abatement of detrimental effects of photo aging by *Prunus amygdalus* skin extract. *International Journal of Current Pharmaceutical Research*, 2011; 3(1), 57-59.
- [33] Halvorsen BL, Holte K, Myhrstad MCV, et al. A systematic screening of total antioxidants in dietary plants. *J Nutr.* 2002; 132:461–471. [PubMed] [Google Scholar]
- [34] Patel S. Rose hips as complementary and alternative medicine: overview of the present status and prospects. *Med J Nutrition Metab.* 2013; 6:89–97. [Google Scholar]
- [35] Fan C, Pacier C, Martirosyan DM. Rose hip (*Rosa canina* L.): a functional food perspective. *Funct Foods Health Dis.* 2014; 4(11):493–509. [Google Scholar]

- [36] Larsen E, Kharazmi A, Christensen LP, Christensen SB. An antiinflammatorygalactolipid from rose hip (*Rosa canina*) that inhibits chemotaxis of human peripheral blood neutrophils in vitro. *J Nat Prod.* 2003;66(7):994– 995. [PubMed] [Google Scholar]
- [37] Schwager J, Hoeller U, Wolfram S, Richard N. Rose hip and its constituent galactolipids confer cartilage protection by modulating cytokine, and chemokine expression. *BMC Complement Altern Med.* 2011;11:105– 119. [PMC free article] [PubMed] [Google Scholar]
- [38] Anitha T. , Medicinal Plants used in Skin Protection, *Asian Journal of Pharmaceutical and Clinical Research.* 2012; 5(3):35-38.
- [39] Pandey S, Meshya N, Viral D. Herbs Play an Important Role in the Field of Cosmetics. *International Journal of Pharm Tech Research.* 2010; 1(1): 632-639.
- [40] Rangari VD. Traditional Drugs of India. *Pharmacognosy and phytochemistry carrier Publication Nashik* 2003; 2(1) 225-267.
- [41] Khandelwal KR *Practical Pharmacognosy Techniques and Experimental.* NiraliPrakashan Pune 2004; (12):149-156.
- [42] Aburjai T, Natsheh FM. Plants used in cosmetics. *Phytotherapy Res* 2003; 17: 987-1000.
- [43] Bendová H, Akrman J, Krejčí A, Kubác L, Jírová D, Kejlová K, et al. in vitro approaches to evaluation of Sun Protection Factor. *Toxicol in vitro* 2007;21:1268-75.
- [44] Sayre. R. M, Agin P P, Levee, G. J, MarloweE. Comparison of in vitro testing of sun screening formulas. *Photochemical Photobiological.* Oxford . 1979; ver. 29, 559-566
- [45] Mishra AK, Chattopadhyay P; *HerbalCosmeceuticals for Photoprotection from Ultraviolet B Radiation: A Review.* *Tropical Journal of Pharmaceutical Research,* 2011; 10 (3): 351-360.
- [46]. Nabiha Y, Cynthia I, Katiyar S, Craig A; Photo protective effects of green tea polyphenols. *Photodermatology, Photoimmunology&Photomedicine,* 2007; 23(1): 48-56.
- [47]. Kumler WD, Daniels TC; Sunscreen compounds. *Journal of the American Pharmaceutical Association,* 1948; 37(11): 474–476.
- [48]. Vogler BK, Ernst E; Aloe vera: A systematic review of its clinical effectiveness. *British Journal of General Practice,* 1999; 49(447): 823–828.
- [49]. West DP, Zhu YF; Evaluation of Aloe vera gel gloves in the treatment of dry skin associatedwith occupational exposure. *American Journal of infection control,* 2003; 31(1): 40–42.
- [50]. Rajpal V; Aloe barbadensis Mill/A. veraTourn ex linn. In *Standardization of botanicals testing and extraction methods of medicinal herbs.*